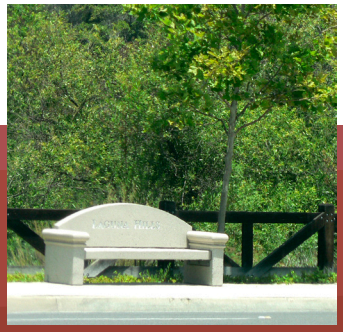
FINAL

City of Laguna Hills General Plan

PROGRAM ENVIRONMENTAL IMPACT REPORT

STATE CLEARINGHOUSE
#20080811100



June 2009

Lead Agency:

City of Laguna Hills
Community Development Department
24035 El Toro Road
Laguna Hills, CA 92653

Contact: Julie Molloy, Senior Planner
(949) 707-2670
jmolloy@ci.laguna-hills.ca.us

Consultants to the City:

EDAW, Inc.
1420 Kettner Boulevard
Suite 500
San Diego, CA 92101
(619) 233-1454

EDAW | AECOM

Final
Program Environmental Impact Report

City of Laguna Hills General Plan

State Clearinghouse # 20080811100

June 2009

Lead Agency:

City of Laguna Hills
Community Development Department
24035 El Toro Road
Laguna Hills, CA 92653

Contact: Julie Molloy, Senior Planner
(949) 707-2670
jmolloy@ci.laguna-hills.ca.us

Consultants to the City:
EDAW, Inc.
1420 Kettner Boulevard, Suite 500
San Diego, CA 92101
(619) 233-1454

TABLE OF CONTENTS

Section **Page**

LIST OF ACRONYMS AND ABBREVIATIONS vii

1.0 INTRODUCTION 1-1
- 1.1 Legal Requirements 1-1
- 1.2 Purposes of the Program EIR 1-1
- 1.3 Intended Use of the Program EIR 1-2
- 1.4 Structure and Organization of Program EIR 1-3
- 1.5 General Approach to Program EIR Analysis 1-3
- 1.6 Background 1-4
- 1.7 Availability of DRAFT Program EIR 1-4
- 1.8 Comments Requested 1-4

2.0 EXECUTIVE SUMMARY 2-1
- 2.1 The Project 2-1
- 2.2 Project Location 2-1
- 2.3 Summary of Environmental Impacts 2-1
- 2.4 Potential Areas of Controversy 2-3
- 2.5 Alternatives to the Proposed Project 2-3

3.0 PROJECT DESCRIPTION 3-1
- 3.1 Background 3-1
- 3.2 Regional Setting 3-1
- 3.3 Planning Area 3-1
- 3.4 Purpose and Objectives of the General Plan 3-4
- 3.5 Project Characteristics 3-5
- 3.6 Alternatives 3-14

4.0 ENVIRONMENTAL SETTING 4-1

5.0 ENVIRONMENTAL IMPACT ANALYSIS 5.0-1
- 5.1 Aesthetics and Visual Resources 5.1-1
- 5.2 Agricultural Resources 5.2-1
- 5.3 Air Quality 5.3-1
- 5.4 Biological Resources 5.4-1
- 5.5 Cultural and Paleontological Resources 5.5-1
- 5.6 Geology, Soils, and Mineral Resources 5.6-1
- 5.7 Hazards and Hazardous Materials 5.7-1
- 5.8 Hydrology and Water Quality 5.8-1
- 5.9 Land Use and Planning 5.9-1
- 5.10 Noise 5.10-1
- 5.11 Population and Housing 5.11-1

5.12 Public Services and Utilities 5.12-1
5.13 Recreation 5.13-1
5.14 Transportation and Circulation 5.14-1
5.15 Theoretical Build-Out Scenario 5.15-1

6.0 ANALYSIS OF LONG-TERM EFFECTS 6-1
6.1 Geographic Scope 6-2
6.2 Cumulative Impacts 6-2
6.3 Global Climate Change 6-8
6.4 Growth-Inducing Impacts 6-26
6.5 Significant Irreversible Environmental Changes 6-27
6.6 Unavoidable Significant Environmental Impacts 6-27
6.7 Areas of No Significant Impact 6-28

7.0 ALTERNATIVES 7-1
7.1 Alternative 1: No Project/Existing General Plan 7-3
7.2 Alternative 2: No Change to Urban Village Specific Plan 7-9
7.3 Alternative 3: Mandatory Conservation Measures and Programs 7-12

8.0 REFERENCES 8-1

9.0 RESPONSES TO COMMENTS ON DRAFT EIR 9-1

APPENDICES

A Notice of Preparation (NOP) and NOP Comment Letters
B Biological Resources Tables
C Seismic and Geologic Technical Background Report
D General Plan Update Noise Modeling
E General Plan Update Traffic Study
F Air Quality and Global Climate Change Calculations

LIST OF FIGURES

Figure		Page
3-1	Regional Location	3-2
3-2	Laguna Hills Planning Area	3-3
3-3	Proposed General Plan Land Use Designations	3-7
3-4	Land Use Opportunity Areas and Future Study Areas	3-9
5.1-1	Scenic Resources	5.1-2
5.4-1	Sensitive Plant and Wildlife Species	5.4-6
5.5-1	Underlying Geologic Formations	5.5-3
5.6-1	Fault Locations	5.6-3
5.6-2	Landslide and Liquefaction Hazard Zones	5.6-5
5.7-1	Fire Hazards	5.7-5
5.8-1	Hydrology	5.8-2
5.8-2	Flood Zones	5.8-5
5.10-1	Laguna Hills Community Noise Exposure Guidelines	5.10-4
5.10-2	Arterial Road Baseline Noise Contours	5.10-5
5.10-3	2030 Noise Contours	5.10-6
5.12-1	Location of Community and Public Facilities	5.12-2
5.12-2	Water District Service Areas	5.12-7
5.12-3	Energy Provider Service Areas	5.12-11
5.13-1	Parkland (Public and Private)	5.13-3
5.13-2	Trails (Existing and Proposed)	5.13-7
5.14-1	Existing Roadway Network	5.14-2
5.14-2	Existing Average Daily Traffic (ADT) Volumes	5.14-6
5.14-3	Study Intersections	5.14-7
5.14-4	Existing Level of Service (LOS)	5.14-8
5.14-5	2030 Average Daily Traffic (ADT) Volumes	5.14-17
5.14-6	2030 Level of Service (LOS)	5.14-19

LIST OF TABLES

Table		Page
2-1	Project Level Environmental Impacts and Mitigation Measures	2-4
3-1	Existing and Proposed Land Use Designations	3-8
3-2	Urban Village Specific Plan Area	3-11
3-3	Laguna Hills Development Capacity (2030)	3-12
3-4	Opportunity Sites and Future Study Areas Development Capacity	3-12
5.3-1	Mission Viejo and Costa Mesa Monitoring Stations – Ambient Air Quality	5.3-6
5.3-2	Federal and State Ambient Air Quality Standards	5.3-10
5.3-3	SCAQMD Air Quality Significance Thresholds	5.3-15
5.3-4	Summary of Modeled Operational Emissions of Criteria Air Pollutants and Precursors – 2030 Conditions upon Buildout of the General Plan	5.3-18
5.3-5	Summary of Carbon Monoxide Hot Spot Screening Level Analysis	5.3-23
5.4-1	Sensitive Plant and Wildlife Species with Moderate or High Potential to Occur in the Vicinity of the Planning Area	5.4-3
5.5-1	Paleontological Sensitivity within Laguna Hills	5.5-4
5.6-1	Major Faults within Approximately 50-mile Radius of Laguna Hills	5.6-4
5.7-1	Properties within the Planning Area on the Cortese List	5.7-2
5.8-1	Beneficial Uses of Watersheds in the Laguna Hills Region	5.8-3
5.9-1	Consistency with SCAG Policies from the RCP and RTP	5.9-7
5.10-1	State of California Interior and Exterior Noise Standards	5.10-2
5.10-2	Residential Noise Standards	5.10-2
5.10-3	Short-Term Noise Measurements – October 2008	5.10-7
5.11-1	City of Laguna Hills and Orange County Population – 1980 through 2008	5.11-1
5.11-2	Population Growth Trends	5.11-2
5.11-3	Comparison of Existing Housing Stock Estimates to SCAG 2030 Projections	5.11-4
5.12-1	Fire Station # 22 Service Call Information (2007)	5.12-1
5.12-2	Fire Stations near Laguna Hills	5.12-3
5.12-3	Crime Statistics in Laguna Hills – 2007 and 2008 (YTD)	5.12-4
5.12-4	Public Schools Serving Laguna Hills Enrollment and Capacity (2007-2008)	5.12-5
5.12-5	Public School Site Characteristics	5.12-5
5.12-6	Saddleback Valley Unified School District Student Generation Factors by New Residential Dwelling Unit Type and Education Level	5.12-15
5.12-7	Potential Environmental Impacts Associated with Desalination Projects	5.12-21
5.13-1	Public Parklands and Recreational Facilities in Laguna Hills	5.13-1
5.13-2	Private Parks (IODs) within Laguna Hills	5.13-4
5.13-3	Existing Pedestrian/Equestrian Trails and Multi-Use Corridors within Laguna Hills	5.13-5
5.13-4	Existing and Future Park Acreage Needs	5.13-9
5.14-1	Roadway Classifications	5.14-3
5.14-2	Level of Service Descriptions	5.14-4
5.14-3	Existing Peak Hour Intersection Levels of Service	5.14-9
5.14-4	OCTA Bus Routes Serving Laguna Hills (2008)	5.14-10
5.14-5	Bikeway Classification Description	5.14-11
5.14-6	Year 2030 Committed Improvements	5.14-15

5.14-7 Proposed Land Use Changes and Trip Generation (ADT) Summary 5.14-16
5.14-8 2030 Peak Hour Level of Service for Study Intersections in Opportunity Areas 5.14-16
5.14-9 2030 Peak Hour Level of Service 5.14-18
5.15-1 Theoretical Build-Out Capacity 5.15-1
6-1 SCAG Projections for City of Laguna Hills and Orange County: 2030 6-1
6-2 Geographic Scope of Cumulative Impacts 6-2
6-3 Global Warming Potentials and Atmospheric Lifetimes 6-10
6-4 City of Laguna Hills General Plan Summary of Greenhouse Gas Emissions under Existing Conditions and Buildout of the General Plan 6-20
7-1 Comparison of Impacts of Alternatives to the Proposed Project 7-2
7-2 Development Capacity and Projected Population Existing No Project/Existing General Plan vs. General Plan 7-4
9-1 Comment Letters Regarding the DEIR Matrix of Comments 9-1

This page intentionally left blank.

LIST OF ACRONYMS AND ABBREVIATIONS

AB	Assembly Bill
ADA	Americans with Disabilities Act
ADT	Average daily traffic
AQMP	Air Quality Management Plan
AMP	Allen-McCulloch pipeline
amsl	above mean sea level
APS	Alternative Planning Strategy
ARB	California Air Resources Board
AST	Aboveground Storage Tanks
ATCM	Airborne Toxic Control Measures
BACT	Best Available Control Technology Guidelines
Basin	South Coast Air Basin
BEP	Business Emergency Plan
BMP	Best Management Practice
CAA	Clean Air Act
CAAA	Clean Air Act Amendments of 1990
CAAQS	California Ambient Air Quality Standards
CAT	Climate Action Team
CalARP	California Accidental Release Program
Cal/EPA	California Environmental Protection Agency
CAL FIRE	California Department of Forestry and Fire Protection
Cal/OSHA	California Division of Occupational Safety and Health
Caltrans	California Department of Transportation
CCAA	California Clean Air Act
CCAR	California Climate Action Registry
CRHR	California Register of Historical Resources
CBC	California Building Code
CCR	California Code of Regulations
CDF	California Department of Finance
CDFG	California Department of Fish and Game
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CESA	California Endangered Species Act
CFC	Chlorofluorocarbons
CFR	Code of Federal Regulations
CGS	California Geological Survey
CH_4	Methane
CHHSL	California Human Health Screening Levels
CHP	California Highway Patrol
CIWMB	California Integrated Waste Management Board
CMP	Congestion Management Program
CNEL	Community Noise Equivalent Level
CNNDB	California Natural Diversity Data Base
CNPS	California Native Plant Society

CPP	Comprehensive Phasing Plans
CPTED	Crime Prevention through Environmental Design
CO	Carbon Monoxide
CO_2	Carbon dioxide
CO_2e	Equivalent carbon dioxide
CUPA	Certified Unified Program Agency
CWA	Clean Water Act
˚C	degrees Celsius
DAMP	Drainage Area Management Plan
dB	decibels
DBA	Diameter at Breast Height
diesel PM	diesel particulate matter
DOC	California Department of Conservation
DOT	Department of Transportation
DMG	California Division of Mines and Geology
EIR	Environmental Impact Report
EMA	Orange County Environmental Management Agency
EOCF	East Orange County Feeder No.2
EOP	Emergency Operation Plan
EPCRA	Emergency Planning Community Right-to-Know Act
ETWD	El Toro Water District
FAA	Federal Aviation Administration
FAR	Floor Area Ratio
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
FIRM	Flood Insurance Rate Maps
FMMP	Farmland Mapping and Monitoring Program
˚F	degrees Fahrenheit
GCM	general circulation models
GHG	Greenhouse Gases
GMA	growth management areas
GMC	Growth Management Chapter
GPAC	General Plan Advisory Council
GRP	General reporting protocol
GWP	Global warming potential
HAP	hazardous air pollutant
HCP	Habitat Conservation Plan
HFC	Hydrofluorocarbons
HMD	Hazardous Materials Disclosure
HMTA	Hazardous Materials Transportation Act
H&SC	Health and Safety Code
HSWA	Hazardous and Solid Waste Amendments
HWCA	Hazardous Waste Control Act

I-5	Interstate 5
IBC	International Building Code
ICU	Intersection Capacity Utilization
IODs	Irrevocable Offers of Dedication
IPCC	Intergovernmental Panel on Climate Change
IWMD	Integrated Waste Management Department
JPA	Joint Powers Authority
JRWSS	Joint Regional Water Supply System
LEED®	Leadership in Energy and Environmental Design
lb/day	pounds per day
L_{eq}	Equivalent sound levels
LHTAM	The City of Laguna Hills Traffic Analysis Model
LID	Low Impact Development
LIP	Local Implementation Plan
L_{dn}	Day-Night Average Sound Level
LOS	Level of Service
MACT	maximum achievable control technology
MATES III	Multiple Air Toxics Exposure Study III
MBTA	Migratory Bird Treaty Act
MMI	Modified Mercalli Intensity Scale
MMRP	Mitigation Monitoring and Reporting Program
MNWD	Moulton Niguel Water District
MPAH	Master Plan of Arterial Highways
MPD	Master Plan of Drainage
MPO	Metropolitan Planning Organization
MRZ	Mineral Resource Zone
MS4s	Municipal Separate Storm Sewer Systems
MSAA	Master Streambed Alteration Agreement
MWD	Metropolitan Water District
MWDOC	Municipal Water District of Orange County
N_2O	Nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NCCP	Natural Communities Conservation Plan
NEPA	National Environmental Policy Act
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NFIP	National Flood Insurance Program
NHPA	National Historic Preservation Act
NOP	Notice of Preparation
NO	Nitric Oxide
NO_2	Nitrogen Dioxide
NO_X	Nitrogen Oxides
NPDES	National Pollutant Discharge Elimination System
NPPA	Native Plant Protection Act
NRHP	National Register of Historic Places

O_3	Near-surface ozone
OCEHD	Orange County Environmental Health Division
OCFA	Orange County Fire Authority
OCFCD	Orange County Flood Control Division
OCPL	Orange County Public Library
OCSD	Orange County Sherriff's Department
OCTA	Orange County Transportation Authority
OEHHA	Office of Environmental Health Hazard Assessment
OES	Office of Emergency Services
OHP	Office of Historic Preservation
OPAC	Online Public Access Catalog
OPR	Office of Planning and Research
OSHA	Occupational Safety and Health Administration
PFC	Perfluorocarbons
PM_{10}	Particulate Matter of 10 micrometers or less
$PM_{2.5}$	Particulate Matter of 2.5 micrometers or less
ppm	parts per million
PUC	Public Utilities Commission
RCP	Regional Comprehensive Plan
RCRA	Resource Conservation and Recovery Act
RELOOC	Regional Landfill Options for Orange County
RHNA	Regional Housing Needs Assessment
ROG	Reactive Organic Gas
RSPA	Research and Special Programs Administration
RTIP	Regional Transportation Improvement Plan
RTP	Regional Transportation Plan
RWQCB	Regional Water Quality Control Board
SARA	Superfund Amendments and Reauthorization Act of 1986
SB	Senate Bill
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCE	Southern California Edison
SCRRA	Southern California Regional Rail Authority
SCS	Sustainable Communities Strategy
SDG&E	San Diego Gas and Electric
SEMS	Standardized Emergency Management System
SESS	Safety and Environmental Services Section
SF_6	Sulfur hexafluoride
SEMS	Standardized Emergency Management System
SHBC	State Historical Building Code
SHMA	Seismic Hazards Mapping Act
SHRC	State Historic Resources Commission
SIP	State Implementation Plan
SJHBT	San Joaquin Hills blind thrust
SMAQMD	Sacramento Metropolitan Air Quality Management District
SMARA	Surface Mining and Reclamation Act
SO_2	Sulfur Dioxide

SO_X	Sulfur Oxides
SOCWA	Southern Orange County Water Authority
SONGS	San Onofre Nuclear Generating Station
SR	State Route
SRRE	Source Reduction and Recycling Element
SSNCP	Southern Subregion Natural Community Conservation Plan
SVUSD	Saddleback Valley Unified School District
SWMP	Storm Water Management Plan
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	Toxic Air Contaminants
taf	thousand acre-feet
TDM	Transportation Demand Management
TMDL	Total Maximum Daily Load
TPY	Tons per year
TRU	Transportation Refrigeration Unit
UBC	Uniform Business Code
UFC	Uniform Fire Code
URM	Unreinforced Masonry
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
UST	Underground Storage Tank
UVSP	Urban Village Specific Plan
UWMP	Urban Water Management Plan
V/C	Volume to Capacity Ratio
VMT	Vehicle Miles Travelled
VOC	Volatile Organic Compounds
WAP	Watershed Action Plans
WRP	Water Recycling Plant

This page intentionally left blank.

1.0 INTRODUCTION

This program environmental impact report (Program EIR) is a first tier evaluation of the environmental effects associated with the adoption and implementation of the updated Laguna Hills General Plan and associated Zoning Ordinance amendments by the City of Laguna Hills. Throughout this document, it is assumed that references to the General Plan mean the proposed General Plan including the associated Zoning Ordinance amendments needed to implement the General Plan.

The City completed a Public Review Draft General Plan and associated Zoning Ordinance amendments in January 2009. The adoption and implementation of these planning and regulatory documents constitutes a project for the purposes of the California Environmental Quality Act (CEQA) and the state CEQA Guidelines.

1.1 LEGAL REQUIREMENTS

This Program EIR has been prepared in accordance with the California Environmental Quality Act of 1970 (Public Resources Code Section 21000 et seq.), and the Guidelines for Implementation of CEQA published by the Resources Agency of the State of California (California Administrative Code Section 15000 et seq.) and the City of Laguna Hills' Local Guidelines for Implementing the California Environmental Quality Act (1999).

The report was prepared by professional environmental consultants under contract to the City of Laguna Hills. The City of Laguna Hills is the lead agency for the preparation of this Program EIR, as defined by CEQA (Public Resources Code Section 21067 as amended), and the content of the document reflects the independent judgment of the City.

1.2 PURPOSES OF THE PROGRAM EIR

This Program EIR is intended to provide information to public agencies, the general public, and decision makers regarding potential environmental impacts related to adoption and implementation of the updated Laguna Hills General Plan and associated Zoning Ordinance amendments. The purpose of an EIR, under the provisions of CEQA, is "to identify the significant effects on the environment of a project, to identify alternatives to the project, and to indicate the manner in which those significant effects can be mitigated or avoided." (Public Resources Code Section 21002.1[a])

According to CEQA Guidelines (Section 15168), a Program EIR may be prepared on a series of actions that can be characterized as one large project, are related geographically, and are logical parts in the chain of contemplated actions in connection with issuance of rules, regulations, or plans. The Program EIR allows for a more exhaustive consideration of effects and alternatives than would be practical in a Program EIR on separate individual actions, and ensures consideration of cumulative impacts that might be slighted on a case-by-case basis.

This Program EIR provides a first-tier analysis of the environmental effects of the updated Laguna Hills General Plan and associated Zoning Ordinance amendments. Section 15152 of the CEQA Guidelines indicates that tiering is appropriate when the sequence of analysis is from an EIR prepared for a general plan, policy, or program to an EIR or negative declaration for another plan, policy, or program of lesser scope, or to a site-specific EIR or negative declaration. Subsequent activities in accordance with the proposed Laguna Hills General Plan must be examined in light of this Program EIR to determine whether an additional environmental analysis must be conducted and documentation prepared. If a subsequent project or later activity would have effects that were not examined in this Program EIR, or were not

examined at an appropriate level of detail to be used for the later activity, an initial study would need to be prepared, leading to a negative declaration or an EIR. If the City finds that pursuant to Section 15152 of the CEQA Guidelines, no new effects could occur or new mitigation measures would be required on a subsequent project, the City can approve the activity as being within the scope of the project covered by this Program EIR, and no new environmental documentation would be required.

This Program EIR serves as an information document for use by public agencies, the general public, and decision makers. This Program EIR is not a City of Laguna Hills policy document; it does, however, discuss the impacts of development pursuant to the General Plan, associated Zoning Ordinance amendments and related components, and analyzes project alternatives. This Program EIR would be used by the City of Laguna Hills City Council in assessing impacts of the proposed project prior to adoption of the General Plan and associated Zoning Ordinance amendments.

1.3 INTENDED USE OF THE PROGRAM EIR

The Program EIR serves as the basis for environmental review and impact mitigation for adoption and implementation of the proposed City of Laguna Hills General Plan. The City would review subsequent implementation projects for consistency with the Program EIR and prepare appropriate environmental documentation pursuant to CEQA provisions for Program EIRs and subsequent projects. Subsequent projects under the Program EIR may include the following implementation activities:

- Zoning text amendments
- Rezoning of properties
- Approval of Specific Plans
- Approval of development plans, including tentative maps, variances, conditional use permits, and other land use permits
- Approval of development agreements
- Approval of facility and service master plans and financing plans
- Approval and funding of public improvements projects
- Approval of resource management plans
- Issuance of municipal bonds
- Issuance of permits and other approvals necessary for implementation of the General Plan
- Acquisition of property by purchase or eminent domain
- Transfer or sale of property
- Issuance of permits and other approvals necessary for public and private development projects

The following lead, responsible, and trustee agencies may utilize this Program EIR in the adoption of the General Plan and approval of subsequent implementation activities. These agencies may include, but are not limited to, the following:

- City of Laguna Hills
- U.S. Fish and Wildlife Service
- U.S. Army Corps of Engineers
- California Department of Fish and Game
- California Department of Conservation
- California Department of Housing and Community Development
- California Department of Transportation (Caltrans)
- State Lands Commission
- California Water Resources Control Board

- Southern California Association of Governments
- South Coast Air Quality Management District
- County of Orange
- Orange County Transportation Authority
- Metropolitan Water District of Southern California
- Moulton Niguel Water District
- El Toro Water District
- Saddleback Valley Union School District
- Southern California Edison
- San Diego Gas and Electric

1.4 STRUCTURE AND ORGANIZATION OF PROGRAM EIR

This Program EIR is organized into eight chapters. Chapter 1.0 is this Introduction. The Executive Summary, provided in Chapter 2.0, includes a brief project description and summarizes project impacts and mitigation measures. Chapter 3.0 provides a detailed description of the General Plan and associated Zoning Ordinance amendments. The general environmental setting is provided in Chapter 4.0. Chapter 5.0 analyzes project impacts and identifies mitigation measures designed to reduce significant impacts. An analysis of cumulative impacts, growth inducing impacts, significant irreversible environmental impacts and areas of no significant impact is provided in Chapter 6.0. Chapter 7.0 provides an analysis of alternatives to the proposed project. Chapter 8.0 contains reference information.

The Appendices consist of the Notice of Preparation and Responses to the Notice of Preparation (Appendix A) and technical documents (Appendices B through F) included as supporting information to the Program EIR. In compliance with Public Resources Section 21081.6, a mitigation monitoring and reporting program would be prepared as a separately bound document that would be adopted in conjunction with the certification of the Final Program EIR and project approval.

1.5 GENERAL APPROACH TO PROGRAM EIR ANALYSIS

As discussed above, the approach to the analysis presented in this Program EIR is programmatic in nature. Each environmental issue is analyzed in the same manner starting with a discussion of the existing environmental setting. Thresholds of significance are then defined and used to measure the project's potential impact in the environmental impact section. If the General Plan would result in a significant impact for a particular environmental issue, mitigation measures are included within the discussion. The majority of the mitigation measures included in this Program EIR have been derived from the Implementation Plan for the General Plan. Each implementation program is a procedure, program, or technique that requires City action, either alone or in collaboration with non-City organizations or state and federal agencies. Some of the implementation programs are processes or procedures the City currently administers on a day-to-day basis (such as development project review), while others identify new programs or projects. By identifying a responsible party, a timeline for implementation, and a monitoring frequency, the Implementation Plan provides a mechanism for ensuring that potential impacts resulting from the proposed project are reduced below a level of significance. It should be noted that not all implementation programs would serve as mitigation in this Program EIR and that mitigation measures proposed are not all from the Implementation Plan. Lastly, the analysis includes a discussion on the level of significance of each environmental impact after proposed mitigation measures are incorporated. Chapter 5.0 of this Program EIR includes a complete discussion of the approach to the analysis contained in this Program EIR.

1.6 BACKGROUND

To define the scope of the investigation of the Program EIR, the City of Laguna Hills distributed a Notice of Preparation (NOP) to city, county and state agencies; other public agencies; and interested private organizations and individuals. The purpose of the NOP was to identify agency and public concerns regarding potential impacts of the proposed project. Comment letters were received from the following:

- Governor's Office of Planning and Research, State Clearinghouse
- Native American Heritage Commission
- Office of Emergency Services
- Department of Transportation – Caltrans District 12
- City of Lake Forest
- City of Mission Viejo
- Roxanne Bernal (private citizen)

Written comments received during the 30-day public review period for the NOP are included in Appendix A of this Program EIR.

1.7 AVAILABILITY OF DRAFT PROGRAM EIR

This Program EIR ~~is~~ was available at the Laguna Hills City Hall for a 45-day public review period from February ~~9~~2, 2009, through March ~~26~~18, 2009. The Laguna Hills City Hall is located at 24035 El Toro Road Laguna Hills, CA 92653. Documents ~~may~~ were available for review~~be reviewed~~ during regular business hours.

1.8 COMMENTS REQUESTED

Comments were received from agencies ~~and individuals are invited~~ regarding the information contained in the Program EIR. ~~Where possible, those responding should endeavor to provide the information they feel is lacking in the Program EIR, or should indicate where the information may be found. All comments~~ Comments on the Program EIR ~~should~~ were~~be~~ sent to the following City of Laguna Hills contact person:

Julie Molloy
City of Laguna Hills Community Development Department
24035 El Toro Road
Laguna Hills, CA 92653
(949) 707-2670
jmolloy@ci.laguna-hills.ca.us

Following the 45-day period of circulation and review of the Program EIR, all comments and the City's responses to the comments ~~will be~~were incorporated into ~~a~~ this Final Program EIR prior to certification of the document by the City of Laguna Hills.

2.0 EXECUTIVE SUMMARY

2.1 THE PROJECT

The proposed project analyzed in this Program EIR is the adoption and implementation of the City of Laguna Hills General Plan and associated Zoning Ordinance amendments. The Program EIR provides a program-level assessment of the general environmental impacts resulting from the development of land uses and implementation of policies established within the General Plan and Zoning Ordinance.

2.2 PROJECT LOCATION

The City of Laguna Hills is comprised of approximately 6.6 square miles of land (or about 4,234 acres) and is located in southern Orange County approximately 45 miles southeast of the City of Los Angeles, 68 miles northwest of the City of San Diego, and 6 miles northeast of the Pacific Ocean. The City is bordered to the north by the cites of Irvine and Lake Forest, to the east by the Interstate 5 (I-5) Freeway and the city of Mission Viejo, to the west by the cities of Laguna Woods and Aliso Viejo, and to the south by the City of Laguna Niguel. Regional access to Laguna Hills is provided by I-5 and State Route (SR) 73. Figure 3-1 depicts the regional location of the planning area, while Figure 3-2 shows the planning area boundaries (shown in Chapter 3.0, Project Description).

2.3 SUMMARY OF ENVIRONMENTAL IMPACTS

The City of Laguna Hills determined that a Program EIR is required pursuant to the state CEQA Guidelines. A summary of the environmental impacts and mitigation measures is provided in Table 2-1 at the end of this chapter.

The analysis contained in this Program EIR uses the phrases “significant” and “less than significant” in the discussion of potential environmental impacts. These words specifically define the degree of impact and coincide with language used in the CEQA Guidelines. As required by CEQA, mitigation measures have been included in this Program EIR to avoid or substantially reduce significant impacts. When these significant impacts, even with the inclusion of mitigation measures, cannot be reduced to a level less than significant, they are identified as “significant and unavoidable impacts.”

SIGNIFICANT AND UNAVOIDABLE IMPACTS

Based on the data and conclusions of this Program EIR, the City of Laguna Hills finds that the project will result in the following potentially significant impacts that cannot be fully mitigated:

- Air Quality
- Public Services and Utilities – Water Supply
- Global Climate Change

If the City chooses to approve the project, it must adopt a “Statement of Overriding Considerations” pursuant to Sections 15093 and 15126 (b) of the CEQA Guidelines for these unavoidable significant impacts.

POTENTIALLY SIGNIFICANT IMPACTS THAT CAN BE MITIGATED

This Program EIR identifies the following potentially significant impacts that can be mitigated to a less than significant level:

- Aesthetics – Scenic vistas and scenic resources, and visual character and quality
- Biological Resources – Sensitive vegetation communities, plant species, wetlands, wildlife, and conflicts with local ordinances and policies
- Geology, Soils, and Mineral Resources – ~~All threshold areas~~Faulting and seismicity, geology and soils
- Hydrology and Water Quality – Flooding ~~Groundwater resources, flooding, seiche, tsunami, and mudflow~~
- Land Use and Planning – Conflicts with existing land use policies, plans, or regulations
- Noise – Compliance with noise standards, groundborne vibration or noise, permanent ambient noise levels, and temporary or periodic increases in ambient noise levels
- Public Services and Utilities – Solid waste

POTENTIAL IMPACTS IDENTIFIED AS LESS THAN SIGNIFICANT

The CEQA Guidelines Section 15128 requires a statement indicating the reason that various possible significant effects are determined not to be significant and therefore are not discussed in the Program EIR. However, all issue areas, regardless of the severity of their potential environmental impacts, were examined in this analysis. The following areas analyzed as part of this Program EIR were found to be less than significant without mitigation:

- Aesthetics – Light and glare
- Air Quality – Objectionable odors
- Agricultural Resources – Conversion of farmland; existing agricultural use zoning; and Williamson Act contract lands
- Biological Resources – Wildlife corridors and conflicts with Habitat Conservation Plans (HCP)
- Cultural Resources – Historic, archeological, and paleontological resources; and human remains
- Geology, Soils, and Mineral Resources – Septic tanks, soil erosion, expansive and collapsible soils, and mineral resources
- Hazards and Hazardous Materials – Hazardous materials, emergency plans, and wildland fire hazards
- Hydrology and Water Quality – Hydrology, groundwater resources, tsunami, seiche, and mudflow
- Land Use and Planning – Divide an established community and conflict with local HCP
- Population and Housing – Population growth and population and housing displacement
- Public Services and Utilities – Fire and police protection, schools, libraries, wastewater, stormwater drainage facilities, and energy infrastructure
- Recreation – Increase use or deterioration of recreational facilities and construction or expansion of recreational facilities
- Transportation and Circulation – Future traffic conditions, air traffic patterns, roadway design, emergency access, parking, and alternative transportation

2.4 POTENTIAL AREAS OF CONTROVERSY

CEQA requires that potential areas of controversy be identified in the Executive Summary. There are no areas of known widespread controversy with respect to the General Plan update for Laguna Hills as no specific issues were raised during the environmental scoping meetings and NOP process for this Program EIR.

However, the community was very involved over the course of the development of the General Plan and the primary area of discussion for citizens and members of the General Plan Advisory Committee (GPAC) has been how to incorporate new development and redevelopment that is compatible with the scale and design of existing neighborhoods, as well as providing an integrated mobility network that enhances the overall connectivity of the planning area. Concerns about parking, increased traffic, and noise from development and recreational activities were also mentioned. This feedback from the public and the members of the GPAC helped to shape the objectives for the General Plan and ultimately was used to guide the direction of the policies set forth in the General Plan.

2.5 ALTERNATIVES TO THE PROPOSED PROJECT

The alternatives evaluated in Section 6.0 of this Program EIR include:

- No Project/Existing General Plan
- No Change to Urban Village Specific Plan
- Mandatory Conservation Measures and Programs

Table 2-1
Project Level Environmental Impacts and Mitigation Measures

Potential Impacts	Mitigation Measures		Level of Significance After Mitigation
5.1 AESTHETICS			
Scenic Vistas and Scenic Resources New development and redevelopment activities pursuant to the General Plan, as well as landscaping and infrastructure improvements along the City's corridors have the potential to significantly impact the existing scenic vistas and resources within the planning area.	**A-1**	The City shall plan and encourage strong unifying gateways at major entrances to the City and in community activity centers, and new private and public infrastructure and development projects to achieve strong gateway features through the use of signage and iconic design, architecture, and/or landscaping components that communicate Laguna Hills' identity and character. **(Implementation Program LU-11)**	Less than significant
	A-2	Enhance the City's identity and promote walkability by developing a program whereby businesses or residents may sponsor street furniture, public art, and/or landscaped areas; and continue to install public amenities such as streetscape, lighting, and landscaping. **(Implementation Program LU-12)**	
	A-3	The City shall require that as new development and revitalization projects come forward, the city will work with developers to preserve scenic views and vistas of natural and man-made landmarks visible from public locations and streets. **(Implementation Program M-12)**	
Visual Character New development and redevelopment pursuant to the General Plan, although limited, has the potential to differ in design and scale than immediately adjacent uses, resulting in perceived significant visual impacts to residents and visitors of the community.	**A-4**	Review and update the Zoning Ordinance and Zoning Map to include the addition of the Planned Community ~~Via Lomas~~Residential Zone and Neighborhood Mixed Use Zone and appropriate development standards; the update and expansion of Section 9-40 Design Regulations and Standards to facilitate and encourage connectivity and compatibility between adjacent land uses and activities, as well as ensure excellent design of development and revitalization projects. **(Implementation Program LU-3)**	Less than significant
	A-5	Review discretionary proposals to assess the compatibility of proposed development with adjacent / surrounding uses and activities; including the requirement of site design, buffers, architectural and buffering techniques, and other measures to be incorporated into projects to ensure compatibility between uses and activities. **(Implementation Program LU-6)**	
	A-6	Review development and revitalization projects for consistency with Zoning Ordinance Section 9-40, Design Regulations and Standards. **(Implementation Program LU-7)**	

Potential Impacts	Mitigation Measures	Level of Significance After Mitigation
Light and Glare No significant impact related to lighting and glare is identified for the project.	No mitigation is required.	No significant impact
5.2 AGRICULTURAL RESOURCES		
Conversion of Farmland No designated Farmland occurs within the planning area and implementation of the General Plan would not result in the conversion of Farmland to non-agricultural use.	No mitigation is required.	No significant impact
Existing Zoning or Williamson Act Land No area zoned for agricultural uses or Williamson Act contract lands occurs within the planning area.	No mitigation is required.	No significant impact
Other Changes No conversion of farmland would take place as a result of the implementation of the General Plan.	No mitigation is required.	No significant impact
5.3 AIR QUALITY		
Short-term Impacts Implementation of the General Plan would result in significant short-term construction-related air quality impacts at both the project and cumulative levels.	**AQ-1** The City shall implement the following measures to reduce the amount of fugitive dust that is re-entrained into the atmosphere from unpaved areas, parking lots and construction sites. 1. Require the following measures to be taken during the construction of all projects to reduce the amount of dust and other sources of PM_{10}, in accordance with SCAQMD Rule 403: • Dust suppression at construction sites using vegetation, surfactants and other chemical stabilizers • Wheel washers for construction equipment • Watering down of all construction areas • Limit speeds at construction sites to 15 miles per hour • Covering of aggregate or similar material during transportation of material 2. Adopt incentives, regulations, and/or procedures to reduce paved road dust emissions through targeted street sweeping of roads subject to high traffic levels and silt loadings. 3. Pave currently unpaved roads and parking lots or establish and enforce	Significant and unavoidable project-level and cumulative impacts

Potential Impacts	Mitigation Measures	Level of Significance After Mitigation
	15 miles per hour speed limits on low-use unpaved roads as permitted under California Vehicle Code section 22365. **AQ-2** The City shall require each project applicant, as a condition of project approval, to implement the following measures to reduce exhaust emissions from construction equipment. 1. Commercial electric power shall be provided to the project site in adequate capacity to avoid or minimize the use of portable gas-powered electric generators and equipment. 2. Where feasible, equipment requiring the use of fossil fuels (e.g., diesel) shall be replaced or substituted with electrically driven equivalents (provided that they are not run via a portable generator set). 3. To the extent feasible, alternative fuels and emission controls shall be used to further reduce exhaust emissions. 4. On-site equipment shall not be left idling when not in use. 5. The hours of operation of heavy-duty equipment and/or the amount of equipment in use at any one time shall be limited. 6. Staging areas for heavy-duty construction equipment shall be located as far as possible from sensitive receptors. 7. Before construction contracts are issued, the project applicants shall perform a review of new technology, in consultation with SCAQMD, as it relates to heavy-duty equipment, to determine what (if any) advances in emissions reductions are available for use and are economically feasible. Construction contract and bid specifications shall require contractors to utilize the available and economically feasible technology on an established percentage of the equipment fleet. It is anticipated that in the near future, both NO_X and PM_{10} control equipment will be available.	
Long-term Impacts The General Plan would result in significant long-term operational air quality impacts at both the project and cumulative levels.	**AQ-3** The City shall continue to bi-annually update the City of Laguna Hills Six-year Capital Improvement Program, which complies with the requirements of the Congestion Management Program (CMP). The Plan identifies and recommends funding for future improvements to the mobility system, as well as other public facilities, including improvements to the existing pedestrian and bicycle network and landscaping right-of-ways. **(Implementation Program M-2)** **AQ-4** The City shall continue to participate in regional efforts to implement Transportation Demand Management (TDM) through implementation of the	Significant and unavoidable project-level and cumulative impact

Potential Impacts	Mitigation Measures	Level of Significance After Mitigation
	City's Transportation Demand Ordinance as set forth in the Municipal Code. The purpose of the ordinance is to promote alternative transportation methods, such as carpools, vanpools, transit, bicycles, walking, park-and-ride lots; parking management programs; and other strategies to meet congestion and air quality goals. The City shall complete intersection capacity improvements and coordinate traffic signals as necessary to improve traffic flow. **(Implementation Program M-4)** **AQ-5** The City shall update the Bikeways, Trails & Open Space Master Plan, identify gaps and major barriers to connectivity in the City and identify appropriate means and locations for overcoming those barriers. The City shall include a pedestrian/walkability component in the updated Plan that identifies areas where major barriers to connectivity exist, and measures and/or techniques to improve walkability and safety. **(Implementation Program M-5)** **AQ-6** The City shall work with project proponents to ensure that safe and attractive sidewalks, walkways, bike lanes, and cross walks that facilitate use are provided in accordance with City standards. The City shall work with developers to construct links to adjacent communities, using open space easements and utility easements when appropriate. **(Implementation Program M-6)** **AQ-7** The City shall provide bike support facilities (e.g., bicycle racks, personal lockers, showers, and other bicycle support facilities) in new development and revitalization projects to encourage bicycle riding as a transportation mode. The City shall adopt a formal bike support facility ordinance and/or guidelines applicable to private and public development. **(Implementation Program M-7)** **AQ-8** The City shall work closely with the Orange County Transportation Authority (OCTA) to achieve the following: 1. Maintain consistency with the County Master Plan of Arterial Highways (MPAH) within the City. 2. Implement the OCTA Congestion Management Plan (CMP) within the City. 3. Expand and improve bus service within the City. 4. Encourage express bus service to regional activity centers.	

Potential Impacts	Mitigation Measures	Level of Significance After Mitigation
	5. Encourage provision of attractive and appropriate transit amenities, including shaded bus stops. 6. Provide special transit services (such as direct shuttle or dial-a-ride services). 7. Support and implement the OCTA Commuter Bikeways Strategic Plan and participate in future updates and revisions to the Plan. In addition, the City shall coordinate with the California Department of Transportation (Caltrans) on all plans, activities, and projects that affect state roadway facilities. **(Implementation Program M-8)** **AQ-9** The City shall coordinate with regional transit providers and use public education to accomplish the following objectives: 1. Encourage City residents and workers to rideshare and use transit. 2. Educate residents of all ages about local mobility choices. 3. Work with schools to improve and advertise nonautomotive options for getting to school and school-related activities. 4. Coordinate education activities and make materials available to residents. Utilize forums, flyers, brochures, and the City's website to accomplish these objectives **(Implementation Program M-9)** **AQ-10** The City shall outline a plan of mobile source enforcement methods such as periodic mobile source (e.g., trucks and buses) checkpoints throughout the City to enforce opacity regulations. Technical assistance shall be sought from the Air Resources Board (ARB) and the California Highway Patrol (CHP) on enforcement issues. **AQ-11** The City shall provide incentives such as preferential parking for alternative fuel vehicles. **AQ-12** The City shall actively encourage the development and maintenance of mixed uses, particularly in the Mixed Use and Neighborhood Mixed Use areas, by maintaining a list of sites available for mixed use and infill development and making the list available to developers. The City shall establish developer incentives to encourage well-designed mixed use and infill development projects in these areas. **(Implementation Program LU-10)** **AQ-13** The City shall adopt a sustainable development program with the goal of	

Potential Impacts	Mitigation Measures	Level of Significance After Mitigation
	reducing ownership costs, reducing water and energy consumption, reducing driving, and reducing greenhouse gas and criteria pollutant emissions. This Sustainable Development program shall incorporate the following programs that address environmental sustainability: Green Building Standards; Mixed Use; Bikeways, Sidewalks, Walkways, Crosswalks; Orange County Transportation Authority; Climate Action Plan; Water Conservation; Recycled and Reclaimed Water; and Community Gardens. In addition, the City will consider incorporating the following measures in the program: 1. Adopt a formal green building program, such as Leadership in Energy and Environmental Design (LEED), GreenPoint Rated and/or other programs applicable to Laguna Hills. 2. Provide developer incentives for green buildings. 3. Adopt a native tree preservation ordinance and encourage planting of new, drought-tolerant trees. 4. Promote and incentivize alternative energy such as wind and solar in new development and revitalization projects 5. Institute green purchasing practices in all City operations, including alternative or very fuel efficient vehicles 6. Establish a marketing and education plan for City residents to encourage green building standards, alternatives to driving, energy conservation through high efficiency lighting and appliances, and alternative energy such as wind and solar. 7. Measure annual progress in City operations, and private development as applicable. 8. ~~Participate in utility-sponsored (e.g., Southern California Edison) sustainability programs.~~ During the development review process for large development projects (greater than 10 units and/or 10,000 square feet), the City will coordinate with energy providers to determine if additional energy efficiency measures can be incorporated into the project design. **(Implementation Program LU-8)** **AQ-14** The City shall evaluate proposed development projects throughout the City using LEED standards, GreenPoint Rated, and/or other green building standards. The City encourages all future development and major renovation projects within the following General Plan designations to achieve LEED certification, and/or other green certifications: High Density Residential, Village Commercial, Freeway Commercial, Community Commercial, Office Professional, Mixed Use, Neighborhood Mixed Use, and Community/Private	

Potential Impacts	Mitigation Measures	Level of Significance After Mitigation
	Institution. The City shall investigate the potential to offer density bonus incentives on residential projects that achieve LEED certification, and other green certifications and ratings. **(Implementation Program LU-9)** **AQ-15** The City shall support, through the use of development standards, the use of fuel-efficient heating equipment, and other appliances, such as water heaters, swimming pool heaters, cooking equipment, refrigerators, furnaces, boiler units, and low or zero-emitting architectural coatings. **AQ-16** The City shall Work with the SCAQMD and the SCAG to implement the AQMP and meet all federal and state air quality standards for pollutants. The City shall participate in any future amendments and updates to the Plan. The City shall also implement, review, and interpret the General Plan and future discretionary projects in a manner consistent with the Air Quality Management Plan to meet standards and reduce overall emissions from mobile and stationary sources. **(Implementation Program COS-7)** **AQ-17** The City shall continue to implement solid waste diversion programs as well as public education programs as outlined in the City's Source Reduction and Recycling Element required by Assembly Bill 939. As part of this program, the City shall work with the private sector contractor providing solid waste services within the City to ensure that appropriate recycling containers, procedures, and education are readily available throughout the community. The City shall develop programs to maximize recycling of waste products generated by the community to reduce the amount of solid waste disposed and prolong useful life of the local landfills. **(Implementation Program CSF-6)** **AQ-18** The City shall review all future development proposals for potential regional and local air quality impacts per CEQA. If potential impacts are identified, mitigation will be required to reduce the impact to a level less than significant, where technically and economically feasible.	
SCAQMD Air Quality Management Plan The General Plan would result in emissions in excess of thresholds for criteria air pollutants and precursors for which the region is in nonattainment.	See Mitigation Measures AQ-3 through AQ-18 above.	Significant and unavoidable project-level and cumulative impact

Potential Impacts	Mitigation Measures	Level of Significance After Mitigation
This would conflict with SCAQMD air quality planning efforts resulting in a significant project-level and cumulative impact.		
Impacts to Sensitive Receptors With implementation of the General Plan, new or modified sources of toxic air contaminants (TACs) could be placed near existing sensitive receptors, and new sensitive receptors could be developed near existing sources of TACs resulting in a significant project-level and cumulative impact.	**AQ-19** The City shall implement the following measures to minimize exposure of sensitive receptors and sites to health risks related to air pollution. 1. Encourage site plan designs to provide the appropriate set-backs and/or design features that reduce TACs at the source. 2. Encourage the applicants for sensitive land uses to incorporate design features (e.g., pollution prevention, pollution reduction, barriers, landscaping, ventilation systems, or other measures) in the planning process to minimize the potential impacts of air pollution on sensitive receptors. 3. Actively participate in decisions on the siting or expansion of facilities or land uses (e.g., freeway expansions), to ensure the inclusion of air quality mitigation measures. 4. Where decisions on land use may result in emissions of air contaminants that pose significant health risks, consider options, including possible relocation, recycling, redevelopment, rezoning, and incentive programs. 5. Activities involving idling trucks shall be oriented as far away from and downwind of existing or proposed sensitive receptors as feasible. 6. Strategies shall be incorporated to reduce the idling time of main propulsion engines through alternative technologies such as IdleAire, electrification of truck parking, and alternative energy sources for transportation refrigeration units (TRUs) to allow diesel engines to be completely turned off.	Significant and unavoidable project-level and cumulative impact
Objectionable Odors The General Plan does not propose the development of any major or minor objectionable odor sources.	No mitigation is required.	Less than significant
5.4 BIOLOGICAL RESOURCES		
Sensitive Vegetation Communities, Sensitive Plant Species, and Wetlands The General Plan has the potential to significantly impact sensitive habitats and wetlands as a result of grading, excavation, and construction activities	**B-1** Activities implemented under the General Plan will undergo project-specific review for potential impacts to biological resources in accordance with CEQA. The City shall require that all General Plan implementation activities adhere to state and federal legislation that protects all sensitive plants, wildlife, habitats and wetlands. The City shall work closely with the U.S. Army Corps of Engineers (USACE), U.S. Fish and Wildlife Service	Less than significant

Potential Impacts	Mitigation Measures	Level of Significance After Mitigation
associated with new development and/or recreational trail expansion.	(USFWS), Regional Water Quality Control Board (RWQCB), and the California Department of Fish and Game (CDFG) during the discretionary project permitting and CEQA review of any project that may result in the alteration of a stream bed, involve the removal of vegetation in wetland and riparian habitats, disturb Waters of the United States or otherwise impacts sensitive biological resources. If recommended or required by the resource agencies, project-specific measures to mitigate potential impacts to sensitive species, such as native birds and bats, will be established as conditions of project approval. Mitigation measures for habitat and species may include, but are not limited to: avoidance, enhancement, restoration, or a combination of any of the three. **B-2** The City shall continue to implement the National Pollutant Discharge Elimination System (NPDES) stormwater permits issued by the State and Regional Water Quality Control Board. Require new development and revitalization projects to incorporate Best Management Practices (BMPs) pursuant to the NPDES permit to ensure that the City complies with applicable state and federal regulations. **(Implementation Program COS-3)** **B-3** As a condition of project-specific approval, the City shall require new development and redevelopment to provide adequate on-site and off-site stormwater and flood management facilities to control direct and indirect erosion and discharges of pollutants and/or sediments. To determine the facility and Best Management Practices (BMP) needs, the City will require, when necessary, a hydrological/drainage analysis be performed by a state-licensed and City-approved engineer, with the cost of said analysis the responsibility of the project applicant. **(Implementation Program S-12)**	
Sensitive Wildlife Species Sensitive wildlife may be directly impacted by grading, excavation, and construction activities. Direct impacts to sensitive wildlife may include permanent habitat disturbance or injury or loss of wildlife due to grading and excavation.	See Mitigation Measure B-1 above.	Less than significant

Potential Impacts	Mitigation Measures	Level of Significance After Mitigation
Wildlife Corridors Implementation of the General Plan is not expected to interfere with existing wildlife corridors associated with existing open space within the planning area.	No mitigation is required.	Less than significant
Local Ordinances and Policies Future development anticipated under the General Plan may result in the removal of existing City-owned trees. Removal of these trees would significantly conflict with The Laguna Hills Tree Protection Ordinance, which regulates the planting, maintenance, protection, and removal of City-owned trees and shrubs in City rights-of-way and in City parks and open space.	**B-4** In accordance with the City of Laguna Hills Tree Protection Ordinance, a permit shall be required from the Public Services Director to plant, move, spray, trim, remove, prune, replace, cut, or otherwise disturb any tree in any public place. Section 8-08.050 of the Laguna Hills Tree Protection Ordinance requires that City trees be replaced by the caliper inch measured at diameter breast height[1] (DBH). For every inch of DBH removed, an equal number of caliper inches shall be replaced. For example, the removal of one twelve-inch tree shall necessitate the planting of a total of twelve-inches of new tree(s) (e.g., one twelve-inch tree, six two-inch trees or four three-inch trees). **(Implementation Program COS-9)**	Less than significant
Habitat Conservation Plans/Natural Community Conservation Plans Implementation of the General Plan will not conflict with the provisions of an adopted Natural Communities Conservation Plan (NCCP)/HCP or other approved habitat conservation plan.	No mitigation required.	Less than significant
5.5 CULTURAL RESOURCES		
Historic Resources No historical resources were identified within the planning area and no known local resource is currently listed or eligible for listing on the National Register of Historic Places (NRHP) or the California Register of Historical Resources (CRHR).	No mitigation is required.	Less than significant

[1] According to Laguna Hills Municipal Code, "Diameter at Breast Height" is the diameter of the tree trunks at the height of four feet six inches from the finished grade at the back of the tree.

Potential Impacts	Mitigation Measures	Level of Significance After Mitigation
Archaeological Resources The majority of new development and redevelopment anticipated under the General Plan would involve infill and redevelopment of existing developed areas. Thus, the likelihood of finding new or undiscovered archaeological resources is limited.	No mitigation is required.	Less than significant
Paleontological Resources Implementation of the General Plan is not expected to destroy a unique paleontological resource or unique geological feature.	No mitigation is required.	Less than significant
Human Remains Implementation of the General Plan is not expected to disturb any human remains.	No mitigation is required.	Less than significant
5.6 GEOLOGY, SOILS, AND MINERAL RESOURCES		
Faulting and Seismicity The entire planning area is at risk for significant damage caused by groundshaking, seismic activity, and earthquake-induced landslides and liquefaction.	**GS-1** The City shall reduce the risk to the community from hazards related to geologic conditions, seismic activity, flooding, and structural and wildfires by requiring feasible mitigation of such impacts on discretionary development projects by assessing development proposals for potential hazards pursuant to CEQA. The City shall require measures to mitigate all identified significant public safety hazards. **(Implementation Program S-2)** **GS-2** The City shall continually update development standards and adopt the latest building construction codes to guide future development and redevelopment in areas with known geologic and seismic-related hazards. **(Implementation Program S-4)** **GS-3** The City shall require geologic and/or geotechnical studies for proposed new development and redevelopment projects located in areas identified as susceptible to landslides and liquefaction, and binding mitigation strategies must be adopted. Compliance with the recommendations set forth in site-specific geologic and/or geotechnical studies will be made a condition of the site development permit for subsequent projects. In addition, the City may require applicants to incorporate measures to stabilize and maintain slopes	Less than significant

Potential Impacts	Mitigation Measures	Level of Significance After Mitigation
	on a site-by-site basis, such as, but not limited to, proper planting, irrigation, retaining walls, and benching. **(Implementation Program S-1)** **GS-4** The City shall continually monitor and encourage remediation of unstable slope areas, particularly in areas characterized by the presence of crib walls or where historical anecdotal evidence of instability exists. **(Implementation Program S-3)**	
Geology and Soils The General Plan may allow development to occur in areas of potential significant geologic hazards, such as landslides and debris flows, and expansive soils.	**GS-5** The City shall require detailed groundwater studies in areas with known or suspected high groundwater levels that identify site-specific conditions. Where groundwater is identified as a potential site-specific hazard, construction approaches shall be incorporated into the design of projects to protect structures from the potential hazard, to the satisfaction of the City Engineer and Building Official.	Less than significant
Mineral Resources No significant impact to mineral resources was identified.	No mitigation is required.	No significant impact
5.7 HAZARDS AND HAZARDOUS MATERIALS		
Hazardous Materials New development and redevelopment due to implementation of the General Plan would be minimal and is therefore not expected to significantly increase the amount of hazardous materials that would be used and/or transported within the planning area. Likewise, implementation of the General Plan is not expected to result in a significant accidental release of hazardous materials into the environment or the release of hazardous substances.	No mitigation is required.	Less than significant
Emergency Plans New development and redevelopment due to implementation of the General Plan would be minimal and is therefore not expected to significantly impair implementation of, or physically interfere with, the Laguna Hills EOP.	No mitigation is required.	Less than significant

Potential Impacts	Mitigation Measures	Level of Significance After Mitigation
Wildland Fire Hazards New development and redevelopment due to implementation of the General Plan would be limited to urban areas and will not involve expansion of urban uses onto lands located within or adjacent to wildland fire hazards areas.	No mitigation is required.	Less than significant
5.8 HYDROLOGY AND WATER QUALITY		
Hydrology Because the City of Laguna Hills is currently mostly built out, most development and redevelopment will occur in areas that are currently developed with impervious surfaces. BMPs are also required to be implemented that would reduce potential impacts to less than significant.	No mitigation is required.	No significant impact
Groundwater Resources Development pursuant to the General Plan does not have the potential to convert existing groundwater recharge areas to urban uses.	No mitigation is required.	Less than significant
Flooding Implementation of the General Plan could result in development and redevelopment in areas located within the 100-year floodplain resulting in a significant impact.	**HWQ-1** The City shall adopt, amend, and/or continue to enforce City policies, regulations, and programs to decrease stormwater and urban runoff pollution while considering the following: 1. Promote the use of low impact development standards in new development and redevelopment projects. 2. Continue to implement the National Pollutant Discharge Elimination System (NPDES) stormwater permits issued by the State and Regional Water Quality Control Board. Require new development and revitalization projects to incorporate Best Management Practices (BMPs) pursuant to the NPDES permit to ensure that the City complies with applicable state and federal regulations. 3. Educate residents regarding surface water quality pollutants, especially those that may result from community activities, such as car washes. Further, as a condition of project approval, require new development and	Less than significant

Potential Impacts	Mitigation Measures	Level of Significance After Mitigation
	redevelopment to provide adequate on-site and off-site stormwater and flood management facilities to control direct and indirect erosion and discharges of pollutants and/or sediments. To determine the facility and Best Management Practices (BMP) needs, the City will require, when necessary, a hydrological/drainage analysis be performed by a state-licensed and City-approved engineer, with the cost of said analysis the responsibility of the project applicant. **(Implementation Programs COS-3 and S-12)** **HWQ-2** The City shall coordinate with the Orange County Flood Control Division (OCFCD) to ensure regularly scheduled maintenance of flood control channels and completion of necessary repairs to promote flood protection. Coordinate with the OCFCD and water districts regarding any needed improvements to existing aboveground water tanks. Work with the District to identify new flood control improvements, and establish installation programs for improvements. (**Implementation Program CSF-9**)	
Tsunami, Seiche, and Mudflow ~~Implementation of the General Plan could result in significant impacts related to seiches or mudflows. Although seiches have not historically occurred within the City of Laguna Hills, it is possible that a seiche may occur if strong ground shaking causes structural damage to above-ground water tanks. There is also a potential for mudflows from the hillsides, in the event the development removes natural vegetation and makes cuts into the earth that could generate mudflows.~~ Due to its inland location, the City of Laguna Hills will not be affected by tsunamis. Although seiches have not historically occurred within the City of Laguna Hills, it is possible that a seiche may occur if strong ground shaking causes structural damage to above-ground water tanks. There is also a potential for	No mitigation is required.~~**HWQ-3** The City shall implement the City's Emergency Operations Plan (EOP) according to requirements and provisions of the State Emergency Management System and National Incident Management System. Ensure that the EOP establishes community emergency shelter facilities and is easily available to the public. The City will also work with nearby jurisdictions to enhance multi-jurisdictional coordination during emergency situations. **(Implementation Program S-13)**~~	No significant impact~~Less than significant~~

Potential Impacts	Mitigation Measures	Level of Significance After Mitigation
mudflows from the hillsides, in the event the development removes natural vegetation and makes cuts into the earth that could generate mudflows. However, standard erosion-prevention practices and avoidance of steepened slopes near existing development would help to reduce impacts related to mudflows. In addition, the City would continue to require new development and redevelopment to comply with the City's Hillside Development Standards and Guidelines as set forth in the Laguna Hills Municipal Code. In the event that these potential hazards would occur, the City would implement measures set forth in the Laguna Hills Emergency Operation Plan (EOP) to respond to such an event (Implementation Program S-13). With implementation of the standard erosion-prevention practices, the Hillside Development Standards and Guidelines, and other related programs included in the General Plan, impacts related to seiche and mudflows would be reduced to a less than significant level.		
5.9 LAND USE		
Dividing and Established Community The General Plan land uses and policies would not result in the division of an established community. No significant impact was identified.	No mitigation is required.	No significant impact
Existing Land Use Plans, Policies, and Regulations Implementation of the General Plan may significantly impact the existing	**LU-1** The City shall review discretionary development proposals to assess the project's effect on the community's jobs/housing balance and fiscal stability. Ensure developments provide their fair share of infrastructure such as utilities, roads, parks, and recreational opportunities or pay in lieu fees	Less than significant

Potential Impacts	Mitigation Measures	Level of Significance After Mitigation
land use plans, policies, and regulations that have been adopted to avoid or mitigate an environmental effect.	toward the development/extension of these facilities. **(Implementation Program LU-1)** **LU-2** The City shall review and update the Zoning Ordinance and the Zoning Map to ensure consistency with the General Plan and to help implement the General Plan policies and principles. The Zoning Ordinance update will include, but not be limited to the following items: 1. Add Planned Community ~~Via Lomas~~Residential Zone and Neighborhood Mixed Use Zone and appropriate development standards. 2. Reassess noise regulations for consistency between General Plan and Zoning Ordinance. 3. Update and expand Section 9-40, Design Regulations and Standards to facilitate and encourage connectivity and compatibility between adjacent land uses and activities as well as ensure excellent design of development and revitalization projects. 4. Revise parking regulations to encourage unique parking solutions and parking management techniques, particularly in the Urban Village Specific Plan area. 5. Define Community Gardens and allow and/or encourage their provision in appropriate zones. 6. Establish standards for gardens, fruit trees, and agricultural production in residential areas. 7. Incorporate sustainability principles (e.g., wind energy standards) and remove barriers to sustainability. **(Implementation Program LU-3)** **LU-3** The City shall review and update the Urban Village Specific Plan (UVSP) to ensure consistency with the General Plan and to help implement the General Plan policies and principles. The Urban Village Specific Plan will be updated to address the following: 1. Require any proposed residential development to be between 30 and 50 dwelling units per acre. 2. Allow additional square footage for retail activities. 3. Revise parking regulations with the intent to offer creative and flexible solutions that would facilitate development. **(Implementation Program LU-4)**	

Potential Impacts	Mitigation Measures	Level of Significance After Mitigation
Existing Conservation Plans There are currently no adopted habitat conservation plans or natural community conservation plans applicable to the General Plan planning area. No impact was identified.	No mitigation is required.	No significant impact
5.10 NOISE		
Compliance with Noise Standards New development and redevelopment pursuant to the General Plan could conflict with adopted noise standards resulting in a significant impact.	**N-1** The City shall review development proposals to ensure that the noise standards and compatibility criteria set forth in the Noise Element are met. The City shall consult Noise Element guidelines and standards for noise compatible land uses to determine the suitability of proposed developments relative to existing and forecasted noise levels. The City shall enforce California Title 24 Noise Standards to ensure an acceptable interior noise level of 45 Dba CNEL in habitable rooms. The City shall require acoustical analysis for all discretionary projects where any of the following apply: 1. The project will create or impact noise sensitive land uses and is located within the existing or future 60 dbA CNEL or higher contour. 2. The addition of more than 10 percent to the volume of average daily traffic of any arterial street. 3. The addition of 1,000 or more vehicles in the peak hour on adjacent roadways. 4. The project will introduce noise or vibration sources associated with mechanical equipment operations, entertainment, maintenance, and facility operations. 5. The project is a proposed residential use in the vicinity of existing and proposed commercial areas. 6. The project is a mixed use development that includes a residential component. The focus of this type of acoustical study is to determine likely interior and exterior noise levels and recommend appropriate design features to reduce noise. The City shall require mitigation measures, where necessary, to reduce noise levels to meet the adopted standards and criteria. Such measures may include landscaped berms, barriers, walls, enhanced parkways, increased parkways, and other sound attenuating architectural design and construction methods. The City will only permit new development if adopted noise standards and regulations can be met. **(Implementation Program N-1)** **N-2** The City shall implement provisions of the California Noise Insulation	Less than significant

Potential Impacts	Mitigation Measures	Level of Significance After Mitigation
	Standards (Title 24) that specify that indoor noise levels for multi-family residential living spaces shall not exceed 45 dB CNEL. The standard is defined as the combined effect of all noise sources and is implemented when existing or future exterior noise levels exceed 60 dB CNEL. Title 24 further requires that the standard be applied to all new hotels, motels, apartment houses, and dwellings other than single-family dwellings. The City shall also apply this standard to single-family dwellings and condominium conversion projects. **(Implementation Program N-3)** **N-3** The City shall review the locations of proposed projects with the potential to generate noise in relation to sensitive receptors through the discretionary project review process. The City shall limit delivery or service hours for stores and businesses with loading areas, docks, or trash bins that front, side, or gain access on driveways next to residential and other noise sensitive areas. The City shall only approve exceptions if full compliance with the nighttime limits of the noise regulations is achieved. **(Implementation Program N-4)**	
Groundborne Vibration or Noise New development and redevelopment pursuant to the General Plan could expose persons to significant excessive groundborne vibration and/or noise.	See Mitigation Measures N-1 and N-2 above and the following: **N-4** The City shall require all construction activity to comply with the limits (maximum noise levels, hours, and days of allowed activity) established in City noise regulations to reduce impacts associated with temporary construction noise to the extent feasible. Trucks associated with construction activities shall follow designated truck routes, where appropriate. **(Implementation Program N-5)**	Less than significant.
Permanent Ambient Noise Levels New development and redevelopment pursuant to the General Plan will generate additional traffic that will increase noise levels along the roadway network, and traffic noise will continue to represent a significant source of noise in the community.	See Mitigation Measure N-1 above.	Less than significant

Potential Impacts	Mitigation Measures	Level of Significance After Mitigation
Temporary or Periodic Increases in Ambient Noise Levels Long-term implementation of the General Plan creates capacity for redevelopment and infill within the planning area, which could result in temporary or periodic significant increases in ambient noise levels due to construction activities.	See Mitigation Measure N-4 above.	Less than significant
5.11 POPULATION AND HOUSING		
Population Growth Implementation of the General Plan will not directly induce a substantial increase in housing or associated population growth. No significant impact is identified.	No mitigation is required.	No significant impact
Population and Housing Displacement Implementation of the General Plan will not displace substantial numbers of existing housing or people. No significant impact is identified.	No mitigation is required.	No significant impact
5.12 PUBLIC SERVICES AND UTILITIES		
Fire and Police Protection Implementation of the General Plan would result in an increase in population and new development within the planning area; however, the overall level of fire and police protection would not be reduced.	No mitigation is required.	No significant impact
Schools Implementation of the General Plan would increase the number of students generated within the planning area, but would not increase demand for the level of school services or create a substantial need for additional schools in the planning area.	No mitigation beyond the payment of school fees is required.	No significant impact

Potential Impacts	Mitigation Measures	Level of Significance After Mitigation
Libraries Implementation of the General Plan could increase the level of demand for library services within the planning area, but would not result in a substantial adverse environmental impact associated with the provision of new or physically altered libraries.	No mitigation is required.	No significant impact
Water Supply New development and redevelopment pursuant to the General Plan would result in an increase in residential and nonresidential uses, which would result in the need for additional water supply. Future supply is uncertain, resulting in a significant project-level and cumulative impact.	**PSU-1** The City shall review all development projects in consultation with the appropriate water district to ensure adequate water supplies, treatment, and distribution capacity for all projects will be achieved without a negative impact to the community. For those projects subject to SB 610 and/or SB 221, the City shall require a Water Supply Assessment or water supply verification demonstrating available water supplies exist to support the proposed development project. In the event that sufficient uncommitted capacity does not exist, the City shall not grant discretionary approval until capacity becomes available. **PSU-2** The City shall implement applicable provisions in the Moulton Niguel and El Toro Water Districts Urban Water Master Plans to ensure that adequate water supplies are available to meet the needs of current and future growth, as well as during an emergency event or drought. Support efforts by these agencies to research and employ new technologies that improve water services and/or sustainability of water supplies serving Laguna Hills. **(Implementation Program COS-2)**	Significant and unavoidable project-level and cumulative impact
Wastewater Implementation of the General Plan would not exceed wastewater treatment requirements and would not require the construction or expansion of wastewater treatment facilities.	No mitigation is required.	No significant impact
Solid Waste New development, redevelopment, and population growth pursuant to the General Plan would generate a significant increased demand for solid waste collection and disposal capacity.	**PSU-3** The City shall implement solid waste diversion programs as well as public education programs as outlined in the City's Source Reduction and Recycling Element required by Assembly Bill 939. As part of this program, work with the private sector contractor providing solid waste services within the City to ensure that appropriate recycling containers, procedures, and education are readily available throughout the community. **(Implementation Program CSF-4)**	Less than significant

Potential Impacts	Mitigation Measures	Level of Significance After Mitigation
	PSU-4 The City shall promote the use of the County of Orange's Household Hazardous Waste Collection Centers for the proper disposal of hazardous waste. Continue to identify locations where residents can properly dispose of hazardous waste and advertise these locations at public counters and on the City's website. ~~The City shall require residents to participate in the County's Hazardous Waste Reduction Program. Continue to identify locations where residents can dispose of household hazardous wastes at public counters and on the City's website and coordinate with public and private collectors to advertise household hazardous waste (e.g., electronics, paints, oil) collection events occurring in the City and nearby jurisdictions~~. **(Implementation Program S-10)**	
Stormwater Drainage Facilities Implementation of the General Plan would result in new residential and nonresidential redevelopment areas within the planning area that are essentially built out and would not result in substantial increases the amount of impervious surfaces within the City.	No mitigation is required.	No significant impact
Energy Infrastructure Energy providers within the planning area, including SCE, SDG&E, and the Southern California Gas Company, indicated that their present facilities are adequate, and no major upgrades are planned within the City in the near future.	No mitigation is required.	No significant impact
5.13 RECREATION		
Increased Use and Physical Deterioration of Recreational Resources New development and redevelopment pursuant to the General Plan would result in increased use of existing City and regional parks, other recreational facilities, and trails. However, the City	No mitigation is required.	No significant impact

Potential Impacts	Mitigation Measures	Level of Significance After Mitigation
currently exceeds the established park acreage standard and would continue to do so upon implementation of the General Plan.		
Construction or Expansion of Recreational Facilities The General Plan does not define any specific project or park improvements. As such, the specific environmental impact cannot be determined at the General Plan level of analysis. Impacts would be determined on a project-by-project basis.	No mitigation is required.	No significant impact
5.14 TRANSPORTATION AND CIRCULATION		
Future Traffic Conditions Development pursuant to the General Plan would not result in an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system.	No mitigation is required.	No significant impact
Air Traffic Patterns There are no airports located within or adjacent to the City therefore no impacts would occur.	No mitigation is required.	No significant impact
Roadway Design And Emergency Access Implementation of the General Plan would not include traffic improvements or designs that would have the potential to make existing and future roadways unsafe.	No mitigation is required.	No significant impact
Parking Development and redevelopment pursuant to the General Plan would be required to comply with all regulations and standards set forth in the Laguna Hills Municipal Code. Therefore,	No mitigation is required.	No significant impact

Potential Impacts	Mitigation Measures	Level of Significance After Mitigation
impacts associated with parking would be less than significant.		
Alternative Transportation With implementation of the General Plan policies and programs, no conflicts with adopted policies or plans associated with alternative transportation would occur.	No mitigation is required.	No significant impact
6.3 GLOBAL CLIMATE CHANGE		
Climate Change The project's incremental contribution to global climate change would be considered cumulatively significant because it would generate a substantial increase in GHG emissions relative to existing conditions.	**GCC-1** The City shall adopt a sustainable development program with the goal of reducing ownership costs, reducing water and energy consumption, reducing driving, and reducing greenhouse gas emissions. This Sustainable Development program shall incorporate the following programs that address environmental sustainability: Green Building Standards; Mixed Use; Bikeways, Sidewalks, Walkways, Crosswalks; Orange County Transportation Authority; Climate Action Plan; Water Conservation; Recycled and Reclaimed Water; and Community Gardens. In addition to the above implementation programs, the City will also consider incorporating additional components into the Sustainable Development Program not directly addressed in these other programs: 1. Adopt a formal green building program, such as Leadership in Energy and Environmental Design (LEED®), GreenPoint Rated and/or other programs applicable to Laguna Hills. 2. Provide developer incentives for green buildings. 3. Adopt a native tree preservation ordinance and encourage planting of new, drought-tolerant trees. 4. Promote and incentivize alternative energy such as wind and solar in new development and revitalization projects. 5. Institute green purchasing practices in all City operations, including alternative or very fuel efficient vehicles. 6. Establish a marketing and education plan for City residents to encourage green building standards, alternatives to driving, energy conservation through high efficiency lighting and appliances, and alternative energy such as wind and solar. 7. Measure annual progress in City operations, and private development as applicable. 8. During the development review process for large development projects	Significant and unavoidable

Potential Impacts	Mitigation Measures	Level of Significance After Mitigation
	(greater than 10 units and/or 10,000 square feet), the City will coordinate with energy providers to determine if additional energy efficiency measures can be incorporated into the project design.~~Participate in utility-sponsored (e.g., Southern California Edison) sustainability programs.~~ **(Implementation Program LU-8)** **GCC-2** The City shall evaluate proposed development projects throughout the City using LEED standards, GreenPoint Rated, and/or other green building standards. The City encourages all future development and major renovation projects within the following General Plan designations to achieve LEED certification, and/or other green certifications: High Density Residential, Village Commercial, Freeway Commercial, Community Commercial, Office Professional, Mixed Use, Neighborhood Mixed Use, and Community/Private Institution. The City shall investigate the potential to offer density bonus incentives on residential projects that achieve LEED certification, and other green certifications and ratings. **(Implementation Program LU-9)** **GCC-3** The City shall actively encourage the development and maintenance of mixed uses, particularly in the Mixed Use and Neighborhood Mixed Use areas, by maintaining a list of sites available for mixed use and infill development and making the list available to developers. The City shall establish developer incentives to encourage well-designed mixed use and infill development projects in these areas. **(Implementation Program LU-10)** **GCC-4** The City shall continue to participate in regional efforts to implement Transportation Demand Management (TDM) through implementation of the City's Transportation Demand Ordinance as set forth in the Municipal Code. The purpose of the ordinance is to promote alternative transportation methods, such as carpools, vanpools, transit, bicycles, walking, park-and-ride lots; parking management programs; and other strategies to meet congestion and air quality goals. The City shall complete intersection capacity improvements and coordinate traffic signals as necessary to improve traffic flow. **(Implementation Program M-4)** **GCC-5** The City shall update the Bikeways, Trails & Open Space Master Plan,	

Potential Impacts	Mitigation Measures	Level of Significance After Mitigation
	identify gaps and major barriers to connectivity in the City and identify appropriate means and locations for overcoming those barriers. The City shall include a pedestrian/walkability component in the updated Plan that identifies areas where major barriers to connectivity exist, and measures and/or techniques to improve walkability and safety. **(Implementation Program M-5)** **GCC-6** The City shall work with project proponents to ensure that safe and attractive sidewalks, walkways, bike lanes, and cross walks that facilitate use are provided in accordance with City standards. The City shall work with developers to construct links to adjacent communities, using open space easements and utility easements when appropriate. **(Implementation Program M-6)** **GCC-7** The City shall provide bicycle support facilities (e.g., bicycle racks, personal lockers, showers, and other bicycle support facilities) in new development and revitalization projects to encourage bicycle riding as a transportation mode. The City shall adopt a formal bike support facility ordinance and/or guidelines applicable to private and public development. **(Implementation Program M-7)** **GCC-8** The City shall work closely with the Orange County Transportation Authority (OCTA) to achieve the following: 1. Maintain consistency with the County Master Plan of Arterial Highways (MPAH) within the City. 2. Implement the OCTA Congestion Management Plan (CMP) within the City. 3. Expand and improve bus service within the City. 4. Encourage express bus service to regional activity centers. 5. Encourage provision of attractive and appropriate transit amenities, including shaded bus stops. 6. Provide special transit services (such as direct shuttle or dial-a-ride services). 7. Support and implement the OCTA Commuter Bikeways Strategic Plan and participate in future updates and revisions to the Plan. In addition, the City shall coordinate with the California Department of Transportation (Caltrans) on all plans, activities, and projects that affect state roadway facilities. **(Implementation Program M-8)**	

Potential Impacts	Mitigation Measures	Level of Significance After Mitigation
	GCC-9 The City shall coordinate with regional transit providers and use public education to accomplish the following objectives: 1. Encourage City residents and workers to rideshare and use transit. 2. Educate residents of all ages about local mobility choices. 3. Work with schools to improve and advertise nonautomotive options for getting to school and school-related activities. 4. Coordinate education activities and make materials available to residents. Utilize forums, flyers, brochures, and the City's website to accomplish these objectives. **(Implementation Program M-9)** **GCC-10** The City shall adopt a formal traffic calming policy. The City shall construct and implement traffic calming measures in appropriate locations, including increased law enforcement of traffic laws. The City shall work with neighborhoods to address local traffic concerns, and explore funding alternatives for neighborhood traffic calming improvements. The City shall discourage frequent driveway curb cuts along Mobility Element roadways and encourage reciprocal access between properties, when appropriate. **(Implementation Program M-10)** **GCC-11** The City shall encourage water conservation throughout Laguna Hills in the following ways: 1. Encourage water developments to apply water-conserving principles, including such techniques and materials as native or low water use (drought-tolerant) plants, low precipitation sprinkler heads, bubblers, drip irrigation systems, and timing devices. 2. Support the production of recycled water and develop new uses for recycled water. 3. Apply water conservation techniques/project "water budgets" to achieve a significant reduction over historic use and over average uses for the proposed type of development by the incorporation of water conservation devices, such as low-flow toilets, flow restriction devices, and water conserving appliances in new public and private development and rehabilitation projects. **(Implementation Program COS-1)** **GCC-12** The City shall, in cooperation with the state, regional, and local water	

Potential Impacts	Mitigation Measures	Level of Significance After Mitigation
	agencies and suppliers, support the expansion of the use of recycled water for urban and agricultural irrigation. The City shall cooperate with these agencies to establish standards and regulations for the use of recycled water in development projects. **(Implementation Program COS-4)** **GCC-13** The City shall prepare a Climate Action Plan consisting, at a minimum, of the following components: 1. A baseline inventory of all known sources of greenhouse gases (as defined by section 38505 of the California Health and Safety Code) in the City. The baseline year shall be the most recent year for which data are available at the time of adoption of the General Plan. 2. An inventory of greenhouse gases emitted in the City in 1990 from all source categories included in the baseline inventory. 3. A projected inventory of greenhouse gases expected to be emitted in the year 2020 due to the City's discretionary land use decisions pursuant to the General Plan Update, as well as greenhouse gases emitted by the City's internal government operations. 4. A target for the reduction of those sources of emissions reasonably attributable to the City's discretionary land use decisions and internal government operations. The reduction shall be based on returning to the 1990 emissions level for the City by 2020 or otherwise set at an emissions level for a year that reduces the City's contribution to global climate change as supported by the best available scientific modeling. 5. Feasible greenhouse gas reduction measures intended to meet the reduction target by regulating those sources of emissions reasonably attributable to the City's discretionary land use decisions and internal government operations. **(Implementation Program COS-8)** **GCC-14** The City shall continue to implement solid waste diversion programs as well as public education programs as outlined in the City's Source Reduction and Recycling Element required by Assembly Bill 939. As part of this program, work with the private sector contractor providing solid waste services within the City to ensure that appropriate recycling containers, procedures, and education are readily available throughout the community. Develop programs to maximize recycling of waste products generated by the community to prolong useful life of the local landfills. **(Implementation Program CSF-6)**	

3.0 PROJECT DESCRIPTION

The purpose of the project description is to describe the project in a way that would be meaningful to the public, reviewing agencies, and decision makers. As described in Section 15124 of the state CEQA Guidelines, a complete project description must contain the following information but is not required to supply extensive detail beyond that needed for evaluation and review of the environmental impact: (1) The location and boundaries of the proposed project on a regional and detail map; (2) A statement of objectives sought by the proposed project; (3) A general description of the project's technical, economic, and environmental characteristics; (4) A statement briefly describing the intended uses of the Program EIR; and (5) A list of alternatives to the General Plan.

3.1 BACKGROUND

California state law requires each City to adopt a comprehensive, long-term general plan to guide the physical development of the city and any land outside of the city boundaries that bears a relationship to its planning activities. The proposed project analyzed in this Program EIR would consist of a comprehensive update of the General Plan and associated amendments to the Municipal Code (Zoning Ordinance) text and maps needed to implement the Plan. This would be the first update to the City's original General Plan dated June 1994.

The General Plan clarifies and articulates the City's intentions with respect to the expectations of residents and businesses, and their long-term vision for the community. Through its General Plan, the City outlines its goals, policies, and standards to the public and private sectors for meeting community objectives. Since the General Plan is the constitution for all future development, any decision by the City affecting land use and development must be consistent with the General Plan. An action, program, or project would be considered consistent with the General Plan if, considering all of its aspects, it would further the objectives and policies set forth within the General Plan and not obstruct their attainment.

The environmental impact analysis in this Program EIR is based on the change between development conditions existing in 2008 and those projected for likely development in accordance with the General Plan by 2030.

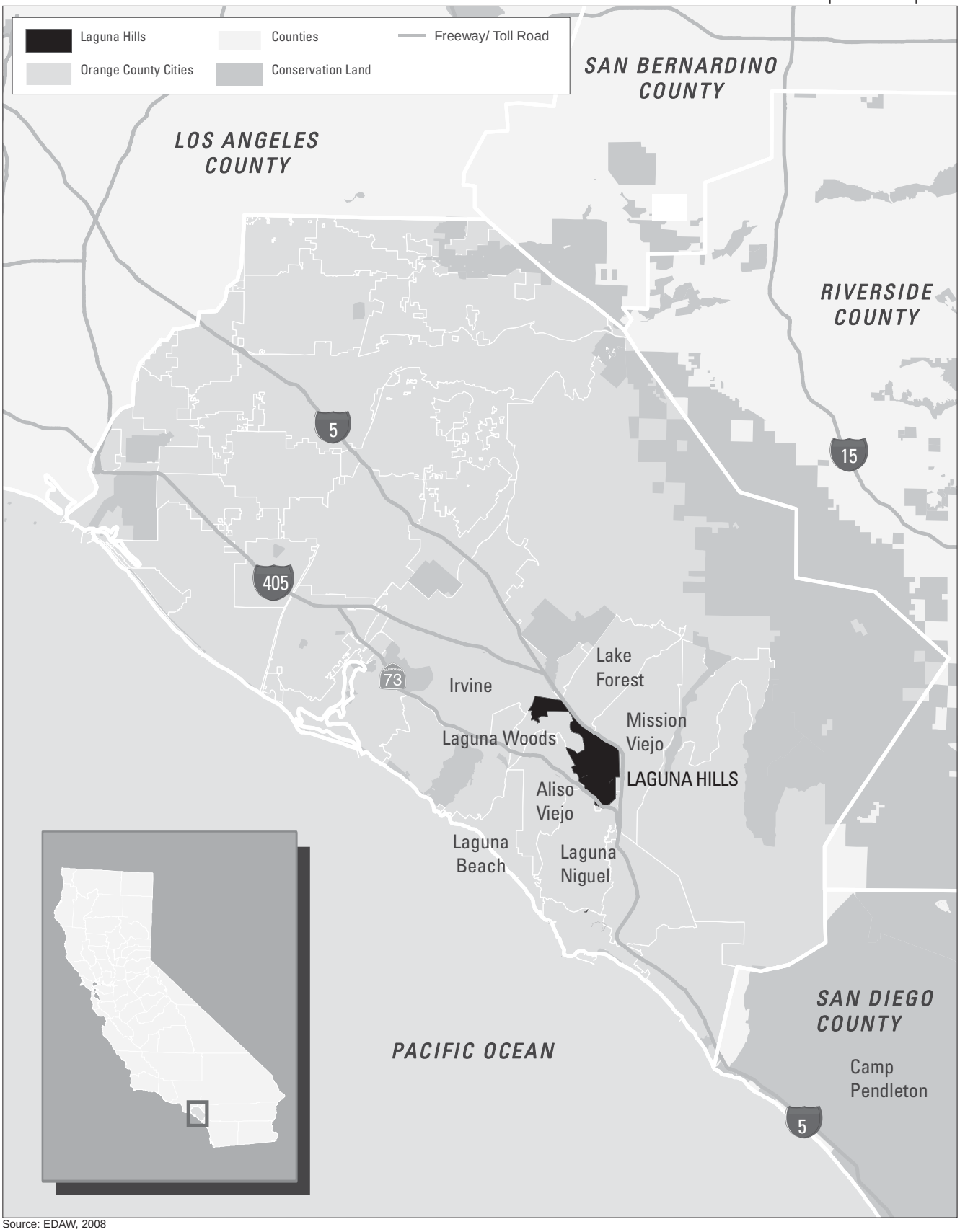
3.2 REGIONAL SETTING

The City of Laguna Hills (planning area) is located in southern Orange County approximately 45 miles southeast of the City of Los Angeles, 68 miles northwest of the City of San Diego, and 6 miles northeast of the Pacific Ocean. The City is bordered to the north by the cites of Irvine and Lake Forest, to the east by Interstate 5 (I-5) and the City of Mission Viejo, to the west by the cities of Laguna Woods and Aliso Viejo, and to the south by the City of Laguna Niguel. Regional access to Laguna Hills is provided by I-5 and State Route (SR) 73. Figure 3-1 depicts the regional location of the planning area, while Figure 3-2 shows the planning area boundaries.

3.3 PLANNING AREA

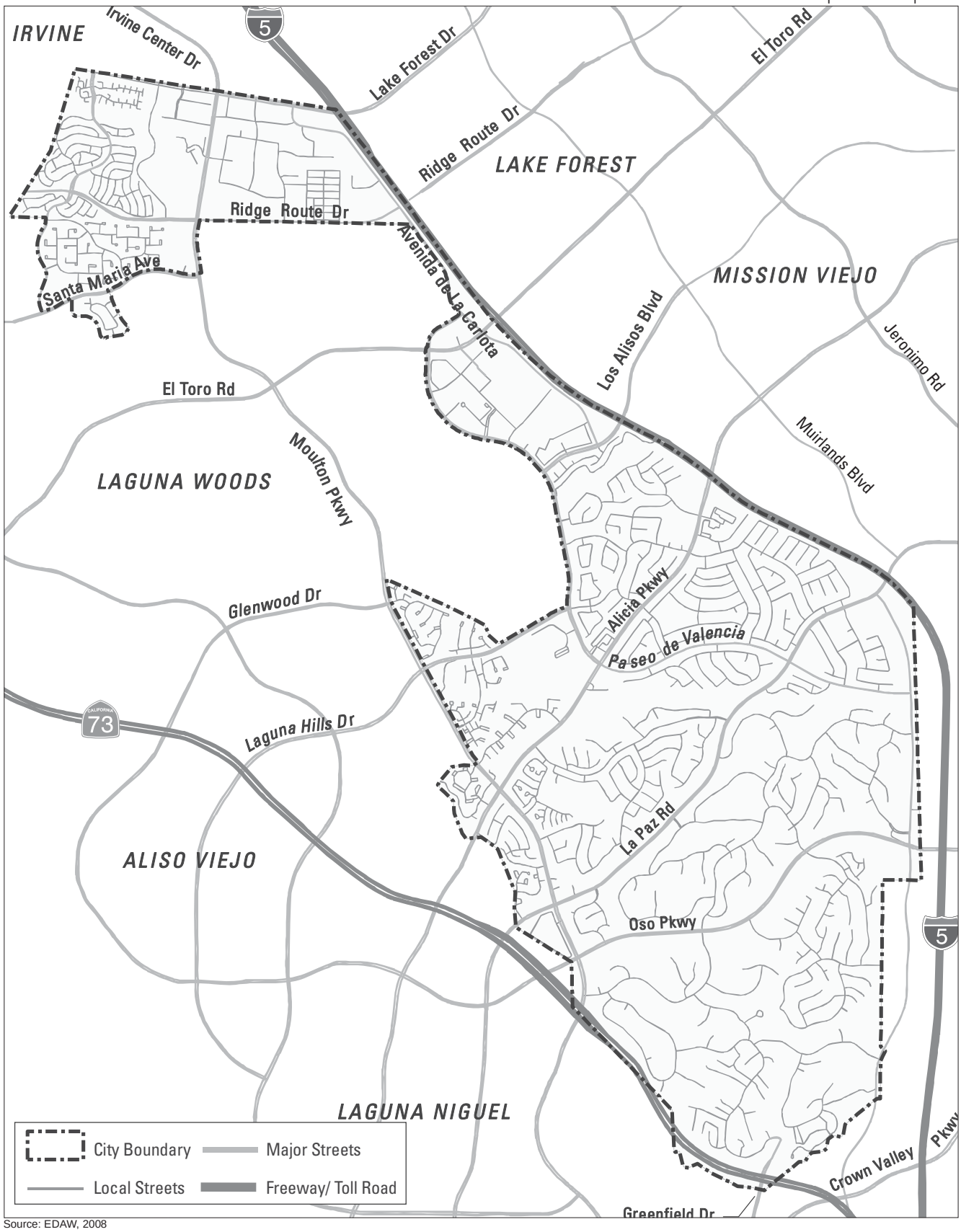
The City of Laguna Hills is approximately 6.6 square miles in size (4,234 acres) and supports a population of approximately 33,421[2] people. The planning area for Laguna Hills consists solely of areas within the City limits and is identical to the City's jurisdictional boundary (Figure 3-2). Since all land

[2] California Department of Finance population estimates as of January 2008.



Source: EDAW, 2008

Figure 3-1
Regional Location



Source: EDAW, 2008

0 0.25 0.5 1 Miles

Figure 3-2
Laguna Hills Planning Area

surrounding the City is under the jurisdiction of other cities, Laguna Hills does not have a planning sphere of influence or any planning authority outside of its jurisdictional boundaries.

3.4 PURPOSE AND OBJECTIVES OF THE GENERAL PLAN

A General Plan serves as the blueprint for future growth and development. As a blueprint for the future, the plan must contain policies and programs designed to provide decision makers with a solid basis for decisions related to land use and development. The General Plan would be guided by interrelated policies and programs to reinforce and build on the City's small-town feel, sense of connectedness, unique identity, environmental stewardship, and community health.

A General Plan stimulates thinking within the community about the City's future and generates many important questions for consideration. As part of the General Plan program public outreach, the citizens were asked a variety of questions at several community meetings in an effort to gather feedback from residents pertaining to desires, issues, passions, concerns, and aspirations for the future of the City. This feedback from the community was captured and synthesized into a set of "Guiding Themes" that set the future course for the General Plan. The Guiding Themes serve as a framework for research and analysis, and are the foundation for the policies and programs of the General Plan. The community's Guiding Themes encapsulate the desires and visions of Laguna Hills' citizens and are an expression of what the community wants to maintain or become. They include:

- A City Prepared for the Future
- Focused Revitalization in Commercial Centers
- Efficient Transportation System
- Strong Community Identity
- Healthy and Supportive Community for Families and People of All Ages
- Protecting Environmental Resources and Open Spaces for Future Generations
- Maintaining Safety within the Community
- Sustaining Community Connections as Laguna Hills Advances

The City is dedicated to supporting future growth that is compatible with and enhances the existing community, while also maintaining adequate services and facilities (such as water, sewer, trash, library, sports facilities, and roadways) as development does occurs. The City recognizes the need to provide a variety of housing opportunities for all segments of the community as they progress through the various stages of life. In addition, the City would continue to look for opportunities to integrate City services with the best technology available.

The updated General Plan promotes revitalization that contributes to the community's quality of life, enhances the public realm, expands the City's unique offerings, and cultivates environmental and economic sustainability. While some of the City's commercial and business centers have aged, they are ripe with opportunities for new activity and redevelopment. Planning would be focused on development that is locally oriented (as opposed to regionally oriented) and small-scale to fit with the existing community character.

While the local circulation system is experiencing some congestion, the updated General Plan would strategically link land use and transportation to make efficient use of existing system capacity. Streets significantly contribute to people's day-to-day experience of the City, and high-quality and safe roads are essential. The future circulation system would continue to emphasize pedestrian paths, bikeways,

equestrian trails, and transit connecting neighborhoods to commercial districts, other activity centers, and regional transportation systems.

Bolstering the unique attributes of Laguna Hills is important to creating a strong community identity. The City would benefit from a defined, consistent character that incorporates the City's origins and culture, while reflecting its natural setting. Planning efforts would be focused on identifiable local facilities (such as the City Hall and community centers), and defined streetscapes that tie neighborhoods and districts within the City together. Efforts would also focus on City beautification as well as reinforcing Citywide identity to better knit together the northern and southern portions of the community.

Laguna Hills recognizes the value of its community members and strives to maintain a healthy and supportive community for families and people of all ages. Attention to the needs of all community members, including seniors, children, persons with special needs, and residents of all ages is a top priority. This is evident in the great schools, senior activities, and recreation opportunities available in the community. With the General Plan Update, these qualities would be maintained and expanded as Laguna Hills recognizes the need for increased opportunities for physical activity and access to parks and recreational amenities to foster healthy lifestyles within the community.

Laguna Hills' natural amenities are highly valued. The community is envisioned as a healthy and clean environment where resources are protected. This includes preservation of existing open spaces, parks, trails, and creeks, and the conservation of energy and water resources. Reducing air and noise pollution and improving recycling efforts are also goals of the community.

Laguna Hills is a community that places great importance on the continued safety of its residents and businesses. Laguna Hills also has a very low crime rate and the City maintains this safe environment through a variety of community programs, law enforcement, and fire protection services. Community members actively participate in local government decision-making processes to help foster and maintain a community in which people, including children, are safe walking or bicycling to schools, recreation, or work. Planning would be focused on traffic calming measures in order to improve the overall safety of the community.

The community of Laguna Hills recognizes and embraces the small-town atmosphere that residents identify with living and working within the community. Community members enjoy knowing their neighborhoods and their neighbors. As the City advances, planning would be focused on fostering an atmosphere that creates opportunities for community connections (both social and physical) and is enhanced by well-designed and well-maintained neighborhoods that complement the natural environment. Planning efforts would focus on promoting more community traditions and events, and by creating more community activity centers where residents would be able to congregate.

3.5 PROJECT CHARACTERISTICS

The proposed project analyzed in the Program EIR is the adoption and implementation of the City of Laguna Hills General Plan. The General Plan consists of seven elements that together meet state requirements for the General Plan. The elements are (1) land use; (2) mobility; (3) conservation and open space; (4) community services and facilities; (5) safety; (6) noise; and (7) housing. The General Plan includes an Implementation Program along with the seven elements. In addition to the elements and the Implementation Program, the Program EIR also identifies and examines minor Zoning Ordinance text and mapping amendments needed to implement the proposed changes relating to the General Plan land use designations. The Program EIR analyzes the environmental effects of the expected development in accordance with the General Plan and Zoning Ordinance over the next two decades (2030).

3.5.1 GENERAL PLAN ELEMENTS

LAND USE ELEMENT

The Land Use Element establishes the general permitted uses of both public and private land within the community, providing a guide for both development of the planning area and protection of open space and sensitive areas. Determining the future location, type, and intensity of new development and redevelopment projects, and establishing the desired mix and relationship between such projects are the primary objectives of the element. The proposed land use designations identify the types and nature of development permitted throughout the planning area. The goals and policies contained in this element are designed to create more active centers within the community through better physical and social connections; protect and enhance established neighborhoods; provide sustainable development opportunities in specific areas; beautify and enhance the character of the community; and promote responsible economic development.

Each General Plan land use designation establishes a permitted range of density or intensity of development. The maximum allowable development on any individual parcel is governed by these measures of density or intensity, with the anticipated result influenced by the physical characteristics of a parcel, access and infrastructure issues, and compatibility considerations, among other factors. The density/intensity maximums provided in the following list serve as development caps. Actual development intensities are expected to be lower than the caps, based on market factors and past development trends. To estimate future buildout of the City and resulting impacts on the circulation system, expected levels of density and intensity have also been assumed. The City anticipates most development would occur at or below these factors, although on any single property, development up to the cap is allowed.

The General Plan Land Use Element would establish 16 land use designations; 14 of those are existing designations, while two new designations are proposed. The two proposed land use designations are Planned Community ~~Via Lomas~~Residential and Neighborhood Mixed Use. Each land use designation includes the range of density or intensity of development allowed within each category. Floor area ratio (FAR) maximums have been identified for several land use designations and no minimum FAR is implied. Each designation is grouped according to the land uses, described in Table 3-1, and shown in Figure 3-3.

Future development within the planning area will take the form of redevelopment and infill opportunities focused in several areas described as Opportunity Areas and Future Study Areas within the General Plan. Opportunity areas represent sites within the City of Laguna Hills where future land use change is likely to occur throughout the planning horizon of the General Plan. Each opportunity area has unique characteristics, opportunities, and constraints. The selection of the land use opportunity areas was the result of several months of collaboration and conversation between the public, City officials, City staff, and property owners. The selected opportunity areas represent sites in the planning area that offer centrality and favorable market conditions and fulfill current needs for the City's commercial and housing markets in a changing economy. Finally, these sites offer the best potential for fulfilling the community's vision for Laguna Hills as described in the Guiding Themes.

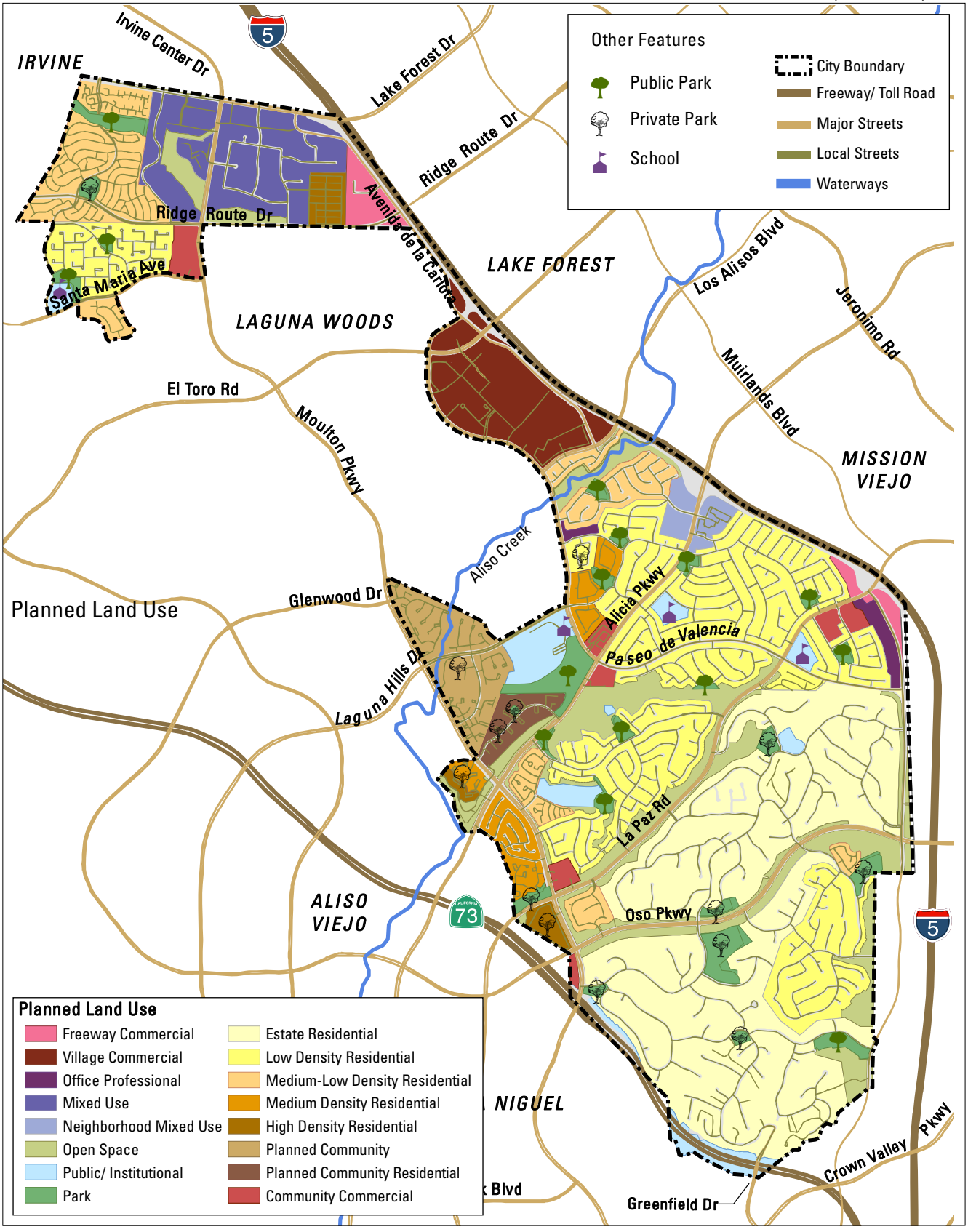


Figure 3-3
Proposed General Plan Land Use Designations

Table 3-1
Existing and Proposed Land Use Designations

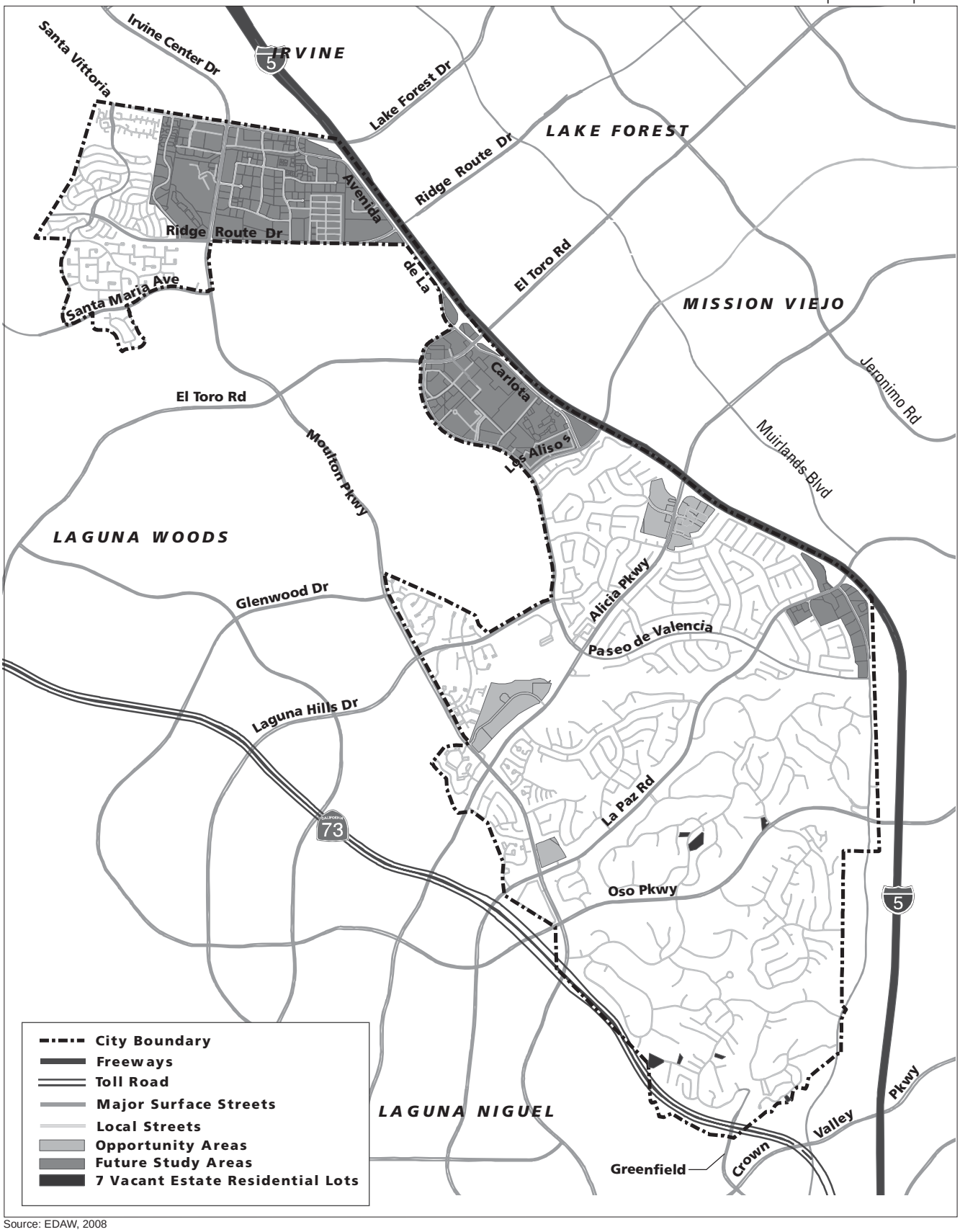
Land Use Designation	Density/Intensity/FAR
Residential Land Use Designations	
Estate Residential (ER)	0-3.5 dwelling units per acre
Low Density Residential (LD)	3.0-6.5 dwelling units per acre
Medium-Low Density Residential (MLD)	6.5-12.5 dwelling units per acre
Medium Density Residential (MD)	12.5-18 dwelling units per acres
High Density Residential (HD)	18.0-30.0 dwelling units per acre
Planned Community Land Use Designations	
Planned Community (PC)	0.5-18.0 dwelling units per acre; 0.75 maximum FAR
Planned Community ~~Via Lomas~~Residential (PCR~~-V~~)*	Maximum of 600 dwelling units
Commercial Land Use Designations	
Village Commercial (VC)	No maximum FAR restrictions
Freeway Commercial (FC)	Maximum 0.40 FAR
Community Commercial (CC)	Maximum 0.35 FAR
Office Land Use Designations	
Office Professional (OP)	Maximum 0.50 FAR
Mixed Use Land Use Designations	
Mixed Use (MU)	Maximum 0.38 FAR
Neighborhood Mixed Use (MU-N)*	Maximum 0.38 FAR of 0.30 nonresidential FAR and 0.08 residential FAR
Public/Institutional Land Use Designations	
Public/Institutional (P/I)	Maximum 1.0 FAR
Recreational Land Use Designations	
Park (P)	No maximum FAR restrictions
Open Space (OS)	Not intended for development

* General Plan Land Use Designation
Source: City of Laguna Hills 2008

The three opportunity areas include Alicia Gateway, Via Lomas, and Moulton and La Paz, which are discussed below and shown in Figure 3-4. The General Plan modifies the land use designations in the opportunity areas. Outside of the opportunity areas, no major land use changes are anticipated to occur. The opportunity areas and the specific land uses are described as follows:

Alicia Gateway: The General Plan features a Neighborhood Mixed Use designation for the entire Alicia Gateway area. The Neighborhood Mixed Use designation would create a moderate density center and gathering place by promoting a mix of retail, housing, and office uses; walkable connections, plazas, and green space for community gatherings; high-quality design and architecture; orientation of buildings toward the street and pedestrians; and accessibility to transit. The Neighborhood Mixed Use designation promotes the development of vertical and horizontal mixed use. Allowed uses include commercial, retail, office, and residential. Stand-alone residential is prohibited. The maximum height is three stories with a maximum of 110 dwelling units on this site. This area currently contains approximately 329,000 square feet of non-residential development. An additional 194,000 square feet of non-residential development is anticipated to occur in this opportunity area throughout the time horizon of the General Plan.

Via Lomas: The General Plan features a Planned Community Residential designation for the entire Via Lomas area. The opportunity for this area is to redevelop the site, improve the quality of the housing stock, add park and recreation opportunities, and provide additional housing



Source: EDAW, 2008

0 0.25 0.5 1 Miles

Figure 3-4
Land Use Opportunity Areas and Future Study Areas

opportunities for the residents of Laguna Hills. Additional development in the Via Lomas area would ensure a buffer area between the Via Lomas area and adjacent residential neighborhoods. This area currently contains 350 dwelling units. An additional 250 dwelling units are anticipated to occur in this opportunity area throughout the time horizon of the General Plan.

Building height limitations would ensure that hillside neighborhoods surrounding the Via Lomas area retain their views and view corridors. Additionally, up to about 13 acres of parks and recreation amenities could be added in this area.

Moulton and La Paz: The key opportunity in this area is to ~~slightly~~ extend the Community Commercial ~~parcel~~ land use designation about 150 feet south. This would result in the loss of approximately 2.27 acres of unimproved dedicated open space. This open space primarily consists of dirt and interspersed eucalyptus trees. The extension of the Community Commercial designation could result in a purchase and sale agreement of the currently publicly owned land to a private developer and ultimately redevelopment of the area with a minor expansion of commercial and retail square footage ~~to commercial buildings,~~. As part of the redevelopment of the Moulton and La Paz area, ~~and~~ reorientation of the commercial buildings would likely occur. Reorientation would improve the pedestrian environment along La Paz Road and create an active presence on the street. ~~No residential development is allowed in this opportunity area.~~ Horse trails at the corner of Moulton Parkway and La Paz Road would be retained and improved while ~~and opportunities to enhance~~ also enhancing the visual appeal of the open space corridor ~~would be explored~~through increased landscaping. No residential development is allowed in this opportunity area. This area currently contains approximately 55,000 square feet of non-residential development. An additional 30,000 square feet of non-residential development is anticipated to occur in this opportunity area throughout the time horizon of the General Plan.

In addition to the opportunity areas discussed above, the City of Laguna Hills contains future study areas that have been considered for revitalization in the future. The Land Use Plan does not change any of the land use designations in the areas identified as future study areas. However, the Plan recognizes that opportunities exist to redevelop, improve, or intensify some of the land uses in the future study areas. The future study areas include the North Business Park, Urban Village, La Paz Gateway, and Alicia Parkway/Aliso Hills Park Triangle. These future study areas are described below and are shown in Figure 3-4.

North Business Park: Existing uses within the North Business Park area include primarily offices and industrial businesses. These businesses provide important employment and services for the residents of the City and provide the City with valuable sales tax revenue. Since many of the facilities within this future study area are one-story tilt-up construction buildings, opportunities for intensification are possible. Larger and better designed buildings could be built, perhaps containing more than one story, subject to the established FAR requirements and other development standards for the area. Additionally, some of the buildings in the southern portion of the study area could be reoriented toward Aliso Creek. None of these changes would require land use designation changes in this area. This area currently contains approximately 2,266,000 square feet of non-residential development. An additional 114,000 square feet of non-residential development is anticipated to occur in this future study area throughout the time horizon of the General Plan.

Urban Village: Opportunities in this area include intensification and redevelopment as already allowed under the Urban Village Specific Plan (UVSP). Additionally, the General Plan allows the addition of 117,000 square feet of retail space, above and beyond that specified in the UVSP. The General Plan would also amend the UVSP to allow residential densities between 30 and 50 dwelling units per acre. Table 3-2 depicts the opportunities allowed under the UVSP and with the addition of retail space allowed under the General Plan. An additional 680,000 square feet of non-

residential development, 250 hotel rooms, and 200 residential dwelling units is anticipated to occur in this future study area throughout the time horizon of the General Plan. It should be noted that the UVSP includes provisions to allow flexibility for various development options dependent upon PM peak hour traffic generation. There could be more retail uses and less office uses or vice-versa. This area currently contains approximately 2,164,000 square feet of non-residential development and 436 dwelling units.

Table 3-2
Urban Village Specific Plan Area

Development Potential	Urban Village Specific Plan	Future Study Area	Total
Retail (square feet)	183,000	117,000	300,0000
Residential (dwelling units)	200	No additional proposed	200
Hotel (rooms)	250	No additional proposed	250
General Office (square feet) (no medical office)	380,000	No additional proposed	380,000
Medical Office (square feet) (no general office)	138,000	No additional proposed	138,000

Source: EDAW 2008

La Paz Gateway: Opportunities within the La Paz Gateway area include revitalization and redevelopment. Buildings could be reconstructed and/or enlarged and reoriented to create more vibrant street life and to provide better pedestrian access from adjacent areas. The addition of iconic architecture would also serve to enhance the character of the area and the image of Laguna Hills. The upper portion of the La Paz Gateway future study area has excellent eastward views of hills and mountains that should be enhanced through any redesign and revitalization of the site. This area currently contains approximately 329,000 square feet of non-residential development. An additional 15,000 square feet of non-residential development is anticipated to occur in this future study area throughout the time horizon of the General Plan.

Alicia Parkway/Aliso Hills Park Triangle: Opportunities for this area include providing additional active parks or recreation facilities or an additional civic use that could connect to the nearby Laguna Hills Community Center. Another option may be community gardens. This area does not contain any development. No commercial, retail, or residential development would occur in this future study area throughout the time horizon of the General Plan.

Table 3-3 identifies the development capacity associated with the planned distribution of land uses specified in the Land Use Plan. Development of land uses by 2030 pursuant to the General Plan would result in an increase of 457 dwelling units and approximately 1,031,530 square feet of nonresidential building floor area over existing conditions. A net population increase of approximately 1,229 persons is also anticipated by 2030.

Over time, as properties transition from one use to another or property owners rebuild in the opportunity areas, land uses and intensities would gradually shift to align with the intent of the Land Use Element. Given the largely built-out character of Laguna Hills and the good condition of most buildings, significant redevelopment activities may not occur over the life of this General Plan. However, within the opportunity areas and future study areas described above, future land use changes are anticipated. The EIR analysis fully considers the level of development anticipated to occur in the opportunity areas and future study areas.

Table 3-3
Laguna Hills Development Capacity (2030)

Land Use Category	Existing	Planned	Anticipated Net Change by 2030
Nonresidential			
Retail (square feet)	2,567,450	3,119,780	528,830
Office (square feet)	1,856,570	2,260,940	415,170
Business Park (square feet)	1,496,620	1,571,450	74,830
Nonresidential Subtotal (square feet)	**5,920,640**	**6,952,170**	**1,031,530**
Hotel (rooms)	212	462	250
Residential			
Single-family (dwelling units)	6,194	6,201	7
Multi-family (dwelling units)	4,992	5,442	450
Residential Subtotal (dwelling units)	**11,186**	**11,643**	**457**
Public/Institutional			
Public/Government/Civic (square feet)	**331,720**	**331,720**	**0**
Parks and Recreation			
Parks and Recreation (acreage)	**133.94**	**144.68***	**10.74***
Open Space			
Open Space (acreage)	**413.10**	~~413~~410.83~~10~~	~~0~~-2.27

*Estimate 10-13 acres in Via Lomas Opportunity Area.
Source: EDAW 2008

Table 3-4 compares the existing ~~General Plan~~ conditions with the proposed General Plan conditions for the opportunity areas and future study areas. ~~The table also shows, where applicable, the maximum development capacity of the specified area~~.

Table 3-4
Opportunity Sites and Future Study Areas Development Capacity

Area	Existing		Planned or Expected	
	SF	FAR/DU	SF	FAR/DU
Opportunity Areas				
Alicia Gateway – 40.4 acres	329,000	0.19	523,000	0.30
Via Lomas – 39 acres	N/A	350	N/A	600
Moulton and La Paz - 8.6 acres	55,000	0.15	85,000	0.23
Future Study Areas				
North Business Park – 380 acres	2,266,000	0.14	2,380,000	0.14
Urban Village – 240 acres	2,164,000	0.21/436 DU	2,844,000	0.27/636 DU
La Paz Gateway – 49.9 acres	329,000	0.15	344,000	0.16

Table 3-4 (continued)
Opportunity Sites and Future Study Areas Development Capacity

Area	Existing		Planned or Expected	
	SF	FAR/DU	SF	FAR/DU
Alicia Parkway/Aliso Hills Park Triangle – 2 acres	N/A	N/A	N/A	N/A

SF = square feet; du = dwelling units; FAR = Floor Area Ratio; N/A = Not Applicable
Square footage calculations do not include hotel rooms.

MOBILITY ELEMENT

The Mobility Element guides the continued development of the circulation system to support planned growth. The anticipated development identified in the Land Use Element would increase the demand for local and regional roadways and other forms of transportation. The Mobility Element addresses the existing transportation needs of the community and identifies transportation facilities required to accommodate the planned development allowed by the Land Use Element. Level of service and phasing are integral components of the element. Both local and regional transportation facilities located within the planning area are discussed. Public transportation facilities and routes, pedestrian and bicycle access, pedestrian safety and walkability, recreational trails, traffic calming, and parking are also addressed in this element.

CONSERVATION AND OPEN SPACE ELEMENT

The Conservation and Open Space Element focuses on the protection and enhancement of parks, open space, and recreational trails. This element also discusses biological resources, scenic resources, air quality, greenhouse gases, water resources and conservation, cultural and historic resources (including archaeological and paleontological resources), energy resources and conservation, community gardens, and local agriculture. It also contains goals and policies to address resource sustainability, recreation, and air quality and climate change.

COMMUNITY SERVICES AND FACILITIES ELEMENT

The purpose of the Community Services and Facilities Element is to ensure that sufficient levels of community services and facilities are provided as development and redevelopment occur within the City. This element addresses a range of community services and facilities, including schools, fire protection and emergency services, police protection, water and sewer services, solid waste disposal, libraries, electricity and natural gas, communications, and flood control and stormwater drainage.

SAFETY ELEMENT

The purpose of the Safety Element is to identify and address those features existing in or near the planning area that represent a potential danger to the citizens, structures, public facilities, and infrastructure located in the community. The Safety Element establishes goals, policies, and plans to minimize dangers to residents, workers, and visitors associated with seismic and geologic hazards, fires, neighborhood safety, hazardous materials, waste and nuclear power, flood hazards and stormwater management. Emergency preparedness planning, such as identifying actions needed to manage crisis situations, is also addressed.

NOISE ELEMENT

The Noise Element addresses noise sources in the community and identifies ways to reduce the impact of these noise sources on the community. This element identifies the effects of noise on the surrounding environment and defines noise standards and land use compatibility guidelines to protect noise sensitive land uses from excessive noise. The element specifically identifies interior and exterior noise standards as well as construction standards. Goals, policies, and plans to address and control transportation-related noise and non-transportation-related noise are also identified.

HOUSING ELEMENT

The Housing Element identifies the current and future housing needs within the City's planning area. This element includes a comprehensive discussion of the community's profile, including population, employment, household, and housing stock characteristics. In addition, this element identifies sites within the planning area suitable for housing developments and addresses the constraints associated with housing production in the City. An integrated set of goals, policies, and programs is presented in this element intended to assist in neighborhood and housing preservation, housing availability, and equal housing opportunities for the planning area. Further, policies for the implementation and monitoring of the housing plans set forth in this element are discussed in detail.

3.5.2 IMPLEMENTATION PROGRAM

The General Plan includes an Implementation Program that would serve to ensure the overall direction provided in each General Plan element is translated from general terms to specific actions. The Implementation Program provides strategies to implement the adopted policies and plans identified in each of the General Plan elements. The various programs within the Implementation Program serve as a basis for making future programming decisions related to the assignment of staff and the expenditure of City funds. The programs specifically identify individual program responsibility, funding sources, and time-frame for completion.

3.5.3 ZONING ORDINANCE AMENDMENT

Text and map amendments to the existing Zoning Ordinance are required to implement the proposed Neighborhood Mixed Use and Planned Community ~~Via Lomas~~Residential land use designations. This includes developing standards and use regulations for the two proposed land use designations in order to be consistent with the General Plan.

3.6 ALTERNATIVES

Several alternatives to the General Plan were evaluated in this Program EIR for environmental impacts. The impacts of the alternatives are compared to the impacts of the General Plan to determine whether any of the alternatives are environmentally superior to the General Plan. Alternatives that were evaluated in the Program EIR include:

- No Project/Existing General Plan
- No Change to Urban Village Specific Plan
- Enhanced Conservation Program/Mandatory Conservation Measures and Programs

A complete discussion of the Alternatives to the proposed project is located in Chapter 7.0, Alternatives.

4.0 ENVIRONMENTAL SETTING

The City of Laguna Hills (the "City" or "planning area") is situated in southern Orange County, approximately 45 miles southeast of the City of Los Angeles, 68 miles northwest of the City of San Diego, and 6 miles northeast of the Pacific Ocean. The planning area is composed of approximately 6.6 square miles of land (or about 4,234 acres) and is bordered to the north by the cites of Irvine and Lake Forest, to the east by I-5 and the City of Mission Viejo, to the west by the cities of Laguna Woods and Aliso Viejo, and to the south by the City of Laguna Niguel. Regional access to Laguna Hills is provided by I-5 and SR-73.

The planning area has a variety of land uses, including residential, commercial, office, mixed use, public and institutional, open space and recreational, as well as planned community areas. The predominant land use in Laguna Hills is moderate to low density single-family homes. The planning area contains a range of housing types, including single-family detached and attached homes, apartments, condominiums, and mobile homes located throughout the City. In 2008, 11,186 housing units existed in the City. Nonresidential uses in the planning area, such as commercial and office, provide valuable revenue to the City and provide jobs and services for the community and region. The City had approximately 5,920,640 square feet of nonresidential development in 2008. Most commercial uses are concentrated along I-5 and the major roadways. The planning area is almost entirely built out, although there are seven undeveloped large lot residential parcels scattered throughout the southern portion of the City. Development within the planning area is primarily guided by the Laguna Hills General Plan, Zoning Ordinance, and the Urban Village Specific Plan (UVSP).

The topography of the planning area varies greatly from north to south. Elevations range from approximately 200 feet above sea level at the northern end of the City to over 650 feet above sea level atop prominent ridges in the Nellie Gail Ranch area. Areas of relatively low relief are found in the northeastern area north and east of Veeh Reservoir (20 to 40 feet), and in the central area between El Toro Road and Aliso Creek (40 to 50 feet). Areas in the northwest and southeast have the highest relief (200 to 450 feet). Due to this varied topography, the planning area contains unique scenic qualities, and view opportunities are present in various areas throughout the City.

The planning area is located within the South Coast Air Basin, which covers all of Orange County as well as potions of Los Angeles, Riverside, and San Bernardino counties. The South Coast Air Basin is a nonattainment area for State Ambient Air Quality Standards for ozone and inhalable particulate matter.

While the majority of the land within the planning area is developed, small areas of open space occur throughout the planning area. Disturbances resulting from current and historic land uses have degraded or replaced most of the native biological resources that once occurred. Native vegetation is primarily limited to isolated patches that occur in stream channels or drainages, hillsides paralleling some roadways, and small urban canyons. Some of these remaining native habitat areas are discontinuous and interspersed with nonnative, disturbed (i.e., ruderal or weedy) vegetative cover. Although the extent of native habitat is limited, various areas in and around residences and parks within the planning area are characterized by lush landscaping and ornamental plantings, or expanses of nonnative plant species that provide "greenbelts" of vegetative cover and separation between developed areas.

The planning area has been identified as having prehistoric archaeological and paleontological resource sensitivity. Significant paleontological resources have been found in the planning area; however, due to the built-out nature the likelihood of finding new or undiscovered cultural and historic resources is limited.

The planning area is located within the Peninsular Ranges geomorphic province, which is characterized by generally northwest-trending mountains and valleys, located south of the Transverse Ranges and west of the Mojave and Colorado deserts. Landforms and topography of the planning area are controlled by the distribution and character of geologic units, by fault movements, and by climate and erosion, all of which contribute to the sculpture of the landscape. Due to the varied topography and geologic setting, portions of the planning area are subject to geologic hazards, including landslides and liquefaction. Further, the planning area is located in the seismically active region of southern California and is located approximately 8.8 miles from the Newport-Inglewood fault. In addition, the City is underlain by the San Joaquin Hills blind thrust. No faults within or near the City have been placed within State of California established Alquist-Priolo Earthquake Fault Zones, which are subject to special land use controls and building standards.

The City of Laguna Hills is located within two State of California Regional Water Quality Control Boards (RWQCBs): Region 8 – the Santa Ana Region and Region 9 – the San Diego Region. The Santa Ana RWQCB encompasses the northern portion of the City (all the area north of El Toro Road). The San Diego RWQCB encompasses the central and southern portions of the City (all of the planning area south of El Toro Road). The City relies strictly on imported water from the Colorado River and the State Water Project (which draws water from the San Francisco-San Joaquin Bay Delta) that travels hundreds of miles to the local water districts through an intricate underground delivery system operated by the Metropolitan Water District of Southern California (MWD). Due to the underlying geologic formations of the planning area, no local groundwater resources exist within the planning area.

According to the U.S. Census Bureau, the population of Laguna Hills was 31,178 in 2000. The California Department of Finance (CDF) estimates that the population was 33,421 as of January 2008, an increase of approximately 7 percent. The 2000 Census reported that Laguna Hills had 10,366 housing units. On January 1, 2008, the CDF reported that Laguna Hills had a total of 11,153 housing units. According to Southern California Association of Governments (SCAG) data, approximately 25,308 jobs were located in the City in 2005. Based on the CDF housing stock reported above, this indicates a jobs/housing ratio of 2.27 jobs per housing unit.

The primary existing noise source within the planning area is vehicular noise from highways and roadways such as I-5, Oso Parkway, La Paz Road, and El Toro Road. Additionally, construction activities, and stationary commercial and recreational uses represent other noise sources within the planning area.

The planning area is served by adequate police and fire protection services, libraries, schools, water, wastewater, solid waste, stormwater drainages, and energy infrastructure. Throughout the planning area are parks and recreational spaces, both public and private.

Existing land uses generate approximately 172,023 average vehicle trips per day. With the exception of the freeway ramp at I-5/Cabot Road and La Paz Road, which is currently operating at a PM level of service (LOS) F, all other intersections are operating at or better than the performance standards defined by the City.

5.0 ENVIRONMENTAL IMPACT ANALYSIS

This chapter of the Program EIR discusses each of the potentially significant effects of implementing the Laguna Hills General Plan and Zoning Ordinance and identifies mitigation measures to reduce impacts found to be potentially significant. In accordance with the CEQA Guidelines, this Program EIR analyzes those environmental issue areas where significant impacts have the potential to occur.

The environmental issues analyzed in this Program EIR are:

- Aesthetics and Visual Resources
- Agricultural Resources
- Air Quality
- Biological Resources
- Cultural and Paleontological Resources
- Geology, Soils, and Mineral Resources
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Noise
- Population and Housing
- Public Services and Utilities
- Recreation
- Transportation and Circulation
- Global Climate Change

With the exception of global climate change, which is addressed in Chapter 6, each issue area and section is analyzed in the following manner:

Environmental Setting describes the existing conditions in the environment in the vicinity of the project before the commencement of the project to provide a baseline for comparing "before the project" and "after the project" environmental conditions.

Regulatory Framework provides a summary of the applicable federal, state, and local laws, regulations, plans, or policies that are relevant to each environmental issue area and, therefore, must be considered by the City of Laguna Hills in the decision-making process.

Thresholds for Determining Significance defines and lists specific criteria used to determine whether an impact is or is not considered to be potentially significant. Major sources used in crafting criteria appropriate to the specifics of the project include the CEQA Guidelines; local, state, federal, or other standards applicable to an impact category; and officially established thresholds of significance. Per CEQA, "…an ironclad definition of significant effect is not possible because the significance of an activity may vary with the setting" (CEQA Guidelines, Section 15064 [b]). Principally, "… a substantial, or potentially substantial, adverse change in any of the physical conditions within an area affected by the project, including land, air, water, flora, fauna, ambient noise, and objects of historic and aesthetic significance" constitutes a significant impact (CEQA Guidelines, Section 15382).

Analysis of Environmental Impacts presents evidence, based to the extent possible on scientific and factual data, for the cause and effect relationship between the proposed project and the potential changes in the environment. The exact magnitude, duration, extent, frequency, range, or other parameters of a

potential impact are ascertained, to the extent possible, to determine whether impacts may be significant, all of the potential effects, including direct effects, reasonably foreseeable indirect effects, and considerable contributions to cumulative effects, are considered.

Mitigation Measures identifies the means by which potentially significant impacts could be reduced or avoided in cases where the Program EIR analysis determines such impacts to be potentially significant. Standard existing regulations, requirements, programs, and procedures that are applied to all similar projects are taken into account in identifying additional project-specific mitigation that may be needed to reduce significant impacts. Mitigation, in addition to measures that the lead agency will implement, can also include measures that are within the responsibility and jurisdiction of another public agency (CEQA Guidelines, Section 15091 [a] [2]). Many of the mitigation measures have been drawn from the Implementation Program of the General Plan.

Impact after Mitigation identifies the impacts that will remain after application of mitigation measures, and whether the remaining impacts are or are not considered significant. When these impacts, even with the inclusion of mitigation measures, cannot be mitigated to a level considered less than significant, they are identified as "unavoidable significant impacts." To approve a project with significant unavoidable impacts, the lead agency must adopt a Statement of Overriding Considerations. In adopting such a statement, the lead agency finds that it has reviewed the Program EIR, has balanced the benefits of the project against the unavoidable adverse environmental effects, and determines that the benefits outweigh the adverse environmental effects. Thus, the adverse environmental effects may be considered "acceptable" (CEQA Guidelines Section 15093 [a]).

5.1 AESTHETICS AND VISUAL RESOURCES

This section describes the existing visual resources within the planning area and analyzes the potential impacts to visual resources that could result from implementation of the General Plan. Specifically, impacts associated with scenic resources, scenic vistas, visual character, and light and glare are discussed.

5.1.1 ENVIRONMENTAL SETTING

SCENIC VISTAS AND SCENIC RESOURCES

The topography of Laguna Hills varies greatly from north to south. Elevations range from approximately 200 feet above sea level at the northern end of the City to over 650 feet above sea level atop prominent ridges in the Nellie Gail Ranch area. Due to this varied topography, view opportunities are present within Laguna Hills. As shown in Figure 5.1-1, portions of Laguna Hills include scenic open spaces and vista points including Lake Hills Corporate Park, Moulton Ranch Park, Mandeville Park, and the Courtyard at La Paz. According to the County of Orange Master Plan there are no designated Viewscape Corridors; however, three roadways within the City of Laguna Hills have been identified and designated as Landscape Corridors. They are Alicia Parkway, La Paz Road, and Oso Parkway.

VISUAL CHARACTER

The majority of Laguna Hills is urbanized with residential developments, commercial shopping centers, schools, and other office/professional uses. A wide variety of built and natural features contribute to the character of Laguna Hills. Parks and open space areas are located throughout the community, including the Aliso Creek Corridor, and a variety of open space, parks, and recreation areas such as pedestrian and equestrian trails; recreational facilities; natural open space corridors; hillsides; canyons; and various utility, roadway, and buffer easements.

LIGHT AND GLARE

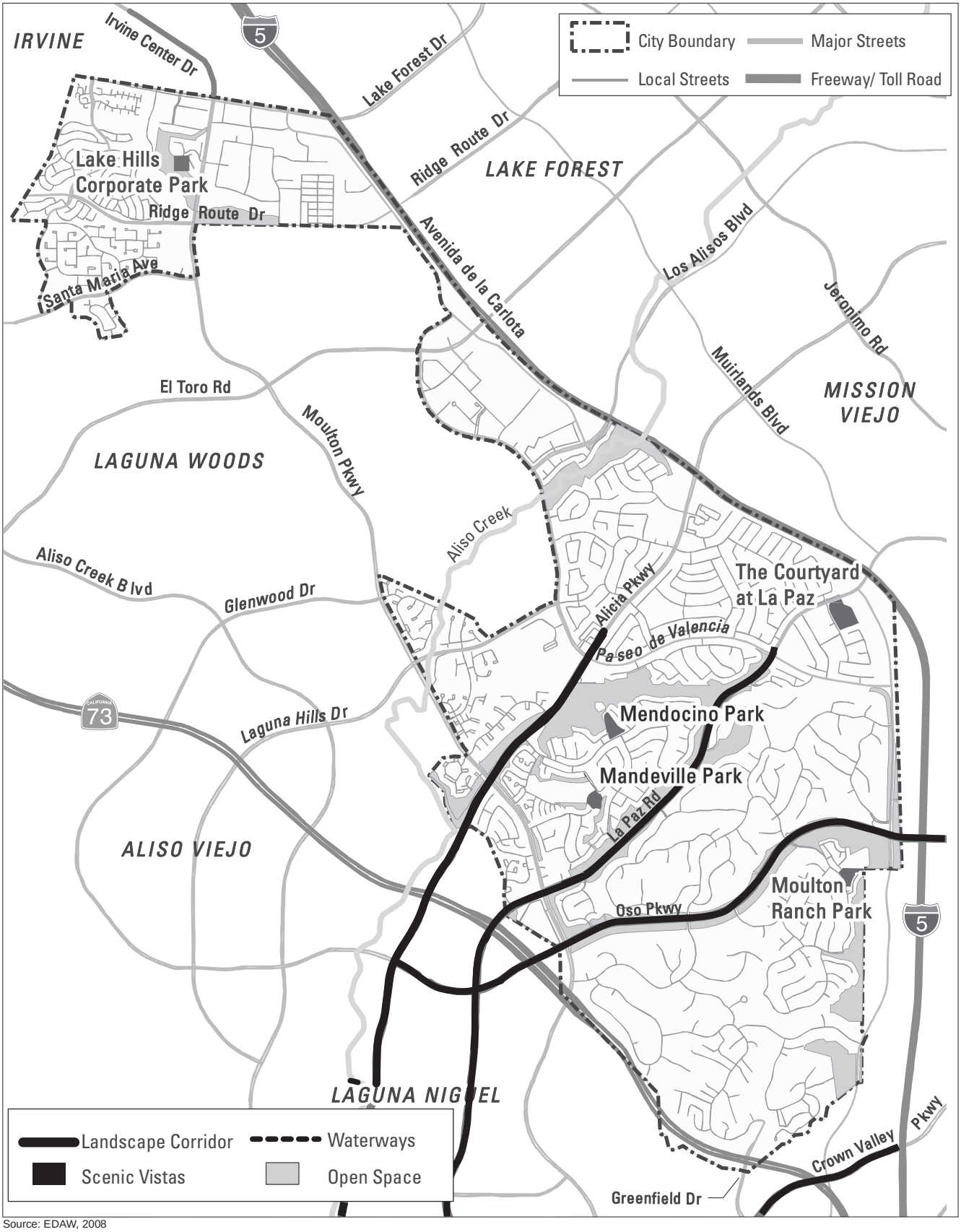
Much of the planning area is urbanized, with existing sources of light and glare, such as street lights along roadways, parking lots and walkways, lighted recreational facilities, and light emitted from residential and nonresidential buildings. While the City's single-family residential neighborhoods are generally not subject to substantial night lighting, more commercial areas such as the Urban Village do experience greater lighting effects.

5.1.2 REGULATORY FRAMEWORK

Regulations exist at local, state, and federal levels that guide the development and enforcement of codes to adequately provide public services and facilities to City residents and businesses. These regulations include, but are not limited to the following subjects:

BIKEWAYS, TRAILS, AND OPEN SPACE MASTER PLAN

The City of Laguna Hills Bikeways, Trails, and Open Space Master Plan was prepared in 2001 and represents a comprehensive planning effort to guide future recreation development and natural area conservation within the City of Laguna Hills. The Plan includes a description of the baseline conditions in 2001 as well as explores the opportunities and constraints for the improvement of bikeways, trails, and open spaces.



Source: EDAW, 2008

0 0.2 0.4 0.8 Miles

Figure 5.1-1
Scenic Resources

MUNICIPAL CODE AND ZONING ORDINANCE

The City's Municipal Code and Zoning Ordinance are the primary tools used to implement the goals and policies of the General Plan. The Zoning Ordinance provides more detailed direction related to design and development standards; permitted, conditionally permitted, and prohibited uses; and other regulations such as parking standards, lighting, and sign regulations. The land uses specified in the Zoning Ordinance are based upon and should be consistent with the land use policies set forth in the General Plan.

URBAN VILLAGE SPECIFIC PLAN (UVSP)

While the General Plan provides overall guidance for the physical development of the City, specific plans are used to provide more detailed regulatory guidance for special areas or large developments within the City. Specific plans are generally composed of a land use plan, circulation plan, development standards, design guidelines, phasing plan, infrastructure plan (water, sewer, or drainage), and implementation plan. They are typically implemented as customized zoning for a particular area of the City and are generally used for large-scale projects that require a comprehensive approach to planning and infrastructure issues.

The City currently has one approved specific plan. The UVSP, adopted in November 2002, is a 240-acre area bounded by Paseo de Valencia on the north and west, Los Alisos Boulevard on the south, and I-5 on the east. The UVSP provides for a continuing mixture of land uses, including retail, residential hotel, medical offices, and general offices.

5.1.3 THRESHOLDS FOR DETERMINING SIGNIFICANCE

Based on Appendix G of the CEQA Guidelines, a significant impact related to aesthetics and visual resources would occur if implementation of the General Plan would:

- Have a substantial adverse effect on a scenic vista;
- Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a scenic highway;
- Substantially degrade the existing visual character or quality of the site and its surroundings; or
- Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

5.1.4 ANALYSIS OF ENVIRONMENTAL IMPACTS

Development by 2030 pursuant to the General Plan land use policy would result in an increase of approximately 457 dwelling units and approximately 1,031,530 square feet of nonresidential building floor area over existing conditions. Given the largely built-out character of Laguna Hills and the good condition of most buildings, substantial new development and redevelopment activities may not occur over the life of the General Plan.

SCENIC VISTAS AND SCENIC RESOURCES

New development and redevelopment activities, as well as landscaping and infrastructure improvements along the City's corridors, have the potential to impact the existing scenic vistas and resources within the planning area.

~~T~~For example, the proposed General Plan proposes to extend the Community Commercial land use designation in the Moulton and La Paz Opportunity Area about 150 feet south. This extension would

result in the loss of approximately 2.27 acres of unimproved dedicated open space, and a purchase and sale agreement of publicly owned land to a private developer. This open space primarily consists of dirt and interspersed eucalyptus trees.

The proposed General Plan designates La Paz Road adjacent to this open space area as a landscape corridor. A landscape corridor, as defined in the proposed General Plan, is a corridor that traverses developed or developing areas and has been designated for special treatment to provide a pleasant driving environment as well as community enhancement. Although extension of the Community Commercial land use designation would result in the loss of the unimproved dedicated open space consisting of dirt and interspersed eucalyptus trees, the area directly adjacent to La Paz Road would remain dedicated open space, and an area currently used as a horse trail would be retained and enhanced. Additionally, improvements to the horse trail and increased landscaping will enhance the visual appeal of this area. Nevertheless, the loss of open space with the extension of the Community Commercial land use designation and potential subsequent redevelopment could result in a potentially significant impact to scenic resources.

Laguna Hills has many regulations in place designed to preserve existing scenic vistas and scenic resources of the community. The continued application of these regulations as well as Mitigation Measures A-1 through A-3 ~~will~~ would reduce scenic vistas and scenic resources impacts to less than significant. ~~result in less than significant impacts to scenic vistas and scenic resources~~.

Specifically, all development projects are required to meet the standards contained within the Zoning Ordinance, or within the applicable Specific Plan that regulate design, lighting, building placement and landscaping. Additionally, Mitigation Measures A-1 and A-2 encourage beautification of key gateways and streetscapes to improve the appearance of both public and private properties that are highly visible to those traveling on key view corridors such as Alicia Parkway, Oso Parkway, and La Paz Road. Implementation of Mitigation Measure A-3 further requires the City and developers to preserve scenic views and vistas of natural and man-made landmarks visible from public locations and roadways. The continued application of existing regulations and the implementation of Mitigation Measures A-1 through A-3 would reduce impacts associated with scenic vistas and scenic resources, to a level less than significant.

VISUAL CHARACTER

The majority of Laguna Hills is urbanized. Implementation of the General Plan is not expected to result in a reduction of the visual character of the City. The Opportunity Areas and Future Study Areas identified in the General Plan are where land uses are most likely to change. Additionally, the proposed Parks and Open Space map identifies parks and open space areas for conservation and preservation throughout the City. Anticipated development activities described in the General Plan include infill and redevelopment, or limited new development that is focused within the identified areas. This new development and redevelopment, although limited, has the potential to differ in design and scale than immediately adjacent uses, resulting in perceived visual impacts to residents and visitors of the community.

Laguna Hills has many regulations in place designed to preserve the existing visual character of the community. The continued application of these regulations, as well as Mitigation Measures A-4 through A-6, will reduce potentially significant impacts to visual character to less than significant. These measures require the City to preserve existing neighborhoods by incorporating policies that protect the character of the City's residential neighborhoods. In particular, all development projects will be required to meet the City's Design Regulations and Standards contained within the Zoning Ordinance, or the applicable City's Specific Plan requirements. The continued application of existing regulations, and the implementation of

Mitigation Measures A-4 through A-6, would reduce impacts associated with visual character to a level less than significant.

LIGHT AND GLARE

New development and redevelopment is largely focused in commercial and nonresidential areas that already experience some effects from night lighting. In some instances, residential neighborhoods may be located adjacent to these areas and sensitive to the introduction of new light sources. With new development and redevelopment, additional lighting sources may be introduced into these areas.

Although the General Plan does not identify any new parks or recreational facilities, the General Plan proposes that a Parks Needs Assessment be completed. As a result of the Parks Needs Assessment, new parks and recreational facilities may also be recommended in the community. All new development and redevelopment projects in the City, including parks and recreational facilities, are required to meet existing regulations, including those contained in the City's Design Regulations and Standards within the Zoning Ordinance. As future projects come forward that include specific lighting plans, they will be reviewed for consistency with these requirements. These regulations and the project review process required by CEQA are designed to limit light and glare to acceptable levels; therefore, no impact associated with light and glare will occur.

5.1.5 MITIGATION MEASURES

Implementation of the following programmatic mitigation measures, derived from the General Plan Implementation Program, will reduce potential impacts to a less than significant level at this Program EIR level of analysis. Individual development projects will be required to undergo project-specific environmental review and mitigation measures will be identified to reduce any significant impacts. Mitigation for significant environmental impacts of each future development project shall include the following: (1) objective of the measure; (2) specific standards or measures to be applied, along with any needed contingency measure; (3) responsible party; (4) location; (5) schedule for initiation; and (6) how the measure will reduce the associated environmental impact.

A-1 The City shall plan and encourage strong unifying gateways at major entrances to the City and in community activity centers, and new private and public infrastructure and development projects to achieve strong gateway features through the use of signage and iconic design, architecture, and/or landscaping components that communicate Laguna Hills' identity and character. **(Implementation Program LU-11)**

A-2 Enhance the City's identity and promote walkability by developing a program whereby businesses or residents may sponsor street furniture, public art, and/or landscaped areas; continue to install public amenities such as streetscape, lighting, and landscaping. **(Implementation Program LU-12)**

A-3 The City shall require that as new development and revitalization projects come forward, the City will work with developers to preserve scenic views and vistas of natural and man-made landmarks visible from public locations and streets. **(Implementation Program M-12)**

A-4 Review and update the Zoning Ordinance and Zoning Map to include the addition of the Planned Community ~~Via Lomas~~Residential Zone and Neighborhood Mixed Use Zone and appropriate development standards, and the update and expansion of Section 9-40 Design Regulations and Standards to facilitate and encourage connectivity and compatibility between

adjacent land uses and activities, as well as ensure excellent design of development and revitalization projects. **(Implementation Program LU-3)**

A-5 Review discretionary proposals to assess the compatibility of proposed development with adjacent / surrounding uses and activities, including the requirement of site design, buffers, architectural and buffering techniques, and other measures to be incorporated into projects to ensure compatibility between uses and activities. **(Implementation Program LU-6)**

A-6 Review development and revitalization projects for consistency with Zoning Ordinance Section 9-40, Design Regulations and Standards. **(Implementation Program LU-7)**

5.1.6 IMPACT AFTER MITIGATION

SCENIC VISTAS AND SCENIC RESOURCES

Implementation of Mitigation Measures A-1 through A-3 would reduce impacts associated with scenic vistas and scenic resources to a level less than significant.

VISUAL CHARACTER

Implementation of Mitigation Measures A-4 through A-6 would reduce impacts associated with visual character to a level less than significant.

LIGHT AND GLARE

No significant lighting and glare impacts were identified and no mitigation is required.

5.2 AGRICULTURAL RESOURCES

This section describes the extent of agricultural resources within the planning area and evaluates the potential impacts on agricultural resources that could result from implementation of the General Plan.

5.2.1 ENVIRONMENTAL SETTING

Because the planning area is almost entirely built out, it consists primarily of developed urban land and City-maintained open space. Consequently, no agricultural land exists within the planning area.

The California Department of Conservation (DOC) administers the Farmland Mapping and Monitoring Program (FMMP). The FMMP produces maps and statistical data used for analyzing impacts on California's agricultural resources. The goal of the FMMP is to provide consistent and impartial data to decision makers for use in assessing present status, reviewing trends, and planning for the future of California's agricultural land resources. Agricultural land is rated according to soil quality and irrigation status; the best quality land is categorized as Prime Farmland. The Important Farmland Maps are updated every 2 years with the use of aerial photographs, a computer mapping system, public review, and field reconnaissance.

The FMMP uses the following criteria to identify mapped land uses:

- PRIME FARMLAND: Farmland with the best combination of physical and chemical features able to sustain long term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.

- FARMLAND OF STATEWIDE IMPORTANCE: Farmland similar to Prime Farmland but with minor shortcomings, such as greater slopes or less ability to store soil moisture. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.

- UNIQUE FARMLAND: Farmland of lesser quality soils used for the production of the state's leading agricultural crops. This land is usually irrigated, but may include nonirrigated orchards or vineyards as found in some climatic zones in California. Land must have been cropped at some time during the four years prior to the mapping date.

- FARMLAND OF LOCAL IMPORTANCE: Land of importance to the local agricultural economy as determined by each county's board of supervisors and a local advisory committee.

- GRAZING LAND: Land on which the existing vegetation is suited to the grazing of livestock. This category was developed in cooperation with the California Cattlemen's Association, University of California Cooperative Extension, and other groups interested in the extent of grazing activities. The minimum mapping unit for Grazing Land is 40 acres.

- URBAN AND BUILT-UP LAND: Land occupied by structures with a building density of at least 1 unit to 1.5 acres, or approximately 6 structures to a 10-acre parcel. This land is used for residential, industrial, commercial, institutional, public administrative purposes, railroad and other transportation yards, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, water control structures, and other developed purposes.

- OTHER LAND: Land not included in any other mapping category. Common examples include low density rural developments; brush, timber, wetland, and riparian areas not suitable for livestock grazing; confined livestock, poultry or aquaculture facilities; strip mines, borrow pits; and water bodies smaller than 40 acres. Vacant and nonagricultural land surrounded on all sides by urban development and greater than 40 acres is mapped as Other Land.

The 2006 Important Farmland Map for Orange County identifies only two categories of land within the planning area: Urban and Built-Up Land and Other Land (DOC 2006). The Important Farmland Map for Orange County did not identify any farmland (including Prime Farmland, Unique Farmland, or Farmland of Statewide Importance) within the planning area.

No zoning for agricultural use exists within the planning area. No Williamson Act contracts exist within the planning area (DOC 2006).

5.2.2 REGULATORY FRAMEWORK

In this Program EIR, the regulatory framework discussion provides a summary of the applicable federal, state, and local laws, regulations, plans, or policies that are relevant to each environmental issue area and, therefore, must be considered by the City of Laguna Hills in the decision-making process. No applicable federal, state, or local laws, regulations, plans, or policies that are relevant to the environmental analysis of agricultural resources were identified. Therefore, the regulatory framework relevant to agricultural resources is not discussed further in this Program EIR.

5.2.3 THRESHOLDS FOR DETERMINING SIGNIFICANCE

Based on Appendix G of the CEQA Guidelines, a significant impact related to agricultural resources would occur if implementation of the General Plan would:

- Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use;
- Conflict with existing zoning for agricultural use, or a Williamson Act contract; or
- Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use.

5.2.4 ANALYSIS OF ENVIRONMENTAL IMPACTS

CONVERSION OF FARMLAND

Because no Farmland designated by the DOC occurs within the planning area, implementation of the General Plan would not result in the conversion of Farmland to non-agricultural use. Thus, no significant impact to Farmland will occur as a result of implementation of the General Plan. No mitigation is required.

CONFLICT WITH AGRICULTURAL ZONING OR WILLIAMSON ACT CONTRACT

No areas zoned for agricultural uses or Williamson Act contract lands occur within the planning area. Thus, no significant impact will occur as a result of implementation of the General Plan. No mitigation is required.

OTHER CHANGES CONVERTING FARMLAND

Because no Farmland occurs within or adjacent to the planning area, implementation of the General Plan would not result in changes in the existing environment that could result in conversion of Farmland to non-agricultural use. Thus, no significant impact will occur as a result of implementation of the General Plan. No mitigation is required.

5.2.5 MITIGATION MEASURES

Impacts to agricultural resources will be less than significant. No mitigation is required.

5.2.6 IMPACT AFTER MITIGATION

CONVERSION OF FARMLAND

Implementation of the General Plan will not result in conversion of Farmland.

CONFLICT WITH AGRICULTURAL ZONING OR WILLIAMSON ACT CONTRACT

Implementation of the General Plan will not conflict with agricultural zoning or Williamson Act contracts.

OTHER CHANGES CONVERTING FARMLAND

Implementation of the General Plan will not result in other changes that would convert Farmland.

This page intentionally left blank.

5.3 AIR QUALITY

This section includes a description of existing air quality conditions in the planning area, a summary of applicable regulations, and an analysis of potential air quality impacts of the General Plan.

5.3.1 ENVIRONMENTAL SETTING

Laguna Hills is located in Orange County, which lies within the South Coast Air Basin (Basin), a 6,600-square-mile coastal plain bounded by the Pacific Ocean to the southwest and the San Gabriel, San Bernardino, and San Jacinto mountains to the north and east. The Basin includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino counties.

Ambient concentrations of air pollutant emissions are determined by the amount of emissions released by sources and the atmosphere's ability to transport and dilute such emissions. Natural factors that affect transport and dilution include terrain, wind, atmospheric stability, and sunlight. Therefore, existing air quality conditions in the Basin are determined by such natural factors as topography, meteorology, and climate, in addition to the amount of emissions released by existing air pollutant sources, as discussed separately below.

TOPOGRAPHY, METEOROLOGY, AND CLIMATE

The distinctive climate of the Basin is determined by its terrain and geographic location. The Basin is a coastal plain with connecting broad valleys and low hills, bounded by the Pacific Ocean to the southwest and high mountains around the rest of its perimeter. The general region lies in the semipermanent high-pressure zone of the eastern Pacific, resulting in a mild climate tempered by cool sea breezes with light average wind speeds. The usually mild climatological pattern is interrupted occasionally by periods of extremely hot weather, winter storms, or Santa Ana winds.

Winds in the planning area are usually driven by the dominant land/sea breeze circulation system. Regional wind patterns are dominated by the daytime onshore sea breezes. At night, the wind generally slows and reverses direction traveling toward the sea. Local canyons can also alter wind direction, with wind tending to flow parallel to the canyons.

The vertical dispersion of air pollutants in the Basin is hampered by the presence of persistent temperature inversions. High-pressure systems, such as the semipermanent high-pressure zone in which the Basin is located, are characterized by an upper layer of dry air that warms as it descends, restricting the mobility of cooler, marine-influenced air near the ground surface, and resulting in the formation of subsidence inversions. Such inversions restrict the vertical dispersion of air pollutants released into the marine layer and, together with strong sunlight, can produce worst-case conditions for the formation of photochemical smog. The Basinwide occurrence of inversions at 3,500 feet above mean sea level or less averages 191 days per year (SCAQMD 1993).

The atmospheric pollution potential of an area is largely dependent on winds, atmospheric stability, solar radiation, and terrain. The combination of low wind speeds and low inversions produces the greatest concentration of air pollutants. On days without inversions, or on days of winds averaging over 15 miles per hour, smog potential is greatly reduced.

EXISTING AIR QUALITY—CRITERIA AIR POLLUTANTS

Concentrations of criteria air-pollutant emissions are used as indicators of ambient air quality conditions. A brief description of each criteria air pollutant (source types, health effects, and future trends) is

provided below along with the most current attainment area designations and monitoring data for the Basin.

Ozone

Ozone is a photochemical oxidant, a substance whose oxygen combines chemically with another substance in the presence of sunlight, and the primary component of smog. Ozone is not emitted directly into the air but is formed through complex chemical reactions between precursor emissions of reactive organic gases (ROG) and oxides of nitrogen (NO_X) in the presence of sunlight. ROG are volatile organic compounds that are photochemically reactive. ROG emissions result primarily from incomplete combustion and the evaporation of chemical solvents and fuels. NO_X are a group of gaseous compounds of nitrogen and oxygen that result from the combustion of fuels.

Ozone located in the upper atmosphere, known as the stratosphere, acts in a beneficial manner by shielding the earth from harmful ultraviolet radiation that is emitted by the sun. However, ozone located in the lower atmosphere , known as the troposphere, is a major health and environmental concern. Meteorology and terrain play a major role in ozone formation. Generally, low wind speeds or stagnant air coupled with warm temperatures and clear skies provide the optimum conditions for formation. As a result, summer is generally the peak ozone season. Because of the reaction time involved, peak ozone concentrations often occur far downwind of the precursor emissions. Therefore, ozone is a regional pollutant that often affects large areas. In general, ozone concentrations over or near urban and rural areas reflect an interplay of emissions of ozone precursors, transport, meteorology, and atmospheric chemistry (Godish 2004).

The adverse health effects associated with exposure to ozone pertain primarily to the respiratory system. Scientific evidence indicates that ambient levels of ozone affect not only sensitive receptors, such as asthmatics and children, but healthy adults as well. Exposure to ambient levels of ozone ranging from 0.10 to 0.40 parts per million (ppm) for 1 or 2 hours has been found to significantly alter lung functions by increasing respiratory rates and pulmonary resistance, decreasing tidal volumes, and impairing respiratory mechanics. Ambient levels of ozone above 0.12 ppm are linked to symptomatic responses such as throat dryness, chest tightness, headache, and nausea. In addition to the above adverse health effects, evidence also exists relating ozone exposure to an increase in the permeability of respiratory epithelia; such increased permeability leads to an increase in the respiratory system's responsiveness to challenges and the interference or inhibition of the immune system's ability to defend against infection (Godish 2004).

Ozone air quality in the Basin has improved substantially over the last 30 years. The 2006 peak 8-hour indicator value was 45 percent lower than the 1987 value. The 2007 3-year average of the maximum 8-hour concentration was over 40 percent lower than the 1989 average. The number of days above the standards has also declined dramatically, and the trend for the 1-hour ozone concentration is similar to that for the 8-hour. Continuing implementation of aggressive emissions control measures will ensure continued progress throughout the Basin (ARB 2008a).

Carbon Monoxide

Carbon monoxide (CO) is a colorless, odorless, and poisonous gas produced by incomplete burning of carbon in fuels, primarily from mobile (transportation) sources. In fact, 77 percent of the nationwide CO emissions is from mobile sources. The other 23 percent consists of CO emissions from wood-burning stoves, incinerators, and industrial sources.

CO enters the bloodstream through the lungs by combining with hemoglobin, which normally supplies oxygen to the cells. However, CO combines with hemoglobin much more readily than oxygen does, resulting in a drastic reduction in the amount of oxygen available to the cells. Adverse health effects associated with exposure to CO concentrations include such symptoms as dizziness, headache, and fatigue. CO exposure is especially harmful to individuals who suffer from cardiovascular and respiratory diseases (USEPA 2008a).

The highest CO concentrations are generally associated with cold, stagnant weather conditions that occur during the winter. In contrast to ozone, which tends to be a regional pollutant, CO tends to cause localized problems.

Nitrogen Dioxide

Nitrogen dioxide (NO_2) is a brownish, highly reactive gas that is present in all urban environments. The major human-made sources of NO_2 are combustion devices, such as boilers, gas turbines, and mobile and stationary reciprocating internal-combustion engines. Combustion devices emit primarily nitric oxide (NO), which reacts through oxidation in the atmosphere to form NO_2 (USEPA 2008a). The combined emissions of NO and NO_2 are referred to as NO_X, which are reported as equivalent NO_2. Because NO_2 is formed and depleted by reactions associated with photochemical smog (ozone), the NO_2 concentration in a particular geographical area may not be representative of the local NO_X emission sources.

Inhalation is the most common route of exposure to NO_2. Because NO_2 has relatively low solubility in water, the principal site of toxicity is in the lower respiratory tract. The severity of the adverse health effects depends primarily on the concentration inhaled rather than the duration of exposure. An individual may experience a variety of acute symptoms, including coughing, difficulty with breathing, vomiting, headache, and eye irritation, during or shortly after exposure. After a period of approximately 4 to 12 hours, an exposed individual may experience chemical pneumonitis or pulmonary edema with breathing abnormalities, cough, cyanosis, chest pain, and rapid heartbeat. Severe, symptomatic NO_2 intoxication after acute exposure has been linked on occasion with prolonged respiratory impairment, with such symptoms as chronic bronchitis and decreased lung functions.

Sulfur Dioxide

Sulfur dioxide (SO_2) is produced by such stationary sources as coal and oil combustion, steel mills, refineries, and pulp and paper mills. The major adverse health effects associated with SO_2 exposure pertain to the upper respiratory tract. SO_2 is a respiratory irritant with constriction of the bronchioles occurring with inhalation of SO_2 at 5 ppm or more. On contact with the moist mucous membranes, SO_2 produces sulfurous acid, which is a direct irritant. Concentration rather than duration of the exposure is an important determinant of respiratory effects. Exposure to high SO_2 concentrations may result in edema of the lungs or glottis and respiratory paralysis.

Particulate Matter

Respirable particulate matter with an aerodynamic diameter of 10 microns or less is referred to as PM_{10}. PM_{10} consists of particulate matter emitted directly into the air, such as fugitive dust, soot, and smoke from mobile and stationary sources, construction operations, fires, and natural windblown dust; and particulate matter formed in the atmosphere by condensation and/or transformation of SO_2 and ROG (USEPA 2008a). $PM_{2.5}$ includes a subgroup of finer particles that have an aerodynamic diameter of 2.5 microns or less (ARB 2008a).

Adverse health effects associated with PM_{10} depend on the specific composition of the particulate matter. For example, health effects may be associated with adsorption of metals, polycyclic aromatic hydrocarbons, and other toxic substances onto fine particulate matter (which is referred to as the "piggybacking effect"), or with fine dust particles of silica or asbestos. Generally, adverse health effects associated with PM_{10} may result from both short-term and long-term exposure to elevated concentrations and may include breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular diseases, alterations to the immune system, carcinogenesis, and premature death (USEPA 2008a). $PM_{2.5}$ poses an increased health risk because the particles can deposit deep in the lungs and contain substances that are particularly harmful to human health.

Direct emissions of PM_{10} have been increasing in the Basin since 1975. A decrease in emissions would have been observed, if not for growth in emissions from areawide sources, primarily fugitive dust from paved and unpaved roads, dust from construction and demolition operations, and other sources. The increase in activity of these areawide sources reflects the increased growth and vehicle miles traveled (VMT) in the Basin. PM_{10} concentrations in the Basin have shown an improvement during the years for which reliable data are available. The 3-year average of the annual average decreased about 33 percent from 1989 to 2006. Despite the overall decrease, ambient concentrations still exceed the state annual and 24-hour PM_{10} standards. Similar to the ambient concentrations, the calculated number of days above the 24-hour PM_{10} standards has also shown an overall drop. During 1989, there were 305 calculated days above the state standard and 34 calculated days above the national standard. By 2006, there were 241 calculated state standard exceedance days and no national standard exceedance days. Despite these decreases, PM_{10} continues to pose a significant problem in the Basin. While emission controls implemented for ozone will also benefit PM_{10}, more controls aimed specifically at reducing PM_{10} will be needed to reach attainment (ARB 2008a).

Direct emissions of $PM_{2.5}$ have decreased slightly in the Basin since 1975. Stationary source emissions have been decreasing, while areawide emissions have been increasing. Annual average $PM_{2.5}$ concentrations (national and state) in the Basin were relatively stable from 1999 to 2001. However, annual average concentrations have shown a declining trend from 2002 to 2006. The 98th percentile of 24-hour $PM_{2.5}$ concentrations has also declined during this time period (ARB 2008a).

Lead

Lead is a metal found naturally in the environment as well as in manufactured products. The major sources of lead emissions have historically been mobile and industrial sources. As a result of the phase-out of leaded gasoline, as discussed in detail below, metal processing is currently the primary source of lead emissions. The highest levels of lead in air are generally found near lead smelters. Other stationary sources are waste incinerators, utilities, and lead-acid battery manufacturers.

Twenty years ago, mobile sources were the main contributor to ambient lead concentrations in the air. In the early 1970s, the U.S. Environmental Protection Agency (USEPA) set national regulations to gradually reduce the lead content in gasoline. In 1975, unleaded gasoline was introduced for motor vehicles equipped with catalytic converters. The USEPA banned the use of leaded gasoline in highway vehicles in December 1995 (USEPA 2008a).

As a result of the USEPA's regulatory efforts to remove lead from gasoline, emissions of lead from the transportation sector declined dramatically (95 percent between 1980 and 1999), and levels of lead in the air decreased by 94 percent between 1980 and 1999. Transportation sources, primarily airplanes, now contribute only 13 percent of lead emissions. A recent National Health and Nutrition Examination Survey reported a 78 percent decrease in the levels of lead in people's blood between 1976 and 1991. This dramatic decline can be attributed to the move from leaded to unleaded gasoline (USEPA 2008a).

Lead emissions and ambient lead concentrations have decreased dramatically in California over the past 25 years. The rapid decrease in lead concentrations can be attributed primarily to phasing out the lead in gasoline. This phase-out began during the 1970s, and subsequent California Air Resources Board (ARB) regulations have eliminated virtually all lead from gasoline now sold in California. All areas of the state are currently designated as attainment for the state lead standard. (USEPA does not designate areas for the national lead standard.) Although the ambient lead standards are no longer violated, lead emissions from stationary sources still pose "hot spot" problems in some areas. As a result, ARB has identified lead as a toxic air contaminant (TAC).

Monitoring-Station Data and Attainment-Area Designations

Criteria air pollutant concentrations are measured at 35 monitoring stations in the Basin. The Mission Viejo monitoring station is the closest in proximity, approximately 4 miles northeast of the planning area, with recent data for ozone, CO, PM_{10}, and $PM_{2.5}$. Air quality data for NO_2 and SO_2 are available from the Costa Mesa – Mesa Verde Drive monitoring station, located approximately 18 miles northwest of the planning area. Even though this station is farther from the planning area, monitoring data from the station were used to characterize air quality in the Basin since data for NO2 and SO_2 are not available from the Mission Viejo monitoring station. In general, the ambient air quality measurements from these stations are representative of the air quality in the vicinity of the planning area. Table 5.3-1 summarizes the air quality data for the most recent 5 years.

Both ARB and the USEPA use this type of monitoring data to designate areas according to their attainment status for criteria air pollutants. The purpose of these designations is to identify the areas with air quality problems and thereby initiate planning efforts for improvement. The three basic designation categories are nonattainment, attainment, and unclassified. Unclassified is used in an area that cannot be classified on the basis of available information as meeting or not meeting the standards. In addition, the California designations include a subcategory of nonattainment-transitional, which is given to nonattainment areas that are progressing and nearing attainment.

The Basin is currently classified as a federal and state nonattainment area for ozone, PM_{10}, and $PM_{2.5}$ and a federal attainment/maintenance area for CO (USEPA 2008b). The Basin is classified as a state attainment area for CO; the Basin currently meets the federal and state standards for NO_2, SO_2, and lead and is classified as an attainment area for these pollutants (ARB 2008b).

Emission Sources

Sources of criteria air pollutants in the City include stationary, area, and mobile sources. According to the 2006 emissions inventory for Orange County, the majority of ROG and NO_X emissions are attributable to mobile sources, while areawide sources are the greatest contributor of particulate matter emissions (ARB 2008d).

Stationary Sources

Major stationary sources of criteria air pollutant emissions within the City include light industrial processes, fuel combustion, waste disposal, surface coating and cleaning, and other sources. The South Coast Air Quality Management District (SCAQMD) issues permits to various types of stationary sources, which must demonstrate implementation of best available control technologies (BACT).

Table 5.3-1
Mission Viejo and Costa Mesa Monitoring Stations – Ambient Air Quality

Pollutant	Averaging Time	Federal Primary Standards	California Air Quality Standards	Maximum Concentrations[1]					Number of Days Exceeding Federal Standard[2]					Number of Days Exceeding State Standard[2]				
				2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007
Ozone	1 hour	0.12 ppm[3]	0.09 ppm	0.153	0.116	0.125	0.123	0.108	4	0	Revoked			16	11	3	13	5
	8 hours	0.075 ppm	0.07 ppm	0.105	0.090	0.085	0.105	0.090	15	15	6	12	5	27	32	10	23	10
Carbon Monoxide	1 hour	35 ppm	20 ppm	3	2	2	2	3	0	0	0	0	0	0	0	0	0	0
	8 hours	9 ppm	9.0 ppm	1.64	1.49	1.59	1.64	2.16	0	0	0	0	0	0	0	0	0	0
Sulfur Dioxide	24 hours	0.14 ppm	0.04 ppm	0.012	0.008	0.008	0.005	0.004	0	0	0	0	0	0	0	0	0	0
	Annual	0.03 ppm	none	0.001	0.002	0.001	0.001	0.001	0	0	0	0	0	0	0	0	0	0
Nitrogen Dioxide	1 hour	none	0.18 ppm	0.107	0.097	0.085	0.101	0.074	-	-	-	-	-	0	0	0	0	0
	Annual	0.053 ppm	0.030 ppm	0.018	0.016	0.014	0.015	0.013	0	0	0	0	0	0	0	0	0	0
PM_{10}[4]	24 hours	150 µg/m^3	50 µg/m^3	64.0	47.0	41.0	57.0	74.0	0	0	0	0	0	2	0	0	1	3
	Annual	Revoked	20 µg/m^3	26.6	23.7	17.6	21.1	23.0	-	-	-	-	-	1	1	0	1	1
$PM_{2.5}$	24 hours	35 µg/m^3	none	50.6	49.4	35.3	46.9	46.8	3	3	0	1	2	-	-	-	-	-
	Annual	15 µg/m^3	12 µg/m^3	*	12.0	10.6	*	*	*	0	0	*	*	*	0	0	*	*

"-" = data not available or applicable.
"*" = there were insufficient data to determine the value.
[1] Concentration units for ozone, carbon monoxide, sulfur dioxide, and nitrogen dioxide are in parts per million (ppm). Concentration units for PM_{10} and $PM_{2.5}$ are in micrograms per cubic meter (µg/m^3).
[2] For annual standards, a value of 1 indicates that the standard has been exceeded.
[3] The federal 1-hour ozone standard was revoked in June 2005.
[4] PM_{10} data are recorded separately for federal and state purposes because the USEPA and California methods are slightly different. Federal values are shown. PM_{10} is measured every 6 days; the number of days exceeding standards is projected to a 365-day base from the measurements.
Source: ARB 2008c

Areawide Sources

Areawide sources of emissions include consumer products, application of architectural coatings, residential fuel combustion, construction and demolition, road dust, fugitive dust, landscaping, fires, and other miscellaneous sources. Paved road dust is the largest contributor to particulate matter emissions within the City.

Mobile Sources

On-road and other mobile sources are the largest contributors of ozone precursor emissions within the City. On-road sources consist of passenger vehicles, trucks, buses, and motorcycles, while off-road vehicles and other mobile sources comprise heavy-duty equipment, boats, aircraft, trains, recreational vehicles, and farm equipment. Major roadways in the City include I-5 and SR-73. Other roadways in the City include El Toro Road, Alicia Parkway, Moulton Parkway, Oso Parkway, Greenfield Drive, and La Paz Road.

Although the City of Laguna Hills is not directly served by rail, the Laguna Niguel/Mission Viejo rail station is located approximately 0.5 mile south of Laguna Hills, within the City of Laguna Niguel. The Irvine station is located approximately 3 miles north of the City on Barranca Parkway. Both Metrolink and Amtrak trains serve these stations. Metrolink provides daily service to these stations, including weekends, via the Orange County Line, and the Inland Empire - Orange County Line. The railroad line in the City runs parallel to I-5 and includes freight, passenger, and transit traffic.

EXISTING AIR QUALITY—TOXIC AIR CONTAMINANTS

TACs are air pollutants that may cause or contribute to an increase in mortality or in serious illness, or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air. However, their high toxicity or health risk may pose a threat to public health even at low concentrations. According to *The California Almanac of Emissions and Air Quality* (ARB 2008a), the majority of the estimated health risk from TACs can be attributed to relatively few compounds, the most important being particulate matter from diesel-fueled engines (diesel particulate matter [diesel PM]). Diesel PM differs from other TACs in that it is not a single substance, but rather a complex mixture of hundreds of substances. Although diesel PM is emitted by diesel-fueled internal-combustion engines, the composition of the emissions varies depending on engine type, operating conditions, fuel composition, lubricating oil, and whether an emission control system is present. Unlike the other TACs, no ambient monitoring data are available for diesel PM because no routine measurement method currently exists. However, ARB has made preliminary concentration estimates based on a particulate matter exposure method. This method uses the ARB emissions inventory's PM_{10} database, ambient PM_{10} monitoring data, and the results from several studies on chemical speciation to estimate concentrations of diesel PM. Of the TACs for which data are available in California, diesel PM, benzene, 1,3-butadiene, acetaldehyde, carbon tetrachloride, hexavalent chromium, para-dichlorobenzene, formaldehyde, methylene chloride, and perchloroethylene pose the greatest existing ambient risks.

Diesel PM poses the greatest health risk among these 10 TACs. Based on receptor modeling techniques, ARB estimated the diesel PM health risk in the Basin in 2000 to be 720 excess cancer cases per million people. Although the health risk is higher than the statewide average, it represents a 33 percent drop between 1990 and 2000 (ARB 2008a). In contrast, the Multiple Air Toxics Exposure Study III (MATES III), released by the SCAQMD in September 2008, reports the carcinogenic risk from air toxics in the Basin to be about 1,200 per million. This study is a monitoring and evaluation study based on indirect estimates of risk associated with diesel PM since no technique is available to measure diesel PM directly (SCAQMD 2008a)

Existing mobile sources of TAC emissions in the City include vehicles and the railroad line that runs parallel to I-5. Vehicles on I-5 and SR-73 are the most significant sources of diesel PM and other TACs associated with vehicle exhaust. In addition, please refer to the existing City of Laguna Hills General Plan's land use policy map (Figure 3-3 in the Project Description) for areas currently designated as mixed use, which includes limited industrial and manufacturing uses (i.e., areas most likely to be stationary sources of emissions).

Sensitive Receptors

Some members of the population are especially sensitive to air pollutant emissions and should be given special consideration when evaluating air quality impacts from projects. These people include children, the elderly, persons with preexisting respiratory or cardiovascular illness, and athletes and others who engage in frequent exercise. Structures that house these persons or places where they gather are defined as sensitive receptors by the SCAQMD (SCAQMD 1993).

Residential areas are considered sensitive to air pollution because residents (including children and the elderly) tend to be at home for extended periods of time, resulting in sustained exposure to any pollutants present. Recreational land uses are considered moderately sensitive to air pollution. Exercise places a high demand on respiratory functions, which can be impaired by air pollution even though exposure periods during exercise are generally short. In addition, noticeable air pollution can detract from the enjoyment of recreation. Industrial and commercial areas are considered the least sensitive to air pollution. Exposure periods are relatively short and intermittent as the majority of the workers tend to stay indoors most of the time. In addition, the working population is generally the healthiest segment of the public.

There are numerous types of these receptors throughout the City. Please refer to the existing General Plan's land use policy map (Figure 3-3 in the Project Description) for areas currently designated as residential and public (i.e., areas most likely to be sensitive land uses).

EXISTING AIR QUALITY—ODORS

Odors are generally regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache).

The ability to detect odors varies considerably among the population and is quite subjective. Some individuals have the ability to smell minute quantities of specific substances; others may not have the same sensitivity but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor; in fact, an odor that is offensive to one person (e.g., from a fast-food restaurant) may be perfectly acceptable to another. Unfamiliar odors are more easily detected than familiar odors and are more likely to cause complaints. This is because of the phenomenon known as odor fatigue, in which a person can become desensitized to almost any odor and recognition occurs only with an alteration in the intensity.

Quality and intensity are two properties present in any odor. The quality of an odor indicates the nature of the smell experience. For instance, if a person describes an odor as flowery or sweet, then the person is describing the quality of the odor. Intensity refers to the strength of the odor. For example, a person may use the word "strong" to describe the intensity of an odor. Odor intensity depends on the odorant concentration in the air. When an odorous sample is progressively diluted, the odorant concentration decreases. As this occurs, the intensity of the odor weakens and eventually becomes so low that detection or recognition of the odor is quite difficult. At some point during dilution, the concentration of the

odorant reaches a detection threshold. An odorant concentration below the detection threshold means that the concentration in the air is not detectable by the average human.

Land uses in the City that constitute odor sources include the Golden Rain Foundation composting facility located on Moulton Parkway. The facility is regulated by the California Integrated Waste Management Board (CIWMB 2008). Other minor sources of odor such as diesel-fueled locomotives traveling on the rail line and diesel-fueled trucks traveling on local roadways would produce associated diesel exhaust fumes.

5.3.2 REGULATORY FRAMEWORK

Air quality in the City is regulated by the USEPA, ARB, and SCAQMD. Each of these agencies develops rules, regulations, policies, and/or goals to comply with applicable legislation. Although the USEPA regulations may not be superseded, both state and local regulations may be more stringent.

CRITERIA AIR POLLUTANTS

Air quality regulations focus on ozone, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead. Because these are the most prevalent air pollutants known to be deleterious to human health, and extensive health-effects criteria documents are available, these pollutants are commonly referred to as "criteria air pollutants."

Federal Plans, Policies, Regulations, and Laws

At the federal level, the USEPA has been charged with implementing national air quality programs. The USEPA's air quality mandates are drawn primarily from the federal Clean Air Act (CAA), which was enacted in 1970. The most recent major amendments to the CAA were made by Congress in 1990.

The CAA required the USEPA to establish national ambient air quality standards (NAAQS). As shown in Table 5.3-2, the USEPA has established primary and secondary NAAQS for ozone, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead. The primary standards protect the public health, while the secondary standards protect the public welfare. The CAA also required each state to prepare an air quality control plan, referred to as a state implementation plan (SIP). The federal Clean Air Act Amendments of 1990 (CAAA) added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is modified periodically to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins, as reported by their jurisdictional agencies. The USEPA is responsible for reviewing all SIPs to determine whether they conform to the mandates of the CAA and its amendments, and to determine whether implementing the SIPs will achieve air quality goals. If the USEPA determines an SIP to be inadequate, a federal implementation plan that imposes additional control measures may be prepared for the nonattainment area. If an approvable SIP is not submitted or implemented within the mandated time frame, sanctions may be applied to transportation funding and stationary sources of air pollution in the air basin.

Table 5.3-2
Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	NAAQS[1]		CAAQS[2]
		Primary[3]	Secondary[4]	Concentration[5]
Ozone (O_3)[6]	1-Hour	-	Same as Primary Standard	0.09 ppm (180 µg/m^3)
	8-Hour	0.075 ppm (147 µg/m^3)		0.070 ppm (137 µg/m^3) [7]
Carbon Monoxide (CO)	8-Hour	9 ppm (10 mg/m^3)	None	9.0 ppm (10 mg/m^3)
	1-Hour	35 ppm (40 mg/m^3)		20 ppm (23 mg/m^3)
	8-Hour (Lake Tahoe)	-	-	6 ppm (7 mg/m^3)
Nitrogen Dioxide (NO_2)	Annual Average	0.053 ppm (100 µg/m^3)	Same as Primary Standard	0.030 ppm (57 µg/m^3)[8]
	1-Hour	-		0.18 ppm (339 µg/m^3)[8]
Sulfur Dioxide (SO_2)	Annual Average	0.030 ppm (80 µg/m^3)	-	-
	24-Hour	0.14 ppm (365 µg/m^3)	-	0.04 ppm (105 µg/m^3)
	3-Hour	-	0.5 ppm (1,300 µg/m^3)	-
	1-Hour	-	-	0.25 ppm (655 µg/m^3)
Respirable Particulate Matter (PM_{10})[9]	24-Hour	150 µg/m^3	Same as Primary Standard	50 µg/m^3
	Annual Arithmetic Mean	Revoked		20 µg/m^3 note 9
Fine Particulate Matter ($PM_{2.5}$)[10]	24-Hour	35 µg/m^3	Same as Primary Standard	-
	Annual Arithmetic Mean	15 µg/m^3		12 µg/m^3
Lead (Pb)	30-Day Average	-	-	1.5 µg/m^3
	Calendar Quarter	1.5 µg/m^3	Same as Primary Standard	-
Hydrogen Sulfide (H_2S)	1-Hour	No Federal Standards		0.03 ppm (42 µg/m^3)
Sulfates (SO_4)	24-Hour			25 µg/m^3
Visibility Reducing Particles	8-Hour (10 a.m. to 6 p.m., Pacific Standard Time)			Extinction coefficient of 0.23 per km-visibility of 10 miles or more (0.07/30 miles for Lake Tahoe) due to particles when the relative humidity is less than 70 percent.
Vinyl Chloride[7]	24-Hour			0.01 ppm (26 µg/m^3)

[1] NAAQS (other than O_3, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The O_3 standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m^3 is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact the USEPA for further clarification and current federal policies.

[2] California Ambient Air Quality Standards for O_3, CO (except Lake Tahoe), SO_2 (1- and 24-hour), NO_2, PM_{10}, $PM_{2.5}$ and visibility reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded.

[3] National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

[4] National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[5] Concentration expressed first in units in which it was promulgated. Ppm in this table refers to ppm by volume or micromoles of pollutant per mole of gas.

[6] On June 15, 2005, the 1-hour ozone standard was revoked for all areas except the 8-hour ozone nonattainment Early Action Compact Areas (those areas do not yet have an effective date for their 8-hour designations). Additional information on federal ozone standards is available at http://www.epa.gov/oar/oaqps/greenbk/index.html.

[7] ARB has identified lead and vinyl chloride as "toxic air contaminants" with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

[8] The nitrogen dioxide ambient air quality standard was amended to lower the 1-hr standard to 0.18 ppm and establish a new annual standard of 0.030 ppm. These changes became effective March 20, 2008.

[9] Due to a lack of evidence linking health problems to long-term exposure to coarse particle pollution, the USEPA revoked the annual PM_{10} standard on December 17, 2006.

[10] Effective December 17, 2006, the USEPA lowered the $PM_{2.5}$ 24-hour standard from 65 µg/m^3 to 35 µg/m^3.

ppm = parts per million; µg/m^3 = micrograms per cubic meter; mg/m^3 = milligrams per cubic meter; km = kilometers
Source: ARB 2008e

State Plans, Policies, Regulations, and Laws

The ARB is responsible for coordination and oversight of state and local air pollution control programs in California and for implementation of the California Clean Air Act (CCAA). The CCAA, which was adopted in 1988, required the ARB to establish California ambient air quality standards (CAAQS) (Table 5.3-2). The ARB has established CAAQS for sulfates, hydrogen sulfide, vinyl chloride, visibility-reducing particulate matter, and the above-mentioned criteria air pollutants. In most cases the CAAQS are more stringent than the NAAQS. Differences in the standards are generally explained through interpretation of the health-effects studies considered during the standard-setting process. In addition, the CAAQS incorporate a margin of safety to protect sensitive individuals.

The CCAA requires all local air districts in the state to endeavor to achieve and maintain the CAAQS by the earliest practical date. The act specifies that local air districts shall focus particular attention on reducing the emissions from transportation and areawide emission sources, and provides districts with the authority to regulate indirect sources.

Among the ARB's other responsibilities are overseeing compliance by local air districts with California and federal laws; approving local air quality plans and submitting SIPs to the USEPA; monitoring air quality; determining and updating area designations and maps; and setting emissions standards for new mobile sources, consumer products, small utility engines, off-road vehicles, and fuels.

Local Plans, Policies, Regulations, and Laws

South Coast Air Quality Management District

The SCAQMD attains and maintains air quality conditions in the Basin through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. The clean air strategy of the SCAQMD includes the preparation of plans for the attainment of ambient air quality standards, adoption and enforcement of rules and regulations concerning sources of air pollution, and issuance of permits for stationary sources of air pollution. The SCAQMD also inspects stationary sources of air pollution and responds to citizen complaints; monitors ambient air quality and meteorological conditions; and implements programs and regulations required by the CAA, CAAA, and the CCAA. Air quality plans applicable to the proposed project are discussed below.

Air Quality Management Plan

The SCAQMD, with input from the Southern California Association of Governments (SCAG), is responsible for preparing the air quality management plan (AQMP), which addresses federal and state CAA requirements. The AQMP details goals, policies, and programs for improving air quality in the Basin. Two versions (2003 and 2007) of the AQMP are in different stages of approval. The 2003 AQMP is an update to the 1997 AQMP. The 2003 AQMP employs up-to-date science and analytical tools and incorporates a comprehensive strategy aimed at controlling pollution from all sources, including stationary sources, on-road and off-road mobile sources, and area sources. The 2003 AQMP proposes policies and measures to achieve federal and state standards for healthy air quality in the Basin. The 2003 AQMP updates the demonstration of attainment for the federal near-surface ozone (O_3) and PM_{10}; replaces the 1997 attainment demonstration for the federal CO standard and provides a basis for a maintenance plan for CO for the future; and updates the maintenance plan for the federal NO_2 standard that the Basin has met since 1992. The 2003 AQMP was adopted by the SCAQMD in August 2003 and approved, with modifications, by the ARB in October 2003 (SCAQMD 2006a). The ARB submitted the South Coast SIP to the USEPA on January 9, 2004; however, this SIP has not been approved, and the 1997 AQMP with 1999 amendments remains the federally approved AQMP.

A draft version of the 2007 AQMP was released to the public, and public workshops were held in October, November, and December 2006 (SCAQMD 2006b). The 2007 AQMP was adopted by the SCAQMD Governing Board on June 1, 2007. The purpose of the 2007 AQMP for the Basin is to set forth a comprehensive program that will lead the region into compliance with federal 8-hour O_3 and $PM_{2.5}$ air quality standards. The ARB adopted the State Strategy for the 2007 SIP, and the 2007 AQMP as part of the SIP on September 27, 2007. On November 28, 2007, the ARB submitted an SIP revision to the USEPA for O_3, $PM_{2.5}$, CO, and NO_2 in the Basin; this revision is identified as the 2007 South Coast SIP. The 2007 AQMP/2007 South Coast SIP demonstrates attainment of the federal $PM_{2.5}$ standard in the Basin by 2014, and attainment of the federal 8-hour O_3 standard by 2023. The SIP also includes a request of reclassification of the O_3 attainment designation from "severe" to "extreme" (ARB 2007). On February 1, 2008, the ARB submitted additional technical information relative to the 2007 South Coast SIP to the USEPA (ARB 2008f).

The $PM_{2.5}$ strategy outlined in the AQMP is of interest. Since $PM_{2.5}$ in the Basin is overwhelmingly formed secondarily, the overall draft control strategy focuses on reducing precursor emission of sulfur oxides (SO_X), directly emitted $PM_{2.5}$, NO_X, and volatile organic compounds (VOC) instead of fugitive dust (SCAQMD 2006b). Based on the SCAQMD's modeling sensitivity analysis, SO_X reductions, followed by directly emitted $PM_{2.5}$ and NO_X reductions, provide the greatest benefits in terms of reducing the ambient $PM_{2.5}$ concentrations.

As a result of state and local control strategies, the Basin has not exceeded the federal CO standard since 2002. In March 2005, the SCAQMD adopted a CO Redesignation Request and Maintenance Plan that provides for maintenance of the federal CO air quality standard until at least 2015 and commits to revising the Redesignation Request and Maintenance Plan in 2013 to ensure maintenance through 2025 (SCAQMD 2005). The SCAQMD also adopted a CO emissions budget that covers 2005 through 2015. On February 24, 2006, the ARB transmitted the Redesignation Request and Maintenance Plan (including the CO budgets) to the USEPA for approval. On June 11, 2007, the USEPA redesignated the Basin as attainment for the federal CO standard and approved the maintenance plan amendment to the SIP for the Basin (Federal Register 2007).

SCAQMD Rules and Regulations

All projects are subject to SCAQMD rules and regulations in effect at the time of construction. Specific rules applicable to the construction of the proposed project may include, but are not limited to:

Rule 401 – Visible Emissions. A person shall not discharge into the atmosphere from any single source of emission whatsoever any air contaminant for a period or periods aggregating more than three minutes in any one hour which is as dark or darker in shade as that designated No. 1 on the Ringelmann Chart, as published by the United States Bureau of Mines.

Rule 402 – Nuisance. A person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause injury or damage to business or property. The provisions of this rule do not apply to odors emanating from agricultural operations necessary for the growing of crops or the raising of fowl or animals.

Rule 403 – Fugitive Dust. This rule is intended to reduce the amount of particulate matter entrained in the ambient air as a result of anthropogenic (man-made) fugitive dust sources by requiring actions to prevent, reduce or mitigate fugitive dust emissions. Rule 403 applies to any activity or man-made condition capable of generating fugitive dust.

Rule 1113 – Architectural Coatings. No person shall apply or solicit the application of any architectural coating within the SCAQMD, with VOC content in excess of the values specified in a table incorporated in the Rule.

TOXIC AIR CONTAMINANTS

Air quality regulations also focus on TACs, or in federal parlance hazardous air pollutants (HAPs). Examples of TACs are discussed in detail in Section 5.3-1, Environmental Setting. In general, for those TACs that may cause cancer, there is no concentration that does not present some risk. In other words, there is no safe level of exposure. This contrasts with the criteria air pollutants, for which acceptable levels of exposure can be determined and for which the ambient standards have been established (Table 5.3-2). Instead, the USEPA and ARB regulate HAPs and TACs, respectively, through statutes and regulations that generally require the use of the maximum or best available control technology for toxics (MACT and BACT) to limit emissions. These statutes and regulations, in conjunction with additional rules set forth by the districts, establish the regulatory framework for TACs.

Federal Programs for Hazardous Air Pollutants

The USEPA has programs for identifying and regulating HAPs. Title III of the CAAA directed the USEPA to promulgate national emissions standards for HAPs (NESHAP). The NESHAP may be different for major sources than for area sources of HAPs. Major sources are defined as stationary sources with potential to emit more than 10 tons per year (TPY) of any HAP or more than 25 TPY of any combination of HAPs; all other sources are considered area sources. The emissions standards are to be promulgated in two phases. In the first phase (1992–2000), the USEPA developed technology-based emission standards designed to produce the maximum emission reduction achievable. These standards are generally referred to as requiring MACT. For area sources, the standards may be different, based on generally available control technology. In the second phase (2001–2008), the USEPA is required to promulgate health risk-based emissions standards where deemed necessary to address risks remaining after implementation of the technology-based NESHAP standards.

The CAAA also required the USEPA to promulgate vehicle or fuel standards containing reasonable requirements that control toxic emissions of, at a minimum, benzene and formaldehyde. Performance criteria were established to limit mobile-source emissions of toxics, including benzene, formaldehyde, and 1,3-butadiene. In addition, Section 219 required the use of reformulated gasoline in selected areas with the most severe ozone nonattainment conditions to further reduce mobile-source emissions.

State and Local Programs for Toxic Air Contaminants

TACs in California are regulated primarily through the Tanner Air Toxics Act (Assembly Bill [AB] 1807 [Chapter 1047, Statutes of 1983]) and the Air Toxics Hot Spots Information and Assessment Act (Hot Spots Act) (AB 2588 [Chapter 1252, Statutes of 1987]). AB 1807 sets forth a formal procedure for the ARB to designate substances as TACs. This includes research, public participation, and scientific peer review before the ARB can designate a substance as a TAC. To date, the ARB has identified more than 21 TACs and adopted the USEPA's list of HAPs as TACs. Diesel PM was added to the ARB list of TACs.

Once a TAC is identified, the ARB then adopts an Airborne Toxics Control Measure (ATCM) for sources that emit that particular TAC. If there is a safe threshold for a substance at which there is no toxic effect, the control measure must reduce exposure below that threshold. If there is no safe threshold, the measure must incorporate BACT to minimize emissions.

The Hot Spots Act requires existing facilities emitting toxic substances above a specified level to prepare a toxic-emission inventory, prepare a risk assessment if emissions are significant, notify the public of significant risk levels, and prepare and implement risk reduction measures.

The ARB has adopted diesel-exhaust control measures and more stringent emission standards for various on-road mobile sources of emissions, including transit buses, and off-road diesel equipment (e.g., tractors, generators). In February 2000, the ARB adopted a new public-transit bus fleet rule and emissions standards for new urban buses. These new rules and standards provide (1) more stringent emission standards for some new urban bus engines beginning with 2002 model year engines, (2) zero-emission bus demonstration and purchase requirements applicable to transit agencies, and (3) reporting requirements under which transit agencies must demonstrate compliance with the public-transit bus fleet rule. New milestones include the low-sulfur diesel fuel requirement, and tighter emission standards for heavy-duty diesel trucks (2007) and off-road diesel equipment (2011) nationwide. Over time, the replacement of older vehicles will result in a vehicle fleet that produces substantially lower levels of TACs than current vehicles. Mobile-source emissions of TACs (e.g., benzene, 1-3-butadiene, diesel PM) have been reduced significantly over the last decade, and they will be reduced further in California through a progression of regulatory measures (e.g., Low Emission Vehicle/Clean Fuels and Phase II reformulated gasoline regulations) and control technologies. With implementation of ARB's risk reduction plan, it is expected that diesel PM concentrations will be reduced by 75 percent in 2010 and 85 percent in 2020 from the estimated year 2000 level. Adopted regulations are also expected to continue to reduce formaldehyde emissions from cars and light-duty trucks. As emissions are reduced, it is expected that risks associated with exposure to the emissions will also be reduced.

The ARB published the *Air Quality and Land Use Handbook: A Community Health Perspective*, which provides guidance concerning land use compatibility with TAC sources (ARB 2005). Although it is not a law or adopted policy, the handbook offers advisory recommendations for the siting of sensitive receptors near uses associated with TACs, such as freeways and high-traffic roads, commercial distribution centers, rail yards, ports, refineries, dry cleaners, gasoline stations, and industrial facilities, to help keep children and other sensitive populations out of harm's way. A number of comments on the handbook were provided to the ARB by air districts, other agencies, real estate representatives, and others. The comments included concern about whether the ARB was playing a role in local land use planning, the validity of relying on static air quality conditions over the next several decades in light of technological improvements, and support for providing information that can be used in local decision making.

At the local level, air pollution control or management districts may adopt and enforce the ARB control measures. Under SCAQMD Regulation XIV (Toxics and Other Non-Criteria Pollutants), and in particular Rule 1401 (New Source Review), all sources that possess the potential to emit TACs are required to obtain permits from the district. Permits may be granted to these operations if they are constructed and operated in accordance with applicable regulations, including new source review standards and air toxics control measures. The SCAQMD limits emissions and public exposure to TACs through a number of programs. The SCAQMD prioritizes TAC-emitting stationary sources based on the quantity and toxicity of the TAC emissions and the proximity of the facilities to sensitive receptors.

ODORS

The SCAQMD has identified some common types of facilities that have been known to produce odors: agriculture (farming and livestock), wastewater treatment plants, food processing plants, chemical plants, composting operations, refineries, landfills, rendering plants, dairies, rail yards, and fiberglass molding operations. This list is not meant to be entirely inclusive, but to act as general guidance. Because offensive odors rarely cause any physical harm and no requirements for their control are included in federal or state air quality regulations, the SCAQMD does not have rules or standards related to odor

emissions other than Rule 402 (Nuisance) and Rule 410 (Odors from Transfer Stations and Material Recovery Facilities). Any actions related to odors are based on citizen complaints to local governments and the SCAQMD.

Two situations increase the potential for odor problems. The first occurs when a new odor source is located near existing sensitive receptors. The second occurs when new sensitive receptors are developed near existing sources of odor. In the first situation, the SCAQMD recommends operational changes, add-on controls, process changes, equipment relocation, or changes in stack heights where feasible to address odor complaints. In the second situation, the potential conflict is considered significant if the project site is at least as close as any other site that has already experienced significant odor problems related to the odor source. For projects locating near a source of odors, and for odor sources locating near existing sensitive receptors, the SCAQMD recommends that the determination of potential conflict be based on variables such as wind speed, wind direction, and the distance and frequency at which odor complaints from the public have occurred in the vicinity of the facility (SCAQMD 1993).

5.3.3 THRESHOLD FOR DETERMINING SIGNIFICANCE

Based on Appendix G of the CEQA Guidelines, a significant impact related to air quality would occur if implementation of the General Plan would do any of the following:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);
- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people.

As stated in Appendix G of the CEQA Guidelines, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the above determinations. The SCAQMD has established thresholds, as shown in Table 5.3-3.

Table 5.3-3
SCAQMD Air Quality Significance Thresholds

Mass Daily Thresholds		
Pollutant	**Construction [a]**	**Operation [b]**
NO_X	100 lb/day	55 lb/day
VOC	75 lb/day	55 lb/day
PM_{10}	150 lb/day	150 lb/day
$PM_{2.5}$	55 lb/day	55 lb/day
SO_X	150 lb/day	150 lb/day
CO	550 lb/day	550 lb/day
Lead	3 lb/day	3 lb/day
Toxic Air Contaminants (TACs) and Odor Thresholds		
TACs (including carcinogens and noncarcinogens)	Maximum Incremental Cancer Risk ≥ 10 in 1 million Hazard Index ≥ 1.0 (project increment)	

Table 5.3-3 (continued)
SCAQMD Air Quality Significance Thresholds

Mass Daily Thresholds	
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402
Ambient Air Quality for Criteria Pollutants [c]	
NO_2 1-hour average annual average	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 0.25 ppm (state) 0.053 ppm (federal)
PM_{10} 24-hour average annual geometric average annual arithmetic mean	10.4 μg/m^3 (construction)[d] & 2.5 μg/m^3 (operation) 1.0 μg/m^3 20 μg/m^3
$PM_{2.5}$ 24-hour average	10.4 μg/m^3 (construction)[d] & 2.5 μg/m^3 (operation)
Sulfate 24-hour average	1 μg/m^3
CO 1-hour average 8-hour average	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 20 ppm (state) 9.0 ppm (state/federal)

[a] Construction thresholds apply to both the South Coast Air Basin and Coachella Valley (Salton Sea Air Basin and Mojave Desert Air Basin).
[b] For Coachella Valley, the mass daily thresholds for operation are the same as the construction thresholds.
[c] Ambient air quality thresholds for criteria pollutants based on SCAQMD Rule 1303, Table A-2 unless otherwise stated.
[d] Ambient air quality threshold based on SCAQMD Rule 403.
KEY: lb/day = pounds per day
ppm = parts per million
μg/m^3 = micrograms per cubic meter
≥ greater than or equal to
Source: SCAQMD 2008b

5.3.4 ANALYSIS OF ENVIRONMENTAL IMPACTS

ANALYSIS METHODOLOGY

Regional and local emissions of criteria air pollutants and precursors, and TACs during project construction and operations consistent with the General Plan were assessed in accordance with the methodologies described below.

Air quality impacts from future development allowed by the General Plan can be divided into two types, short-term impacts and long-term impacts. Short-term impacts are associated with construction activities, and long-term impacts are associated with the continued operation of developed land uses and the associated increase in vehicular trips.

Construction-related emissions of criteria air pollutants (e.g., PM_{10}) and ozone precursors (ROG and NO_X) were assessed in accordance with methodologies recommended by the ARB and SCAQMD.

Project-specific data (e.g., construction equipment types and number requirements, and maximum daily acreage disturbed) were not available at the level of the General Plan for modeling purposes.

Regional operational emissions of criteria air pollutants and precursors (e.g., mobile and area sources) were quantified using the URBEMIS 2007 Version 9.2.4 (URBEMIS) computer model. Modeling was based on buildout assumptions in the General Plan and information about vehicle trip generation from the traffic analysis prepared for this project (see Section 5.14, Transportation and Circulation, in this Program EIR).

Other air quality impacts (i.e., local emissions of CO, construction- and operation-related TACs, and odors) were assessed in accordance with methodologies recommended by the ARB and SCAQMD.

SHORT-TERM IMPACTS

Construction-related emissions are described as short term or temporary in duration and have the potential to represent a significant impact with respect to air quality. Buildout of the General Plan is dependent on individual housing decisions, employment opportunities, provision of services for housing and supporting commercial uses, land use decisions of the City and other public agencies, regional transportation planning decisions, the decisions of financial institutions related to development projects, and other similar factors.

Planned phasing of buildout of the General Plan will be reviewed in relation to residential uses, revenue-generating employment uses, housing affordability, provision and financing of infrastructure and public facilities, mechanisms for funding of ongoing service needs, and overall coordination of phase improvements with previous and subsequent phases. Subsequent implementation projects and plans would continue to define phasing at a detailed level and be reviewed by the City to ensure that development occurs in a logical manner consistent with policies in the General Plan, and that additional environmental review is conducted under CEQA as needed.

Construction-related activities would result in emissions of criteria air pollutants and ozone precursors from site preparation (e.g., excavation, grading, and clearing); exhaust from off-road equipment, material delivery trucks, and worker commute vehicles; vehicle travel on paved and unpaved roads; and other miscellaneous activities (e.g., building construction, asphalt paving, application of architectural coatings, and trenching for utility installation).

Because the General Plan identifies future land uses and does not contain specific development proposals, construction-related emissions are speculative and cannot be accurately determined at this stage of the planning process. Assuming relatively robust economic conditions over the next 20 to 25 years, construction activity will occur throughout the planning area, but the rate of development cannot be anticipated. This is a potentially significant impact.

While individual development projects will be required to comply with applicable SCAQMD rules and employ construction approaches that minimize pollutant emissions (e.g., watering for dust control, tuning of equipment, limiting truck traffic to non-peak hours), the project area lies in a nonattainment air basin and growth associated with General Plan implementation will continue to contribute pollutant emissions in that nonattainment context. Although short-term construction-related air quality impacts will be evaluated on a project-specific basis and implementation of Mitigation Measures AQ-1 and AQ-2, listed in Section 5.3.5, will reduce the impact to the extent feasible, this impact will remain significant and unavoidable.

LONG-TERM IMPACTS

Area- and Mobile-Source Emissions

Regional area- and mobile-source emissions of criteria air pollutants and ozone precursors were modeled using the URBEMIS 2007 Version 9.2.4 computer program, which is designed to estimate emissions for land use development projects (SCAQMD 2008c). URBEMIS allows land use data entries that include project location specifics and trip generation rates. URBEMIS accounts for area-source emissions from the use of natural gas, wood stoves, fireplaces, landscape maintenance equipment, and consumer products; and mobile-source emissions associated with vehicle trip generation. Regional area- and mobile-source emissions were modeled based on proposed land use types and sizes (see Chapter 3.0, Project Description), the increase in trip generation from the traffic analysis prepared for this project (see Section 5.14, Transportation and Circulation), and default settings and parameters attributable to analysis period and site location.

Modeled operational emissions are summarized in Table 5.3-4 for 2030 full-buildout conditions. These emission estimates assume that the entire General Plan would be constructed over the 20-year planning horizon. As shown in Table 5.3-4, operational activities would result in worst-case daily unmitigated emissions of approximately 224 pounds per day (lb/day) of ROG, 157 lb/day of NO_X, 1,375 lb/day of CO, 679 lb/day of PM_{10}, and 155 lb/day of $PM_{2.5}$ under full buildout conditions.

Table 5.3-4
Summary of Modeled Operational Emissions of Criteria Air Pollutants and Precursors – 2030 Conditions upon Buildout of the General Plan

Source	Emissions (lb/day)[1]					
	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Area Sources[2]	103.7	20.5	209.1	<0.1	30.8	29.6
Mobile Sources[3]	120.2	136.1	1165.9	3.9	648.1	125.6
Total Unmitigated Emissions	223.9	156.6	1374.9	3.9	678.9	155.2
SCAQMD Significance Threshold	55	55	550	150	150	55

Notes:
SCAQMD = South Coast Air Quality Management District; lb/day = pounds per day; CO = carbon monoxide; NO_X = oxides of nitrogen; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; ROG = reactive organic gases; SO_X = oxides of sulfur.
[1] Emissions modeled using the URBEMIS 2007 (Version 9.2.4) computer model, based on trip generation rates obtained from the analysis prepared for this project and proposed land uses identified in Chapter 3.0, Project Description, and Section 5.14, Transportation and Circulation, of this Program EIR.
[2] For this estimate, default model assumptions were used for the number of residences that would contain hearth features.
[3] Trip generation rates were obtained from the traffic analysis for the respective land uses (see Section 5.14, Transportation and Circulation).
Refer to Appendix F for detailed assumptions and modeling output files.
Source: Data modeled by EDAW in 2008

Based on the modeling conducted, operational activities would result in emissions of ROG, NO_X, CO, PM_{10}, and $PM_{2.5}$ that exceed the SCAQMD's applicable thresholds. Thus, operational emissions of these ozone precursors and particulate matter could violate or contribute substantially to an existing or projected air quality violation, and/or expose sensitive receptors to substantial pollutant concentrations. This is a potentially significant impact.

Stationary-Source Emissions

The General Plan could accommodate stationary sources of pollutants that would be required to obtain permits to operate in compliance with SCAQMD rules. These sources could include but not be limited to diesel-engine or gas turbine generators for emergency power generation; central-heating boilers for commercial, industrial, or large residential buildings; process equipment for light-industrial uses; kitchen equipment at restaurants and schools; service-station equipment; and dry-cleaning equipment. The permit process would assure that these sources would be equipped with the required emission controls, and that individually, these sources would not cause a significant environmental impact. There is no available methodology to reliably estimate these emissions; nonetheless, the emissions from these sources would be additive to the estimated area-source and mobile-source emissions described above.

The General Plan contains numerous goals, policies, and implementation programs intended to reduce per-capita VMT and resulting air pollution. Compliance with these policies and implementation of Mitigation Measures AQ-3 through AQ-18 will reduce operational air quality impacts due to the implementation of the General Plan, but not to a less than significant level. This impact will remain significant and unavoidable.

SCAQMD AIR QUALITY MANAGEMENT PLAN

Future changes to emissions in the City were computed based on trip generation estimates and proposed land use types and sizes. The ARB motor vehicle emissions model (EMFAC2007) emission factors, as contained in the ARB-approved URBEMIS 2007 (Version 9.2.4) computer model, were used along with trip generation estimates from the traffic analysis prepared for this project (see Section 5.14, Transportation and Circulation, of this Program EIR) to calculate emissions in units of lb/day for future (2030) conditions upon buildout of the General Plan. Daily air pollutant emissions are shown in Table 5.3-4.

Emissions of criteria air pollutants and ozone precursors (ROG and NO_X) associated with new growth under the General Plan are treated as new to the region. (This is a conservative [worst-case] assumption because many "new vehicle trips" may actually be moved from one part of the region to another partly as a result of the General Plan.)

In preparation of the AQMP, the SCAQMD and SCAG rely on population growth projections in the region to forecast, inventory, and allocate regional emissions from land use and development-related sources. The 2007 AQMP relied on demographic growth forecasts developed by SCAG for the 2004 Regional Transportation Plan (RTP). For purposes of analyzing consistency with the AQMP, it may be assumed that if the General Plan would accommodate population growth substantially greater than anticipated in the AQMP, then the proposed project would conflict with the AQMP. According to SCAG projections, the population in Laguna Hills will increase to 35,833 in 2030 (SCAG 2004). According to the most recent SCAG projections for the adopted 2008 RTP, the City of Laguna Hills will have 36,210 residents by 2030 (SCAG 2008). Under the General Plan, population could increase to 34,620 (see Section 5.11, Population and Housing). Thus, the General Plan would not increase population (and thus VMT) beyond that anticipated by SCAG. However, the General Plan would result in emissions in excess of thresholds for criteria air pollutants and precursors for which the region is in nonattainment. This would conflict with SCAQMD air quality planning efforts. This is a potentially significant impact.

Implementation of Mitigation Measures AQ-3 through AQ-18 will reduce operational air quality impacts due to the implementation of the General Plan, but not to a less than significant level. This impact will remain significant and unavoidable.

IMPACTS TO SENSITIVE RECEPTORS

Toxic Air Contaminants

With implementation of the General Plan, new or modified sources of TACs could be placed near existing sensitive receptors, and new sensitive receptors could be developed near existing sources of TACs. Emissions of TACs during construction of development envisioned under the General Plan (e.g., emissions from heavy-duty diesel equipment) and from operational sources under the General Plan (e.g., emissions from area, stationary and mobile source) and the resulting levels of TAC exposure of sensitive receptors are discussed and analyzed separately below.

Construction-related Emissions

Construction-related activities would result in short-term emissions of diesel PM from the exhaust of off-road heavy-duty diesel equipment for site preparation (e.g., excavation, grading, and clearing); paving; application of architectural coatings; and other miscellaneous activities. Diesel PM was identified as a TAC by ARB in 1998. The potential cancer risk from the inhalation of diesel PM, as discussed below, outweighs the potential for all other health impacts (ARB 2003).

It is important to note that emissions from construction equipment would be reduced over the period of buildout of the General Plan. In January 2001, the USEPA promulgated a final rule to reduce emissions standards for heavy-duty diesel engines in 2007 and subsequent model years. These emissions standards represent a 90 percent reduction in NO_X emissions, 72 percent reduction of nonmethane hydrocarbon emissions, and 90 percent reduction of particulate matter emissions in comparison to the emissions standards for the 2004 model year. In December 2004, the ARB adopted a fourth phase of emission standards (Tier 4) in the Clean Air Non-road Diesel Rule that are nearly identical to those finalized by the USEPA on May 11, 2004. As such, engine manufacturers are now required to meet after-treatment-based exhaust standards for NO_X and particulate matter starting in 2011 that are more than 90 percent lower than current levels, putting emissions from off-road engines virtually on par with those from on-road heavy-duty diesel engines.

More specifically, the dose to which receptors are exposed is the primary factor used to determine health risk (i.e., potential exposure to TAC emission levels that exceed applicable standards). Dose is a function of the concentration of a substance or substances in the environment and the duration of exposure to the substance. Dose is positively correlated with time, meaning that a longer exposure period would result in a higher exposure level for the maximally exposed individual. Thus, the risks estimated for a maximally exposed individual are higher if a fixed exposure occurs over a longer period of time. According to the California Office of Environmental Health Hazard Assessment, health risk assessments, which determine the exposure of sensitive receptors to TAC emissions, should be based on a 70-year exposure period; however, such assessments should be limited to the period and duration of activities associated with the project, in this case the General Plan (Salinas, pers. comm., 2004). Thus, because the use of off-road heavy-duty diesel equipment would be temporary and would combine with the highly dispersive properties of diesel PM (Zhu et al. 2002), further reductions in exhaust emissions would occur, construction-related activities would be typical to similar development-type projects, and construction-related TAC emissions would not expose sensitive receptors to substantial concentrations of TACs. It is also important to note that compliance with the construction dust mitigation requirements would also reduce particulate matter exhaust emissions. As a result, this impact would be less than significant.

Operational Emissions

Stationary Sources

The General Plan anticipates construction of light industrial and commercial land uses, which may potentially include stationary sources of TACs, such as dry-cleaning establishments, gasoline-dispensing facilities, and diesel-fueled backup generators. These types of stationary sources, in addition to any other stationary sources that may emit TACs, would be subject to SCAQMD's rules and regulations. Thus, as discussed above, the SCAQMD would analyze such sources (e.g., health risk assessment) based on their potential to emit TACs. If it is determined that the sources would emit TACs in excess of SCAQMD's applicable significance thresholds, MACT or BACT would be implemented to reduce emissions. If the implementation of MACT or BACT would not reduce the risk below the applicable threshold, the SCAQMD would deny the required permit. As a result, given compliance with applicable rules and regulations, operation of stationary sources would not result in the exposure of sensitive receptors to TACs at levels exceeding SCAQMD's significance thresholds, and this impact would be less than significant.

Furthermore, the stationary sources of TAC emissions in the City would be required to be permitted and regulated to prevent new land use compatibility conflicts. Therefore, there would be no incompatibility of proposed land uses with existing sources of TAC emissions. This impact would also be less than significant.

On-Road Mobile Sources

The General Plan includes a mix of land uses, including commercial, light industrial, manufacturing, and residential uses. The 2005 ARB guidance document *Air Quality and Land Use Handbook: A Community Health Perspective* recommends avoiding the placement of new sensitive land uses (e.g., residences and schools) within 500 feet of major freeways (those with 100,000+ vehicles per day, such as I-5, Interstate 405 and SR-73). However, because it is not specified under law that sensitive receptors are to be placed a minimum of 500 feet from major roadways, the residential land uses proposed in the General Plan could result in the location of sensitive receptors adjacent to major roadways.

Sensitive receptors could be sited within 500 feet of a major freeway, and risk associated with implementation of the General Plan would exceed the ARB's (and subsequently SCAQMD's) recommendation. Thus, this impact would be potentially significant.

Implementation of the General Plan could also place commercial/industrial land uses near sensitive receptors. In those cases, on-site mobile sources of TACs would be associated primarily with the operation of on-road heavy-duty diesel trucks used for proposed on-site commercial/industrial activities (e.g., unloading/loading). According to the 2005 ARB guidance document *Air Quality and Land Use Handbook: A Community Health Perspective*, ARB recommends avoiding the siting of new commercial trucking facilities that accommodate more than 100 trucks per day, or 40 trucks equipped with transportation refrigeration units (TRUs), within 1,000 feet of sensitive receptors (e.g., residences) (ARB 2005). The ARB guidance document is advisory, not regulatory. Operational activities that require the use of diesel-fueled vehicles for extended periods, such as commercial trucking facilities or delivery/distribution areas, may expose sensitive receptors to diesel PM emissions. Although commercial and industrial uses that would be developed under the General Plan have not been identified, it is assumed some of the potential commercial land uses would require large delivery and shipping trucks that use diesel fuel. The diesel PM emissions generated by these uses would be produced primarily at single locations on a regular basis (e.g., loading dock areas). Idling trucks, including TRUs, would increase

diesel PM levels at these locations and in the immediate vicinity. Occupants of nearby existing and proposed residences may be exposed to diesel PM emissions on a reoccurring basis.

The ARB has adopted an idling restriction ATCM for large commercial diesel-powered vehicles, which became effective February 1, 2005. In accordance with this measure, affected vehicles are required to limit idling to no longer than 5 minutes under most circumstances. The ARB is currently evaluating additional ATCMs intended to further reduce TACs associated with commercial operations, including a similar requirement to limit idling of smaller diesel-powered commercial vehicles.

It is unknown at this time whether the concentration of diesel PM at any sensitive receptor locations might exceed the threshold for acceptable cancer risk for the maximally exposed individual. It is also unclear what effect the ARB's new diesel-engine emission standards and diesel PM regulations would have on the level of emissions from any one facility. Therefore, because of uncertainty with respect to determination and location of tenants, frequency of diesel-fueled trucks visiting the proposed land uses, and distances between trucking activities and sensitive receptors at final buildout of the General Plan and associated mobile emissions of diesel exhaust, this impact would be potentially significant.

Implementation of Mitigation Measure AQ-19 would reduce the exposure of sensitive receptors to on-road mobile source emissions, but not to a less than significant level. This impact will remain significant and unavoidable.

Long-Term Off-Site Rail Traffic Sources

As discussed earlier, the City of Laguna Hills is not directly served by rail. However, a rail line runs parallel to I-5 and the City's eastern boundary and includes freight, passenger, and transit rail traffic.

In October 2004, the ARB released a study that provided a health risk characterization and assessment of the diesel PM from locomotives at the J. R. Davis Rail Yard in Roseville, California (ARB 2004). The study indicated that locomotive-related activities at the rail yard would result in the exposure of sensitive receptors near the yard to a cancer risk level in excess of the applicable threshold. However, rail lines in the City are used specifically for passenger and freight service and experience extremely light daily rail traffic (four trains during peak hours) relative to the traffic occurring at the rail yard in Roseville. The freight trains do not stop at any location in the City. In addition, unlike the locomotives in the City, the locomotives at the Roseville rail yard undergo engine testing, and they idle for extended periods of time, so emissions are higher and persist in one localized area for greater amounts of time. The rail yard study describes conditions that are unlike those associated with the rail lines adjacent to the City, which would not expose sensitive receptors to diesel PM concentrations that would result in a health risk in excess of the threshold. This impact would be less than significant.

Local CO Impacts

CO concentration is a direct function of motor vehicle activity (e.g., idling time and traffic flow conditions), particularly during peak commute hours, and meteorological conditions. Under specific meteorological conditions (e.g., stable conditions that result in poor dispersion), CO concentrations may reach unhealthy levels with respect to local sensitive land-uses such as residential areas, schools, and hospitals. As a result, the SCAQMD recommends analysis of CO emissions at a local as well as a regional level.

An appropriate qualitative screening procedure is provided in the procedures and guidelines contained in *Transportation Project-Level Carbon Monoxide Protocol* (the Protocol) to determine whether a project poses the potential for a CO hotspot (UCD ITS 1997). A CO hotspot is an area of localized CO pollution

that is caused by severe vehicle congestion on major roadways, typically near intersections. According to the Protocol, projects may worsen air quality if they significantly increase the percentage of vehicles in cold start modes by 2 percent or more; significantly increase traffic volumes (by 5 percent or more) over existing volumes; or worsen traffic flow, defined for signalized intersections as increasing average delay at intersections operating at Level of Service (LOS) E or F or causing an intersection that would operate at LOS D or better without the project, to operate at LOS E or F.

The project's traffic analysis (see Section 5.14, Transportation and Circulation) indicates that the Avenida de la Carlota at El Toro Road intersection would operate at LOS E under cumulative conditions in 2030. Traffic volumes at this intersection would also increase significantly over existing volumes (by more than 5 percent). Therefore, further investigation of potential CO impacts is warranted.

The Protocol prescribes a quantitative screening analysis to determine a project's CO impacts. However, the screening analysis has become obsolete because it uses emission factors from an older version of ARB's EMFAC model. As a substitute, various air quality agencies in California have developed conservative screening methods. The SCAQMD has not developed quantitative CO screening criteria; therefore, the methods of the Sacramento Metropolitan Air Quality Management District (SMAQMD) are used (SMAQMD 2004). The method is based on background CO concentrations and project trip generation and is not dependent on the traffic volumes or geometry for a specific intersection. The screening is based on the background concentration of CO and a conservative estimate of project-related CO as a function of peak hour trip generation. The screening analysis for the proposed project's potential CO impacts at a generalized intersection is shown in Table 5.3-5.

Table 5.3-5
Summary of Carbon Monoxide Hot Spot Screening Level Analysis

Concentration (ppm)	1-Hour	8-Hour
Background[1]	2	N/A
Project-Related[2]	9.34	N/A
Anticipated Total[3]	11.34	7.94
NAAQS	35	9.0
CAAQS	20	9.0
Exceed standards?	No	No

[1] Second highest 1-hour CO concentration recorded from Table 5.3-1.
[2] Peak hour trip generation is 3,781 vehicles in the evening peak hour. CO contribution is extrapolated from SMAQMD table as 9.34 ppm.
[3] Eight-hour concentration assumed to be 0.7 times 1-hour concentration.
Sources: Data compiled by EDAW 2008; SMAQMD 2004

As shown in Table 5.3-5, project-generated long-term local mobile-source emissions of CO would not violate or substantially contribute to a violation of the CAAQS or NAAQS, or expose sensitive receptors to substantial pollutant concentrations. As a result, this impact is considered less than significant.

ODORS

As discussed previously, the human response to odors is extremely subjective, and sensitivity to odors varies greatly among the public. The screening-level distance identified by the SCAQMD under Rule 410 for transfer stations and material recovery facilities is 2,000 feet from sensitive receptors. The SCAQMD does not identify a screening-level distance for other major sources of odors near sensitive receptors. Minor sources of odors, such as exhaust from mobile sources and charbroilers associated with commercial uses, are not typically associated with numerous odor complaints but are known to have some

temporary, less concentrated odorous emissions. Major and minor sources of odors are discussed separately below.

Major Sources of Odors

The SCAQMD has identified some common types of facilities that have been known to produce odors: agriculture (farming and livestock), wastewater treatment plants, food processing plants, chemical plants, composting operations, refineries, landfills, rendering plants, dairies, rail yards, and fiberglass molding operations. This list is not meant to be entirely inclusive, but to act as general guidance. The composting facility on Moulton Parkway is the only identified major source of odor in the City and is subject to CIWMB regulations and SCAQMD rules. No odor complaints have been confirmed for this identified source. The General Plan does not propose the development of any major odor sources identified above. Therefore, land use conflicts between major odor sources and sensitive receptors are not expected to occur. As a result, this impact would be less than significant.

Minor Sources of Odors

Minor sources of odors associated with the General Plan would be associated with the construction of the proposed land uses. The predominant source of power for construction equipment is diesel engines. Exhaust odors from diesel engines, as well as emissions associated with asphalt paving and the application of architectural coatings may be considered offensive to some individuals. Similarly, diesel-fueled locomotives traveling along the rail lines in the City and diesel-fueled trucks traveling on local roadways would produce associated diesel exhaust fumes. However, because odors associated with diesel fumes and other minor sources would be temporary and would disperse rapidly with distance from the source, construction-generated and mobile-source odors would not result in the frequent exposure of receptors to objectionable odor emissions. As a result, short-term construction-related and long-term mobile-source related odors would be less than significant.

5.3.5 MITIGATION MEASURES

Implementation of the following programmatic mitigation measures, derived largely from the General Plan Implementation Program, will reduce potential impacts but not to a level less than significant. Individual development projects will be required to undergo project-specific environmental review and mitigation measures will be identified to reduce any significant impacts. Mitigation for significant environmental impacts of each future development project shall include the following: (1) objective of the measure; (2) specific standards or measures to be applied, along with any needed contingency measure; (3) responsible party; (4) location; (5) schedule for initiation; and (6) how the measure will reduce the associated environmental impact.

AQ-1 The City shall implement the following measures to reduce the amount of fugitive dust that is re-entrained into the atmosphere from unpaved areas, parking lots, and construction sites:

1. Require the following measures to be taken during the construction of all projects to reduce the amount of dust and other sources of PM_{10}, in accordance with SCAQMD Rule 403:
   - Dust suppression at construction sites using vegetation, surfactants, and other chemical stabilizers
   - Wheel washers for construction equipment
   - Watering down of all construction areas
   - Limit speeds at construction sites to 15 miles per hour
   - Covering of aggregate or similar material during transportation of material

2. Adopt incentives, regulations, and/or procedures to reduce paved road dust emissions through targeted street sweeping of roads subject to high traffic levels and silt loadings.
3. Pave currently unpaved roads and parking lots or establish and enforce 15 miles per hour speed limits on low-use unpaved roads as permitted under California Vehicle Code section 22365.

AQ-2 The City shall require each project applicant, as a condition of project approval, to implement the following measures to reduce exhaust emissions from construction equipment:

1. Commercial electric power shall be provided to the project site in adequate capacity to avoid or minimize the use of portable gas-powered electric generators and equipment.
2. Where feasible, equipment requiring the use of fossil fuels (e.g., diesel) shall be replaced or substituted with electrically driven equivalents (provided that they are not run via a portable generator set).
3. To the extent feasible, alternative fuels and emission controls shall be used to further reduce exhaust emissions.
4. On-site equipment shall not be left idling when not in use.
5. The hours of operation of heavy-duty equipment and/or the amount of equipment in use at any one time shall be limited.
6. Staging areas for heavy-duty construction equipment shall be located as far as possible from sensitive receptors.
7. Before construction contracts are issued, the project applicants shall perform a review of new technology, in consultation with the SCAQMD, as it relates to heavy-duty equipment, to determine what (if any) advances in emissions reductions are available for use and are economically feasible. Construction contract and bid specifications shall require contractors to utilize the best available and economically feasible technology on an established percentage of the equipment fleet. It is anticipated that in the near future, both NO_X and PM_{10} control equipment will be available.

AQ-3 The City shall continue to biannually update the City of Laguna Hills Six-year Capital Improvement Program, which complies with the requirements of the Congestion Management Program (CMP). The CMP identifies and recommends funding for future improvements to the mobility system, as well as other public facilities, including improvements to the existing pedestrian and bicycle network and landscaping right-of-ways. **(Implementation Program M-2)**

AQ-4 The City shall continue to participate in regional efforts to implement Transportation Demand Management (TDM) through implementation of the City's Transportation Demand Ordinance as set forth in the Municipal Code. The purpose of the ordinance is to promote alternative transportation methods, such as carpools, vanpools, transit, bicycles, walking, and park-and-ride lots; parking management programs; and other strategies to meet congestion and air quality goals. The City shall complete intersection capacity improvements and coordinate traffic signals as necessary to improve traffic flow. **(Implementation Program M-4)**

AQ-5 The City shall update the Bikeways, Trails & Open Space Master Plan, identify gaps and major barriers to connectivity in the City, and identify appropriate means and locations for overcoming those barriers. The City shall include a pedestrian/walkability component in the updated Master Plan that identifies areas where major barriers to connectivity exist, and

measures and/or techniques to improve walkability and safety. **(Implementation Program M-5)**

AQ-6 The City shall work with project proponents to ensure that safe and attractive sidewalks, walkways, bike lanes, and crosswalks that facilitate use are provided in accordance with City standards. The City shall work with developers to construct links to adjacent communities, using open space easements and utility easements when appropriate. **(Implementation Program M-6)**

AQ-7 The City shall provide bike support facilities (e.g., bicycle racks, personal lockers, showers, and other bicycle support facilities) in new development and revitalization projects to encourage bicycle riding as a transportation mode. The City shall adopt a formal bike support facility ordinance and/or guidelines applicable to private and public development. **(Implementation Program M-7)**

AQ-8 The City shall work closely with the Orange County Transportation Authority (OCTA) to achieve the following:

1. Maintain consistency with the County Master Plan of Arterial Highways (MPAH) within the City.
2. Implement the OCTA CMP within the City.
3. Expand and improve bus service within the City.
4. Encourage express bus service to regional activity centers.
5. Encourage provision of attractive and appropriate transit amenities, including shaded bus stops.
6. Provide special transit services (such as direct shuttle or dial-a-ride services).
7. Support and implement the OCTA Commuter Bikeways Strategic Plan and participate in future updates and revisions to the MPAH.

In addition, the City shall coordinate with the California Department of Transportation (Caltrans) on all plans, activities, and projects that affect California roadway facilities. **(Implementation Program M-8)**

AQ-9 The City shall coordinate with regional transit providers and use public education to accomplish the following objectives:

1. Encourage City residents and workers to rideshare and use transit.
2. Educate residents of all ages about local mobility choices.
3. Work with schools to improve and advertise nonautomotive options for getting to school and school-related activities.
4. Coordinate education activities and make materials available to residents. Utilize forums, flyers, brochures, and the City's website to accomplish these objectives. **(Implementation Program M-9)**

AQ-10 The City shall outline a plan of mobile source enforcement methods such as periodic mobile source (e.g., trucks and buses) checkpoints throughout the City to enforce opacity regulations. Technical assistance shall be sought from the ARB and the California Highway Patrol (CHP) on enforcement issues.

AQ-11 The City shall provide incentives such as preferential parking for alternative fuel vehicles.

AQ-12 The City shall actively encourage the development and maintenance of mixed uses, particularly in the Mixed Use and Neighborhood Mixed Use areas, by maintaining a list of sites available for mixed use and infill development and making the list available to developers. The City shall establish developer incentives to encourage well-designed mixed use and infill development projects in these areas. **(Implementation Program LU-10)**

AQ-13 The City shall adopt a sustainable development program with the goal of reducing ownership costs, reducing water and energy consumption, reducing driving, and reducing greenhouse gas and criteria pollutant emissions. This Sustainable Development program shall incorporate the following programs that address environmental sustainability: Green Building Standards; Mixed Use; Bikeways, Sidewalks, Walkways, Crosswalks; Orange County Transportation Authority; Climate Action Plan; Water Conservation; Recycled and Reclaimed Water; and Community Gardens. In addition, the City will consider incorporating the following measures in the program:

1. Adopt a formal green building program, such as Leadership in Energy and Environmental Design (LEED®), GreenPoint Rated, and/or other programs applicable to Laguna Hills.
2. Provide developer incentives for green buildings.
3. Adopt a native tree preservation ordinance and encourage planting of new, drought-tolerant trees.
4. Promote and incentivize alternative energy such as wind and solar in new development and revitalization projects.
5. Institute green purchasing practices in all City operations, including alternative or very fuel-efficient vehicles.
6. Establish a marketing and education plan for City residents to encourage green building standards, alternatives to driving, energy conservation through high efficiency lighting and appliances, and alternative energy such as wind and solar.
7. Measure annual progress in City operations, and private development as applicable.
8. ~~Participate in utility-sponsored (e.g., Southern California Edison) sustainability programs.~~ During the development review process for large development projects (greater than 10 units and/or 10,000 square feet), the City will coordinate with energy providers to determine if additional energy efficiency measures can be incorporated into the project design. **(Implementation Program LU-8)**

AQ-14 The City shall evaluate proposed development projects throughout the City using LEED standards, GreenPoint Rated, and/or other green building standards. The City encourages all future development and major renovation projects within the following General Plan designations to achieve LEED certification, and/or other green certifications: High Density Residential, Village Commercial, Freeway Commercial, Community Commercial, Office Professional, Mixed Use, Neighborhood Mixed Use, and Community/Private Institution. The City shall investigate the potential to offer density bonus incentives on residential projects that achieve LEED certification, and other green certifications and ratings. **(Implementation Program LU-9)**

AQ-15 The City shall support, through the use of development standards, the use of fuel-efficient heating equipment, and other appliances, such as water heaters, swimming pool heaters, cooking equipment, refrigerators, furnaces, boiler units, and low or zero-emitting architectural coatings.

AQ-16 The City shall work with the SCAQMD and the SCAG to implement the AQMP and meet all federal and state air quality standards for pollutants. The City shall participate in any future amendments and updates to the AQMP. The City shall also implement, review, and interpret the General Plan and future discretionary projects in a manner consistent with the AQMP to meet standards and reduce overall emissions from mobile and stationary sources. **(Implementation Program COS-7)**

AQ-17 The City shall continue to implement solid waste diversion programs as well as public education programs as outlined in the City's Source Reduction and Recycling Element required by Assembly Bill 939. As part of this program, the City shall work with the private sector contractor providing solid waste services within the City to ensure that appropriate recycling containers, procedures, and education are readily available throughout the community. The City shall develop programs to maximize recycling of waste products generated by the community to reduce the amount of solid waste disposed and prolong useful life of the local landfills. **(Implementation Program CSF-6)**

AQ-18 The City shall review all future development proposals for potential regional and local air quality impacts per CEQA. If potential impacts are identified, mitigation will be required to reduce the impact to a level less than significant, where technically and economically feasible.

AQ-19 The City shall implement the following measures to minimize exposure of sensitive receptors and sites to health risks related to air pollution:

1. Encourage site plan designs to provide the appropriate set-backs and/or design features that reduce TACs at the source.
2. Encourage the applicants for sensitive land uses to incorporate design features (e.g., pollution prevention, pollution reduction, barriers, landscaping, ventilation systems, or other measures) in the planning process to minimize the potential impacts of air pollution on sensitive receptors.
3. Actively participate in decisions on the siting or expansion of facilities or land uses (e.g., freeway expansions), to ensure the inclusion of air quality mitigation measures.
4. Where decisions on land use may result in emissions of air contaminants that pose significant health risks, consider options, including possible relocation, recycling, redevelopment, rezoning, and incentive programs.
5. Activities involving idling trucks shall be oriented as far away from and downwind of existing or proposed sensitive receptors as feasible.
6. Strategies shall be incorporated to reduce the idling time of main propulsion engines through alternative technologies such as IdleAire, electrification of truck parking, and alternative energy sources for TRUs to allow diesel engines to be completely turned off.

5.3.6 IMPACT AFTER MITIGATION

SHORT-TERM IMPACTS

Implementation of Mitigation Measures AQ-1 and AQ-2 would reduce short-term, construction-related emissions, but not to a less than significant level. Construction-related emissions of criteria air pollutants and precursors would still exceed significance thresholds; for this reason, and because of the nonattainment status of the Basin, such emissions could violate or contribute substantially to an existing

or projected air quality violation, and/or expose sensitive receptors to substantial pollutant concentrations. As a result, this impact would remain significant and unavoidable.

LONG-TERM IMPACTS

Implementation of Mitigation Measures AQ-3 through AQ-18 would reduce operational emissions of criteria air pollutants and precursors from mobile- and area-sources, but not to a less-than-significant level. Operational emissions could violate or contribute substantially to an existing or projected air quality violation, and/or expose sensitive receptors to substantial pollutant concentrations. This impact would remain significant and unavoidable.

SCAQMD AIR QUALITY MANAGEMENT PLAN

Implementation of Mitigation Measures AQ-3 through AQ-18 would reduce air quality impacts due to implementation of the General Plan, but not to a less than significant level. Thus, the impact associated with conflicts to the SCAQMD Air Quality Management Plan will remain significant and unavoidable.

IMPACTS TO SENSITIVE RECEPTORS

Implementation of Mitigation Measure AQ-19 would reduce the potential for exposure of sensitive receptors to TACs from mobile sources. However, the only measure available to completely mitigate this impact—completely separating emissions sources (diesel vehicles associated with commercial trucking activities at commercial and industrial land uses, rail operations, stationary sources) by 1 to 2 miles from all sensitive receptors—is not feasible; therefore, no feasible mitigation is available to reduce the impact to a less-than-significant level. The City will coordinate with the SCAQMD as implementation of the General Plan occurs to assess situations in which toxic risk from diesel PM may occur and to review methodologies that may become available to estimate the risk. However, this impact would remain significant and unavoidable.

ODORS

A less than significant impact associated with short-term and long-term odor impacts will occur. No mitigation is required.

This page intentionally left blank.

5.4 BIOLOGICAL RESOURCES

This section describes existing biological resources within the City of Laguna Hills, presents the regulatory and planning context for addressing biological issues, and evaluates the potential impacts on biological resources that could result from implementation of the General Plan. Mitigation measures are provided where appropriate.

5.4.1 ENVIRONMENTAL SETTING

The majority of the land within Laguna Hills is developed. However, small areas of open space occur throughout the City. Disturbances resulting from current and historic land uses have degraded or replaced most of the native biological resources that once occurred within the City. Native vegetation is primarily limited to isolated patches that occur in stream channels or drainages, hillsides paralleling some roadways, and small urban canyons. Some of these remaining native habitat areas are discontinuous and interspersed with non-native, disturbed (i.e., ruderal or weedy) vegetative cover. Although the extent of native habitat is limited, various areas in and around residences and parks within the City are characterized by lush landscaping and ornamental plantings, or expanses of non-native plant species that provide "greenbelts" of vegetative cover and separation between developed areas. Figure 5.13-1, in Section 5.13, Recreation, depicts open space areas within the City.

HABITAT CONSERVATION PLANS/NATURAL COMMUNITY CONSERVATION PLANS

The Orange County Environmental Management Agency (EMA), now part of Orange County Public Works, prepared a Natural Community Conservation Plan and Habitat Conservation Plan for the Coastal Subregion of the County of Orange (Orange County Coastal NCCP/HCP), which includes Laguna Hills. The Orange County Coastal NCCP/HCP was prepared in cooperation with the California Department of Fish and Game (CDFG) and the U.S. Fish and Wildlife Service (USFWS). The intent of the NCCP/HCP is to provide permanent, regional protection of natural vegetation and wildlife diversity, while allowing compatible land use and appropriate development and growth. The NCCP/HCP is accomplished with the institution of a subregional Habitat Reserve System and implemented through a coordinated program to manage biological resources within the habitat reserve. The City is not a participating entity in the NCCP/HCP.

No land designated as "Habitat Reserve" under the NCCP/HCP occurs within the City. However, Non-Reserve Open Space and Conservation Easement areas occur adjacent to the northwest portion of the City. Within the Habitat Reserve area, the NCCP/HCP restricts the kinds of permitted uses to protect long-term habitat values. Residential, commercial, and industrial uses are prohibited, as are new active recreational uses outside already disturbed areas. Non-Reserve Open Spaces designate regional open spaces that were in public ownership prior to adoption of the NCCP/HCP. These open spaces are not subject to the development requirements associated with the Reserve system, but they are recognized as integral components of the overall subregional conservation strategy. Conservation easements typically restrict uses on given parcels of land in perpetuity.

In addition, approximately 6,500 acres of regional open space preserve occurs in the South Coast Wilderness area (composed of Aliso and Wood Canyons Wilderness Park, Crystal Cove State Park, the City of Irvine Open Space and Irvine Ranch Land Reserve, and Laguna Coast) located roughly 1 mile west of the City. The Laguna Coast Wilderness Park, owned by the City of Laguna Beach, the County of Orange, and the CDFG, supports vast expanses of native vegetation communities including coastal sage scrub, maritime chaparral, oak woodlands, and riparian habitats. State and federally listed species

recorded for these areas include the coastal California gnatcatcher (*Polioptila californica californica*), least Bell's vireo (*Vireo bellii pusillus*), and southwestern willow flycatcher (*Empidonax traillii extimus*).

METHODOLOGY

An assessment of the existing biological resources was completed through review of aerial photographs, review of the City of Laguna Hills Final Master EIR (Planning Network and LSA Associates 1994), a records search of the California Natural Diversity Database (CNDDB; CDFG 2008), and communication with City staff (City of Laguna Hills 2007, 2008). No biological surveys, formal wetland delineations, vegetation mapping, or rare plant surveys were conducted within the City by biologists in 2008.

SENSITIVE VEGETATION COMMUNITIES, SENSITIVE PLANT SPECIES, AND WETLANDS

Historical land use practices such as ranching and farming have resulted in a loss of the majority of native habitat within the City. Native habitat has been primarily replaced by ornamental and disturbed habitats. A few sections of intact native vegetation exist along drainages and adjacent to major roadways. Seven types of vegetation communities are known to occur within the City: southern arroyo willow forest, mulefat scrub, open water and coastal brackish marsh, coastal sage scrub, annual grasslands, disturbed/ruderal, and ornamental (Planning Network and LSA Associates 1994). Non-native grasslands, disturbed habitat, and ornamental landscaping characterize the majority of undeveloped land within the City; however, sensitive vegetation occurs in small patches throughout the City.

Sensitive Vegetation Communities

Sensitive vegetation communities occur in small patches throughout the City. Sensitive vegetation communities are vegetation assemblages, associations, or subassociations that support or potentially support sensitive plant or wildlife species, have significant cumulative losses throughout the region, have relatively limited distribution, or have particular value to wildlife. Sensitive vegetation communities may be regulated by various local, state, and federal resource agencies. The CNDDB provides an inventory of vegetation communities that are considered sensitive by state and federal resource agencies, academic institutions, and conservation groups such as the California Native Plant Society (CNPS). The CNDDB (CDFG 2008) and City of Laguna Hills Final Master EIR (Planning Network and LSA Associates 1994) were used to determine the occurrence of sensitive vegetation communities within the City. Sensitive vegetation communities (as defined by the Orange County Habitat Classification System) known to occur within the planning area based on review of the City of Laguna Hills Final Master EIR, include southern arroyo willow forest, coastal brackish marsh, coastal sage scrub, and mulefat scrub (Planning Network and LSA Associates 1994; CDFG 2008). Southern arroyo willow forest occurs around Veeh Reservoir and along the Aliso and Oso Creek drainages. Coastal brackish marsh occurs in patches around Veeh Reservoir and along Aliso Creek. Coastal sage scrub occurs in small scattered patches along Cabot Road and Oso Parkway. These patches are generally small, highly fragmented, and surrounded by development. Mulefat scrub occurs around Veeh Reservoir and along the Aliso and Oso Creek drainages.

Sensitive Plant Species

Due to the disturbed and fragmented nature of the undeveloped areas within the City it is unlikely that sensitive plant species occur within the City. The CNDDB (CDFG 2008) and City of Laguna Hills Final Master EIR (Planning Network and LSA Associates 1994) were used to determine the occurrence of sensitive plant species within the City. A CNDDB search revealed no sensitive plant species records within the City (CDFG 2008). However, the CNDDB search indicated that intermediate mariposa-lily (*Calochortus weedii* var. *intermedius*), many-stemmed dudleya (*Dudleya multicaulis*), and white rabbit-

tobacco (*Pseudognaphalium leucocephalum*) occur in the general vicinity of the City. The nearest record of a sensitive plant species (intermediate mariposa-lily) is approximately 0.5 mile from the planning area boundary. The many-stemmed dudleya was detected 1.4 miles to the west of the planning area, and the white rabbit-tobacco was detected 0.7 mile south of the planning area. Table 5.4-1 provides information about the status of sensitive plant and wildlife species with moderate or high potential to occur in the vicinity of the planning area. Appendix B provides information about the status of sensitive plant and wildlife species with a low potential to occur in the vicinity of the planning area.

Table 5.4-1
Sensitive Plant and Wildlife Species with Moderate or High Potential to Occur in the Vicinity of the Planning Area

Common Name *Scientific Name*	Sensitivity Status[1]	General Habitat Description	Probability of Occurrence
PLANTS			
intermediate mariposa lily *Calochortus weedii* var. *intermedius*	NCCP/HCP: Target Species CNPS: List 1B.2	Chaparral, coastal scrub, and valley and foothill grassland on rocky soils; elevation 600-2,800 feet. Perennial herb (bulbiferous), blooms May-July.	Moderate. Habitat present in several small patches of coastal scrub and annual grassland on-site. The closest known occurrence is 0.5 mile east of the City limits.
FISH			
None			
AMPHIBIANS			
None			
REPTILES			
None			
BIRDS			
Cooper's hawk *Accipiter cooperi*	CDFG: Watch List (nesting)	Usually in oak woodlands, but occasionally in willow or eucalyptus woodlands. Inhabits urban canyons and habitats near bird feeders.	High. Suitable foraging habitat present on-site. Closest known occurrence is 0.3 mile north of the City limits in riparian vegetation in 2003. Potential to breed on-site in large trees near Veeh Reservoir.
least Bell's vireo *Vireo bellii pusillus*	USFWS: Endangered CDFG: Endangered NCCP/HCP: Target Species	Riparian woodland with understory of dense young willows or mulefat and willow canopy. Nests often placed a few feet above the ground in riparian vegetation.	High. Suitable habitat present on-site around Veeh Reservoir, Aliso Creek, and Oso Creek. Closest known occurrence is 0.3 mile west of the City limits. Potentially suitable breeding habitat present west of Veeh Reservoir with the City.
coastal California gnatcatcher *Polioptila californica californica*	USFWS: Threatened CDFG: Species of Special Concern NCCP/HCP: Target Species	Diegan coastal sage scrub dominated by California sagebrush (*Artemisia californica*) and flat-topped buckwheat (*Eriogonum fasciculatum*) below 2,500 feet elevation in Riverside County and below 1,000 feet elevation	Medium. Potentially suitable habitat present in fragmented sections throughout the City. Known to occur in adjacent lands, specifically less than 0.1 mile south of the City limits in 2000. Also known from adjacent open space

Table 5.4-1 (continued)
Sensitive Plant and Wildlife Species with Moderate or High Potential to Occur in the Vicinity of the Planning Area

		along the coastal slope; generally avoids steep slopes above 25 percent and dense, tall vegetation for nesting.	and to the west of the City limits in 2003.
yellow warbler *Dendroica petechia*	CDFG: Species of Special Concern	Occupies marshes, swamps, streamside groves, willow and alder thickets, open woodlands with thickets, orchards, gardens, and open mangroves.	Medium. Potentially suitable habitat present along Veeh Reservoir, Aliso Creek, and Oso Creek. May occur during migration in the above-mentioned drainages. Not likely to breed on-site.
yellow-breasted chat *Icteria virens*	CDFG: Species of Special Concern	Riparian woodland, thickets, and brush with dense undergrowth near water.	Medium. Potentially suitable habitat present along Veeh Reservoir, Aliso Creek, and Oso Creek. May occur during migration in the above mentioned drainages. Not likely to breed on-site. Closest known occurrence is 0.2 mile north of the City limits in 1996.
MAMMALS			
California (western) mastiff bat *Eumops perotis californicus*	CDFG: Species of Special Concern	Chaparral, live oaks, and arid, rocky regions. Requires downward-opening crevices. Roosts in cliffs, tall buildings, trees, and tunnels.	Medium. Detected on-site within the City limits in 1991 near El Toro Road and Interstate 5. Suitable habitat no longer appears to be present.

[1]Sensitivity Status Codes
Federal U.S. Fish and Wildlife Service (USFWS)
State California Department of Fish and Game (CDFG)
Other California Native Plant Society (CNPS):
1B: Plants rare, threatened, or endangered in California and elsewhere
2: Plants rare, threatened, or endangered in California, but more common elsewhere
3: Plants more information is needed for
4: Plants of limited distribution – a watch list

NCCP/HCP: Included on the Orange County Conservation Plan & Habitat conservation Plan (NCCP/HCP) Multiple Species Conservation Plan (MSCP) target plant and animal species list (1996).

SOURCES:
Federal and State Rankings:
California Natural Diversity Database (CDFG) list of Endangered, Threatened, and Rare plants of California (October 2008).

All CNPS Rankings, nomenclature, habitat descriptions, plant habit and blooming period information from Tibor 2001.
NCCP/HCP covered species list from County of Orange 1996.

Wetlands

The U.S. Army Corps of Engineers (USACE) regulates activities related to jurisdictional "waters of the U.S." CDFG is the lead agency that regulates activities that would substantially alter jurisdictional "waters of the state." Waters of the U.S. encompass both wetland and non-wetland aquatic habitats, such as streams, rivers, lakes, ponds, bays, and oceans. Jurisdictional waters of the state include the channel, bed, or bank of, a lake, river, or stream to the continuous edge of its riparian canopy extent. Areas under the jurisdiction of the CDFG include the areas of USACE jurisdictional waters of the U.S., as well as non-USACE jurisdictional riparian habitat. In practice, CDFG jurisdiction extends to the limits of the riparian canopy, or from the top of a bank on one side of a stream to the top of the opposite bank.

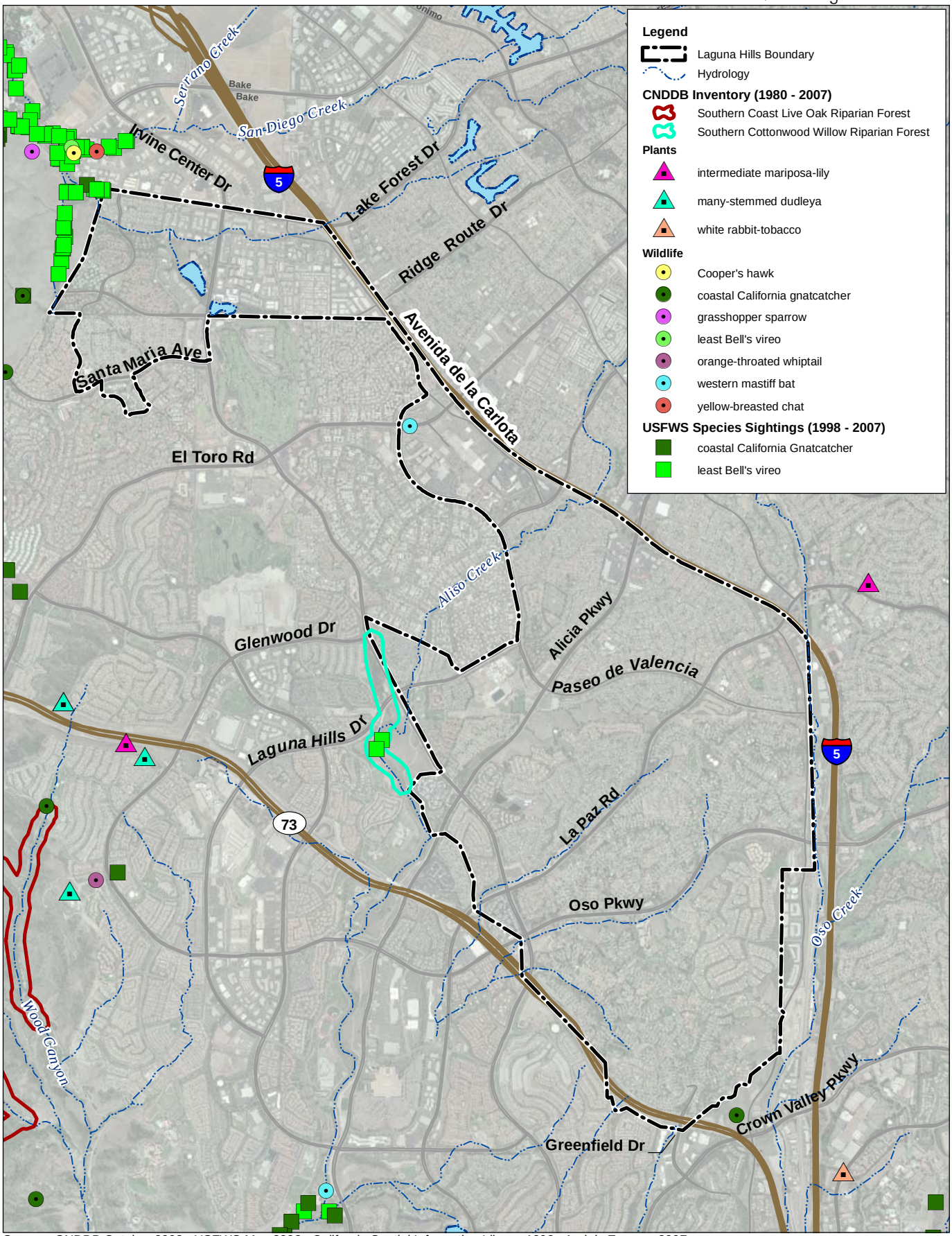
Riparian and wetland vegetation communities within the survey area are primarily associated with Veeh Reservoir and its associated tributary of the San Diego Creek, Aliso Creek, Oso Creek, and to a lesser extent, small drainage features and seeps resulting from municipal separate stormwater system facilities, irrigation, and/or roadway runoff. Figure 5.4-1 depicts hydrological features and sensitive plant and wildlife species within the planning area. A variety of small blue line drainages and creeks traverse the City and occur within the City or adjacent to City boundaries. Aliso Creek traverses the middle portion of the City. Small tributaries to Oso Creek and Sulphur Creek flow along the City boundaries in the eastern and southern portions of the City. Oso Creek is outside the City boundaries. San Diego Creek flows primarily outside of the City limits to the north, with a tributary connecting to Veeh Reservoir.

WILDLIFE

A variety of wildlife species may occur within the City in association with the various vegetation communities that are present. Vegetation communities present, such as the southern arroyo willow forest and mulefat scrub, may support riparian species, including the least Bell's vireo (*Vireo bellii pusillus*), Cooper's hawk (*Accipiter cooperi*), and various warbler species. Wildlife species associated with nonnative grasslands, disturbed habitat, and ornamental landscaping in the City include reptiles, birds, and mammals such as the side-blotched lizard (*Uta stansburiana*), Brewer's blackbird (*Euphagus cyanocephalus*), brown-headed cowbird (*Molothrus ater*), mourning dove (*Zenaida macroura*), house finch (*Carpodacus mexicanus*), northern mockingbird (*Mimus polyglottos*), and California ground squirrel (*Spermophilus beecheyi*). Raptor species that may nest in adjacent preserved land and forage in fragmented habitat within the City may include the red-tailed hawk (*Buteo jamaicensis*), red-shouldered hawk (*Buteo lineatus*), Cooper's hawk, and American kestrel (*Falco sparverius*). Species with the potential to occur, or known to be associated with aquatic habitat of the drainages or Veeh Reservoir include nonnative species such as the mosquito fish (*Gambusia affinis*), American bullfrog (*Rana catesbeiana*), African clawed frog (*Xenopus laevis*), and Pacific chorus frog (*Pseudacris regilla*). Common species with the potential to occur in pockets of disturbed coastal sage scrub within City boundaries include the western fence lizard (*Sceloporus occidentalis*), western whiptail (*Aspidoscelis tigris*), gopher snake (*Pituophis catenifer*), California towhee (*Pipilo crissalis*), Audubon's cottontail (*Sylvilagus audubonii*), deer mouse (*Peromyscus maniculatus*), and Botta's pocket gopher (*Thomomys bottae*).

SENSITIVE WILDLIFE SPECIES

Upon review of a CNDDB nine quad search for all sensitive species detected, a total of 30 wildlife species had a low, moderate, or high potential to occur within the City. After review of species locations, the year they were detected, aerial photographs, and general biological knowledge of the various species, two bird species (coastal California gnatcatcher and least Bell's vireo) were determined to have a high potential to occur within the City. Table 5.4-1 describes species with a moderate or high potential to occur within the City, sensitivity status, a general habitat description, and the probability of occurrence



Source: CNDDB October 2008; USFWS May 2008; California Spatial Information Library 1999; Aerials Express 2007

0 0.2 0.4 0.8 1.2 Miles

Figure 5.4-1
Sensitive Plant and Wildlife Species

within the City. A brief description of federally and/or state listed threatened or endangered species with a high level of probability of occurrence within the City, coastal California gnatcatcher, and least Bell's vireo is provided below.

Coastal California Gnatcatcher

The coastal California gnatcatcher is listed as federally threatened by the USFWS (USFWS 1993) and is considered a species of special concern by the CDFG (CDFG 2008). The coastal California gnatcatcher is an uncommon year-round resident of southern California. This species is declining proportionately with the continued loss of coastal sage scrub habitat in the six southern California counties (San Bernardino, Ventura, Los Angeles, Orange, San Diego, and Riverside) located within the coastal plain.

The coastal California gnatcatcher generally inhabits coastal sage scrub dominated by California sagebrush (*Artemesia californica*) and flat-topped buckwheat (*Eriogonum fasciculatum*), generally below 1,500 feet in elevation along the coastal slope. When nesting, the coastal California gnatcatcher typically avoids slopes greater than 25 percent with tall, dense vegetation. Coastal California gnatcatcher pairs will attempt several nests each year, each placed in a different location inside their breeding territory, but most nest attempts are unsuccessful due to depredation by a variety of species (Atwood and Bontrager 2001). Clutch size ranges from one to five eggs, with three or four eggs most common. Coastal California gnatcatchers will remain paired through the nonbreeding season and will generally expand their home range when not breeding.

The coastal California gnatcatcher is particularly vulnerable to habitat destruction and fragmentation because of poor dispersal, reliance to a specific habitat type, and difficulty in successful breeding. Juvenile gnatcatchers tend to remain close to their natal territories. On average, juveniles disperse less than 1.2 miles from their natal territories, making colonization of distant habitat patches difficult. Coastal California gnatcatchers are closely tied to coastal sage scrub and have been described as "obligate residents of coastal sage scrub" (Atwood and Bontrager 2001).

Critical habitat was designated for the coastal California gnatcatcher in 2000, and according to the CNDDB, no critical habitat was identified within or adjacent to the project area. While no critical habitat occurs within the City, the USFWS has designated critical habitat for the gnatcatcher in open space approximately 2 to 3 miles southeast and southwest of the City, and approximately 3.5 miles north of the City (CDFG 2008).

Potentially suitable habitat for the coastal California gnatcatcher is present in fragmented sections throughout the City. These areas occur along Cabot Road and Oso Parkway, and along the slopes of several of the natural drainage courses. However, the CNDDB search did not reveal any records of this species within the City. They have been detected in suitable habitat as close as 0.1 mile to the south of the City. Large expanses of coastal sage scrub can be found west of the City among the hillsides in the Aliso Viejo area, or in small canyons southeast of the City. The coastal California gnatcatcher has been recorded in these large areas of coastal sage scrub (CDFG 2008). Due to the proximity of known coastal California gnatcatcher populations to the City, and the presence of coastal sage scrub habitat, there is a high potential for this species to occur within the project area.

Least Bell's Vireo

The least Bell's vireo is a federally and state endangered species within its nesting habitat (CDFG 2008). It is limited to semi-open willow-mulefat-dominated riparian woodlands with dense shrub understory in southern California and northern Baja California, Mexico. The least Bell's vireo occurs most frequently in areas that have a combined understory of dense young willows or mulefat with a canopy of tall willows.

Since vireos build their nests in dense shrubbery 3 to 4 feet above the ground (Salata 1984), they require young successional riparian habitat or older habitat with a dense understory. Therefore, riparian plant succession is an important factor in maintaining vireo habitat. Nests are also often placed along internal or external edges of riparian thickets (USFWS 1986).

Historically, this subspecies was a common summer visitor to riparian habitat throughout much of California until its decline in recent years. The vireo's decline was attributed to loss, degradation, and fragmentation of riparian habitat combined with nest parasitism by the brown-headed cowbird. Due to concerted programs focused on preserving, enhancing, and creating suitable nesting habitat, the vireo population has steadily increased in population size along several of its breeding drainages in southern California. Currently, the least Bell's vireo is found only in riparian woodlands in southern California, with the majority of breeding pairs in San Diego, Santa Barbara, and Riverside counties.

Riparian vegetation surrounding Veeh Reservoir and within the Aliso and Oso drainages may provide breeding and migratory habitat for the least Bell's vireo. The CNDDB search did not reveal any records of this species directly within the City. Recently, least Bell's vireo has been detected 0.2 mile south of the City along Aliso Creek in 2002. Least Bell's vireo has also been detected 0.3 mile northwest of the City in 2005. There is limited habitat connectivity between known locations of least Bell's vireo outside the City, to suitable habitat along Veeh Reservoir and the Aliso and Oso drainages. Due to the presence of suitable habitat, there is a high potential for this species to occur within the City.

WILDLIFE MOVEMENT CORRIDORS

Wildlife movement corridors link together areas of suitable wildlife habitat that are otherwise separated by rugged terrain, changes in vegetation, or human disturbance. In the absence of habitat linkages allowing movement to adjoining open space areas, larger and more mobile mammal species will not likely persist over time in fragmented or isolated habitat areas (Harris and Gallagher 1989). Although the majority of the City is characterized by urbanized areas with low habitat value for wildlife, the streams and riparian corridors that traverse the City may serve as limited corridors for wildlife species, including migratory birds such as the least Bell's vireo, yellow warbler, and lesser goldfinch. Aliso Creek has the potential to function as a wildlife corridor for migratory birds, dispersing wildlife, and various amphibian and reptile species. Aliso Creek and its associated vegetation communities traverse the middle of the City and assist in connecting various intact patches of native habitat. The San Diego Creek and its tributaries connect Veeh Reservoir to native habitat that has been preserved to the north and west of the City. To the west of the City lies the Laguna Coast Wilderness Park, a 6,500-acre regional open space preserve that functions as a key component of the larger South Coast Wilderness area (EDAW 2007). Within the City, the various creeks and drainages may function as wildlife corridors for migration, dispersal, and movement between patches of habitat.

LOCAL POLICIES AND ORDINANCES

The City of Laguna Hills Tree Protection Ordinance (Laguna Hills Municipal Code, Section 8-08.010 through 8-08.110) regulates the planting, maintenance, protection, and removal of City-owned trees and shrubs in City rights-of-way and in City parks and open space. A permit is required from the Public Services Director to plant, move, spray, trim, remove, prune, replace, cut, or otherwise disturb any tree in any public place.

HABITAT CONSERVATION PLANS/NATURAL COMMUNITY CONSERVATION PLANS

The Orange County EMA, now part of Orange County Public Works, prepared the Orange County Coastal NCCP/HCP, which includes Laguna Hills. No land designated as "reserve" under the NCCP/HCP occurs within the planning area. However, nonreserve open space and conservation easement areas occur adjacent to the northwest portion of the City. In addition, approximately 6,500 acres of regional open space preserve occurs in the South Coast Wilderness area (composed of Aliso and Wood Canyons Wilderness Park, Crystal Cove State Park, the City of Irvine Open Space and Irvine Ranch Land Reserve, and Laguna Coast) located roughly 1 mile west of the planning area.

5.4.2 REGULATORY FRAMEWORK

The following federal, state, and local regulations establish a framework for conservation of the City of Laguna Hills' biological resources.

FEDERAL

Clean Water Act

Congress passed the Federal Water Pollution Control Act Amendments of 1972 and the Clean Water Act (CWA) of 1977 to provide for the restoration and maintenance of the chemical, physical, and biological integrity of the nation's lakes, streams, and coastal waters. Primary authority for the implementation and enforcement of the CWA (33 U.S.C. 1251) now rests with the USEPA and to a lesser extent, the USACE. In addition to the measures authorized before 1972, the CWA implements a variety of programs, including federal effluent limitations and state water quality standards, permits for the discharge of pollutants and dredged and fill materials into navigable waters, and enforcement mechanisms. Section 404 of the CWA is the principal federal program that regulates activities affecting the integrity of wetlands. Section 404 prohibits the discharge of dredged or fill material in jurisdictional waters of the U.S. unless permitted by USACE under individual permits or general permits, or unless the discharge is exempt from regulation.

Executive Order 11990, Protection of Wetlands (May 24, 1977)

Executive Order 11990 (May 24, 1977) requires federal agencies to prepare wetland assessments for proposed actions located in or affecting wetlands. This Executive Order establishes a national policy to avoid adverse impacts on wetlands whenever there is a practicable alternative. On projects with federal actions or approvals, impacts on wetlands must be identified in the environmental document. Alternatives that avoid wetlands must be considered. If wetland impacts cannot be avoided, then all practicable measures to minimize harm to those wetlands must be included. This must be documented in a specific Wetlands Only Practicable Alternative Finding in the final environmental document for the proposed project.

Federal Endangered Species Act

The federal Endangered Species Act (FESA) was established to protect wildlife species and habitats from extinction and diminishment and is administered by the USFWS. FESA applies to federally listed species and habitat occupied by federally listed species. FESA Section 9 forbids acts that directly or indirectly harm listed species. Section 9 also prohibits taking of any species of wildlife or fish listed as endangered. These restrictions apply to all federal agencies and all persons subject to U.S. jurisdiction. Specifically, Section 9 (16 U.S.C. 1538) identifies prohibited acts related to endangered species, and prohibits all persons, including federal, state and local governments, from taking listed species of fish and wildlife,

except as specified under the provisions for exemptions (16 U.S.C. 1539). The term "take" is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct (16 U.S.C. 1532[18]).

Migratory Bird Treaty Act (16 U.S.C. Section 703-711)

The Migratory Bird Treaty Act (MBTA) of 1918, implemented by the USFWS, is an international treaty that makes it unlawful to take, possess, buy, sell, purchase, or barter, any migratory bird listed in 50 CFR Part 10, including feathers or other parts, nests, eggs or products, except as allowed by implementing regulations (50 CFR 21). The MBTA requires that project-related disturbance at active nesting territories be reduced or eliminated during critical phases of the nesting cycle (1 February to 31 August, annually).

STATE

California Endangered Species Act

The California Endangered Species Act (CESA) (Fish and Game Code, Section 2050 et seq.) generally parallels the main provisions of FESA and is administered by the CDFG. Under CESA, the term "endangered species" is defined as a species of plant, fish, or wildlife which is "in serious danger of becoming extinct throughout all, or a significant portion of its range" and is limited to species or subspecies native to California. CESA prohibits the taking of listed species, except as provided in state law. Specifically, Section 2053 of CESA prohibits projects that would jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat essential to the continued existence of those species, if there are reasonable and prudent alternatives available consistent with conserving the species or its habitat that would prevent jeopardy. Any future development or redevelopment in the City that has the potential to affect wildlife is subject to the restrictions contained in CESA.

California Fish and Game Code Sections 1600-1603

The CDFG, through provisions of the Fish and Game Code Sections 1600-1603, is empowered to issue agreements (Streambed Alteration Agreements) for projects that would "divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake, or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake" (Fish and Game Code Section 1602[a]). Streams and rivers are defined by the presence of a channel bed and banks, and intermittent flow. The limits of CDFG jurisdiction are also based on riparian habitat and may include wetland areas that do not meet USACE criteria for soils and/or hydrology (e.g., where riparian woodland canopy extends beyond the banks of a stream away from frequently saturated soils).

Native Plant Protection Act (California Fish and Game Code Sections 1900-1913)

California's Native Plant Protection Act (NPPA) requires all California state agencies to establish criteria for determining if a species, subspecies, or variety of native plant is endangered or rare. Provisions of the NPPA prohibit the taking of listed plants from the wild and require notification of the CDFG at least 10 days in advance of any change in land use that would adversely impact listed plants. This requirement allows the CDFG to salvage listed plant species that would otherwise be destroyed.

Natural Community Conservation Planning Act (Fish and Game Code Sections 2800-2835)

The purpose of natural community conservation planning is to sustain and restore those species and their habitat identified by the department that are necessary to maintain the continued viability of those biological communities impacted by human changes to the landscape. It is also the policy of the state to conserve, protect, restore, and enhance natural communities. The State of California may acquire a fee or less than fee interest in lands consistent with approved natural community conservation plans and may provide assistance with the implementation of those plans.

Porter-Cologne Water Quality Control Act California Water Code, Division 7, Sections 13000-14958)

This Act provides for statewide coordination of water quality regulations. The Act established the California State Water Resources Control Board as the statewide authority and nine separate RWQCBs to oversee water quality on a day-to-day basis at the regional/local level.

Proposed discharges of waste that would affect state waters (that are not federal waters) within or adjacent to the proposed project site would require a Report of Waste Discharge from the RWQCB.

LOCAL

Orange County Coastal NCCP/HCP

The City falls within the Orange County Coastal NCCP/HCP. However, no designated reserve land occurs within the City. The NCCP/HCP seeks to identify and protect individual species whose numbers have declined significantly by conserving natural communities at the ecosystem level while accommodating compatible land uses. However, nonreserve open space and conservation easement areas occur adjacent to the northwest portion of the City. In addition, approximately 6,500 acres of regional open space preserve occurs in the South Coast Wilderness area (composed of Aliso and Wood Canyons Wilderness Park, Crystal Cove State Park, the City of Irvine Open Space and Irvine Ranch Land Reserve, and Laguna Coast) located roughly 1 mile west of the City.

The NCCP/HCP was approved in July 1996 along with an implementation agreement between the federal and state wildlife agencies (USFWS and CDFG) and participating entities. The City of Laguna Hills is not a participating entity. The measures contained in the NCCP/HCP mitigate direct and indirect impacts to the 39 species and 4 covered habitats identified within designated development sites in the NCCP/HCP area. These measures also satisfy the federal, state, and local project-specific mitigation requirements for the species and habitats addressed in the NCCP/HCP under FESA, CESA, CEQA, the National Environmental Policy Act (NEPA), and MBTA.

Regional Water Quality Control Board

No license or permit may be issued by a federal agency until certification required by Section 401 has been granted. Under the CWA, USACE Section 404 permits are subject to RWQCB Section 401 Water Quality Certification.[3] Section 401 of the CWA requires certification from the RWQCB that the proposed project is in compliance with established water quality standards. Projects that have the potential to discharge pollutants are required to comply with established water quality objectives. Section 401 of the CWA provides the State Water Resources Control Board and the RWQCB with the regulatory authority

[3] The regulations governing California's issuance of 401 Certifications were updated in 2000 and are contained in Title 23 Sections 3830 through 3869 of the CCR.

to waive, certify, or deny any proposed federally permitted activity, which could result in a discharge to waters of the state.

For any projects within the City that have the potential for permanent impacts to jurisdictional waters of the U.S. and state, the RWQCB will likely require a Section 401 permit as a prerequisite to USACE Section 404 permit authorization.

Laguna Hills Tree Protection Ordinance

The City of Laguna Hills Tree Protection Ordinance (Laguna Hills Municipal Code, Section 8-08.010 through 8-08.110) regulates the planting, maintenance, protection, and removal of City-owned trees and shrubs in City rights-of-way and in City parks and open space. A permit is required from the Public Services Director to plant, move, spray, trim, remove, prune, replace, cut, or otherwise disturb any tree in any public place.

5.4.3 THRESHOLD FOR DETERMINING SIGNIFICANCE

Based on Appendix G of the CEQA Guidelines, a significant impact related to biological resources would occur if implementation of the General Plan would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service;
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

5.4.4 ANALYSIS OF ENVIRONMENTAL IMPACTS

Proposed projects within the City would result in direct, indirect, temporary, and permanent impacts to biological resources. These impacts are defined below.

Direct: Any alteration, disturbance, or destruction of biological resources that would result from project-related activities is considered a direct impact. Examples include removal of vegetation for underground pipeline trenching activities and not allowing the natural vegetation to recolonize the impact area, or actively restoring the natural vegetation, encroaching into wetlands, diverting surface water flows, and the loss of individual species and/or their habitats.

Indirect: Sensitive vegetation communities, plant species, and wildlife in the vicinity of a project site have the potential to be indirectly impacted by project-related development and activities. Examples include elevated noise and dust levels, soil compaction, increased human activity, decreased water quality, and the introduction of invasive wildlife (domestic cats and dogs) and plants.

Temporary: Any impacts considered to have reversible effects on biological resources can be viewed as temporary. Examples include the generation of fugitive dust during construction.

Permanent: All impacts that result in the irreversible removal of biological resources are considered permanent. Examples include constructing a building or permanent road on an area containing biological resources.

SENSITIVE VEGETATION COMMUNITIES, SENSITIVE PLANT SPECIES, AND WETLANDS

Sensitive vegetation communities and wetlands occur within the planning area. Sensitive plant species have not been documented within the planning area. While sensitive plant species could occur within the planning area, this impact discussion focuses on sensitive vegetation communities and wetlands because they are known to occur within the planning area.

Direct Impacts

Temporary

The General Plan has the potential to impact sensitive habitats and wetlands as a result of grading, excavation, and construction activities associated with new development and/or recreational trail expansion. Sensitive habitats within the City are degraded and exist only in small, isolated pockets. Because the majority of new development will be limited to infill areas and the expansion of recreational trails, the likelihood is low that sensitive habitats and wetlands will be impacted. However, any temporary disturbance to sensitive habitats or wetlands (e.g., removal of vegetation due to grading activities) would be a significant impact. Further temporary direct impacts could occur through temporary changes in hydrology in and around a project during construction-related activities. This is a potentially significant impact and mitigation is required.

Mitigation Measures B-1, B-2, and B-3 are proposed to address this impact. Mitigation Measure B-1 requires discretionary project permitting and CEQA review of any project that may affect sensitive species, sensitive communities, or riparian habitats/wetlands. If recommended or required by the resource agencies, project-specific measures to mitigate potential impacts to sensitive species will be established as conditions of project approval. Mitigation Measure B-2 requires new development projects to incorporate best management practices (BMPs) to minimize alterations of stormwater runoff during and after construction. Mitigation Measure B-3 requires that new development projects provide adequate on-site and off-site measures to control erosion and discharge of pollutants and/or sediments to ensure that "no net increase in runoff" occurs as a result of proposed projects. Implementation of Mitigation Measures B-1, B-2, and B-3 would reduce this impact to a level less than significant.

Permanent

Permanent direct impacts to sensitive habitats and wetlands would typically result from the ongoing operation and/or maintenance in support of a project or plan. For example, permanent increases in foot traffic due to trail creation in the vicinity of sensitive habitats and/or wetlands could increase the potential

for human and/or pet traffic within these areas. Trampling by humans or pets would be considered a significant permanent direct impact. This is a potentially significant impact, and mitigation is required.

Mitigation Measures B-1, B-2, and B-3 are proposed to address this impact. Mitigation Measure B-1 requires discretionary project permitting and CEQA review of any project that may affect sensitive species, sensitive communities, or riparian habitats/wetlands. If recommended or required by the resource agencies, project-specific measures to mitigate potential impacts to sensitive vegetation, plants, or wetlands will be established as conditions of project approval. Mitigation Measure B-2 requires new development projects to incorporate BMPs to minimize alterations of stormwater runoff during and after construction. Mitigation Measure B-3 requires that new development projects provide adequate on-site and off-site measures to control erosion and discharge of pollutants and/or sediments to ensure that "no net increase in runoff" occurs as a result of proposed projects. Implementation of Mitigation Measures B-1, B-2, and B-3 would reduce this impact to a level less than significant.

Indirect Impacts

Temporary

Indirect temporary impacts to sensitive vegetation, plants, or wetlands associated with potential development could include elevated dust levels associated with construction activities. Elevated dust levels could impact photosynthetic rates and thus impact overall plant health. This is a potentially significant impact, and mitigation is required.

Mitigation Measure B-1 is proposed to address this impact. Mitigation Measure B-1 requires discretionary project permitting and CEQA review of any project that may affect sensitive species, sensitive communities, or riparian habitats/wetlands. If recommended or required by the resource agencies, project-specific measures to mitigate potential impacts to sensitive vegetation, plants, or wetlands will be established as conditions of project approval. Implementation of Mitigation Measure B-1 would reduce this impact to a level less than significant.

Permanent

Permanent indirect impacts to sensitive habitats and wetlands can occur as a result of permanent alterations to the hydrology of the area that occurs upstream of sensitive habitats and wetlands. Any impacts such as increased erosion or sedimentation, and changes in water runoff that occur as a result of development will have impacts to habitats downstream. Most new development proposed under the General Plan will occur in existing developed areas; however new development could potentially alter hydrology in downstream wetlands and sensitive habitats due to changes in the timing and/or amount of runoff. Alterations in hydrology and/or increased pollutants and sediment in runoff can decrease the function and value of wetlands and sensitive habitats. This is a potentially significant impact, and mitigation is required.

Mitigation Measures B-1, B-2, and B-3 are proposed to address this impact. Mitigation Measure B-1 requires discretionary project permitting and CEQA review of any project that may affect sensitive species, sensitive communities, or riparian habitats/wetlands. If recommended or required by the resource agencies, project-specific measures to mitigate potential impacts to sensitive vegetation, plants, or wetlands will be established as conditions of project approval. Mitigation Measure B-2 requires new development projects to incorporate BMPs to minimize alterations of stormwater runoff during and after construction. Mitigation Measure B-3 requires that new development projects provide adequate on-site and off-site measures to control erosion and discharge of pollutants and/or sediments to ensure that "no

net increase in runoff" occurs as a result of proposed projects. Implementation of Mitigation Measures B-1, B-2, and B-3 would reduce this impact to a level less than significant.

SENSITIVE WILDLIFE SPECIES

Direct Impacts

Temporary

Temporary direct impacts to wildlife species may occur through temporary construction-related disturbance to sensitive wildlife habitat. Sensitive wildlife habitat may be graded temporarily to allow access to construction areas associated with recreational trail creation and/or extension. In addition, construction-related equipment could block or impede sensitive wildlife movement. This is a potentially significant impact, and mitigation is required.

Mitigation Measure B-1 is proposed to address this impact. Mitigation Measure B-1 requires discretionary project permitting and CEQA review of any project that may affect sensitive species, sensitive communities, or riparian habitats/wetlands. If recommended or required by the resource agencies, project-specific measures to mitigate potential impacts to sensitive species will be established as conditions of project approval. Implementation of Mitigation Measure B-1 would reduce this impact to a level less than significant.

Permanent

Sensitive wildlife may be directly impacted by grading, excavation, and construction activities. Direct impacts to sensitive wildlife may include permanent habitat disturbance or injury or loss of wildlife due to grading and excavation. Sensitive amphibian, reptile, and mammal species are particularly susceptible to injury or death during ground-breaking activities. In addition, removal of nesting habitat, such as trees and/or shrubs, could disturb nesting bird pairs causing nest abandonment, loss of young, or reduced nesting success. This is a potentially significant impact, and mitigation is required.

Mitigation Measure B-1 is proposed to address this impact. Mitigation Measure B-1 requires discretionary project permitting and CEQA review of any project that may affect sensitive species, sensitive communities, or riparian habitats/wetlands. If recommended or required by the resource agencies, project-specific measures to mitigate potential impacts to sensitive species will be established as conditions of project approval. Implementation of Mitigation Measure B-1 would reduce this impact to a level less than significant.

Indirect Impacts

Temporary

Grading, excavation, and construction activities associated with new development and trail creation could result in temporary, indirect impacts to sensitive species. The majority of these activities would occur in existing developed areas or in open space dominated by ruderal vegetation and/or landscaping. However, these open space areas may support sensitive species. Potential temporary indirect impacts to sensitive species include temporary elevations in noise and dust levels, and human activity in the vicinity of construction areas.

It is likely that open space areas support nesting habitat for native birds whose nests are protected under the MBTA and the California Fish and Game Code. General Plan implementation could disturb nesting birds if they are present in the vicinity of implementation activities. In addition, temporary construction

activity could disturb sensitive bat species, such as the California mastiff bat, if they are present in the vicinity of the project site. This is a potentially significant impact, and mitigation is required.

Mitigation Measure B-1 is proposed to address this impact. Mitigation Measure B-1 requires discretionary project permitting and CEQA review of any project that may affect sensitive species, sensitive communities, or riparian habitats/wetlands. If recommended or required by the resource agencies, project-specific measures to mitigate potential impacts to sensitive species will be established as conditions of project approval. Implementation of Mitigation Measure B-1 would reduce this impact to a level less than significant.

Permanent

Potential permanent, indirect impacts to sensitive species resulting from new development and trail creation include increased lighting and noise, as well as increased disturbance by humans and pets. Most new development anticipated under the General Plan will occur in existing developed areas and/or within or adjacent to degraded/disturbed open space of limited habitat value. In general the wildlife inhabiting open space areas are habituated to high levels of disturbance because of the proximity to urban development and associated noise, light, and activity. However, sensitive wildlife may occur in open space areas and any permanent increases in traffic through an area occupied by sensitive wildlife species would be considered a significant permanent indirect impact.

Mitigation Measure B-1 is proposed to address this impact. Mitigation Measure B-1 requires discretionary project permitting and CEQA review of any project that may affect sensitive species, sensitive communities, or riparian habitats/wetlands. If recommended or required by the resource agencies, project-specific measures to mitigate potential impacts to sensitive species will be established as conditions of project approval. Implementation of Mitigation Measure B-1 would reduce this impact to a level less than significant.

WILDLIFE CORRIDORS

Although the majority of the City is characterized by urbanized areas with low habitat value for wildlife, the streams and riparian corridors that traverse the City may serve as limited, truncated movement corridors for common wildlife species adapted to urban environments. However, these drainages provide only limited value as wildlife corridors because they are surrounded by moderately urbanized areas, they occur in small, discrete patches, and provide limited connectivity to large habitat reserves. New development anticipated under the General Plan is primarily infill and redevelopment. Thus, implementation of the General Plan is not expected to interfere with existing wildlife corridors associated with existing open space within the planning area. Impacts are less than significant. No mitigation is required.

LOCAL POLICIES AND ORDINANCES

Future development anticipated under the General Plan may result in the removal of existing City-owned trees. Removal of these trees would conflict with The Laguna Hills Tree Protection Ordinance, which regulates the planting, maintenance, protection, and removal of City-owned trees and shrubs in City rights-of-way and in City parks and open space. This represents a significant impact, and mitigation is required.

Mitigation Measure B-4 is proposed to address this impact. Mitigation Measure B-4 requires that a permit be procured from the Public Services Director to plant, move, spray, trim, remove, prune, replace, cut, or otherwise disturb any tree in any public place. In addition, this measure requires that removed trees be

replaced at a one-to-one ratio. Implementation of Mitigation Measure B-1 would reduce this impact to a level less than significant.

HABITAT CONSERVATION PLANS/NATURAL COMMUNITY CONSERVATION PLANS

Laguna Hills is not a "participating city" in the Orange County Coastal NCCP/HCP. In addition, no "reserve land" occurs within the planning area. Implementation of the General Plan is not expected to conflict with the provisions of the Orange County Coastal NCCP/HCP. Implementation of the General Plan will not conflict with the provisions of an adopted NCCP/HCP or other approved habitat conservation plan, and will not result in a significant impact. No mitigation is required.

5.4.5 MITIGATION MEASURES

Implementation of the following programmatic mitigation measures, derived largely from the General Plan Implementation Program, will reduce potential impacts to a less than significant level at this Program EIR level of analysis. Individual development projects will be required to undergo project-specific environmental review and mitigation measures will be identified to reduce any significant impacts. Mitigation for significant environmental impacts of each future development project shall include the following: (1) objective of the measure; (2) specific standards or measures to be applied, along with any needed contingency measure; (3) responsible party; (4) location; (5) schedule for initiation; and (6) how the measure will reduce the associated environmental impact.

B-1 Activities implemented under the General Plan will undergo project-specific review for potential impacts to biological resources in accordance with CEQA. The City shall require that all General Plan implementation activities adhere to California and federal legislation that protects all sensitive plants, wildlife, habitats and wetlands. The City shall work closely with the USACE, USFWS, RWQCB, and the CDFG during the discretionary project permitting and CEQA review of any project that may result in the alteration of a stream bed, involve the removal of vegetation in wetland and riparian habitats, disturb waters of the U.S. or otherwise impacts sensitive biological resources. If recommended or required by the resource agencies, project-specific measures to mitigate potential impacts to sensitive species, such as native birds and bats, will be established as conditions of project approval. Mitigation measures for habitat and species may include, but are not limited to, avoidance, enhancement, restoration, or a combination of any of the three.

B-2 The City shall continue to implement the National Pollutant Discharge Elimination System (NPDES) stormwater permits issued by the state and RWQCB. The City shall also require new development and revitalization projects to incorporate BMPs pursuant to the NPDES permit to ensure compliance with applicable state and federal regulations. **(Implementation Program COS-3)**

B-3 As a condition of project-specific approval, the City shall require new development and redevelopment to provide adequate on-site and off-site stormwater and flood management facilities to control direct and indirect erosion and discharges of pollutants and/or sediments. To determine the facility and BMP needs, the City will require, when necessary, a hydrological/drainage analysis be performed by a state-licensed and City-approved engineer, with the cost of said analysis the responsibility of the project applicant. **(Implementation Program S-12)**

B-4 In accordance with the City of Laguna Hills Tree Protection Ordinance, a permit shall be required from the Public Services Director to plant, move, spray, trim, remove, prune, replace, cut, or otherwise disturb any tree in any public place. Section 8-08.050 of the Laguna Hills Tree Protection Ordinance requires that City trees be replaced by the caliper inch measured at diameter breast height[4] (DBH). For every inch of DBH removed, an equal number of caliper inches shall be replaced. For example, the removal of one 12-inch tree shall necessitate the planting of a total of 12 inches of new tree(s) (e.g., one 12-inch tree, six 2-inch trees, or four 3-inch trees). **(Implementation Program COS-9)**

5.4.6 IMPACT AFTER MITIGATION

SENSITIVE VEGETATION COMMUNITIES, SENSITIVE PLANT SPECIES, AND WETLANDS

Direct

Temporary

Implementation of Mitigation Measures B-1, B-2, and B-3 identified above would avoid and/or reduce temporary direct impacts to sensitive vegetation communities, sensitive plant species, and wetlands to a level less than significant.

Permanent

Implementation of Mitigation Measures B-1, B-2, and B-3 identified above would avoid and/or reduce permanent direct impacts to sensitive vegetation communities, sensitive plant species, and wetlands to a level less than significant.

Indirect

Temporary

Implementation of Mitigation Measure B-1 identified above would avoid and/or reduce temporary indirect impacts to sensitive vegetation communities, sensitive plant species, and wetlands to a level less than significant.

Permanent

Implementation of Mitigation Measures B-1, B-2, and B-3 identified above would avoid and/or reduce permanent indirect impacts to sensitive vegetation communities, sensitive plant species, and wetlands to a level less than significant.

SENSITIVE WILDLIFE SPECIES

Direct

Temporary

Implementation of Mitigation Measure B-1 identified above would avoid and/or reduce temporary direct impacts to sensitive wildlife species to a level less than significant.

[4] According to Laguna Hills Municipal Code, "diameter at breast height" is the diameter of the tree trunks at the height of 4 feet 6 inches from the finished grade at the back of the tree.

Permanent

Implementation of Mitigation Measure B-1 identified above would avoid and/or reduce permanent direct impacts to sensitive wildlife species to a level less than significant.

Indirect

Temporary

Implementation of Mitigation Measure B-1 identified above would avoid and/or reduce temporary indirect impacts to sensitive wildlife species to a level less than significant.

Permanent

Implementation of Mitigation Measure B-1 identified above would avoid and/or reduce permanent indirect impacts to sensitive wildlife species to a level less than significant.

WILDLIFE CORRIDORS

Implementation of the General Plan is not expected to interfere with existing wildlife corridors. Impacts would be less than significant without mitigation.

LOCAL POLICIES AND ORDINANCES

Implementation of Mitigation Measure B-4 identified above would avoid or reduce conflicts with a local plan or ordinance to a level less than significant.

HABITAT CONSERVATION PLANS/NATURAL COMMUNITY CONSERVATION PLANS

Implementation of the General Plan is not expected to conflict with the provisions of an adopted NCCP/HCP or other approved habitat conservation plan. Impacts would be less than significant without mitigation.

This page intentionally left blank.

5.5 CULTURAL AND PALEONTOLOGICAL RESOURCES

This section describes existing cultural and paleontological resources within the Laguna Hills Planning Area and evaluates the potential impacts on cultural and paleontological resources that could result from implementation of the General Plan.

5.5.1 ENVIRONMENTAL SETTING

METHODOLOGY

A cultural resources site records search was conducted at the South Central Coastal Information Center at California State University, Fullerton on September 6, 2007. The records search included a review of all recorded archaeological sites within the project area and within a ½-mile radius of the project area, as well as a review of cultural resource reports on file. Additional listings were reviewed for the project area, including the California Points of Historical Interest, the California Historical Landmarks, the California Register of Historical Resources (CRHR), the National Register of Historic Places (NRHP), and the California State Historic Resources Inventory. Historic maps were also reviewed (Corona 1946 30' USGS, Santa Ana 1986 and 1945 15' USGS, and Santiago Peak 1943 15' USGS).

The discussion of paleontological resources is summarized from the following documents: (1) the Seismic and Geologic Technical Background Report for the City of Laguna Hills General Plan Update, prepared by Wilson Geosciences, Inc.; and (2) City of Laguna Hills General Plan Final Master EIR, prepared in 1994 by Planning Network and LSA Associates, Inc.

HISTORICAL AND ARCHAEOLOGICAL SETTING

Human occupation of Orange County may date as far back as 13,000 years. Prior to the arrival of Spanish colonists, the area of Laguna Hills was inhabited by the Gabrielino tribe. The region located immediately to the south was inhabited by the Luiseño, also known as the Juaneño, who moved seasonally between mountain and seashore camps to hunt, collect shellfish, and harvest plant items such as acorns and hard seeds (Moratto 1984). Although it is difficult to assign definitively, Aliso Creek is generally considered the southern boundary of the Gabrielino territory and the dividing line between the two groups (Bean and Smith 1978).

Prehistoric communities in the Laguna Hills vicinity exploited resources in two distinct geographical regions. Subsistence resources in the interior mountains and foothills consisted of numerous small animals, deer, acorns, sage, and piñon nuts. In the prairies flanking the interior mountains, including the Santa Ana plain, resources included acorns, sage, yucca, deer, small rodents, cactus, fruit, and a variety of plants and animals from the freshwater marshes (McCawley 1996). In the winter, communities from the inland prairies migrated to shellfish-gathering camps near the Newport Bay area (McCawley 1996).

Spanish colonial expansion into Alta California in the latter part of the 18th century was stimulated by geopolitical and religious considerations (Cleland 1944). As elsewhere along the northern borderlands of New Spain, the plan for the colonization of Alta California included three types of settlements: missions to convert the Native Americans and provide them with an agricultural subsistence; pueblos to act as residential, commercial, and administrative centers; and presidios to protect the colony from foreign powers and potential Native American hostility (Hallenbeck 1926). The main goal of the missions was to convert the Native American population and help them to become skilled farmers, builders, and craftsmen. Mission San Juan Capistrano is located approximately 10 miles south of Laguna Hills. The Spaniards founded the mission in 1776, and ruled the region until 1782 when California became a Mexican territory and was divided into several large ranchos.

In 1842, Governor Alvarez granted a 13,000-acre rancho, Rancho Niguel, to Juan Avila and his sister, Conception Avila de Sanchez. The City of Laguna Hills would develop much later out of a portion of Rancho Niguel. During this time the land was used for raising cattle and sheep.

In 1890, the Moulton family took title to approximately 222,000 acres of land in southwestern Orange County, naming the area Moulton Ranch. Over the years, portions of the ranch were sold and became Laguna Niguel, Leisure World (now part of Laguna Woods), and Laguna Hills. Laguna Hills officially became a city on December 20, 1991.

HISTORICAL AND ARCHAEOLOGICAL RESOURCES

Based on the cultural resources site records search, no historical resources are located within the planning area. However, based on the records search, 14 archaeological sites are located within the planning area.

The NRHP is the nation's official list of cultural resources identified for preservation. Authorized under the National Historic Preservation Act of 1966 (NHPA), the NRHP is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect historic and archaeological resources. Properties listed in the NRHP include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archaeology, engineering, and culture. No site within the planning area is listed on the NRHP.

The CRHR includes historic resources of importance at the state level. All properties listed in the NRHP are automatically included in the CRHR. The State of California also maintains a historical resources inventory, which is administered by 12 regional offices. The Orange County records are maintained at the South Central Coastal Information Center at California State University, Fullerton. No site within the planning area is listed in the CRHR.

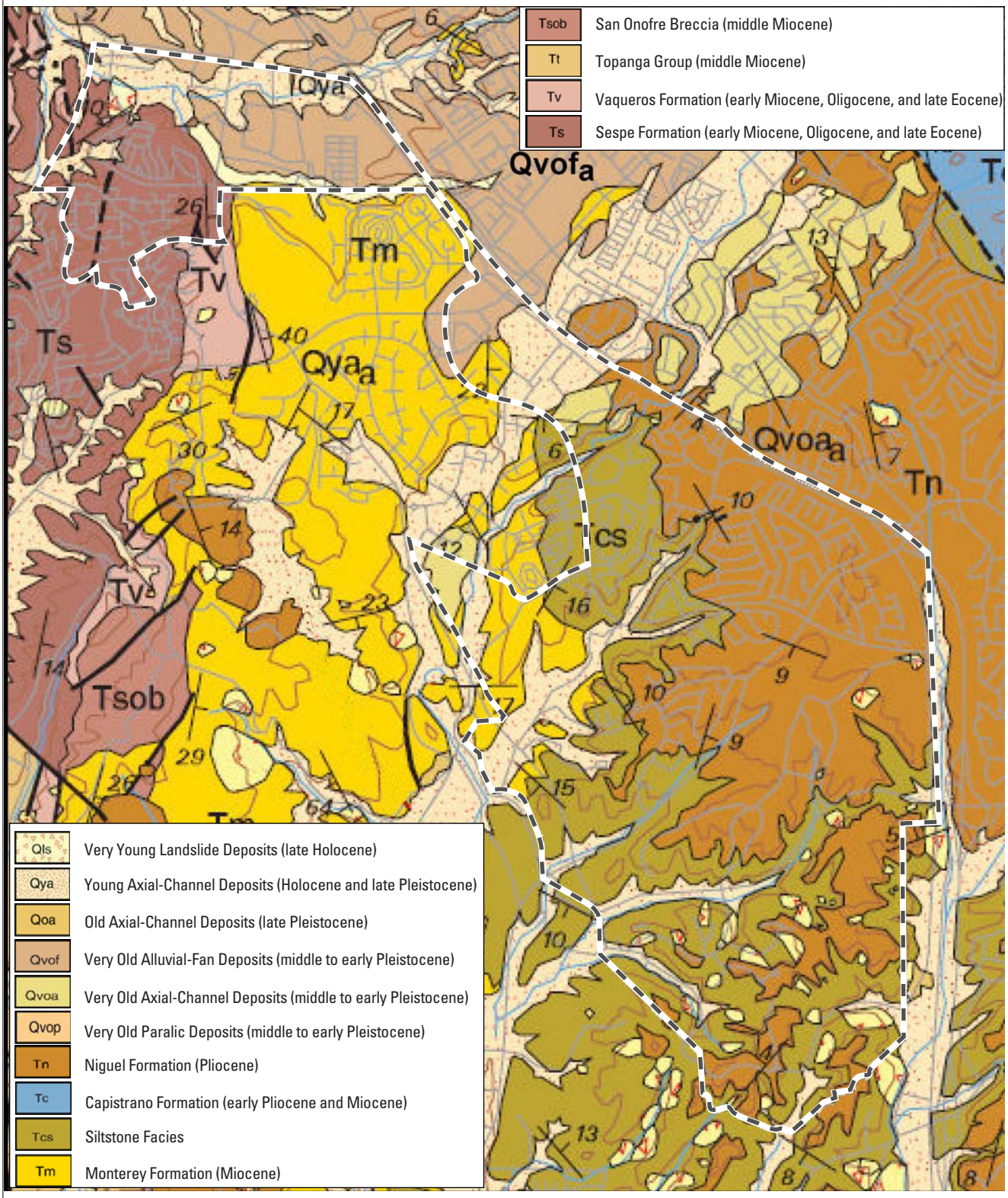
PALEONTOLOGICAL SETTING

Fossils are remains and/or traces of prehistoric plant and animal life. Fossils such as bones, teeth, shells, and leaves are found in geologic deposits (rock formations) within which they were originally buried. Paleontological resources include not only fossils, but also the collecting localities and the geologic formations containing those localities. Knowledge of the geology of a particular area and the paleontological resource sensitivity (i.e., fossil productivity) of particular rock formations makes it possible to predict where fossils will (or will not) be encountered. The planning area is underlain by areas ranging from no paleontological sensitivity to high sensitivity.

PALEONTOLOGICAL RESOURCES

As depicted in Figure 5.5-1, the geologic formations present within the Laguna Hills area consist of Sespe Formation, Vaqueros Formation, Monterey Formation, Capistrano Formation, Niguel Formation, Non-Marine Terrace deposits, and Young Alluvium (including slopewash and artificial fill). As shown in Table 5.5-1, the paleontological resource sensitivity of these formations ranges from no sensitivity to high sensitivity.

Given the relatively high resource sensitivity of these underlying geologic formations, hundreds of Pleistocene fossils have been recovered in the Laguna Hills area from the Costeau Pit in the 1960s, and from the excavation for the Laguna Hills Community Center and Sports Complex in 1989 and 1999. Pleistocene taxa from alluvial and terrace deposits include amphibians, reptiles, birds, and mammals (including ground sloth, dire wolf, sabertooth cat, mammoth, mastodon, horse, camel, antelope, and bison).



Source: Morton and Miller, 2006; USGS OFR 2006-1217

0 0.25 2000 4000 Feet

Figure 5.5-1
Underlying Geologic Formations

Table 5.5-1
Paleontological Sensitivity within Laguna Hills

Geologic Formation	Resource Sensitivity
Sespe Formation	Low
Vaqueros Formation	Moderate to High
Monterey Formation	High
Capistrano Formation	High
Niguel Formation	High
Non-Marine Terrace Deposits	High
Recent Alluvium, Slopewash, Artificial Fill	Low to No Sensitivity

Source: Planning Network and LSA Associates 1994

5.5.2 REGULATORY FRAMEWORK

Regulations have been enacted to protect historic, archaeological, and paleontological resources, as well as human remains. These regulations include, but are not limited to the following.

NATIONAL HISTORIC PRESERVATION ACT

Enacted in 1966, the NHPA established the NRHP program under the Secretary of the Interior, authorized funding for state programs with provisions for pass-through funding and participation by local governments, created the Advisory Council on Historic Preservation, and established the Section 106 review process for protecting historic resources. The goal of the Section 106 review process is to offer a measure of protection to sites that are determined eligible for listing in the NRHP. As part of this process, the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring and Preserving Historic Buildings were developed to provide guidance to federal agencies in reviewing potential impacts to historic resources. The NHPA provides the legal framework for most state and local preservation laws.

CALIFORNIA REGISTER OF HISTORICAL RESOURCES

The Office of Historic Preservation (OHP) administers the CRHR, which was established in 1992 though amendments to the Public Resources Code, as an authoritative guide to be used by state and local agencies, private groups, and citizens to identify the state's historical resources and to indicate what properties are to be protected from substantial adverse change. The CRHR includes resources that have been formally determined eligible for, or listed in, the NRHP, State Historical Landmark Number 770 or higher, Points of Historical Interest recommended for listing by the State Historical Resources Commission (SHRC), resources nominated for listing and determined eligible in accordance with criteria and procedures adopted by the SHRC, and resources and districts designated as city or county landmarks when the designation criteria are consistent with CRHR criteria.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

With establishment of the CRHR and the SHRC, the State Legislature amended CEQA in 1992 to define historical resources as a resource listed in, or determined eligible for listing in, the CRHR; a resource included in a local register of historical resources or identified as significant in a historical resource survey that meets certain requirements; and any object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be significant. Generally, a resource is considered to be historically significant if it meets the criteria for listing in the CRHR. However, a lead agency under CEQA is not precluded from determining a resource is significant that is not listed in or determined

eligible for listing in the CRHR, not included in a local register, or identified in a historical resources survey as a historical resource, as defined in the Public Resources Code.

CEQA was further amended to clarify that a project that may cause a substantial adverse change in the significance of a historical resource is a project that may have a significant effect on the environment. While demolition and destruction are fairly obvious significant impacts, it is more difficult to assess when change, alteration, or relocation crosses the threshold of substantial adverse change. The CEQA Guidelines provide that a project that demolishes or alters those physical characteristics of a historical resource that convey its historical significance (i.e., its character-defining features) can be considered to materially impair the resource's significance. However, a project that conforms to the Secretary of the Interior's Standards for the Treatment of Historic Properties can generally be considered a project that will not cause a significant impact.

CALIFORNIA HEALTH AND SAFETY CODE

California Health and Safety Code Section 7050.5 regulates the procedure in the event of human remains discovery. Pursuant to Public Resources Code Section 5097.98, in the event of human remains discovery, no further disturbance is allowed until the County Coroner has made the necessary findings regarding the origin and disposition of the remains. If the remains are determined to be Native American, the Coroner is required to contact the Native American Heritage Commission (NAHC). The NAHC is responsible for contacting the most likely Native American descendent, who will consult with the local agency regarding how to proceed with the remains. According to Section 15064.5 of the CEQA Guidelines, all human remains are a significant resource.

NATIVE AMERICAN CONSULTATION

Government Code Section 65352.3 (Senate Bill 18) requires local governments to consult with California Native American tribes identified by the California NAHC prior to the adoption or amendment of a general plan or specific plan. The purpose of this consultation is to preserve or mitigate impacts to cultural places.

5.5.3 THRESHOLDS FOR DETERMINING SIGNIFICANCE

Based on Appendix G of the CEQA Guidelines, a significant impact related to cultural and paleontological resources would occur if implementation of the General Plan would:

- Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5;
- Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5;
- Directly or indirectly destroy a unique paleontological resource or site or unique geological feature; or
- Disturb any human remains, including those interred outside of formal cemeteries.

5.5.4 ANALYSIS OF ENVIRONMENTAL IMPACTS

HISTORICAL AND ARCHAEOLOGICAL RESOURCES

No historical resources were identified through the cultural resources site records search. The search revealed 14 archaeological sites within the planning area, indicating the potential for other archaeological resources to exist.

No known local resource is currently listed or eligible for listing in the NRHP or the CRHR. However, resources may be eligible to be listed at some point in the future and development anticipated under the General Plan has the potential to directly impact the resources themselves or impact their immediate surroundings. Actions that could directly affect historical structures include demolition, seismic retrofitting, and accidents or vibration caused by nearby construction activities. Impacts to the immediate surroundings may result from individual development projects that could alter a historic structure or the unique character of the physical environment.

The majority of new development anticipated under the General Plan will involve infill and redevelopment of existing developed areas. Thus, the likelihood of finding new or undiscovered archaeological resources is limited.

Laguna Hills currently assesses discretionary development proposals for potential impacts to sensitive historic, archaeological, and paleontological resources pursuant to Section 15064.5 of the CFEQA Guidelines. If historic resources become listed prior to 2030 these resources would undergo CEQA review on a project-specific basis. Likewise, potential impacts to archaeological resources would undergo CEQA review on a project-specific basis. If project-level impacts are identified, specific mitigation measures are required per CEQA.

Implementation of the General Plan is not expected to result in significant impacts to historic and archaeological resources. With adherence to existing City review practice, impacts to historical and archaeological resources will be less than significant. No mitigation is required.

PALEONTOLOGICAL RESOURCES

The planning area is underlain by areas ranging from no paleontological sensitivity to high sensitivity. Ground-disturbing activities, such as construction associated with infill, redevelopment, and/or expansion of infrastructure, have the potential to impact buried paleontological resources. Thus, development of land pursuant to the General Plan has the potential to impact significant known and unknown paleontological resources. However, the majority of new development anticipated under the General Plan will involve infill and redevelopment of existing developed areas. Thus, the likelihood of finding new or undiscovered paleontological resources is limited.

Existing City programs and review processes also limit the potential for impacts to paleontological resources. The City assesses and mitigates the potential impacts of private development and public facilities and infrastructure to these resources pursuant to the provisions of CEQA. Pursuant to Section 15064.5 of the state CEQA Guidelines, a lead agency must find that a project may have a significant effect on the environment where the project has the potential to eliminate important examples of the major periods of California prehistory, which includes impacts to archaeological resources, paleontological resources, and human remains. The City will continue to review future development proposals to ensure that archaeological resources, paleontological resources, and human remains are conserved in compliance with CEQA requirements.

With adherence to and implementation of existing regulations and City programs and review processes, impacts to paleontological resources will be less than significant. No mitigation is required.

DISTURBANCE OF HUMAN REMAINS

The records search that revealed the presence of archaeological resources points to the fact that the Laguna Hills area was home to indigenous populations. This indicates a potential for human remains to exist within the planning area. Ground-disturbing activities, such as construction associated with infill, redevelopment, and/or expansion of infrastructure, have the potential to impact buried human remains. Thus, development of land pursuant to the General Plan has the potential to impact human remains. However, the majority of new development anticipated under the General Plan will involve infill and redevelopment of existing developed areas. Thus, the likelihood of encountering human remains is limited.

Existing City programs and review processes also limit the potential for disturbance of human remains. The City assesses and mitigates the potential impacts of private development and public facilities and infrastructure to these resources pursuant to the provisions of CEQA. Pursuant to Section 15064.5 of the state CEQA Guidelines, a lead agency must find that a project may have a significant effect on the environment where the project has the potential to eliminate important examples of the major periods of California prehistory, which includes impacts to archaeological resources, paleontological resources, and human remains. The City will continue to review future development proposals to ensure that archaeological resources, paleontological resources, and human remains are conserved in compliance with CEQA requirements.

With adherence to and implementation of existing regulations and City programs and review processes, impacts to human remains will be less than significant. No mitigation is required.

5.5.5 MITIGATION MEASURES

Impacts to cultural and paleontological resources will be less than significant. No mitigation is required.

5.5.6 IMPACT AFTER MITIGATION

HISTORICAL AND ARCHAEOLOGICAL RESOURCES

Implementation of the General Plan will not result in a substantial adverse change in the significance of a historical or archaeological resource. Impacts would be less than significant without mitigation.

PALEONTOLOGICAL RESOURCES

Implementation of the General Plan is not expected to destroy a unique paleontological resource or unique geological feature or disturb any human remains. Impacts would be less than significant without mitigation.

DISTURBANCE OF HUMAN REMAINS

Implementation of the General Plan is not expected to destroy a unique paleontological resource or unique geological feature or disturb any human remains. Impacts would be less than significant without mitigation.

This page intentionally left blank.

5.6 GEOLOGY, SOILS, AND MINERAL RESOURCES

This section of the General Plan Program EIR discusses the geologic, soil, and mineral resources conditions of the Laguna Hills planning area and identifies the related potential environmental impacts and development constraints upon implementation of the General Plan. Information presented in the discussion and subsequent analysis was drawn from the *Seismic and Geologic Technical Background Report for the City of Laguna Hills General Plan Update, Laguna Hills, Orange County, California* prepared by Wilson Geosciences, Inc. October 2008 (Appendix C).

5.6.1 ENVIRONMENTAL SETTING

REGIONAL AND LOCAL GEOLOGIC SETTING

The City of Laguna Hills planning area is located within the Peninsular Ranges geomorphic province, which is characterized by generally northwest-trending mountains and valleys, located south of the Transverse Ranges and west of the Mojave and Colorado deserts. Landforms and topography of the planning area are controlled by the distribution and character of geologic units, by fault movements, and by climate and erosion, all of which contribute to the sculpture of the landscape.

According to the geotechnical background report prepared by Wilson Geosciences, Inc. (2008), the planning area is underlain by four bedrock formations. From oldest to youngest these are the Sespe Formation, the Monterey Formation, the Capistrano formation siltstone member, and the Niguel Formation. The formations with the largest surface exposure areas are the Niguel and Capistrano Formations, which occupy at least 90 percent of the planning area south and east of Aliso Creek. The Monterey Formation is exposed in the area of the Saddleback Medical Center and an area roughly bounded by Aliso Creek, Paseo de Valencia, and Alicia Parkway. The Sespe Formation is exposed in the hilly area south and west of Veeh Reservoir. The underlying geologic formations above are discussed in detail in Section 5.5, Cultural Resources, and are shown in Figure 5.5-1.

Surficial deposits within the planning area consist of relatively recent (geologically young) sediments formed by alluvial and colluvial processes in streams and swales, and on alluvial fans/basins located down gradient from canyons draining the foothills of the Santa Ana Mountains (Wilson Geosciences, Inc. 2008). These deposits have been laid down over a range of geologic time; in general, the uppermost surficial sediments are Holocene (less than 10000-12000 years old) to late Pleistocene (less than a few hundred thousand years old) in age, although it is likely that few of these deposits within the City have been age-dated by absolute methods. The oldest surficial deposits may be much older, approaching 750,000 years old. Except for artificial fill compacted with engineering controls, the younger the age of the surficial deposit, the less adequate the engineering properties.

Topography

Hilly terrain characterizes most of the City where elevations range from approximately 654 feet above mean sea level (amsl) near Nellie Gail Road and Gallup Circle to about 200 feet near the intersection of Oso and Moulton parkways (Wilson Geosciences, Inc. 2008). Areas of relatively low relief are found in the northeastern area north and east of Veeh Reservoir (20 to 40 feet), and in the central area between El Toro Road and Aliso Creek (40 to 50 feet). Areas in the northwest and southeast have the highest relief (200 to 450 feet). These areas are traversed by various local drainage courses. In the lower relief areas the surface slopes are in the 2 to 4 percent range, while slopes in the intermediate relief areas are about 10 percent and the higher relief hillside (potentially unstable slopes in ungraded areas) areas are 15 to 60 percent.

FAULTING AND SEISMICITY

The planning area shares general seismic conditions with other cities that lie along the southern slope of the Santa Ana Mountains and foothills (Wilson Geosciences, Inc. 2008). For millions of years, tectonic movement and uplift along the Elsinore fault system northeast of the Santa Ana Mountains and frontal faults along the southwest base of the mountains have juxtaposed the old metasedimentary, volcanic, and crystalline basement rocks in the Santa Ana Mountains against the younger bedrock and alluvial deposits of the Santa Ana Valley sedimentary basin on the south.

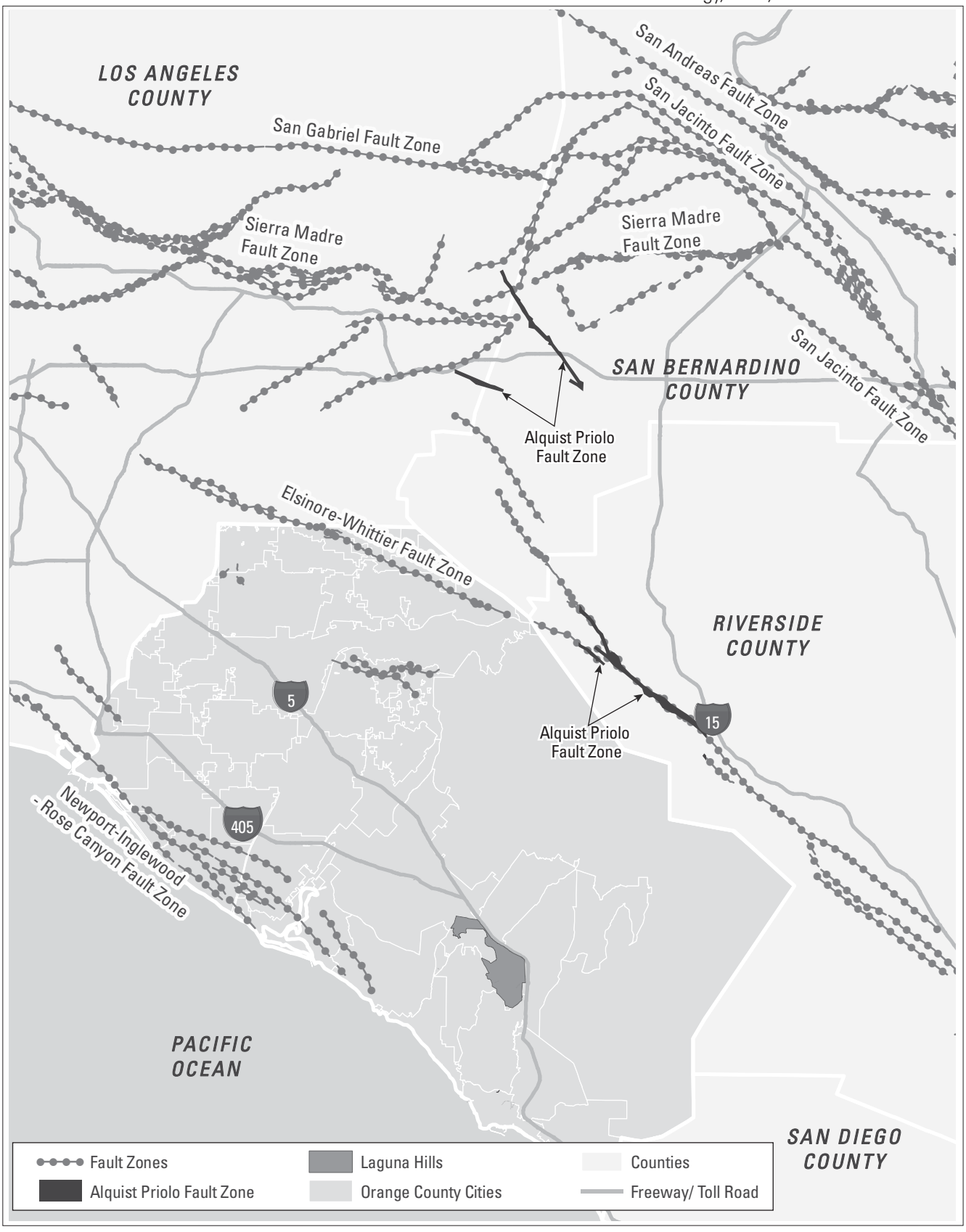
According to the geotechnical evaluation prepared for Laguna Hills, two faults have been documented to directly underlie the City, each having different potential impacts, and each having differing levels of information regarding their degree of activity and damage generating potential. An unnamed single, very short "young" fault has been mapped by the U.S. Geological Survey (USGS; Figure 5.6-1) at the west edge of the City, but it has not been deemed "active" by the California Geological Survey (CGS). In addition, a large earthquake on the San Joaquin Hills blind thrust beneath the City could cause general ground uplift and possibly some surface tilting, but this is not a likely event. No faults within or near the City have been placed within State of California established Alquist-Priolo Earthquake Fault Zones, which are subject to special land use controls and building standards.

Ground Shaking

Historically, earthquake shaking has affected the City in the past, with a few large, distant earthquakes occurring within the recent memories of many residents. Events centered some distance from the City (e.g., 1992 Landers/Big Bear and 1994 Northridge) were unsettling but caused relatively minor local disruptions within the planning area. Only one instrumentally recorded earthquake of greater than magnitude 6.0 has occurred near the planning area. The Long Beach earthquake occurred in 1933 on the Newport-Inglewood fault zone near Newport Beach. It is estimated that this earthquake caused a Modified Mercalli (MMI)[5] shaking intensity effect of between IV and VI, which is classified as very light damage.

General background seismicity is considered low for the southern portion of Orange County with earthquake activity concentrated on faults to the east (Elsinore), north (Whittier and Puente Hills), and west (Newport-Inglewood) (Wilson Geosciences, Inc. 2008). Table 5.6-1 lists the major known faults within a 50-mile radius of the planning area.

[5] The Modified Mercalli (MMI) intensity scale is a scale used for measuring the intensity of an earthquake. The scale quantifies the effects of an earthquake on the Earth's surface, humans, objects of nature, and man- made structures on a scale of I through XII, with I denoting a weak earthquake and XII one that causes almost complete destruction.



Source: Department of Conservation, California Geologic Survey, 2005

0 2 4 8 Miles

Figure 5.6-1
Fault Locations

Table 5.6-1
Major Faults within Approximately 50-mile Radius of Laguna Hills

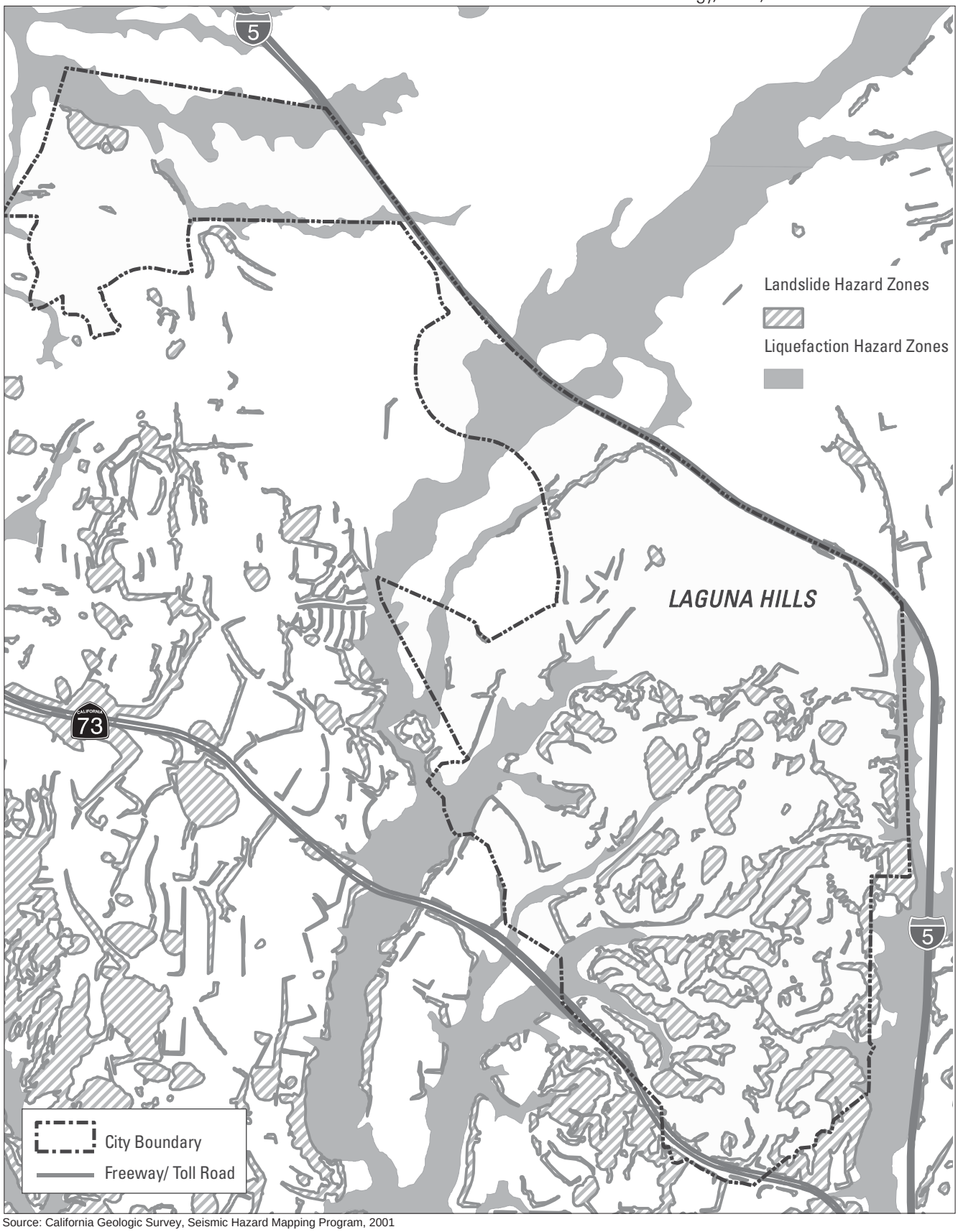
Fault Name	Approximate Distance from Laguna Hills*(miles)	Maximum Magnitude
San Joaquin Hills	0.0	6.6
Newport-Inglewood (Offshore)	8.8	7.1
Newport-Inglewood (L. A. Basin)	12.2	7.1
Chino-Central Avenue (Elsinore)	13.2	6.8
Elsinore (Glen Ivy)	15.3	7.5
Whittier	17.2	6.8
Elsinore (Temecula)	21.0	6.8
Palos Verdes	22.8	7.3
Puente Hills Blind Thrust	23.5	7.1
Coronado Bank	26.8	7.6
San Jose	31.0	6.4
Sierra Madre	35.3	7.2
Cucamonga	35.4	6.9
Rose Canyon	37.7	7.2
Upper Elysian Park Blind Thrust	38.6	6.4
San Jacinto (San Bernardino)	39.0	6.7
San Jacinto (San Jacinto Valley)	39.1	6.9
Raymond	41.3	6.5
Clamshell-Sawpit	42.4	6.5
Elsinore (Julian)	43.4	7.1
Verdugo-Eagle Rock	43.9	6.9
Hollywood	46.0	6.4
San Jacinto-Anza	46.5	7.2
San Andreas (Carrizo-Big Bend)	48.3	7.8

* Distance measured from Laguna Hills City Hall.
Source: Wilson Geosciences, Inc. 2008

Liquefaction

Liquefaction occurs when severe groundshaking leads to loss of shear strength of a soil, and is a function of soil type and groundwater. Soils that are poorly consolidated and combine with groundwater during an earthquake lose their shear strength and take on the properties of a heavy liquid. Liquefaction generally occurs within areas that have high ground water (less than 40 feet below the surface), loose sandy alluvial deposits (usually of recent age), and the potential for significant ground shaking. The CGS Seismic Hazard Zones maps delineate areas within the City and adjacent areas that are susceptible to liquefaction (Figure 5.6-2). Within the City and immediately adjacent areas of influence, there are several liquefaction areas identified. These areas generally correspond to the areas of shallow groundwater found in the following locations:

- The northern part of the City associated with the south branch of the San Diego Creek channel, the former drainage through Veeh Reservoir extending east along Ridge Route Drive;
- Aliso Creek (Laguna Hills Mall area) and tributaries to the south (including Alicia Parkway); and
- Recent alluvium extending along the western edge of I-5.



Source: California Geologic Survey, Seismic Hazard Mapping Program, 2001

0 0.25 0.5 1 Miles

Figure 5.6-2
Landslide and Liquefaction Hazard Zones

Earthquake-Induced Landslides

Earthquake-induced landslides and shallow surficial failures are possible in hillside terrain and on steep excavation slopes during large earthquakes. Landslides most typically consist of shallow failures involving surficial soils and the underlying highly weathered bedrock in moderate to steep terrain. In reports previously conducted for the City, such slope movement occurred under static conditions with substantial rainfall (Wilson Geosciences, Inc. 2008). Structures, engineered slopes, roadways, utilities, and the general population located on or below these hazard areas could be subject to severe damage or injury (Figure 5.6-2).

GEOLOGY AND SOILS

Soil Erosion

Erosion is a normal and inevitable geologic process whereby earth materials are loosened, worn away, decomposed or dissolved, and are removed from one place and transported to another location. Precipitation, running water, waves, and wind are all agents of erosion. Ordinarily, erosion proceeds so slowly as to be imperceptible, but when the natural equilibrium of the environment is changed, the rate of erosion can be greatly accelerated. This can create both aesthetic and engineering problems. Accelerated erosion within an urban area can cause damage by undermining structures; blocking storm sewers; and depositing silt, sand, or mud in roads and tunnels. Eroded materials are eventually deposited into our coastal waters where the carried silt remains suspended for some time, constituting a pollutant and altering the normal balance of plant and animal life.

Expansive and Collapsible Soils

Expansive soils are found associated with soils, alluvium, and bedrock formations that contain clay minerals susceptible to expansion under wetting conditions and contraction under drying conditions. Depending upon the type and amount of clay present in a geologic deposit, these volume changes (shrink and swell) can cause severe damage to slabs, foundations, and concrete flatwork. Due to the more granular (sandy) nature of the alluvium found in the planning area, it is less likely to have expansive clays. Expansive clays do occur in the soils covering the older alluvial deposits and all bedrock formations in the hillside areas and the upper reaches of canyons where colluvium is present.

Collapsible soils undergo a volume reduction when the pore spaces become saturated causing loss of grain-to-grain contact and possibly dissolving interstitial cement holding the grains apart. The weight of overlying structures can cause uniform or differential damage to foundations and walls. The most likely locations for collapsible soils are the current and predevelopment washes and drainage channels, particularly the Aliso and Oso Creek drainages.

Groundwater

The City of Laguna Hills does not overlie a named groundwater basin. The El Toro Water District (ETWD) serves the northern area of the City and there are alluvial deposits that likely contain free groundwater. However, the ETWD does not currently have a groundwater storage source (ETWD 2005). This is also true for the Moulton Niguel Water district (MNWD), which relies on imported water (MNWD 2007).

According to the geotechnical report, shallow groundwater was present in the following areas:

- In the northern part of the City along the south branch of San Diego Creek channel and along a former drainage passing through Veeh Reservoir then extending east roughly parallel to Ridge Route Drive;
- Aliso Creek and its secondary alluvial/colluvial filled drainages;
- Along the recent alluvial areas extending south from El Toro Reservoir in Mission Viejo to Oso Creek; and
- Oso Creek along the southeastern edge of the City along I-5.

MINERAL RESOURCES

Pursuant to the California Mining and Reclamation Act, the CGS designated areas within the southern and western portions of Laguna Hills as Mineral Resource Zone (MRZ) 1, and areas in the northern and eastern portions of the City as MRZ 3. The two mineral resource zones are defined as follows:

> MRZ 1: Areas where adequate information indicates that no significant mineral deposits are present, or where it has been determined that little likelihood exists for their presence.
>
> MRZ 3: Area containing mineral deposits of which the significance cannot be evaluated from the available data.

The California Surface Mining and Reclamation Act (SMARA) of 1975 does not require local governments to protect land designated as MRZ 1 (California Department of Conservation 2000). The remainder of the City is designated MRZ 3, indicating that the significance of mineral resources could not be evaluated from available data. The City is responsible for recognizing lands designated as MRZ 3 and, if significant aggregate resources are ultimately found, state policy favors conservation and development of those resources.

5.6.2 REGULATORY FRAMEWORK

Regulations exist at local, state, and federal levels that guide the development and enforcement of codes to adequately provide public services and facilities to City residents and businesses. These regulations include, but are not limited to the following.

USGS LANDSLIDE HAZARD IDENTIFICATION PROGRAM

The USGS in fulfillment of the requirements of Public Law 106-113 created the National Landslide Hazards Program to reduce long-term losses from landslide hazards by improving understanding of the causes of ground failure and suggesting mitigation strategies. The Federal Emergency Management Agency (FEMA) is the responsible agency for the long-term management of natural hazards.

ALQUIST-PRIOLO EARTHQUAKE FAULT ZONING ACT

The Alquist-Priolo Act (Public Resources Code Sections 2621–2630) was passed in 1972 to mitigate the hazard of surface faulting to structures designed for human occupancy. The main purpose of the law is to prevent the construction of buildings used for human occupancy on the surface trace of active faults. The law addresses only the hazard of surface fault rupture and is not directed toward other earthquake hazards. The Alquist-Priolo Act requires the State Geologist to establish regulatory zones known as "Earthquake Fault Zones" around the surface traces of active faults and to issue appropriate maps. The maps are distributed to all affected cities, counties, and state agencies for their use in planning efforts. Before a project can be permitted in a designated Alquist-Priolo Earthquake Fault Zone, cities and counties must

require a geologic investigation to demonstrate that proposed buildings would not be constructed across active faults. Laguna Hills is not located within an Alquist-Priolo Earthquake Fault Zone.

CALIFORNIA SURFACE MINING AND RECLAMATION ACT (SMARA)

SMARA requires that all cities address in their General Plans the significant aggregate resources classified by the State Geologist and designated by the State Mining and Geology Board. SMARA was enacted to promote conservation and protection of significant mineral deposits. The law also ensures that significant aggregate resources are recognized and considered before land use decisions are made that may compromise the availability of these resources.

NATURAL HAZARDS DISCLOSURE ACT

The Natural Hazards Disclosure Act (effective June 1, 1998), requires: "that sellers of real property and their agents provide prospective buyers with a 'Natural Hazard Disclosure Statement' when the property being sold lies within one or more state-mapped hazard areas, including a Seismic Hazard Zone." The Seismic Hazards Mapping Act of 1990 (SHMA) specifies two ways in which this disclosure can be made:

1. The Local Option Real Estate Transfer Disclosure Statement as provided in Section 1102.6a of the Civil Code.

2. The Natural Hazard Disclosure Statement as provided in Section 1103.2 of the Civil Code.

The Local Option Real Estate Disclosure Statement can be substituted for the Natural Hazards Disclosure Statement if it contains substantially the same information and substantially the same warning as the Natural Hazards Disclosure Statement. Both the Alquist-Priolo Act and the SHMA require that real estate agents, or sellers of real estate acting without an agent, disclose to prospective buyers that the property is located in an Alquist-Priolo Earthquake Fault Zone or Seismic Hazard Mapping Zone.

SEISMIC HAZARDS MAPPING ACT

SHMA (Public Resources Code Sections 2690–2699.6) addresses earthquake hazards from nonsurface fault rupture, including liquefaction and seismically induced landslides. SHMA established a mapping program for areas that have the potential for liquefaction, landslide, strong groundshaking, or other earthquake and geologic hazards. SHMA also specifies that the lead agency for a project may withhold development permits until geologic or soils investigations are conducted for specific sites and mitigation measures are incorporated into plans to reduce hazards associated with seismicity and unstable soils.

BUILDING CODES

Laguna Hills City Council adopted (municipal code Chapter 10-28.010) the California Building Code 2007 Edition (CBC) based on the 2006 International Building Code (IBC) as published by the International Code Council, together with other amendments provided in municipal code Chapter 10-28.030. As of January 1, 2008, all new residential, commercial, and light industrial construction is governed by the CBC. Due to the type, quality, and age of some of the city buildings, the 2001 State Historical Building Code (SHBC; is defined in CCR Part 8 of Title 24) applies to the strengthening of unreinforced historic structures, while the 1986 Unreinforced Masonry Law (Section 8875 et seq., of California's Government Code) applies to the identification, reporting, and retrofit of non-historic Unreinforced Masonry (URM) buildings.

The 2007 California Building Code (defined in CCR Part 2 of Title 24) includes additions to the previous building code that make it more stringent, in particular with regard to seismic and earthquake conditions

for critical structures such as essential facilities, public schools, and hospitals. The CBC, which is included in Title 24 of the California Administrative Code, is a compilation of three types of building standards from three different origins. International and national model code standards adopted into Title 24 apply to all occupancies in California except for modifications adopted by state agencies and local governing bodies. Facilities and structures such as power plants, freeways, emergency management centers (e.g., traffic management, 911 centers), and dams are regulated under criteria developed by various California and federal agencies.

5.6.3 THRESHOLDS FOR DETERMINING SIGNIFICANCE

Based on Appendix G of the CEQA Guidelines, a significant impact related to geology, soils, and mineral resources would occur if implementation of the General Plan would:

- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:
  - Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault. Refer to Division of Mines and Geology Special Publication 42;
  - Strong seismic ground shaking;
  - Seismic-related ground failure, including liquefaction;
  - Landslides;
- Result in substantial soil erosion or the loss of topsoil;
- Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on-site or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse;
- Be located on expansive soil, as defined in Table 18-1-B of the CBC, creating substantial risks to life or property;
- Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater; and
- Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state, or result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan.

5.6.4 ANALYSIS OF ENVIRONMENTAL IMPACTS

FAULTING AND SEISMICITY

Fault Rupture

The City of Laguna Hills is not located within a designated Alquist-Priolo fault zone. As discussed in Section 5.6.1, two faults have been documented to directly underlie the City. These active and potentially active faults are referred to as the San Joaquin Blind thrust, and an unnamed “young” fault at the west edge of the City. The San Joaquin Hills blind thrust (SJHBT) fault underlies the City and surrounding communities; the location and characteristics of this faults are less well known than for surface faults. If movement were to occur on a buried fault like SJHBT, the most likely results would be regional uplift.

In addition to the SJHBT, one short, nearly northeast-southwest-trending "young" fault segment has been mapped at the far western edge of the City, near the intersection of Moulton Parkway and Aliso Creek. No determination has been made by the state that this fault is either active or potentially active and the potential for surface fault rupture is unknown (Wilson Geosciences, Inc. 2008). A similarly young fault is mapped approximately 2,000 feet west of, and roughly parallel to the long dimension of, the City. These faults are unlikely to be capable of independently generating even a moderate-size earthquake. If fault movement were to occur on the "young" fault (this is conjecture), it would likely be in conjunction with a large earthquake on the SJHBT.

As a matter of practice, the City requires that all development activity comply with local and state building and seismic codes, as they apply to the type of structure proposed. Further, the General Plan's Safety Element contains policies and programs that recognize potential hazards and set forth actions the City would be required to undertake to minimize potential hazards due to fault rupture. These policies and programs require detailed site-specific geology, geotechnical, and earthquake engineering investigations and mitigation as prescribed by licensed professionals as part of the environmental development review process (see Mitigation Measure GS-1). Additionally, Mitigation Measure GS-2 requires the City to adopt and implement the most recent state seismic requirements for structural design of new development and redevelopment to minimize damage from earthquakes and other geologic activity. With implementation of Mitigation Measures GS-1 and GS-2 and compliance with state regulations regarding seismic construction techniques, impacts would be reduced to a level less than significant.

Ground Shaking

The potential earthquake events from the largest potential earthquakes for the SJHBT and the young unnamed fault discussed previously could result in moderate to heavy damage from very intense ground shaking (Wilson Geosciences, Inc. 2008). While this condition exists in all of southern California, widespread damage and loss of life in the event of a major seismic event could result in localized potentially significant impacts. This damage would be greater in areas where ground failure occurred due to liquefaction, or dynamic consolidation and ground subsidence.

As a matter of practice, the City requires that all development activity comply with local and state building and seismic codes, as they apply to the type of structure proposed. Further, the General Plan's Safety Element contains policies and programs that recognize potential hazards and set forth actions the City would be required to undertake to minimize potential hazards due to fault rupture. These policies and programs require detailed site-specific geology, geotechnical, and earthquake engineering investigations and mitigation as prescribed by licensed professionals as part of the environmental development review process (see Mitigation Measure GS-1). Additionally, Mitigation Measure GS-2 requires the City to adopt and implement the most recent state seismic requirements for structural design of new development and redevelopment to minimize damage from earthquakes and other geologic activity. With implementation of Mitigation Measures GS-1 and GS-2 and compliance with state regulations regarding seismic construction techniques, impacts would be reduced to a level less than significant.

Earthquake-Induced Ground Failure Including Liquefaction

Liquefaction areas shown in Figure 5.6-2 are considered to have potential land use constraints. Each type of liquefaction failure can cause damage to surface and subsurface structures, with the severity dependent upon the type and magnitude of failure, and the relative location of the structures. Liquefaction assessments must be made for all major projects and the depth and intensity of the study would vary dependent on location, type, and importance of the project. For planning purposes it is only possible to designate areas where the likelihood of these ground failures, as a group, is greatest. In addition, since liquefaction-induced lateral spread failures are more prevalent adjacent to topographic depressions or

valley areas that form unsupported slopes or "free faces," it is possible to conclude for Laguna Hills that slopes into San Diego Creek, Aliso Creek, and Oso Creek would be the most susceptible to a lateral spread landslide failure.

As a matter of practice, the City requires geologic and/or geotechnical studies for all proposed new development and redevelopment projects located in areas identified as being susceptible to landslides and liquefaction, and binding mitigation strategies must be adopted (see Mitigation Measure GS-3). Compliance with the recommendations set forth in site-specific geologic and/or geotechnical studies is made a condition of the site development permit for subsequent projects. With the continued compliance with City requirements for geotechnical studies, implementation of appropriate remediation and Mitigation Measure GS-3, impacts would be reduced to a level less than significant.

Earthquake-Induced Landslides

The Seismic Hazard Mapping Program delineates the approximate boundaries of areas susceptible to earthquake-induced landslides and other slope failures (e.g., rockfalls). Figure 5.6-2 shows the designated areas within the Laguna Hills planning area that are susceptible to earthquake-induced landslides or other slope failures. These areas include the extreme northwest corner of Laguna Hills on the hillside just south of Veeh Ranch Park; the area along the eastern slopes of Aliso Creek west of Paseo de Valencia; and primarily southeast of Alicia Parkway to I-5 (Wilson Geosciences, Inc. 2008). Areas are delineated where there was known earthquake-induced slope failure during historic earthquakes, landslide movement (including both landslide deposits and source areas), and where analysis from the CGS indicates ground slope and geologic materials are susceptible to earthquake-induced slope failure. The delineated areas are not necessarily unstable, but the maps provide an opportunity to consider these areas when planning for new development or redevelopment. Structures, roadways, utilities, and the general population located on or below these hazard areas could be subject to severe damage or injury.

As a matter of practice, the City requires geologic and/or geotechnical studies for all proposed new development and redevelopment projects located in areas identified as being susceptible to landslides and liquefaction, and binding mitigation strategies must be adopted (see Mitigation Measure GS-3). Compliance with the recommendations set forth in site-specific geologic and/or geotechnical studies is made a condition of the site development permit for subsequent projects. In addition, the City is required to continually monitor and remediate unstable slopes subject to landslides (see Mitigation Measure GS-4). With the continued compliance with City requirements for geotechnical studies, implementation of appropriate remediation and Mitigation Measures GS-3 and GS-4, impacts would be reduced to a level less than significant

GEOLOGY AND SOILS

Soil Erosion

The topography of Laguna Hills includes several hills and valleys and therefore has the potential to be susceptible to soil erosion. Development would be subject to local and state building codes and requirements for erosion control and grading. In addition, all new development and redevelopment projects would be required to comply with the City's Grading and Excavation Code. Further, new development and redevelopment project sites would also be required to be compliant with an NPDES permit and consequently the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP), which are further discussed in Section 5.8, Hydrology and Water Quality, of this Program EIR. With adherence to these codes and regulations, and implementation of the General Plan, impacts related to soil erosion would be less than significant.

Unstable Geology Units

Soil and slope instability under nonearthquake (static) conditions is considered a potentially significant hazard in the hillside terrain of the planning area. These areas are susceptible to landslides, mudslides, and debris flow and have been mapped by the CGS (Figure 5.6-2). However, they represent a small portion of landslides mapped within the City and surrounding areas. The most mapped landslides are found in the Sespe Formation in the northwest corner of the City; in the Monterey Formation between Alicia Parkway and Aliso Hills Drive; and within the Niguel and Capistrano siltstone formations scattered throughout the City south and east of La Paz Road (Wilson Geosciences, Inc. 2008).

Subsidence due to groundwater withdrawal is possible due to substantial pumping of groundwater aquifers; however, the City does not overlie a groundwater basin and there are no records of such subsidence occurring within the planning area (Wilson Geosciences, Inc. 2008). However, in areas where shallow groundwater is present, there is a possibility that liquefaction could occur. All of the areas of shallow groundwater are located within alluvial channels and creeks where unconfined groundwater exists at depths ranging from 5 to 20 feet. While these areas of unconfined shallow groundwater do exist within the planning area, the degree of hazard is generally low (Wilson Geosciences, Inc. 2008). Nevertheless, if development pursuant to the General Plan would be located in alluvial areas and would require deep excavation activities, individual impacts would be determined on case-by-case basis (see Mitigation Measure GS-5).

The City is required to continually monitor and remediate areas subject to hazards due to unstable geologic units. With the continued compliance with City requirements for geotechnical studies, implementation of appropriate remediation and Mitigation Measure GS-5, impacts would be reduced to a level less than significant.

Expansive and Collapsible Soils

Expansive soils are found in areas associated with soils, alluvium, and bedrock formations that contain clay minerals susceptible to expansion under wetting conditions and contraction under drying conditions. Depending upon the type and amount of clay present in a geologic deposit, these volume changes (shrink and swell) can cause severe damage to slabs, foundations, and concrete flatwork.

In the planning area, expansive clays occur in the soils covering the older alluvial deposits and all bedrock formations in the hillside areas and the upper reaches of canyons where colluvium is present. Collapsible soils undergo a volume reduction when the pore spaces become saturated causing loss of grain-to-grain contact and possibly dissolving interstitial cement holding the grains apart. The weight of overlying structures can cause uniform or differential damage to foundations and walls. The most likely locations for collapsible soils are the current and predevelopment washes and drainage channels, particularly those located near the Aliso Creek drainages within the planning area and near the Oso Creek drainages located just south of the planning area boundaries.

The City implements a number of existing codes and policies that serve to mitigate the impacts of development within areas containing expansive soils. Current codes and regulations relating to geology and soils are identified in the Laguna Hills Municipal Code, Title 10 – Buildings and Construction. These codes address grading, excavation, fills, and watercourses, as well as applicable geotechnical report preparation and submittal. Application of the existing regulations identified in the Municipal Code and Uniform Building Code and grading regulations would minimize the risk associated with any development proposed within areas containing expansive soils. Therefore, impacts associated with expansive and collapsible soils would be less than significant.

Septic Systems

Properties within the Laguna Hills planning area are currently served by a public sewage collection system maintained by the South Orange County Wastewater Authority (SOCWA) and carried by the MNWD and the ETWD and do not rely on septic systems. Because Laguna Hills is largely urbanized and built out, and has few remaining vacant sites in the city, the remaining capacity at the SOCWA Regional Treatment Plant wastewater treatment facility is sufficient to serve potential new development and redevelopment (MNWD 2007). Development proposals and amendments would be reviewed for consistency with sewer infrastructure requirements established in development plans and agreements. New development and redevelopment activities would be required to cooperate with the SOCWA, MNWD, and ETWD to ensure the adequacy of existing wastewater infrastructure to service the City. Therefore, the use of septic tanks or alternative wastewater disposal systems would not be required as part of the implementation of the General Plan, and no significant impacts would occur.

MINERAL RESOURCES

The City of Laguna Hills is essentially built out and there are no areas within the planning area used for extraction of any mineral resources. The City is not located within an area specifically identified by the California Department of Mines and Geology as having substantial mineral resources, as it has been identified with MRZ-1 and MRZ-3 mineral resource classifications. As described earlier, areas classified as MRZ-1 are areas where adequate information indicates that no significant mineral deposits are present or where little likelihood exists for their presence. Areas classified with a MRZ-3 designation indicate that mineral deposits have the potential to exist, but the likelihood of occurrence and the significance of the deposit are not known. In addition, no known mineral resource recovery sites of local importance are included in the General Plan, the UVSP, or any other specific land use plan associated with the planning area. Further, the General Plan contains policies and programs to ensure compliance with CEQA for the protection of mineral resources, if they should be discovered within the planning area. Given that no known mineral resources have been identified in the planning area and that the policies and programs included in the General Plan ensure the protection and preservation of mineral resources, impacts related to the loss of availability of a locally known mineral resource that would be of future value to the region and the residents of the state would be less than significant.

5.6.5 MITIGATION MEASURES

Implementation of the following programmatic mitigation measures, derived largely from the General Plan Implementation Program, will reduce potential impacts to a less than significant level at this Program EIR level of analysis. Individual development projects will be required to undergo project-specific environmental review and mitigation measures will be identified to reduce any significant impacts. Mitigation for significant environmental impacts of each future development project shall include the following: (1) objective of the measure; (2) specific standards or measures to be applied, along with any needed contingency measure; (3) responsible party; (4) location; (5) schedule for initiation; and (6) how the measure will reduce the associated environmental impact.

GS-1 The City shall reduce the risk to the community from hazards related to geologic conditions, seismic activity, flooding, and structural and wildfires by requiring feasible mitigation of such impacts on discretionary development projects by assessing development proposals for potential hazards pursuant to CEQA. The City shall require measures to mitigate all identified significant public safety hazards. **(Implementation Program S-2)**

GS-2 The City shall continually update development standards and adopt the latest building construction codes to guide future development and redevelopment in areas with known geologic and seismic-related hazards. **(Implementation Program S-4)**

GS-3 The City shall require geologic and/or geotechnical studies for proposed new development and redevelopment projects located in areas identified as susceptible to landslides and liquefaction, and binding mitigation strategies must be adopted. Compliance with the recommendations set forth in site-specific geologic and/or geotechnical studies will be made a condition of the site development permit for subsequent projects. In addition, the City may require applicants to incorporate measures to stabilize and maintain slopes on a site-by-site basis, such as, but not limited to, proper planting, irrigation, retaining walls, and benching. **(Implementation Program S-1)**

GS-4 The City shall continually monitor and encourage remediation of unstable slope areas, particularly in areas characterized by the presence of crib walls or where historical anecdotal evidence of instability exists. **(Implementation Program S-3)**

GS-5 The City shall require detailed groundwater studies in areas with known or suspected high groundwater levels that identify site-specific conditions. Where groundwater is identified as a potential site-specific hazard, construction approaches shall be incorporated into the design of projects to protect structures from the potential hazard, to the satisfaction of the City Engineer and Building Official.

5.6.6 IMPACT AFTER MITIGATION

FAULTING AND SEISMICITY

Implementation of Mitigation Measures GS-1, GS-2, and GS-3 would reduce impacts associated with faulting and seismicity to a level less than significant.

GEOLOGY AND SOILS

Implementation of Mitigation Measures GS-4 and GS-5 would reduce impacts associated with faulting and seismicity to a level less than significant.

MINERAL RESOURCES

Impacts associated with mineral resources would be less than significant without mitigation.

5.7 HAZARDS AND HAZARDOUS MATERIALS

This section describes the hazardous materials, wildland fire, and emergency planning conditions of the planning area and identifies potential environmental impacts to these conditions that may result from implementation of the General Plan.

5.7.1 ENVIRONMENTAL SETTING

HAZARDOUS MATERIALS

The Safety Element of the General Plan defines hazardous materials as any injurious substance, including pesticides, herbicides, toxic metal and chemicals, explosives, and nuclear fuels and materials. In addition, hazardous waste can be considered a hazardous material. Hazardous waste is a waste with properties that make it potentially dangerous or harmful to human health or the environment. The universe of hazardous wastes is large and diverse. Hazardous wastes can be liquids, solids, or contained gases. They can be the by-products of manufacturing processes, discarded used materials, or discarded unused commercial products such as cleaning fluids (solvents) or pesticides (City of Laguna Hills 2008).

Hazardous materials may be released through spilling, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment. The use of these hazardous materials is commonplace in commercial, industrial, and manufacturing activities, and many businesses within the planning area are permitted to handle and transport hazardous materials, such as dry cleaners and automotive businesses. USEPA and other federal, state, and county regulatory agencies closely monitor these businesses and the disposition of hazardous materials. Hazardous materials require special methods of disposal, storage, and treatment, and the release of hazardous materials requires an immediate response to protect human health and safety, and/or the environment. Improper disposal can harm the environment and people who work in the waste management industry.

California Government Code Section 65962.5 requires the California Environmental Protection Agency (Cal/EPA) to prepare an annual Hazardous Waste and Substances List, commonly referred to as the Cortese List. The list, or a site's presence on the list, has bearing on the local permitting process as well as on compliance with CEQA. Projects that occur on a Cortese List site are not eligible for categorical exemptions to CEQA. The Cortese List is not maintained as a centralized list. However, Cal/EPA has designated the following lists as components of the Cortese List:

- Department of Toxic Substances Control EnviroStor database
- State Water Resources Control Board's list of leaking underground storage tanks identified in GeoTracker database
- State Water Resources Control Board's list of solid waste disposal sites with waste constituents above hazardous waste levels outside the waste management unit
- State Water Resources Control Board list of active Cease and Desist Orders and Cleanup and Abatement Orders
- Department of Toxic Substances Control listing of hazardous waste facilities subject to corrective action pursuant to Section 25187.5 of the Health and Safety Code

Seven hazardous materials sites, as designated by the Cortese List, are located within the planning area (Table 5.7-1).

Table 5.7-1
Properties within the Planning Area on the Cortese List

Geotracker ID	Name	Address	Cleanup Status
T0605999120	Tosco - 76 #5646	25912 La Paz Road	Verification Monitoring
T0605905542	Laguna Hills Car Wash	24795 Alicia Parkway	Site Assessment
T0605900287	Shell #23971	23971 El Toro Road	Remediation
T0605900466	Wright Petroleum	23991 El Toro Road	Remediation
T0605902446	Mobil #18-826	25491 Alicia Parkway	Remediation
L10003421973	Greenwaste, Golden Rain Foundations	24401 Moulton Parkway	Not Available
SLT8R2344011	Valencia Shopping Center	24191 Paseo De Valencia	Not Available

Source: California Government Code Section 65962 ("Cortese List");
http://www.calepa.ca.gov/SiteCleanup/CorteseList/. Accessed November 21, 2008.

Typical producers of large quantities of hazardous waste, such as industrial uses, do not occur within the planning area at present. However, some commercial businesses that are small-quantity generators of hazardous waste do occur within the planning area. These businesses include automotive repair, gas stations, photograph processing, dry cleaners, printing companies, manufacturers, and educational facilities. Pursuant to federal law, all such generators must register with the USEPA for record-keeping and recording.

The Unified Program consolidates, coordinates, and makes consistent the administrative requirements, permits, inspections, and enforcement activities of six environmental and emergency response programs related to hazardous materials and hazardous waste. The state agencies responsible for these programs set the standards for their program while local governments implement the standards. Cal/EPA oversees the implementation of the program as a whole. The Unified Program is implemented at the local level by 84 government agencies certified by the Secretary of Cal/EPA. These Certified Unified Program Agencies (CUPAs) have typically been established as a function of a local environmental health or fire department.

The Orange County Environmental Health Division (OCEHD) was designated by the State Secretary for Environmental Protection on January 1, 1997, as the CUPA for the County of Orange. The CUPA is the local administrative agency that coordinates the following six programs regulating hazardous materials and hazardous wastes in Orange County:

- Hazardous Waste
- Underground Storage Tanks (USTs)
- Aboveground Storage Tanks (ASTs)
- Hazardous Materials Disclosure (HMD)
- Business Plan
- California Accidental Release Program (CalARP)

County and City Fire Agencies within Orange County have joined the CUPA, as Participating Agencies, to form a partnership with the County's Unified Program. In the City of Laguna Hills, OCEHD administers the Hazardous Waste, UST and AST programs while Orange County Fire Authority (OCFA) administers Hazardous Materials Disclosure, Business Plans, and the California Accidental Release Program.

The City maintains permitting requirements that parallel County requirements for businesses within Laguna Hills that handle, store, or generate hazardous waste. In addition, common household items such as medical waste (syringes), latex and oil-based paints, antifreeze, batteries, used motor oil, fertilizers,

pesticides, herbicides, and electronic waste such as used cell phones and computers are considered hazardous waste and cannot be disposed of along with other residential trash. In an effort to ensure that household hazardous wastes are collected and disposed of in a safe manner, the County of Orange Department of Waste and Recycling (Integrated Waste Management Department) administers a household hazardous waste collection program. Four permanent collection facilities are located throughout the County, with the nearest Household Hazardous Waste Collection Center located approximately 7 miles north of Laguna Hills in the City of Irvine.

I-5 and the San Joaquin Hills Transportation Corridor (SR-73) are major transportation arterials that border Laguna Hills and it is likely that hazardous materials are transported along these roadways, thus potentially exposing people to potential catastrophic events. Gas pipelines also exist along the railroad right-of-way that traverses the city. All motor carriers and drivers involved in the transportation of hazardous materials must comply with the requirements of federal and state regulations, and must apply for and obtain a hazardous materials transportation license from the California Highway Patrol. When transporting explosives, inhalation hazard, and highway route-controlled quantities of radioactive materials, safe routing and safe stopping-places are required. The driver is required to display warning placards or markings while hauling hazardous materials.

OCFA provides 24-hour emergency response services to hazardous materials incidents occurring throughout Orange County, including Laguna Hills. In addition, the Safety and Environmental Services Section (SESS) of OCFA is responsible for gathering and maintaining inventories of chemicals stored, handled, and used within Laguna Hills. Once identified, SESS is responsible for compiling this information into a database, which can be accessed through the "Community's Right to Know" program. This program responds to all requests from the public for hazardous materials information and disclosure. In addition, OCFA has developed a Hazardous Materials Area Plan addressing day-to-day hazardous material operations as well as extreme emergencies. The role of Laguna Hills in the event of a hazardous materials emergency is focused on discovery, notification evaluation, and initiation of immediate on-scene action.

AIRPORT HAZARDS

The planning area is not located within an airport land use plan or within the vicinity of a public or private airport; thus airport hazards are not discussed further in this Program EIR.

EMERGENCY PLANS

Laguna Hills updated its Emergency Operations Plan (EOP) in 2006 and has conducted training exercises with the Office of Homeland Security and the State Office of Emergency Services to ensure that the plan serves as an extension to, and is consistent with, the guidelines provided in the statewide Standardized Emergency Management System (SEMS). The EOP takes the "all hazards" approach and determines the actions that need to be taken by the City to (1) prevent disasters where possible; (2) reduce vulnerability of residents to any disasters that cannot be prevented; (3) respond effectively to actual occurrences of disasters; and (4) provide recovery in the aftermath of any emergency involving extensive damage or other debilitating influence on the normal pattern of life within the community. The EOP is not intended for day-to-day emergencies, but rather for disaster situations where normal resources are exhausted or nearly exhausted. The EOP becomes activated when a threat to lives and property is so great that the City needs to expand beyond normal day-to-day operations to meet the demands. While it is likely that outside assistance would be available in most large-scale disaster situations and plans have been created to facilitate the coordination of this mutual aid, the City is prepared to carry out disaster response and short-term recovery operations on an independent basis.

The federal Disaster Mitigation Act of 2000 provided a new set of mitigation plan requirements that emphasize that state and local jurisdictions must coordinate disaster mitigation planning and implementation. California's updated State Hazard Mitigation Plan was adopted on October 8, 2007, and approved by the Federal Emergency Management Agency (FEMA) Region IX on December 17, 2007. The City of Laguna Hills has not yet completed its hazard mitigation plan. The City will need to do so in order to receive funding from the state and federal government in the event of a natural disaster.

The San Onofre Nuclear Generating Station (SONGS) is located in San Diego County approximately 15 miles south of Laguna Hills. The U.S. Nuclear Regulatory Commission has identified the area surrounding SONGS, and every nuclear power facility, as an Emergency Planning Zone, and the State of California has defined the area outside and adjacent to the Emergency Planning Zone as a Public Education Zone. Laguna Hills is located outside of the Emergency Planning Zone but lies within the Public Education Zone. For areas located within this zone, the State of California and Southern California Edison have created education programs to ensure that residents are prepared for any potential problems associated with the facility.

WILDLAND FIRE HAZARDS

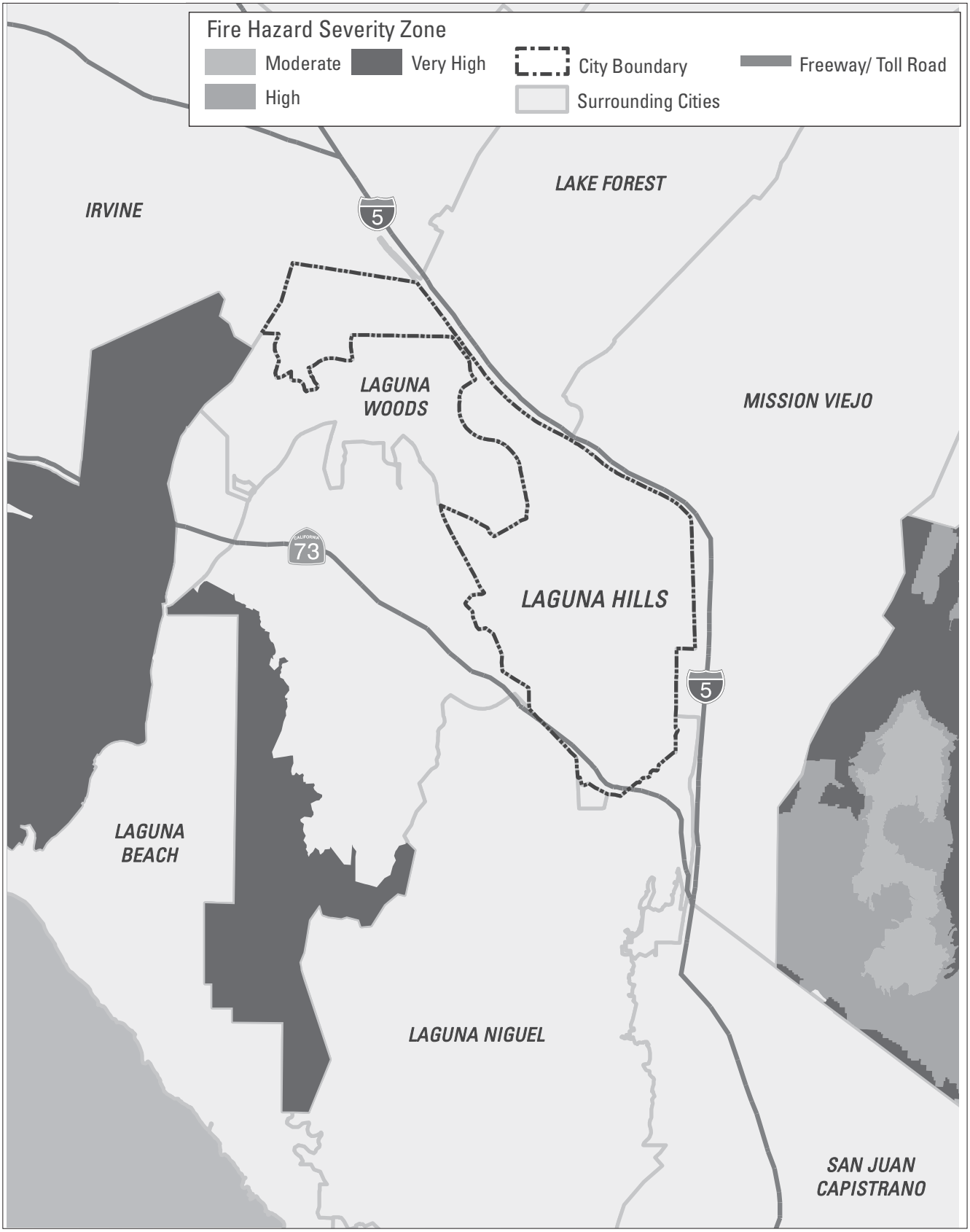
While major wildfires pose a significant risk in the large, open space areas in other parts of Orange County, the urbanized nature of Laguna Hills and adjacent cities significantly reduces the threat of large, catastrophic wildfires within the City. Nevertheless, wildland fire hazards do exist.

Public Resources Code 4201-4204 direct the California Department of Forestry and Fire Protection (CAL FIRE) to map fire hazard within State Responsibility Areas, based on relevant factors such as fuels, terrain, and weather. These statutes were passed after significant wildland/urban interface fires; consequently these hazards are described according to their potential for causing ignitions to buildings.

CAL FIRE adopted Fire Hazard Severity Zone maps for State Responsibility Areas in November 2007. CAL FIRE is currently in the process of creating maps for Very High Fire Hazard Severity Zones in Local Responsibility Areas. Until Recommended Maps are posted, Draft Maps used to develop recommendations for cities and unincorporated Local Responsibility Areas in the county remain available. The Draft Map for Laguna Hills indicates that Moderate, High, and Very High Hazard Severity Zones occur within the planning area. Specifically, Moderate, High, and Very High Hazard Severity Zones occur in northern portions of the planning area, and pockets of Moderate and High Hazard Severity Zones occur in central and southern portions of the planning area. Because the Draft Maps for Local Responsibility Areas have not been adopted by CAL FIRE, this Program EIR uses CAL FIRE adopted Fire Hazard Severity Zone maps for State Responsibility Areas to evaluate potential environmental impacts associated with wildland fire hazards. There are no areas of Laguna Hills that are located within designated mapped fire hazard zones according to the adopted Fire Hazard Severity Zone Map for State Responsibility Areas. However, this map designates areas to the west and southeast of the planning area as Very High Fire Hazard Severity Zone (Figure 5.7-1).

5.7.2 REGULATORY FRAMEWORK

Regulations have been enacted to prevent or mitigate damage to public health and safety and the environment from the release or threatened release of hazardous substances into the workplace or environment, and to protect human health and environmental resources from potential existing site contamination. These regulations include, but are not limited to the following.



Source: CalFire, 11/2007.

Figure 5.7-1
Fire Hazards

FEDERAL

Federal Disaster Mitigation Act of 2000

The Disaster Mitigation Act of 2000 provided a new set of mitigation plan requirements that emphasize state and local jurisdictions to coordinate disaster mitigation planning and implementation. States are encouraged to complete a "Standard" or an "Enhanced" Natural Mitigation Plan. "Enhanced" plans demonstrate increased coordination of mitigation activities at the state level, and if completed and approved, would increase the amount of funding through the Hazard Mitigation Grant Program. California's updated State Hazard Mitigation Plan was adopted on October 8, 2007, and approved by FEMA Region IX on December 17, 2007.

Resource Conservation and Recovery Act

The Resource Conservation and Recovery Act (RCRA) establishes a framework for national programs to achieve environmentally sound management of both hazardous and nonhazardous wastes. RCRA was designed to protect human health and the environment, reduce/eliminate the generation of hazardous waste, and conserve energy and natural resources. RCRA also promotes resource recovery techniques. The Hazardous and Solid Waste Amendments of 1984 (HSWA) both expanded the scope of RCRA and increased the level of detail in many of its provisions. The Hazardous Waste Management subchapter of the RCRA deals with a variety of issues regarding the management of hazardous materials, including the export of hazardous waste, state programs, inspections of hazardous waste disposal facilities, enforcement, and the identification and listing of hazardous waste.

Uniform Fire Code and Uniform Building Code

The Uniform Fire Code (UFC) is the primary means for authorizing and enforcing procedures and mechanisms to ensure the safe handling and storage of any substance that may pose a threat to public health and safety. The UFC regulates the use, handling, and storage requirements for hazardous materials at fixed facilities. The UFC and the Uniform Building Code (UBC) use a hazard classification system to determine what protective measures are required to protect fire and life safety. These measures may include construction standards, separations from property lines, and specialized equipment. To ensure that these safety measures are met, the UFC employs a permit system based on hazard classification.

Chemical Accident Prevention Provisions

The provisions listed under Part 68 of the Code of Federal Regulations (CFR) set forth the list of regulated substances and thresholds, the petition process for adding or deleting substances to the list of regulated substances, the requirements for owners or operators of stationary sources concerning the prevention of accidental releases, and the state accidental release prevention programs approved under Section 112(r). CalARP Program, described below, is the state adaptation of this federal regulation. The list of federally regulated substances and federally regulated flammable substances and their threshold quantities can be accessed online from the California Office of Emergency Services' website, http://www.oes.ca.gov.

Emergency Planning Community Right-to-Know Act

The Emergency Planning Community Right-to-Know Act (EPCRA) was included under the Superfund Amendments and Reauthorization Act of 1986 (SARA) and is commonly referred to as SARA Title III. EPCRA was passed in response to concerns regarding the environmental and safety hazards posed by the storage and handling of toxic chemicals. EPCRA establishes requirements for federal, state, and local governments; Indian tribes; and industry regarding emergency planning and "Community Right-to-

Know" reporting on hazardous and toxic chemicals. SARA Title III requires states and local emergency planning groups to develop community emergency response plans for protection from a list of extremely hazardous substances (40 CFR 355 Appendix A). The Community Right-to-Know provisions help increase the public's knowledge and access to information on chemicals at individual facilities, their uses, and releases into the environment. In California, SARA Title III is implemented through the CalARP.

Hazardous Materials Transportation Act

The transportation of hazardous materials is regulated by the Hazardous Materials Transportation Act (HMTA), which is administered by the Research and Special Programs Administration (RSPA) of the U.S. Department of Transportation (DOT). HMTA provides DOT with a broad mandate to regulate the transport of hazardous materials, with the purpose of adequately protecting the nation against risk to life and property, which is inherent in the commercial transportation of hazardous materials. The HMTA governs the safe transportation of hazardous materials by all modes, excluding bulk transportation by water. RSPA carries out these responsibilities by prescribing regulations and managing a user-funded grant program for planning and training grants for states and Indian tribes. DOT regulations that govern the transportation of hazardous materials are applicable to any person who transports, ships, causes to be transported or shipped, or who is involved in any way with the manufacture or testing of hazardous materials packaging or containers. DOT regulations pertaining to the actual movement govern every aspect of the movement, including packaging, handling, labeling, marking, placarding, operational standards, and highway routing. Additionally, DOT is responsible for developing curriculum to train for emergency response, and administers grants to states and Indian tribes for ensuring the proper training of emergency responders. HMTA was enacted in 1975 and was amended and reauthorized in 1990, 1994, and 2005.

U.S. Nuclear Regulatory Commission Emergency Planning Zones

The U.S. Nuclear Regulatory Commission has identified the area surrounding nuclear generating stations, such as SONGS, as Emergency Planning Zones. The federal government establishes the area with a 50-mile radius around every nuclear generating station as an Ingestion Pathway Zone. At SONGS, the Ingestion Pathway Zone encompasses all of Orange County.

STATE

California Emergency Services Act

The California Emergency Services Act provides the basic authority for conducting emergency operations following a proclamation of emergency by the governor and/or appropriate local authorities. Local government and district emergency plans are considered to be extensions of the California Emergency Plan, established in accordance with the Emergency Services Act.

California Fire Code

The California Fire Code and Office of the State Fire Marshall provide regulations and guidance for local agencies in the development and enforcement of fire safety standards. The California Fire Code also establishes minimum requirements that will provide a reasonable degree of safety from fire, panic, and explosion.

California Health and Safety Code, Hazardous Materials Release Response Plans and Inventory

CalARP is authorized by Chapter 6.95 of Division 20 of the California Health and Safety Code (H&SC). CalARP is designed to minimize the risk that extremely hazardous substances will cause immediate harm to the public and the environment. OCFA administers CalARP within the City of Laguna Hills. These regulations require businesses within Orange County to complete a chemical inventory form to disclose hazardous materials stored, used, or handled on-site. This disclosure information assists emergency responders in planning for and handling emergencies involving hazardous materials. The main program objective is to safeguard the lives of emergency responders and the public, and to minimize property loss.

The H&SC also requires a Business Emergency Plan (BEP). The intent of the BEP is to assist in mitigating a release or threatened release of a hazardous material, and to minimize any potential harm or damage to human health or the environment.

California Health and Safety Code, Hazardous Waste Control

The Hazardous Waste Control Act (HWCA) regulates the generation, treatment, storage, and disposal of hazardous waste. Hazardous waste is any material or substance that is discarded, relinquished, disposed of, or burned, or for which there is no intended use or reuse, and the material or substance causes or significantly contributes to an increase in mortality or illness; or the material or substance poses a substantial present or potential hazard to human health or the environment. These materials or substances include spent solvents and paints (oil and latex), used oil, used oil filters, used acids and corrosives, and unwanted or expired products (pesticides, aerosol cans, cleaners, etc.). If the original material or substance is labeled Danger, Warning, Toxic, Caution, Poison, Flammable, Corrosive or Reactive, the waste is very likely to be hazardous.

California Health and Safety Code, Underground Storage Tank Regulations

Chapter 6.7 of the H&SC outlines the requirements for USTs, identifies requirements for corrective actions, cleanup funds, liability, and the responsibilities of owners and operators of USTs.

California Human Health Screening Levels

The California Human Health Screening Levels (CHHSLs) are concentrations of 54 hazardous chemicals in soil or soil gas that the Cal/EPA considers to be below thresholds of concern for risks to human health. The CHHSLs were developed by the Office of Environmental Health Hazard Assessment (OEHHA) on behalf of Cal/EPA and are contained in their report entitled Human-Exposure-Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil. The thresholds of concern used to develop the CHHSLs are an excess lifetime cancer risk of one in a million (10-6) and a hazard quotient of 1.0 for noncancer health effects. The CHHSLs were developed using standard exposure assumptions and chemical toxicity values published by the USEPA and Cal/EPA. The CHHSLs can be used to screen sites for potential human health concerns where releases of hazardous chemicals to soils have occurred. Under most circumstances, the presence of a chemical in soil, soil gas, or indoor air at concentrations below the corresponding CHHSLs can be assumed to not pose a significant health risk to people who may live (residential CHHSLs) or work (commercial/industrial CHHSLs) at the site.

LOCAL

Orange County Fire Authority Hazardous Materials Area Plan

The OCFA Hazardous Materials Area Plan addresses normal day-to-day hazardous materials operations as well as extreme emergencies, in which coordination among a variety of emergency response agencies is required. Local government involvement in a hazardous materials emergency is principally focused on discovery, notification, evaluation, and initiation of immediate on-scene action, along with long-term preparedness measures, which are implemented in coordination with local businesses. The Area Plan provides guidance for all local government agencies within OCFA's jurisdiction, including Laguna Hills, in response to a hazardous materials emergency.

City of Laguna Hills Emergency Operations Plan

An Emergency Operations Plan developed by the City guides the training and execution of actions in preparation for or in response to significant disasters. Executive Order S-04-06 signed by the Governor of California directs the State Office of Emergency Services to provide models and resources for local agencies in the preparation of or execution of Emergency Management Plans. Additionally, the Orange County Sheriff's Department and Department of Environmental Health provide similar models and resources for local agencies.

Laguna Hills Hillside Development Ordinance

The Hillside Development Ordinance (Chapter 9-50 of the Laguna Hills Municipal Code) requires all planting on slopes of 15 percent or greater to be fire resistant. In addition, the City encourages ornamental nonnative fire retardant species in transition zones between developed areas and wildlands.

5.7.3 THRESHOLDS FOR DETERMINING SIGNIFICANCE

Based on Appendix G of the CEQA Guidelines, a significant impact related to hazards and hazardous materials would occur if implementation of the General Plan would:

- Create a significant hazard to the public and environment involving the production, use, or transport of hazardous waste and materials;
- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school;
- Be located on a site which is included on a list of hazardous materials sites compiled as a result of Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment;
- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan; or
- Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residents are intermixed with wildlands.

5.7.4 ANALYSIS OF ENVIRONMENTAL IMPACTS

HAZARDOUS MATERIALS

Typical hazard-generating land uses, such as industrial uses, are not anticipated to expand significantly under the General Plan. However, development of new commercial businesses is anticipated under the General Plan. Some commercial businesses are small-quantity generators of hazardous waste. These businesses would be subject to existing regulations and are not expected to produce a significant increase of hazardous waste within the planning area.

Because the planning area is almost entirely built out, most development anticipated under the General Plan will involve infill and/or redevelopment of existing uses. Accordingly, new development is expected to be minimal and is therefore not expected to substantially increase the amount of hazardous materials that would be used and/or transported within the planning area. Likewise, implementation of the General Plan is not expected to result in the accidental release of hazardous materials into the environment or the release of hazardous substances within one-quarter mile of a school.

The current regulatory environment provides a high level of protection from hazardous materials manufactured within, transported to, and stored at commercial, industrial, and educational facilities within the planning area. Under the General Plan, the City will continue to maintain permitting requirements that parallel County requirements for businesses within Laguna Hills that handle, store, or generate hazardous waste. The City will continue to enforce disclosure laws that require all users, producers, and transporters of hazardous materials and wastes to clearly identify the materials that they store, use, or transport, and to notify the appropriate city, county, state, and federal agencies in the event of a violation. By recognizing these hazards and ensuring that an educated public can work with City officials to minimize risks associated with hazardous materials in the urban environment, Laguna Hills can maintain safe conditions.

In accordance with federal, state, and local requirements and regulations, any new development facilitated by the General Plan that involves contaminated property, such as those properties listed on the Cortese List, will involve the cleanup and/or remediation of the property. No construction will occur at such locations until a "no further action" or similar determination is issued by the OCFA, the State Department of Toxic Substances Control, the RWQCB, and/or other responsible agencies.

All new development projects will be required to meet existing regulations, including permitting requirements and disclosure laws. With adherence to existing regulations and plans, impacts associated with hazardous materials would be reduced to a level less than significant. No mitigation is required.

EMERGENCY PLANS

Because the planning area is almost entirely built out, most development anticipated under the General Plan will involve infill and/or redevelopment of existing uses. Accordingly, new development is expected to be minimal and is therefore not expected to impair implementation of, or physically interfere with, the Laguna Hills EOP. As a matter of practice, the City implements the EOP according to requirements and provisions of the State Emergency Management System and National Incident Management System. The EOP requires continued review and update during the preparedness phase of emergency management. Although new development would be expected to have minimal impacts on the implementation and execution of the EOP, it would be reviewed and updated to respond to changing conditions within the planning area over the course of General Plan implementation. With adherence to existing regulations and plans, impacts associated with emergency plans would be reduced to a level less than significant. No mitigation is required.

WILDLAND FIRE HAZARDS

The urbanized nature of Laguna Hills and the adjacent areas significantly reduces the threat of large, catastrophic wildfires within the City. Because the planning area is almost entirely built out, most development anticipated under the General Plan will involve infill and/or redevelopment of existing uses. Accordingly, new development is expected to be limited to urban areas and will not involve expansion of urban uses onto lands located within or adjacent to wildland fire hazards areas.

As a matter of practice, the City conducts discretionary review and CEQA review of all projects and requires mitigation for any potential wildland fire hazard impacts. With adherence to existing policies and regulations, impacts associated with wildland fire hazards would be reduced to a level less than significant. No mitigation is required.

5.7.5 MITIGATION MEASURES

Impacts associated with hazardous materials, wildland fire hazards, and emergency planning conditions will be less than significant. No mitigation is required.

5.7.6 IMPACT AFTER MITIGATION

HAZARDOUS MATERIALS

Implementation of the General Plan is not expected to result in significant impacts associated with hazardous materials. Impacts would be less than significant without mitigation.

EMERGENCY PLANS

Implementation of the General Plan is not expected to result in significant impacts associated with emergency plans. Impacts would be less than significant without mitigation.

WILDLAND FIRE HAZARDS

Implementation of the General Plan is not expected to result in significant impacts associated with wildland fire hazards. Impacts would be less than significant without mitigation.

This page intentionally left blank.

5.8 HYDROLOGY AND WATER QUALITY

5.8.1 ENVIRONMENTAL SETTING

HYDROLOGY

A watershed is the land area that drains into a particular watercourse or body of water. The City of Laguna Hills encompasses parts of three watersheds, which are shown in Figure 5.8-1. The majority of the City lies within the Aliso Creek watershed, which drains to Aliso Creek; a small portion of the southern part of the city is in the San Juan Creek watershed, which flows into San Juan Creek; and a small region of the northern part of the City is in the San Diego Creek watershed, which drains to San Diego Creek.

The Aliso Creek watershed covers 30.4 square miles, draining a long, narrow coastal canyon with headwaters in the Santa Ana Mountains inside the boundaries of the Cleveland National Forest. Smaller tributaries include Wood Canyon, Sulphur Creek, the Aliso Hills Channel, and the English Channel. The creek ultimately discharges into the Pacific Ocean at Aliso Beach.

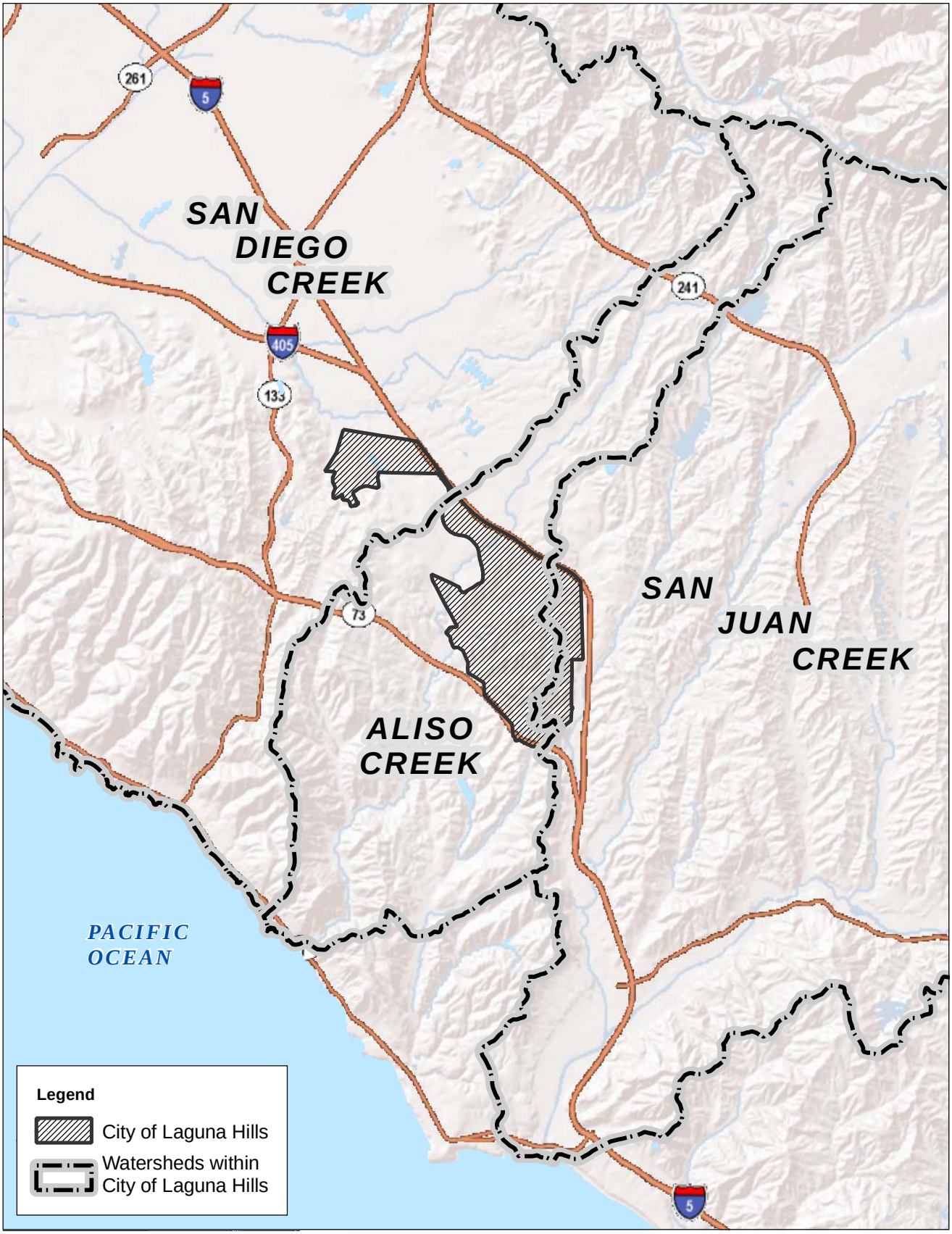
The Aliso Creek watershed is largely developed and includes portions of the cities of Aliso Viejo, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, and Mission Viejo. Undeveloped portions include the Cleveland National Forest in the upper watershed and the Aliso Wood Canyon Regional Park in the lower watershed. Major transportation arteries through the watershed include the San Joaquin Hills Transportation Corridor and I-5.

Aliso Creek has been identified as an "impaired" stream for water quality problems by the RWQCB; moreover, Aliso Creek drains into a marine protected area. Watershed studies have been underway for several years. The U.S. Army Corps of Engineers Reconnaissance Study noted substantial issues with channel degradation and geotechnical instability, loss of natural habitat and recreation opportunities, and flooding. Most of the water quality impairments are a result of urban runoff. Residential and commercial use of fertilizers and pesticides, and pet and waterfowl waste are most likely the primary contributors to the nutrient and potential stormwater toxic impacts and elevated bacteria load.

The San Juan Creek watershed is a broad, fan-shaped, fairly steep watershed, with much of its headwaters in the Cleveland National Forest, and other public lands. The watershed covers 133.9 square miles and includes portions of the cities of Dana Point, Laguna Hills, Laguna Niguel, Mission Viejo, Rancho Santa Margarita, San Juan Capistrano, and unincorporated areas within Orange County. Its main tributary, San Juan Creek, originates in the Santa Ana Mountains district of the Cleveland National Forest in the easternmost part of Orange County. The Arroyo Trabuco and Oso Creek are smaller tributaries. The creek discharges into the Pacific Ocean at Doheny State Park Beach. Offshore are two marine protected areas, Doheny State Marine Park and Doheny State Marine Conservation Area.

Doheny State Park Beach frequently exceeds state recreational water quality standards for bacteria. Currently, no major point source dischargers of pollutants to the creeks of the watershed have been clearly identified. Water quality problems in the watershed are believed to be primarily due to nonpoint source runoff from urbanized areas. There is also a significant, and as yet not completely defined, contribution of bacteria from birds and other wildlife sources outside of the developed areas.

The San Juan Creek watershed and the Aliso Creek watershed fall within the jurisdiction of RWQCB Region 9.



Source: Orange County Watersheds Program

0 0.5 1 2 3 Miles

Figure 5.8-1
Hydrology

The San Diego Creek watershed covers 112.2 square miles in central Orange County. It includes portions of the cities of Laguna Hills, Costa Mesa, Irvine, Laguna Woods, Lake Forest, Newport Beach, Orange, Santa Ana, and Tustin. Its main tributary, San Diego Creek, drains into Upper Newport Bay. Smaller tributaries include Serrano Creek, Borrego Canyon Wash, Agua Chinon Wash, Bee Canyon Wash, Peters Canyon Wash, Sand Canyon Wash, Bonita Canyon Creek, and the Santa Ana Delhi Channel. The San Diego Creek watershed falls within the jurisdiction of RWQCB Region 8. The RWQCB has issued a Total Maximum Daily Load (TMDL) for San Diego Creek.

Both Reaches of San Diego Creek and Upper and Lower Newport Bay have been listed, pursuant to Clean Water Act Section 303(d), as impaired by various pollutants, and the following existing and anticipated TMDLs have been adopted:

Siltation (sediments) and nutrients for Lower Newport Bay, Upper Newport Bay, San Diego Creek Reach 1, and San Diego Creek Reach 2.

A fecal coliform TMDL (pathogens) has been adopted for Lower Newport Bay and Upper Newport Bay. A diazinon/chlorpyrifos pesticide TMDL has been adopted for Upper Newport Bay and San Diego Creek Reach 1.

TMDLs for toxic pollutants, including selenium, were promulgated by the U.S. Environmental Protection Agency in June 2002. Future TMDLs are anticipated for selenium and metals (Lower and Upper Newport Bay), selenium and fecal coliform (San Diego Creek Reach 1), and specified metals (san Diego Creek Reach 2). TMDLs for organochlorine compounds (particularly DDT, chlordane, and PCBs) is anticipated for all four of these water bodies (as well as Newport Bay's Rhine Channel), with toxaphene also targeted in San Diego Creek Reaches 1 and 2.

San Diego Creek also has established water quality objectives. The surface water objectives for San Diego Creek Reach 1 are 1,500 mg/l for total dissolved solids (TDS), 13 mg/l for total inorganic nitrogen (TIN), and 90 mg/l chemical oxygen demand (COD). The surface water objectives for San Diego Creek Reach 2 are 720 mg/l for TDS and 5 mg/l for TIN.

Table 5.8-1 illustrates the beneficial uses of watersheds in the Laguna Hills region.

Table 5.8-1
Beneficial Uses of Watersheds in the Laguna Hills Region

Watershed	GWR	REC1	REC2	AGR	WARM	WILD	IND	COLD
Aliso Creek	●	○	●	●	●	●		
San Juan Creek		●	●	●	●	●	●	●
San Diego Creek ~~(1)~~ Reach 1 below Jeffrey Road		●*	●		●	●		
San Diego Creek Reach 2 above Jeffrey Road	○	○	○		○	○		

NOTES:

~~(1) Reach below Jeffrey Rd.~~

(~~2~~1) Beneficial uses for tributaries in the San Diego Creek area are intermittent for GWR, REC1, REC2, WARM, and WILD.

(~~3~~2) Beneficial uses for the mouth of the Aliso Creek include REC1, REC2, WILD, RARE, and MAR.

(~~4~~3) Beneficial uses for the mouth of the San Juan Creek include REC1, REC2, WILD, RARE, MAR, SHELL, and MIGR.

(~~5~~4) ● = existing beneficial use
○ = potential beneficial use
* = Access prohibited in all or part by Orange County Resources Development and Management Division

LEGEND:

GWR = Groundwater	IND = industrial service supply
REC1 = contact recreation	COLD = cold freshwater habitat
REC2 = non-contact recreation	RARE = rare, threatened, or endangered species
AGR = agricultural supply	MAR = marine habitat
WARM = warm freshwater habitat	SHELL = shellfish harvesting
WILD = wildlife habitat	MIGR = migration of aquatic organisms

WATER SUPPLY

Laguna Hills obtains water and wastewater services from the Moulton Niguel Water District (MNWD) and the El Toro Water District (ETWD). These services are provided in the northern portion of the City by the ETWD and in the southern portion of the City by the MNWD. The division line runs through a neighborhood north of Alicia Parkway and south of Aliso Creek. Water from both districts comes from the Colorado River and the State Water Project (which draws water from the San Francisco-San Joaquin Bay Delta) and travels hundreds of miles to the local water districts through an intricate underground delivery system operated by the Metropolitan Water District of Southern California.

GROUNDWATER

The City of Laguna Hills ~~does not overlie a named groundwater basin~~overlaps portions of the Irvine Groundwater Management~~.~~ Zone (GMZ). Beneficial uses on this zone include Municipal Supply (MUN), AGR, IND, and Industrial Process Supply (PROC). The water quality objectives of the GMZ include 910 mg/l TDS and 5.9 mg/l for nitrate-nitrogen (NO3-N).

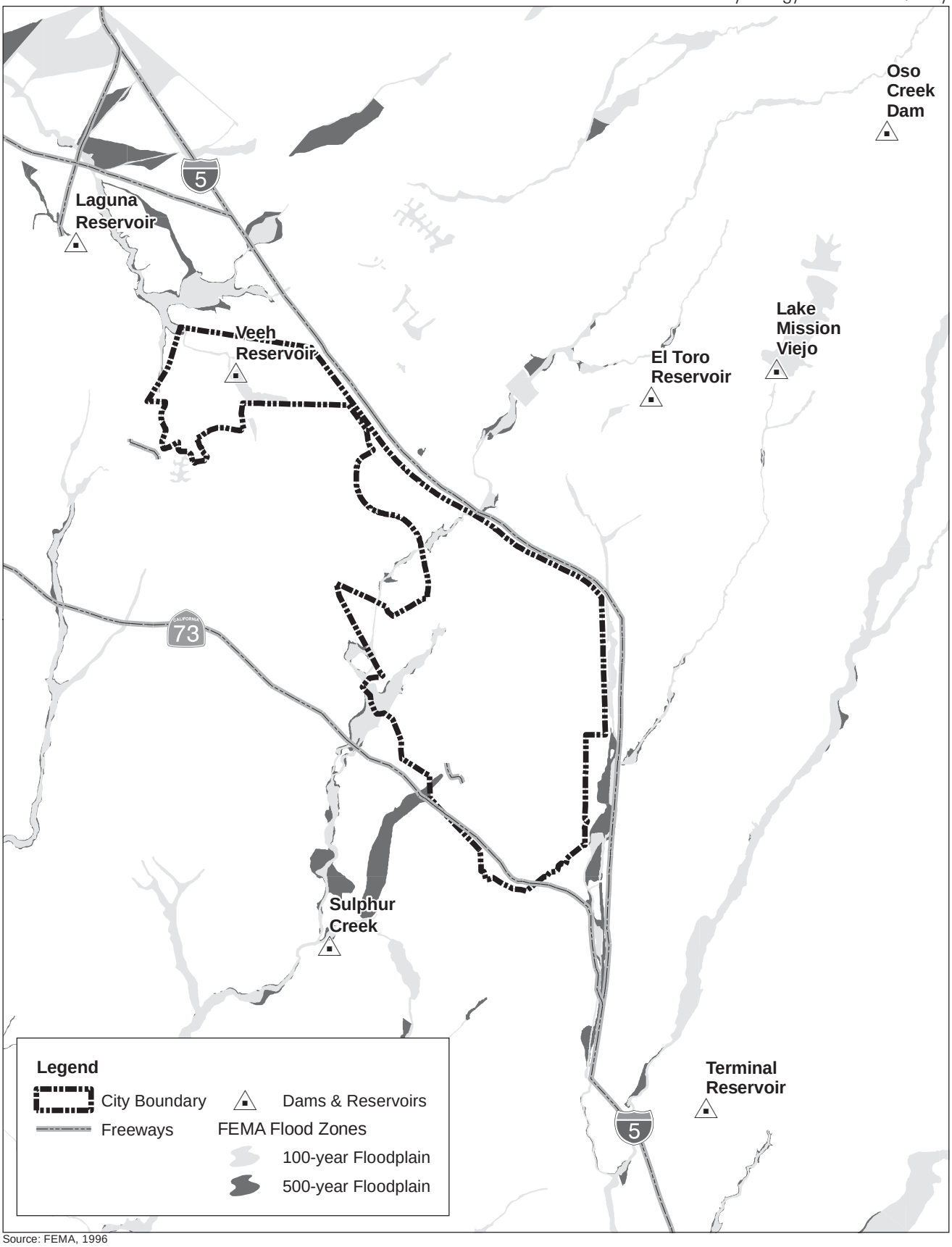
~~-~~Both water districts that serve the city obtain imported water from the Colorado River and the State Water Project.

Shallow groundwater is characterized as an area where the water table is within 20 to 30 feet of the ground surface at any time during the year. The shallowest water levels are found in Sulphur Creek (and its main tributary), Aliso Creek, and Oso Creek, where groundwater is estimated to be approximately 5 to 10 feet deep. At these depths, water can interfere with construction of structures such as underground parking (subsurface excavations) and deep foundations (pile driving). Additionally, some shallow perched water may be encountered within the more southerly portions of Laguna Hills. In the remaining creeks, the levels are expected to be closer to 20 feet deep.

Very general groundwater studies indicate that, historically, highest groundwater levels (shallowest depths) are found in the creek/canyon areas and range from about 5 feet to less than 20 feet in the City. Shallow groundwater was present (a) in the northern part of the City along the south branch of the San Diego Creek Channel and along a former drainage passing through Veeh Reservoir then extending east roughly parallel to Ridge Route Drive, (b) Aliso Creek and its secondary alluvial/colluvial filled drainages, (c) along the recent alluvial areas extending south from El Toro Reservoir in Mission Viejo to Oso Creek, and (d) Oso Creek adjacent to the southeastern edge of the City along I-5.

FLOOD CONTROL AND STORMWATER DRAINAGE

Some areas of Laguna Hills are determined to be within a FEMA-designated flood zone; therefore, the City participates in the Federal Flood Insurance Study to determine the mandatory insurance necessary for identified properties. As shown on Federal Insurance Rate Maps (FIRMs), areas within the 100-year floodplain are identified around Aliso Creek, Veeh Reservoir, Mill Creek, and in a zone northwest of Alicia Parkway in the southern portion of the City (Figure 5.8-2). Additional zones in the periphery of these flood areas may pose a flood risk, but since they are outside the designated 1 percent annual chance



Source: FEMA, 1996

0 0.4 0.8 1.6 2.4 Miles

Figure 5.8-2
Flood Zones

floodplain, they do not require additional flood insurance. Lower risk areas are also located along the La Paz Channel on the eastern border of Laguna Hills, and along North Sulfur Creek around Moulton Parkway.

The City and Orange County Flood Control Division (OCFCD) maintain an extensive storm drain system, including storm drains, creek channels, retaining basins, dams, and other measures, that would normally divert any excessive rainfall into appropriate channels. However, a significant rain event could cause flooding in the zones identified above, or minor, localized flooding elsewhere in the City. The City coordinates with the OCFCD to maintain the necessary flood control and stormwater management. Major natural drainages serving the City include Aliso Creek, with flows parallel to Alicia Parkway providing drainage from I-5 to the Pacific Ocean, and Oso Creek, located at and just beyond the eastern boundary of the City.

Most of the City does not lie downstream from any dams or major levees, so there is little risk of inundation due to structural failures. However, strong seismic events could result in impacts to a residential area surrounding Veeh Reservoir in the northwestern area of the City. The City coordinates with the OCFCD to maintain the necessary flood control and stormwater management facilities.

5.8.2 REGULATORY FRAMEWORK

Regulations exist at local, state, and federal levels that guide the development and enforcement of codes to adequately provide public services and facilities to City residents and businesses. These regulations include, but are not limited to, Clean Water Act, Porter-Cologne Water Quality Act, Orange County Drainage Area Management Plan, applicable watershed management plans, and applicable local ordinances. Regulations regarding flooding are also discussed in Section 5.6, Geology, Soils, and Mineral Resources.

CLEAN WATER ACT (33 U.S.C. §1251 ET SEQ. [1972])

The Clean Water Act (CWA) establishes the basic structure for regulating discharges of pollutants into the "waters of the U.S." and regulating quality standards for surface waters. The basis of the CWA was enacted in 1948 and was called the Federal Water Pollution Control Act, but the Act was significantly reorganized and expanded in 1972. "Clean Water Act" became the Act's common name with amendments in 1977.

Under the CWA, the USEPA has implemented pollution control programs such as setting wastewater discharge standards for industry. The USEPA has also set water quality standards for contaminants in surface waters.

The CWA made it unlawful to discharge any pollutant from a point source into navigable waters, unless a permit was obtained. The USEPA's National Pollutant Discharge Elimination System (NPDES) permit program controls both point source and nonpoint source discharges. Point sources are discrete conveyances such as pipes or man-made ditches. Nonpoint source pollution is water pollution affecting a water body from diffuse sources. According to the USEPA, nonpoint source pollution is the leading cause of water pollution in the United States today.

NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES)

The USEPA has authorized the State of California to administer its NPDES permitting program. The NPDES permitting program prohibits the unauthorized discharge of pollutants from a point source (pipe, ditch, well, etc.) to U.S. waters. The permitting program addresses municipal, commercial, and industrial

wastewater discharges and discharges from large animal feeding operations. Permittees must verify compliance with permit requirements by monitoring their effluent, maintaining records, and filing periodic reports. The program is administered at the local level by the RWQCBs. NPDES permits pertinent to the City of Laguna Hills include the State of California General Industrial Permit, the State of California Construction General Permit, and the Municipal Separate Storm Sewer System (MS4) permit.

Where groundwater dewatering is necessary for projects that discharge into storm drains and natural drainages of the San Diego Creek watershed, these discharges require coverage under Order No. R8-004-0021 (amended by R8-2006-0065), NPDES No. CAG998002, "General Waste Discharge Requirements for Short-Term Groundwater-Related Discharges and De Minimus Wastewater Discharges to Surface Waters Within the San Diego Creek /Newport Bay Watershed." This general permit establishes a waste discharge management program applicable to the project area, for the purpose of reducing selenium, sediment, nutrients, and other pollutants to Upper Newport Bay.

ORANGE COUNTY DRAINAGE AREA MANAGEMENT PLAN

The RWQCB issued an MS4 permit naming the OCFCD and all associated cities in Orange County as co-permittees. The Orange County Drainage Area Management Plan (DAMP) is the co-permittees' primary policy, planning, and implementation document for municipal NPDES stormwater permit compliance. The DAMP describes specific water pollution control elements that permittees will implement. This permit, as well as associated implementation plans, is updated on a routine basis. The 2003 DAMP describes the agreements, structures and programs that require BMPs at industrial, commercial, residential development, and construction sites; educate the public about urban stormwater pollution issues; provide for an illegal discharge/illicit connection program; and other stormwater management requirements. Co-permittees must prepare Local Implementation Plans (LIPs); watersheds must prepare Watershed Action Plans (WAPs).

5.8.3 THRESHOLDS FOR DETERMINING SIGNIFICANCE

Based on Appendix G of the CEQA Guidelines, a significant impact related to hydrology and water quality would occur if implementation of the General Plan would:

- Violate any water quality standards or waste discharge requirements;
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted);
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site;
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;
- Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;
- Otherwise substantially degrade water quality;
- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map;

- Place within a 100-year flood hazard area structures which would impede or redirect flood flows;
- Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam; or
- Inundation by seiche, tsunami, or mudflow.

5.8.4 ANALYSIS OF ENVIRONMENTAL IMPACTS

HYDROLOGY

Implementation of the General Plan will not involve the alteration of existing streams or rivers. However, the most prominent concern affecting water quality for Laguna Hills is stormwater runoff. Stormwater runoff is one of the most common sources of water pollution. Generally speaking, future development will likely convert vegetation and topsoil into impervious surfaces such as buildings, roads, sidewalks, and parking lots. Runoff generated by rainfall events that otherwise would have been absorbed by groundcover or soil would flow into the stormwater system.

Areas with high percentages of impervious surfaces may contain significant contaminants such as trash, litter, silt, automotive chemicals, fertilizers, animal wastes, and others that could flow directly into storm sewers that send the runoff into local streams. Construction-related activities could contribute additional pollutants, including sediments from grading activities; contaminants associated with construction materials, vehicles, and equipment; and erosion. Since storm drains are designed to carry only stormwater, these drains typically are not equipped with filters or cleaning systems and, consequently, deliver polluted urban runoff directly into local flood control channels and the ocean. Many of the pollutants found in this runoff are toxic to marine life; watersheds associated with the City of Laguna Hills drain to marine protected areas.

Because the City of Laguna Hills is currently mostly built out, most development and redevelopment will occur in areas that are currently developed with impervious surfaces. Therefore, the overall increase in impervious surfaces will be slight. Although construction activities and development have the potential to violate water quality standards and waste discharge requirements, implementation of the General Plan likely would not result in such violations because of the small quantity of land that remains undeveloped. BMPs are also required to be implemented that would reduce potential impacts to a level of insignificance.

As required under the Orange County NPDES Stormwater Discharge Permit, which the City was grandfathered into after incorporation in 1991, Laguna Hills is required to develop and implement BMPs to control the discharge of pollutants. These BMPs would be required of all new development and redevelopment projects both during and after construction. These BMPs consist of both structural and nonstructural measures, including retention basins, first flush diversion devices, porous pavements, public education, street sweeping, and neighborhood toxic waste collection plans.

In addition, the City encourages the incorporation and use of Low Impact Development (LID) standards in the design of new development and redevelopment as it occurs in Laguna Hills. LID is a stormwater management and land development strategy applied at the parcel scale that emphasizes conservation and use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely mimic predevelopment, or natural hydrologic functions. LID aims to decrease stormwater runoff by treating it at the source and can include actions such as minimizing paved areas and soil compaction, preserving natural open spaces, locating open space areas to absorb overflows, directing runoff to natural and landscaped areas and filtration devices, and harvesting or reusing rain water as an irrigation source.

Examples of LID design techniques include green rooftop systems, vegetated buffer strips, vegetated swales, and rooftop rainwater collection systems.

The incorporation of one or more of these LID design techniques results in a decrease of impervious (paved) materials and an increase of permeable materials and water infiltration, ultimately decreasing stormwater runoff and reducing water pollution. The City will continue to implement the required BMPs in accordance with the NPDES Stormwater Discharge Permit as well as encourage the use of natural drainage solutions and LID standards, such as vegetated swales and stormwater cascades to slow flows and filter out contaminants. Thus, a less than significant impact associated with water quality, drainage, or runoff will occur, and no mitigation is required.

GROUNDWATER RESOURCES

Development associated with the General Plan does not have the potential to convert existing groundwater recharge areas to urban uses. As previously stated, the City of Laguna Hills does not overlie a named groundwater basin. Both water districts that serve the city obtain imported water from the Colorado River and the State Water Project (which draws water from the San Francisco-San Joaquin Bay Delta). Therefore, implementation of the General Plan will have less than significant impacts on groundwater resources, with no mitigation required.

FLOODING

As shown in Figure 5.8-2, areas within the 100-year floodplain are identified around Aliso Creek, Veeh Reservoir, Mill Creek, and in a zone northwest of Alicia Parkway in the southern portion of the City. Additional zones in the periphery of these flood areas may pose a flood risk, but since they are outside the 100-year floodplain they do not require additional flood insurance. Lower risk areas are also located along the La Paz Channel on the eastern border of Laguna Hills, and along Sulphur Creek around Moulton Parkway.

Development within Laguna Hills has been planned and constructed in conformance with the National Flood Insurance Program, and the existing flood control and stormwater drainage systems have both been designed and created to accommodate the anticipated growth and future land development within Laguna Hills. The City intends to optimize the existing system and maintain the community's drainage features in their natural condition. In an effort to achieve this, the City will also work closely with the OCFCD to construct and maintain flood control facilities for the community. In addition, the City requires adequate flood control facilities to protect all structures and major roadways from hazards associated with being near a 100-year floodplain and will require new development and redevelopment to be located to either avoid flood hazards or incorporate them into the overall design. The City will also encourage the use of LID standards to reduce the amount of stormwater runoff and pollution.

Additional flood prevention methods such as utilization of natural drainages as detention basins and onsite storm water drainage will be required of developers to reduce runoff into the City's drainage facilities and to provide adequate drainage for new developments. To minimize runoff, the City will promote developments that incorporate permeable surfaces within site design.

There are multiple possibilities for flood impacts due to tank, dam, or reservoir failure. For example, the flood impacts of dam or reservoir failures could be somewhat significant for Lake Mission Viejo since water flows down Oso Creek, which might affect the southeasternmost edge of the City adjacent to I-5. Local inundation and erosion effects could impact the area and water tanks immediately adjacent to the Veeh Reservoir and Sulphur Creek Reservoir, depending upon the amount of water impounded at the time of the dam or reservoir failure. However, water from El Toro Reservoir in Aliso Creek would likely not

reach the City. Water tank sites could also potentially be impacted by slope instability. Should any of the dams, reservoirs, or water tanks fail, persons and property in Laguna Hills could be subjected to inundation, flooding, or erosion.

Implementation of Mitigation Measures HWQ-1 and HWQ-2 will reduce the impacts associated with flooding to a less than significant level. Mitigation Measure HWQ-1 requires the City to work with the OCFCD to fully implement the NPDES permits, including the incorporation of on-site storm water treatment facilities into project design. With Mitigation Measure HWQ-2, the City will also inspect storm drains and monitor water storage facilities to determine potential inundation hazards to surrounding properties.

~~As shown in Figure 5.8-2, areas within the 100-year floodplain are identified around Aliso Creek, Veeh Reservoir, Mill Creek, and in a zone northwest of Alicia Parkway in the southern portion of the City. Additional zones in the periphery of these flood areas may pose a flood risk, but since they are outside the 100-year floodplain they do not require additional flood insurance. Lower risk areas are also located along the La Paz Channel on the eastern border of Laguna Hills, and along Sulphur Creek around Moulton Parkway.~~

~~Development within Laguna Hills has been planned and constructed in conformance with the National Flood Insurance Program, and the existing flood control and stormwater drainage systems have both been designed and created to accommodate the anticipated growth and future land development within Laguna Hills. The City intends to optimize the existing system and maintain the community's drainage features in their natural condition. In an effort to achieve this, the City will also work closely with the OCFCD to construct and maintain flood control facilities for the community. In addition, the City requires adequate flood control facilities to protect all structures and major roadways from hazards associated with being near a 100-year floodplain and will require new development and redevelopment to be located to either avoid flood hazards or incorporate them into the overall design. The City will also encourage the use of LID standards to reduce the amount of stormwater runoff and pollution.~~

~~Additional flood prevention methods such as utilization of natural drainages as detention basins and on-site stormwater drainage will be required of developers to reduce runoff into the City's drainage facilities and to provide adequate drainage for new developments. To minimize runoff, the City will promote developments that incorporate permeable surfaces within site design.~~

~~Implementation of Mitigation Measures HWQ-1 and HWQ-2 will reduce the impacts associated with flooding to a less than significant level. Mitigation Measure HWQ-1 requires the City to work with the OCFCD to fully implement the NPDES permits, including the incorporation of on-site stormwater treatment facilities into project design. With Mitigation Measure HWQ-2, the City will also inspect storm drains and monitor water storage facilities to determine potential inundation hazards to surrounding properties.~~

TSUNAMI, SEICHE, AND MUDFLOW

Due to its inland location, the City of Laguna Hills will not be affected by tsunamis. Although seiches have not historically occurred within the City of Laguna Hills, it is possible that a seiche may occur if strong ground shaking causes structural damage to above-ground water tanks. There is also a potential for mudflows from the hillsides, in the event the development removes natural vegetation and makes cuts into the earth that could generate mudflows. However, standard erosion-prevention practices and avoidance of steepened slopes near existing development would help to reduce impacts related to mudflows. In addition, the City would continue to require new development and redevelopment to comply with the City's Hillside Development Standards and Guidelines as set forth in the Laguna Hills

Municipal Code. In the event that these potential hazards would occur, the City would implement measures set forth in the Laguna Hills Emergency Operation Plan (EOP) to respond to such an event (Implementation Program S-13). With implementation of the standard erosion-prevention practices, the Hillside Development Standards and Guidelines, and other related programs included in the General Plan, impacts related to seiche and mudflows would be reduced to a less than significant level.

~~Due to its inland location, the City of Laguna Hills will not be affected by tsunamis. Although seiches have not historically occurred within the City of Laguna Hills, it is possible that a seiche may occur if strong ground shaking causes structural damage to above-ground water tanks. There is also a potential for mudflows from the hillsides, in the event the development removes natural vegetation and makes cuts into the earth that could generate mudflows.~~

~~There are multiple possibilities for flood impacts due to tank, dam, or reservoir failure. For example, the flood impacts of dam or reservoir failures could be somewhat significant for Lake Mission Viejo since water flows down Oso Creek, which might affect the southeasternmost edge of the City adjacent to I-5. Local inundation and erosion effects could impact the area and water tanks immediately adjacent to the Veeh Reservoir and Sulphur Creek Reservoir, depending upon the amount of water impounded at the time of the dam or reservoir failure. However, water from El Toro Reservoir in Aliso Creek would likely not reach the City. Water tank sites could also potentially be impacted by slope instability. Should any of the dams, reservoirs, or water tanks fail, persons and property in Laguna Hills could be subjected to inundation, flooding, or erosion. This is a potentially significant impact.~~

~~These potential hazards are addressed in the Laguna Hills Emergency Operation Plan (EOP). Mitigation Measure HWQ-3 requires the City of Laguna Hills to fully implement and follow the EOP. Implementation of the relevant General Plan requirements, and City programs and policies would reduce impacts related to seiche and mudflows to a less than significant level.~~

5.8.5 MITIGATION MEASURES

Implementation of the following programmatic mitigation measures, derived from the General Plan Implementation Program, will reduce potential impacts to a less than significant level at this Program EIR level of analysis. Individual development projects will be required to undergo project-specific environmental review and mitigation measures will be identified to reduce any significant impacts. Mitigation for significant environmental impacts of each future development project shall include the following: (1) objective of the measure; (2) specific standards or measures to be applied, along with any needed contingency measure; (3) responsible party; (4) location; (5) schedule for initiation; and (6) how the measure will reduce the associated environmental impact.

HWQ-1 The City shall adopt, amend, and/or continue to enforce City policies, regulations, and programs to decrease stormwater and urban runoff pollution while considering the following:

1. Promote the use of low impact development standards in new development and redevelopment projects.
2. Continue to implement the National Pollutant Discharge Elimination System (NPDES) stormwater permits issued by the State and Regional Water Quality Control Board. Require new development and revitalization projects to incorporate Best Management Practices (BMPs) pursuant to the NPDES permit to ensure that the City complies with applicable state and federal regulations.
3. Educate residents regarding surface water quality pollutants, especially those that may result from community activities, such as car washes.

Further, as a condition of project approval, require new development and redevelopment to provide adequate on-site and off-site stormwater and flood management facilities to control direct and indirect erosion and discharges of pollutants and/or sediments. To determine the facility and Best Management Practices (BMP) needs, the City will require, when necessary, a hydrological/drainage analysis be performed by a state-licensed and City-approved engineer, with the cost of said analysis the responsibility of the project applicant. **(Implementation Programs COS-3 and S-12)**

HWQ-2 The City shall coordinate with the OCFCD to ensure regularly scheduled maintenance of flood control channels and completion of necessary repairs to promote flood protection facilities capable of accommodating 100 year storm flows. Coordinate with the OCFCD and water districts regarding any needed improvements to existing aboveground water tanks. Work with the District to identify new flood control improvements, and establish installation programs for improvements. ~~In addition, the City will coordinate with the County of Orange Subdivision and Grading Services concerning water quality issues.~~ **(Implementation Program CSF-9)**

~~**HWQ-3** The City shall implement the City's Emergency Operations Plan (EOP) according to requirements and provisions of the State Emergency Management System and National Incident Management System. Ensure that the EOP establishes community emergency shelter facilities and is easily available to the public. The City will also work with nearby jurisdictions to enhance multi-jurisdictional coordination during emergency situations. **(Implementation Program S-13)**~~

5.8.6 IMPACT AFTER MITIGATION

HYDROLOGY

Impacts associated with hydrology, drainage and runoff would be less than significant without mitigation.

GROUNDWATER RESOURCES

No significant impact associated with groundwater resources would occur.

FLOODING

With implementation of Mitigation Measures HWQ-1 and HWQ-2, impacts associated with flooding would be reduced to a level less than significant.

TSUNAMI, SEICHE, AND MUDFLOW

No significant impact associated with tsunamis, seiche, and mudflow would occur. ~~With implementation of Mitigation Measure HWQ-3, impacts associated with seiche and mudflow would be reduced to a level less than significant.~~

5.9 LAND USE AND PLANNING

This section discusses land use and planning characteristics in the planning area and evaluates the potential impacts that could result from implementation of the General Plan.

5.9.1 ENVIRONMENTAL SETTING

The planning area is located in the San Joaquin Hills in southern Orange County, approximately 60 miles south of Los Angeles and 70 miles north of San Diego. The planning area is bounded by the cities of Irvine and Lake Forest to the north; I-5 and the cities of Mission Viejo and Lake Forest to the east; the City of Laguna Niguel to the south; and, the cities of Aliso Viejo and Laguna Woods to the west. Regional access is provided by I-5 and the San Joaquin Hill Transportation Corridor (SR-73). The planning area contains approximately 6.6 square miles of land or 4,234 acres. Figure 3-1 depicts the regional location of the planning area (shown in Chapter 3.0, Project Description).

The planning area for Laguna Hills consists solely of areas within the City limits and is identical to the City's jurisdictional boundary. Since all land surrounding the City is under the jurisdiction of other cities, Laguna Hills does not have a planning sphere of influence or any planning authority outside of its jurisdictional boundaries.

EXISTING LAND USES

The planning area has a variety of land uses, including residential, commercial, office, mixed use, public and institutional, and open space and recreational, as well as planned community areas. The predominant land use in Laguna Hills is moderate to low density single-family homes. This contributes to the small-town character many residents identify with Laguna Hills. The City contains a range of housing types, including single-family detached and attached homes, apartments, condominiums, and one mobile home park.

Nonresidential uses in the City, such as commercial and office, provide valuable revenue to the City and provide jobs and services for the community and region. Most commercial uses in the City are concentrated along I-5 and the major roadways. The City is almost entirely built out, although there are seven undeveloped large lot residential parcels scattered throughout the southern portion of the City.

Several patterns of development exist throughout the City of Laguna Hills. The next section more fully describes how land is used in the northern, central, and southern portions of the City. Surrounding land uses in adjacent communities are also described.

Northern Land Uses

The northern portion of the City is generally located between Los Alisos Boulevard and Lake Forest Drive. A variety of uses are located here, including a mobile home park designated as Medium Density Residential, open space and park areas, neighborhood and freeway commercial centers, and a designated Mixed Use area. The Mixed Use area provides the City with various goods and services needed to support the local community, including administrative and professional offices, institutional and government uses, business support uses, restaurants, personal services, and retail stores.

Central Land Uses

The central portion of Laguna Hills is generally located north of La Paz Road and south of Los Alisos Boulevard. This area of the City contains low, medium-low, and medium density residential

neighborhoods. The medium density neighborhoods contain multi-family housing such as apartments and condominiums.

Pockets of this area also contain apartments, condominiums, and residential towers, primarily southwest of Moulton Parkway. This area is designated as High Density Residential. Two apartment communities in this area, Rancho Moulton and Rancho Niguel, provide government-assisted affordable housing opportunities to Laguna Hills residents.

Land designated as Community Commercial is also integrated throughout this area, which provides valuable services to the surrounding neighborhoods. These sites provide retail, markets, commercial services, restaurants, automotive repair, hardware and home improvement centers, commercial recreation, professional and business offices, financial institutions, and automotive sales. There are medium-intensity commercial sites along I-5 serving the needs of the motoring public both in Laguna Hills and surrounding areas.

This area of the City is also home to Laguna Hills High School, north of La Paz Road, as well as two elementary schools and several community parks. Cultural resources are located along Coastal Street, and a historic adobe structure is located near Aliso Creek.

Urban Village

The civic and retail heart of Laguna Hills, the Urban Village, is also located in the central portion of the City. This area is generally bounded by Paseo de Valencia on the north and west, Los Alisos Boulevard on the south, and I-5 on the east. This area is anchored by Laguna Hills Mall and Saddleback Memorial Medical Center and is home to several retail stores as well as medical services and offices. The Laguna Hills Civic Center is also located within this area. The Urban Village Specific Plan (UVSP) guides new development in the Urban Village.

Southern Land Uses

The largest residential development in Laguna Hills is the Nellie Gail Ranch community. This community is bounded by I-5 on the east, SR-73 on the west, and La Paz Road to the north. Located on 1,350 acres, Nellie Gail Ranch consists of 1,407 lots and is a mixture of tract and custom homes on large lots in an equestrian setting, with homes ranging from 1,700 to 10,000 square feet. The land use designation for this area is Estate Residential. Nellie Gail Ranch has an equestrian center, 20 miles of equestrian trails, and several parks and community areas, as well as substantial open space. The majority of Nellie Gail Ranch is developed, but there are a few vacant, buildable sites located throughout the community.

In addition to Nellie Gail Ranch, the southern portion of the City contains a few residential neighborhoods containing single-family detached homes, designated as Low and Medium-Low Density Residential.

SURROUNDING LAND USES

The cities of Mission Viejo and Lake Forest border Laguna Hills on the east. These cities are primarily residential, although there are a number of offices and businesses providing shopping and employment opportunities. Immediately north of Laguna Hills is the City of Irvine. Irvine provides much of the employment opportunities in the region, including large business parks, a commercial airport, and a university. To the west and south of Laguna Hills are the cities of Laguna Woods, Aliso Viejo, and Laguna Niguel, which are also predominantly residential communities with areas dedicated to office, business park, and commercial developments.

West of Laguna Hills is the Laguna Coast Wilderness Park. This 6,500-acre regional open space preserve provides Laguna Hills residents with numerous recreation opportunities within a short distance from the City.

5.9.2 REGULATORY FRAMEWORK

The following sections describe the ordinances, plans, and programs relevant to the General Plan development and planning decisions.

SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS REGIONAL COMPREHENSIVE PLAN

The Southern California Association of Governments (SCAG) undertakes regional planning for the six-county SCAG region composed of Los Angeles, Orange, Riverside, San Bernardino, Imperial and Ventura counties. SCAG's efforts focus on developing regional strategies to minimize traffic congestion, protect environmental quality, and provide adequate housing. The Regional Comprehensive Plan (RCP) sets forth broad goals intended to be implemented by participating local and regional jurisdictions and the South Coast Air Quality Management District. SCAG has adopted companion documents to the RCP, most notably the Regional Transportation Plan (RTP).

SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS REGIONAL TRANSPORTATION PLAN

In May 2008, SCAG adopted the 2008 RTP. The RTP is the culmination of a multiyear effort involving stakeholders from across the SCAG region and connects the six-county region of Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura counties to a future vision in which innovative solutions address current transportation challenges. The 2008 RTP presents the transportation vision for this region through the year 2035 and provides a long-term investment framework for addressing the region's transportation and related challenges. The RTP focuses on maintaining and improving the transportation system through a balanced approach that considers system preservation, system operation and management, improved coordination between land-use decisions and transportation investments, and strategic expansion of the system to accommodate future growth. SCAG has also adopted a Regional Transportation Improvement Program to implement the projects and programs listed in the RTP. These plans work together to help improve vehicular traffic within the region and thereby reduce air pollution.

SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS COMPASS BLUEPRINT (GROWTH VISION)

SCAG has developed a growth vision, referred to as the Compass Blueprint, for southern California that recommends methods to redirect regional growth in an effort to maintain the region's prosperity, continue to expand its economy, house its residents affordably, and protect its environmental setting as a whole (SCAG 2004). While SCAG has no authority to mandate implementation of the Compass Blueprint, the plan's goals are reflected throughout the proposed Laguna Hills General Plan.

COUNTY OF ORANGE GROWTH MANAGEMENT PLAN (MEASURE M)

In 1990, Orange County voters approved Measure M authorizing a half-cent retail sales tax increase for a period of 20 years effective April 1, 1991. In 2006, Orange County voters approved the renewal of Measure M for another 30 years until 2041. Measure M revenue is returned to local jurisdictions for use on local and regional transportation and maintenance projects.

The purpose of the Orange County Growth Management Plan is to ensure that transportation and other public facilities are adequate to meet current and projected needs of County residents. The Plan establishes the following five major policies:

- **Development Phasing:** Development would be phased according to Comprehensive Phasing Plans (CPPs) adopted by the County. Phasing is limited to roadway and public facility capacities.

- **Balanced Community Development:** Development would be balanced to encourage employment of local residents, and both employment and employee housing in the County, as well as in individual growth management areas (GMAs).

- **Traffic Level of Service:** Future development creates the need for improvements to major intersections significantly impacted by growth, and a developer fee program is included to pay for improving affected intersections on a pro-rata basis.

- **Traffic Improvement Programs:** All new development must provide necessary transportation facilities and intersection improvements as a condition of development approval.

- **Public Facility Plans:** Comprehensive public facility plans for fire, sheriff/police, and library services are required. New development participates on a pro-rata basis.

Implementation of the Orange County Growth Management Plan involves the establishment of (1) GMAs to implement CPPs; (2) Facility Implementation Plans to address the financing of public facilities for each GMA; (3) Countywide implementation and evaluation of compliance with development phasing and improvements; and (4) traffic improvement/public facility development agreements.

To qualify for Measure M revenue, each jurisdiction must comply with the Countywide Traffic Improvement and Growth Management Program. Specifically, to receive an allocation of Measure M revenue, Laguna Hills must submit a statement of compliance with the growth management components of this program. Requirements include the adoption of a traffic circulation plan consistent with the Master Plan of Arterial Highways, adoption of a Growth Management Element within the General Plan, adoption and adequate funding for a local transportation fee program, and adoption of a 7-year capital improvement program that includes all transportation projects funded either partially or fully by Measure M funds.

LAGUNA HILLS MUNICIPAL CODE

The City's Municipal Code, including the Zoning Ordinance, is the primary tool used to implement the goals and policies of the General Plan. The Zoning Ordinance provides more detailed direction related to development standards; permitted, conditionally permitted, and prohibited uses; and other regulations such as parking standards and sign regulations. The land uses specified in the Zoning Ordinance are based upon and should be consistent with the land use policies set forth in the General Plan.

URBAN VILLAGE SPECIFIC PLAN

While the General Plan provides overall guidance for the physical development of the City, specific plans are used to provide more detailed regulatory guidance for special areas or large developments within the City. Specific plans are generally composed of a land use plan, circulation plan, development standards, design guidelines, phasing plan, infrastructure plan (water, sewer, or drainage), and implementation plan. They are typically implemented as customized zoning for a particular area of the City and are generally used for large-scale projects that require a comprehensive approach to planning and infrastructure issues.

The City currently has one approved specific plan. The UVSP, adopted in November 2002, is a 240-acre area bounded by Paseo de Valencia on the north and west, Los Alisos Boulevard on the south, and I-5 on the east. The UVSP provides for a continuing mixture of land uses, including retail, residential, hotel, medical offices, and general offices.

DEVELOPMENT AGREEMENTS

State law provides for development agreements between a project proponent and the City. The purpose of a development agreement is to provide developers with additional assurances that the policies, rules and regulations, and conditions of approval in effect at the time a project was approved would not be nullified by a future local policy or regulation change. In exchange, the developer may be required to meet certain conditions or performance criteria, which become part of the agreement.

Development agreements can be a useful means of meeting General Plan goals and policies while removing some of the risks faced by developers. Agreements can remain in effect for a few or several years, the term typically being set forth in the agreement. It is important to emphasize that, as set forth in the Government Code, the City is not prohibited from applying new rules, regulations, and policies to the property unless specifically stated in the development agreement, nor is the City prevented from denying or conditionally approving any subsequent development project application on the basis of such existing or new rules, regulations, or policies.

5.9.3 THRESHOLDS FOR DETERMINING SIGNIFICANCE

Based on Appendix G of the CEQA Guidelines, a significant impact related to land use and planning would occur if implementation of the General Plan would:

- Physically divide an established community;
- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect; or
- Conflict with any applicable habitat conservation plan or natural community conservation plan.

5.9.4 ANALYSIS OF ENVIRONMENTAL IMPACTS

Development pursuant to the General Plan land use policy would result in an increase of approximately 457 dwelling units and 1,031,530 square feet of nonresidential building floor area over existing conditions. A net population increase of approximately 1,229 persons is also anticipated at buildout according to the General Plan.

Because Laguna Hills is largely built out, the proposed land use plan reflects long-established land use patterns. The key changes proposed relative to the current land use policy are as follows:

- Establishment of the *Neighborhood Mixed Use* land use designation and its application to properties in the Alicia Gateway Opportunity Area.
- Establishment of the *Planned Community ~~Via Lomas~~Residential* land use designation and its application to properties in the Via Lomas Opportunity Area.
- Extension of a parcel designated as *Community Commercial* by approximately 150 feet to the south in the Moulton/La Paz Opportunity Area.

- Minor Zoning Ordinance text and map amendments to implement the proposed land use designations.
- Redevelopment, improvement, or intensification of some of the land uses in the future study areas (future study areas are described in detail in Chapter 3.0, Project Description). No changes in land use designations would occur at the future study areas.

Table 3-2 (see Chapter 3.0, Project Description) identifies the development capacity associated with the planned distribution of land uses specified in the Land Use Plan. Over time, as properties transition from one use to another or property owners rebuild in the opportunity areas, land uses and intensities would gradually shift to align with the intent of the Land Use Element. Given the largely built-out character of Laguna Hills and the good condition of most buildings, significant redevelopment activities may not occur over the life of the General Plan. However, within opportunity areas described above, future land use changes are anticipated.

DIVIDE AN ESTABLISHED COMMUNITY

Given the built-out nature of Laguna Hills and the minimal number of vacant sites remaining within the planning area, the proposed arrangement of General Plan land uses would not result in the division of an established community. The General Plan assumes the existing land use development patterns as a basis for future development and redevelopment. The General Plan also contains policies that emphasize increasing connectivity between and within the planning area that would have the effect of unifying, rather than dividing, established communities or neighborhoods within the planning area. Furthermore, the General Plan was designed to focus on redevelopment of existing urbanized areas and siting new residential development in vacant portions of the planning area, rather than developing in a way that might divide established communities. Therefore, implementation of the General Plan would result in a less than significant impact with regard to division of an existing community.

CONFLICT WITH AN ADOPTED LAND USE PLAN

Implementation of the General Plan may impact the existing land use plans, policies, and regulations that have been adopted to avoid or mitigate an environmental effect. The potential impacts to the plans, policies, and regulations are described below.

Southern California Association of Governments

The SCAG RCP and RTP contain a number of policies applicable to the General Plan. SCAG's growth vision, the Compass Blueprint, also contains principles that are applicable to the General Plan. While SCAG has no authority to mandate implementation of its Compass Blueprint, principal goals are nevertheless considered by Laguna Hills for consistency. These policies and their consistency with the General Plan are discussed in Table 5.9-1.

Table 5.9-1
Consistency with SCAG Policies from the RCP and RTP

SCAG Policy		Laguna Hills General Plan Consistency Determination
RCP Growth Management Chapter (GMC) Policies related to growth forecasts.		
3.01	The population, housing, and jobs forecasts, which are adopted by SCAG's Regional Council and that reflect local plans and policies shall be used by SCAG in all phases of implementation and review.	**Consistent:** SCAG's population, housing, and jobs forecasts, along with U.S. Census data, were used throughout the preparation of the General Plan.
3.03	The timing, financing, and location of public facilities, utility systems, and transportation systems shall be used by SCAG to implement the region's growth policies.	**Consistent:** No specific infrastructure or service improvements projects are identified as part of the General Plan Update. However, future development projects as a result of General Plan buildout would require infrastructure and service improvements subject to review by the City and responsible agencies.
RCP GMC Policies related to the RCP Goal to improve the regional standard of living.		
3.04	Encourage local jurisdictions' efforts to achieve a balance between the types of jobs they seek to attract and housing prices.	**Consistent:** The General Plan Update contains policies in the Housing Element to maintain a good balance between jobs and housing and to provide housing opportunities affordable to the incomes of all segments of the community.
3.05	Encourage patterns of urban development and land use which reduce costs on infrastructure construction and make better use of existing facilities.	**Consistent:** Under the provisions of Measure M, Laguna Hills is considered a developed community. The General Plan discusses growth management in the Mobility Element. The purpose of this element is to ensure that capital facilities planning would meet the needs of current and future residents of Laguna Hills and the region, including addressing infrastructure construction and existing services and facilities. The General Plan Mobility Element contains growth management programs such as Transportation Demand Management (TDM) and transportation improvement projects.
3.09	Support local jurisdictions' efforts to minimize the cost of infrastructure and public service delivery, and efforts to seek new sources of funding for development and the provision of services.	**Consistent:** The General Plan Land Use and Community Services and Facilities Elements contain policies and programs to seek private funding sources for the extension of services and facilities where these services are not already part of the City's financed capital improvement program.
3.10	Support local jurisdictions' actions to minimize red tape and expedite the permitting process to maintain economic vitality and competitiveness.	**Consistent:** The General Plan Land Use Element provides policies to expedite the permitting process.
RCP GMC Policies related to the RCPG Goal to improve the regional quality of life.		
3.12	Encourage existing or proposed local jurisdictions' programs aimed at designing land uses which encourage the use of transit and thus reduce the need for roadway expansion, reduce the number of auto trips and vehicle miles traveled, and create opportunities for residents to walk and bike.	**Consistent:** The Land Use and Mobility Elements of the General Plan include several policies that encourage the use of transit, create opportunities for residents to walk and bike, and thus reduce the number of auto trips and the need for roadway expansion, including encouraging mixed use projects linked with a multi-modal circulation network composed of transit, bicycle, and trail systems; targeting increased density, improving walkability.

Table 5.9-1 (continued)
Consistency with SCAG Policies from the RCP and RTP

SCAG Policy		Laguna Hills General Plan Consistency Determination
3.13	Encourage local jurisdictions' plans that maximize the use of existing urbanized areas accessible to transit through infill and redevelopment.	**Consistent:** Laguna Hills is virtually built out and surrounded by other urbanized areas. Based on these circumstances, new development allowed for under the General Plan would primarily take the form of redevelopment or infill projects on underutilized lots. The General Plan Land Use Element contains policies that encourage the use and redevelopment of existing urbanized areas.
3.16	Encourage developments in and around activity centers, transportation corridors, underutilized infrastructure systems, and areas needing recycling and redevelopment.	**Consistent:** The Land Use Element provides guidance for development in and around activity centers, transportation corridors, underutilized infrastructure system, and areas needing recycling and redevelopment.
3.17	Support and encourage settlement patterns, which contain a range of urban densities.	**Consistent:** The Land Use Element proposes a range of urban residential densities and nonresidential intensities. The various land use designations established by the Land Use Element propose residential densities ranging from 1 to 30 dwelling units per acre and nonresidential intensities ranging from 0 to 1.0 Floor Area Ratio (FAR).
3.18	Encourage planned development in locations least likely to cause adverse environmental impact.	**Consistent:** Given the built-out nature of Laguna Hills, the Land Use Element of the General Plan includes land use designations and policies that are oriented to new development occurring primarily in the form of infill-oriented site redevelopment or adaptive reuse of buildings, supporting the protection of natural resources, environmentally sensitive areas, and production lands. Figure 5.13-1 of this Program EIR illustrates the areas within the City's planning area that are designated as Open Space, Open Space Recreation, Park, and other protective designations. Further, as discussed in Section 5.4, Biological Resources, development associated with the General Plan shall be required to undergo the CEQA process on a project-by-project basis to minimize environmental impacts. Additionally, Section 5.8, Hydrology and Water Quality, addresses potential impacts related to water quality and groundwater recharge.
3.20	Support the protection of vital resources such as wetlands, groundwater recharge areas, woodlands, production lands, and land containing unique and endangered plants and animals.	
3.21	Encourage the implementation of measures aimed at the preservation and protection of recorded and unrecorded cultural resources and archaeological sites.	**Consistent:** As described in Section 5.5, Cultural Resources, the City would be required to assess potential impacts to cultural resources prior to approval of any development project allowed under the General Plan. Additionally, the Conservation and Open Space Element contains policies to preserve both publicly and privately owned historic and cultural resources.

Table 5.9-1 (continued)
Consistency with SCAG Policies from the RCP and RTP

SCAG Policy		Laguna Hills General Plan Consistency Determination
3.22	Discourage development, or encourage the use of special design requirements, in areas with steep slopes, high fire, flood, and seismic hazards.	**Consistent:** As described in Sections 5.4 Biological Resources, 5.6 Geology, Soils, and Mineral Resources, 5.7 Hazards and Hazardous Materials, and 5.8 Hydrology and Water Quality, development associated with the General Plan would be required to assess potential impacts related to biological and ecological resources, steep slopes, high fire, flood, and seismic hazards. Section 5.4, Biological Resources, describes actions and policies contained in the General Plan that would reduce impacts related to biological resources to a level less than significant. Section 5.6, Geology, Soils, and Mineral Resources, contains mitigation measures, which require the City to address geologic risks related to steep slopes and seismic hazards, including enforcement of the hillside development ordinance and using open space easements and other regulatory techniques to prohibit development and avoid public safety hazards where the threat from seismic hazards cannot be mitigated. Section 5.7, Hazards and Hazardous Materials, describes actions and policies contained in the General Plan that would address risks related to high fire hazards and providing adequate emergency response and recovery plans. Section 5.8, Hydrology and Water Quality, describes actions and policies contained in the General Plan that would address risks related to flood hazards. The Safety Element contains policies to restrict and/or minimize the risks of development in areas subject to hazards.
3.23	Encourage mitigation measures that reduce noise in certain locations, measures aimed at preservation of biological and ecological resources, measures that would reduce exposure to seismic hazards, minimize earthquake damage, and to develop emergency response and recovery plans.	
RCP GMC Policies related to the RCPG Goal to provide social, political, and cultural equity.		
3.24	Encourage efforts of local jurisdictions in the implementation of programs that increase the supply and quality of housing and provide affordable housing as evaluated in the Regional Housing Needs Assessment.	**Consistent:** The General Plan Housing Element provides guidance through its goals and policies and implementation programs regarding provision of housing within the City, including the supply and quality of housing as evaluated in the Regional Housing Needs Assessment.
3.27	Support local jurisdictions and other service providers in their efforts to develop sustainable communities and provide, equally to all members of society, accessible and effective services such as: public education, housing, health care, social services, recreational facilities, law enforcement, and fire protection.	**Consistent:** The General Plan Community Services and Facilities and Housing Elements provide goals and policies regarding the provision of public services and facilities, including public education, housing, health care, social services, recreational facilities, law enforcement, and fire protection, to all residents of the City.

Table 5.9-1 (continued)
Consistency with SCAG Policies from the RCP and RTP

SCAG Policy		Laguna Hills General Plan Consistency Determination
RCP Air Quality Chapter (AQC)		
5.11	Through the environmental document review process, ensure that plans at all levels of government (regional, air basin, county, subregional, and local) consider air quality, land use, transportation, and economic relationships to ensure consistency and minimize conflicts.	**Consistent:** The General Plan supports these policies by establishing policies and programs that would require analysis of air quality impacts on a project-by-project basis as part of the development and environmental review process. These issues related to implementation of the General Plan itself are analyzed throughout this Program EIR, but most specifically in Section 5.3, Air Quality, and Section 5.14, Transportation and Circulation.
RCP Open Space and Conservation Chapter (OSCC)		
9.1	Provide adequate land resources to meet the outdoor recreation needs of the present and future residents in the region and to promote tourism in the region.	**Consistent:** As described in Section 5.13, Recreation, the General Plan would provide open space and recreation areas that meet the outdoor recreation needs of the present and future residents in the region, increase the accessibility to open space lands for outdoor recreation, and promote self-sustaining regional recreation resources and facilities. In addition, the Conservation and Open Space Element of the proposed General Plan contains policies and implementation programs such as parks needs assessments to ensure compliance with these policies.
9.2	Increase the accessibility to open space lands for outdoor recreation.	
9.3	Promote self-sustaining regional recreation resources and facilities.	
9.4	Maintain open space for adequate protection to lives and properties against natural and manmade hazards.	**Consistent:** The General Plan Safety Element contains a number of policies and implementation programs that address the threat of natural and man-made hazards within certain areas of the City.
9.5	Minimize potentially hazardous developments in hillsides, canyons, areas susceptible to flooding, earthquakes, wildfire and other known hazards, and areas with limited access for emergency equipments.	**Consistent:** The General Plan Safety Element contains a number of policies and implementation programs that address hazardous developments in hillsides, canyons, areas susceptible to flooding, etc.
RCP Water Quality Chapter (WQC)		
11.07	Encourage water reclamation throughout the region where it is cost-effective, feasible, and appropriate to reduce reliance on imported water and wastewater discharges. Current administrative impediments to increased use of wastewater should be addressed.	**Consistent:** The Community Services and Facilities Element and Conservation and Open Space Element contain policies that promote water conservation and increased use of recycled water. In addition, the General Plan calls for the City to support efforts by the Moulton Niguel Water District and El Toro Water District to achieve the following water supply, distribution, and conservation objectives: (a) reduce the amount of water used for landscaping and increase use of native and drought-tolerant plants; and (b) encourage the production, distribution, and use of recycled and reclaimed water for landscaping projects, while maintaining urban runoff water quality objectives.

Table 5.9-1 (continued)
Consistency with SCAG Policies from the RCP and RTP

SCAG Policy		Laguna Hills General Plan Consistency Determination
Regional Transportation Plan (RTP) Policies		
4.01	Transportation investments shall be based on SCAG's adopted Regional Performance Indicators.	**Consistent:** The proposed policies and programs of the General Plan would facilitate implementation of the RTP. As discussed in Section 5.14, Transportation and Circulation, the City would undertake actions to improve local and regional roadways, facilitate access to alternative modes of transportation, and expand existing nonvehicular transportation options. Additionally, policies and programs described in the Mobility Element of the General Plan would facilitate traffic improvements for the City's orderly growth and development.
4.04	Transportation Control Measures shall be a priority.	**Consistent:** Goals, policies, and programs discussed in the Mobility Element of the General Plan would provide transportation control measures. Additionally, implementation of mixed use development described in the Land Use Element of the General Plan would reduce the length and duration of vehicle trips and reduce traffic congestion.
4.16	Maintaining and operating the existing transportation system would be a priority over expanding capacity.	**Consistent:** The General Plan would include committed roadway improvements. However, these improvements are necessary to improve upon existing inadequate vehicular mobility and would be limited to the existing roadway system and would not constitute additions of entirely new roadways. Furthermore, the General Plan would include additional alternative modes of transportation that would reduce vehicle trips within the City, such as bicycles and pedestrian trails. The Mobility Element contains policies that promote the maintenance of roads, trails, and sidewalks.
Compass Blueprint/Growth Visioning Principles		
Principle 1: Increasing the region's mobility		
GV P1.1	Encourage transportation investments and land use decisions that are mutually supportive.	**Consistent:** The Land Use and Mobility Elements provide direction for fostering mobility within the City of Laguna Hills. The Land Use Plan provides policies and programs that would foster mixed use development in areas with existing concentrations of employment and services, as well as regional bus and rail service and other strategies that would shorten and reduce vehicular trips. Additionally, the Mobility Element includes transportation improvements that would reduce traffic congestion and provides guidance for the development of alternative modes of transportation, as well as policies that support continued development of a multi-modal transportation network in the City. Additionally, the Mobility Element provides a means of implementing the City's Master Plan of Arterial Highways.
GV P1.3	Encourage transit-oriented development.	
GV P1.4	Promote a variety of travel choices.	

Table 5.9-1 (continued)
Consistency with SCAG Policies from the RCP and RTP

SCAG Policy		Laguna Hills General Plan Consistency Determination
Principle 2: Foster livability in all communities		
GV P2.1	Promote infill development and redevelopment to revitalize existing communities.	**Consistent:** The General Plan Land Use Element calls for mixed use development that would reduce vehicular trips and promote walking not only within mixed use areas, but also between existing neighborhoods and abutting commercial districts. The Mobility Element of the General Plan expands upon the existing pedestrian, bicycle, and equestrian network to improve walkability within the City of Laguna Hills. Overall, the proposed Land Use and Mobility Elements contain numerous policies and programs that encourage development of high-quality, well-designed mixed use projects. The General Plan Land Use Map designates significant portions of the City for low density residential development and incorporates policies and programs to preserve the distinctive character of the existing single-family neighborhoods.
GV P2.2	Promote developments, which provide a mix of uses.	
GV P2.3	Promote "people scaled," walkable communities.	
GV P2.4	Support the preservation of stable, single-family neighborhoods.	
Principle 3: Enable prosperity for all people		
GV P3.1	Provide, in each community, a variety of housing types to meet the housing needs of all income levels.	**Consistent:** The General Plan contains policies and programs supporting provision of a variety of housing. The General Plan allows a variety of housing types for all income levels by establishing five residential land use designations ranging from Estate Low Density Residential (0 - 3.5 dwelling units per acre) to High Density Residential (18 - 30 dwelling units per acre). The Plan also identifies two mixed use land use designations, including Mixed Use and Neighborhood Mixed Use designations. The Land Use Element of the General Plan contains numerous goals and policies related to sustaining a strong and diversified economic base, ensuring fiscal stability, reducing or eliminating physical and environmental constraints that may impede economic development, fostering new commercial and retail development and expansion, and providing adequate infrastructure to support anticipated economic development and growth. The Housing Element of the General Plan also encourages provision of affordable housing to increase housing opportunities and improve quality of life for workers in Laguna Hills.
GV P3.2	Support educational opportunities that promote balanced growth.	
GV P3.4	Support local and state fiscal policies that encourage balanced growth.	

Table 5.9-1 (continued)
Consistency with SCAG Policies from the RCP and RTP

SCAG Policy		Laguna Hills General Plan Consistency Determination
Principle 4: Promote sustainability for future generations		
GV P4.1	Preserve rural, agricultural, recreational and environmentally sensitive areas.	**Consistent:** The General Plan Conservation and Open Space Element includes programs to manage the limited natural resources found within the planning area. Land Use Element includes policies and programs that encourage development and redevelopment activities that would involve the revitalization of property in an environmentally sustainable manner through smart growth principles and mixed use development, which would reduce vehicular trips and promote walking. One of the primary objectives of the Mobility Element is to provide a safe and efficient local transportation system consistent with the regional system. The Mobility Element of the General Plan expands upon the existing pedestrian, equestrian, and bicycle network to improve walkability within the City of Laguna Hills. Overall, the proposed Land Use Element and Mobility Element contain numerous goals and policies that encourage development of high-quality, well-designed projects, which would incorporate energy-efficient design techniques to conserve energy resources and reduce pollution. The Conservation and Open Space Element also contains goals and policies that promote recycling and water conservation, such as the incorporation of Low Impact Development Principles.
GV P4.2	Focus development in urban centers and existing cities.	
GV P4.3	Develop strategies to accommodate growth that uses resources efficiently, eliminate pollution and significantly reduce waste.	
GV P4.4	Utilize "green" development techniques.	

Source: SCAG Policies from Comparison Table of SCAG Policies for Intergovernmental Review 2008

As stated in Table 5.9-1, the General Plan is consistent with the RCP, RTP, and the Compass Blueprint administered by SCAG and would result in a less than significant impact from a land use plan consistency perspective.

County of Orange Growth Management Plan (Measure M1) and Renewed Measure M (M2)

The City of Laguna Hills has based its approach to the Measure M1 and future M2 requirement for adoption of a Growth Management Element on the Model Growth Management Element developed jointly by the County of Orange and the Orange County Division of the League of California Cities. The Growth Management Element of the General Plan is found within the Mobility Element and encompasses all required policy provisions necessary to comply with Measure M1 and M2. The General Plan contains an implementation plan to ensure that required Measure M1 programs and future M2 programs pertaining to Growth Management are included within the Mobility Element and are applied consistently during the City development review process.

Implementation of the City of Laguna Hills Mobility Element – Growth Management Program would result in a more equitable balance between housing opportunities and employment opportunities within the City, which would allow residents to live closer to their jobs and thereby reduce commuting distance and times. A complementary commitment of development mitigation, development phasing, and performance monitoring is necessary to achieve a coordinated land use development and transportation infrastructure. The City of Laguna Hills would ensure that the actions described below would be applied to applicable development projects and a Citywide assessment of land use development/transportation infrastructure capacity would be conducted in conjunction with fee program implementation and capital improvement program development (see Mitigation Measure LU-1).

To compensate the public for any increased burden on public services attributed to new development, jurisdictions have the authority to impose reasonable fees or required related improvements. The County of Orange and the City of Laguna Hills have imposed development fees on development transportation improvements within the City. The City of Laguna Hills Development Mitigation Program requires that development proposals be reviewed so new development may pay its share of costs associated with that development on existing and planned transportation facilities.

The City of Laguna Hills would review traffic levels of service on City arterials, contrast operating levels of service with General Plan performance standards, and provide necessary improvements in conjunction with the annual development of its Capital Improvements Program. This information would be shared with participating jurisdictions in applicable Growth Management Area Interjurisdictional Planning Forums. The City of Laguna Hills also maintains adopted traffic performance standards by outlining and coordinating necessary transportation improvements, including a 7-year Capital Improvements Program, and Traffic Improvement/Public Facilities Development Agreements consistent with the Growth Management Element, and its implementing ordinances, plans, and programs. In addition, the City is an active participant in interjurisdictional forums for Orange County jurisdictions that address areawide transportation improvement projects. Furthermore, the City of Laguna Hills endorses alternative transportation modes and strategies to reduce vehicular trips and has adopted programs to reduce trip generation, including a Transportation Demand Management Ordinance to assist in reducing trips to and from employment.

As discussed above, the Laguna Hills General Plan Mobility Element includes all required policy provisions necessary to comply with Measures M1 and M2. In addition, Mitigation Measure LU-1 would ensure the City's further compliance with the requirements of Measures M1 and M2 and would result in a less than significant impact from a land use plan, policy, or regulation consistency perspective.

Laguna Hills Municipal Code

The Laguna Hills Municipal Code is one of the primary tools for implementing the General Plan land use policy. Two additional land use designations proposed by the General Plan are different from the existing General Plan land use designations. Amendments to the Zoning Ordinance would be necessary to implement the changes to the land use designations and would also require revisions to the existing text and zoning maps. These amendments to the Zoning Ordinance would be updated subsequent to adoption of the General Plan to establish consistency (see Mitigation Measure LU-2 below). With implementation of Mitigation Measure LU-2, consistency would be achieved, and impacts would be less than significant from a land use plan, policy, or regulation consistency perspective.

Urban Village Specific Plan

The UVSP regulates development within the Village Commercial area of Laguna Hills. The purpose of the Village Commercial area is to develop a community core in which a variety of public, regional commercial, recreational, and high density residential uses work in concert to create an urban village. The UVSP, which governs the land uses in this area, provides for a continuing mixture of land uses, including retail, residential hotel, medical offices, and general offices. While no changes to this Village Commercial area are likely to occur within the life of this General Plan Update, this area has been identified for possible revitalization in the future. The USVP currently allows for intensification and redevelopment in this area; however, the General Plan projects the future addition of 117,000 square feet of retail space, above and beyond that currently specified in the UVSP. The General Plan also proposes an amendment to the Urban Village Specific Plan to allow for increased residential densities between 30 and 50 dwelling units per acre in the Village Commercial area. The additional retail space and increase in residential density allowance would be compatible and complement the goals of the UVSP; however, the UVSP

would need to be amended to reflect these changes. Implementation of Mitigation Measure LU-3 would ensure the amendment of the UVSP. As such, the General Plan would then be consistent with the UVSP, and impacts would be less than significant from a land use plan consistency perspective.

CONFLICT WITH AN APPLICABLE HABITAT CONSERVATION PLAN

There are currently no adopted habitat conservation plans or natural community conservation plans in the General Plan planning area (City of Laguna Hills 2008b). The County of Orange has prepared the Southern Subregion Natural Community Conservation Plan/Master Streambed Alteration Agreement/Habitat Conservation Plan (SSNCCP/MSAA/HCP), and while portions of the planning area are located within the SSNCCP Coastal Subarea, the City of Laguna Hills does not participate in the SSNCCP. Biological resource issues associated with implementation of the Laguna Hills General Plan and habitats and species located in the planning area are addressed in Section 5.4, Biological Resources, of this document. Given that the SSNCCP is not an adopted plan and has no regulatory standing within the City of Laguna Hills, implementation of the General Plan would result in a less than significant impact pertaining to consistency with a habitat conservation plan or natural community conservation plan.

5.9.5 MITIGATION MEASURES

Implementation of the following programmatic mitigation measures, derived from the General Plan Implementation Program, will reduce potential impacts to a less than significant level at this Program EIR level of analysis. Individual development projects will be required to undergo project-specific environmental review and mitigation measures will be identified to reduce any significant impacts. Mitigation for significant environmental impacts of each future development project shall include the following: (1) objective of the measure; (2) specific standards or measures to be applied, along with any needed contingency measure; (3) responsible party; (4) location; (5) schedule for initiation; and (6) how the measure will reduce the associated environmental impact.

LU-1 The City shall review discretionary development proposals to assess the project's effect on the community's jobs/housing balance and fiscal stability. Ensure developments provide their fair share of infrastructure such as utilities, roads, parks, and recreational opportunities or pay in lieu fees toward the development/extension of these facilities. **(Implementation Program LU-1)**

LU-2 The City shall review and update the Zoning Ordinance and the Zoning Map to ensure consistency with the General Plan and to help implement the General Plan policies and principles. The Zoning Ordinance update will include, but not be limited to, the following items:

1. Add Planned Community ~~Via Lomas~~Residential Zone and Neighborhood Mixed Use Zone and appropriate development standards.
2. Reassess noise regulations for consistency between General Plan and Zoning Ordinance.
3. Update and expand Section 9-40, Design Regulations and Standards to facilitate and encourage connectivity and compatibility between adjacent land uses and activities as well as ensure excellent design of development and revitalization projects.
4. Revise parking regulations to encourage unique parking solutions and parking management techniques, particularly in the Urban Village Specific Plan (UVSP) area.
5. Define Community Gardens and allow and/or encourage their provision in appropriate zones.

6. Establish standards for gardens, fruit trees, and agricultural production in residential areas.
7. Incorporate sustainability principles (e.g., wind energy standards) and remove barriers to sustainability.

(Implementation Program LU-3)

LU-3 The City shall review and update the UVSP to ensure consistency with the General Plan and to help implement the General Plan policies and principles. The UVSP will be updated to address the following:

1. Require any proposed residential development to be between 30 and 50 dwelling units per acre.
2. Allow additional square footage for retail activities.
3. Revise parking regulations with the intent to offer creative and flexible solutions that would facilitate development.

(Implementation Program LU-4)

5.9.6 IMPACT AFTER MITIGATION

DIVIDE AN ESTABLISHED COMMUNITY

Impacts associated with the division of an establish community would be less than significant without mitigation.

CONFLICT WITH AN ADOPTED LAND USE PLAN

Implementation of Mitigation Measures LU-1, LU-2, and LU-3 would reduce impacts related to potential inconsistencies with any applicable land use plan, policy, or regulation to a level less than significant.

CONFLICT WITH AN APPLICABLE HABITAT CONSERVATION PLAN

Impacts associated with the General Plan conflicting with an applicable habitat conservation plan would be less than significant without mitigation.

5.10 NOISE

This section describes existing noise characteristics within the planning area and evaluates the potential impacts associated with noise that could result from implementation of the General Plan. Information presented in the discussion and subsequent analysis was drawn from *Laguna Hills General Plan Update Traffic Noise Modeling* (Urban Crossroads 2008), which is included as Appendix D of this Program EIR.

5.10.1 ENVIRONMENTAL SETTING

Noise is most often defined as unwanted sound. Noise within the planning area is composed of the cumulative noise generated by transportation activities and stationary sources. Transportation noise refers to noise from automobile use, trucking, airport operations, and rail operations. Nontransportation noise typically refers to noise from stationary sources such as commercial establishments, machinery, air conditioning systems, compressors, and landscape maintenance equipment. Regardless of the type of noise, noise levels are highest near the source and decrease with distance.

NOISE STANDARDS

Although sound can be easily measured, the perceptibility is subjective and the physical response to sound complicates the analysis of its impact on people. People judge the relative magnitude of sound sensation in subjective terms such as "noisiness" or "loudness." Sound pressure magnitude is measured and quantified using a logarithmic ratio of pressures, the scale of which gives the level of sound in decibels (dB). The human hearing system is not equally sensitive to sound at all frequencies. Therefore, to approximate this human, frequency-dependent response, the A-weighting filter system is used to adjust measured sound levels and is expressed as dBA.

Noise consists of pitch, loudness, and duration; therefore, it is difficult to describe noise with a single unit of measure. Federal and state agencies have established noise and land use compatibility guidelines that use averaging approaches to noise measurement. Two measurement scales commonly used in California are the Community Noise Equivalent Level (CNEL) and the day-night level (L_{dn}). To account for increased human sensitivity at night, the CNEL level includes a 5 dB penalty on noise during the 7:00 p.m. to 10:00 p.m. time period and a 10 dB penalty on noise during the 10:00 p.m. to 7:00 a.m. time period. The L_{dn} level includes only the 10 dB weighting for late-night noise. These values are nearly identical for all but unusual noise sources. The City of Laguna Hills relies on the CNEL.

California Noise Insulation Standards (Title 24)

The California Commission of Housing and Community Development officially adopted noise standards in 1974. Title 24 establishes standards for interior room noise attributable to outside noise sources. In 1988, the Building Standards Commission approved revisions to the standards (Title 24, Part 2, California Code of Regulations). As revised, Title 24 establishes an interior noise standard of 45 dB(A) for residential space (CNEL or L_{dn}). Title 24 specifies that acoustical studies be prepared whenever a residential building or structure is proposed to be located within exterior CNEL or L_{dn} contours of 60 dB or greater attributable to an existing adopted freeway, expressway, parkway, major street, thoroughfare, rail line, rapid transit line, or industrial noise source. The studies must demonstrate that the building has been designed to limit intruding noise to an interior CNEL or L_{dn} of 45 dB. Table 5.10-1 outlines the interior and exterior noise standards set forth by Title 24, Part 2 of the California Code of Regulations.

Table 5.10-1
State of California Interior and Exterior Noise Standards

Land Use	Noise Standards[1]	
	Interior[2,3]	Exterior
Residential – Single-family, multi-family, duplex, mobile home	CNEL 45 dB	CNEL 65 dB[4]
Residential – Transient lodging, hotels, motels, nursing homes, hospitals	CNEL 45 dB	CNEL 65 dB[4]
Private offices, church sanctuaries, libraries, board rooms, conference rooms, theaters, auditoriums, concert halls, meeting halls, etc.	L_{eq}(12) 45 dB(A)	---
Schools	L_{eq}(12) 45 dB(A)	L_{eq}(12) 67 dB(A)[5]
General offices, reception, clerical, etc.	L_{eq}(12) 50 dB(A)	---
Bank, lobby, retail store, restaurant, typing pool, etc.	L_{eq}(12) 55 dB(A)	---
Manufacturing, kitchen, warehousing, etc.	L_{eq}(12) 65 dB(A)	---
Parks, playgrounds	---	CNEL 65 dB[5]
Golf courses, outdoor spectator sports, amusement parks	---	CNEL 70 dB[5]

Source: Title 24, Part 2, California Code of Regulations
Notes:
[1] CNEL: Community Noise Equivalent Level. L_{eq}(12): The A-weighted equivalent sound level averaged over a 12-hour period (usually the hours of operations).
[2] Indoor standard with windows closed. Mechanical ventilation would be provided per UBC requirements to provide a habitable environment.
[3] Indoor environment excluding bathrooms, toilets, closets, and corridors.
[4] Outdoor environment limited to rear yard of single-family homes, multi-family patios and balconies (with a depth of 6 feet or more) and common recreation areas.
[5] Outdoor environment limited to playground areas, picnic area, and other areas of frequent human use.

City of Laguna Hills Noise Ordinance

Chapter 5-24 of the Laguna Hills Municipal Ordinance (Noise Ordinance) is designed to protect people from nontransportation noise sources such as construction activity, commercial and industrial operations, machinery, and pumps and air conditioners. Enforcement of the Noise Ordinance includes requiring proposed development projects to show compliance with the ordinance, including operating in accordance with noise levels and hours of operation limits placed on the project site. The City also requires construction activity to comply with established work schedule limits. The Noise Ordinance is reviewed periodically for adequacy and amended as needed to address community needs and development patterns. In addition, Chapter 6-16 of the City of Laguna Hills Municipal Ordinance specifically regulates noise disturbances during normal sleeping hours (10 p.m. to 7 a.m.) in residential areas. Table 5.10-2 summarizes the City of Laguna Hills residential noise standards.

Table 5.10-2
Residential Noise Standards

	Daytime Noise Standards (7:00 a.m. to 10:00 p.m.)	Nighttime Noise Standards (10:00 p.m. to 7:00 a.m.)
Interior Noise Standards	55 dB(A)	45 dB(A)
Exterior Noise Standards	55 dB(A)	50 dB(A)

Note: Standards are based on measurements taken from any residential property in the City.
Source: Laguna Hills Municipal Code Chapter 5-24

Enforcement of noise ordinances is the responsibility of the City Manager and the Orange County Sheriff's Department (OCSD), which is under contract with the City for the provision of law enforcement services). Noise complaints in violation of the State of California Penal or Vehicle Code are enforced by

OCSD. This delegation of responsibilities allows consistent and continual enforcement of the noise standards.

NOISE AND LAND USE COMPATIBILITY GUIDELINES

Generalized community noise conditions are frequently illustrated using noise contour maps. Similar to a topographic map, a noise contour map shows conditions within a specific geographic area. The City uses noise contours as a guide for land use and development decisions.

The City has adopted Community Noise Exposure Guidelines, which are depicted in Figure 5.10-1. Contours of 60 dB(A) or greater are noise impacted areas. When noise sensitive land uses are proposed within these contours, an acoustical analysis must be prepared. For the project to be approved, the analysis must demonstrate that the project is designed to attenuate noise to meet the City's noise standards as defined in Table 5.10-1. If the project is not designed to meet the noise standards, mitigation measures can be recommended in the analysis. If the analysis demonstrates that the noise standards can be met with implementation of the mitigation measures, the project can be approved with the mitigation measures required as conditions of project approval.

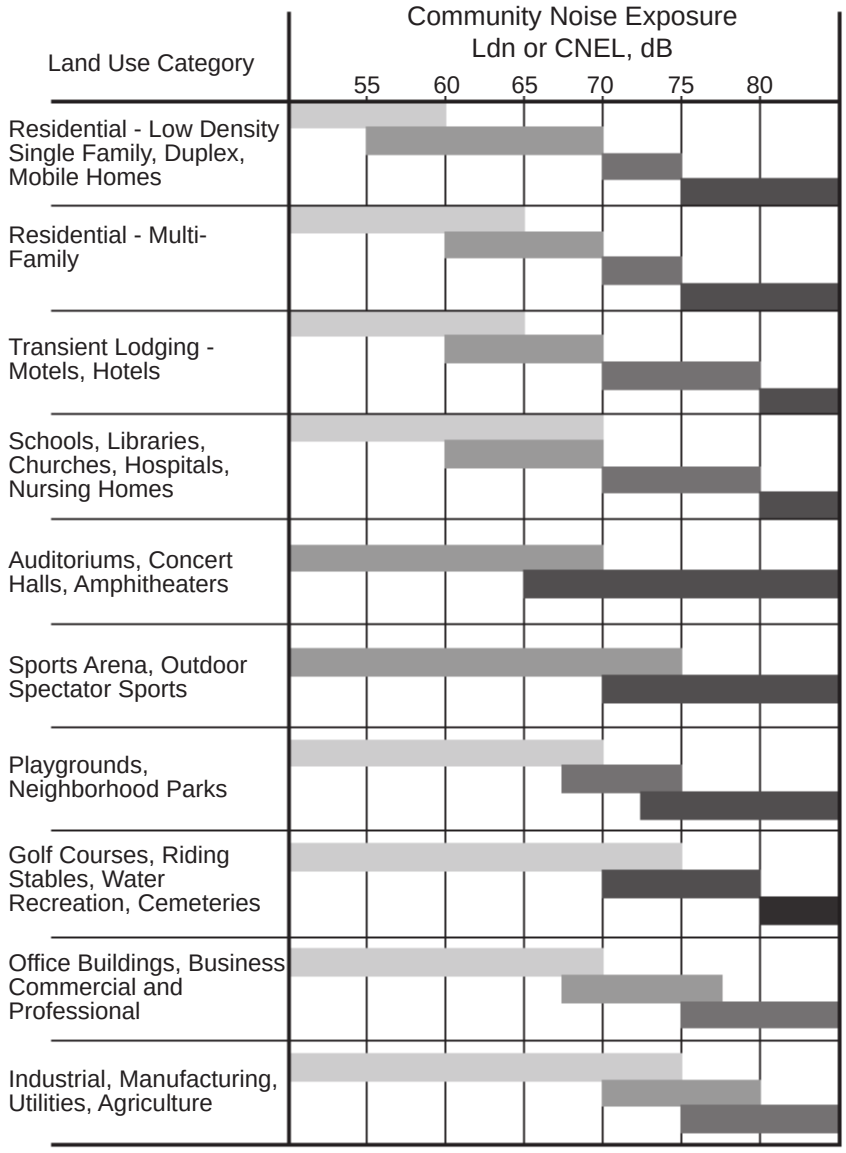
EXISTING NOISE CONDITIONS

The City of Laguna Hills is exposed to numerous noise sources that contribute to the ambient background noise experienced throughout the planning area. In the planning area, the most significant noise-producing source is transportation. This noise source consists of several elements: I-5, the SR-73 Toll Road, and major local roadways. Hence, the noise contours show higher levels along these transportation routes. Figure 5-10-2 depicts the existing noise contours generated by arterial roads within the planning area based on conservative contour modeling.

TRAFFIC NOISE

To identify baseline community noise conditions, 11 short-term noise measurements (30-minute to 1-hour) were taken within the planning area at select locations. The locations of the measurements are shown in Figure 5.10-2, and the results of the measurements are summarized in Table 5.10-3.

Equivalent sound levels (L_{eq}) are used to develop single-value descriptions of average noise exposure over various periods of time. Other average noise exposure values, such as CNEL, often include additional weighting factors for annoyance potential attributable to time of day or other considerations. Because freeways are such a constant source of noise, daytime hourly noise levels (L_{eq}) are typically within 2 dBA of the CNEL value. The results of the short-term measurements indicate an L_{eq} of 62 to 70 dBA at residences in the vicinity of I-5 and an L_{eq} of 52 in the vicinity of the SR-73 Toll Road. These short-term measurements are representative of typical hourly noise levels from these roadways. Based on conservative contour modeling, Figures 5.10-2 and 5.10-3 show that most of the residential areas within the planning area are currently exposed to a CNEL of 65 or greater. This level of exposure is considered conditionally acceptable for residential and institutional uses, such as schools, libraries, churches, hospitals, and nursing homes. However, the modeling does not account for changes in topography and the existence of buildings or other structures that reduce sound from traffic on major roadways and I-5. Therefore, in many instances, the actual level of exposure from this source of noise is less than that indicated by the contours shown on the two figures.



INTERPRETATION:

Normally Acceptable
Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

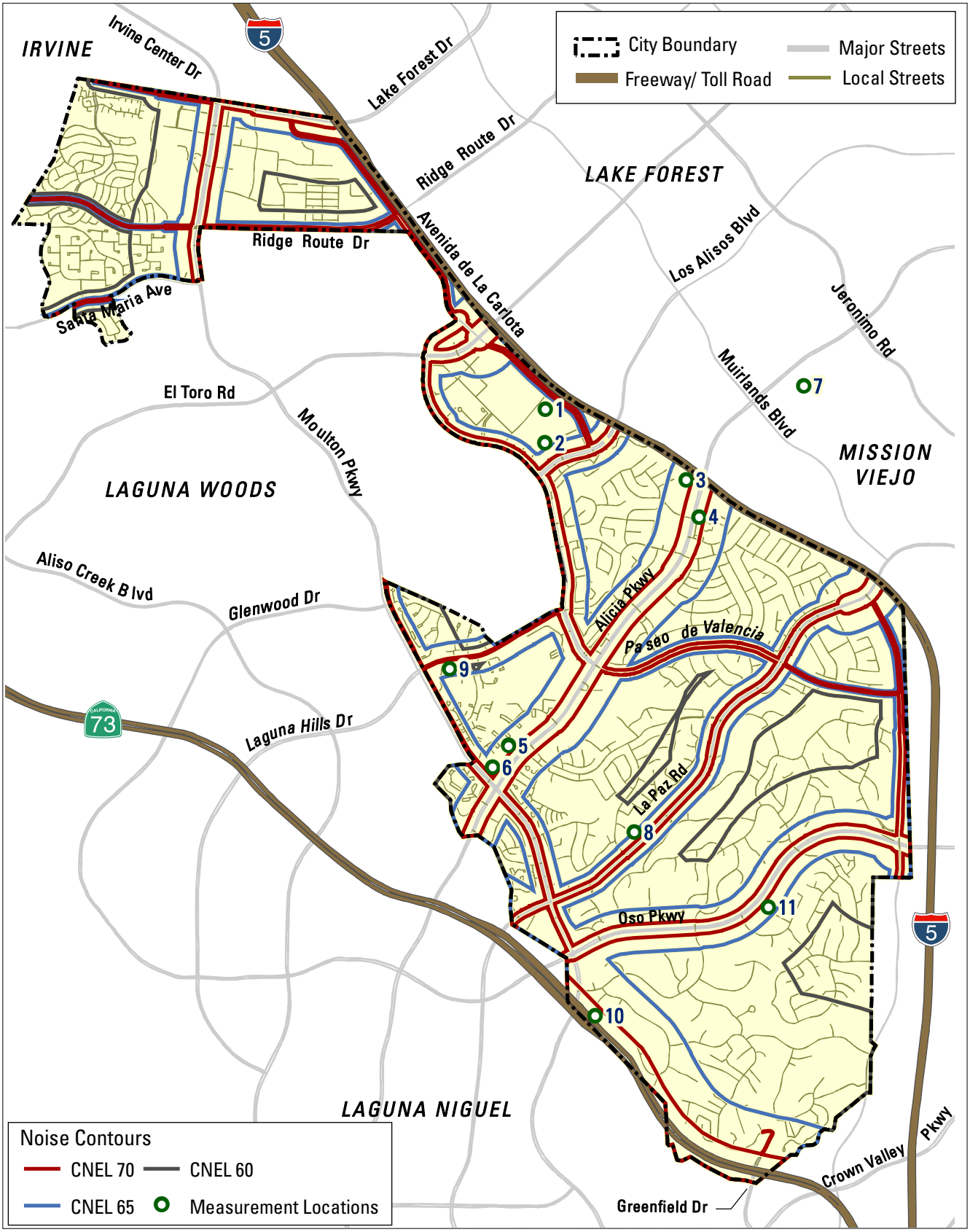
Conditionally Unacceptable
New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction but with closed windows and fresh air supply systems or air conditioning will normally suffice.

Normally Unacceptable
New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

Clearly Unacceptable
New construction or development should generally not be undertaken.

Source: OPR 2003

Figure 5.10-1
Laguna Hills Community Noise Exposure Guidelines



Source: Urban Crossroads, 2008.

Note: Noise Contours are based on flat terrain and hard surfaces.

0 0.25 0.5 1 Miles

Figure 5.10-2
Arterial Road Baseline Noise Contours

Note: Noise Contours are based on flat terrain and hard surfaces. Source: Urban Crossroads, 2008

0 0.25 0.5 1 Miles

Figure 5.10-3
2030 Noise Contours

Table 5.10-3
Short-Term Noise Measurements – October 2008

Site ID[1]	Location	Date	Time	dBA L_{eq}	dBA L_{max}	dBA L_{min}
1	Commercial Parking Lot, 150 feet south of I-5, 60 feet south of Avenida del la Carlota	10/14/08	1:50 p.m. – 2:20 p.m.	70	78	65
2	Commercial Parking Lot, 650 feet south of Avenida del la Carlota	10/14/08	2:30 p.m. – 2:50 p.m.	57	67	47
3	Commercial Parking Lot, 50 feet southeast of I-5 off-ramp at Alicia Parkway	10/14/08	10:30 a.m. – 10:55 a.m.	62	71	58
4	Commercial Parking Lot, 60 feet west of Alicia Parkway, 100 feet north of Bentley	10/14/08	11:10 a.m. – 11:40 a.m.	61	75	51
5	Residential Parking Lot, 50 west of Via Lomas	10/14/08	12:50 p.m. – 1:15 p.m.	55	78	39
6	Residential Parking Lot, approximately 70 feet north of Moulton Parkway	10/14/08	12:10 p.m. – 12:35 p.m.	62	74	47
7	275 feet east of Metrolink train tracks	10/14/08	3:40 p.m. – 4:40 p.m.	52	76	39
8	115 feet east of La Paz Road	10/14/08	9:35 a.m. – 10:05 a.m.	52	66	37
9	75 feet south of Aliso Viejo Parkway	10/29/08	12:20 p.m. – 1:20 p.m.	60	81	40
10	370 feet north of SR-73, 50 feet south of Westridge Lane	10/29/08	10:55 a.m. – 11:55 a.m.	52	70	41
11	Horse Riding Trail, 100 feet southwest of Oso Parkway	10/29/08	9:35 a.m. – 10:35 a.m.	58	74	41

[1] Site ID corresponds to locations shown in Figure 5.10-2.
Note: 30-minute to 1-hour noise level measurements were taken on October 14, 2008, and October 29, 2008.

RAILROAD NOISE

The Southern California Regional Rail Authority (SCRRA) rail line runs along the eastern boundary of the planning area from roughly Oso Parkway to La Paz Avenue. Noise generated by train traffic along the SCRRA rail line affects the planning area. Train traffic generates a CNEL of 60 dBA at a distance of about 800 feet from the rail line, and a CNEL of 65 dBA approximately 250 feet from the rail line, and 70 CNEL approximately 100 feet from the rail line. These CNEL levels are consistent with the City's Community Noise Exposure Guidelines (see Figure 5.10-1).

AIRPORT NOISE

The planning area is not located within an airport land use plan or within 2 miles of a public airport or public use airport. The planning area is not located within the vicinity of a private airstrip. Airport noise is not addressed further in this section.

5.10.2 REGULATORY FRAMEWORK

Regulations applicable to noise are presented above in the noise standards section to provide context for the discussion of existing noise conditions.

5.10.3 THRESHOLDS FOR DETERMINING SIGNIFICANCE

Based on Appendix G of the CEQA Guidelines, a significant impact related to noise would occur if implementation of the General Plan would:

- Expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Expose persons to or generate excessive groundborne vibration or groundborne noise levels;
- Create a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project; or
- Create a substantial temporary or periodic increase in ambient noise levels in the project vicinity about levels existing without the project.

5.10.4 ANALYSIS OF ENVIRONMENTAL IMPACTS

COMPLIANCE WITH NOISE STANDARDS

Noise is particularly problematic when noise sensitive land uses are affected. Noise sensitive land uses are defined as uses that typically experience or require low levels of noise, such as residential uses, schools, hospitals, churches, performing arts facilities, and hotels. The City of Laguna Hills deems residential uses particularly noise sensitive because families and individuals expect to use time in the home for quiet rest. Variability in standards for noise sensitivity applies to different densities of residential development, specifically infill and mixed use developments; residential uses are considered the most noise sensitive.

The City's Community Noise Exposure Guidelines, listed in Figure 5.10-1, provide the basis for evaluating potential conflicts between land use and noise. Future projects pursuant to General Plan land use policy will be considered compatible with the noise environment if noise levels in the area where the project will be constructed fall within the "normally acceptable" or "conditionally acceptable" noise exposure levels. If the anticipated noise environment is categorized as "normally acceptable," no mitigation is typically needed. If the anticipated noise level falls within the "conditionally acceptable" range, minor mitigation may be required to meet City and Title 24 noise standards. If the noise level falls within the "normally unacceptable" range, substantial mitigation may be necessary to meet City noise standards. Project-specific mitigation could include construction of noise barriers and/or the inclusion of substantial building sound insulation. If noise levels fall within or above the "clearly unacceptable" level, the project is incompatible with the noise environment, and new construction of the particular land use should not be undertaken.

Development of land uses by 2030 pursuant to the General Plan would result in an increase of 475 dwelling units and approximately 1,031,530 square feet of nonresidential building floor area over existing conditions. A net population increase of approximately 1,229 persons is also anticipated by 2030. New development pursuant to the General Plan will generate additional traffic that will increase noise levels along the roadway network, and traffic noise will continue to represent the primary sources of noise in the community. In addition, increasing mixed use development will place more sensitive residential uses alongside or above commercial uses, which could result in exposure of persons to, or generation of, noise levels in excess of standards established within the City's noise and land use compatibility guidelines. For example, residential development may occur in the vicinity of commercial uses in the Urban Village and Alicia Gateway as part of mixed use developments anticipated under the General Plan. This represents a potentially significant impact.

Noise contour modeling was performed, based upon projected future traffic volumes provided by Austin-Foust Associates, Inc., to determine future noise conditions. The traffic study is included in Appendix E of this Program EIR.

As shown in Figure 5.10-3, future noise levels along major streets are projected to range from approximately 60 to 70 CNEL. In most portions of the community, the 60, 65 and 70 CNEL noise contours are projected to expand beyond current conditions. Although some roadway segments could experience a decrease, wide-ranging variability exists across the roadway network. As a result, new development pursuant to the General Plan could conflict with adopted noise standards. This is considered a significant impact.

Mitigation Measures N-1, N-2, and N-3 are proposed to address this impact. Mitigation Measure N-1 requires that proposed projects avoid conflicts between land use and noise as outlined in Figure 5.10-1. Mitigation Measure N-2 requires that proposed residential projects comply with the California Noise Insulation Standards listed in Table 5.10-1 to limit indoor noise levels within dwelling units. Mitigation Measure N-3 requires that proposed projects with the potential to generate noise do not adversely affect sensitive receptors. Implementation of Mitigation Measures N-1, N-2, and N-3 would reduce this impact to a level less than significant.

GROUNDBORNE VIBRATION OR NOISE

Common sources of groundborne vibration include trains, buses on rough roads, and construction activities such as blasting, pile driving, and operating heavy earth-moving equipment (Harris Miller Miller & Hanson, Inc. 1995). Groundborne vibration and/or noise that may occur within the planning area may include vibration and noise generated by railways, nighttime entertainment, and construction activity. Long-term implementation of the General Plan could expose persons to excessive groundborne vibration and/or noise. Mixed use projects present unique concerns, such as when restaurants with nighttime entertainment are located close to residential units. For example, residential development may occur in the vicinity of commercial uses in the Urban Village and Alicia Gateway as part of mixed use developments anticipated under the General Plan. In addition, construction-related activities may be short-term sources of groundborne noise that could affect occupants of neighboring uses. These are potentially significant impacts, and mitigation is required.

Mitigation Measures N-1, N-2, and N-4 are proposed to address this impact. Mitigation Measure N-1 requires that proposed projects avoid conflicts between land use and noise as outlined in Figure 5.10-1. Mitigation Measure N-2 requires that proposed residential projects comply with the California Noise Insulation Standards listed in Table 5.10-1 to limit indoor noise levels within dwelling units. Mitigation Measure N-4 requires all construction activity to comply with the limits (maximum noise levels, hours, and days of allowed activity) established in City noise regulations to reduce impacts associated with temporary construction noise to the extent feasible. Implementation of Mitigation Measures N-1, N-2, and N-4 would reduce this impact to a level less than significant.

PERMANENT AMBIENT NOISE LEVELS

Development of land uses by 2030 pursuant to the General Plan would result in an increase of 475 dwelling units and approximately 1,031,530 square feet of nonresidential building floor area over existing conditions. A net population increase of approximately 1,229 persons is also anticipated by 2030. New development pursuant to the General Plan will generate additional traffic that will increase noise levels along the roadway network, and traffic will continue to represent the primary sources of noise in the community.

As mentioned above, noise contour modeling was performed, based upon projected future traffic volumes provided by Austin-Foust Associates, Inc., to determine future noise conditions. The traffic study is included in Appendix E of this Program EIR.

As shown in Figure 5.10-3, future noise levels along major streets are projected to range from approximately 60 to 70 CNEL. In most portions of the community, the 60, 65 and 70 CNEL noise contours are projected to expand beyond current conditions. Although some roadway segments could experience a decrease, wide-ranging variability exists across the roadway network. As a result, new development pursuant to the General Plan will increase permanent ambient noise levels within the planning area. This is considered a significant impact.

Mitigation Measure N-1 is proposed to address this impact. Mitigation Measure N-1 requires that proposed projects avoid conflicts between land use and noise as outlined in Figure 5.10-1. This mitigation measure also requires acoustical analysis for projects that may result in increases in traffic. For those projects that result in conflicts with existing noise standards, the City may require landscaped berms, barriers, walls, enhanced parkways, increased parkways, and other sound attenuating architectural design and construction methods. Implementation of Mitigation Measure N-1 would reduce this impact to a level less than significant.

TEMPORARY OR PERIODIC INCREASES IN AMBIENT NOISE LEVELS

Long-term implementation of the General Plan creates capacity for redevelopment and infill within the planning area, which could result in temporary or periodic increases in ambient noise levels due to construction activities. Construction equipment generates high levels of intermittent noise ranging from 70 dBA to 105 dBA. Thus, construction activity will result in a significant impact where noise-sensitive land uses are adjacent to construction sites. This is a potentially significant impact and mitigation is required.

Mitigation Measures N-4 is proposed to address this impact. Mitigation Measure N-4 requires all construction activity to comply with the limits (maximum noise levels, hours, and days of allowed activity) established in City noise regulations to reduce impacts associated with temporary construction noise to the extent feasible. Implementation of Mitigation Measure N-4 would reduce this impact to a level less than significant.

5.10.5 MITIGATION MEASURES

Implementation of the following programmatic mitigation measures, derived largely from the General Plan Implementation Program, will reduce potential impacts to a less than significant level at this Program EIR level of analysis. Individual development projects will be required to undergo project-specific environmental review and mitigation measures will be identified to reduce any significant impacts. Mitigation for significant environmental impacts of each future development project shall include the following: (1) objective of the measure; (2) specific standards or measures to be applied, along with any needed contingency measure; (3) responsible party; (4) location; (5) schedule for initiation; and (6) how the measure will reduce the associated environmental impact.

N-1 The City shall review development proposals to ensure that the noise standards and compatibility criteria set forth in the Noise Element are met. The City shall consult Noise Element guidelines and standards for noise compatible land uses to determine the suitability of proposed developments relative to existing and forecasted noise levels. The City shall enforce California Title 24 Noise Standards to ensure an acceptable interior noise level of 45 dBA CNEL in habitable rooms.

The City shall require acoustical analysis for all discretionary projects where any of the following apply:

1. The project will create or impact noise sensitive land uses and is located within the existing or future 60 dbA CNEL or higher contour.
2. The project will add more than 10 percent to the volume of average daily traffic of any arterial street.
3. The project will add 1,000 or more vehicles in the peak hour on adjacent roadways.
4. The project will introduce noise or vibration sources associated with mechanical equipment operations, entertainment, maintenance, and facility operations.
5. The project is a proposed residential use in the vicinity of existing and proposed commercial areas.
6. The project is a mixed use development that includes a residential component. The focus of this type of acoustical study is to determine likely interior and exterior noise levels and recommend appropriate design features to reduce noise.

The City shall require mitigation measures, where necessary, to reduce noise levels to meet the adopted standards and criteria. Such measures may include landscaped berms, barriers, walls, enhanced parkways, increased parkways, and other sound attenuating architectural design and construction methods. The City will only permit new development if adopted noise standards and regulations can be met. **(Implementation Program N-1)**

N-2 The City shall implement provisions of the California Noise Insulation Standards (Title 24) that specify that indoor noise levels for multi-family residential living spaces shall not exceed 45 dB CNEL. The standard is defined as the combined effect of all noise sources and is implemented when existing or future exterior noise levels exceed 60 dB CNEL. Title 24 further requires that the standard be applied to all new hotels, motels, apartment houses, and dwellings other than single-family dwellings. The City shall also apply this standard to single-family dwellings and condominium conversion projects. **(Implementation Program N-3)**

N-3 The City shall review the locations of proposed projects with the potential to generate noise in relation to sensitive receptors through the discretionary project review process. The City shall limit delivery or service hours for stores and businesses with loading areas, docks, or trash bins that gain access on driveways next to residential and other noise sensitive areas. The City shall only approve exceptions if full compliance with the nighttime limits of the noise regulations is achieved. **(Implementation Program N-4)**

N-4 The City shall require all construction activity to comply with the limits (maximum noise levels, hours, and days of allowed activity) established in City noise regulations to reduce impacts associated with temporary construction noise to the extent feasible. Trucks associated with construction activities shall follow designated truck routes, where appropriate.

5.10.6 IMPACT AFTER MITIGATION

COMPLIANCE WITH NOISE STANDARDS

Implementation of Mitigation Measures N-1, N-2, and N-3 identified above would avoid and/or reduce impacts associated with existing noise standards to a level less than significant.

GROUNDBORNE VIBRATION OR NOISE

Implementation of Mitigation Measures N-1, N-2, and N-4 identified above would reduce impacts associated with groundborne vibration or noise to a level less than significant.

PERMANENT AMBIENT NOISE LEVELS

Implementation of Mitigation Measure N-1 identified above would reduce impacts associated with permanent ambient noise to a level less than significant.

TEMPORARY OR PERIODIC INCREASES IN AMBIENT NOISE LEVELS

Implementation of Mitigation Measure N-4 identified above would reduce impacts associated with potential temporary or periodic increases in ambient noise levels to a level less than significant.

5.11 POPULATION AND HOUSING

This section describes existing population, housing, and employment characteristics within the planning area and evaluates the potential impacts on population and housing that could result from implementation of the General Plan.

5.11.1 ENVIRONMENTAL SETTING

POPULATION

Laguna Hills experienced substantial population growth and construction of new homes during the late 1970s and mid-1980s. Table 5.11-1 depicts population growth in Laguna Hills and Orange County from 1980 through 2008. As vacant land for development became scarce in other parts of Orange County, growth shifted to the southern areas of the County, triggering a large surge in population growth (129 percent) within Laguna Hills between 1980 and 1990. Between 1990 and 2000, population growth within the City slowed to a more moderate pace, at about 36 percent for the decade. According to the U.S. Census Bureau, the population of Laguna Hills was 31,178 in 2000. Table 5.11-2 depicts estimated population growth between 2000 and 2008 within Laguna Hills and the region. The California Department of Finance (CDF) estimates that the population was 33,421 as of January 2008, an increase of approximately 7 percent. The majority of the population growth is attributed to the "Westside Annexation," which occurred in September 2000. The annexation added approximately 149 acres of residential land to the City and 1,800 residents. Even with the Westside Annexation, the population growth rate in all of the cities surrounding Laguna Hills was greater than that of Laguna Hills, with the exception of Mission Viejo. The population growth rate in Orange County was also higher than that of Laguna Hills during this period.

Table 5.11-1
City of Laguna Hills and Orange County Population – 1980 through 2008

	Laguna Hills		Orange County	
Year	Population	% Change	Population	% Change
1980	12,181	N.A.	1,932,709	N.A.
1990	27,888	129.0%	2,410,556	24.7%
2000	31,178	35.9%	2,846,289	18.1%
2008*	33,421	7.2%	3,121,251	9.7%

*Population Estimates
N.A. = not applicable
Sources: California Department of Finance 2008; Center for Demographic Research 2007; City of Laguna Hills 1994; and U.S. Census Bureau 2000

Table 5.11-2
Population Growth Trends

	2000	2008	Percent Change 2000-2008
Laguna Hills	31,178	33,421	7.2
Aliso Viejo	40,166*	45,249	12.7
Mission Viejo	93,102	98,572	5.9
Laguna Woods	16,507	18,442	11.7
Laguna Niguel	61,891	66,877	8.1
Lake Forest	58,707	78,317	33.4
Orange County	2,846,289	3,121,251	9.7

*Data is for Aliso Viejo Census Designated Place (CDP) because Aliso Viejo was unincorporated until 2001.
Sources: U.S. Census Bureau 2000; California Department of Finance 2008

HOUSING

The 2000 Census reported that Laguna Hills had 10,366 housing units. Originally, the Census reported that Laguna Hills had 11,303 housing units, but subsequently revised this figure downward by 937 housing units to 10,366. On January 1, 2008, the CDF reported that Laguna Hills had a total of 11,153 housing units. From 2000 to 2008, the housing stock increased in Laguna Hills by approximately 787 units (about 7.6 percent). The majority of the increase in housing units is attributed to the Westside Annexation, which added over 770 single-family, single-family attached, and multi-family housing units to the planning area. A survey conducted by the City and their consultants documented that a total of 11,186 housing units existed within the planning area as of 2008.

EMPLOYMENT

Employment data from 2005 are the most recent data available at the City level. According to Southern California Association of Governments (SCAG) data, approximately 25,308 jobs were located in the City in 2005 (Stanley R. Hoffman Associates 2007). Based on the CDF housing stock reported above, this indicates a jobs/housing ratio of 2.27 jobs per housing unit. This ratio is consistent with the City's goal of promoting sustainable economic development and fiscal health. From a regional perspective, SCAG growth projections estimated that Orange County's population was 3,100,000 in the year 2005. SCAG's 2005 growth projections also estimated that Orange County had 978,000 households and 1,580,000 jobs, resulting in a jobs/housing ratio of 1.6 jobs per household. As a whole, the five-county SCAG region has a current jobs/housing ratio of 1.36.

5.11.2 REGULATORY FRAMEWORK

In this Program EIR, the regulatory framework discussion provides a summary of the applicable federal, state, and local laws, regulations, plans, or policies that are relevant to each environmental issue area and, therefore, must be considered by the City of Laguna Hills in the decision-making process. No applicable federal, state, or local laws, regulations, plans, or policies that are relevant to the environmental analysis of population and housing impacts were identified. Therefore, the regulatory framework relevant to population and housing is not discussed further in this Program EIR.

5.11.3 THRESHOLDS FOR DETERMINING SIGNIFICANCE

Based on Appendix G of the CEQA Guidelines, a significant impact related to population and housing would occur if implementation of the General Plan would:

- Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure);
- Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere; or
- Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.

5.11.4 ANALYSIS OF ENVIRONMENTAL IMPACTS

INDUCE SUBSTANTIAL POPULATION GROWTH

Direct Impacts

Population, housing, and employment estimates for 2030 have been developed based on land use changes expected to occur as a result of implementation of the General Plan. New development pursuant to the General Plan could result in approximately 457 new dwelling units (450 multi-family units and 7 single-family units) in the planning area. A total of 11,610 dwelling units is expected in 2030, which represents a 4.1 percent increase over existing conditions. Based on estimates of 3.22 persons per household for single-family units and 2.68 persons per household for multi-family units, a net population increase of approximately 1,229 persons (from 33,421 to 34,650) is expected by 2030 (Stanley R. Hoffman Associates 2008). This represents a 3.7 percent increase by 2030.

The *2008 Regional Transportation Plan: Growth Forecast Report* (Growth Forecast Report; SCAG 2008) provides demographic projections for jurisdictions within the SCAG region, including the City of Laguna Hills. It should be noted that forecasts such as the one prepared for the Growth Forecast Report are prepared as planning tools and do not regulate the course of future events. SCAG's forecasts, which are based on adopted general plan land use policies for jurisdictions, among other factors, are used primarily to prepare the Regional Transportation Plan (RTP) and to provide inputs into air quality management plans. These forecasts are typically most reliable at the regional and county level and less so for smaller areas like cities and census tracts.

The City's 2008 housing stock survey documented 11,186 housing units within the planning area. SCAG anticipates that the City of Laguna Hills will have 11,159 households and 36,210 residents by 2030 (SCAG 2008). Table 5.11-3 summarizes existing housing stock values by data source and compares those values to SCAG's 2030 housing projections. When compared to the total 2008 housing stock documented by the City, SCAG projections for 2030 indicate a total dwelling unit decrease of 27 units. When compared to the total number of housing units within the planning area reported by CDF as of January 1, 2008 (11,153 housing units), SCAG projections for 2030 indicate a total dwelling unit increase of 6 units over existing conditions. When compared to SCAG's estimate of total number of households within the planning area in 2005, SCAG projections for 2030 indicate a total dwelling unit increase of 301 units. In addition, when compared to the population estimate for Laguna Hills reported by CDF as of January 2008, SCAG projects an 8.3 percent increase in population over the current population of 33,421 by 2030.

Table 5.11-3
Comparison of Existing Housing Stock Estimates to SCAG 2030 Projections

Existing Housing Data Source	Existing Housing	SCAG 2030 Household Projections	Change in Total Number of Housing Units by 2030
City of Laguna Hills Housing Stock Survey, 2008	11,186	11,159	(-27)
California Department of Finance, 2008	11,153	11,159	6
SCAG 2008 Regional Transportation Plan	10,858*	11,159	301

*Projection is for 2005 because SCAG projections are available in 5-year increments.
Sources: City of Laguna Hills, 2008; California Department of Finance, 2008; SCAG, 2008.

While discrepancies exist between General Plan projections and SCAG projections, it should be noted that General Plan projections are based on proposed land use changes and are intended chiefly for environmental analysis purposes within this Program EIR. Because the majority of proposed land use changes are designated as mixed use (Neighborhood Mixed Use and Village Commercial), the actual population, housing, and employment changes that are generated will ultimately depend on project-specific development within the planning period.

The projected population increase by 2030 ranges from approximately 3.7 percent (based on General Plan land use changes) to 8.3 percent (SCAG projections). General Plan and SCAG estimated population increases represent a modest level of growth and do not constitute substantial population growth. Likewise, projected increases in the total number of dwelling units will range from negligible (6 units according to SCAG) to 4.1 percent (based on the General Plan).

Implementation of the General Plan is expected to result in an increase of approximately 1,031,530 square feet of nonresidential building floor area by 2030. Based on proposed land use changes, implementation of the General Plan is estimated to result in an increase of 2,677 jobs (from 25,308 to 27,677) by 2030 (Stanley R. Hoffman Associates 2008), which represents a 10.6 percent increase over 2005 estimates. SCAG projects a total of 28,893 jobs by 2030, which represents a 14.2 percent increase over existing conditions.

Jobs and housing projections based on proposed land use changes would result in a ratio of 2.38 jobs per housing unit in 2030, whereas the jobs housing ratio is currently estimated at 2.27. Because employment is estimated to grow faster than housing opportunities (based on an estimated 10.6 percent increase in employment and a 4.1 percent increase in housing), the planning area could experience an increase in commuters. However, land use changes anticipated under the General Plan are not expected to significantly impact traffic circulation patterns, as discussed in Section 5.14, Transportation and Circulation. As described in Section 5.14, while certain study intersections would experience a higher volume of traffic when compared to existing conditions, none of these intersections would exceed the performance standard or surpass the established thresholds of significance. In addition, because employment is expected to increase at a higher rate than housing during the planning horizon, high employment growth could potentially indirectly induce population growth. However, because the majority of proposed land use changes are designated as mixed use, the actual population, housing, and employment changes that are generated will ultimately depend on project-specific development within the planning period.

While new residential units and jobs are expected to be developed under the General Plan, implementation of the General Plan will not directly induce a substantial increase in housing or associated population growth and thus will not result in a significant impact. No mitigation is required.

Indirect Impacts

Because the planning area is almost entirely built out, most roads and other infrastructure are currently in place and few improvements and/or extensions are expected under implementation of the General Plan. In addition, any improvements and/or extensions of roads and other infrastructure that may occur would be sized to serve only new development anticipated under the General Plan. No roads or other infrastructure would be extended into areas that are not currently served. The General Plan would not cause significant indirect population impacts because population growth would be within projected capacity for the planning area. While some road and infrastructure improvements may occur under the General Plan, implementation of the General Plan will not indirectly induce substantial housing or associated population growth and thus will not result in a significant impact. No mitigation is required.

DISPLACE SUBSTANTIAL NUMBERS OF EXISTING HOUSING OR PEOPLE

The General Plan anticipates the redevelopment of an existing residential area, Via Lomas. The area is designated Planned Community ~~Via Lomas~~Residential, which will allow a maximum of 600 dwelling units through a variety of different densities. Redevelopment of this area is expected to result in an increase of 250 dwelling units over existing conditions.

Residential development may also occur in the Urban Village and Alicia Gateway as part of mixed use developments anticipated under the General Plan. However, no residential development currently exists within these areas. Thus, future residential development under the General Plan would not result in the displacement of existing housing or people.

The General Plan also identifies several future study areas that have been considered for revitalization in the future. No residential development currently exists within these areas. The General Plan does not change any of the land use designations in the areas identified as future study areas. However, opportunities exist to redevelop, improve, or intensify some of the land uses in the future study areas, including residential development.

As outlined above, redevelopment proposed under the General Plan that may affect existing residential development is limited to those activities that would increase or maintain the existing housing stock. In addition, most areas proposed for redevelopment do not currently contain residential development. Thus, implementation of the General Plan will not displace substantial numbers of existing housing or people and will not result in a significant impact. No mitigation is required.

5.11.5 MITIGATION MEASURES

Impacts to population and housing would be less than significant. No mitigation is required.

5.11.6 IMPACT AFTER MITIGATION

INDUCE SUBSTANTIAL POPULATION GROWTH

Implementation of the General Plan is not expected to induce substantial population growth. Impacts would be less than significant without mitigation.

DISPLACE SUBSTANTIAL NUMBERS OF EXISTING HOUSING OR PEOPLE

Implementation of the General Plan is not expected to displace substantial numbers of existing housing or people. Impacts associated with the displacement of existing housing or people would be less than significant without mitigation.

This page intentionally left blank.

5.12 PUBLIC SERVICES AND UTILITIES

This section describes the public services and utilities that would serve the planning area. Specifically, this section includes an examination of fire protection and emergency medical services, police services, schools, libraries, water infrastructure, wastewater service, solid waste service, stormwater and drainage facilities, and electrical and natural gas services. Each subsection includes descriptions of existing facilities, service standards, potential environmental impacts resulting from implementation of the General Plan, and mitigation measures where appropriate.

5.12.1 ENVIRONMENTAL SETTING

FIRE PROTECTION AND EMERGENCY MEDICAL SERVICES

The Orange County Fire Authority (OCFA) is contracted to provide fire protection and emergency services to Laguna Hills. OCFA provides fire suppression services, and emergency medical, rescue, and fire prevention services for the City, as well as 22 additional cities and the unincorporated areas within the County. In addition, OCFA has an inspection service section that conducts fire safety inspections and enforces applicable fire codes and ordinances in Laguna Hills.

The City of Laguna Hills is served by Fire Station #22, located on Paseo de Valencia in nearby Laguna Woods (Figure 5.12-1). This fire station contains 39 staff members, including 3 battalion chiefs, 9 captains, 9 engineers, and 18 firefighters (OCFA 2008a). The firefighter to population ratio is 0.75 firefighters per 1,000 persons in Laguna Hills. Fire Station #22 also has two fire engines (E22 and E222), one truck (T22), and one battalion command vehicle. In 2007, Station #22 responded to over 8,900 calls, of which, 70 percent were emergency medical calls (OCFA 2008b). Table 5.12-1 provides detailed information pertaining to the number and types of calls each unit responded to in 2007.

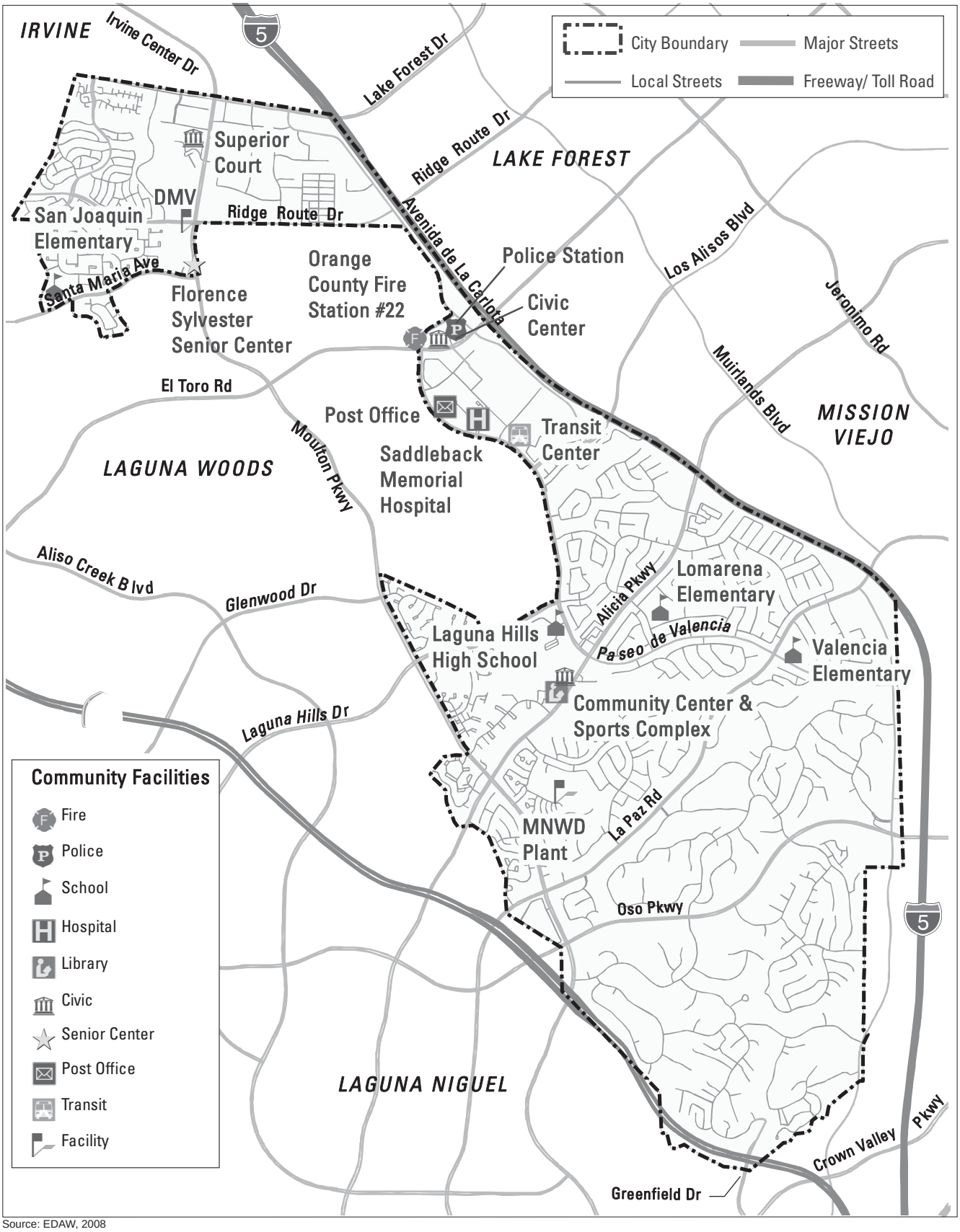
Table 5.12-1
Fire Station # 22 Service Call Information (2007)

	Type of Service Call			
Fire Unit (Vehicle)	**Medical Calls (EMS)**	**Fire**	**Other**	**Total Incidents**
E22	2,696	74	830	3,600
E222	2,964	80	608	3,652
T22	598	162	896	1,656
Totals	***6,258***	***316***	***2,334***	***8,908***

Source: OCFA 2008b

The OCFA response goal is for the first engine to reach the emergency scene within 7 minutes and 20 seconds 80 percent of the time (OCFA 2008b). This response time is measured from the time the dispatcher picks up the call to the time the first engine arrives on scene. The aforementioned service standard/response goal is the same for emergency medical calls. In the event of a medical emergency, OCFA transports patients to the Saddleback Memorial Medical Center located off Paseo de Valencia behind the Laguna Hills Mall.

Additional fire stations in surrounding cities are available to assist Station #22 with supplemental resources in an event of great need (OCFA 2008b). Table 5.12-2 provides a list of additional fire stations within the vicinity of Laguna Hills.



Source: EDAW, 2008

0 0.25 0.5 1 Miles

Figure 5.12-1
Location of Community and Public Facilities

Table 5.12-2
Fire Stations near Laguna Hills

Station Name	Location	Distance from Laguna Hills (miles)
OCFA Fire Station # 22 Laguna Hills	24001 Paseo de Valencia Laguna Woods, CA 92637	0.9 North
OCFA Fire Station # 57 Aliso Viejo	57 Journey Aliso Viejo, CA 92656	2.3 Southwest
OCFA Fire Station # 19 Lake Forest	23022 El Toro Rd Lake Forest, CA 92630	2.3 Northeast
OCFA Fire Station # 39 No. Laguna Niguel	24241 Avila Rd Laguna Niguel, CA 92677	2.6 South
OCFA Fire Station # 24 Mission Viejo	25862 Marguerite Pkwy Mission Viejo, CA 92692	3.0 East
OCFA Fire Station # 51 Irvine Center Dr	18 Cushing Irvine, CA 92618	3.3 Northwest
OCFA Fire Station # 9 So. Mission Viejo	26312 Via Curacion Mission Viejo, CA 92691	3.8 Southeast
OCFA Fire Station # 38 Irvine	26 Parker Irvine, CA 92618	4.1 North
Laguna Beach Fire Station #3	2900 Alta Laguna Blvd Laguna Beach, CA 92651	4.5 Southwest

Source: OCFA 2008

POLICE PROTECTION

The City contracts its law enforcement services through the Orange County Sheriff's Department (OCSD). OCSD personnel are responsible for general patrol, traffic enforcement, traffic collision, and criminal investigation. The OCSD assigns a Chief of Police Services to oversee a staff of 27 sworn officers and 3 full-time equivalent administrative staff members who operate locally from the Laguna Hills Police Service substation, located at 24035 El Toro Road (Figure 5.12-1).

The OCSD classifies calls according to the four priority levels described below:

- Priority 1 (P1) – Includes criminal or noncriminal situations where there is an immediate danger of injury to persons.
- Priority 2 (P2) – Includes serious crimes that just occurred where no one is in immediate danger or the suspect(s) have left; any incident likely to escalate to a crime against a person; any incident where a delay in response would likely impede further investigation or cause anyone to be in jeopardy.
- Priority 3 (P3) – Includes most report calls, crimes where suspects have left or late reported crimes; child or property exchange; noninjury collision, suspicious persons.
- Priority 4 (P4) – Includes nonemergency incidents where the informant wants no contact, parking problems, loud music or parties where there is no immediate danger.

The OCSD's service standard is to respond to all Priority 1 calls within 5 minutes from the time of dispatch to arrival, 12 minutes for Priority 2 calls, and 20 minutes for Priority 3 and 4 calls. Response times continue to remain within these expected parameters for all four levels (City of Laguna Hills 2007). In addition, the provision of preventative patrol time ranges between 40 percent and 50 percent of an officer's workday (OCSD 2008a).

The Laguna Hills sheriff's station receives approximately 13,000 calls for service annually, while the number of crimes has remained relatively consistent over the previous 8 years (OCSD 2008b). Table 5.12-3 provides year-to-date crime statistics in Laguna Hills for 2007 and 2008. As shown, violent crime, including homicide, rape, and assault, has decreased while property crime has increased. Overall, occurrences of criminal activities have decreased by 9 percent from 2007 to 2008.

Table 5.12-3
Crime Statistics in Laguna Hills – 2007 and 2008 (YTD)

Year	Month	Homicide	Rape	Robbery	Assault	Burglary	Larceny	Auto Theft	Monthly Total
2007	Jan	0	1	0	4	18	43	3	69
	Feb	0	0	0	0	15	29	1	45
	Mar	0	0	3	3	14	32	1	53
	Apr	0	0	1	0	21	29	0	51
	May	0	0	0	2	22	51	7	82
	Jun	0	1	1	3	8	28	1	42
	Jul	0	1	0	13	8	42	1	65
	Aug	0	1	1	1	10	35	6	54
	Sep	0	1	2	3	4	37	2	49
	Oct	0	0	4	4	7	41	2	58
	Total	***0***	***5***	***12***	***33***	***127***	***367***	***24***	***568***
2008	Jan	0	0	1	0	5	28	1	35
	Feb	0	0	1	2	2	43	3	51
	Mar	0	0	2	6	12	47	2	69
	Apr	0	0	2	3	14	47	1	67
	May	0	0	0	2	6	35	6	49
	Jun	0	0	1	1	5	39	3	49
	Jul	0	0	0	1	10	43	3	57
	Aug	0	0	2	3	13	33	7	58
	Sep	0	0	0	2	9	32	0	43
	Oct	0	0	0	2	8	24	1	35
	Total	***0***	***0***	***9***	***22***	***84***	***371***	***27***	***513***
	Change	**0**	**-5**	**-3**	**-11**	**-43**	**4**	**3**	**-55**
	%	**N/C**	**-100%**	**-25%**	**-33%**	**-33%**	**1%**	**12%**	**-9%**

Source: OCSD 2008

Furthermore, the crime rate in the planning area has continually decreased since 2005 and the increase in population pursuant to the General Plan is not anticipated to increase crime within the planning area (OCSD 2008a).

SCHOOLS

Public schools serving students in the Laguna Hills planning area operate within the Saddleback Valley Unified School District (SVUSD). SVUSD has 26 elementary schools, 4 intermediate schools, 4 high schools, 1 continuation high school, 1 independent study high school, and 1 special education school. Four SVUSD schools are located within and serve the City Laguna Hills: Valencia Elementary School, Lomarena Elementary School, San Joaquin Elementary School, and Laguna Hills High School (Figure 5.12-1). The nearest junior high school is La Paz Intermediate School in Mission Viejo. Some residents of Laguna Hills may also have children attending de Portola Elementary School or Los Alisos Intermediate School. Table 5.12-4 provides the location, student enrollment, and capacity for the aforementioned schools. None of the schools listed below are overcrowded; however, it is unlikely that Lomarena

Elementary and Valencia Elementary would have adequate space available for any students that do not reside within the planning area (SVUSD 2008).

Table 5.12-4
Public Schools Serving Laguna Hills
Enrollment and Capacity (2007-2008)

School Name	Location	Grades Served	Enrollment	Facility Capacity*	Percent of Capacity
Valencia Elementary School	25661 Paseo de Valencia Laguna Hills, CA 92653	K-6	671	738	91%
Lomarena Elementary School	25100 Earhart Rd. Laguna Hills, CA 92653	K-6	519	584	88%
San Joaquin Elementary School	22182 Barbera Laguna Hills, CA 92653	K-6	620	703	88%
Laguna Hills High School	25401 Paseo de Valencia Laguna Hills, CA 92653	9-12	1,838	2,304	80%
La Paz Intermediate School	25151 Pradera Dr. Mission Viejo, CA 92691	7-8	1,132	1,291	88%
de Portola Elementary School	27031 Preciados Dr. Mission Viejo, CA 92691	K-6	574	667	86%
Los Alisos Intermediate School	25171 Moor Ave. Mission Viejo, CA 92691	7-8	1,088	1,265	86%

* Facility capacities are fluid due to adjustments in state budget and changes in teacher-to-student ratios.
Source: SVUSD 2008

Table 5.12-5 describes the school site characteristics of the facilities serving the planning area.

Table 5.12-5
Public School Site Characteristics

School Name	Portable Classrooms	Acreage	Building Area (square feet)	Year Constructed
Valencia Elementary School	0	10.6	62,488	1969
Lomarena Elementary School	5	9.2	42,196	1974
San Joaquin Elementary School	13	10.0	36,649	1974
Laguna Hills High School	19	51.8	134,930	1978
La Paz Intermediate School	8	23.9	62,488	1969
de Portola Elementary School	Information requested but not provided by school district			
Los Alisos Intermediate School	0	20.5	81,513	1972

Source: SVUSD 2008

Many facilities at these schools have recently undergone, are presently undergoing, or will soon undergo significant renovations to modernize and better serve students. When completed, facilities should be more than adequate to serve the student population of Laguna Hills for the upcoming years (SVUSD 2008). Though student growth at all schools generally increased between 1987 and 2004, the system observed a leveling or slight decline of student population since then, consistent with trends elsewhere in the district, county, and state. Projected enrollment is expected to decrease even further in the future (SVUSD 2008).

In addition to the public schools, there are also several private and religious academic schools located within the planning area that serve residents. There are no colleges located in Laguna Hills; however, Saddleback Valley Community College is located approximately 3.5 miles southeast of the City and the University of California, Irvine is located 12 miles northwest of the City.

LIBRARIES

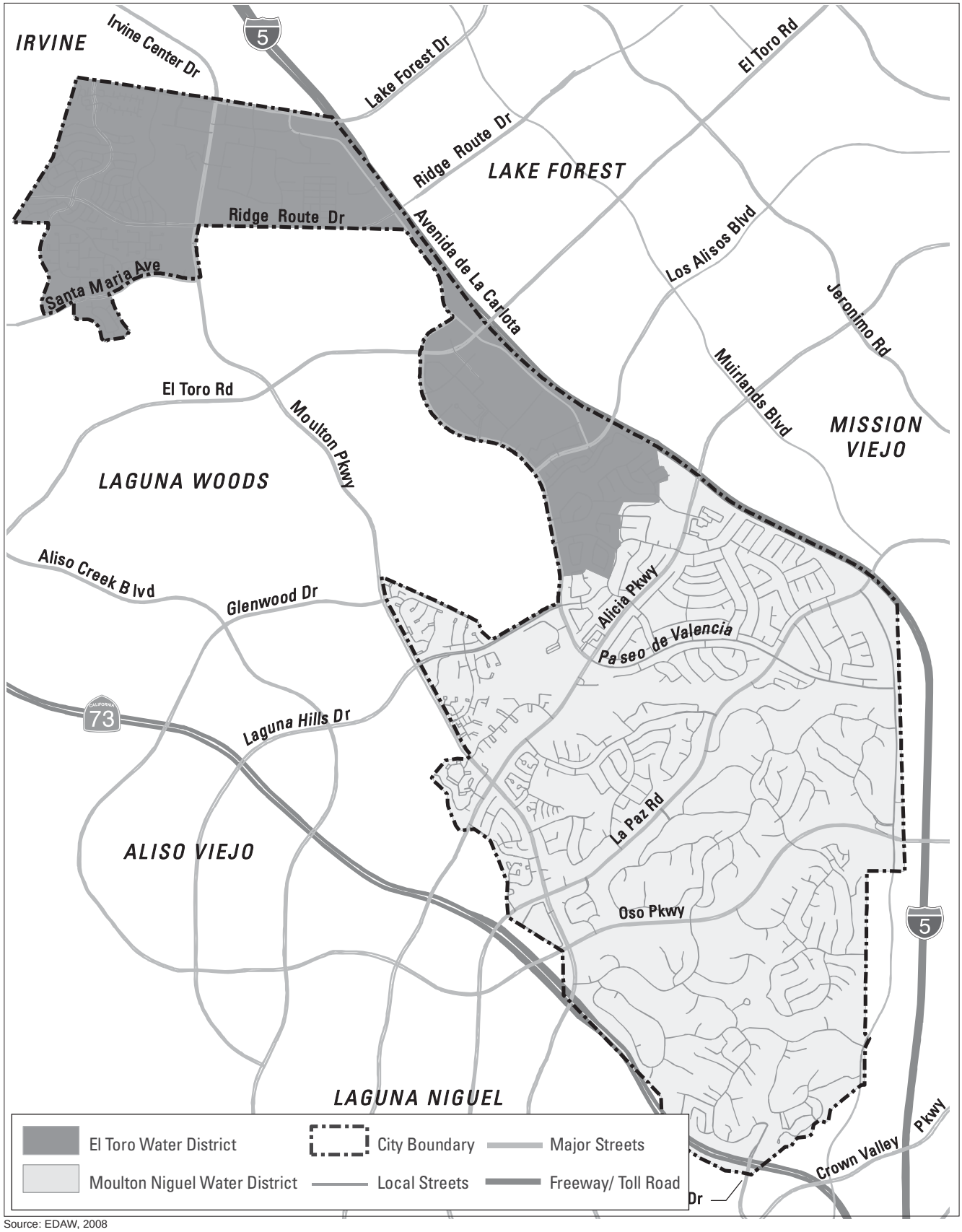
Library services in Laguna Hills are provided regionally by the Orange County Public Library (OCPL) system. The Laguna Hills Technology Library is located inside the Community Center and is approximately 1,368 square feet in size (Figure 5.12-1). This branch was designed to support public computer and internet access also while providing a modest circulating collection of books, popular magazines, and major newspapers for all ages. As part of the OCPL system, Laguna Hills Technology Branch Library shares collection materials with the County's other 33 branches. Patrons are encouraged to browse the Online Public Access Catalog (OPAC) on-site or remotely via the Internet. Any books, magazines, or audiovisual materials that are not physically available at the Laguna Hills Technology Library can be delivered from another branch for a small fee. Similarly, library materials may be returned to any other branch within the OCPL system.

The OCPL has determined that a service standard of 0.2 square foot of library facility per capita is feasible for the purpose of projecting the number and location of new libraries needed. This service standard is a modification of the old American Library Association standard of 0.33 square foot per capita. The OCPL has found that libraries with the 0.2 ratio are providing a satisfactory level of service. This service standard has been accepted by the Board of Supervisors as a planning guide (County of Orange 2005).

WATER SERVICE

Laguna Hills obtains water services from the Moulton Niguel Water District (MNWD) and the El Toro Water District (ETWD). These services are provided in the northern portion of the City by the ETWD and in the southern portion of the City by the MNWD. The division line runs through a neighborhood north of Alicia Parkway and south of Aliso Creek (Figure 5.12-2). Water from both districts comes from the Colorado River and the State Water Project (which draws water from the San Francisco-San Joaquin Bay Delta) and travels hundreds of miles to the local water districts through an intricate underground delivery system operated by the Metropolitan Water District of Southern California (MWD). Both districts are almost entirely reliant on the MWD for their imported water supplies. Both the MNWD and ETWD have numerous potable water emergency interdistrict connections between themselves and neighboring water districts to ensure water delivery continuity in case of service failure in any district.

Both the MNWD and ETWD use recycled or reclaimed water for irrigation instead of expensive and increasingly scarce imported potable water, to help ensure the long-term availability of drinking water to residents. Due to the uncertainty of future statewide water supply and projected cost increases of imported potable water, both the MNWD and ETWD plan to expand their reclaimed water distribution system to offset future development water demands. The recycled water system is completely independent of the



Source: EDAW, 2008

0 0.25 0.5 1 Miles

Figure 5.12-2
Water District Service Areas

drinking water system and requires its own dedicated pipelines, pump stations, and reservoirs (MNWD 2007, ETWD 2005).

Moulton Niguel Water District

The MNWD provides water service to over 165,000 residents within its service area, which includes the southern portion of Laguna Hills. The District is almost entirely developed and encompasses almost all of the Cities of Aliso Viejo, Laguna Niguel, Laguna Hills, and Mission Viejo, and portions of the City of Dana Point. The MNWD has a modern water system, which dates back to 1960. The MNWD operates and maintains 31 water storage reservoirs, 29 pumping stations, and 700 miles of domestic water pipelines (MNWD 2007). Due to poor quality, no local groundwater resources are utilized by the MNWD. Imported water from the MWD through the Municipal Water District of Orange County (MWDOC) is the major source of water supply to the District.

The MNWD has a number of service connection agreements with the MWDOC. These agreements entitle the MNWD to receive water from available MWD sources via the regional distribution system located in Orange County. The MWDOC delivers water from the MWD in the amount requested by the MNWD, subject to capacity limitations of the service connections and the capacity limits of the MNWD. The MNWD has 10 connections to the Joint Regional Water Supply System (JRWSS) and three connections to the Allen-McCulloch (AMP) pipeline. These are the sources of the MNWD's imported water supply (MNWD 2007).

El Toro Water District

The ETWD also provides water and sewer service to over 50,000 customers, including northern portions of Laguna Hills. The ETWD is almost entirely developed and encompasses all of the City of Laguna Woods and portions of four other cities: Lake Forest, Aliso Viejo, Laguna Hills, and Mission Viejo. Like the MNWD, the ETWD is also a member agency of the MWDOC, which is a member agency of the MWD. The ETWD has a number of service connection agreements with the MWDOC. These agreements entitle the ETWD to receive water from available MWD sources via the regional distribution system located in Orange County. The MWDOC delivers water from the MWD in the amount requested by the ETWD, subject to capacity limitations of the service connections and the capacity limits of the ETWD. The ETWD has three service connections to the AMP and one service connection to the JRWSS, which is directly supplied from the East Orange County Feeder No. 2 (EOCF No. 2) operated by the MWD. Due to poor quality, no local groundwater resources are utilized by the ETWD.

WASTEWATER

Wastewater (including sewage) generated within Laguna Hills is collected via a network of gravity lines, lift stations, and force mains throughout the planning area and is primarily residential in nature. Wastewater is collected by the MNWD and ETWD and is carried to the South Orange County Wastewater Authority (SOCWA) plants for treatment and disposal. SOCWA is a Joint Powers Authority (JPA) that collects, treats, and disposes of wastewater and sludge in south Orange County. The MNWD and ETWD are member agencies of SOCWA

SOCWA currently operates four treatment plants: Regional Treatment Plant, Jay B. Latham, Coastal Treatment Plant, and 3A Plant. The current total average daily flow tributary to the J.B. Latham Treatment Plant is 8.5 million gallons per day (MGD). The plant has a design capacity of 13 MGD. The Coastal Treatment Plant has a capacity of 6.7 MGD. The Regional Treatment Plant has a capacity of 12 MGD and is currently processing slightly over 10 MGD. 3A Plant has a secondary treatment capacity of 8

MGD and is currently processing 4 MGD (MNWD 2007). The MNWD owns 22.7 MGD of secondary treatment capacity in the SOCWA treatment plants.

Almost all of the wastewater generated within the ETWD service area is conveyed to the District Water Recycling Plant (WRP) where it is treated and either used for irrigation or disposed of through the SOCWA effluent transmission main and ocean outfall. The WRP is located in the western portion of the ETWD adjacent to the Leisure World Golf Course. A small portion of flow in the southeast portion of the ETWD is conveyed directly to the MNWD collection system. Generally the ETWD relies on gravity flow to convey wastewater generated to the WRP. The ETWD operates and maintains 11 lift stations, which convey flow through force mains to the gravity collection system and on to the WRP (ETWD 2005).

SOLID WASTE

Solid waste generated in Laguna Hills is collected by a private sector contractor; CC&R Waste and Recycling Services. CR&R began a 10-year contract agreement with the City in 2005 to provide residential and commercial waste pickup and disposal, including recycling services.

The City's solid waste is managed by the County of Orange, Integrated Waste Management Department (IWMD). IWMD operates three municipal solid waste landfills: Olinda Alpha, Frank R. Bowerman, and Prima Deshecha. Olinda Alpha serves northern Orange County; Frank R. Bowerman serves central Orange County; and Prima Deshecha serves southern Orange County. Each of these landfills also receives imported waste from jurisdictions outside of the Orange County. The City's solid waste is disposed of in the Frank R. Bowerman Landfill, located approximately 8 miles north of the City at the base of the San Joaquin Foothills. This landfill is currently scheduled to close in 2022 but upon completion of the Regional Landfill Options for Orange County Plan's short-term strategy No. 2, the scheduled closure date is anticipated to be 2053 (IWMD 2007).

Waste Diversion

The California Integrated Waste Management Act of 1989 (AB 939) mandates local governments to develop a long-term strategy for the management and diversion of solid waste, by requiring cities and counties to divert 50 percent of its solid waste. According to the California Integrated Waste Management Board (CIWMB), Laguna Hills diverted an estimated 42 percent of its waste in 2004 (latest figures available). Preliminary diversion data for 2005 is 48 percent and 2006 is 57 percent, pending CIWMB approval (CIWMB 2008). The City provides curbside recycling for both residential and commercial uses, which counts toward the City's solid waste diversion rate. The City also collects curbside residential green waste, which counts toward the City's diversion rate.

In addition, IWMD operates four household hazardous waste collection centers located throughout the County at which Orange County residents can properly dispose of their household hazardous waste. New regulations have broadened the definition of household hazardous waste to include electronics containing circuit boards. Residents must now deposit items such as cell phones, VCRs, microwaves, and computers at a hazardous waste collection center. Regional household hazardous waste collection centers are located in Anaheim, Huntington Beach, Irvine, and San Juan Capistrano (IWMD 2007).

STORMWATER DRAINAGE FACILITIES

The OCFCD manages the maintenance and operation of an integrated system of storm drains, creek channels, retaining basins, dams, and other measures to protect the City from flooding and flood-related disasters. Major natural drainages serving the City include Aliso Creek, with flows parallel to Alicia Parkway providing drainage from I-5 to the Pacific Ocean, and Oso Creek, located at and just beyond the

eastern boundary of the City. Several concrete-lined drainages are also located in various areas throughout the City.

Laguna Hills lies primarily within the Aliso Creek watershed area, although portions are in the San Diego Creek and San Juan Creek watershed areas as well. The National Pollutant Discharge Elimination System (NPDES) permit for these watershed areas requires that all runoff be treated so that pollutant levels at the stormwater outfalls are minimized to the maximum extent practicable. In addition, existing development within Laguna Hills has been planned and constructed in conformance with the National Flood Insurance Program (NFIP), and the existing flood control and stormwater drainage systems have both been designed and created to accommodate the anticipated growth and future land development within Laguna Hills.

ENERGY FACILITIES

The primary sources of energy in Laguna Hills are electricity and natural gas. Southern California Edison (SCE) and San Diego Gas & Electric (SDG&E) provide electricity services to Laguna Hills, while the Southern California Gas Company is the provider for natural gas (Figure 5.12-3). Energy that is provided throughout California, including the planning area, is generated by numerous power plants that are located within and outside California. Refer to Section 6.3, Global Climate Change, for a discussion pertaining to energy supply.

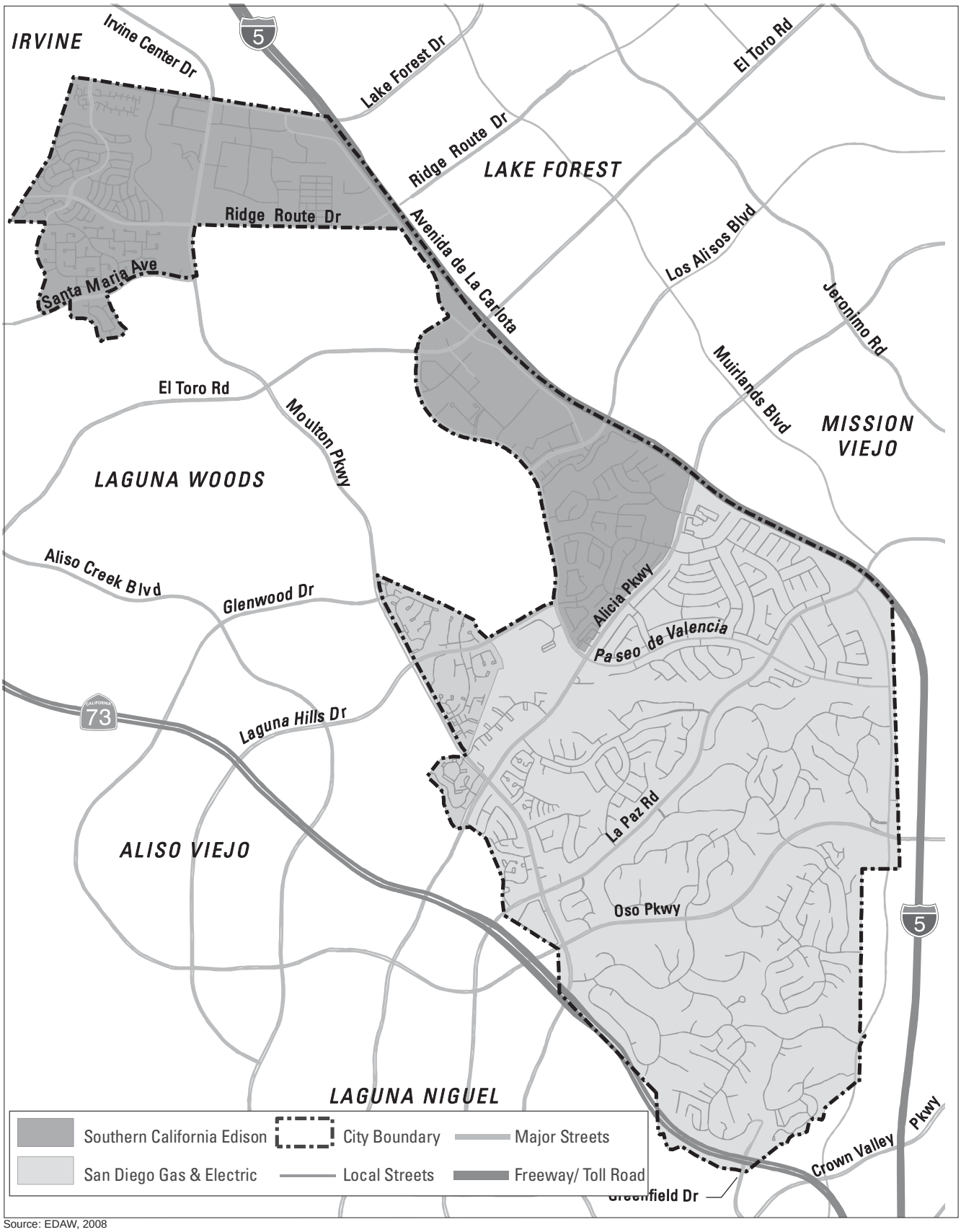
SCE, an independently owned utility, provides electrical power service to the planning area. During the restructuring of California's electric industry in the late 1990s, SCE sold most of its generating facilities, retaining only its hydropower, coal, and nuclear power generating plants. SCE's only southern California energy generation facility is San Onofre Nuclear Generating Station, which is owned in partnership with SDG&E and the City of Riverside. In addition to these company-owned facilities, SCE's other electrical energy generation sources include natural gas, coal, nuclear, renewable energy (geothermal, small hydroelectric, solar, and wind), and large hydroelectric facilities.

SCE distributes electricity purchased through the California Power Exchange, which is the electricity marketplace for approximately 80 percent of California's electricity customers. The California Independent System Operator coordinates the scheduling and dispatch of electricity that is bought and sold through the Power Exchange, which is essentially a statewide electricity generation and distribution grid. SCE facilities currently located throughout the planning area include substations, main transmission lines, and other overhead conductor lines. Electrical power from SDG&E is transmitted through 138kV transmission lines to the Trabuco and Capistrano substations located near the planning area boundary and voltage is transmitted to customers throughout the City.

California's existing gas supply portfolio is regionally diverse and includes supplies from onshore and offshore sources, including the southwestern United States, the Rocky Mountains, and Canada. The Southern California Gas Company supplies natural gas to businesses and residents of the planning area. A Southern California Gas Company transmission line following the Santa Fe railroad right-of-way brings natural gas from San Diego to Orange County.

5.12.2 REGULATORY FRAMEWORK

Regulations exist at local, state, and federal levels that guide the development and enforcement of codes to adequately provide public services and facilities to City residents and businesses. These regulations include, but are not limited to the following:



Source: EDAW, 2008

0 0.25 0.5 1 Miles

Figure 5.12-3
Energy Provider Service Areas

UNIFORM FIRE CODE

The Uniform Fire Code (UFC) is the primary means for authorizing and enforcing procedures and mechanisms to ensure the safe handling and storage of any substance that may pose a threat to public health and safety. The UFC regulates the use, handling and storage requirements for hazardous materials at fixed facilities. The UFC and the Uniform Building Code (UBC) use a hazard classification system to determine what protective measures are required to protect fire and life safety. These measures may include construction standards, separations from property lines, and specialized equipment. To ensure that these safety measures are met, the UFC employs a permit system based on hazard classification.

CALIFORNIA FIRE CODE

The California Fire Code (CFC) and Office of the State Fire Marshall provides regulations and guidance for local agencies in the development and enforcement of fire safety standards. The CFC also establishes minimum requirements that would provide a reasonable degree of safety from fire, panic and explosion.

SENATE BILL 610 AND SENATE BILL 221

SB 610 and SB 221, amended into state law effective January 1, 2002, improve the linkage between certain land use decisions made by cities and counties and water supply availability. The statutes require detailed information regarding water availability and reliability with respect to certain developments to be included in the administrative record to serve as evidentiary basis for an approval action by the City or county on such projects.

Under SB 610, a water supply assessment must be furnished to local government for inclusion in any environmental documentation for certain types of projects, as defined in Water Code Section 10912 [a] and subject to CEQA. A fundamental source document for compliance with SB 610 is the Urban Water Management Plan (UWMP). The UWMP can be used by the water supplier to meet the standard for SB 610.

SB 221 applies to the Subdivision Map Act, conditioning a tentative map on the applicant to verify that the public water supplier has sufficient water available to serve the proposed development.

The General Plan is not subject to either SB 610 or SB 221 because the Plan itself does not grant entitlements; instead, it provides a planning framework for future development in the planning area. However, as individual projects are implemented under the General Plan, they will be reviewed for compliance with the requirements of SB 610 and/or SB 221. Adequate water availability must be demonstrated, as required.

NATIONAL POLLUTANT DISCHARGE AND ELIMINATION SYSTEM

Laguna Hills is under the jurisdiction of the San Diego Regional Water Quality Control Board (RWQCB), which implements the NPDES permit for the San Diego area (including southern Orange County). The NPDES permit, a requirement under the Clean Water Act, addresses pollution from urban runoff that impacts water quality of receiving waters (such as streams and lakes). Under the NPDES permit, Laguna Hills must implement measures to reduce urban runoff during all phases of development: planning, construction and existing uses. Requirements include incorporating best management practices to reduce runoff from construction and current uses, reporting any violations to the San Diego RWQCB, and education regarding the negative water quality impacts of urban runoff.

URBAN WATER MANAGEMENT PLANS

Urban water purveyors are required to prepare and update a UWMP every 5 years. The MNWD and ETWD, which serve Laguna Hills, updated their UWMPs in 2005. Applicable to the Conservation and Open Space Element, the UWMPs address water supply, treatment, reclamation, and water conservation, and contain a water shortage contingency plan. Local UWMPs, such as those prepared by the MNWD and ETWD, are supplemental to the regional plans prepared by the MWD and MWDOC.

INTEGRATED WASTE MANAGEMENT PROGRAM

In 1989, AB 939, known as the Integrated Waste Management Act, was passed because of the increase in waste stream and the decrease in landfill capacity. As a result, the current CIWMB was established. A disposal reporting system with CIWMB oversight was established, and facility and program planning was required. AB 939 mandates a reduction of waste being disposed: jurisdictions were required to meet diversion goals of 25 percent by 1995 and 50 percent by the year 2000. AB 939 also established an integrated framework for program implementation, solid waste planning, and solid waste facility and landfill compliance.

SADDLEBACK VALLEY UNIFIED SCHOOL DISTRICT FACILITIES MASTER PLAN

To plan for future facility needs, school districts typically implement a long-range planning approach with Long-Range Facility Plans and Master Plans. These documents allow school districts to estimate the number of additional students that new development would generate and plan for needed improvements to meet the demand. The Saddleback Valley Unified School District Facilities Master Plan is based on the projected development levels established for the City. The Master Plan also considers demographic trends, such as increased household size, that can affect the need for future school services.

5.12.3 THRESHOLDS FOR DETERMINING SIGNIFICANCE

Based on Appendix G of the CEQA Guidelines, a significant impact related to public services and utilities would occur if implementation of the General Plan would:

- Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:
  - Police Protection
  - Fire Protection
  - Schools
  - Libraries
  - Other Public Facilities;
- Exceed wastewater treatment requirements of the applicable RWQCB;
- Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- Result in insufficient availability of water supplies to serve the project from existing entitlements and resources, or are new or expanded entitlements needed;

- Result in a determination by the wastewater treatment provider that serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments;
- Generate waste materials that would exceed the permitted capacity of local landfills or fail to comply with federal, state, and local statutes and regulations related to solid waste; or
- Violate federal, state, and local statutes and regulations related to solid waste.

Although not included in Appendix G of the CEQA Guidelines, the following would also be considered a significant impact if implementation of the General Plan would:

- Create demand for electricity or natural gas service that would require the construction of facility improvements that could cause significant environmental impacts.

5.12.4 ANALYSIS OF ENVIRONMENTAL IMPACTS

Development pursuant to the General Plan land use policy would result in an increase of approximately 457 dwelling units and 1,031,530 square feet of nonresidential building floor area over existing conditions. A net population increase of approximately 1,229 persons is also anticipated at buildout according to the General Plan.

FIRE PROTECTION AND EMERGENCY SERVICES

Implementation of the General Plan would result in an increase in population and new development within the planning area, increasing the overall demand for fire protection and emergency services. The OCFA maintains a ratio of 0.75 firefighters per 1,000 residents for the planning area. Fire Station #22, which serves Laguna Hills, currently exceeds this ratio, and no additional personnel would be required due to implementation of the General Plan (OCFA 2008b). In addition, it is anticipated that no new equipment would be needed to adequately serve the planning area; however, Fire Station #22 is reportedly one of the busiest stations in Orange County (OCFA 2008b). OCFA is currently looking for a new station within the region to house one of the existing fire units located at Station #22 in a proactive effort to maintain response times.

Pursuant to Section 15145 of CEQA, analysis of the physical changes in the planning area that may occur from future construction of fire station facilities would be speculative and no further analysis of the impact is required at this time. However, construction of the fire protection facilities would be subject to CEQA. Environmental documentation prepared pursuant to CEQA would identify potentially significant impacts and appropriate mitigation measures. In addition, the City would continue to require all future development and redevelopment projects to be reviewed by the OCFA on an individual basis to ensure that an adequate level of fire protection and emergency services would be provided to the community. Therefore, impacts associated with fire protection and emergency services would be less than significant.

POLICE PROTECTION

Implementation of the General Plan would result in an increase in population and new development within the planning area, increasing the demand for police protection and services; however, the overall level of police protection would not be reduced. The OCSD currently maintains a ratio of 1.2 sworn officers per 1,000 residents but does not utilize a standard personnel-to-population ratio to measure the adequacy of policing levels within the planning area. Instead, the OCSD analyzes demographics, calls for service, population, and crime trends to determine the level of police services needed in the planning area. Police service response times continue to remain within these expected parameters for all four priority

levels as defined by the OCSD. Also, in an effort to maintain the low crime rate, the General Plan contains policies and programs that promote neighborhood safety through neighborhood watch and community-oriented policing programs as well as through the design principles, such as Crime Prevention through Environmental Design (CPTED). Moreover, the City would continue to require all future development and redevelopment projects to be reviewed by the OCSD on an individual basis to ensure that an adequate level of police protection services would be provided to the community.

While it is not possible to determine with certainty that future growth would not result in the need for new facilities, the OCSD does not have plans for the immediate or future expansion of police facilities, staff, or general equipment inventory within the planning area at General Plan buildout (OCSD 2008a). Pursuant to Section 15145 of CEQA, analysis of the physical changes in the planning area that may occur from future construction of police station facilities would be speculative and no further analysis of the impact is required at this time. However, construction of the police station facilities would be subject to CEQA. Environmental documentation prepared pursuant to CEQA would identify potentially significant impacts and appropriate mitigation measures. Therefore, impacts associated with police protection would be less than significant.

SCHOOLS

Table 5.12-6 highlights the student generation rates for SVUSD. Based on the SVUSD student generation rates and the approximate increase of 457 dwelling units pursuant to development from the General Plan, an estimated 115 new students would be generated due to the General Plan's implementation. This new development and redevelopment would occur in the Via Lomas ~~Planned Community~~ area, Alicia Gateway, and the seven vacant estate residential parcels in the Nellie Gail Ranch community located in the southern are of the City.

Table 5.12-6
Saddleback Valley Unified School District Student Generation Factors by New Residential Dwelling Unit Type and Education Level

Dwelling Unit Type	Proposed Dwelling Units	Education Level	Generation Factor	Students Generated
Single-Family (detached)	7	Elementary	.34	2.38
		Middle	.065	0.46
		High	.16	1.12
Total Students from Single-Family Residences				***3.96***
Multi-Family (attached)	450	Elementary	.10	45.00
		Middle	.046	20.70
		High	.10	45.00
Total Students from Multi-Family Residences				***110.70***
Total Students Generated at General Plan Buildout				**114.66**

Source: SVUSD 2008

As of November 2008, SVUSD data reported a remaining capacity of approximately 1,110 students at schools that serve the planning area. SVUSD periodically adjusts enrollment capacities in cooperation with the City to provide for optimum long-range facilities management.

Based on the SVUSD's student generation rates provided in Table 5.12-6, an estimate of 115 new students could be generated in the planning area by the implementation of the General Plan. Assuming that current enrollment rates remain constant over the span of the General Plan, it is not anticipated that district capacity would be exceeded in the future.

SVUSD as a whole is experiencing declining enrollment primarily at the elementary level; however, the pattern of declining enrollment is expected to continue through intermediate and high school levels over the next several years (SVUSD 2008). Changing demographics, including families with fewer children, have caused enrollment dips. As the local population increases over time, SVUSD has flexibility built into its enrollment strategy to accommodate new students who live in Laguna Hills.

Also, SVUSD collects school fees to fund new construction needed as a result of new housing. With adoption of SB 50 and Proposition 1A in 1998, school districts that meet certain requirements now have the option of adopting school fees, also known as Level 2 Fees and Level 3 Fees (Public Resources Code Sections 65995.5, 65995.6 and 65995.7). School fees, which are calculated for each school district, allow districts to collect fees for new construction, including home additions. Current developer fees assessed for residential development is $2.97 per square foot and $0.47 per square for commercial and industrial development. Payment of alternative school fees would be used to offset the cost to SVUSD of providing education facilities to future students, if and when such facilities are needed. The environmental effects of expansion, construction, and operation of additional school facilities will be evaluated by SVUSD in its efforts to plan for construction of new schools or expansion of existing facilities. SB 50 states that for CEQA purposes, payment of fees to the affected school district reduces school facility impacts to a level less than significant.

Although potential impacts to local school districts are fully mitigated by payment of SB 50, the General Plan contains policies and programs to reduce potential impacts even further. The City would continue to work with SVUSD to address the following issues, as they apply to school capacity and facilities:

- Assist SVUSD to update information in their Master Plans and Long-Range Facility Plans, and identify future school and administrative facility sites, student generation formulas, and facility improvement plans.
- Assist SVUSD in their review of development proposals to ensure that proposals are consistent with school facilities requirements.
- Coordinate any needed amendments to the City General Plan with applicable school districts.
- Develop safe pedestrian and bicycle routes to all schools and ensure physical improvements (such as crosswalks and bike racks) are in place to support walking and bicycling to schools.
- Explore nonstructural solutions that may encourage people to walk or bus to school, rather than drive (e.g., staggered start times, walking groups, etc.)
- Coordinate busing programs and expand ride-sharing opportunities to relieve congestion and improve safety conditions during school drop-off and pick-up times.
- Enter into joint-use agreements to make additional recreational facilities available to the community during nonschool hours.

  (Implementation Program CSF-2)

The specific environmental impact of constructing new schools in the planning area cannot be determined at the General Plan level of analysis because no specific school construction projects are proposed; however, like the development of other land uses allowed under the General Plan, individual school development projects would have CEQA environmental documents prepared by SVUSD to evaluate the potential impacts of the proposed project.

LIBRARIES

With the increase in population and new development and redevelopment pursuant to the General Plan, additional library services and potentially new or expanded facilities would be required to adequately serve the planning area. The OCPL has established a recommended standard of 0.2 square feet of library space per capita, which is not currently being met by the existing library facilities. Development pursuant to the General Plan would require the provision of approximately 5,556 additional square feet of library space to be available within the planning area. The City had recognized this need and is continuing to work with the OCPL to ensure that library development keeps pace with overall City development and population growth. However, the specific environmental impact of constructing a new library or expanded facilities in the planning area cannot be determined at this General Plan level of analysis because no specific projects are proposed. Like the development of other uses allowed under the General Plan, development and operation of new or expanded public facilities, such as a library, may result in potentially significant impacts that are addressed by various City policies included in the General Plan, as well as site-specific mitigation measures identified once a project site and proposal are known. Therefore, impacts associated with libraries would be less than significant.

WATER

Water Infrastructure Impact

New development and redevelopment pursuant to the General Plan would be primarily located within the three opportunity areas or the four future study areas previously discussed in Chapter 3.0, Project Description. All three opportunity areas and two of the future study areas[6] are situated within the MNWD service area. According to the MNWD UWMP, because the planning area is almost entirely developed, water infrastructure is in place and few improvements would be required to accommodate new development (MNWD 2007). However, the City would be required to review development proposals and amendments, in consultation with the appropriate water district, for their consistency with water infrastructure requirements established in development plans and agreements and to ensure that sufficient water infrastructure capacity is available to serve a new development prior to approval of the project.

The remaining two future study areas, North Business Park and the Urban Village, are situated within the ETWD service area. Infrastructure and public services are readily available within these areas, and all areas served by THE ETWD (City of Laguna Hills 2008). The ETWD would review proposed site-specific projects as they are proposed to determine if upgrades to existing facilities or construction of new facilities would be required. Specific improvements to the water distribution system that may be necessary to accommodate the development would be evaluated and defined at the time development occurs and incorporated into the project design. The cost of any improvements necessary to provide water or sewer service to the development would be borne by the developer(s).

The specific environmental impact of constructing new water infrastructure in the planning area cannot be determined at the General Plan level of analysis because no specific water infrastructure construction projects are proposed; however, like the development of other land uses allowed under the General Plan, individual development projects would be required to evaluate the potential impacts of the proposed project in accordance with CEQA. In addition, various policies and programs included in the General Plan address the potential impacts associated with the construction of new water infrastructure. Therefore, impacts are less than significant.

[6] Alicia Gateway, Via Lomas ~~Planned Community~~, and Moulton/La Paz (opportunity areas) are located within the MNWD service area. In addition, future study areas located within the MNWD service area are La Paz Gateway and Alicia Parkway/Aliso Hills.

Water Supply Impact

New development and redevelopment pursuant to the General Plan would result in an increase in residential and nonresidential uses over existing conditions, which would result in the need for additional water supply. Both the MNWD and the ETWD UWMPs (2005) indicate that the districts expect to have adequate water supply available to meet the demand posed by growth within their jurisdictions. In addition, the Metropolitan Water District (MWD), the primary supplier of water for both districts, indicated in the MWD 2005 Regional UWMP that MWD can provide 100 percent of the supply demanded by its member agencies until 2030 (MWND 2007).

While both the MNWD and the ETWD continually look for opportunities to increase storage capacity and incorporate water conservation strategies to offset the effects of possible water supply shortages, implementation of the General Plan may result in a demand for water that exceeds the capacity of the existing entitlements and resources. Policies and programs in the General Plan direct the City to continue to implement water conservation measures to limit water consumption and help meet the current and projected future daily and peak water demands for the planning area. Water conservation represents the most cost-effective and environmentally sound way to reduce current and future demand. The General Plan stipulates policies specific to water supply and quality, including the use of drought-tolerant landscaping, water efficient plumbing, and water reclamation techniques; coordination with regional water services providers to plan for emergency water services and drought; use of natural drainage improvements for retention and detention of storm water in order to reduce contaminants; promotion of LID standards in the design of new development/redevelopment projects; and expansion of reclaimed water for irrigation of public and private landscaping. These provisions are intended to effect landscapes that can be maintained with low water use serviced by irrigation systems that would not overuse or waste the available water supply.

While the General Plan is not subject to the requirements of SB 610 and/or SB 221 because it does not grant entitlements, individual projects envisioned under the Plan may create demand that exceeds expected water supplies. Mitigation Measure PSU-1 would require the City to review individual development and redevelopment projects in consultation with the appropriate water district to demonstrate adequate availability of long-term water supplies would be available to support the proposed development without a negative impact on the community. Moreover, the City would be required to implement the MNWD and ETWD UWMPs to further ensure that adequate water supplies are available to meet the needs of current and future growth, as well as during an emergency event or drought (see Mitigation Measure PSU-2).

As the population continues to grow in the southern California region, the demand for finite water supplies also continues to increase. Although optimistic about the adequacy of future water supplies, it cannot be stated with certainty that unforeseen water shortages would not occur over the life of the General Plan. Southern California has experienced multiple dry years, resulting in an overall increase and use of imported supplies from MWD. While the MWD has comprehensive regional Water Shortage Contingency and Drought Management Plans in place to ensure adequate water supplies are available to all of its member agencies, including the MNWD and the ETWD, it is necessary to examine other water source options that could help reduce the dependency on imported water.

Other Water Source Options

This discussion describes other water source options that may be available to help address the uncertainty of long-term water supply to the southern California region as a whole. It is important to note that the following discussion is included in this Program EIR to comply with the guidance provided by the California Supreme Court's decision in *Vineyard Area Citizens for Responsible Growth v. City of Rancho*

Cordova which requires an explanation of how the long-term demand for adequate water supplies is likely to be met with other water source options. The description of other water source options, the potential environmental impacts of exploiting those sources, and how those impacts are to be mitigated are discussed below.

Other water source options that may be available to the southern California region, including the water districts that serve the planning area (MNWD and ETWD), are as follows:

- Desalination of Seawater
- Expansion of Water Reclamation Facilities

It is important to note that the potential impacts of the other water source options identified in the following discussion and the mitigation for those potential impacts do not represent direct impacts of, or necessary mitigation for, the General Plan. Instead they are provided in accordance with guidance under the California Supreme Court decision in *Vineyard Area Citizens for Responsible Growth v. City of Rancho Cordova.*

Desalination of Seawater

Until recently, seawater desalination has been considered uneconomical to be included in the water supply mix. However, recent breakthroughs in membrane technology and plant siting strategies have helped reduce desalination costs, warranting consideration among alternative resource options. However, the implementation of large-scale seawater desalination plants faces considerable challenges. These challenges include high capital and operation costs for power and membrane replacement, availability of funding measures and grants, addressing environmental issues and addressing the requirements of permitting organizations, such as the Coastal Commission. These issues require additional research and investigation. Therefore, opportunities for desalinated water are considered on a regional basis (MWDOC service area) and not for the planning area specifically. Neither the ETWD nor the MNWD has, on its own, attempted to investigate seawater desalination due to economic and physical impediments.

MWDOC has been in the process of studying the feasibility of ocean desalination on behalf of its member agencies. MWDOC is reviewing and assessing treatment technologies, pretreatment alternatives, and brine disposal issues, and identifying and evaluating resource issues such as permitting, and the regulatory approvals (including CEQA) associated with the delivery of desalinated seawater to regional and local distribution system. MWDOC is also assisting its member agencies in joint development of legislative strategies to seek funding in the form of grant and/or loans, and to inform decision-makers of the role of seawater desalination in the region's future water supplies. Observing the strategies and outcomes of other agency programs (such as that in Tampa Bay, Florida) to gain insights into seawater desalination implementation and cost issues is also being undertaken.

In Orange County, there are three proposed ocean desalination projects that could serve MWDOC and its member agencies with additional water supply. These projects are the Poseidon Resources proposed Huntington Beach Seawater Desalination Project, the joint SDCWA and MWDOC proposed Regional San Onofre Seawater Desalination Project, and the MWDOC proposed Dana Point Ocean Desalination Project. A brief description of each desalination project is included below.

The Poseidon Resources proposed Seawater Desalination Project would be co-located within the AES Generation Power Plant in Huntington Beach. It is being planned to provide 50 million gallons per day (MGD) of desalinated supply for distribution into coastal and south Orange County. Currently, the project is in the construction phase and is scheduled to commence operation in early 2009.

The joint San Diego County Water Authority (SDCWA) and MWDOC proposed Regional San Onofre Seawater Desalination Project is currently being investigated to determine project feasibility. The project size is yet to be determined, but a large facility is being investigated (50 to 150 MGD). This project's time frame has been estimated by SDCWA for implementation in 2020.

MWDOC is currently investigating the feasibility of an ocean desalination plant in Dana Point, in the vicinity of San Juan Creek. This project would provide both system reliability as well as providing supply reliability to the area and MWDOC service area. MWDOC commissioned a preliminary feasibility study of the project in 2000. That study suggested that the site appeared feasible for a desalination project and a 25 MGD project was recommended for this location.

While none of these projects is expected to directly supply the MNWD or the ETWD with water, this type of desalinization project could decrease the overall demand for water elsewhere in the region. This would increase the availability of water throughout the region, which has the potential to indirectly increase the water availability for the MNWD and the ETWD.

Expansion of Water Reclamation Facilities

In the 1990s, the United States Bureau of Reclamation, in conjunction with MWD, the California Department of Water Resources, and six other southern California water agencies, studied the feasibility of regional water reclamation projects in southern California. This study identified 34 potential regional projects within Metropolitan's service area with an estimated yield of 450 thousand acre feet (taf) per year. MWD and its member agencies continue to explore these and other projects and develop updated plans on a regular basis (MWD 2005).

Currently, there are planned and permitted uses of recycled water throughout Metropolitan's service area. These uses include landscape irrigation, commercial and industrial use, seawater intrusion barriers, and groundwater recharge applications. Approximately 480 taf per year of new recycled water could be developed in Metropolitan's service area by the year 2025, and an additional 130 taf per year could be developed by the year 2050, for a total of 610 taf per year. A number of these projects are currently being implemented and are scheduled to go on-line within the next five years. Other projects are in various stages of planning, and their development will depend on cost, financing, regulatory actions, and water supply demands (MWD 2005). Both the MNWD and the ETWD acknowledged plans to expand their water reclamation systems in their UWMP, but no expansion projects are under way at this time.

Potential Environmental Impacts

Both construction and operational-related environmental impacts associated with a desalination plant and/or the expansion of reclaimed (recycled) water distribution system would be determined by future environmental analysis on a project-by-project basis and appropriate mitigation measures would also be indentified to reduce any significant environmental impacts at the time the project is proposed. However, in an effort to supply a general overview of the potential environmental impacts associated with the construction and operation of these types of projects, relevant projects in close proximity to the planning area were examined for general environmental impacts as well as typical mitigation for those impacts. Those projects are:

- City of Huntington Beach – Final EIR for the Seawater Desalination Project at Huntington Beach dated April 5, 2005; and
- Irvine Ranch Water District – Final EIR for the Michelson Water Reclamation Plant Phase 2 and 3 Capacity Expansion Project.

These projects serves as reasonable examples for the general types of potential environmental impacts and potential mitigation measures that can be expected for these types of projects in the Orange County region. The environmental issues surrounding these types of projects have similarities and are therefore summarized in Table 5.12-7. While the information included in Table 5.12-7 has been gathered from the documents mentioned above, this discussion is meant to be general in nature and does not directly apply to any other specific desalination project, reclaimed water expansion project, or the General Plan.

Table 5.12-7
Potential Environmental Impacts Associated with Desalination Projects*

Environmental Issue Area	Potential Impact	Possible Mitigation
Aesthetic/Visual Impact on Landscape	Construction activities may alter scenic views; Addition of new visual features that may block views and cause additional sources of light and glare	Project applicant shall implement short-term construction equipment staging areas with appropriate screening; provide a vegetative buffer around facility; install fencing that is complimentary with surrounding environment; shield exterior light sources away from adjoining uses.
Air Quality	Temporary construction air quality impacts; Emission of toxic air contaminants; Conflict with local air quality Management Plan	Project applicant shall comply with applicable federal, state, and local air quality guidelines.
Biological Resources	Construction and operation activities may impact terrestrial and marine biological resources	Project applicant shall comply with applicable federal, state, and local regulatory agencies to ensure proper safeguards are in place protecting all sensitive biological resources before, during, and after construction.
Cultural Resources	Construction and operation activities may potentially disturb undiscovered archeological and paleontological resources	Project applicant shall perform pre-construction surveys; require a professional archeologist and/or paleontologist on site during construction; flag and monitor Areas of Potential Effect (APE).
Geology and Soils	Seismic-related hazards including earthquakes; Geologic related hazards including landslides and liquefaction, soil and topsoil erosion, and water and wind erosion	Project applicant shall comply with standards set forth in the UBC (most current edition) to assume seismic safety; A detailed site-specific geotechnical study must be prepared; compliance with the recommendations set forth in site-specific geologic and/or geotechnical studies will be made a condition of the site development permit for subsequent projects.
Global Climate Change	Increase the emission of greenhouse gases	Project shall implement and comply with all state and local initiatives to reduce the emission of greenhouse gases.
Hazards and Hazardous Materials	Project may create hazards due to the storage, transportation, and/or handling of hazardous materials, thereby increasing the risk of exposure to hazards and hazardous materials	All hazardous materials shall be handled, and stored, transported and disposed in accordance with all applicable federal, state and local codes and regulations.

Table 5.12-7 (continued)
Potential Environmental Impacts Associated with Desalination Projects*

Environmental Issue Area	Potential Impact	Possible Mitigation
Hydrology and Water Quality	Storm water runoff and flooding	Project applicant shall have a Water Quality Management Plan (WQMP) specifically identifying Best Management Practices (BMPs); The project applicant shall demonstrate compliance with all applicable regulations established by the United States Environmental Protection Agency (USEPA) as set forth in the National Pollutant Discharge Elimination System (NPDES) permit requirements for urban runoff and storm water discharge and any regulations adopted by the jurisdiction within which construction will take place; appropriate hydrology and hydraulic analysis shall be performed for the project prior to grading or building permits; appropriate on-site drainage systems shall be installed.
Noise	Construction and operation may cause impacts to nearby sensitive receptors.	Project applicant shall prepare acoustical analysis reports and appropriate construction plans; All stationary equipment shall be designed to comply with the appropriate noise standards set by the jurisdiction in which the project is located.
Public Services and Utilities	Increased solid waste production	Project must be in compliance with the appropriate waste reduction and recycling regulations; project must be in compliance with AB 939.
Traffic and Circulation	Short-term project construction could potentially impact traffic.	Prior to improvement plan approval, a traffic control plan will be prepared for approval by each jurisdiction within which the project is proposed to be located; the traffic control plan will show all signage, striping, delineate detours, flagging operations and any other devices which will be used during construction to guide motorists safely through the construction zone and allow for adequate access and circulation, to the satisfaction of the jurisdiction or agency.

* Note: Potential environmental impacts and mitigation are generalized and are only indications of the types of impacts and mitigation that could be applied to the projects mentioned above.

While implementation of the policies and programs in the General Plan would continue and expand conservation efforts within the planning area, and Mitigation Measures PSU-1 and PSU-2 would help to ensure that adequate water supplies are available to meet the needs of current and future growth, uncertainty remains about the long-term supply of water within the southern California region. Therefore, impacts associated with the provision of adequate water supplies to the planning area would be potentially significant and unavoidable.

WASTEWATER

New development and redevelopment pursuant to the General Plan would result in an increase in residential and nonresidential uses over existing General Plan conditions, which would result in an increased demand on existing wastewater collection treatment facilities. However, because the planning area is largely urbanized and essentially built out, there are few remaining undeveloped sites in the City.

According to the SOCWA, MNWD, and ETWD, the remaining capacity at the Regional Treatment Plant wastewater treatment facility is sufficient to serve potential new development and redevelopment located within the planning area (MNWD 2007). However, the City would continue to review development proposals and amendments, in consultation with the appropriate water district, for their consistency with wastewater collection system requirements established in development plans and agreements and to ensure that sufficient wastewater infrastructure capacity is available to serve a new development prior to approval of the project. Specific improvements to the wastewater collection system may be necessary to accommodate the development. These improvements would be evaluated and defined at the time development occurred and incorporated into the project design. The cost of any improvements necessary to provide wastewater collection service to the development would be borne by the developer.

The specific environmental impact of constructing new wastewater collection infrastructure in the planning area cannot be determined at the General Plan level of analysis because no specific construction projects are proposed; however, like the development of other land uses allowed under the General Plan, individual development projects would be required to evaluate the potential impacts of the proposed project in accordance with CEQA. In addition, various policies and programs included in the General Plan address the potential impacts associated with the construction of new water infrastructure. Therefore, impacts associated with wastewater infrastructure are less than significant.

SOLID WASTE

Implementation of the General Plan would result in new residential and nonresidential development, as well as population growth. This new development and population growth would generate an increased demand for solid waste collection and disposal capacity. However, the population projections associated with the General Plan are slightly less than the SCAG projections associated with the IWMD projections. Since the projected solid waste generation would be slightly reduced under the General Plan as compared to the IWMD projections, no significant impacts are anticipated provided IWMD continues to expand landfill capacity consistent with adopted County growth projections. In addition, solid waste generated within the planning area would be disposed of at regional landfills, which have the existing capacity to accommodate the region's solid waste disposal needs for the foreseeable future (IWMD 2007). The County IWMD is responsible for ensuring that County waste is disposed of in a way that protects public health, safety, and the environment. Long-range strategic planning is necessary to ensure that waste generated by the County is safely disposed of and that the County's future disposal needs are met. To adequately plan for adequate waste disposal capacity, the IWMD has adopted the "RELOOC" program. RELOOC, an acronym for "Regional Landfill Options for Orange County," is a 40-year strategic plan being prepared by the IWMD to evaluate options for trash disposal for Orange County citizens. The General Plan includes programs that would demonstrate compliance with the RELOOC program in an effort to further reduce potential impacts to regional landfills.

The California Integrated Waste Management Act of 1989 (AB 939) mandates local governments to develop a long-term strategy for the management and diversion of solid waste, by requiring cities and counties to divert 50 percent of its solid waste. According to the CIWMB, Laguna Hills diverted an estimated 42 percent of its waste in 2004 (latest figures available). Preliminary diversion data for 2005 is 48 percent and 2006 is 57 percent, pending CIWMB approval (CIWMB 2008). The increase in diversion rates can be attributed to the City's participation in residential curbside recycling, the adoption of a Source Reduction and Recycling Element (SRRE), and participation in the County's Household Hazardous Waste Reduction Program to develop programs to address household hazardous waste State Law (see Mitigation Measures PSU-3 and PSU-4). The City would continue to implement solid waste reduction programs in compliance with AB 939. Also, implementation of the General Plan policies and programs would also help mitigate impacts on solid waste and would guide future provision of solid

waste disposal services within the City. Therefore, impacts associated with solid waste would be reduced to a level less than significant.

STORMWATER DRAINAGE FACILITIES

Implementation of the General Plan would result in new residential and nonresidential redevelopment areas within the planning area that are essentially built out. This new development would not substantially increase the amount of impervious surfaces within the City. However, in an effort to further optimize the existing system and maintain the existing drainage features in their natural condition, the City would continue to work in close coordination with the OCFCD to construct and maintain flood control facilities for the planning area. In addition, the City would continue to require that adequate flood control facilities be established and maintained to protect all structures and major roadways from hazards associated with being near a 100-year floodplain. The City would also continue to require new development and redevelopment to be located in an area that either avoids flood hazards completely or would incorporate flood hazards into the overall design. Therefore, impacts associated with stormwater drainage facilities would be less than significant.

ENERGY

SCE, SDG&E, and the Southern California Gas Company review new development and redevelopment projects on a case-by-case basis and evaluate existing infrastructure for its adequacy. At this time, neither SCE nor SDG&E has plans to underground any utility or transmission lines in Laguna Hills (City of Laguna Hills 2008). Further, all Laguna Hills' energy providers, including SCE, SDG&E, and the Southern California Gas Company, indicated that their present facilities are adequate, and no major upgrades are planned within the City in the near future. However, ongoing upgrades and infrastructure improvements on existing systems and facilities could be required to meet increasing future demands of growing customers.

The specific environmental impact of construction of new electrical and gas infrastructure in the planning area cannot be determined at the General Plan level of analysis because no specific electrical and gas construction projects are proposed; however, like the development of other land uses allowed under the General Plan, individual development projects would be required to evaluate the potential impacts of the proposed project in accordance with CEQA. Mitigation measures would be required to reduce impacts to a less than significant level, as necessary. In addition, the General Plan contains policies and programs that require the City to support efforts of SDG&E, SCE, and the Southern California Gas Company to research and consider the latest technology and infrastructure advances. Therefore, impacts related to energy infrastructure within the planning area would be less than significant. Energy supply impacts are discussed in Section 6.3, Global Climate Change.

5.12.5 MITIGATION MEASURES

Implementation of the following programmatic mitigation measures, derived largely from the General Plan Implementation Program, will reduce potential impacts to a less than significant level at this Program EIR level of analysis. Individual development projects will be required to undergo project-specific environmental review and mitigation measures will be identified to reduce any significant impacts. Mitigation for significant environmental impacts of each future development project shall include the following: (1) objective of the measure; (2) specific standards or measures to be applied, along with any needed contingency measure; (3) responsible party; (4) location; (5) schedule for initiation; and (6) how the measure will reduce the associated environmental impact.

WATER SUPPLY

PSU-1 The City shall review all development projects in consultation with the appropriate water district to ensure adequate water supplies, treatment, and distribution capacity for all projects will be achieved without a negative impact to the community. For those projects subject to SB 610 and/or SB 221, the City shall require a Water Supply Assessment or water supply verification demonstrating available water supplies exist to support the proposed development project. In the event that sufficient uncommitted capacity does not exist, the City shall not grant discretionary approval until capacity becomes available.

PSU-2 The City shall implement applicable provisions in the Moulton Niguel and El Toro Water Districts Urban Water Master Plans to ensure that adequate water supplies are available to meet the needs of current and future growth, as well as during an emergency event or drought. Support efforts by these agencies to research and employ new technologies that improve water services and/or sustainability of water supplies serving Laguna Hills. **(Implementation Program COS-2)**

SOLID WASTE

PSU-3 The City shall implement solid waste diversion programs as well as public education programs as outlined in the City's Source Reduction and Recycling Element required by Assembly Bill 939. As part of this program, work with the private sector contractor providing solid waste services within the City to ensure that appropriate recycling containers, procedures, and education are readily available throughout the community. **(Implementation Program CSF-4)**

PSU-4 The City shall promote the use of the County of Orange's Household Hazardous Waste Collection Centers for the proper disposal of hazardous waste. Continue to identify locations where residents can properly dispose of hazardous waste and advertise these locations at public counters and on the City's website.~~The City shall require residents to participate in the County's Hazardous Waste Reduction Program. Continue to identify locations where residents can dispose of household hazardous wastes at public counters and on the City's website and coordinate with public and private collectors to advertise household hazardous waste (e.g., electronics, paints, oil) collection events occurring in the City and nearby jurisdictions~~. **(Implementation Program S-10)**

5.12.6 IMPACT AFTER MITIGATION

FIRE AND POLICE PROTECTION

Impacts associated with fire and police protection would be less than significant without mitigation.

SCHOOLS

Impacts associated with school capacity and facilities would be less than significant without mitigation.

LIBRARIES

Impacts associated with library capacity and facilities would be less than significant without mitigation.

WATER SUPPLY

Implementation of Mitigation Measures PSU-1 and PSU-2 would reduce impacts associated with water supply; however, uncertainty remains about the long-term supply of water in the southern California region and, therefore, impacts remain potentially significant and unavoidable.

WASTEWATER

Impacts associated with wastewater facilities would be less than significant without mitigation.

SOLID WASTE

Implementation of Mitigation Measures PSU-3 and PSU-4 would reduce impacts associated with solid waste to a level less than significant.

STORMWATER DRAINAGE FACILITIES

Impacts associated with stormwater drainage facilities would be less than significant without mitigation.

ENERGY INFRASTRUCTURE

Impacts associated with energy infrastructure would be less than significant without mitigation.

5.13 RECREATION

This section describes parks and other recreational facilities that serve the Laguna Hills planning area. Specifically, this section includes an examination of community parks, regional and wilderness parks, and recreational trails. Each subsection includes descriptions of existing facilities, potential environmental impacts resulting from implementation of the General Plan, and mitigation measures where appropriate.

5.13.1 ENVIRONMENTAL SETTING

Laguna Hills has a broad range of community facilities, programs, and parks available for both public and private use. The planning area currently has 13 public parks, 15 private parks, and 1 community center that offer diverse recreational programs, depending upon the size of the park and the type of facilities. Nearby golf courses, regional parks, and open space in the coastal foothills also offer additional outdoor recreation opportunities for residents within the planning area.

PUBLIC PARKS AND RECREATIONAL FACILITIES

The 13 public parks located within the planning area include amenities such as sports fields, ballparks, tennis courts, picnic shelters, playgrounds, walking trails, fountains, restrooms, and lighting. In addition to parklands, various recreation programs are available to City residents, including youth and adult sports leagues; seasonal or special events and classes; cooking, dance, and art classes; gallery exhibits; wellness series and lectures; and fossil exhibits, among other programs. Most recreation programs are coordinated from the Laguna Hills Community Center and Sports Complex; however, the City does have joint-use and rental agreements with several of the schools within the planning area. Laguna Hills High School, Lomarena Elementary School, San Joaquin Elementary School, and Valencia Elementary School allow the use of their facilities for non-school related recreational activities outside of school hours. A description of each public park or facility, its size, and available amenities is provided in Table 5.13-1. Figure 5.13-1 illustrates the location of each park.

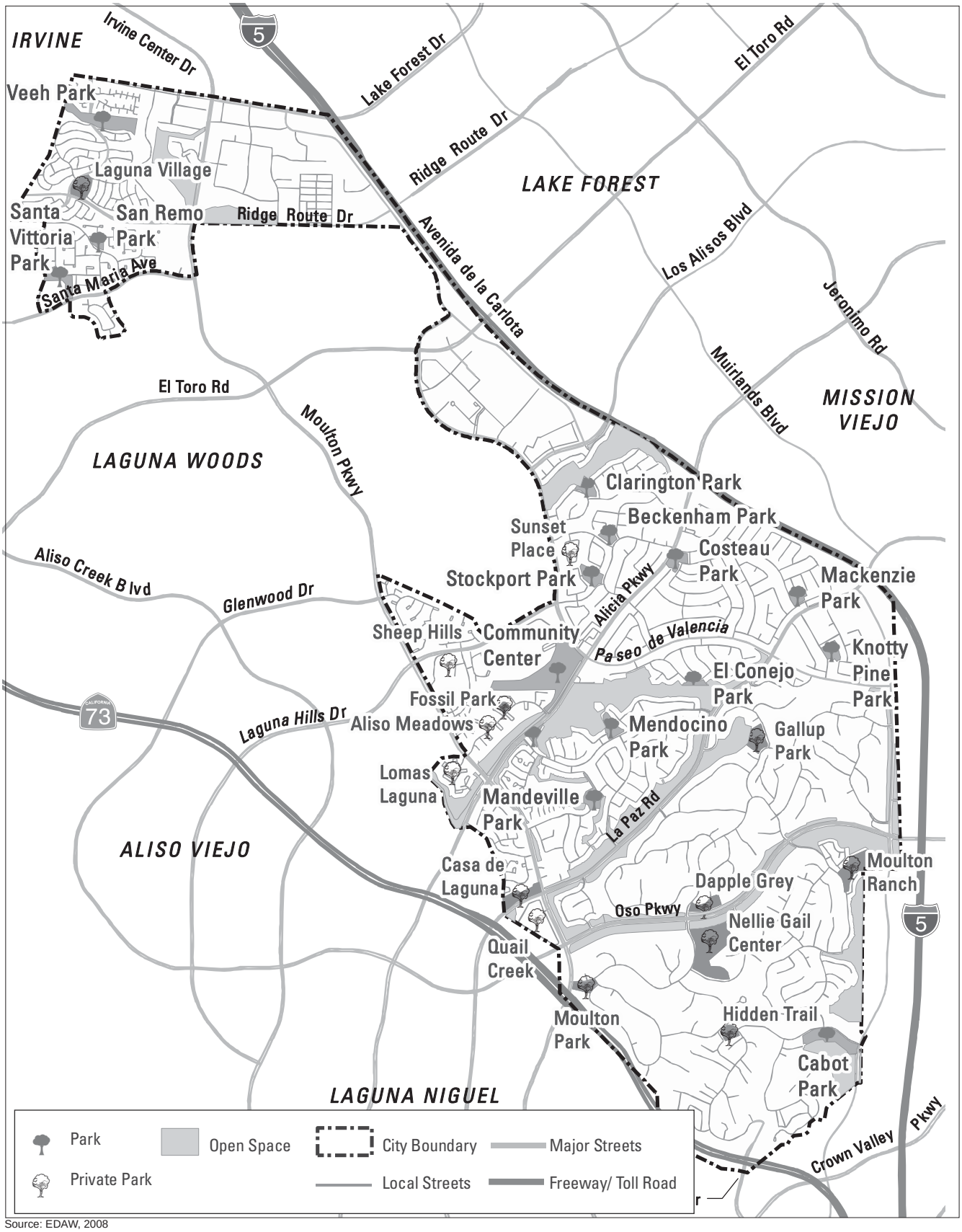
Table 5.13-1
Public Parklands and Recreational Facilities in Laguna Hills

Park Name	Acreage	Location	Amenities
Beckenham Park	2.8	Off Alicia Parkway, turn north on Costeau. At intersection of Wilkes/Camberwell and Beckenham	Picnic tables and shelter, lighting, playground, drinking fountain, walkways, benches, open field.
Cabot Park	8.6	At intersection of Cabot Road and Rapid Falls Road	Parking lot, restrooms, playground, drinking fountains, baseball field, sports field, picnic tables, benches, bike rack, walkways, equestrian trail.
Clarington Park	3.5	Off Alicia Parkway. Turn on Hon to Georgia Sue, left to park	Playground, picnic tables, walkways, open field, access to regional trail, lighting.
Costeau Park	3.7	At intersection of Alicia Parkway and Costeau Street	Basketball court, picnic tables, playground, drinking fountain, lighting, benches, bike rack, walkways, baseball field, volleyball sand, baseball field.
El Conejo Park	2.0	Off Paseo de Valencia near La Paz. Turn on Alisal to Linda Vista, go right. Turn left on El Conejo	Playground, benches, picnic tables, lighting, walkways, open field, bike rack, ½ basketball court.

Table 5.13-1 (continued)
Public Parklands and Recreational Facilities in Laguna Hills

Park Name	Acreage	Location	Amenities
Knotty Pine Park	3.9	At intersection of McIntyre and Knotty Pine	Volleyball sand, playground, walkways, drinking fountain, picnic tables, bike rack, open field.
Laguna Hills Community Center and Sports Complex	30.6	At intersection of Alicia Parkway and Paseo de Valencia	The 43,000-square-foot Community Center includes a gymnasium, fossil exhibit, rotating art gallery, and Technology Branch of the Orange County Public Library, the Center also provides a large banquet facility referred to as the "Heritage Room," a catering kitchen, two classroom facilities, an art room, and a physical activity room, the sports complex features a softball field, baseball field, soccer fields, skate park, roller hockey rink, snack bar, picnic shelters, and a prehistoric themed playground.
Mackenzie Park	2.9	At intersection of McIntyre and Mackenzie	Tennis court, walkways, picnic tables, drinking fountain, open field, playground.
Mandeville Park	3.3	On Mandeville east of Moulton	Playground, walkways, picnic tables, drinking fountain, open field, exercise circuit.
Mendocino Park	3.9	Intersection of Aliso Hills and Alameda Avenue	Playground, walkways, benches, drinking fountain, picnic tables, open field, access to trail system.
San Remo Park	1.6	At intersection of San Remo and Santa Maria	Playground, volleyball sand, handball court, tennis court, benches, walkways.
Santa Vittoria Park	2.9	At intersection of Santa Maria and Santa Vittoria	Playground, volleyball sand, handball court, tennis court, benches, walkways.
Stockport Park	4.0	At intersection of Wilkes and Stockport	Picnic tables, volleyball sand, sports field, lighting, drinking fountain, playground, walkways.
Veeh Ranch Park	11.0	At intersection of Santa Vittoria and Lake Forest	Basketball court, picnic tables, playground, drinking fountain, open field, benches, walkways.
Laguna Hills High School*	51.8	25401 Paseo de Valencia	Baseball/softball fields, soccer fields, pool, basketball court, gymnasium, library, football stadium, track.
Lomarena Elementary School*	9.2	25100 Earhart Road	Softball field, soccer field, multi-purpose room.
San Joaquin Elementary School*	10.0	22182 Barbera	Softball field, soccer field, multi-purpose room, library, lunch tables.
Valencia Elementary School*	10.6	25661 Paseo de Valencia	Softball field, soccer field, multi-purpose room.

*School locations now shown on Parkland Figure 5.13-1.
Source: City of Laguna Hills 2008a, 2008b; SVUSD 2008



Source: EDAW, 2008

0 0.25 0.5 1 Miles

Figure 5.13-1
Parkland (Public and Private)

IRREVOCABLE OFFERS OF DEDICATION (IODS)

In addition to public parks, Laguna Hills also contains parks and recreational areas that are designated as Irrevocable Offers of Dedication (IODs) or private parks. IODs are parks and recreational areas that were developed by private organizations for specific residential developments within the planning area (i.e., Reef Park at Via Lomas). The various developers of these sites have offered them to the City for assumption of ownership and maintenance responsibilities. These IODs are identified in Table 5.13-2 and also shown in Figure 5.13-1.

Table 5.13-2
Private Parks (IODs) within Laguna Hills

Park Name	Acreage	Location
Casa de Laguna	5.25	La Paz Road and Moulton Pkwy
Dapple Grey	3.47	Dapple Grey and Nellie Gail Road
Fossil Park	1	Via Lomas Neighborhood
Gallup Park	5.17	Gallup Circle and Nellie Gail Road
Hidden Trail	2.44	Hidden Trail Road and Stage Line Drive
Laguna Village	4.57	Ridge Route and Mill Creek Drive
Moulton Park	2.77	Moulton and Nellie Gail Road
Moulton Ranch	8.22	Meadow Crest Drive and Bridlewood Drive
Nellie Gail Equestrian Center	20.11	Nellie Gail Rd and Empty Saddle Drive
Sheep Hills	8	Laguna Hills Dr and Moulton Pkwy
Quail Creek	--	La Paz Rd and Moulton Pkwy
Bella Vista	--	Bridlewood Dr and Oso Pkwy
Lomas Laguna	--	Moulton Pkwy and Alicia Pkwy
Sunset Place	--	Paseo de Valencia and Avenida Sevilla
Reef Park	1	Via Lomas Neighborhood

Source: City of Laguna Hills 2008a

REGIONAL WILDERNESS PARKS

Several regional and wilderness parks are easily accessible to the residents of Laguna Hills. Regional parks frequently encompass large areas of land and may include special recreation features such as lakes, trails, and natural open space. These parks play an important part in providing a wider spectrum of recreation opportunities for the residents of the community. Aliso and Wood Canyon Regional Park and Laguna Niguel Regional Park are both located just to the south of the City boundary. Crystal Cove State Park, Laguna Coast Wilderness Park, Salt Creek Corridor Regional Park, Arroyo Trabuco Regional Park, O'Neil Regional Park, Mason Regional Park, Thomas F. Riley Wilderness Park, and Caspers Wilderness Park are additional regional recreation sites within a short drive from Laguna Hills.

RECREATIONAL TRAILS

Currently, the trail system within Laguna Hills is maintained by the City, the County of Orange, the Nellie Gail Ranch Owners Association, and Lomas Laguna Homeowners Association. This system of trails provides both internal trails for walking, biking, and horseback riding as well as external links to trails that lead into nearby wilderness areas and adjacent cities. The trails in Laguna Hills are classified as Pedestrian/Equestrian Trails or Multi-use Corridors. Table 5.13-3 provides a description of the existing trail types, uses, locations, and linkages to adjacent communities.

Table 5.13-3
Existing Pedestrian/Equestrian Trails and Multi-Use Corridors within Laguna Hills

Trail/ Corridor	Trail Type*	Uses Permitted	Description of Trail/Corridor	Linkages to Adjacent Communities
Aliso Creek	T	Pedestrian/Equestrian/ Off-road Bicycle	County Trail from Paseo de Valencia to I-5 to Clarington Park. Trail located on southeast bank of Aliso Creek.	Trail ends to the west at Paseo de Valencia into Laguna Woods. Trail ends to the east at I-5 into Mission Viejo.
Cabot Road	T	Pedestrian/Equestrian/ Off-road Bicycle	County Trail located on east side of Cabot Road from the south City limits to Oso Parkway to the north.	Trail connects to County Trail located at the south side of Oso Parkway.
	T	Pedestrian/Equestrian	Private Nellie Gail Trail on west side of Cabot Road that traverses to connect with another Nellie Gail trail along the north side of Oso Parkway.	None
Laguna Hills Drive	T	Pedestrian/Equestrian/ Off-road Bicycle	County Trail located to the north of Laguna Hills Drive from Paseo de Valencia to the western City Limit.	Trail connects to Aliso Creek Trail and into Aliso & Woods Canyon Park.
La Paz Road	MU	Off-road Bicycle/ Pedestrian/Equestrian	County Trail located on north side of La Paz Road from approximately 850 feet east of Alameda Avenue, west under Moulton Parkway, continuing north to the County Aliso Creek Trail into Aliso & Woods Canyons Park.	Trail connects to Aliso Creek Trail and into Aliso & Woods Canyon Park.
Moulton Parkway	T	Pedestrian/Equestrian/ Off-road Bicycle	County Trail from Moulton Parkway and Laguna Hills Drive and traversing south to La Paz Road.	Trail connects to Aliso Creek Trail and into Aliso & Woods Canyon Park.
San Joaquin Hills Transportation Corridor	T	Pedestrian/Equestrian/ Off-road Bicycle	Private Nellie Gail Trail from Moulton Parkway just east of Pinestrap Circle. Trail interrupted by fenced-no access area owned by Caltrans. Trail continues just west of Greenfield Drive.	Trail links to County Trail from Laguna Niguel to Aliso & Wood Canyon Park.

Table 5.13-3 (continued)
Existing Pedestrian/Equestrian Trails and
Multi-Use Corridors within Laguna Hills

Trail/ Corridor	Trail Type*	Uses Permitted	Description of Trail/Corridor	Linkages to Adjacent Communities
Oso Parkway	T	Pedestrian/Equestrian/ Off-road Bicycle	Trail on south side of Oso Parkway from Moulton Parkway to Cabot Road. Portion City trail and portion County trail.	Trail connects to southbound County Trail east of Cabot Road in Mission Viejo.
Paseo de Valencia	T	Pedestrian/Equestrian	Trail on east side of Paseo de Valencia from just south of Aliso Creek to Laguna Hills Drive. Trail connects to County Aliso Creek Trail along Laguna Hills Drive.	None
La Paz Road/ Oso Parkway Connector	T	Pedestrian/Equestrian/ Off-road Bicycle	Private Nellie Gail Trail from Oso Parkway, between Falcon Hills and Nellie Gail, linking to La Paz Road Trail.	Trail links to the Aliso Creek Trail by way of the La Paz Trail.

* Trail Type designated by the City of Laguna Hills and defined as:
T = Pedestrian/Equestrian Trails
MU = Multi-Use Corridors
Source: City of Laguna Hills 2001

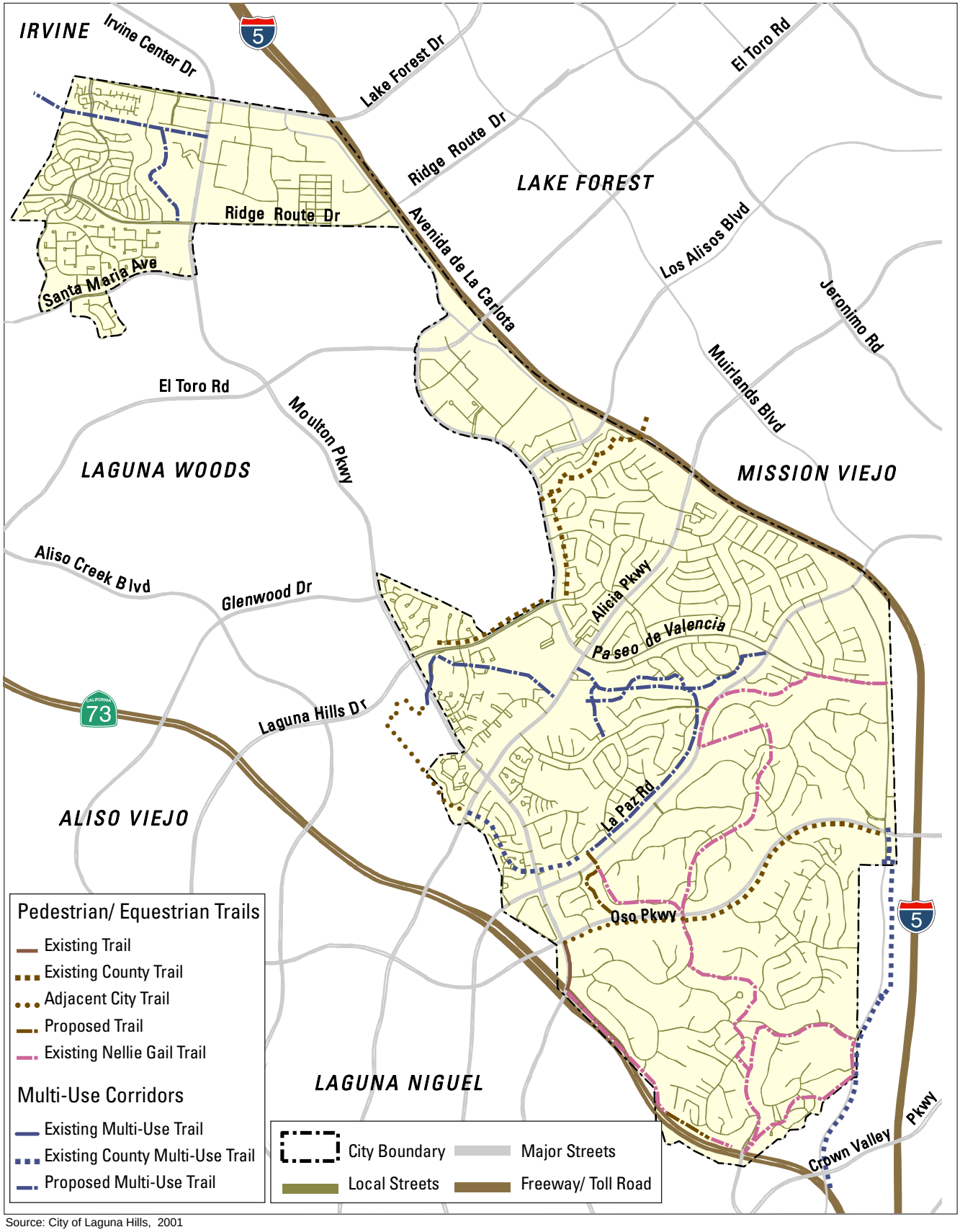
Pedestrian/Equestrian Trails

Sidewalks contribute to the walkability of Laguna Hills. Due to the built-out nature of Laguna Hills, these suburban sidewalks constitute the majority of pedestrian by-ways provided within City limits. In addition to sidewalks, many portions of the City are suitable for equestrian uses, which have been long established. The Nellie Gail Ranch Owners Association has built, and continues to maintain, a system of trails in the southeast portion of the City that are primarily intended for equestrian uses. The trail network provides an internal network of private trails intended for Nellie Gail residents but also provides connections to County trails leading into larger wilderness parks in adjacent communities. Signal buttons at equestrian height are provided at several intersections along the trails and there are four tunnels beneath major arterials in the City to provide safer linkages for equestrians.

While most of the pedestrian/equestrian trails are maintained by the County or are privately maintained trails, opportunities exist for additional City trails and linkages that would increase the livability of the community by connecting parks, open space, schools, and other community activity centers. Figure 5.13-2 illustrates the existing collection of trails and multi-use corridors within the City and also identifies areas where potential opportunities exist to increase community connections and provide the missing links in the current network of trails.

Multi-Use Corridors

Multi-use corridors include pedestrian and equestrian uses but also have adequate right-of way to accommodate bikeways. Multi-use corridors can either be composed of a bikeway and pedestrian/equestrian trail separated by a fence or median, or a bikeway with a soft shoulder wide enough to be used as a pedestrian/equestrian trail. Several arterials have been identified as having the additional right-of-way needed to accommodate bikeways and are therefore eligible to be multi-use corridors.



Source: City of Laguna Hills, 2001

0 0.25 0.5 1 Miles

Figure 5.13-2
Trails (Existing and Proposed)

OPEN SPACE

The open space areas within the planning area total approximately 413 acres and include both areas of public and private parks; natural open space corridors; hillsides; canyons; and various utility, roadway, and buffer easements. The purpose of designating these open space areas is to preserve environmental resources and aesthetic attributes, and protect public health and safety. The City plants and maintains many trees in these areas.

The City was primarily developed as a series of small residential communities. Much of the open space consists of steep slopes captured between the residential areas and along utility corridors. Some of the open space is landscaped with ornamental plants; however, there are areas of disturbed European grasses and coastal sage scrub, as well as riparian areas adjacent to Aliso Creek and San Diego Creek. The largest open space area in the southern part of the City is the land through which the Edison Easement traverses (Figure 5.13-1). In north Laguna Hills, the area adjacent to Veeh Ranch Park is a large, privately owned open space, with man-made lakes, and is surrounded by riparian habitat.

5.13.2 REGULATORY FRAMEWORK

Regulations exist at local, state, and federal levels that guide the development and enforcement of codes to adequately provide public services and facilities to City residents and businesses. These regulations include, but are not limited to the following.

QUIMBY ACT

The 1975 Quimby Act (California Government Code §66477) authorized cities and counties to pass ordinances requiring that developers set aside land, donate conservation easements, or pay park fees for parkland acquisition or parkland improvements.

CITY OF LAGUNA HILLS MUNICIPAL CODE

Section 8-06.040 of the City of Laguna Hills Municipal Code requires that 5.0 net acres of usable parkland for each one thousand (1,000) persons residing within the City shall be devoted to public parks (Ord. 2000-6 § 1 (part)).

BIKEWAYS, TRAILS, AND OPEN SPACE MASTER PLAN

The City of Laguna Hills Bikeways, Trails, and Open Space Master Plan was prepared in 2001 and represents a comprehensive planning effort to guide future recreation development and natural area conservation within the City of Laguna Hills. The Plan includes a description of the baseline conditions in 2001 as well as explores the opportunities and constraints for the improvement of bikeways, trails, and open spaces.

5.13.3 THRESHOLDS FOR DETERMINING SIGNIFICANCE

Based on Appendix G of the CEQA Guidelines, a significant impact related to recreation would occur if implementation of the General Plan would:

- Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated; or
- Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse effect on the environment.

5.13.4 ANALYSIS OF ENVIRONMENTAL IMPACTS

INCREASED USE AND PHYSICAL DETERIORATION OF RECREATIONAL RESOURCES

Development pursuant to the General Plan would result in an increase of approximately 457 dwelling units and 1,031,530 square feet of nonresidential building floor area over existing conditions. A net population increase of approximately 1,229 persons is also anticipated at buildout according to the General Plan. New residents would result in increased use of existing City and regional parks, other recreational facilities, and trails.

At the national level, professional park planners have not adopted a parkland acreage goal or standard for urban areas. Many cities throughout California use a standard of 3.0 to 5.0 acres of parkland per 1,000 residents as a benchmark for sufficient park space. Laguna Hills has adopted a standard of 5.0 acres per 1,000 residents. This is the ratio the City uses for park dedication/fees requirements.

Table 5.13-4 identifies the population, park space demand, and the total park acreage for 2008, with projections for 2030 based upon the projected population within the planning area and the planned active park space. The total park acreage includes public parks and recreational areas, IODs, and school site recreational areas.[7] While the City's total park acreage does not include various recreational trails, open space areas, or the nearby regional wilderness parks, it should be noted that these areas provide valuable recreational opportunities for residents within the planning area in addition to the organized public recreational areas.

Table 5.13-4
Existing and Future Park Acreage Needs

	Population[1]	Park Acreage Required to Meet 5.0 acres/ 1,000 residents	Total Park Acreage	Parkland Surplus or (Shortfall)
Existing (2007)	33,421	167.11	187.34[2]	20.23
Future (2030)	34,650	173.10	200.34[3]	27.24

Notes:
1 2007 Population estimates are based on U.S. Census Bureau and Center for Demographic. 2030 population based on estimates of 3.22 persons per household for single-family units and 2.68 persons per household for multi-family units, a net population increase of approximately 1,229 persons (from 33,421 to 34,650) is expected by 2030.
2 Public park acreage: 84.54; IODs acreage: 62; School acreage (81.6 acres @ 50 percent credit): 40.8; Total: 187.34.
3 2030 acreage assumes future development parks are implemented (13 acres in the Via Lomas Opportunity Area).

As shown in Table 5.13-4, approximately 187.34 acres of existing parklands are located within the planning area. This exceeds the established park acreage standard defined in the City's Municipal Code by approximately 20.23 acres. Further, it is anticipated that approximately 200.34 acres of parkland would be located within the planning area by 2030. This would exceed the future (2030) park acreage requirements by approximately 27.24 acres.

7 The City currently holds rental agreements and/or joint-use agreements with the four schools located within the planning area for the use of certain recreational spaces outside of normal school hours. Fifty percent of the acreage for each school site is included in the total parkland acreage.

Even though the City is currently exceeding the established park standard and would continue to do so in the future, the City continues to recognize the need for additional public parks and recreational facilities. In fact, there are numerous policies and programs included in the General Plan aimed at increasing the supply of recreational resources in the planning area in an effort to avoid potential impacts from increased use and physical deterioration of existing and future park and recreational facilities. In addition, the General Plan contains an implementation program that requires the City to conduct a Park and Recreation Needs Assessment to determine which areas within the City would be suitable for public parks or other recreational facilities. This may include joint-use opportunities with schools or other institutions.

The proposed General Plan does extend the Community Commercial land use designation in the Moulton and La Paz Opportunity Area about 150 feet south. This extension would result in the loss of approximately 2.27 acres of unimproved dedicated open space, and a purchase and sale agreement of publicly owned land to a private developer. This open space primarily consists of dirt and interspersed eucalyptus trees. The area is not used for recreational purposes and is not included in the park acreage totals presented in Table 5.13-4. Adjacent to this area and to the south is dedicated open space that is used for recreational purposes, as a horse trail, at the corner of Moulton Parkway and La Paz Road. The area is also not included in the park acreage totals presented in Table 5.13-4. The horse trail would be retained and enhanced with the extension of the Community Commercial land use designation and any subsequent redevelopment. Additionally, landscaping would be increased to further enhance the visual appeal of this area. The loss of the approximate 2.27 acres of open space would not increase the use and physical deterioration of other recreational resources in the planning area because this portion of the open space system is not used for recreation.

With adherence to the existing regulations as well as the implementation of the policies and programs included in the General Plan, programmatic level impacts to recreational resources would be less than significant.

CONSTRUCTION OR EXPANSION OF RECREATIONAL FACILITIES

The General Plan has identified a 13-acre site located in the Via Lomas Opportunity Area for potential park development; however, no specific project or park improvements have been defined. As such, the specific environmental impact cannot be determined at the General Plan level of analysis. Future development of park and recreational facilities could potentially result in significant impacts in such areas as aesthetics, biology, geology, biology, hazards and hazardous materials, and water quality. However, existing City programs for project design and approval as well as the CEQA environmental review process require that such potential impacts be addressed prior to construction of new facilities. The actual impacts of new park facilities would depend upon the precise type and location of such facilities and would therefore need to be addressed in a project-level environmental review. However, it is anticipated that implementation of General Plan policies and programs, coupled with existing City regulations and review processes, would adequately mitigate any potential secondary environmental impacts. Therefore, impacts would be less than significant and no further mitigation at this Program EIR level would be required.

5.13.5 MITIGATION MEASURES

No mitigation measures would be required since impacts are less than significant.

5.13.6 IMPACT AFTER MITIGATION

INCREASED USE AND PHYSICAL DETERIORATION OF RECREATIONAL RESOURCES

Impacts associated with the increased use and physical deterioration of recreational resources within the planning area would be less than significant without mitigation.

CONSTRUCTION OR EXPANSION OF RECREATIONAL FACILITIES

The significance of impacts resulting from specific future park development projects would be determined on a project-by-project basis. If project level significant impacts are identified, specific mitigation measures will be required.

This page intentionally left blank.

5.14 TRANSPORTATION AND CIRCULATION

This section includes an analysis of the existing and future traffic operations for the key intersections and roadways in the City of Laguna Hills. This section reviews traffic volume forecasts, assuming buildout of the General Plan, and identifies intersection and roadway improvements that would be required to accommodate the buildout traffic volumes. The primary source of information presented in this section is summarized from the *City of Laguna Hills Draft Mobility Element Traffic Study* prepared by Austin-Foust Associates, Inc in November 2008 (Appendix E).

5.14.1 ENVIRONMENTAL SETTING

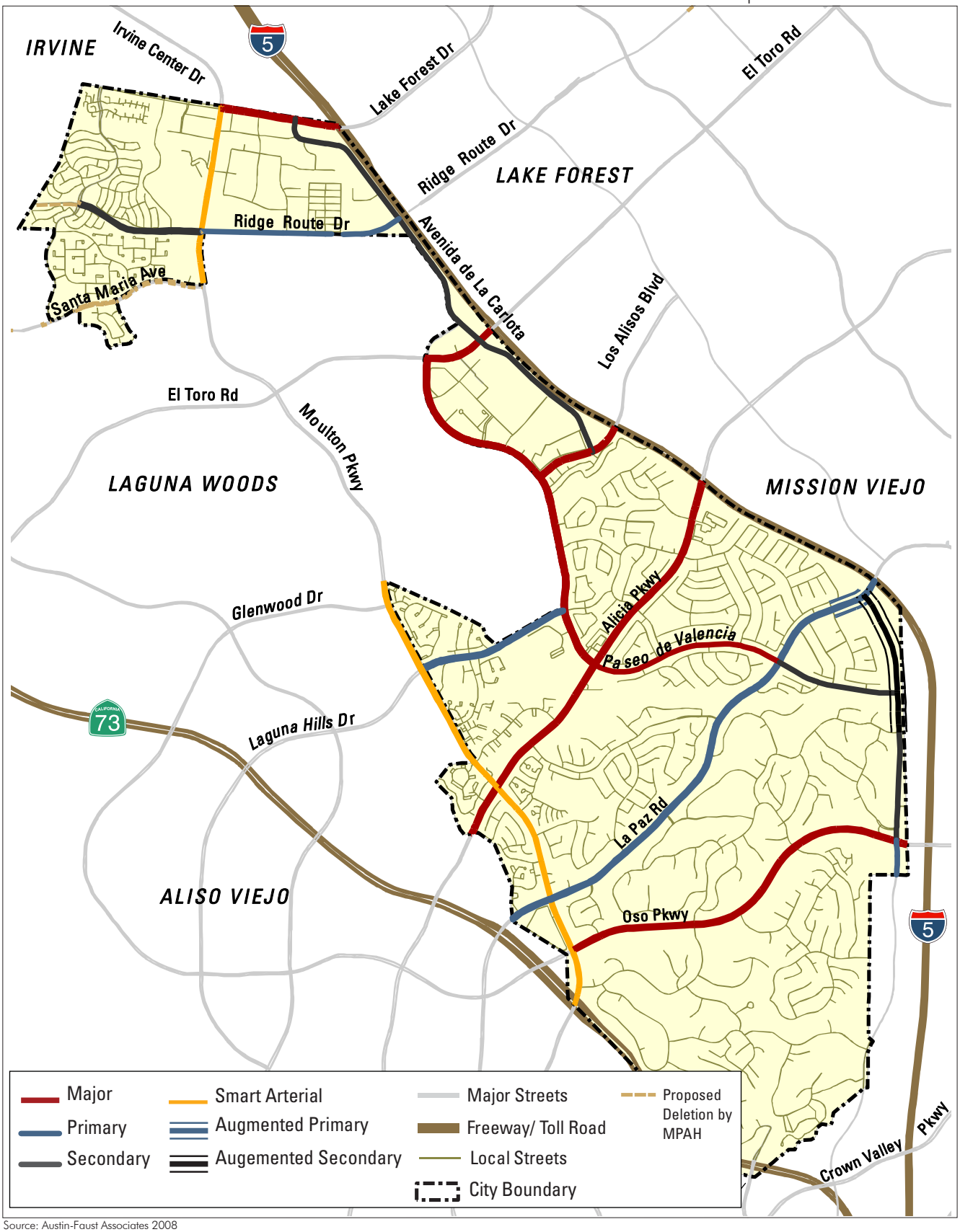
EXISTING ROADWAY SYSTEM

The planning area's existing roadway network is shown in Figure 5.14-1. The City of Laguna Hills' local circulation network is connected to an efficient regional circulation system. I-5 is the major north-south transportation facility that defines the eastern boundary of the City of Laguna Hills. I-5 provides access to destinations throughout southern California and beyond. Within the City, access to I-5 is provided from Lake Forest Drive, El Toro Road, Alicia Parkway, and La Paz Road. Access to I-5 is also provided by Oso Parkway, just east of the City limits. The San Joaquin Hills Transportation Corridor (SR-73) forms a portion of the City's western and southern border and is another north-south facility. SR-73 is a toll road, which extends between the Interstate 405 interchange in Costa Mesa to the north, and an I-5 interchange in Laguna Niguel to the south. SR-73 on- and off-ramps are located adjacent to the City limits at La Paz Road, Moulton Parkway, and Greenfield Drive.

The planning area also includes a local street system as well as a system of recreational trails that accommodate a variety of different users such as bikers, walkers, and equestrians. The City is also served by public transit and a system of bike trails and bike lanes.

ROADWAY CLASSIFICATION STANDARDS

The street classifications in Laguna Hills are based on Countywide Master Plan of Arterial Highways (MPAH) classifications as maintained by the Orange County Transportation Authority (OCTA) and adopted by the City upon incorporation. These classifications and street standards have been incorporated into the existing circulation system design. The classifications use a hierarchy system that classifies streets based on the intended traffic volume capacity and character of travel (i.e., regional vs. local). The roadway categories are summarized in Table 5.14-1.



Source: Austin-Faust Associates 2008

0 0.25 0.5 1 Miles

Figure 5.14-1
Existing Roadway Network

Table 5.14-1
Roadway Classifications

MPAH Classification	Facility Type	Characteristics	Arterials in Laguna Hills
Principal Arterials	8 Lane Divided	Primarily serves through traffic with limited local access	None
Major Arterials	6 Lane Divided	Serves mostly through traffic with some local access allowed	Alicia Parkway, El Toro Road, Lake Forest Drive, Los Alisos Boulevard, Moulton Parkway, Oso Parkway, and Paseo de Valencia (El Toro Road to La Paz Road)
Primary Arterials	4 Lane Divided	Serves through and local traffic	Laguna Hills Drive, La Paz Road, Cabot Road (La Paz to Oso Parkway), and Ridge Route Drive
Secondary Arterials	4 Lane Undivided	Serves mostly local traffic	Avenida de la Carlota, Cabot Road (south of Oso Parkway), and Paseo de Valencia (La Paz Road to Cabot Road)
Augmented Arterials	varies	Modified roadways with characteristics such as auxiliary lanes and raised medians to accommodate more traffic volumes	La Paz Road between I-5 and McIntyre Street, and Cabot Road from La Paz Road to Nellie Gail Road
Collector Arterials	2 Lane Undivided	Serves local traffic	Santa Vittoria Drive, Mill Creek Drive, and Aliso Hills Drive
Smart Street	varies	4- to 8-lane divided, with possible signal coordination, intersection capacity improvements, and/or grade separation	Moulton Parkway

Source: City of Laguna Hills General Plan 2008

PERFORMANCE CRITERIA – LEVEL OF SERVICE STANDARDS

The performance criteria used in Laguna Hills are based on two primary measures. The first is "capacity," which establishes the vehicle carrying ability of a roadway and the second is "volume." The volume measure is either a traffic count (in the case of existing volumes) or a forecast for a future point in time. The ratio between the volume and the capacity gives a volume/capacity (V/C) ratio and based on that V/C ratio, a corresponding level of service is defined. A level of service scale is used to evaluate roadway performance based on V/C ratios. The level of service (LOS) levels range from "A" to "F," with LOS A representing free flow conditions and LOS F representing severe traffic congestion. Descriptions of traffic flow characteristics associated with each level of service are provided in Table 5.14-2.

Table 5.14-2
Level of Service Descriptions

LOS	Description	HCM[1] Delay Per Vehicle (sec.)		ICU or V/C[2]
		Signalized	Unsignalized	
A	LOS "A" describes operations with low control delay, up to 10 seconds per vehicle. This LOS occurs when progression is extremely favorable and most vehicles arrive during the green phase. Many vehicles do not stop at all. Short cycle lengths may tend to contribute to low delay values.	≤ 10.0	≤ 10.0	≤ .60
B	LOS "B" describes operations with control delay greater than 10 and up to 20 seconds per vehicle. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than the LOS "A," causing higher levels of delay.	10.1 – 20.0	10.1 – 15.0	.61 - .70
C	LOS "C" describes operations with control delay greater than 20 and up to 35 seconds per vehicle. These higher delays may result from only fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. Cycle failure occurs when a given green phase does not serve queued vehicles, and overflows occur. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.	20.1 – 35.0	15.1 – 25.0	.71 - .80
D	LOS "D" describes operations with control delay greater than 35 and up to 55 seconds per vehicle. At LOS "D," the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, and high V/C ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	35.1 – 55.0	25.1 – 35.0	.81 - .90
E	LOS "E" describes operations with control delay greater than 55 and up to 80 seconds per vehicle. These high delay values generally indicate poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent.	55.1 – 80.0	35.1 – 50.0	.91 – 1.00
F	LOS "F" describes operations with control delay in excess of 80 seconds per vehicle. This level, considered unacceptable to most drivers, often occurs with oversaturation, that is, when arrival flow rates exceed the capacity of lane groups. It may also occur at high V/C ratios with many individual cycle failures. Poor progression and long cycle lengths may also contribute significantly to high delay levels.	> 80.0	> 50.0	> 1.00

HCM = Highway Capacity Manual; ICU = Intersection Capacity Utilization; V/C = Volume to Capacity Ratio
Source: Austin-Foust Associates 2008

Various level of service standards have been established to evaluate observed traffic conditions, future development plans, and street network modifications. At the regional planning level, the County's Congestion Management Program (CMP) specifies LOS E (V/C ratio less than or equal to 1.00) as the operating standard for CMP intersections in Orange County. There is only one CMP intersection in Laguna Hills—Avenida de la Carlota at El Toro Road.

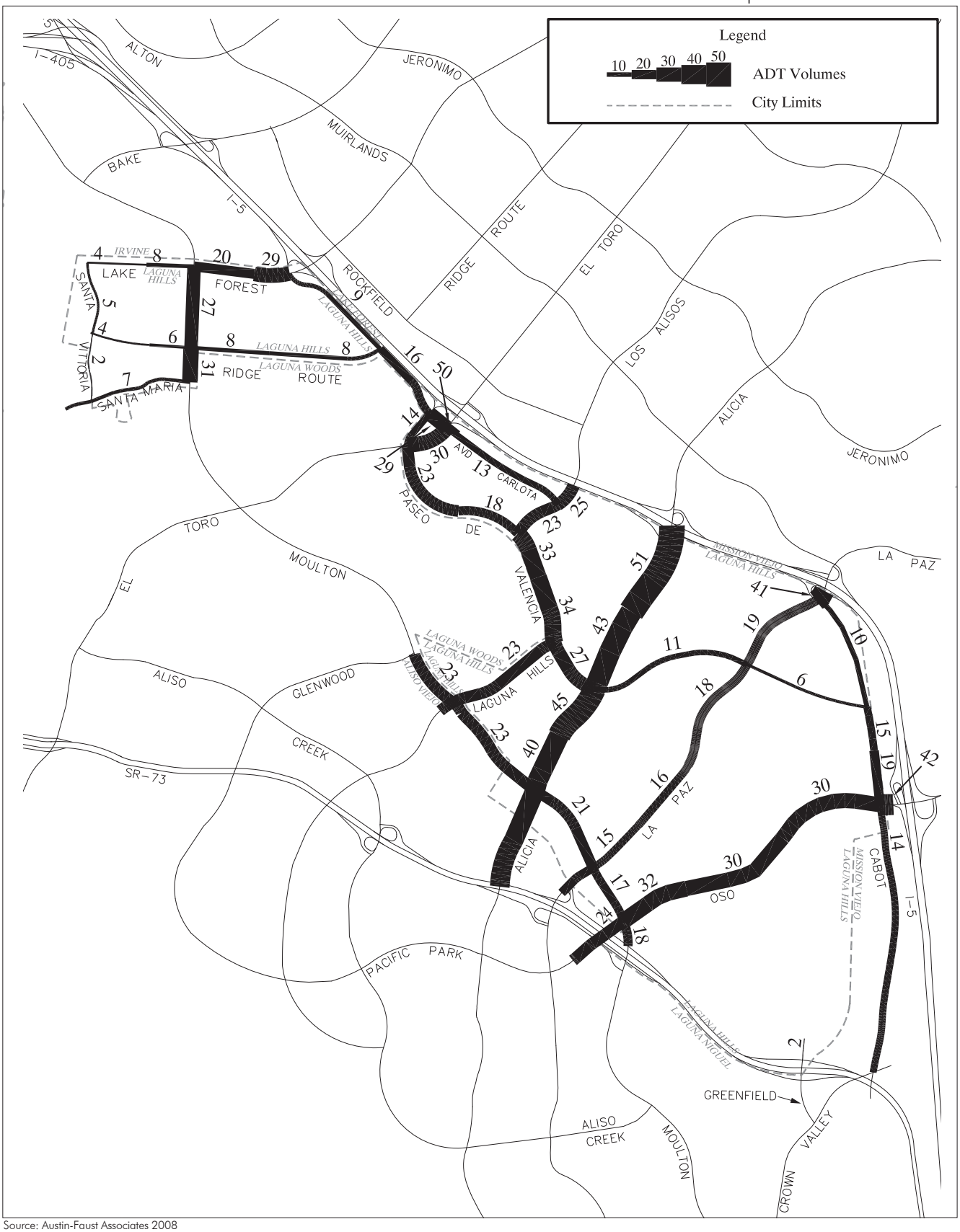
At the local level, evaluation of volumes, capacities, and levels of service on the City street system is based on peak hour intersection data, since intersections are the primary limiting factor affecting traffic flow on City streets. The City uses peak hour intersection capacity utilization (ICU) values to calculate the performance of intersections within its jurisdiction. The City's performance standard for intersections is LOS D, which is an ICU value of .90 or less.

This LOS D policy represents a desirable threshold for attaining acceptable mobility on the City's arterial street system over time. However, not all traffic growth is attributable to land use decisions made by the City and specific intersections may have physical or other constraints that create difficulties in making the necessary improvements. Under such circumstances, a finding can be made that a specific location is a "critical intersection" with level of service able to degrade below LOS D. At the same time, any such critical intersections are to be monitored over time to determine if (1) improvements at nearby locations direct enough traffic from the critical intersection to bring it to an acceptable level of service or (2) changes occur that reduce traffic at the intersection or create opportunities for making physical improvements. For an intersection that is forecast to operate worse than the performance standard, the impact of a given project is considered to be significant if the project increases the ICU by .02 or more.

EXISTING TRAFFIC CONDITIONS

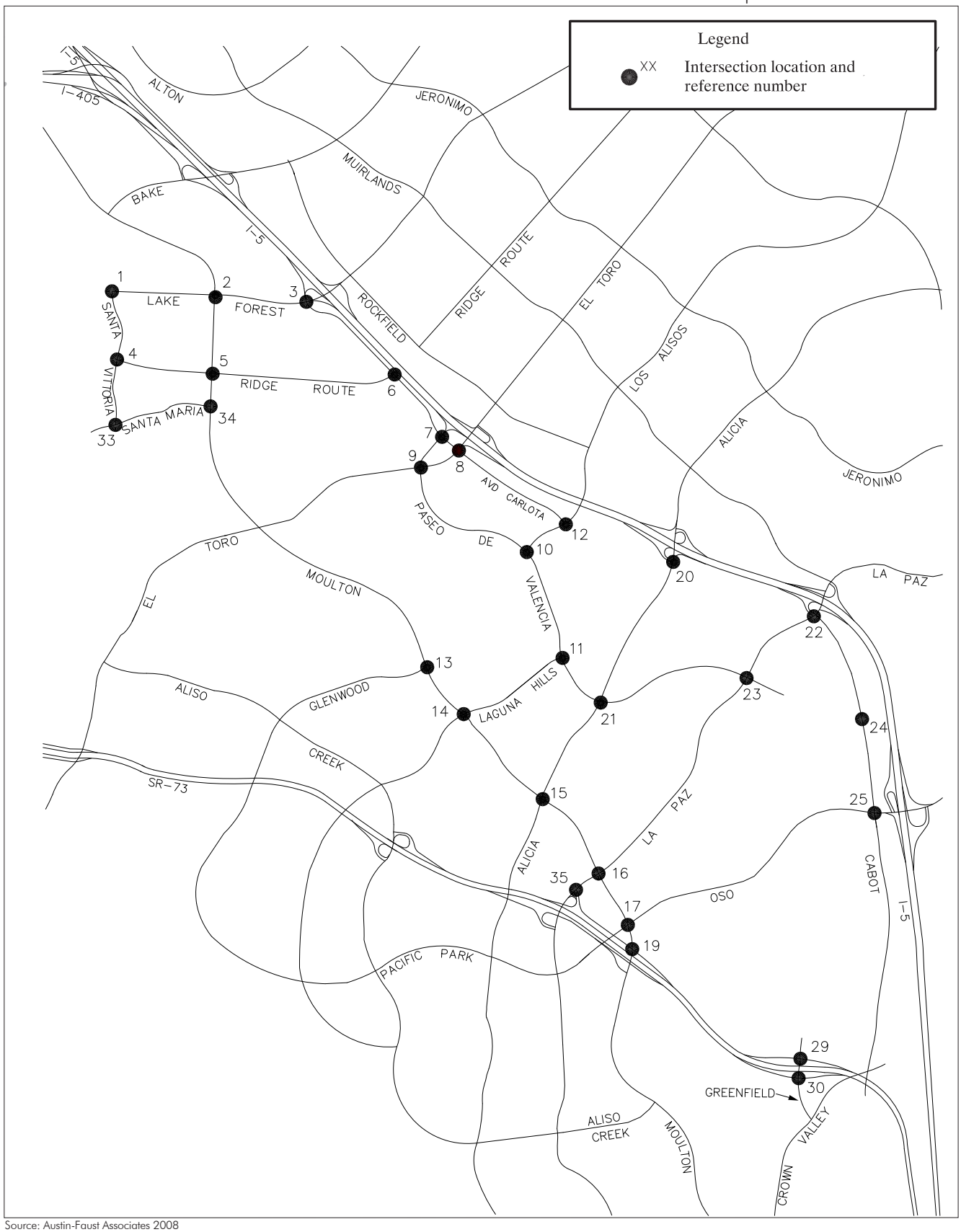
The existing average daily traffic (ADT) volumes on the circulation system are illustrated in Figure 5.14-2. The volumes for the arterial roads in the planning area are from traffic counts collected in 2007 and total 172,023 ADT. Moulton Parkway, a six-lane arterial traversing the City, experienced volumes ranging from 27,000 ADT at the north end to 17,000 ADT at the boundary with Laguna Niguel. Alicia Parkway, a four- to six-lane arterial, carried volumes ranging from 51,000 ADT at I-5 to 39,000 ADT where it crosses at the SR-73. Other high volume roadways include Paseo de Valencia with 34,000 ADT north of Laguna Hills Drive and Oso Parkway with 30,000 ADT west of Cabot Road.

Figure 5.14-3 illustrates the intersections analyzed in the planning area. Table 5.14-3 summarizes the existing peak hour intersection ICU and level of service values throughout the City. For each intersection location, the highest peak hour ICU value during the AM or PM peak hour is shown here together with the corresponding level of service and illustrated in Figure 5.14-4.



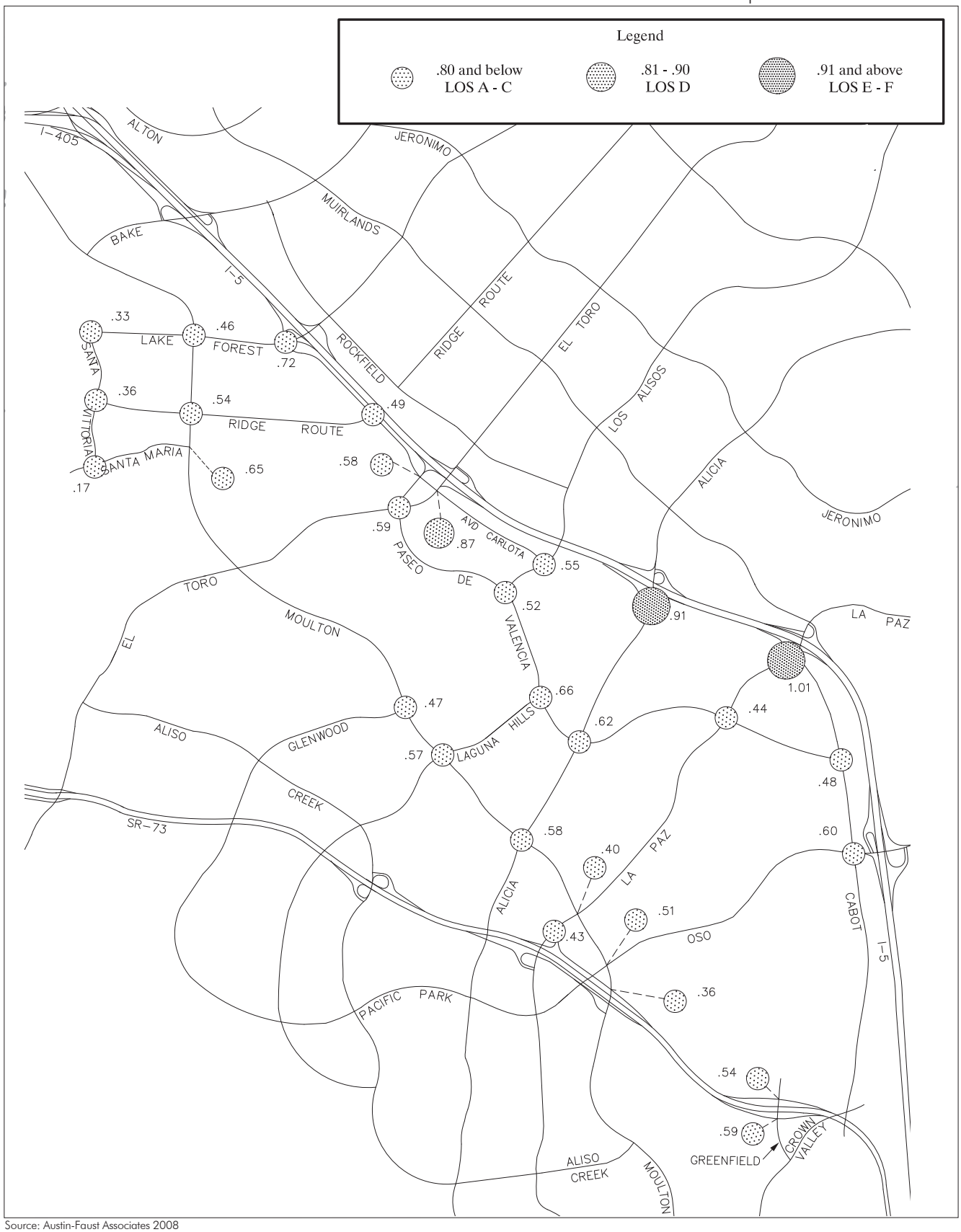
Source: Austin-Faust Associates 2008

Figure 5.14-2
Existing Average Daily Traffic (ADT) Volumes



Source: Austin-Faust Associates 2008

Figure 5.14-3
Study Intersections



Source: Austin-Faust Associates 2008

Figure 5.14-4
Existing Level of Service (LOS)

Table 5.14-3
Existing Peak Hour Intersection Levels of Service

	Intersection	AM Peak Hour		PM Peak Hour	
		ICU	LOS	ICU	LOS
1.	Santa Vittoria Dr & Lake Forest Dr	.28	A	.33	A
2.	Moulton Pkwy & Lake Forest Dr	.467	A	.445	A
3.	I-5/Avd de la Carlota & Lake Forest Dr	.52	A	.72	C
4.	Santa Vittoria Dr & Ridge Route Dr	.36	A	.32	A
5.	Moulton Pkwy & Ridge Route Dr	.45	A	.543	A
6.	Avd de la Carlota & Ridge Route Dr	.321	A	.498	A
7.	Avd de la Carlota & Paseo de Valencia	.53347	A	.58	A
8.	Avd de la Carlota & El Toro Rd (a)	.656	B	..87796	DE
9.	Paseo de Valencia & El Toro Rd	.59	A	.58	A
10.	Paseo de Valencia & Los Aliso Blvd	.41	A	.52	A
11.	Paseo de Valencia & Laguna Hills Dr	.587	A	.665	B
12.	Avd de la Carlota & Los Alisos Blvd	.41	A	.55	A
13.	Moulton Pkwy & Glenwood Dr	.46	A	.47	A
14.	Moulton Pkwy & Laguna Hills Dr	.556	A	.57	A
15.	Moulton Pkwy & Alicia Pkwy	.545	A	.587	A
16.	Moulton Pkwy & La Paz Rd	.40	A	..39340	A
17.	Moulton Pkwy & Oso Pkwy	.40	A	.51	A
~~18.~~	~~Moulton Pkwy & Nellie Gail Rd~~	~~.33~~	~~A~~	~~.32~~	~~A~~
19.	Moulton Pkwy & SR-73 WB Ramp	.36	A	.28	A
20.	I-5 SB Ramps & Alicia Pkwy	.79	C	.91	E*
21.	Paseo de Valencia & Alicia Pkwy	.58	A	.62	B
22.	I-5 SB Ramps/Cabot & La Paz Rd	.84	D	1.01	F*
23.	Paseo de Valencia & La Paz Rd	.43	A	.44	A
24.	Cabot Rd & Paseo de Valencia	.38	A	.48	A
25.	Cabot Rd & Oso Pkwy	.51	A	.60	A
29.	Greenfield Dr & SR-73 Ramps	.54	A	.45	A
30.	Greenfield Dr & SR-73 ES Ramps	.43	A	.598	A
33.	Santa Vittoria Dr & Santa Maria	.165	A	.176	A
34.	Moulton Pkwy & Santa Maria	.43	A	.65	B
35.	Merienda/SR-73 WB Ramps & La Paz Rd	.435	A	.321	A

(a) LOS "E" is acceptable at this CMP intersection. * Exceeds LOS "D."
ICU level of service (LOS) ranges:
.00 – .60 A
.61 – .70 B
.71 – .80 C
.81 – .90 D
.91 – 1.00 E
Above 1.00 F

There are currently two intersections within the planning area that operate worse than the acceptable LOS D threshold (ICU to not exceed .90). Both intersections are at I-5 Freeway interchanges (Alicia Parkway and La Paz Road). It should be noted that Avenida de la Carlota at El Toro Road is operating at LOS E (ICU between .91 and 1.00), which is acceptable since it is an intersection in the County's CMP.

PARKING

Parking availability is important for the overall quality of life in Laguna Hills and the vitality of shopping and service areas. A lack of parking frustrates residents, businesses, and visitors, while too much parking wastes valuable land and impedes the City's economic, aesthetic, and environmental objectives. Greater

management of parking spaces in the City can help achieve mobility, environmental, and community development goals. As portions of the City redevelop, additional parking may be necessary to accommodate greater intensity of development.

ALTERNATIVE TRANSPORTATION

Public transportation and alternative modes of travel such as bicycling are an important component of a comprehensive circulation system. Public and alternative modes of transportation offer an alternative to the use of automobiles and help reduce air pollution and road congestion. To promote the increased usage of these modes of transportation, adequate facilities must be provided.

Bus Service

Public bus service in Laguna Hills is provided by OCTA. OCTA transit routes provide access to residences, jobs, recreation areas, civic uses, shopping, and services throughout Laguna Hills, and connect to numerous other destinations in Orange County. Some of the routes also connect to Metrolink and Amtrak rail services just south of the City in Laguna Niguel and north of the City in Irvine, at the Irvine Transportation Center. OCTA routinely updates its long-range service plans to respond to necessary changes to service levels and route configurations. Currently, 10 fixed routes provide bus service to portions of Laguna Hills. Table 5.14-4 lists the OCTA bus routes that provide service to Laguna Hills as of 2008. All routes, except bus route 70, serve the Laguna Hills Transportation Center, which is located near the Laguna Hills Mall at the intersection of Paseo de Valencia and Calle de los Caballeros. A park and ride facility is also located at the Laguna Hills Transportation Center and in the Laguna Hills Mall parking lot.

Table 5.14-4
OCTA Bus Routes Serving Laguna Hills (2008)

Route	Origin	Destination
70	Sunset Beach	Dana Point
83	Anaheim	Laguna Hills
87	Rancho Santa Margarita	Laguna Niguel
89	Mission Viejo	Laguna Beach
91	Laguna Hills	San Clemente
177	Foothill Ranch	Laguna Hills
187	Laguna Hills	Dana Point
188	Laguna Hills	Irvine
212	Irvine	San Juan Capistrano Express
216	San Juan Capistrano	Costa Mesa Express

Source: OCTA 2008

Paratransit

The Americans with Disabilities Act (ADA) requires all public transit operations to provide paratransit (door-to-door) service to persons whose disabilities prevent them from using accessible fixed-route public transit. Paratransit services are transportation services such as carpooling, vanpooling, taxi service, and dial-a-ride programs. In Laguna Hills, OCTA provides shared-ride paratransit services via the ACCESS program for people who are unable to use the regular, fixed-route bus service because of functional limitations caused by a disability.

Rail Service

Rail service is an important mobility option for residents of Laguna Hills to reach destinations outside of the City. Although the City of Laguna Hills is not directly served by rail, the Laguna Niguel/Mission Viejo rail station is located approximately 0.5 mile south of Laguna Hills, within the City of Laguna Niguel. The Irvine station is located approximately 3 miles north of the City on Barranca Parkway. Both Metrolink and Amtrak trains serve these stations. Metrolink provides daily service to these stations, including weekends, via the Orange County Line, and the Inland Empire - Orange County Line.

Bikeways

The City has an existing system of bikeways that provide internal community links as well as bicycle access to many of the surrounding communities. Laguna Hills utilizes the standards developed by Caltrans to classify bikeways within the City. Table 5.14-5 describes the bike standards as well as general locations within the City.

Table 5.14-5
Bikeway Classification Description

Type	Description	Location
Class 1 – Bike Path	Provides a completely separated right-of-way for the exclusive use of bicycles and pedestrians with cross flow minimized	Portions of Aliso Creek, the San Diego Freeway, Oso and Alicia parkways, Paseo de Valencia, and through Veeh Ranch Park.
Class 2 – Bike Lane	Provides a striped lane for one-way bike travel on a street or highway.	Portions of Moulton, Alicia, and Oso parkways, Paseo de Valencia, Ridge Route and Laguna Hills Drives, Los Alisos Boulevard, and La Paz Road.
Class 3 – Bike Route	Provides for shared use with pedestrian or motor vehicle traffic.	Portions of Cabot Road, Moulton Parkway, and Avenida de La Carlota.

Source: City of Laguna Hills 2008

In addition to the bikeways listed in Table 5.14-5, several arterials in the City have sufficient right-of-way to accommodate additional bikeways and could fill in missing links in the City's bike network. The City continues to explore ways to further enhance connectivity throughout the planning area through the use of additional bikeways.

5.14.2 REGULATORY FRAMEWORK

Regulations exist at local, state, and federal levels that guide the development and enforcement of codes to adequately provide public services and facilities to City residents and businesses. These regulations include, but are not limited to the following.

SCAG REGIONAL TRANSPORTATION PLAN

In May 2008, the Southern California Association of Governments (SCAG) adopted the 2008 Regional Transportation Plan (RTP). The RTP is the culmination of a multiyear effort involving stakeholders from across the SCAG Region and connects the six-county region of Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura counties to a future vision in which innovative solutions address current transportation challenges. The 2008 RTP presents the transportation vision for this region through the year 2035 and provides a long-term investment framework for addressing the region's transportation and

related challenges. The plan focuses on maintaining and improving the transportation system through a balanced approach that considers system preservation, system operation and management, improved coordination between land use decisions and transportation investments, and strategic expansion of the system to accommodate future growth. SCAG has also adopted a Regional Transportation Improvement Program to implement the projects and programs listed in the RTP. These plans work together to help improve vehicular traffic within the region and thereby reduce air pollution.

COUNTY OF ORANGE CONGESTION MANAGEMENT PROGRAM

The State of California requires urbanized areas such as Orange County to adopt a CMP with the goal of reducing traffic congestion and facilitating coordination of local land use planning and regional transportation improvement decision. The Orange County CMP is largely a composite of data collected by local jurisdictions according to guidelines established by the Orange County Transportation Authority (OCTA). The data are compiled by OCTA and submitted to SCAG, the agency that determines regional consistency. Within Laguna Hills, Moulton Parkway, El Toro Road, I-5, and SR-73 are components of the Orange County CMP.

COUNTY OF ORANGE GROWTH MANAGEMENT PLAN (MEASURE M)

In 1990, Orange County voters approved Measure M authorizing a half-cent retail sales tax increase for a period of 20 years effective April 1, 1991. In 2006, Orange County voters approved the renewal of Measure M for another 30 years until 2041. Measure M revenue is returned to local jurisdictions for use on local and regional transportation and maintenance projects.

The purpose of the Orange County Growth Management Plan is to ensure that transportation and other public facilities are adequate to meet current and projected needs of County residents. The Plan establishes the following five major policies:

- **Development Phasing:** Development would be phased according to Comprehensive Phasing Plans (CPPs) adopted by the County. Phasing is limited to roadway and public facility capacities.

- **Balanced Community Development:** Development would be balanced to encourage employment of local residents, and both employment and employee housing in the County, as well as in individual growth management areas (GMAs).

- **Traffic Level of Service:** Future development creates the need for improvements to major intersections significantly impacted by growth, and a developer fee program is included to pay for improving affected intersections on a pro-rata basis.

- **Traffic Improvement Programs:** All new development must provide necessary transportation facilities and intersection improvements as a condition of development approval.

- **Public Facility Plans:** Comprehensive public facility plans for fire, sheriff/police, and library services are required. New development participates on a pro-rata basis.

Implementation of the Orange County Growth Management Plan involves the establishment of (1) GMAs to implement CPPs; (2) Facility Implementation Plans to address the financing of public facilities for each GMA; (3) Countywide implementation and evaluation of compliance with development phasing and improvements; and (4) traffic improvement/public facility development agreements.

To qualify for Measure M revenue, each jurisdiction must comply with the Countywide Traffic Improvement and Growth Management Program. Specifically, to receive an allocation of Measure M revenue, Laguna Hills must submit a statement of compliance with the growth management components of this Program. Requirements include the adoption of a traffic circulation plan consistent with the Master Plan of Arterial Highways, adoption of a Growth Management Element within the General Plan, adoption and adequate funding for a local transportation fee program, and adoption of a 7-year capital improvement program that includes all transportation projects funded either partially or fully by Measure M funds.

COUNTY OF ORANGE MASTER PLAN OF ARTERIAL HIGHWAYS

~~The County of Orange MPAH forms part of the Orange County General Plan and designates the arterial system in the Circulation Element of the General Plan. Defined according to specific arterial functional classifications, the MPAH serves to define the intended future roadway system for the County. Cities within the County are expected to achieve consistency with the MPAH in individual General Plan circulation elements. To implement changes to the MPAH, approval from the Orange County Transportation Authority is required.~~The Orange County Master Plan of Arterial Highways serves as a long range blueprint to ensure consistent standards and coordinated planning for over 1,400 miles of arterial streets in Orange County. The MPAH was initially established in 1956, and is continuously updated to reflect changing development and traffic patterns. Since 1990, consistency of local jurisdiction's General Plan Circulation Elements with the MPAH has been required for the receipt of Measure M funding. As part of the MPAH consistency requirement, local jurisdictions must also obtain OCTA approval of proposed changes to MPAH facilities on their General Plan Circulation Elements. In order to ensure that inter-jurisdictional impacts are addressed, a cooperative traffic study is required in cases where the proposed MPAH amendments may have an impact outside of the boundary of the requesting agency.

OCTA COMMUTER BIKEWAYS STRATEGIC PLAN

The OCTA Commuter Bikeways Strategic Plan is a regional planning document that identifies existing and proposed bikeways in Orange County. OCTA is currently updating the Commuter Bikeways Strategic Plan. The updated plan would help coordinate bikeway planning efforts between local agencies by providing a regional perspective of the needs and benefits of bikeways in Orange County.

CITY OF LAGUNA HILLS BIKEWAYS, TRAILS, AND OPEN SPACE MASTER PLAN

The City of Laguna Hills Bikeways, Trails, and Open Space Master Plan was prepared in 2001 and represents a comprehensive planning effort to guide future recreation development and natural area conservation within the City of Laguna Hills. The Plan includes a description of the baseline conditions in 2001 as well as explores the opportunities and constraints for the improvement of bikeways, trails, and open spaces.

5.14.3 THRESHOLDS FOR DETERMINING SIGNIFICANCE

Based on Appendix G of the CEQA Guidelines, a significant impact related to transportation and circulation would occur if implementation of the General Plan would:

- Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections);

- Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways;
- Result in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks;
- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);
- Result in inadequate emergency access;
- Result in inadequate parking capacity; or
- Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks).

The City does not have adopted thresholds for specific intersections but has established the following performance standards and thresholds of significance for peak-hour level of service for the following roadway classifications:

Roadway Type	Performance Standard	Threshold of Significance
Arterial Intersection	LOS D (peak hour ICU less than or equal to .90), except for specially designated intersections (i.e., CMP intersections) where LOS E is acceptable.	For an intersection that is forecast to operate worse than the performance standard, the impact of a given project is considered to be significant if the project increases the ICU by .02 or more.
Freeway Ramp	LOS E (peak hour V/C less than or equal to 1.00).	For an intersection that is forecast to operate worse than the performance standard, the impact of a given project alternative is considered to be significant if, the V/C increases by more than .01.

5.14.4 ANALYSIS OF ENVIRONMENTAL IMPACTS

METHODOLOGY

The overall purpose of this traffic analysis is to determine the adequacy of the arterial highway component of the circulation system in relation to the General Plan Land Use Element. For this reason, the study area encompasses only those key roadway segments and intersections within the City of Laguna Hills (Figure 5.14-3). Within the City, the long-range 2030 data analyzed in the traffic study depict the development potential of the proposed Land Use Element. Outside the City, year 2030 demographic data as given in OCP-2004 are assumed as well as data for nearby approved projects in the Cities of Irvine and Lake Forest. The land uses being depicted are not compared to a "no project" scenario as would occur in a typical project Program EIR. This is appropriate for a General Plan study since no actual entitlement is given by the adoption of a General Plan. Entitlement for each of the proposed land use changes is not being sought at this time, and as each opportunity area applies for entitlement, an analysis will be required to determine the extent of the project's impact (i.e., study area) according to well-defined impact criteria.

To evaluate the future transportation system, this section includes forecasts of traffic, level of service at study intersections, and roadway volume. Traffic flow is measured and analyzed both on a daily basis and during peak commuting hours to estimate ADT on selected roadways and at intersections. Traffic volumes are counted to determine operating conditions at study intersections during peak hours. Peak hours are typically measured during the morning (7:00-9:00 a.m.) and afternoon/evening (4:00-6:00 p.m.)

commutes, and are referred to as the AM and PM peak hours, respectively. The single highest hourly traffic volume in the morning and afternoon are then used to develop intersection level of service estimates. The intersection capacity utilization (ICU) methodology was used to determine the LOS for intersections analyzed in this EIR. The Highway Capacity Manual (HCM) delay methodology was applied for those locations where situations such as physical constraints exist. Physical constraints include, for example, closely spaced intersections that do not allow the theoretical ICU values to be achieved. In such cases, operational analyses are carried out using delay-based procedures as described in the HCM. ~~The Highway Capacity Manual (HCM 2000) delay-based methodology was used to estimate the level of service at intersections.~~

The City of Laguna Hills Traffic Analysis Model (LHTAM) was used to derive the traffic forecasts discussed above. The LHTAM uses geographically defined land use databases as primary inputs to the modeling process. The information is quantified by traffic analysis zones, of which there are 100 such zones in the City. The year 2030 land uses represent a future scenario as defined by long-range development plans depicted in the Land Use Element of the General Plan. Buildout land use data from the General Plan Land Use Element thereby show future circulation system needs in relation to future land use projections.

2030 ANALYSIS

As mentioned above, the year 2030 traffic forecasts derived from the LHTAM reflect a specially prepared land use database within the City and use OCP-2004 demographic data outside the City. The 2030 traffic scenario for the planning area assumes that committed improvements, described in Table 5.14-6, would be made to the City's arterial system. These programmed improvements in Table 5.14-6 represent projects that are fully funded and thereby have reasonable assurance of being completed by the year 2030.

Table 5.14-6
Year 2030 Committed Improvements

Location	Improvement
Lake Forest Drive	Extend from existing terminus at Tesla/Santa Vittoria Drive to Laguna Canyon Road as a four-lane primary arterial.
Bake Parkway	Extend from existing terminus at Irvine Center Drive to future extension of Lake Forest Drive as a six-lane major arterial.
La Paz Road	Third eastbound lane added from McIntyre Street to the I-5 ramps.
Santa Vittoria & Lake Forest	Add southbound right lane.
I-5 Southbound Ramps/Avenida de la Carlota and Lake Forest Drive	Restripe shared 3rd SBL/2nd SBT to 3rd SBL and SBT to shared SBT/2nd SBR, add 2nd NBL and NB right-turn overlap.
~~I-5 Southbound El Toro Ramp/Avenida de la Carlota & Paseo de Valencia~~	~~Add 2nd SBL, SBR, 2nd WBL, 2nd NBL and 4th NBT.~~
Moulton Parkway and Ridge Route Drive	Add 2nd SBL, SBR, 2nd WBL, 2nd NBL and 4th NBT
Avenida de la Carlota & El Toro	Restripe 2nd WBT to shared 3rd WBL/2nd WBT.
I-5 Southbound Ramps & Alicia	Add full 2nd SBL ~~and 2nd NBR, restripe NBL to NBL/2nd NBT.~~
I-5 Southbound Ramps/Cabot & La Paz	~~Add full 2nd SBL.~~Restripe SB to 2 SBL, shared SBT/2nd SBR and full SBR, add 3rd EBT, 2nd WBL and free WBR, restripe 2nd NBR to shared 2nd NBL/2nd NBR

Abbreviations:
L,T,R – left, through, right
SB, NB, WB, EB – southbound, northbound, westbound, eastbound
Source: Austin-Foust Associates 2008

Assuming these improvements above, Figure 5.14-5 illustrates the year 2030 ADT volumes on the City's arterial roadway system. The volumes on Moulton Parkway would range from 51,000 ADT at the north end near the City of Irvine to 25,000 ADT at the south end boundary with Laguna Niguel. Alicia Parkway would experience volumes ranging from 62,000 ADT at I-5 to 47,000 ADT where it crosses at SR-73. Other high-volume roadways would include Paseo de Valencia with 46,000 ADT north of Laguna Hills Drive and Oso Parkway with 38,000 ADT east of Moulton Parkway.

It is anticipated that a total of 212,650 ADT would occur within the planning area in 2030. This would represent a net increase of 40,626 ADT over existing conditions. Most of the potential growth implied by the General Plan Land Use Element would occur in a few select growth areas identified in Chapter 3.0, Project Description: the opportunity areas, the future study areas,[8] and the seven vacant residential parcels. Table 5.14-7 summarizes the changes in ADT associated with the General Plan land use changes in these growth areas.

Table 5.14-7
Proposed Land Use Changes and Trip Generation (ADT) Summary

Location	Existing ADT	Proposed Future (2030) ADT	Net Change (ADT)	Net Change (Percentage Increase)
Alicia Gateway	13,035	23,545	10,510	80%
Moulton/La Paz	2,914	4,512	1,598	55%
Via Lomas	2,710	4,765	2,055	76%
La Paz Gateway	10,951	11,398	447	4%
North Business Park	45,411	47,618	2,207	5%
Urban Village	95,373	119,115	23,742	25%
Vacant Residential Sites	1,629	1,697	68	4%
TOTAL	**172,023**	**212,650**	**40,627**	**24%**

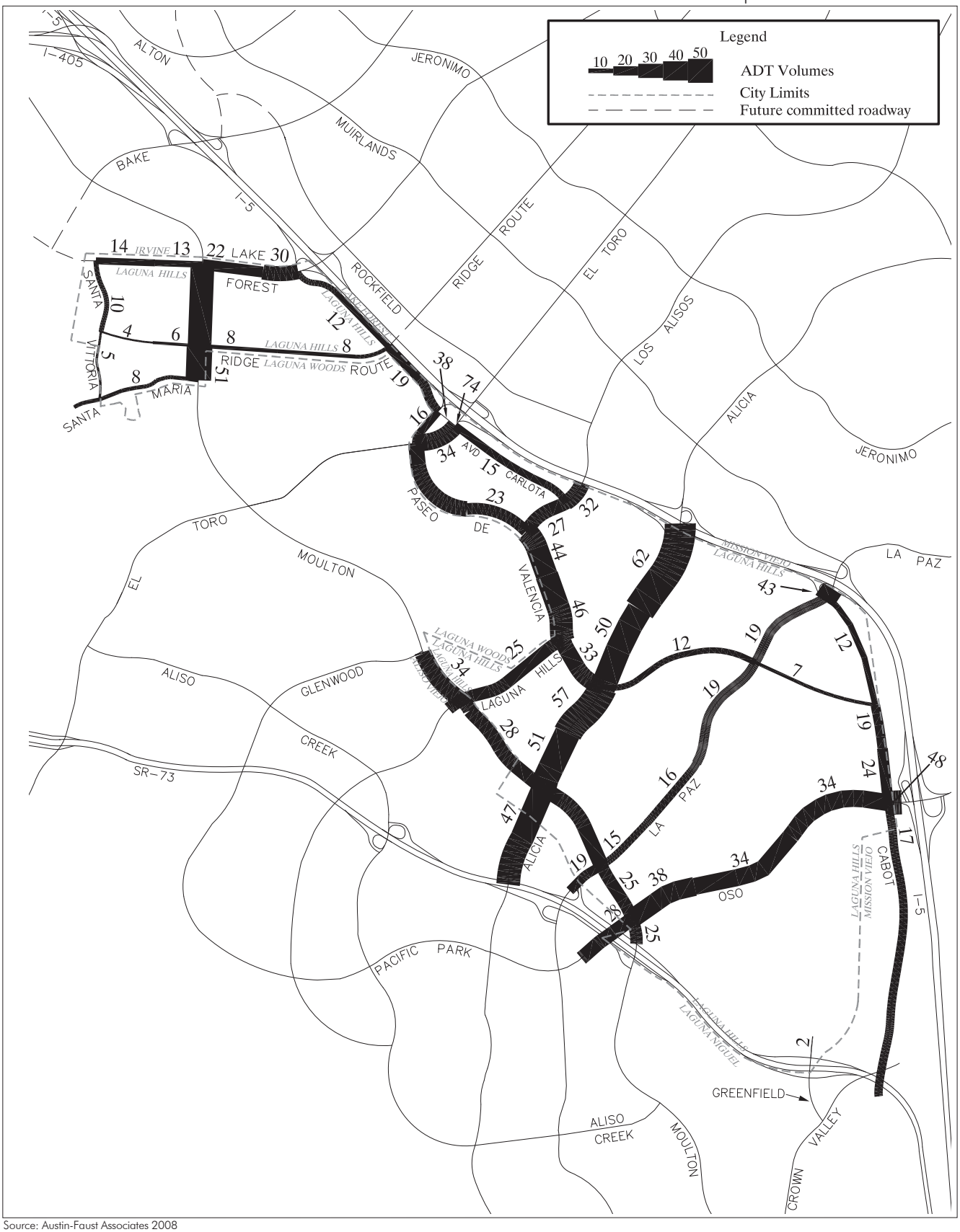
Source: Austin-Foust Associates 2008

Overall, the planning area would experience a 24 percent increase in the total ADT by 2030. As shown above in Table 5.14-7, the three opportunity areas (Alicia Gateway, Moulton/La Paz, and Via Lomas) would experience the greatest increases in ADT in 2030 with implementation of the General Plan. However, as shown in Table 5.14-8, each of the study intersections serving these opportunity areas would continue to operate at an acceptable level of service (LOS D or better).

Table 5.14-8
2030 Peak Hour Level of Service for Study Intersections in Opportunity Areas

Opportunity Area	Study Intersection	AM Peak Hour		PM Peak Hour	
		ICU	LOS	ICU	LOS
Alicia Gateway	I-5 SB Ramps & Alicia Pkwy	.88	D	.90	D
	Paseo de Valencia & Alicia	.77	C	.81	D
Moulton/La Paz	Moulton & La Paz	.54	A	.53	A
	Merienda/SR-73 WB Ramps & La Paz	.61	B	.34	A
Via Lomas	Moulton & Alicia	.67	B	.76	C
	Paseo de Valencia & Alicia	.77	C	.81	D
	Paseo de Valencia & Laguna Hills	.71	C	.90	D
	Moulton & Laguna Hills	.65	B	.78	C

[8] The Alicia Parkway/Aliso Hills Park Triangle future study area was not included in this traffic analysis because no land use changes are proposed for the area. The existing land use designations at the Alicia Parkway/Aliso Hills Park Triangle future study area are parks and open space.



Source: Austin-Faust Associates 2008

Figure 5.14-5
2030 Average Daily Traffic (ADT) Volumes

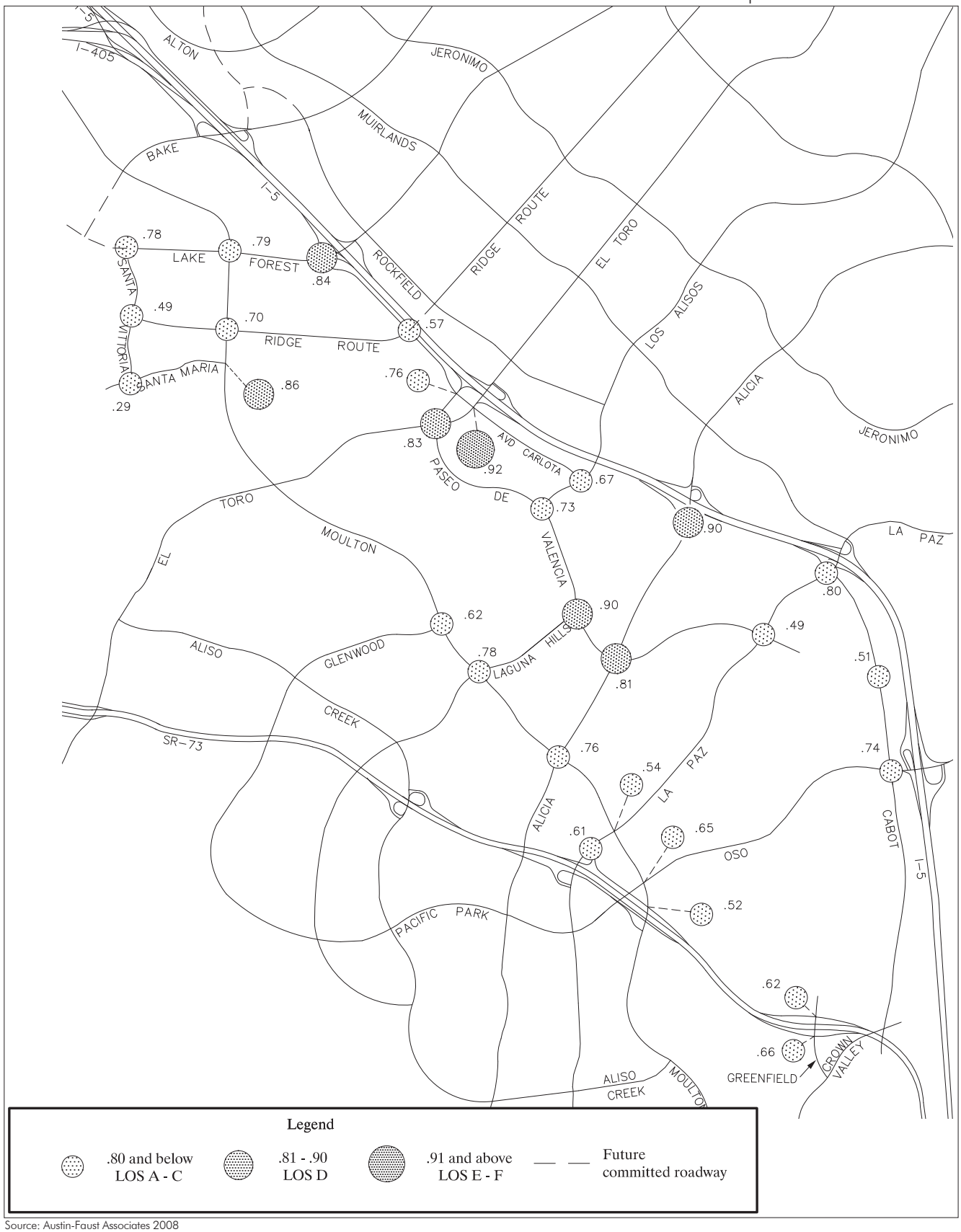
Table 5.14-9 summarizes the year 2030 peak hour ICU values and levels of service for all of the study intersections within the planning area. Figure 5.14-6 illustrates the peak hour ICUs and level of service for the highest AM/PM peak hour.

Table 5.14-9
2030 Peak Hour Level of Service

	Intersection*	AM Peak Hour		PM Peak Hour	
		ICU	LOS	ICU	LOS
1.	Santa Vittoria & Lake Forest	.78	C	.78	C
2.	Irvine Center/Moulton & Lake Forest	.59	A	.79	C
3.	I-5 SB/Avd Carlota & Lake Forest	.55	A	.84	D
4.	Santa Vittoria & Ridge Route	.49	A	.41	A
5.	Moulton & Ridge Route	.52	A	.70	B
6.	Avd de la Carlota & Ridge Route	.36	A	.57	A
7.	Avd de la Carlota & Paseo de Valencia	.67	B	.76	C
8.	Avd de la Carlota & El Toro (a)	.67	B	.926	E
9.	Paseo de Valencia & El Toro	.55	A	.83	D
10.	Paseo de Valencia & Los Alisos	.67	B	.73	C
11.	Paseo de Valencia & Laguna Hills	.71	C	.90	D
12.	Avd de la Carlota & Los Alisos	.46	A	.67	B
13.	Moulton & Glenwood	.59	A	.62	B
14.	Moulton & Laguna Hills	.65	B	.78	C
15.	Moulton & Alicia	.7467	CB	.76	C
16.	Moulton & La Paz	.54	A	.53	A
17.	Moulton & Oso	.53	A	.65	B
~~18.~~	~~Moulton & Nellie Gail Rd~~	~~.44~~	~~A~~	~~.40~~	~~A~~
19.	Moulton & SR-73 WB Ramps	.52	A	.41	A
20.	I-5 SB Ramps & Alicia	.88	D	.90	D
21.	Paseo de Valencia & Alicia	.77	C	.81	D
22.	I-5 Ramps/Cabot & La Paz	.627	B	.80	C
23.	La Paz & Paseo de Valencia	.49	A	.47	A
24.	Cabot & Paseo de Valencia	.51	A	.4661	AB
25.	Cabot & Oso	.61	B	.74	C
29.	Greenfield & SR-73 WB Ramps	.62	B	.49	A
30.	Greenfield & SR-73 EB Ramps	.49	A	.66	B
33.	Santa Vittoria & Santa Maria	.29	A	.26	A
34.	Moulton Pkwy & Santa Maria	.65	B	.86	D
35.	Merienda/SR-73 WB Ramps & La Paz	.61	B	.34	A

(a) LOS "E" is acceptable at this CMP intersection. * Exceeds LOS "D."
ICU level of service (LOS) ranges:
.00 – .60 A
.61 – .70 B
.71 – .80 C
.81 – .90 D
.91 – 1.00 E
Above 1.00 F

As shown in the analysis above, no intersection is forecast to be deficient based on ICU or LOS values in 2030. Also as previously noted, LOS E at Avenida de la Carlota and El Toro Road intersection is acceptable since it is an intersection in the County's CMP.



Source: Austin-Faust Associates 2008

Figure 5.14-6
2030 Level of Service (LOS)

FUTURE TRAFFIC CONDITIONS

As shown in Table 5.14-8, none of the study intersections are forecasted to be deficient (exceed the LOS D performance standard as define by the City) based on ICU/LOS values for 2030. All intersections within the planning area would operate at a LOS D or better, with the exception of the intersection at Avenida de la Carlota and El Toro Road, which would operate at a LOS E. However, the intersection at Avenida de la Carlota and El Toro Road is specially designated under the County's CMP, and LOS E is acceptable at this location. Furthermore, all freeway ramps would operate at LOS D or better at General Plan buildout, which is an improvement over existing conditions. While certain study intersections would experience a higher volume of traffic when compared to existing conditions, none of these intersections would exceed the performance standard or surpass the established thresholds of significance. More specifically, the study intersections serving the opportunity areas would continue to operate at an acceptable level of service with implementation of the General Plan. Therefore, development pursuant to the General Plan would not result an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system and impacts would be less than significant. Further, development pursuant to the General Plan would not exceed the level of service standard established by the County's CMP. Impacts would be less than significant.

In an effort to maintain adequate levels of service in the planning area, the General Plan contains policies and programs that aim to reduce potential impacts of development and redevelopment within the planning area as well as the region. The City would continue to review discretionary development proposals on a project-by-project basis for potential impacts to the mobility and infrastructure systems to ensure the circulation network meets City standards. In addition, the City would use the level of service standards established in the proposed Mobility Element to determine the significance of impacts and require mitigation in the form of physical improvements and/or impact fees to reduce the significant impacts (Implementation Program M-1). Moreover, the City would continue to coordinate with the surrounding local jurisdictions to reduce the impacts of development in Laguna Hills on adjacent jurisdictions by actively participating in the interjurisdictional forums for GMAs 9 and 10 (Implementation Program M-3).

AIR TRAFFIC PATTERNS

Although development pursuant to the General Plan would result in changes to the land use designations in portions of the City, the changes would not impact air traffic patterns as there are no airports located within or adjacent to the City. Therefore, no significant impacts related to air traffic patterns would occur.

ROADWAY DESIGN AND EMERGENCY ACCESS

Implementation of the General Plan would not include traffic improvements or designs that would have the potential to make existing and future roadways unsafe. In fact, the General Plan contains a program to adopt a formal traffic calming policy that would construct and implement traffic calming measures in appropriate locations that would actually enhance traffic safety on the overall circulation system. Traffic calming measures can slow traffic on local streets or divert traffic from roadways not intended to accommodate high traffic levels. Traffic calming measures can include increased law enforcement, signage, landscaping, trees, sidewalks, and bike lanes to also help serve as traffic calming techniques. In addition, adequate levels of service are maintained at intersections and freeway ramps within the planning area resulting in adequate emergency access. As a result, impacts associated with roadway design or emergency access would result in less than significant impacts upon implementation of the General Plan.

PARKING

As portions of the City redevelop, additional parking may be necessary to accommodate greater intensity of development. It is important that parking demand generated by future development does not negatively impact adjacent uses and neighborhoods. The City would utilize a broad range of parking management tools and strategies to avoid excessive parking requirements and to prevent parking spillover effects. In addition, development and redevelopment pursuant to the General Plan would be required to comply with all regulations and standards set forth in the Laguna Hills Municipal Code. Therefore, impacts associated with parking would be less than significant.

ALTERNATIVE TRANSPORTATION

Enhanced local bicycle and pedestrian linkages are anticipated to be implemented in the planning area due to the General Plan. The General Plan contains programs and policies designed to link residential areas, schools, parks and commercial centers so that residents can travel within the community without driving. The City has adopted a Transportation Demand Ordinance as part of the Municipal Code to support alternative transportation methods. The City would also update the Bikeways, Trails & Open Space Master Plan to identify gaps and major barriers to connectivity in the City to improve pedestrian/walkability. Additionally, Laguna Hills is committed to ensuring that public transportation improves as a viable alternative to the automobile for residents. The City would also continue to work with OCTA to maintain consistency with on all plans, activities, and projects that may affect public transportation within the planning area. With implementation of the General Plan policies and programs, no conflicts with adopted policies or plans associated with alternative transportation would occur and impacts would be less than significant.

5.14.5 MITIGATION MEASURES

No mitigation measures would be required.

5.14.6 IMPACT AFTER MITIGATION

FUTURE TRAFFIC CONDITIONS

Impacts associated with future traffic conditions would be less than significant without mitigation.

AIR TRAFFIC PATTERNS

No significant impacts associated with air traffic patterns would occur and no mitigation measures are required.

ROADWAY DESIGN AND EMERGENCY ACCESS

Impacts associated with roadway design and emergency access would be less than significant without mitigation.

PARKING

Impacts associated with parking would be less than significant without mitigation.

ALTERNATIVE TRANSPORTATION

Impacts associated with alternative transportation would be less than significant without mitigation.

This page intentionally left blank.

5.15 THEORETICAL BUILD-OUT SCENARIO

This section provides a description of the theoretical build-out scenario for the planning area. The theoretical build-out scenario is included to provide the reader with the ability to understand the worst-case scenario of full, but theoretical, development of the General Plan.

The theoretical build-out scenario demonstrates residential and nonresidential development levels that could theoretically be achieved under the General Plan. Unlike a forecast, a theoretical build-out scenario does not have a time horizon, such as 2030, nor does it include transportation, demographic, or economic assumptions typically used by a forecasted model to provide more realistic land use planning data. Therefore, due to regulatory constraints, physical constraints, and foreseeable market conditions, realization of this scenario is highly unlikely; however, this scenario is analyzed because the General Plan land use designations do provide the theoretical capacity (dwelling units and nonresidential building square feet) to allow the build-out statistics presented below in Table 5.15-1.

Table 5.15-1
Theoretical Build-Out Capacity

Land Use Designation	Acreage	Density		Build-Out Capacity		
		du/ acre	FAR	Commercial (square feet)	Office (square feet)	Dwelling Units
Residential						
Estate Residential	1,094.42	5.0	--	--	--	5,472
Low Density	971.51	6.5	--	--	--	6,315
Medium Density	115.46	18.0	--	--	--	2,078
Medium-Low Density	380.08	12.5	--	--	--	4,751
High Density	57.78	30.0	--	--	--	1,733
Planned Community	139.81	18.0	--	--	--	2,517
Planned Community ~~Via Lomas~~Residential	39.00	fixed	--	--	--	600
Mixed Use						
Mixed Use	262.31	3.5	0.30; 0.08[1]	3,427,867	--	918
Neighborhood Mixed Use	61.53	3.5	0.30; 0.08[1]	804,074	--	215
Commercial						
Community Commercial	~~99.40~~101.67	--	0.35	1,515,452	--	--
Freeway Commercial	86.42	--	0.40	1,505,782	--	--
Village Commercial	226.17	--	--	375,000	518,000	200
Office Professional	26.03	--	0.50	--	566,933	--
Public/Recreation						
Public/Institutional	157.49	--	1.00	6,860,264	--	--
Parks	133.43	--	--	--	--	--
Open Space	~~395.39~~393.12	--	--	--	--	--
Less ROW (subtract from total)	12.23	--	--	--	--	--
TOTAL	**4,234**	**--**	**--**	**14,488,439**	**1,084,933**	**24,799**

[1] Mixed Use designations have a maximum 0.38 FAR of 0.30 nonresidential FAR and 0.08 residential FAR. For this calculation, 0.08 FAR = 3.5 dwelling units per acre as reflected in the "du/acre" column.

Theoretical buildout of land within the planning area would result in a substantial change in the level of residential and nonresidential development. To achieve the theoretical build-out scenario, it was assumed for residential that existing land uses, located on plan-designated multifamily land, would redevelop or infill at the maximum point of their residential density range. For nonresidential (commercial, office, and

public uses) it is assumed that all existing land uses, located on plan-designated nonresidential land, would redevelop or infill at the maximum allowed zoning FAR.

Under the theoretical build-out scenario, when compared to the existing conditions, there would be a 122 percent increase in total housing units and a 149 percent increase in nonresidential (commercial, office, and public uses) building square footage. Under the theoretical build-out scenario, there would also be substantially more development than that anticipated under the General Plan build-out scenario. When comparing the two, there would be a 113 percent increase in total housing units and a 114 percent increase in nonresidential building square footage.

Given the generalized, highly theoretical nature of this build-out analysis, this analysis does not account for variations due to the implementation of additional regulations or site-specific conditions that will affect attainment of density. For example, parking requirements and topography may make attainment of maximum densities infeasible, and site-specific easements may restrict development of certain properties to levels below what is permitted by the General Plan and Zoning Ordinance. In addition, additional units that may be attained through density bonus regulations are not accounted for in this analysis.

5.15.1 AESTHETICS AND VISUAL RESOURCES

Under the General Plan build-out scenario, the basic neighborhood character and aesthetic quality of the environment would remain the same, with some alteration of specific sites as redevelopment occurs. Under the theoretical build-out scenario, entire neighborhoods could be subject to redevelopment to achieve buildout. As such, the neighborhood character and the aesthetic quality of many areas could be dramatically altered. Areas currently occupied by single-family homes in areas that allow multifamily uses would be redeveloped with the allowed additional density. Commercial areas would also be enlarged to meet maximum build-out potential, which would be strikingly different from the current environment. A major alteration of the City's topography would be needed to accommodate this level of development. View corridors (landscape corridors) would be substantially altered if not blocked completely in some areas. Due to the magnitude of change in intensity of development under the theoretical build-out scenario and the lack of specific development projects and associated project-level mitigation, the impacts to aesthetics and visual resources would be significant and unavoidable.

5.15.2 AGRICULTURAL RESOURCES

There are no designated farmlands located within the planning area. In addition, there are no lands within the planning area that are currently used for agricultural purposes. Therefore, no lands within the planning area would be subject to conversion from agricultural use to urban use. Under the theoretical build-out scenario, there would be no impacts to agricultural resources.

5.15.3 AIR QUALITY

Under theoretical build-out conditions, the increased development capacity and density would add a substantial number of automobile, train, or airplane trips or stationary source emissions, which could potentially affect Laguna Hills' ability to meet regional, state, and federal clean air standards, including the RAQS or State Implementation Plan.

This increase in development could also create air emissions that could substantially deteriorate ambient air quality, including the exposure of sensitive receptors to substantial pollutant concentrations. The construction needed to create this increase in density would be a considerable source of NO_X, CO_2, and ROG from the diesel fuel used to operate construction equipment. In addition, construction activities associated with the theoretical build-out scenario would generate additional vehicle trips by construction

workers traveling to and from construction sites. Therefore, implementation of the theoretical build-out scenario would result in localized short-term air quality impacts.

Although the General Plan includes policies and implementation programs that would lessen impacts, the magnitude of change in the level of residential and nonresidential development under the theoretical build-out scenario would result in impacts to air quality that could not be mitigated without major advancements in technology or restrictions on travel. It is also infeasible at this Program EIR level to provide more specific mitigation that would reduce impacts to a less than significant level since no specific development projects are known. Therefore, impacts would be significant and unavoidable.

5.15.4 BIOLOGICAL RESOURCES

While biological resources are limited within the planning area and additional development under the theoretical build-out scenario would not necessarily encroach into protected habitats, it would be reasonable to assume that an increase in impacts on the edge on habitats (including wetlands) would occur from increased population and development.

Under the theoretical build-out scenario, the intensification of development could also result in increased noise levels throughout the City. During the redevelopment process there would be elevated noise from construction. In addition, there would be a general increase in ambient noise from roadway traffic (and transit) associated with the population growth. An increase in noise levels has the potential to affect behavioral and physiological responses in noise-sensitive wildlife receptors. Adverse responses to increased noise may include hearing loss or the temporary masking of vocalizations commonly used during the breeding season, nest abandonment, and decrease in predator awareness, thereby resulting in a decrease in reproductive and overall fitness of certain animal species.

Although the General Plan includes policies and implementation programs that would lessen impacts, the magnitude of change under the theoretical build-out scenario would result in substantial impacts to biologic resources. It is infeasible at this Program EIR level to provide more specific mitigation that would reduce impacts to a less than significant level because no specific projects are known. Therefore, these impacts would be significant and unavoidable.

5.15.5 CULTURAL AND PALEONTOLOGICAL RESOURCES

As part of the development required to achieve the theoretical build-out scenario, extensive grading of large amounts of area within the City would be necessary—much more than would be anticipated under the General Plan scenario. Because the majority of these projects would be infill and redevelopment, this grading would occur on previously graded surfaces. The likelihood of encountering archaeological resources is greatest on sites that have been minimally excavated in the past (e.g., undeveloped parcels, vacant lots, and lots containing surface parking; etc.). Previously excavated areas are generally considered to have a low potential for archaeological or historic resources, since the soil containing such resources has been removed.

However, projects required to create the theoretical build-out scenario likely would involve mass grading, road construction, underground parking areas, underground tanks, new pipelines, or replacement of pipelines, all at a lower depth than the previous development. In addition, some projects would require subterranean parking, causing the likelihood of impacts to cultural and paleontological resources to amplify because of the increased depth of grading. Furthermore, building demolition and surface clearance could result in impacts to cultural resources. The potential for encountering human remains during construction development activities is possible and impacts to human remains under the theoretical build-out scenario may occur. Due to the magnitude of grading that would be required to support

development under theoretical buildout, and the lack of specific development projects and associated project-level mitigation, the impacts to unique paleontological resources or geologic formations possessing a medium to high fossil bearing potential would be significant and unavoidable.

Although the General Plan includes policies and implementation programs that would lessen impacts, it is infeasible at this Program EIR level to provide specific mitigation that would reduce impacts to a less than significant level since no specific development projects are proposed. Due to the magnitude of grading that would be required to support the infill and redevelopment of residential and nonresidential densities under the theoretical build-out scenario and the lack of mitigation available for historic resources, the potential for adverse physical or aesthetic effects to prehistoric, historic, or architecturally significant buildings, structures, objects, or sites; or impacts to existing archeological resources or the disturbance of any human remains, including those interred outside formal cemeteries, would be significant and unavoidable.

5.15.6 GEOLOGY, SOILS, AND MINERAL RESOURCES

Although the General Plan may allow for a theoretical increase in density, many of the developments within the City are already built out to the maximum extent feasible under the constraints that the surrounding geologic conditions impose. To achieve the theoretical build-out condition, there would have to be increased development on steep slopes or areas prone to geologic hazards, which would not be allowed under the General Plan scenario. This substantial increase of development would require the alterations of hillsides and slopes. In certain instances under a theoretical build-out scenario, structures would be located on geological units or soils that are unstable or that would become unstable, and potentially result in on- or off-site landslides, lateral spreading, subsidence, liquefaction, or collapse. As a result, a greater number of people and properties would be exposed to geologic hazards such as groundshaking, fault rupture, landslides, mudslides, ground failure, or similar hazards even though available mitigation would be applied. Also, since no specific development projects are identified, it is infeasible at this Program EIR level to provide specific mitigation that would reduce impacts to a less than significant level. Therefore, these impacts associated with geology and soils would be significant and unavoidable.

There are no known mineral resources located within the planning area. Laguna Hills is primarily a residential developed community; no mineral extraction or mining activities occur within the planning area. Therefore, no significant impact to mineral resources would occur under the theoretical build-out scenario.

5.15.7 HAZARDS AND HAZARDOUS MATERIALS

Development pursuant to implementation of the General Plan at the density required for the theoretical build-out scenario could occur on contaminated sites located throughout the City. This increased development could also lead to an increase in the number of underground storage tanks and thus potentially more leaking underground storage tanks. New development and redevelopment could result in the increased use, transport, and disposal volumes of hazardous materials within the planning area. All of these conditions would create a much more substantial risk of exposure to people or sensitive receptors to potential health hazards over the General Plan scenario because of the volume of development that would have to occur to create theoretical build-out conditions.

There would also be a considerable growth in population associated with the increased density under the theoretical build-out conditions. As such, more people and structures would be at risk of significant loss, injury, or death from wildland fires, flooding, seiches, or mudflows because there would be more people and structures in the plan area community. In addition, the adopted Emergency Operation Plan (EOP)

would be unsuitable. The EOP would need to be redesigned to protect the increased population and development. Although the General Plan includes policies and implementation programs that would lessen impacts, the magnitude of change in the level of residential and nonresidential development under the theoretical build-out scenario and associated growth would be significant. Since no specific development projects are proposed, it is infeasible at this Program EIR level to provide specific mitigation measures that would reduce impacts to a less than significant level. Therefore, impacts associated with hazards and hazardous materials would be significant and unavoidable.

5.15.8 HYDROLOGY AND WATER QUALITY

Under the theoretical build-out scenario, there would be substantially more development than that anticipated under the General Plan scenario. When comparing the two, there would be a 103 percent increase in total housing units and a 129 percent increase in nonresidential building square feet. This would also lead to a substantial change in absorption rates, drainage patterns, and the rate of surface runoff. To achieve the theoretical build-out scenario, it was assumed for residential that existing land uses located on plan-designated multifamily land would redevelop or infill at the maximum point of their adopted community plan residential density range. For nonresidential (commercial and industrial uses) it is assumed that all existing land uses located on plan-designated nonresidential land would redevelop or infill at the maximum allowed zoning ordinance FAR. This conversion would lead to considerably more nonpermeable surfaces added to the environment. This additional nonpermeable surface area would limit absorption rates, radically alter drainage patterns, and substantially increase the rate of surface runoff. The increase of nonpermeable surface area required to support the build-out scenario would allow for population growth well beyond anticipated growth scenarios developed by SCAG. Due to the anthropogenic nature of water quality impairments, the growth in population required to support the build-out scenario would ultimately lead to significant and unavoidable impacts to regional water quality.

Although the General Plan includes policies and implementation programs that would lessen impacts, it is infeasible at this Program EIR level to provide specific mitigation that would reduce impacts to a less than significant level. Due to the magnitude of change in the level of residential and nonresidential development under the theoretical build-out scenario and the lack of specific development projects and associated project-level mitigation, the impacts to absorption rates, drainage patterns, water quality, and the rate of surface runoff would be significant and unavoidable.

5.15.9 LAND USE AND PLANNING

Development pursuant to the theoretical build-out scenario would conflict with the environmental goals of adopted community plans; land use designations; and other applicable land use plans, policies, or regulations of state and federal agencies with jurisdiction over the City. The extensive development required to achieve the theoretical build-out scenario could also result in the physical division of established communities or create substantial incompatibilities between adjacent land uses. Although the General Plan contains policies and implementation programs that would reduce impacts, it is infeasible at this Program EIR level to provide more specific mitigation that would reduce impacts to a less than significant level, since specific development projects are not known. Due to the magnitude of growth under the theoretical build-out scenario and the lack of specific development projects and associated project-level mitigation, impacts related to land use and planning would be significant and unavoidable under the theoretical build-out scenario.

5.15.10 NOISE

The adopted (existing) General Plan, community plans, Noise Ordinance, and applicable standards of other agencies were not written in anticipation of future development that would necessitate the

theoretical build-out condition. Almost all noise planning documents addressing noise in the region rely on SCAG forecasts. No forecast analysis produced by SCAG has projected the population and level of development within the City similar to that of the theoretical build-out scenario. As such, the increase of noise from the construction related to the redevelopment required for this theoretical condition, as well as noise generated by the increased number of automobile or train trips from the associated burgeoning population would cause exposure of sensitive receptors to future noise levels that would exceed established standards. The increased construction-related noise and population growth-related noise would also cause a substantial increase in the existing ambient noise levels and would create land use incompatibilities associated with increased noise.

Although the General Plan includes policies and implementation programs that would lessen impacts, it is infeasible at this Program EIR level to provide specific mitigation that would reduce impacts to a less than significant level, since specific development projects are not known. Due to the magnitude of change in the level of residential and nonresidential development under the theoretical build-out scenario and the lack of specific development projects and associated project-level mitigation, all impacts to noise would be significant and unavoidable under the theoretical build-out scenario.

5.15.11 POPULATION AND HOUSING

To achieve the theoretical build-out scenario, there would be major changes in the overall level of development Citywide, much more than projected under the General Plan scenario. This conversion would lead to substantial displacement of residents as older existing housing units are replaced. Although the General Plan contains implementation programs that would seek to reduce displacement impacts, it is infeasible at this Program EIR level to provide mitigation that can reduce such impacts to a less than significant level, since specific development projects are not known. For this reason and due to the magnitude of change in the level of residential and nonresidential development under the theoretical build-out scenario, the impact from the displacement of substantial numbers of people or housing, necessitating the construction of replacement housing, would be significant and unavoidable.

5.15.12 PUBLIC SERVICES AND UTILITIES

This increase in the overall level of development would lead to considerably larger populations within the City, well beyond anticipated growth scenarios developed by SCAG. This growth in population would require an increase of public services, which would in turn necessitate the construction of additional or improved public facilities. These new and upgraded facilities could cause significant environmental impacts in order to construct the facilities and services necessary to maintain service ratios, response times, or other performance objectives.

Additionally, all public utility planning has not been written in anticipation of the growth that would occur with the theoretical build-out condition. Almost all utility planning documents in the region rely heavily on population growth and development projection data provided by SCAG. No population growth analysis produced by SCAG has projected the population within the planning area similar to that of the theoretical build-out scenario. As such, excessive amounts of water beyond projected available supplies and excessive amounts of electrical power, fuel, or other forms of energy would result. In addition, with increased population and development, there would be more demand for utilities under the theoretical build-out scenario and the construction of new or physically altered utilities could cause significant environmental impacts in order to maintain service ratios, response times, or other performance objectives. Due to the magnitude of change in the level of residential and nonresidential development under the theoretical build-out scenario and the lack of specific development projects and associated project-level mitigation, impacts to public services and utilities would be significant and unavoidable under the theoretical build-out scenario.

5.15.13 RECREATION

The increased development associated with the theoretical build-out scenario would tax existing park and recreation facilities due to the substantial increase in population. Fee structures identified in the City's Municipal Code and Zoning Ordinance would help to increase park and recreation facilities as part of the redevelopment process. Although the General Plan includes policies and implementation programs that would lessen impacts, it is infeasible at this Program EIR level to provide specific mitigation that would reduce such impacts to a less than significant level since no specific parks or recreational facility improvement project information is known. In addition, the considerable population growth and increase in development associated with the theoretical build-out scenario can be expected to create substantial impacts associated with construction of additional or improved park and recreational facilities and a substantial increase in the use of park and recreation facilities. For these reasons, these impacts would be significant and unavoidable.

5.15.14 TRANSPORTATION AND CIRCULATION

The City's transportation system is not designed to accommodate the population, employment growth, and the increase in the development capacity associated with the theoretical build-out scenario. It is likely that there would be substantial increases of the number of average daily trips and percent of daily vehicle miles traveled at LOS E or F on the planned circulation system. The demand for parking within the planning area to accommodate the theoretical population growth as a result of buildout would likely exceed the available supply. In addition, there would likely be a reduction in the percentage of multi-modal trips because transit would be completely impacted and not able to support the demand of the increased population. It is infeasible at this Program EIR level to provide specific mitigation that would reduce impacts to a less than significant level, since specific development projects are not known. Due to the magnitude of change in the level of residential and nonresidential development under the theoretical build-out scenario and the lack of specific development projects and associated project-level mitigation fact that transportation planning in the region is not designed to provide infrastructure beyond what is anticipated in the General Plan (2030) projections, impacts related to transportation and circulation would be significant and unavoidable.

This page intentionally left blank.

6.0 ANALYSIS OF LONG-TERM EFFECTS

CEQA requires the discussion of the cumulative impacts, growth-inducing impacts, and long-term impacts of proposed projects. The following sections address these issues as they relate to implementation of the City of Laguna Hills General Plan.

The CEQA Guidelines define cumulative effects as "two or more individual effects that, when considered together, are considerable or which compound or increase other environmental impacts." The CEQA Guidelines further state that the individual effects can be the various changes related to a single project or the changes involved in a number of other closely related past, present, and reasonably foreseeable future projects (Section 15335). The CEQA Guidelines allow for the use of two alternative methods to determine the scope of projects for the cumulative impact analysis:

- List Method - A list of past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the agency.
- Regional Growth Projections Method - A summary of projects contained in an adopted general plan or related planning document or in a prior environmental document which has been adopted or certified, which described or evaluated regional or area wide conditions contributing to the cumulative impact (Section 15130).

The General Plan establishes policies to guide future development within the City and implementation is long-term in nature. The Regional Growth Projections Method is appropriate methodology in evaluating cumulative impacts because it provides general growth projections for the region and considers long-term growth. Table 6-1 depicts the projected 2030 population for the City of Laguna Hills and Orange County.

Table 6-1
SCAG Projections for City of Laguna Hills and Orange County: 2030

	Total Population	
	2005*	**2030**
City of Laguna Hills	32,960	36,210
Orange County	3,059,952	3,629,539

*SCAG publishes growth projections in 5-year increments.

It should be noted that forecasts such as the one prepared for the 2008 Regional Transportation Plan: Growth Forecast Report are prepared as planning tools and do not predict the course of future events. SCAG's forecasts, which are based on adopted general plan land use policies for jurisdictions, among other factors, are used primarily to prepare the Regional Transportation Plan (RTP) and to provide inputs into air quality management plans. Experience shows that these forecasts are most reliable at the regional and county level and less so for smaller areas like cities and census tracts.

SCAG's current projections for the City of Laguna Hills reflect the current General Plan, adopted in 1994, but not the General Plan. Thus, there is variance between SCAG's projections cited in Table 6-1 above and those set forth in the General Plan (see Section 5.11, Population and Housing). The SCAG numbers do not account for the proposed land use designations included as part of the General Plan.

The projected population increase by 2030 ranges from approximately 3.7 percent (based on General Plan land use changes) to 8.3 percent (SCAG projections). Both the General Plan and SCAG population estimates represent a modest level of growth and do not constitute substantial population growth.

Likewise, projected increases in the total number of dwelling units will range from negligible (6 units according to SCAG) to 4.1 percent (based on the General Plan).

6.1 GEOGRAPHIC SCOPE

The geographic area that could be affected by the General Plan varies depending on the type of environmental resource being considered. The general geographic area associated with different environmental effects of the General Plan defines the boundaries of the area considered in the cumulative impact analysis. Each section of this Program EIR considers the specific geographic segment of this growth that is directly related to the individual topic addressed within that section. For example, the analysis of air quality, noise, and transportation and circulation impacts is based on growth on a regional level because these impacts are regional in nature, whereas, an aesthetic impact, given its localized impact area, only considers related projects in the vicinity of the project site. Table 6-2 presents the general geographic areas associated with the different resources addressed in this Program EIR analysis.

Table 6-2
Geographic Scope of Cumulative Impacts

Resource Issue	Geographic Area
Aesthetic/Visual Resources (Light and Glare)	Local (planning area and adjacent communities)
Agricultural Resources	Local
Air Quality	Regional and Local
Biological Resources	Regional and Local
Cultural Resources	Local
Geology, Soils, and Mineral Resources	Local
Hazards and Hazardous Materials	Local
Hydrology and Water Quality	Regional
Land Use and Planning	Local
Noise	Regional and Local
Population and Housing	Regional and Local
Public Services, Utilities, and Service Systems	Regional
Recreation	Local
Transportation and Circulation	Regional and Local
Global Climate Change	Global, Statewide, and Local

6.2 CUMULATIVE IMPACTS

The following is a discussion of the cumulative impacts of the General Plan when taken within the context of regional growth patterns. The cumulative impacts of Citywide growth have been addressed within the Impact Analysis section. Implementation of the mitigation measures and General Plan goals and policies identified in the previous sections of this Program EIR will serve to reduce cumulative impacts generated by the project to the extent feasible. In many cases, these mitigation measures and General Plan goals and policies will reduce the project's cumulative impact to a level less than significant. For other impacts, the implementation of the identified mitigation measures will not avoid a significant cumulative impact. The following section identifies those significant, unavoidable cumulative impacts that will not be reduced to a less than significant level by implementation of the identified mitigation measures.

AESTHETICS AND VISUAL RESOURCES

New development and redevelopment will be allowed by the General Plan that has the potential to disrupt scenic vistas of resources such as hillsides, ridgelines, and open space. These activities and associated infrastructure and landscape improvements may also result in impact views visible from key viewscape corridors. When new development and redevelopment are introduced in already developed areas, a potential exists for inconsistent design style and scale to occur that may be perceived by some to degrade the visual character of the community. Lastly, new development allowed by the General Plan may increase the amount of light and glare within the planning area. The enforcement of current regulations and review processes as well as implementation of mitigation measures identified in Section 5.1 of this Program EIR will reduce potential impacts related to aesthetics and visual resources to a less than significant level. Additionally, future development projects will be reviewed by the City per CEQA to identify potential impacts to aesthetic resources on a project-by-project basis. If project-level impacts are identified, specific mitigation measures will be required. Because significant aesthetics impacts will be avoided with the implementation of these regulations and mitigation measures, the General Plan's contribution to cumulative aesthetics and visual resources impacts will be less than significant.

AGRICULTURAL RESOURCES

Because the planning area is almost entirely built out, it consists primarily of developed urban land and City-maintained open space. Consequently, no agricultural land exists within the planning area. As development occurs within the City and Orange County, development pressure on existing agricultural land will increase. However, the extent of agricultural land within the vicinity of Laguna Hills is limited. While implementation of the General Plan will result in an increase in the City's housing stock, employment, and population, the City's contribution to potential development pressure to convert agricultural land to urban uses within the county is not substantial. Thus, the General Plan's contribution to cumulative agricultural impacts will be less than significant.

AIR QUALITY

The South Coast Air Basin is in nonattainment for ozone and particulate matter (both PM_{10} and $PM_{2.5}$). Future urban development associated with the General Plan would add to this air quality problem by adding vehicle trips and accommodating construction. As described in Section 5.3 of this Program EIR, construction-related air quality impacts will occur periodically throughout implementation of the General Plan. These construction-related emissions will impact cumulative air quality, resulting in a significant and unavoidable cumulative impact.

Implementation of the General Plan will also contribute to long-term cumulative air quality impacts associated with mobile and stationary sources. Given that compliance with applicable rules and regulations would be required for the control of stationary-source emissions of TACs, both on-site and off-site, the contribution of the General Plan to long-term cumulative increases in stationary-source TAC concentrations would be less than cumulatively considerable. No major nonpermitted sources of TAC emissions are proposed as part of the General Plan. Exposure to TAC emissions from mobile sources, specifically diesel PM, is of growing concern within the Basin, and no restrictions on where sensitive receptors will be located relative to major roadways are currently in place. For this reason, this would be a significant cumulative impact. The General Plan would make a cumulatively considerable contribution to this significant cumulative impact.

Implementation of the General Plan would not result in significant long-term air quality impacts related to CO emissions from local mobile sources. As a result, no cumulatively considerable contribution is attributable to the proposed project. Thus, this would be a less than significant cumulative impact.

A variety of uses and facilities in the region are known to generate odors. No significant major or minor source of odor is expected to occur as a result of implementing the General Plan. The contribution to cumulative odor impacts is less than significant.

BIOLOGICAL RESOURCES

The geographic scope for cumulative impacts to biological resources includes the planning area and immediately adjacent communities and jurisdictions in Orange County. The majority of land within the planning area is developed. However, small areas of open space occur throughout the planning area. Given the developed nature of the City, few sensitive biological resources are expected to occur within the planning area. Few sensitive species have moderate or high likelihoods of occurrence within the planning area. Wildlife corridors within the planning area are limited to drainages. These drainages provide only limited value as wildlife corridors because they are surrounded by moderately urbanized areas; they occur in small, discrete patches; and they provide limited connectivity to large habitat reserves. At present, no regional habitat conservation plan or other regulation applies to the City. Although the occurrence of sensitive biological resources within the planning area is limited, development anticipated by the General Plan will have the potential to impact those sensitive biological resources that do occur within the planning area.

Cumulative impacts to biological resources may occur as a result of direct and indirect impacts involving the loss of sensitive biological resources, construction activities adjacent to sensitive biological resource areas, and potential alterations in urban runoff characteristics. However, implementation of federal and state regulations, City programs, and mitigation measures identified in Section 5.4 of this Program EIR will reduce impacts related to biological resources to a level less than significant. For example, implementation of mitigation measures will reduce the potential for alteration of urban runoff characteristics to occur in areas downstream of the planning area. Additionally, future development projects will be reviewed by the City per CEQA to identify potential impacts to biological resources on a project-by-project basis. If project-level impacts are identified, specific mitigation measures will be required. Because the presence of biological resources within the planning area is limited, and through the implementation of mitigation measures, the General Plan's contribution to potential cumulative biological resource impacts will be less than significant.

CULTURAL RESOURCES

Implementation of the General Plan anticipates primarily redevelopment and infill, which could involve demolition or renovation of existing structures. Because no historical resources occur within the planning area, implementation of the General Plan is not expected to contribute to significant cumulative impacts to historical resources within the planning area or the region.

Ground-disturbing activities, such as construction associated with infill, redevelopment, and/or expansion of infrastructure, have the potential to impact buried paleontological resources and human remains. Thus, development of land pursuant to the General Plan has the potential to impact significant known and unknown paleontological resources and human remains. However, the majority of new development anticipated under the General Plan will involve infill and redevelopment of existing developed areas. Thus, the likelihood of finding new or undiscovered paleontological resources or human remains is limited.

Existing City programs and review processes also limit the potential for impacts to archaeological resources, paleontological resources, and human remains. The City assesses and mitigates the potential impacts of private development and public facilities and infrastructure to these resources pursuant to the provisions of CEQA. Implementation of the General Plan is not expected to result in significant impacts

to cultural or paleontological resources within the planning area. Thus, implementation of the General Plan would not contribute to significant cumulative impacts to cultural and paleontological resources.

GEOLOGY, SOILS, AND MINERAL RESOURCES

The geographic scope for cumulative impacts to geology, soils, and mineral resources includes the planning area and immediately adjacent communities and jurisdictions in Orange County. Future development within the planning area will increase the number of people exposed to earthquakes and other geologic hazards. Future development could also be constrained by unstable soils, landslides, and shallow groundwater. Erosion rates could be accelerated by earthwork for new construction. Cumulative impacts related to geologic conditions can be mitigated by implementation of local grading ordinances, standard structural regulations, and public safely policies such as those contained in the City of Laguna Hills General Plan and the mitigation measures set forth in Section 5.6 of this Program EIR. In surrounding jurisdictions, similar local regulations will guard against exposure of people and structures to geologic and seismic hazards. Geotechnical studies will be required for any future development projects to identify constraints and develop engineering parameters at a project-specific level. Implementation of the General Plan will not result in a significant cumulative geology impact

HAZARDS AND HAZARDOUS MATERIALS

The planning area is almost entirely built out; therefore, most development that is anticipated under the General Plan will involve infill and/or redevelopment of existing uses. Future development anticipated by the General Plan will result in a modest increase in the number of people exposed to hazards related to hazardous materials and wildland fires. Likewise, new development is expected to be minimal and is therefore not expected to impair implementation of, or physically interfere with, adopted emergency plans, such as the Laguna Hills Emergency Operations Plan or the Orange County Fire Authority Hazardous Materials Area Plan. Enforcement of state, county, and local hazardous material regulations will reduce potential impacts associated with hazards to a level less than significant. Thus, implementation of the General Plan will not result in a significant cumulative hazards and hazardous materials impact.

HYDROLOGY AND WATER QUALITY

The City of Laguna Hills is located within three watersheds, which ultimately drain to marine protected areas. Regulatory protection of these areas would likely increase under existing laws; however, as eastern areas of the watersheds become more heavily populated, contaminant loading would likely increase. As the population of Orange County grows, demands on water supply would increase, as would demands for infrastructure to support growth. Drainage areas and watersheds would likely change due to increased impervious surfaces. Changes would likely include channel degradation and geotechnical instability, loss of natural habitat and recreation opportunities, and flooding. Cumulative impacts related to hydrologic conditions may be mitigated by implementation of local grading ordinances and NPDES permits. Also, mitigation measures presented in this Program EIR as well as programs within the General Plan will mitigate impacts to water supply to a less than significant level. Additional studies would be required for any future development projects to identify and evaluate constraints and develop management parameters at a project-specific level. Implementation of the General Plan would not contribute to a significant cumulative hydrology and water quality impact.

LAND USE AND PLANNING

SCAG is the regional organization that provides guidance for planning for the region. Development under the General Plan would be implemented according to the recommended distribution and intensity

identified in the Land Use Element. Additionally, future development would comply with adopted land use standards, policies, and ordinances and would be compatible with surrounding land uses consistent with the Land Use Element. Furthermore, the General Plan is consistent with the SCAG Regional Comprehensive Plan and the adopted policies. Implementation of the General Plan would not physically divide established communities either within the City or surrounding areas. In addition, the General Plan contains policies and implementation programs intended to ensure that development is compatible with existing regional plans. Therefore, implementation of the General Plan would not contribute to a significant cumulative land use impact.

NOISE

The assumptions in the project noise analysis include traffic and other noise sources from the planning area and surrounding cities. As such the analysis of potential noise impacts addresses cumulative noise impacts as well.

Anticipated regional development will generate short term noise during the construction process of individual projects. Development pursuant to the General Plan will also increase traffic volumes and associated noise levels. Significant noise levels already occur along many of the region's transportation corridors. Some existing development is already impacted by vehicular noise and may continue to experience high noise levels whether or not the project is implemented. Implementing local noise ordinances, constructing buildings according to state acoustical standards, proper land use planning, and implementation of the mitigation measures identified in Section 5.10 of this Program EIR will reduce cumulative impacts to new noise sensitive land uses to a less than significant level.

POPULATION AND HOUSING

While implementation of the General Plan will result in an increase in the City's population, housing stock, and employment characteristics, the City's contribution to the projected population and employment increase within the region is not substantial. New development pursuant to General Plan land use policy will result in approximately 457 new dwelling units and an additional 1,031,530 square feet of nonresidential building floor area by 2030. A net population increase of approximately 1,229 persons is anticipated as is a net increase of approximately 2,677 jobs.

Jobs and housing projections based on proposed land use changes would result in a ratio of 2.38 jobs per housing unit in 2030, whereas the jobs housing ratio is currently estimated at 2.27. Because employment is estimated to grow faster than housing opportunities the planning area could experience an increase in commuters. Increased commuting could contribute to regional impacts on traffic and air quality. Likewise, because employment is expected to increase at a higher rate than housing during the planning horizon, this employment growth could potentially indirectly induce population growth in the region. However, when compared to the population estimate for Orange County reported by California Department of Finance as of January, 2008, SCAG projects a 16.3 percent increase in population over the current population by 2030 (from 3,121,251 to 3,629,539). A population increase of 3.7 percent within the planning area based on proposed land use changes is not substantial compared to a population increase of 16.3 percent for Orange County. Likewise, SCAG projects that between 2005 and 2030 the number of jobs in Orange County will increase by 21.3 percent (from 1,615,936 to 1,960,633). An employment increase of 10.6 percent within the planning area based on proposed land use changes is not substantial. Therefore, the General Plan will not contribute to a significant cumulative housing or population impact.

PUBLIC SERVICES AND UTILITIES

The geographic scope of cumulative public services impacts is generally limited to the jurisdiction under analysis. However, shortages of certain public services in one jurisdiction can lead to unanticipated demand for public services from nearby and regional service providers. The analysis in Section 5.12 of this Program EIR assesses the cumulative, long-term impacts of growth within the planning area on schools, water service, sewer service, gas and electrical services, solid waste services, police protection, fire protection and emergency services, and libraries. As concluded for each of these issue areas, with the exception of water supply, impacts will be less than significant. Service providers will continue to evaluate the levels of service desired and the funding sources available to meet increases in demand. Although the ability of local service providers to provide specific levels of services varies throughout the region, sound local planning to accommodate future growth, along with implementation of the mitigation measures contained in this Program EIR, would reduce cumulative impacts associated with the provision of services and utilities, with the exception of water supply, to a less than significant level.

Due to the uncertainty in the southern California region surrounding the long-term provision of adequate water supply, the General Plan in combination with other future cumulative projects that include demand for water supply could result in decreased on imported water from the MWD. The issue is statewide, however, and would result from the cumulative nature of projects within and beyond the region. This would be a significant and unavoidable cumulative impact.

RECREATION

Cumulative growth within the planning area and Orange County as a whole would result in increases in population in the local area. As has been previously noted in Section 5.13 of this Program EIR, the City currently maintains park standards that require 5 acres of designated parkland for each 1,000 residents. Future development would be required to pay parkland fees in proportion to the square footage of the development, and/or directly provide facilities as mitigation for these impacts. Payment of these fees and/or implementation of facilities on a project-by-project basis would offset cumulative parkland impacts by providing funding for new and/or renovated parks equipment and facilities. The City also enters into joint-use agreements with Saddleback Valley Union School District (SVUSD) in which residents are able to use school facilities such as gymnasiums, play equipment, sports fields, swimming pools, and classrooms. In addition, the City would also conduct a park needs assessment after adoption of the General Plan to further evaluate the recreational needs within the planning area. Furthermore, the General Plan contains policies and programs that address potential impacts related to recreation. As such, the project's contribution to cumulative impacts related to recreation is less than significant and, therefore, and would not result in a cumulative impact.

TRANSPORTATION AND CIRCULATION

Section 5.14 evaluates both project and cumulative (2030) traffic impacts for the planning area. Future (2030) traffic conditions are based on data from the City of Laguna Hills Traffic Analysis Model, which reflects specially prepared land use data for the City and also accounts for regional growth and committed roadway improvements for the entire County. As discussed in Section 5.14.4, implementation of the General Plan would not result in significant traffic impacts under the existing plus 2030 buildout conditions. Therefore, the project's contribution to cumulative impacts related to transportation and circulation is less than significant and impacts associated with future traffic conditions would not be cumulatively considerable.

6.3 GLOBAL CLIMATE CHANGE

This section includes a discussion of existing climate conditions, climate change, and greenhouse gas (GHG) emissions sources in California; a summary of applicable regulations; and a description of potential impacts of the General Plan related to climate change.

6.3.1 ENVIRONMENTAL SETTING

GENERAL DESCRIPTION OF GLOBAL CLIMATE CHANGE

Climate change is a recorded change in the average weather of the earth, measured by variables such as wind patterns, storms, precipitation, and temperature, that lasts for a long period of time (e.g., decades or centuries). According to overwhelming scientific consensus on the subject, climate change is already under way. Global scientific research on climate change indicates very high confidence (i.e., at least 90 percent) that the rate and magnitude of current global temperature changes are anthropogenic (i.e., human caused), and that global warming will lead to adverse climate change effects around the globe (IPCC 2007). It is extremely unlikely that global climate change of the past 50 years can be explained without the contribution from human activities (IPCC 2007).

Greenhouse Gases

Atmospheric GHGs[9] and clouds within the Earth's atmosphere influence the Earth's temperature by absorbing most of the infrared radiation rising from the Earth's sun-warmed surface that would otherwise escape into space. This process is commonly known as the greenhouse effect. GHGs are emitted by natural processes and human activities. The Earth's surface temperature averages about 58 degrees Fahrenheit (°F) because of the greenhouse effect. Without it, the Earth's average surface temperature would be somewhere around an uninhabitable 0°F (Henson 2006). The resulting balance between incoming solar radiation and outgoing radiation from both the Earth's surface and atmosphere keeps the planet habitable.

The increasing emissions of GHGs—primarily associated with the burning of fossil fuels (during motorized transport, electricity generation, industrial activity, manufacturing, etc.) and deforestation, as well as agricultural activity and the decomposition of solid waste—have led to a trend of anthropogenic warming of the Earth's average temperature, which is causing changes in the Earth's climate. This increasing temperature phenomenon is known as global warming and the climatic effect is known as climate change or global climate change.

Anthropogenic[10] emissions of GHGs into the atmosphere enhance the greenhouse effect by absorbing the radiation from other atmospheric GHGs that would otherwise escape to space, thereby trapping more radiation in the atmosphere and causing temperature to increase. Carbon dioxide (CO_2) is the most important anthropogenic GHG. The global atmospheric concentration of CO_2 has dramatically increased from a preindustrial (roughly 1750) value of about 280 ppm to 379 ppm in 2005, primarily due to fossil fuel use, with land use change providing a significant but smaller contribution. The annual rate of growth in CO_2 concentrations continues to increase, with a larger annual CO_2 concentration growth rate during

[9] GHGs are global pollutants, unlike criteria air pollutants (CAPs) and toxic air contaminants (TACs), which are pollutants of regional and local concern. While pollutants with localized air quality effects have relatively short atmospheric lifetimes (generally on the order of a few days), GHGs have relatively long atmospheric lifetimes ranging from 1 year to several thousand years. The long atmospheric lifetimes allow for GHGs to disperse around the globe. In addition, the impacts of GHGs are borne globally, as opposed to the localized air quality effects of CAPs and TACs.

[10] Anthropogenic effects or processes are derived from human activities, as opposed to those occurring naturally and without human influence.

the last 10 years (1995-2005 average: 1.9 ppm), than since the beginning of continuous direct measurements in 1960.

The human-produced GHGs responsible for increasing the greenhouse effect and their relative contribution to global warming (i.e., their relative ability to trap heat in the atmosphere) are CO_2 (53 percent); methane (CH_4) (17 percent); near-surface ozone (O_3) (13 percent); nitrous oxide (N_2O) (12 percent); and chlorofluorocarbons (CFCs) (5 percent). The most common GHG is CO_2, which constitutes approximately 84 percent of all GHG emissions in California (CEC 2006).

Like CO_2, the global atmospheric concentration of CH_4 in 2005 exceeded its preindustrial value. CH_4 growth rates have declined since the early 1990s with total emissions being nearly constant during this period. The observed increase in CH_4 concentration is very likely (at least 90 percent likelihood) due to anthropogenic activities, primarily agriculture and fossil fuel use. The atmospheric concentrations of CO_2 and CH_4 in 2005 greatly exceeded the natural range over the last 650,000 years. The global concentration of N_2O in 2005 also exceeded the preindustrial value. The growth rate in N_2O concentration has been approximately constant since 1980. More than a third of all N_2O emissions are anthropogenic and primarily due to agriculture.

Eleven of the 12 years from 1995-2006 rank among the 12 warmest years in the instrumental record of global surface temperature (since 1850). Global average temperature has risen approximately 0.76 degree Celsius (°C) since 1850; even if global emissions were decreased to zero today, global average temperature would rise an additional 0.5°C by the end of this century. This phenomenon is caused by the inertia of the climate system and time scale of the main sequestration mechanism in the carbon cycle—the ocean. In other words, global climate is committed to an additional 0.5°C of warming associated with past human activities. Since GHG emissions will continue to occur to some degree for the foreseeable future, a range of scenarios for global average temperature rise would be 1.8–4.0°C by the end of the century, depending on the global emissions scenario that ultimately occurs. (For example, the Intergovernmental Panel on Climate Change's [IPCC's] B1 scenario—low population growth, clean technologies, and low emissions—is the best-case scenario; its A2 scenario—high population growth, fossil-fuel dependence, and high emissions—is the worst-case scenario; and its A1B scenario is a moderate scenario.)

Impacts associated with the incremental increase in global temperature have already begun to occur. Such impacts are projected to occur in numerous forms: sea level rise, reduction in the extent of polar and sea ice, changes to ecosystems, changes in precipitation patterns, reduced snowpack, agricultural disruption, increased intensity and frequency of storms and temperature extremes, increased risk of floods and wildfires, increased frequency and severity of drought, effects on human health from vectorborne disease, species extinction, and acidification of the ocean.

Some level of climate change impacts is unavoidable as a result of past human activities and the existing mass of GHGs in the atmosphere. However, international treaties on climate change attempt to avoid "dangerous" climate change—in other words, to manage the risk of foreseeable impacts to a "tolerable" level of climate change that would avoid the most catastrophic impacts. For this to occur, CO_2 concentrations should be stabilized at 350–400 ppm, with an associated global average temperature increase of no more than 2°C–2.4°C above preindustrial times. To avoid "dangerous" climate change, global CO_2 emissions would be required to peak during the 2000–2015 period (IPCC 2007).

Prominent GHGs contributing to the greenhouse effect are CO_2, CH_4, O_3, N_2O, and fluorinated compounds. GHGs vary widely in the power of their climatic effects; therefore, climate scientists have established a unit called global warming potential (GWP). The GWP of a gas is a measure of both potency and lifespan in the atmosphere as compared to CO_2. For example, since CH_4 and N_2O are approximately 21 and 310 times more powerful than CO_2, respectively, in their ability to trap heat in the

atmosphere, they have GWPs of 21 and 310 (CO_2 has a GWP of 1). Carbon dioxide equivalent (CO_2e) is a figure that enables all GHG emissions to be considered as a group despite their varying GWP. The GWP of each GHG is multiplied by the prevalence of that gas to produce CO_2e.

The atmospheric lifetime and GWP of selected GHGs are summarized in Table 6-3. As shown in the table, GWP ranges from 1 (carbon dioxide) to 23,900 (sulfur hexafluoride).

Table 6-3
Global Warming Potentials and Atmospheric Lifetimes

Greenhouse Gas	Atmospheric Lifetime (years)	Global Warming Potential (100 year time horizon)
Carbon Dioxide (CO_2)	50 – 200	1
Methane (CH_4)	12 ± 3	21
Nitrous Oxide (N_2O)	120	310
HFC-134a	48.3	1,300
PFC: Tetrafluoromethane (CF_4)	50000	6,500
PFC: Hexafluoroethane (C_2F_6)	10000	9,200
Sulfur Hexafluoride (SF_6)	3200	23,900

Source: USEPA 2007; CCAR 2008

The State Legislature adopted the public policy position that global warming is, "a serious threat to the economic well-being, public health, natural resources, and the environment of California" (Health and Safety Code § 38501). Further, the State Legislature has determined that, "the potential adverse impacts of global warming include the exacerbation of air quality problems, a reduction in the quality and supply of water to the state from the Sierra Nevada snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious disease, asthma, and other human health-related problems," and that, "(g)lobal warming will have detrimental effects on some of California's largest industries, including agriculture, wine, tourism, skiing, recreational and commercial fishing, and forestry (and)…will also increase the strain on electricity supplies necessary to meet the demand for summer air-conditioning in the hottest parts of the State" (Health and Safety Code § 38501). These public policy statements became law with the enactment of AB 32, Statutes of 2006.

IMPACTS OF CLIMATE CHANGE

Overview

Much of the available trend data, modeling, and projections related to climate change are on a global scale. Projecting impacts of climate change often relies on general circulation models (GCMs), which develop large-scale scenarios of changing climate parameters, usually comparing scenarios with different concentrations of GHGs in the atmosphere. This information is typically at too coarse a scale to make accurate regional assessments. As a result, more effort has recently been put into reducing the scale and increasing the resolution of climate models through various techniques such as "downscaling" or integrating regional models into the global models (Kiparsky and Gleick 2005; Roos 2005; DWR 2006). However, the level of uncertainty related to regional climate change is generally higher than that related to global projections because downscaling and similar activities increase the level of uncertainty. The effects on the environment anticipated under various climate change models should be considered as general projections of potential future conditions, with actual environmental effects likely falling within the range of results provided by a variety of model outputs.

Executive Order S-3-05, discussed in Section 6.3.2, Regulatory Background, resulted in the preparation of a report on the impacts of climate change on California, including impacts to water supply, public health, agriculture, the coastline, and forestry. *Scenarios of Climate Change in California: An Overview* (Climate Scenarios report) was published in February 2006 (California Climate Change Center 2006).

The Climate Scenarios report uses a range of emissions scenarios developed by the IPCC to project a series of potential warming ranges (i.e., temperature increases) that may occur in California during the 21st century: lower warming range (3.0–5.5°F); medium warming range (5.5–8.0°F); and higher warming range (8.0–10.5°F). The Climate Scenarios report then presents analysis of future climate in California under each warming range.

Each emissions scenario would result in substantial temperature increases for California. According to the report, substantial temperature increases would result in a variety of impacts to the people, economy, and environment of California associated with a projected increase in extreme conditions, with the severity of the impacts depending upon actual future emissions of GHGs and associated warming. Under the emissions scenarios of the Climate Scenarios report (California Climate Change Center 2006), the impacts of global warming in California are anticipated to include, but are not limited to, the following:

- **Public Health** – Higher temperatures are expected to increase the frequency, duration, and intensity of conditions conducive to air pollution formation. For example, days with weather conducive to O_3 formation are projected to increase from 25 to 35 percent under the lower warming range to 75 to 85 percent under the medium warming range. In addition, if global background O_3 levels increase as predicted in some scenarios, it may become impossible to meet local air quality standards. Air quality could be further compromised by increases in wildfires, which emit fine particulate matter that can travel long distances depending on wind conditions. The Climate Scenarios report indicates that large wildfires could become up to 55 percent more frequent if GHG emissions are not significantly reduced.

  In addition, under the higher warming scenario, there could be up to 100 more days per year with temperatures above 90°F in Los Angeles and 95°F in Sacramento by 2100. This is a large increase over historical patterns and approximately twice the increase projected if temperatures remain within or below the lower warming range. Rising temperatures will increase the risk of death from dehydration, heat stroke/exhaustion, heart attack, stroke, and respiratory distress caused by extreme heat.

- **Water Resources** – A vast network of man-made reservoirs and aqueducts captures and transports water throughout the state from northern California rivers and the Colorado River. The current distribution system relies on the Sierra Nevada snowpack to supply water during the dry spring and summer months. Rising temperatures, potentially compounded by decreases in precipitation, could severely reduce spring snowpack, increasing the risk of summer water shortages.

  If GHG emissions continue unabated, more precipitation will fall as rain instead of snow, and the snow that does fall will melt earlier, reducing the Sierra Nevada spring snowpack by as much as 70 to 90 percent. Under the lower warming scenario, snowpack losses are expected to be only half as large as those expected if temperatures were to rise to the higher warming range. How much snowpack will be lost depends in part on future precipitation patterns, the projections for which remain uncertain. However, even under the wetter climate projections, the loss of snowpack would pose challenges to water managers, hamper hydropower generation, and nearly eliminate all skiing and other snow-related recreational activities.

The state's water supplies are also at risk from rising sea levels. An influx of saltwater would degrade California's estuaries, wetlands, and groundwater aquifers. Saltwater intrusion caused by rising sea levels is a major threat to the quality and reliability of water within the southern edge of the Sacramento/San Joaquin River Delta—a major state fresh water supply.

Global warming is also projected to seriously affect agricultural areas, with California farmers projected to lose as much as 25 percent of the water supply they need; decrease the potential for hydropower production within the state (although the effects on hydropower are uncertain); and seriously harm winter tourism. Under the lower warming range, the ski season at lower elevations could be reduced by as much as a month. If temperatures reach the higher warming range and precipitation declines, there might be many years with insufficient snow for skiing and snowboarding.

- **Agriculture** – Increased GHG emissions are expected to cause widespread changes to the agriculture industry reducing the quantity and quality of agricultural products statewide. Although higher CO_2 levels can stimulate plant production and increase plant water-use efficiency, California's farmers will face greater water demand for crops and a less reliable water supply as temperatures rise. Crop growth and development will change, as will the intensity and frequency of pest and disease outbreaks. Rising temperatures will likely aggravate O_3 pollution, which makes plants more susceptible to disease and pests and interferes with plant growth.

  Plant growth tends to be slow at low temperatures, increasing with rising temperatures up to a threshold. However, faster growth can result in less-than-optimal development for many crops, so rising temperatures are likely to worsen the quantity and quality of yield for a number of California's agricultural products. Products likely to be most affected include wine grapes, fruits and nuts, and milk.

  In addition, continued global warming will likely shift the ranges of existing invasive plants and weeds and alter competition patterns with native plants. Range expansion is expected in many species, while range contractions are less likely in rapidly evolving species with significant populations already established. Should range contractions occur, it is likely that new or different weed species will fill the emerging gaps. Continued global warming is also likely to alter the abundance and types of many pests, lengthen pests' breeding season, and increase pathogen growth rates.

- **Forests and Landscapes** – Global warming is expected to intensify this threat by increasing the risk of wildfire and altering the distribution and character of natural vegetation. If temperatures rise into the medium warming range, the risk of large wildfires in California could increase by as much as 55 percent, which is almost twice the increase expected if temperatures stay in the lower warming range. However, since wildfire risk is determined by a combination of factors, including precipitation, winds, temperature, and landscape and vegetation conditions, future risks will not be uniform throughout the state. For example, if precipitation increases as temperatures rise, wildfires in southern California are expected to increase by approximately 30 percent toward the end of the century. In contrast, precipitation decreases could increase wildfires in northern California by up to 90 percent.

  Moreover, continued global warming will alter natural ecosystems and biological diversity within the state. For example, alpine and subalpine ecosystems are expected to decline by as much as 60 to 80 percent by the end of the century as a result of increasing temperatures. The productivity of the state's forests is also expected to decrease as a result of global warming.

Greenhouse Gas Emissions Sources and Inventory

California

Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors (CEC 2006). In California, the transportation sector is the largest emitter of GHGs, followed by electricity generation (CEC 2006). Emissions of CO_2 are byproducts of fossil-fuel combustion. CH_4, a highly potent GHG, results from off-gassing (the release of chemicals from nonmetallic substances under ambient or greater pressure conditions) largely associated with agricultural practices and landfills. CO_2 sinks, or reservoirs, include vegetation and the ocean, which respectively absorb CO_2 through photosynthesis and dissolution, two of the most common processes of CO_2 sequestration.

California is the 12th to 16th largest emitter of CO_2 in the world and is responsible for approximately 2 percent of the world's CO_2 emissions (CEC 2006). California produced 484 million gross metric tons of CO_2e in 2004. Combustion of fossil fuels in the transportation sector was the single largest source of California's GHG emissions in 2004, accounting for 41 percent of total GHG emissions in the state (CEC 2006). This sector was followed by the electric power sector (22 percent; including both in-state and out-of-state sources) and the industrial sector (21 percent) (CEC 2006).

City of Laguna Hills

No GHG emissions inventory has been conducted for the City of Laguna Hills.

6.3.2 REGULATORY BACKGROUND

FEDERAL PLANS, POLICIES, REGULATIONS, AND LAWS

As of this writing, there are no adopted federal plans, policies, regulations, or laws mandating reductions in GHG emissions that cause addressing global warming. According to the USEPA, "the United States government has established a comprehensive policy to address climate change" that includes slowing the growth of emissions; strengthening science, technology, and institutions; and enhancing international cooperation. To implement this policy, "the Federal government is using voluntary and incentive-based programs to reduce emissions and has established programs to promote climate technology and science." The federal government's goal is to reduce the GHG intensity (a measurement of GHG emissions per unit of economic activity) of the American economy by 18 percent over the 10-year period from 2002 to 2012. In addition, USEPA administers multiple programs that encourage voluntary GHG reductions, including ENERGY STAR, Climate Leaders, and Methane Voluntary Programs.

The U.S. Supreme Court ruled on April 2, 2007, that CO_2 is an air pollutant as defined under the CAA, and that USEPA has the authority to regulate emissions of GHGs.

STATE PLANS, POLICIES, REGULATIONS, AND LAWS

Various statewide initiatives to reduce the state's GHG emissions have raised awareness that, even though the various contributors to and the severity of the consequences of global climate change are not yet fully understood, global climate change is under way, and that there is a real potential for severe adverse environmental, social, and economic effects in the long term. Because every nation emits GHGs and therefore makes an incremental cumulative contribution to global climate change, cooperation on a global scale will be required to reduce the rate of GHG emissions to a level that slows or stops the human-caused increase in average global temperature and associated adverse changes to people and the environment.

California Climate Action Registry (Senate Bills 1771 and 527)

The California Climate Action Registry (CCAR) was established in 2001 by Senate Bill (SB) 1771 and SB 527 as a nonprofit voluntary registry for GHG emissions. The purpose of CCAR is to help companies and organizations with operations in the state establish GHG emissions baselines against which any future GHG emissions reduction requirements may be applied. CCAR has developed a general reporting protocol (GRP) and additional industry-specific protocols that provide guidance on how to inventory GHG emissions for participation in the registry.

California's Renewable Energy Portfolio Standard Program and Senate Bill 107

In 2002, California established its Renewable Energy Portfolio Standard Program, which originally included a goal of increasing the percentage of renewable energy in the state's electricity mix to 20 percent by 2017. SB 107 requires investor-owned utilities such as Pacific Gas and Electric, Southern California Edison, and San Diego Gas and Electric (SDG&E) to meet the 20 percent renewable energy goal by 2010. The state's most recent Energy Action Plan (2005) raised the renewable energy goal to 33 percent by 2020.

Assembly Bill 1493

In 2002, Governor Gray Davis signed Assembly Bill (AB) 1493. AB 1493 required ARB to develop and adopt, by January 1, 2005, regulations that achieve "the maximum feasible reduction of GHGs emitted by passenger vehicles and light-duty truck and other vehicles determined by CARB to be vehicles whose primary use is noncommercial personal transportation in the state."

To meet the requirements of AB 1493, ARB approved amendments to the California Code of Regulations (CCR) adding GHG emission standards to California's existing motor vehicle emission standards in 2004. Amendments to CCR Title 13 Sections 1900 (CCR 13 1900) and 1961 (CCR 13 1961) and adoption of Section 1961.1 (CCR 13 1961.1) require automobile manufacturers to meet fleet average GHG emission limits for all passenger cars, light-duty trucks within various weight criteria, and medium-duty passenger vehicle weight classes beginning with the 2009 model year. Emission limits are further reduced each model year through 2016.

In December 2004 a group of car dealerships, automobile manufacturers, and trade groups representing automobile manufacturers filed suit against ARB to prevent enforcement of CCR 13 1900 and CCR 13 1961 as amended by AB 1493 and CCR 13 1961.1 (*Central Valley Chrysler-Jeep et al. v. Catherine E. Witherspoon*, in her official capacity as Executive Director of the California Air Resources Board, et al.). The suit, heard in the U.S. District Court for the Eastern District of California, contended that California's implementation of regulations that in effect regulate vehicle fuel economy violates various federal laws, regulations, and policies. In January 2007, the judge hearing the case accepted a request from the State Attorney General's office that the trial be postponed until a decision is reached by the U.S. Supreme Court on a separate case addressing GHGs. In the Supreme Court Case, *Massachusetts vs. EPA*, the primary issue in question is whether the federal CAA provides authority for USEPA to regulate CO_2 emissions. In April 2007, the U.S. Supreme Court ruled in Massachusetts' favor, holding that GHGs are air pollutants under the CAA. On December 11, 2007, the judge in the *Central Valley Chrysler-Jeep* case rejected each plaintiff's arguments and ruled in California's favor. On December 19, 2007, the USEPA denied California's waiver request. California filed a petition with the Ninth Circuit Court of Appeals challenging USEPA's denial on January 2, 2008. California's waiver request has not been granted as of this writing.

Executive Order S-20-04 – The California Green Building Initiative

Governor Schwarzenegger signed Executive Order S-20-04 ("The California Green Building Initiative") establishing California's priority for energy and resource-efficient high performance buildings on December 14, 2004. Executive Order S-20-04 sets a goal of reducing energy use in state-owned and private commercial buildings by 20 percent in 2015 using nonresidential Title 20 and 24 standards adopted in 2003 as the baseline. The California Green Building Initiative also encourages private commercial buildings to be retrofitted, constructed, and operated in compliance with the state's Green Building Action Plan.

Executive Order S-3-05

Executive Order S-3-05, signed by Governor Arnold Schwarzenegger on June 1, 2005, proclaims that California is vulnerable to the impacts of climate change. It declares that increased temperatures could reduce the Sierra Nevada snowpack, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. In an effort to avoid or reduce the impacts of climate change, Executive Order S-3-05 calls for a reduction in GHG emissions to the year 2000 level by 2010, 1990 levels by 2020, and 80 percent below 1990 levels by 2050.

To meet the targets established under Executive Order S-3-05, the Governor directed the Secretary of Cal/EPA to lead a Climate Action Team (CAT) composed of representatives from the Business, Transportation and Housing Agency; the Department of Food and Agriculture; the Resources Agency; the ARB; the California Energy Commission (CEC); and the Public Utilities Commission (PUC). The 2006 CAT Report to the Governor contains a number of recommendations and strategies to help ensure that the targets established in Executive Order S-3-05 are met. The Secretary will submit biennial reports to the governor and state legislature describing progress made toward reaching the emission targets established by the executive order and on the impacts of climate change on California, including impacts to water supply, public health, agriculture, the coastline, and forestry, and shall prepare and report on mitigation and adaptation plans to combat these impacts. The first of these reports on the impacts to California, *Scenarios of Climate Change in California: An Overview* (Climate Scenarios report), was published in February 2006 (California Climate Change Center 2006).

Senate Bill 1505

SB 1505 of 2006 establishes environmental performance standards for the production and use of hydrogen fuel for transportation purposes in the state. In general, SB 1505 specifically requires that hydrogen-fueled vehicles reduce GHG emissions by at least 30 percent compared to emissions from new gasoline vehicles; at least one-third of the hydrogen produced or dispensed for transportation purposes in the state must be made from renewable sources of electricity; well-to-tank emissions of smog-forming pollutants from hydrogen fuel dispended in the state must be reduced by at least 50 percent when compared to gasoline; and emissions of toxic contaminants must be reduced to the maximum extent feasible compared to gasoline on a site-specific basis.

Assembly Bill 32

The State Legislature adopted the public policy position that global warming is, "a serious threat to the economic well-being, public health, natural resources, and the environment of California" (Health and Safety Code § 38501). Further, the State Legislature has determined that, "the potential adverse impacts of global warming include the exacerbation of air quality problems, a reduction in the quality and supply of water to the state from the Sierra Nevada snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural

environment, and an increase in the incidences of infectious disease, asthma, and other human health-related problems," and that, "(g)lobal warming will have detrimental effects on some of California's largest industries, including agriculture, wine, tourism, skiing, recreational and commercial fishing, and forestry (and)…will also increase the strain on electricity supplies necessary to meet the demand for summer air-conditioning in the hottest parts of the State" (Health and Safety Code § 38501). These public policy statements became law with the enactment of AB 32, the California Global Warming Solutions Act of 2006, signed by Governor Arnold Schwarzenegger in September 2006. AB 32 is now codified as Health & Safety Code sections 38500-38599.

AB 32 requires that statewide GHG emissions be reduced to 1990 levels by 2020. This reduction is to be accomplished through an enforceable statewide cap on GHG emissions to be phased in starting in 2012. AB 32 directs that ARB establish this statewide cap based on 1990 GHG emissions levels; disclose how it arrived at the cap; institute a schedule to meet the emissions cap; and develop tracking, reporting, and enforcement mechanisms. Emission reductions under AB 32 are to include carbon sequestration projects and BMPs that are technologically feasible and cost-effective. As of this writing in November 2008, ARB has not yet promulgated GHG emission or reporting standards directly applicable to the proposed project.

GHGs as defined under AB 32 include CO_2, CH_4, N_2O, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). General discussions of climate change often include water vapor, O_3, and aerosols in the category of GHGs. Water vapor and atmospheric O_3 are not gases that are formed directly in the construction or operation of development projects nor can they be controlled in these projects. Aerosols are not gases. While these elements have a role in climate change, they are not considered by either regulatory bodies, such as ARB, or other entities, such as CCAR as gases to be reported or analyzed for control. Therefore, no further discussion of water vapor, O_3, and aerosols is provided.

Senate Bill 1368 (Public Utilities Code §§ 8340-41)

SB 1368 is the companion bill of AB 32 and was signed by Governor Schwarzenegger in September 2006. SB 1368 required the PUC to establish a GHG emission performance standard for baseload generation from investor-owned utilities by February 1, 2007. Similarly, the CEC was tasked with establishing a similar standard for local publicly owned utilities by June 30, 2007. These standards cannot exceed the GHG emission rate from a baseload combined-cycle natural gas-fired plant. The legislation further requires that all electricity provided to California, including imported electricity, must be generated from plants that meet the standards set by the PUC and the CEC. In January 2007, the PUC adopted an interim Greenhouse Gas Emissions Performance Standard, which requires that all new long-term commitments for baseload generation entered into by investor-owned utilities have emissions no greater than a combined cycle gas turbine plant (i.e., 1,100 pounds of CO_2 per megawatt-hour). A "new long-term commitment" refers to new plant investments (new construction), new or renewal contracts with a term of 5 years or more, or major investments by the utility in its existing baseload power plants. In May 2007, the CEC approved regulations that prohibit the state's publicly owned utilities from entering into long-term financial commitments with plants that exceed the standard adopted by the PUC of 1,100 pounds of CO_2 per megawatt hour.

ARB "Early Action Measures"

On June 21, 2007, ARB approved a list of discrete early action measures to address climate change as required by AB 32. The three measures include (1) a low-carbon fuel standard, which will reduce the carbon intensity in California's transportation fuels by at least 10 percent by 2020, thereby reducing total CO_2 emissions; (2) reduction of refrigerant losses from motor vehicle air conditioning system

maintenance through the restriction of "do-it-yourself" automotive refrigerants; and (3) increased CH_4 capture from landfills through the required implementation of state-of-the-art capture technologies.

ARB Resolution 07-55

The adoption of ARB Resolution 07-55 on December 6, 2007, established 427 million metric tons of carbon dioxide equivalent ($MMTCO_2e$) as the statewide GHG emissions limit to be achieved by 2020 as required by AB 32.

Governor's Office of Planning and Research Technical Advisory

On June 19, 2008, the State of California Governor's Office of Planning and Research (OPR) issued a Technical Advisory on addressing climate change impacts of a proposed project under CEQA (OPR Climate Change Advisory). The OPR Climate Change Advisory recommends that lead agencies quantify, determine the significance of, and (as needed) mitigate the cumulative climate change impacts of a proposed project. The OPR Climate Change Advisory identifies that each lead agency is required under CEQA to exercise its own discretion in choosing how to determine significance, in the absence of adopted thresholds or significance guidelines from the state, ARB, or the applicable local air district.

Air Resources Board (ARB) Scoping Plan

As discussed previously, ARB is required by AB 32 (Health and Safety Code § 38501 et seq.) to develop a Scoping Plan to lower the state's GHG emissions to meet the 2020 limit. A Draft Scoping Plan was released for public comment on June 26, 2008. Key elements of the Draft Scoping Plan include expansion and strengthening of existing energy efficiency programs and building and appliance standards; expansion of the Renewables Portfolio Standard to 33 percent; development of a California cap-and-trade program linked with other similar programs; implementation of existing laws and standards such as California's clean car standards (AB 1493), goods movement measures, and the Low Carbon Fuel Standard; and targeted fees to fund the state's long-term commitment to AB 32 administration.

Table 4.15-5 of AB 32 Draft Scoping Plan Measures, lists ARB's preliminary recommendations for achieving GHG reductions under AB 32 along with a brief description of the requirements and applicability.

Senate Bill 97 (2007)

SB 97, signed in August 2007 (Chapter 185, Statutes of 2007; Public Resources Code, §§ 21083.05 and 21097), acknowledges that climate change is a prominent environmental issue that requires analysis under CEQA. This bill directs the OPR to prepare, develop, and transmit to the California Resources Agency by July 1, 2009, guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions, as required by CEQA. The California Resources Agency is required to certify and adopt those guidelines by January 1, 2010. This bill also removes, both retroactively and prospectively, as legitimate causes of action in litigation any claim of inadequate CEQA analysis of effects of GHG emissions associated with environmental review for projects funded by the Highway Safety, Traffic Reduction, Air Quality and Port Security Bond Act of 2006 (Proposition 1B) or the Disaster Preparedness and Flood Protection Bond Act of 2006 (Proposition 1E). This provision will be repealed by operation of law on January 1, 2010; at that time such projects, if any remain unapproved, will no longer enjoy protection against litigation claims based on failure to adequately address issues related to climate change. This bill would protect only a handful of public agencies from CEQA challenges on certain types of projects for a few years' time.

Senate Bill 375

SB 375, signed in September 2008, aligns regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation. SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a Sustainable Communities Strategy (SCS) or Alternative Planning Strategy (APS), which will prescribe land use allocation in that MPO's Regional Transportation Plan (RTP). ARB, in consultation with MPOs, will provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. These reduction targets will be updated every 8 years but can be updated every 4 years if advancements in emissions technologies affect the reduction strategies to achieve the targets. ARB is also charged with reviewing each MPO's SCS or APS for consistency with its assigned targets. If MPOs do not meet the GHG reduction targets, transportation projects will not be eligible for funding programmed after January 1, 2012.

This bill also extends the minimum time period for the Regional Housing Needs Allocation (RHNA) cycle from 5 years to 8 years for local governments located within an MPO that meets certain requirements. City or County land use policies (including General Plans) are not required to be consistent with the RTP (and associated SCS or APS). However, new provisions of CEQA would incentivize qualified projects that are consistent with an approved SCS or APS, categorized as "transit priority projects."

REGIONAL AND LOCAL PLANS, POLICIES, REGULATIONS, AND ORDINANCES

There are currently no regional or local policies, regulations, or laws specifically pertaining to GHG emissions.

Effects of Climate Change on the City of Laguna Hills

As discussed previously in this section, human-induced increases in GHG concentrations in the atmosphere have led to increased global average temperatures (global warming) through the intensification of the greenhouse effect, and associated changes in local, regional, and global average climatic conditions.

Although there is a strong scientific consensus that global climate change is occurring and is influenced by human activity, there is less certainty as to the timing, severity, and potential consequences of the climate phenomena. Scientists have identified several ways in which global climate change could alter the physical environment in California (IPCC 2007a; CEC 2006, DWR 2006). These include:

- increased average temperatures;
- modifications to the timing, amount, and form (rain vs. snow) of precipitation;
- changes in the timing and amount of runoff; and
- reduced water supply.

The changes listed above may translate into a variety of issues and concerns that may affect the City, including but not limited to:

- changes in the composition, health, and distribution of terrestrial and aquatic ecosystems;
- increased energy demand associated with increased temperatures;
- increased air pollution and related effects on human health;

- decreased water supply, reliability, and quality;
- increased risk of flooding and landslide associated with changes to precipitation patterns; and
- increased frequency and intensity of wildfire as result of changing precipitation patterns and temperatures.

Although some uncertainty exists as to the precise levels of these impacts, there is consensus regarding the range that can be expected. For detailed discussions of these potential impacts see Section 6.3.1, Environmental Setting, above.

Although climate change is an issue of global scale and the impacts described above are likely to occur whether or not the General Plan is adopted, implementation of the plan would influence the degree to which climate change affects the city's residents, ecosystems, and economy. Development associated with buildout of the General Plan could subject an increased number of persons and structures to potential hazards, such as flood, wildfire, and sea level rise. Additionally, environmental impacts resulting from implementation of the plan (as identified in Sections 5.1 through 5.14 of this Program EIR) could combine with climate change-associated impacts to intensify such impacts and exacerbate hardships for the city.

Although the General Plan is likely to increase the City's exposure to such risks and hardships, the plan also includes a variety of policies and programs that would assist the city in avoiding and adapting to the impacts of climate change.

6.3.3 THRESHOLD OF SIGNIFICANCE

By adopting AB 32, the California Legislature has indicated that global climate change is a serious environmental issue and has identified a GHG reduction requirement for the state. To comply with AB 32, California would need to generate fewer GHGs than current levels. It is recognized, however, that for most development projects there is no simple metric available to determine whether the individual project would substantially increase or decrease overall emission levels of GHGs.

The primary objective of AB 32 is to reduce California's contribution to global warming by reducing California's total annual GHG emissions. The impact that emissions of GHGs have on global climate change does not depend on whether they were generated by stationary, mobile, or area sources or whether they were generated in one region or another.

As stated above, the California Legislature and global scientific community have found that global climate change poses the threat of significant adverse effects to the environment of California and the entire world. To mitigate these adverse effects, the California Legislature and Governor, respectively, have required statewide GHG reductions to the 1990 level by 2020 and 80 percent below the 1990 level by 2050.

In light of the substantial GHG emission reductions established by the California Legislature and Governor to mitigate the significant adverse environmental effects of global climate change, the following global climate change significance threshold is used for this analysis:

- The project's incremental contribution to global climate change would be considered cumulatively significant if, due to the size or nature of the project, it would generate a substantial increase in GHG emissions relative to existing conditions.

6.3.4 ANALYSIS OF ENVIRONMENTAL IMPACTS

Global climate change is caused by the addition of massive quantities of GHGs to the atmosphere due primarily to human activities in the last 150 years from all over the world. For example, about 26 billion metric tons of CO_2 were added to the Earth's atmosphere in 2005 alone. If viewed apart from the GHG emissions produced by activities elsewhere in the world, the mass of GHG emissions generated by an individual development project under a General Plan such as the General Plan would be so minute that the concentration of GHGs in the atmosphere would essentially remain the same. The increasing concentration of GHGs in the atmosphere is caused by the aggregate GHG emissions from a variety of human activities throughout the world, including activities like vehicle miles traveled (VMT) and building energy use affected by the General Plan. Therefore, it is appropriate to evaluate a project's contribution to global climate change in this cumulative, worldwide context.

The General Plan would generate GHG emissions including CO_2, CH_4, and N_2O primarily associated with VMT; electricity and natural gas consumption of buildings; energy embodied in water consumption (i.e., the electricity required to extract, convey, treat, and distribute treated water to the project site); and construction activities associated with future development activities under the General Plan.

As discussed previously, historic and current global GHG emissions are known by the state and the global scientific community to be causing global climate change, and future increases in GHG emissions associated with development under the proposed project would only exacerbate climate change and contribute to the significant adverse environmental effects described previously. Furthermore, increased GHG emissions associated with the proposed project could potentially impede implementation of the state's mandatory requirement under AB 32 to reduce statewide GHG emissions to the 1990 level by 2020.

Although there are no universally accepted methodologies for quantifying emissions of GHGs, methodologies for calculating GHG emissions do exist and are discussed below to provide a rough calculation of GHG emissions associated with projected future vehicle travel, electricity and natural gas consumption of buildings, and embodied energy of water consumption associated with development allowed by the General Plan. A summary of GHG emissions under existing conditions and development capacity of the General Plan is provided in Table 6-4.

Table 6-4
City of Laguna Hills General Plan
Summary of Greenhouse Gas Emissions under Existing Conditions and Buildout of the General Plan

Source	Existing GHG Emissions (MTCO2 or MTCO2e /yr)	Buildout GHG Emissions (MTCO2 or MT CO2e /yr)	Percent Increase
Construction Total (over 20-year buildout of the General Plan)	n/a	17,603	n/a
Vehicles	285,018	358,588	26%
Building Energy	86,365	101,587	18%
Embodied Energy of Water Consumption	2,268	2,370	5%
Operations Total	**373,651**	**462,545**	**24%**

Notes:
$MTCO_2$ = metric tons carbon dioxide per year
$MTCO_2e$ = metric tons carbon dioxide equivalent per year
Source: Data calculated by EDAW in 2008

CO_2 emissions associated with VMT were calculated in tons per year in 2030 using URBEMIS 2007 (Version 9.2.4). The results were converted to metric tons per year using the standard conversion rate of 1 ton equals 0.90718474 metric tons. The calculations assume that existing annual VMT is 1,737,914 and projected VMT under buildout of the General Plan is 2,148,350. URBEMIS does not calculate CH_4 or N_2O emissions, two other GHGs associated with the combustion of gasoline and diesel fuel. However, CO_2 emissions are considered a good estimate of total GHG emissions from vehicle trips since CH_4 and N_2O represent a negligible portion of the GHGs associated with the burning of gasoline and diesel fuel compared to CO_2.

It is estimated that existing VMT resulted in approximately 285,018 metric tons of carbon dioxide ($MTCO_2$) per year while VMT under buildout of the General Plan is projected to result in approximately 358,588 $MTCO_2$ per year. Overall, GHG emissions associated with VMT under buildout of the General Plan would increase by about 26 percent relative to existing conditions. The calculations used to estimate GHG emissions are provided in Appendix F of this Program EIR.

GHG emissions associated with building energy consumption are estimated based on assumptions for electricity and natural gas consumption per land use from the CEC and GHG emission factors for electricity and natural gas consumption from the CCAR GRP (Version 2.2 March 2007, Appendix C, Tables C.1 and C.2). Existing buildings studied in this analysis include single- and multi-family residential, and all commercial, office, hospital, and industrial buildings. Other building types were not studied due to a lack of data for either the existing condition or build-out year. However, the building types studied represent the vast majority of land uses within the General Plan area in the existing condition and under buildout of the General Plan. Consumption of energy in the studied existing buildings is estimated to have emitted approximately 86,365 $MTCO_2e$.[11] Energy consumption in the same building types under buildout of the General Plan is expected to result in approximately 101,587 $MTCO_2e$ per year. Overall, GHG emissions associated with building energy consumption under future development capacity of the General Plan would increase by about 18 percent relative to existing conditions.

Water consumption associated with various activities under the General Plan is embedded with energy by virtue of the amount of energy consumed in collecting, extracting, conveying, treating, and distributing water to end users, and treating and disposing of wastewater. The analysis of embodied energy of water consumed by the proposed project assumed that imported water has an embodied energy of 0.013 kilowatt-hours (kWh) per gallon[12] and 0.002 kWh/gallon for groundwater.[13] Water demand for the proposed project was assumed consistent with Section 5.8, Hydrology and Water Quality. Existing demand for the embodied energy of water is estimated to result in 2,268 $MTCO_2e$ per year, while projected demand for the embodied energy of water at buildout of the General Plan would be 2,370 $MTCO_2e$ per year, an increase of 5 percent relative to existing conditions.

As shown in Table 6-4, existing GHG emissions from VMT and building energy consumption were estimated to be approximately 373,651 $MTCO_2e$ while GHG emissions under buildout of the General Plan are projected to be approximately 462,545 $MTCO_2e$.

[11] Carbon dioxide equivalent (CO_2e) is a calculation that enables all GHG emissions to be considered equally in order to measure the impact of all GHG emissions. This is necessary because GHGs vary widely in their ability to absorb radiation and trap heat in the atmosphere, which means their power to affect the climate—or their global warming potential—also varies widely. The global warming potential of GHGs is measured relative to the global warming potential of CO_2. For example, since CH_4 and NO_X are approximately 23 and 300 times more powerful than CO_2, respectively, in their ability to trap heat in the atmosphere, they have global warming potentials of 23 and 300 (CO_2 has a global warming potential of 1). The global warming potential of each GHG is then multiplied by the prevalence of that gas to produce a CO_2e.

[12] *Refining Estimates of Water-Related Energy Use in California*. California Energy Commission, Public Interest Energy Research Program. CEC-500-2006-118. December 2006.

[13] *Energy Down the Drain. The Hidden Costs of California's Water Supply.* Natural Resources Defense Council, Pacific Institute. August 2004.

Together, this represents an approximately 24 percent increase in GHG emissions from these sources. Increased solid waste generation and the associated management and disposal in landfills under the General Plan are also anticipated to result in increased GHG emissions associated with the release of landfill gas (i.e., CH_4), GHG emissions would also result from the collection of solid waste and transport to the landfill. Recycled waste would avoid the GHG emissions associated with landfilling, although the collection and transport of recycled materials would still result in emissions. Due to the detailed nature of accurately quantifying the climate change impact of solid waste management, such GHG emissions are not quantified in this section. However, it is acknowledged that such emissions are no less important than those from other sources. Other activities that would result in GHG emissions under the General Plan but not quantified in this section include public outdoor lighting (such as street lights, sports field lighting, and traffic signals) and management of carbon sinks (e.g., the removal, preservation, and installation of vegetation that absorbs CO_2).

New growth anticipated under the General Plan would generate a finite quantity of approximately 19,404 $MTCO_2$ from the aggregate of construction activities during the lifetime of the General Plan. Construction activities consistent with the General Plan would generate GHG emissions to a much lesser extent than operational activities under the plan.

Existing federal regulations addressing GHG emissions from passenger cars and trucks (e.g., Corporate Average Fuel Economy [CAFE)] standards revised in the 2007 House Energy Bill) and state regulations to increase the amount of electricity generated from renewable sources (e.g., California Renewable Energy Portfolio Standard Program) will likely reduce the rate of GHG emissions increase associated with VMT, building energy consumption, and embodied energy of water consumption under the General Plan. Furthermore, regulations targeting sources of GHG emissions called for in AB 32 are expected to be adopted and in effect by 2012, although it is unknown at this time precisely what effect such regulations will have on emissions related to land development activities under buildout of the General Plan. It is not known at this time what reductions are achievable from other emission sources through state regulatory measures such as the AB 32 Early Action Measures (adopted in July 2007). Also not known at this time is whether additional GHG reductions for mobile sources might be available through legislation such as AB 1493, which would create more stringent vehicle emission standards for GHGs. Finally, market factors could affect the density of land uses actually constructed under the build-out scenario, which are unknown at this time. The City's General Plan includes implementation programs to reduce GHG emissions, such as adoption of a climate action plan. Therefore, it is not yet clear what the net GHG emissions would actually be under the build-out scenario of the General Plan, given the uncertainty of future legislative and regulatory actions. Many factors that would be used to calculate the net change in GHG emissions attributable to individual projects within the General Plan are either unknown at this time or outside the control of the City.

Since annual GHG emissions under buildout of the proposed Project are projected to exceed the existing level by the substantial margin of 24 percent, the General Plan would contribute to the exacerbation of climate change and the significant adverse environmental effects thereof. Furthermore, increased GHG emissions associated with the proposed project could potentially impede implementation of the state's mandatory requirement under AB 32 to reduce statewide GHG emissions to 1990 levels by the same year. Therefore, the incremental GHG emissions associated with development under the General Plan would cause a cumulatively considerable incremental contribution to the significant cumulative (worldwide) impacts when viewed in connection with worldwide GHG emissions. By generating increased emissions that contribute to global climate change, development that occurs in accordance with the General Plan throughout the City of Laguna Hills would incrementally contribute to the adverse economic, public health, natural resources, and other environmental impacts mentioned earlier in this section that are projected to occur in California and throughout the world as a result of global climate change.

6.3.5 MITIGATION MEASURES

Implementation of the following programmatic mitigation measures, derived from the General Plan Implementation Program, will reduce potential impacts but not to a level less than significant. Individual development projects will be required to undergo project-specific environmental review and mitigation measures will be identified to reduce any significant impacts. Mitigation for significant environmental impacts of each future development project shall include the following: (1) objective of the measure; (2) specific standards or measures to be applied, along with any needed contingency measure; (3) responsible party; (4) location; (5) schedule for initiation; and (6) how the measure will reduce the associated environmental impact.

The General Plan includes implementation programs aimed at addressing the threat of climate change. These implementation programs shall be adopted as part of the Mitigation Monitoring and Reporting Program (MMRP) to reduce the GHG emissions of the General Plan. Full text of these implementation programs is provided below.

GCC-1 The City shall adopt a sustainable development program with the goal of reducing ownership costs, reducing water and energy consumption, reducing driving, and reducing greenhouse gas emissions. This Sustainable Development program shall incorporate the following programs that address environmental sustainability: Green Building Standards; Mixed Use; Bikeways, Sidewalks, Walkways, Crosswalks; Orange County Transportation Authority; Climate Action Plan; Water Conservation; Recycled and Reclaimed Water; and Community Gardens. In addition to the above implementation programs, the City will also consider incorporating additional components into the Sustainable Development Program not directly addressed in these other programs:

1. Adopt a formal green building program, such as Leadership in Energy and Environmental Design (LEED®), GreenPoint Rated and/or other programs applicable to Laguna Hills.
2. Provide developer incentives for green buildings.
3. Adopt a native tree preservation ordinance and encourage planting of new, drought-tolerant trees.
4. Promote and incentivize alternative energy such as wind and solar in new development and revitalization projects.
5. Institute green purchasing practices in all City operations, including alternative or very fuel-efficient vehicles.
6. Establish a marketing and education plan for City residents to encourage green building standards, alternatives to driving, energy conservation through high efficiency lighting and appliances, and alternative energy such as wind and solar.
7. Measure annual progress in City operations, and private development as applicable.
8. During the development review process for large development projects (greater than 10 units and/or 10,000 square feet), the City will coordinate with energy providers to determine if additional energy efficiency measures can be incorporated into the project design. ~~Participate in utility-sponsored (e.g., Southern California Edison) sustainability programs.~~ **(Implementation Program LU-8)**

GCC-2 The City shall evaluate proposed development projects throughout the City using LEED standards, GreenPoint Rated, and/or other green building standards. The City encourages all future development and major renovation projects within the following General Plan designations to achieve LEED certification, and/or other green certifications: High Density

Residential, Village Commercial, Freeway Commercial, Community Commercial, Office Professional, Mixed Use, Neighborhood Mixed Use, and Community/Private Institution. The City shall investigate the potential to offer density bonus incentives on residential projects that achieve LEED certification, and other green certifications and ratings. **(Implementation Program LU-9)**

GCC-3 The City shall actively encourage the development and maintenance of mixed uses, particularly in the Mixed Use and Neighborhood Mixed Use areas, by maintaining a list of sites available for mixed use and infill development and making the list available to developers. The City shall establish developer incentives to encourage well-designed mixed use and infill development projects in these areas. **(Implementation Program LU-10)**

GCC-4 The City shall continue to participate in regional efforts to implement Transportation Demand Management (TDM) through implementation of the City's Transportation Demand Ordinance as set forth in the Municipal Code. The purpose of the ordinance is to promote alternative transportation methods, such as carpools, vanpools, transit, bicycles, walking, park-and-ride lots; parking management programs; and other strategies to meet congestion and air quality goals. The City shall complete intersection capacity improvements and coordinate traffic signals as necessary to improve traffic flow. **(Implementation Program M-4)**

GCC-5 The City shall update the Bikeways, Trails & Open Space Master Plan; identify gaps and major barriers to connectivity in the City; and identify appropriate means and locations for overcoming those barriers. The City shall include a pedestrian/walkability component in the updated Plan that identifies areas where major barriers to connectivity exist, and measures and/or techniques to improve walkability and safety. **(Implementation Program M-5)**

GCC-6 The City shall work with project proponents to ensure that safe and attractive sidewalks, walkways, bike lanes, and crosswalks that facilitate use are provided in accordance with City standards. The City shall work with developers to construct links to adjacent communities, using open space easements and utility easements when appropriate. **(Implementation Program M-6)**

GCC-7 The City shall provide bicycle support facilities (e.g., bicycle racks, personal lockers, showers, and other bicycle support facilities) in new development and revitalization projects to encourage bicycle riding as a transportation mode. The City shall adopt a formal bike support facility ordinance and/or guidelines applicable to private and public development. **(Implementation Program M-7)**

GCC-8 The City shall work closely with the Orange County Transportation Authority (OCTA) to achieve the following:

1. Maintain consistency with the County Master Plan of Arterial Highways (MPAH) within the City.
2. Implement the OCTA Congestion Management Plan (CMP) within the City.
3. Expand and improve bus service within the City.
4. Encourage express bus service to regional activity centers.
5. Encourage provision of attractive and appropriate transit amenities, including shaded bus stops.
6. Provide special transit services (such as direct shuttle or dial-a-ride services).

7. Support and implement the OCTA Commuter Bikeways Strategic Plan and participate in future updates and revisions to the Plan.

In addition, the City shall coordinate with the California Department of Transportation (Caltrans) on all plans, activities, and projects that affect state roadway facilities. **(Implementation Program M-8)**

GCC-9 The City shall coordinate with regional transit providers and use public education to accomplish the following objectives:

1. Encourage City residents and workers to rideshare and use transit.
2. Educate residents of all ages about local mobility choices.
3. Work with schools to improve and advertise nonautomotive options for getting to school and school-related activities.
4. Coordinate education activities and make materials available to residents. Utilize forums, flyers, brochures, and the City's website to accomplish these objectives. **(Implementation Program M-9)**

GCC-10 The City shall adopt a formal traffic calming policy. The City shall construct and implement traffic calming measures in appropriate locations, including increased law enforcement of traffic laws. The City shall work with neighborhoods to address local traffic concerns, and explore funding alternatives for neighborhood traffic calming improvements. The City shall discourage frequent driveway curb cuts along Mobility Element roadways and encourage reciprocal access between properties, when appropriate. **(Implementation Program M-10)**

GCC-11 The City shall encourage water conservation throughout Laguna Hills in the following ways:

1. Encourage water developments to apply water-conserving principles, including such techniques and materials as native or low water use (drought-tolerant) plants, low precipitation sprinkler heads, bubblers, drip irrigation systems, and timing devices.
2. Support the production of recycled water and develop new uses for recycled water.
3. Apply water conservation techniques/project "water budgets" to achieve a significant reduction over historic use and over average uses for the proposed type of development by the incorporation of water conservation devices, such as low-flow toilets, flow restriction devices, and water conserving appliances in new public and private development and rehabilitation projects. **(Implementation Program COS-1)**

GCC-12 The City shall, in cooperation with the state, regional, and local water agencies and suppliers, support the expansion of the use of recycled water for urban and agricultural irrigation. The City shall cooperate with these agencies to establish standards and regulations for the use of recycled water in development projects. **(Implementation Program COS-4)**

GCC-13 The City shall prepare a Climate Action Plan consisting, at a minimum, of the following components:

1. A baseline inventory of all known sources of greenhouse gases (as defined by Section 38505 of the California Health and Safety Code) in the City. The baseline year shall be the most recent year for which data are available at the time of adoption of the General Plan.
2. An inventory of greenhouse gases emitted in the City in 1990 from all source categories included in the baseline inventory.

3. A projected inventory of greenhouse gases expected to be emitted in the year 2020 due to the City's discretionary land use decisions pursuant to the General Plan Update, as well as greenhouse gases emitted by the City's internal government operations.
4. A target for the reduction of those sources of emissions reasonably attributable to the City's discretionary land use decisions and internal government operations. The reduction shall be based on returning to the 1990 emissions level for the City by 2020 or otherwise set at an emissions level for a year that reduces the City's contribution to global climate change as supported by the best available scientific modeling.
5. Feasible greenhouse gas reduction measures intended to meet the reduction target by regulating those sources of emissions reasonably attributable to the City's discretionary land use decisions and internal government operations. **(Implementation Program COS-8)**

GCC-14 The City shall continue to implement solid waste diversion programs as well as public education programs as outlined in the City's Source Reduction and Recycling Element required by Assembly Bill 939. As part of this program, work with the private sector contractor providing solid waste services within the City to ensure that appropriate recycling containers, procedures, and education are readily available throughout the community. Develop programs to maximize recycling of waste products generated by the community to prolong useful life of the local landfills. **(Implementation Program CSF-6)**

6.3.6 IMPACT AFTER MITIGATION

Implementation of the General Plan Implementation Programs described above would reduce the incremental GHG emissions associated with buildout of the General Plan, although it is not known at this program level of analysis whether the GHG emissions of the General Plan can be reduced to a level less than cumulatively significant. In addition, the mitigation measures outlined in Section 5.3, Air Quality, that reduce operational criteria air pollutant emissions would also reduce GHG emissions to some extent. Even with these mitigation measures, buildout of the General Plan will continue to contribute to global climate change. Therefore, the cumulatively considerable incremental contribution to the worldwide increase in GHG emissions represented by buildout of the General Plan is considered significant and unavoidable.

6.4 GROWTH-INDUCING IMPACTS

CEQA Guidelines Section 15126.2(d) requires that an EIR discuss the growth-inducing impact of the proposed project. Growth-inducement includes, "…ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth (a major expansion of a waste water treatment plant might, for example, allow for more construction in service areas)."

The General Plan is specifically intended to plan for the orderly growth of Laguna Hills and define the limits of that growth, and act as a mechanism to accommodate future managed growth. Projects permitted pursuant to land use policy will BE provided for additional housing for all income levels, create more activity centers to enhance community cohesion, promote a more pedestrian-friendly environment, provide a safe and efficient local transportation system while also promoting alternative modes of transit, and manage limited natural resources for future generations. A major feature of the General Plan is the introduction of higher density Neighborhood Mixed Use and Planned Community land use designations.

Implementation of the General Plan will result in a more inclusive community, bring new employment opportunities to Laguna Hills through commercial redevelopment, and foster a stable economic base.

The General Plan focuses on sustainable development approaches, such as infill development, and use of the current roadway system. The key growth opportunity may result from land use changes that allow higher densities/intensities within the opportunity areas as well as the future study areas discussed in Chapter 3.0, Project Description; however, such growth is limited by the land use designations of the General Plan. Therefore, growth inducement resulting from General Plan implementation would be less than significant.

6.5 SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES

Development pursuant to the General Plan land use policy would result in the consumption of nonrenewable resources. This use will have an irreversible effect on such resources. The irreversible commitment of limited resources is inherent in any development project, or in the case of the General Plan, cumulative development projects. Resources anticipated to be irreversibly committed over the approximate 20-year life of the General Plan include, but are not limited to, lumber and other related forest products; sand, gravel, and concrete; petrochemicals; construction materials; steel, copper, lead, and other metals; and water. Buildout of the General Plan represents a long-term commitment to the consumption of fossil fuel oil and natural gas. These increased energy demands relate to construction, lighting, heating, and cooling of residences and buildings, and transportation to and from the planning area.

6.6 UNAVOIDABLE SIGNIFICANT ENVIRONMENTAL IMPACTS

Implementation of the General Plan would result in significant and unavoidable project level and cumulative air quality and water supply impacts. Implementation of the mitigation measures in Section 5.3, Air Quality, and Section 5.12, Public Services and Utilities, would reduce the air quality and water supply impacts to an extent; however, the project level and cumulative impacts would remain significant and unavoidable.

Implementation of the General Plan would contribute to the exacerbation of climate change and the significant adverse environmental effects thereof since annual greenhouse gas (GHG) emissions under buildout of the General Plan are projected to exceed the existing level by the substantial margin of 24 percent. Furthermore, increased GHG emissions associated with the proposed project could potentially impede implementation of the state's mandatory requirement under Assembly Bill 32 to reduce statewide GHG emissions to 1990 levels by the same year. Therefore, the incremental GHG emissions associated with development under the General Plan would cause a cumulatively considerable incremental contribution to the significant cumulative (worldwide) impacts when viewed in connection with worldwide GHG emissions. By generating increased emissions that contribute to global climate change, development that occurs in accordance with the General Plan throughout the City of Laguna Hills would incrementally contribute to the adverse economic, public health, natural resources, and other environmental impacts mentioned earlier in this section that are projected to occur in California and throughout the world as a result of global climate change.

6.7 AREAS OF NO SIGNIFICANT IMPACT

The following areas were analyzed as part of this Program EIR and were found to be less than significant without mitigation.

- Aesthetics – Light and glare
- Air Quality – Objectionable odors
- Agricultural Resources – Conversion of farmland; existing agricultural use zoning; and Williamson Act contract lands
- Biological Resources – Wildlife corridors and conflicts with Habitat Conservation Plans (HCP)
- Cultural Resources – Historic archeological, and paleontological resources; and human remains
- Geology, Soils, and Mineral Resources – Septic tanks and mineral resources
- Hazards and Hazardous Materials – Hazardous materials, emergency plans, and wildland fire hazards
- Hydrology and Water Quality – Hydrology, groundwater resources, and tsunami, seiche, and mudflow
- Land Use and Planning – Divide an established community and conflict with local HCP
- Population and Housing – Population growth and housing displacement
- Public Services and Utilities – Fire and police protection, schools, libraries, wastewater, stormwater drainage facilities, and energy infrastructure
- Recreation – Increase use or deterioration of recreational facilities and construction or expansion of recreational facilities
- Transportation and Circulation – Future traffic conditions, air traffic patterns, roadway design, emergency access, parking, and alternative transportation

7.0 ALTERNATIVES

RATIONALE FOR ALTERNATIVES SELECTION

CEQA requires the consideration of alternative development scenarios and the analysis of impacts associated with the alternatives. Through comparison of these alternatives to the proposed project, the advantages of each can be weighed and analyzed. Section 15126.6 of the CEQA Guidelines requires that an EIR "describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project, but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives." The emphasis is added to stress that the alternatives analysis should look for ways to further mitigate the effects of the project. Thus, the selection and analysis of project alternatives presented in this section do not include any alternatives that assume intensification of development beyond that associated with the General Plan.

Additionally, the CEQA Guidelines state:

- The specific alternative of "no project" shall also be evaluated along with its impact. If the environmentally superior alternative is the "no project" alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives. [Section 15126.6(e)(1)(2)]

- An EIR need not consider every conceivable alternative to a project. Rather, it must consider a reasonable range of potentially feasible alternatives that will foster informed decision making and public participation. An EIR is not required to consider alternatives which are infeasible. The range of potential alternatives to the proposed project shall include those that could feasibly accomplish most of the basic objectives of the project and could avoid or substantially lessen one or more of the significant effects. The EIR should briefly discuss the rationale for selecting the alternatives to be discussed. The EIR should also identify any alternatives that were considered by the lead agency but were rejected as infeasible during the scoping process and briefly explain the reasons underlying the lead agency's determination. Among the factors that may be used to eliminate alternatives from detailed consideration in an EIR are: (i) failure to meet most of the basic project objectives, (ii), infeasibility, or (iii) inability to avoid significant environmental impacts. (Section 15126.6[a][c])

In addition to focusing on alternatives capable of either eliminating any significant environmental effects of the project or reducing them to a less than significant level, the following analysis examines variations of the proposed project that were considered during preparation of the General Plan and that may be considered further during the public hearing process. The alternatives analyzed in the Program EIR are general in nature, as is the proposed project. The degree of specificity used in the alternatives analysis is related to the general level of information associated with implementation of the General Plan. Development over the entire planning area is addressed in the alternatives analysis, rather than specific development projects. The following project alternatives are examined:

- No Project/Existing General Plan
- No Change to Urban Village Specific Plan
- Enhanced Conservation Program/Mandatory Conservation Measures and Programs

These alternatives were developed in the course of project planning and environmental review. The discussion in this section provides:

- A description of alternatives considered;
- An analysis of whether each alternative meets most of the basic objectives of the proposed project as described in Chapter 3.0, Project Description, of this Program EIR; and
- A comparative analysis of the alternatives under consideration and the proposed project. The focus of this analysis is to determine if alternatives are capable of eliminating or reducing the significant environmental effects of the project to a less than significant level. Table 7-1 summarizes the comparison of impacts of each alternative to the proposed project.

Table 7-1
Comparison of Impacts of Alternatives to the Proposed Project

Impact	No Project	No Change to Urban Village Specific Plan	Mandatory Conservation Programs
Aesthetics	Greater	Similar	Similar
Agricultural Resources	Similar	Similar	Similar
Air Quality	Similar	Less	Less
Biological Resources	Similar	Similar	Similar
Cultural Resources	Similar	Similar	Similar
Geology/Soils/Mineral Resources	Similar	Similar	Similar
Hazards/Hazardous Materials	Similar	Similar	Similar
Hydrology/Water Quality	Greater	Similar	Less
Land Use and Planning	Greater	Similar	Similar
Noise	Greater	Similar	Similar
Population and Housing	Similar	Similar	Similar
Public Services and Utilities	Less	Similar	Less
Recreation	Greater	Similar	Similar
Transportation and Circulation	Greater	Similar	Similar
Global Climate Change	Greater	Less	Less
Conclusion	**Environmentally Inferior**	**Environmentally Superior**	**Environmentally Superior**

ALTERNATIVES CONSIDERED BUT REJECTED

The City considered a range of land use alternatives during preparation of the General Plan, both for the City as a whole and within nine identified focus areas: Oakbrook Village; Alicia Gateway; La Paz Gateway; Alicia Valencia Plaza; Via Lomas Housing Area; Alicia Parkway/Aliso Hills Park Triangle; Moulton/La Paz Center; Laguna Hills Business Park; and Ridge Route Open Space. Although all the sites were viewed as potential areas for future redevelopment, two were not included for the final set to be evaluated for General Plan purposes. The Alicia Parkway/Aliso Hills Park Triangle~~Open Space~~ Triangle, which was presented as an opportunity site for a civic use, such as a library, was not included because the current designation already allowed for such use. The Laguna Hills Business Park was not included because it currently offers community and business services, which were considered a long-term need. However, the area was reserved as a site for future study within the General Plan. The final opportunity areas included in the General Plan were chosen by the General Plan Advisory Committee (GPAC), ~~city~~ City staff, and EDAW and included Alicia Gateway, Moulton/La Paz, and Via Lomas Housing Area.

Alternatives for each of the geographic areas described above were developed and reviewed with the GPAC, the City Council, and the general public. The alternatives, to varying degrees, reflected the vision statement and preliminary policies developed by the GPAC and the wider community, as well as various land use changes recommended by City staff members. The approach to creating land use alternatives for

the three sites was slightly different for each site. The primarily commercial and office site of Alicia Gateway was developed following precedents of vertical mixed use developments. The Moulton/La Paz area, which had been previously identified as a potential place for recreational fields, was further evaluated for potential commercial redesign and expansion. The Via Lomas Housing site was examined solely from an increased housing density standpoint, so that no change in use was suggested. In each area, up to two alternative land use scenarios were proposed in addition to an alternative in which existing General Plan land use designations would remain.

Multiple community workshops, GPAC meetings, and City Council study sessions were held between 2007 and 2008 to identify key community issues, develop and refine land use alternatives, and select a community-preferred land use alternative. Alternatives presented to the community responded to unique priorities expressed by the workshop participants as well as the constraints and opportunities present within each focus area. It should be noted that several alternatives were determined to be infeasible at this time due to strong political and public opposition, and were not evaluated further.

As stated above, the City considered numerous land use alternatives as a part of the General Plan update process. These alternatives featured varying overall development footprints in a number of focus areas. The alternatives presented in this section were specifically created for the purposes of this Program EIR analysis. The City determined that a simple repeat of the earlier range of land use alternatives would not serve the decision makers or public as well as the present range. For example, alternatives previously considered featured greater levels of residential, commercial, and retail development than the General Plan. This is not helpful for comparison in a Program EIR because the purpose of an alternatives analysis is to reduce potentially significant environmental impacts compared to the impacts of the proposed project.

Alternate Project Location Alternative

The CEQA Guidelines recommend considering an alternative location to reduce potential impacts of a proposed project. However, the policies and programs of the General Plan are specific to the geographic context of Laguna Hills. Buildout pursuant to the General Plan at another location does not make sense for a plan that applies to all properties within the City's jurisdiction. Thus, this Program EIR does not examine the Alternate Project Location alternative.

7.1 ALTERNATIVE 1: NO PROJECT/EXISTING GENERAL PLAN

This alternative is analyzed within this Program EIR as it is required under CEQA Guidelines Section 15126.6(e). According to Section 15126.6(e)(2) of the CEQA Guidelines, the "no project" analysis shall discuss, "... what is reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services." When the project is the revision of an existing land use policy, CEQA Guidelines §15126.6(e)(3)(A) states that "the No Project Alternative will be the continuation of the existing plan…into the future." So, for the purposes of this Program EIR, the No Project Alternative represents buildout under the currently adopted General Plan as further described below. This alternative, however, does not represent a "no build" scenario in which no future development or redevelopment would occur.

DESCRIPTION OF THE ALTERNATIVE

This alternative assumes that the General Plan would not be adopted and implemented. Instead, the planning area would be developed according to the existing General Plan land use map (1994) and

existing development patterns. The 1994 General Plan projected 10,745 dwelling units and a population of 29,111. These projections are less than the existing conditions as it stands today, and are therefore not a useful comparison for the No Project/Existing General Plan Alternative. Instead, SCAG 2030 projections were used for the number of projected dwelling units as well as the projected population. The square footage of nonresidential uses was assumed from the existing 1994 General Plan as SCAG does not project nonresidential square footages. Table 7-2 identifies the development capacity and projected population for the No Project/Existing General Plan compared to the General Plan.

Table 7-2
Development Capacity and Projected Population
Existing No Project/Existing General Plan vs. General Plan

Alternative	Dwelling Units	Population	Square Feet of Nonresidential Uses
No Project/Existing General Plan	11,186	33,421	7,898,232[1]
General Plan	11,643	34,620	6,952,170
Difference	**-457**	**-1,199**	**946,062**

[1] City of Laguna Hills Final Master EIR 1994

Buildout under the existing General Plan would result in approximately 457 fewer dwelling units and approximately 1,199 fewer people; however, the existing General Plan would allow for an increase of approximately 946,062 more square feet of nonresidential development than would be allowed under the General Plan.

COMPARISON OF ENVIRONMENTAL IMPACTS TO PROPOSED PROJECT

Aesthetics

The implementation of the No Project/Existing General Plan Alternative would result in a decreased level of residential development and an increased level of nonresidential development relative to the General Plan. Project objectives identified in both the existing and General Plan are to preserve and enhance the existing community character and sense of place. The General Plan Land Use Element contains numerous policies and programs to encourage high-quality urban design in new development and redevelopment areas and visually enhance and beautify existing streetscapes, districts, gateways, and corridors. Under the General Plan, the Neighborhood Mixed Use designation has the potential to change the aesthetic characteristics of the City compared to the existing General Plan. The proposed Neighborhood Mixed Use designation would allow for greater residential density, with building massing encouraged to be sited at the street frontage and retail uses recommended on the ground floor within some designations. Although the Neighborhood Mixed Use designation would support different types of mixed use development compared to the existing General Plan, any proposed development projects within the Mixed Use areas would still be required to undergo design review by the City, thus yielding higher quality projects that reflect surrounding land uses, including meaningful architectural designs, incorporating site planning that is consistent with the character of Laguna Hills, and providing appropriate transitions between mixed use projects and single-family homes. The existing General Plan would not implement the policies and programs contained in the General Plan Land Use Element such as those that would support distinctive gateway architecture, landscaping, and signs at major entries to the community and in community activity centers to enhance the visual character of the planning area. Implementation of this alternative would result in a slightly greater impact to aesthetics than the General Plan.

Agricultural Resources

The implementation of the No Project/Existing General Plan Alternative would not result in impacts to agricultural resources given that the planning area consists primarily of developed urban land and open space. Both the existing General Plan and the General Plan contain no agricultural land use designations. Further, no impacts to agricultural resources would occur under the No Project/Existing General Plan Alternative. Therefore, impacts to agricultural resources would be similar under the No Project/Existing General Plan Alternative and the General Plan.

Air Quality

The implementation of the No Project/Existing General Plan Alternative would result in a decreased level of residential development and an increased level of nonresidential development relative to the General Plan. Potential short-term air quality impacts resulting from demolition and/or construction activities in the planning area would be similar under the No Project/Existing General Plan Alternative when compared to the General Plan; however, vehicle exhaust would continue to be the most significant factor contributing to long-term regional air quality. The amount of exhaust would rise as traffic volumes increase due to new development and redevelopment within Laguna Hills as well as regional growth. A comparison of the number of vehicular trips anticipated at buildout of the General Plan and the No Project Alternative is a good proxy to assess the potential long-term air quality impacts of the General Plan and No Project Alternative. At buildout, the existing General Plan projected approximately 274,042 average daily trips. However, the General Plan would result in approximately 212,650 average daily trips, representing a decrease of approximately 61,392 average daily trips. It is also expected that even if the General Plan and associated Implementation Programs were not adopted, the City would impose requirements similar to those proposed by the existing General Plan in order to reduce air quality impacts in the planning area to the extent feasible. Consequently, potential short-term and long-term air quality impacts from the No Project/Existing General Plan Alternative would be similar to that occurring under implementation of the General Plan. Project-level and cumulative air quality impacts would remain significant and unavoidable under either alternative because Laguna Hills is in a nonattainment air basin. Overall, impacts to air quality would be similar under either the No Project/Existing General Plan Alternative or the General Plan.

Biological Resources

Development under both the No Project/Existing General Plan Alternative and the General Plan would be subject to the same state and federal environmental review requirements and regulations for the protection of sensitive and endangered species and habitats. Additionally, the majority of development under the proposed project would occur within opportunity and future study areas that are located in previously developed lands of the City, away from areas with biological resources. Implementation of the No Project/Existing General Plan Alternative would result in similar impacts compared with the General Plan.

Cultural Resources

Implementation of the No Project/Existing General Plan Alternative would result in a similar impact to cultural resources because even if the General Plan and associated Implementation Programs were not adopted, the City would impose requirements similar to those proposed by the General Plan policies and programs in order to reduce cultural resources impacts in the planning area to a level less than significant. This assumption is particularly true since future development in the planning area would be required to be consistent with existing CEQA requirements for the protection of archaeological and historical resources.

Overall, impacts to cultural resources would be similar under the No Project/Existing General Plan Alternative and the General Plan.

Geology, Soils, and Mineral Resources

Implementation of the No Project/Existing General Plan Alternative or the General Plan would expose a similar number of people and structures to substantial adverse effects of seismically related geologic events. It is expected that even if the General Plan and associated Implementation Programs were not adopted, the City would impose requirements similar to those proposed by the General Plan policies and programs in order to reduce geology/soils impacts in the planning area to a level less than significant. Because this alternative would impose similar geology, soils, and mineral resources requirements on future development as the proposed project, impacts related geology, soils, and mineral resources would be similar. This No Project/Existing General Plan Alternative would also not propose the additional development described in the analysis of the General Plan. Therefore, this alternative would not have any significant impacts on mineral resources. Overall, impacts to geology, soils, and mineral resources would be similar under the No Project/Existing General Plan Alternative and the General Plan.

Hazards and Hazardous Materials

Implementation of the No Project/Existing General Plan Alternative or the General Plan would result in both residential and nonresidential development that could potentially produce, use, and store hazardous materials. Other potential hazards located in the planning area include nuclear power hazards and urban and wildland fire hazards. It is expected that even if the General Plan and associated Implementation Programs were not adopted, the City would impose requirements similar to those proposed by the General Plan policies and programs in order to reduce hazards and hazardous materials impacts in the planning area to a level less than significant. Overall, impacts to hazards and hazardous materials would be similar under the No Project/Existing General Plan Alternative and the General Plan.

Hydrology and Water Quality

Under the No Project/Existing General Plan Alternative, the City would continue to function under the direction of the existing General Plan. Although the existing General Plan currently discusses issues related to water and hydrology, the existing General Plan contains only general discussions and does not contain policies that specifically target the prevention or reduction of urban runoff or water pollution, such as low impact development design techniques. With increased levels of population and development anticipated under the No Project/Existing General Plan Alternative, increased levels of water pollution and urban runoff could result. Therefore, the impacts under the No Project/Existing General Plan Alternative may be slightly greater than the General Plan.

Land Use and Planning

Buildout under the No Project/Existing General Plan Alternative ~~existing General Plan~~ would result in approximately 457 fewer dwelling units and approximately 1,199 fewer people; however, the existing General Plan would allow for an increase of approximately 946,062 more square feet of nonresidential development than would be allowed under the General Plan. Development under either the existing or General Plans would not physically divide communities or conflict with habitat plans. The character of development under the General Plant, however, is more consistent with the goals of the Regional Comprehensive Plan compared with the development allowed under the existing General Plan. The majority of development under the proposed project would occur within the opportunity and future study areas, through mixed use and planned community development, in already developed areas of the City. Many of these areas are adjacent to existing employment centers, transit, and services that would reduce

vehicle trips. Additionally the Mobility Element of the General Plan emphasizes a multi-modal system of roadways, pedestrian walkways, and bicycle paths throughout the City that could also reduce vehicle trips. Implementation of the No Project/Existing General Plan Alternative would result in greater impacts to land use and planning when compared to the General Plan.

Noise

The majority of development under the General Plan would occur within opportunity and future study areas, through mixed use and planned community developments, in already developed areas of the City, many of which are located adjacent to high trafficked roadways. Many of these areas are also adjacent to existing employment centers, transit, and services that could reduce vehicle trips and resultant vehicular noise. In fact, buildout of the General Plan would result in a reduction of approximately 61,392 average daily trips when compared to buildout of the existing General Plan. Additionally the Mobility Element of the General Plan emphasizes a multi-modal system of roadways, pedestrian walkways, and bicycle paths throughout the City that could further reduce vehicle trips. Although the existing General Plan contains policies related to noise compatibility between land uses and noise reduction strategies, the General Plan contains noise policies aimed specifically at commercial and mixed use development. Both alternatives would require new development and redevelopment to assess compatibility with existing uses through CEQA. However, because of the significant increase in vehicle trips, implementation of the No Project/Existing General Plan Alternative would result in greater noise impacts when compared to the General Plan.

Population and Housing

Implementation of the No Project/Existing General Plan Alternative would result in a lower projected population and fewer housing units, but would result in increased business growth opportunity relative to the General Plan. As shown in Table 7-2, the General Plan could yield 457 fewer housing units, 1,199 fewer people, and 946,062 more square feet of nonresidential uses compared to the existing General Plan. The existing General Plan would provide for slightly greater development capacity for nonresidential uses within the planning area; however, that would not induce more growth than allowed under the General Plan. Neither the proposed or existing General Plans would displace substantial numbers of people or housing necessitating the construction of replacement housing. Given the relatively small increase anticipated for population and housing under the General Plan as compared to the existing General Plan, the No Project/Existing General Plan Alternative would result in similar population and housing impacts when compared to the General Plan.

Public Services and Utilities

Buildout under the existing General Plan would result in approximately 457 fewer dwelling units, approximately 1,199 fewer people, and 946,062 more square feet of nonresidential development, than would be allowed under the General Plan. The No Project/Existing General Plan Alternative would allow for more nonresidential uses, development would be less intensive than development that would occur under implementation of the General Plan. The No Project/Existing General Plan Alternative would result in less of an impact to the public services and utilities in the City. Therefore, the impacts under the No Project/Existing General Plan Alternative would be less than the General Plan.

Recreation

Under the No Project/Existing General Plan Alternative, the City would continue to function under the direction of the existing General Plan. Due to the higher level of population predicted under buildout conditions of the General Plan, the demands on existing recreational facilities would be increased. As a

result, a greater amount of parkland would be required to serve the projected population. Therefore, the impacts under the No Project/Existing General Plan Alternative would be greater than the General Plan.

Transportation and Circulation

Implementation of the No Project/Existing General Plan Alternative would result in a greater number of average daily vehicle trips (61,392 trips) when compared to the General Plan. Under the existing General Plan, there are two arterial segments that exceed the acceptable LOS D threshold during peak PM hours; I-5 Southbound Ramp and Alicia Parkway, and I-5 Southbound Freeway Ramp/Cabot Road and La Paz Road. Under the General Plan, these arterial segments would operate at an acceptable level of service due to scheduled committed improvements discussed in Section 5.14, Transportation and Circulation. Upon General Plan buildout, all local and regional arterials would operate at an acceptable level of service. Given that the General Plan would not result in any significant impacts on the local road network and the No Project/Existing General Plan Alternative would negatively impact certain arterial segments and cause an increase in average traffic, the No Project/Existing General Plan Alternative would result in greater impacts than the General Plan.

Global Climate Change

Implementation of the No Project/Existing General Plan Alternative would result in a greater impact to global climate change than the General Plan. The No Project/Existing General Plan Alternative would not include strategies and programs for encouraging future growth through infill and redevelopment in areas with existing or planned transit investments. Growth under this alternative would be less likely to result in walkable, transit-oriented developments and therefore would be less conducive to transit use, biking, and walking. Thus, this alternative would likely result in a higher proportion of automobile trips and greater traffic congestion than development under the General Plan. The higher proportion of automobile trips and greater traffic congestion would increase the amount of fuel (primarily gasoline but also diesel) consumption, which would result in greater GHG emissions than the General Plan.

CONCLUSIONS

Buildout under the existing General Plan would result in approximately 457 fewer dwelling units, approximately 1,199 fewer people, and 946,062 more square feet of nonresidential development than would be allowed under the General Plan. The No Project/Existing General Plan Alternative would result in similar environmental impacts to the General Plan in the areas of agricultural resources, air quality, biological resources, cultural resources, soils, geology, and mineral resources, hazards and hazardous materials, and population and housing. This alternative would result in greater environmental impacts to aesthetics, global climate change, hydrology and water quality, land use and planning, noise, recreation, and transportation and circulation. Less environmental impacts can be expected to occur under this alternative for public services and utilities.

The No Project/Existing General Plan Alternative would not implement the General Plan. As such, the No Project/Existing General Plan Alternative would not achieve most of the objectives of the General Plan, such as the focused revitalization of commercial centers, providing a multi-modal transportation system that promotes efficiency and community connections; incorporating new recreational uses for all members of the community; and enabling the development of enhanced mixed use projects near areas served by public transit. The No Project/Existing General Plan Alternative would not provide updated planning tools or Implementation Programs that address the current planning area and regional setting, which is the general purpose of the General Plan. Based on this balance of factors and the severity of the impacts, overall the No Project/Existing General Plan alternative would be environmentally inferior to the General Plan.

7.2 ALTERNATIVE 2: NO CHANGE TO URBAN VILLAGE SPECIFIC PLAN

DESCRIPTION OF THE ALTERNATIVE

The Urban Village Specific Plan (UVSP) was adopted in November 2002 and regulates the development within the Village Commercial area of Laguna Hills. This area consists of 240 acres bounded by Paseo de Valencia on the north and west, Los Alisos Boulevard on the south, and I-5 on the east. The Urban Village area is the heart of Laguna Hills providing a mix of retail, office, financial, medical, residential, and transportation uses. The uses within this area provide numerous goods and services to the City's residents and also generate major sales tax revenues for the City. The Laguna Hills Transportation Center is located within this area, which is served by transit.

The General Plan Land Use designation for this area is Village Commercial. The purpose of the Village Commercial area is to develop a community core in which a variety of public, regional commercial, recreational, and high density residential uses work in concert to create an urban village. The UVSP, which governs the land uses in this area, provides for a continuing mixture of land uses, including retail, residential hotel, medical offices, and general offices. These uses should be interconnected through safe pedestrian pathways and provide direct access to the transit center, civic center, and regional trails.

As currently allowed under the UVSP, there are opportunities within the Urban Village for intensification and redevelopment. However, the General Plan would allow for the addition of approximately 117,000 square feet of retail space, above and beyond that specified in the UVSP. In addition, the General Plan would establish minimum residential development of 30 dwelling units per acre in the UVSP area and a maximum of 50 dwelling units per acre. The No Change to Urban Village Specific Plan Alternative would not allow for the additional 117,000 square feet of retail space in this area and would not set a minimum range for the number of dwelling units per acre.

COMPARISON OF ENVIRONMENTAL IMPACTS TO PROPOSED PROJECT

Aesthetics

In its current state, the UVSP would allow for redevelopment and increased intensification within the Urban Village. Even if no changes were made to the UVSP to further increase housing densities and retail space, the No Change to Urban Village Specific Plan Alternative would result in similar aesthetic, neighborhood character, light, and glare impacts when compared to the General Plan. In addition, both alternatives would impose similar project review requirements as well as conformance with the City's Municipal Code. Therefore, implementation of the No Change to Urban Village Specific Plan Alternative would result in similar aesthetic/visual impacts when compared to the General Plan.

Agricultural Resources

As there are no known agricultural resources within the planning area or the Urban Village, implementation of the No Change to Urban Village Specific Plan Alternative would result in similar impacts when compared to the General Plan.

Air Quality

Implementation of the No Change to Urban Village Specific Plan Alternative would slightly reduce the amount of development and the local traffic within the Urban Village. The No Change to Urban Village Specific Plan Alternative would result in 23,742 fewer average daily trips than the General Plan. This

would result in a reduction of air pollution emissions and associated impacts would also be reduced. Since construction emissions and mobile source emissions (traffic) are one of the major contributors to air pollution, regional emissions would likely be slightly less under this alternative when compared to the General Plan. However, impacts would continue to be significant regardless of the alternative given the current nonattainment status of the South Coast Air Basin. Therefore, implementation of this alternative would result in slightly less air quality impacts when compared to the General Plan.

Biological Resources

Implementation of the No Change to Urban Village Specific Plan Alternative would result in similar development within the planning area as the General Plan. The UVSP governs development in an area that is previously disturbed and redevelopment is already permitted. In addition, the City would preserve and enhance biological resources through the application of CEQA under both alternatives. As such, the potential for impacts to biological resources would be similar when compared to the General Plan.

Cultural Resources

Implementation of the No Change to Urban Village Specific Plan Alternative would result in similar development within the planning area as the General Plan. The UVSP governs development in an area that is previously disturbed and redevelopment is already permitted. In addition, the City would preserve and enhance cultural resources through the application of CEQA under both alternatives. As such, the potential for impacts to cultural resources would be similar when compared to the General Plan.

Geology, Soils, and Mineral Resources

Implementation of the No Change to Urban Village Specific Plan Alternative would result in similar development within the planning area as the General Plan. The UVSP governs development in an area that is previously disturbed and redevelopment is already permitted. In addition, the City would protect people and structures from seismic and geologic hazards as well as preserve and enhance mineral resources through the application of CEQA under both alternatives. As such, the potential for impacts to geologic and mineral resources would be similar when compared to the General Plan.

Hazards and Hazardous Materials

Implementation of the No Change to Urban Village Specific Plan Alternative would result in similar development within the planning area as the General Plan. The UVSP governs development in an area that is previously disturbed and redevelopment is already permitted. This alternative would result in a reduction of commercial uses and housing densities, possibly resulting in the reduction of commercial and household hazardous waste. However, overall impacts to the planning area would be similar under both alternatives. Therefore, implementation of the No Change to Urban Village Specific Plan Alternative would result in similar hazards and hazardous materials impacts when compared to the General Plan.

Hydrology and Water Quality

Implementation of the No Change to Urban Village Specific Plan Alternative would result in similar stormwater drainage impacts and similar impervious surface coverage resulting in similar runoff as the Urban Village area is entirely built out. The demand placed on water supply would be slightly reduced. Overall, since this alternative would not change the development area significantly, implementation of the No Change to Urban Village Specific Plan Alternative would result in similar hydrology and water quality impacts when compared to the General Plan.

Land Use and Planning

Implementation of the No Change to Urban Village Specific Plan Alternative would slightly reduce the intensity of redevelopment allowed within the Urban Village. However, no changes would occur in the land use designations, and development pursuant to the current USVP would continue to be allowed. While this might not fully achieve the City's goals to create active neighborhood centers, development patterns would still be similar. Therefore, implementation of the No Change to Urban Village Specific Plan Alternative would result in similar land use impacts when compared to the General Plan.

Noise

Implementation of the No Change to Urban Village Specific Plan Alternative would slightly reduce the intensity of development and the local traffic within the Urban Village. This would result in a slight reduction noise generated from car trips; however, development would continue to be permitted in the Urban Village pursuant to the existing UVSP. In addition, most of the noise generated in this area comes from I-5, which would occur under both alternatives. Therefore, implementation of the No Change to Urban Village Specific Plan Alternative would result in similar noise impacts when compared to the General Plan.

Population and Housing

Implementation of the No Change to Urban Village Specific Plan Alternative would not result in changes to the number of housing units permitted in the Urban Village. Therefore, implementation of the No Change to Urban Village Specific Plan Alternative would result in similar impacts associated with population and housing when compared to the General Plan.

Public Services and Utilities

Implementation of the No Change to Urban Village Specific Plan Alternative would place a moderately lower demand on public services and utility providers, including water, wastewater, solid waste, fire, and police. The analysis for the General Plan indicated that there are adequate public services and facilities to accommodate for growth and development pursuant to the proposed Plan. Therefore, implementation of the No Change to Urban Village Specific Plan Alternative would result in similar impacts associated with population and housing.

Recreation

Implementation of the No Change to Urban Village Specific Plan Alternative would result in similar demands for recreational facilities and parkland when compared to the General Plan. Therefore, implementation of the No Change to Urban Village Specific Plan Alternative would result in similar recreational resource impacts when compared to the General Plan.

Transportation and Circulation

Implementation of the No Change to Urban Village Specific Plan Alternative would reduce the intensity of development and the local traffic within the Urban Village. Average daily traffic would be reduced by approximately 23,742 trips in and around the Urban Village. However, the main intersections serving the Urban Village (Avenida de la Carlota and El Toro Road; Avenida de la Carlota and Los Alisos Blvd; Paseo de Valencia and El Toro Road; and Paseo de Valencia and Los Alisos Blvd) would operate at an acceptable level of service with implementation of either alternative. Therefore, implementation of the No Change to Urban Village Specific Plan Alternative would result in similar traffic impacts when compared to the General Plan.

Global Climate Change

Implementation of the No Change to Urban Village Specific Plan Alternative would slightly reduce the intensity of redevelopment and the local traffic within the Urban Village. This would slightly decrease the amount of GHG emissions associated with the burning of fossil fuels and consumption of nonrenewable energy. As such, the potential for impacts to global climate change would be slightly less under the No Change to Urban Village Specific Plan Alternative when compared to the General Plan.

CONCLUSIONS

The No Change to Urban Village Specific Plan Alternative would result in similar environmental impacts to the General Plan in the areas of aesthetics, agricultural resources, biological resources, cultural resources, geology, solid, and mineral resources, hazards and hazardous materials, hydrology and water quality, land use and planning, population and housing, noise, public services and utilities, recreation, and traffic. Less environmental impacts can be expected to occur under this alternative for air quality and global climate change. This alternative would be environmentally superior when compared to the General Plan.

7.3 ALTERNATIVE 3: MANDATORY CONSERVATION MEASURES AND PROGRAMS

DESCRIPTION OF THE ALTERNATIVE

The Mandatory Conservation Measures and Programs Alternative is analyzed as a means of further reducing the environmental effects of the General Plan related to energy and water consumption, solid waste generation, water quality, and air quality. This alternative would add mandatory policies and programs to the General Plan to enhance the sustainability of future development within the planning area and require their enforcement. It would likely take several years to develop and adopt new or amended regulations and programs to implement the mandatory policies of this alternative.

These policies would include requirements for:

- Builders/property owners to employ sustainable building techniques (e.g., energy efficient design, landscaped "green" roofs, low impact development techniques, renewable energy generation [e.g., solar panels]) in public and private developments;
- The installation of recycled water systems for large development projects;
- Reductions in water consumption associated with existing and future development in the planning area (e.g., water-efficient plumbing associated with residential land uses, drought-tolerant landscaping associated with residential uses as well as fields within parks and open spaces, water reclamation for landscape irrigation, etc.);
- Achieving maximum waste recycling in all sectors of the community (e.g., mandatory recycling and reuse of construction and demolition materials); and
- Achieving greater energy efficiency by the City through the procurement process (e.g., green purchasing practices, alternative fuel vehicles).

The General Plan contains policies and programs that would promote sustainable development and enhance conservation within the planning area; however, these are not proposed as mandatory regulations. The Mandatory Conservation Measures and Programs Alternative has been developed by

considering the impacts associated with the implementation of mandatory standards and regulations by an established time period in order to achieve more sustainable development.

COMPARISON OF ENVIRONMENTAL IMPACTS TO PROPOSED PROJECT

Aesthetics

Implementation of requirements for the Mandatory Conservation Measures and Programs Alternative would result in a similar amount of urban development allowable and would result in similar aesthetic, light, and glare impacts when compared to the General Plan. Therefore, implementation of this alternative would result in similar aesthetic/visual impacts when compared to the General Plan.

Agricultural Resources

Given that there are no agricultural resources designated within the planning area, implementation of requirements for the Mandatory Conservation Measures and Programs Alternative would result in similar impacts to agricultural resources when compared to the General Plan.

Air Quality

Implementation of requirements for the Mandatory Conservation Measures and Programs Alternative, such as more energy-efficient design, landscaped "green roofs" (which reflect solar radiation and cool the interior of buildings), and renewable energy production (i.e., installation of solar panels) would reduce the amount of nonrenewable energy consumed by new development and redevelopment within the planning area under this alternative. The prevalence of sustainable buildings and design techniques incorporated in new development and redevelopment could significantly decrease the amount of air pollution associated with the burning of fossil fuels. Therefore, new development and redevelopment under the Mandatory Conservation Measures and Programs Alternative would result in less air quality impacts when compared to the General Plan.

Biological Resources

Development under both the Mandatory Conservation Measures and Programs Alternative and the General Plan would be subject to the same state and federal environmental review requirements and regulations for the protection of sensitive and endangered species and habitats. Additionally, the majority of development under the proposed project would occur within opportunity and future study areas that are located in previously developed lands of the City, away from areas with limited biological resources. Implementation of requirements for the Mandatory Conservation Measures and Programs Alternative would result in similar impacts to biological resources when compared to the General Plan.

Cultural Resources

Implementation of the Mandatory Conservation Measures and Programs Alternative would result in similar impacts to cultural resources when compared to the General Plan because the City would impose similar requirements in both alternatives in order to reduce potential impacts to cultural resources within the planning area. This assumption is particularly true since future development in the planning area would be required to be consistent with existing CEQA requirements for the protection of archaeological and historical resources. Overall, impacts to cultural resources would be similar under the Mandatory Conservation Measures and Programs Alternative and the General Plan.

Geology, Soils, and Mineral Resources

Implementation of requirements for the Mandatory Conservation Measures and Programs Alternative would involve the same policies and programs contained within the General Plan that protect people and property from seismic and geologic hazards. Further, all new development and redevelopment would be subject to the California Building Code seismic safety standards for construction. The Mandatory Conservation Measures and Programs Alternative would result in similar impacts to geologic and mineral resources when compared to the General Plan.

Hazards and Hazardous Materials

Implementation of requirements for the Mandatory Conservation Measures and Programs Alternative would result in similar impacts related to hazards and hazardous materials when compared to the General Plan. Implementation of requirements of this alternative would involve the same policies and programs contained in the General Plan that protect people and property from hazards and hazardous materials.

Hydrology and Water Quality

Implementation of requirements for the Mandatory Conservation Measures and Programs Alternative, such as the requirement for the incorporation of low impact development design techniques into new development and redevelopment projects, would increase the absorption of rainwater and other runoff that would otherwise drain into the stormwater system. As long-term development occurs under this alternative, the prevalence of sustainable buildings within the planning area could significantly decrease the amount and rate of surface runoff and significantly increase absorption rates of runoff within the plan area relative to the General Plan. Therefore, development under the Mandatory Conservation Measures and Programs Alternative would result in less hydrologic impacts when compared to the General Plan.

Land Use and Planning

Buildout pursuant to the Mandatory Conservation Measures and Programs Alternative would result in similar land use development patterns when compared to the General Plan. Further, this alternative would not result in substantial changes to types of development that would occur within the planning area. Therefore, development under the Mandatory Conservation Measures and Programs Alternative would result in similar land use impacts when compared to the General Plan

Noise

Implementation of this alternative would result in a similar level of development in the planning area, therefore resulting in similar accompanying impacts associated with noise. Implementation of the Mandatory Conservation Measures and Programs Alternative would result in similar noise impacts when compared to the General Plan.

Population and Housing

Implementation of this alternative would result in a similar level of development in the planning area and accompanying levels of housing and population as the General Plan. Implementation of requirements for the Mandatory Conservation Measures and Programs Alternative would result in similar impacts associated with population and housing when compared to the General Plan.

Public Services and Utilities

Implementation for the Mandatory Conservation Measures and Programs Alternative would result in similar impacts related to the construction of new or physically altered public services and facilities associated with police, fire, and schools when compared to the General Plan.

Implementation of requirements for the Mandatory Conservation Measures and Programs Alternative would involve the incorporation of more energy-efficient design, use of recycled building materials, landscaped "green roofs" (which absorb rainwater and reflect solar radiation and cool the interior of buildings), and renewable energy production (i.e., installation of solar panels); also, requirements for recycled water systems and reduced water consumption. These requirements would reduce the consumption of nonrenewable energy and water, and the generation of solid waste and stormwater within the planning area. As long-term development occurs under this alternative, the prevalence of sustainable buildings, recycled water systems, and continued implementation of requirements for reduced water consumption could significantly reduce the need for the construction of new or physically altered public utilities infrastructure associated with water, energy, stormwater, and solid waste (i.e., landfills) and the associated potential construction-related environmental impacts relative to long-term development under the General Plan. In addition, the consumption of available water supplies would be significantly reduced over the long term under this alternative when compared to the General Plan.

Although the need for new or physically altered infrastructure associated with water and the environmental impacts thereof would significantly decrease over the long term, the construction of recycled water infrastructure could result in significant environmental impacts that would not occur under the General Plan. Overall, the significantly reduced potential environmental impacts associated with reduced demand for new or physically altered energy, potable water, stormwater, and solid waste infrastructure, and the significantly reduced consumption of available water supplies would outweigh the potential significant environmental impacts associated with requirements for recycled water systems. Therefore, long-term development under the Mandatory Conservation Measures and Programs Alternative would result in less impacts associated with the construction of new or physically altered public utilities infrastructure when compared to the General Plan.

Recreation

Implementation of the Mandatory Conservation Measures and Programs Alternative would not reduce the demand on existing recreational facilities or the amount of parkland that would be required to serve the population. Therefore, this alternative would result in similar impacts associated with the recreation when compared to the General Plan.

Transportation and Circulation

Implementation of the Mandatory Conservation Measures and Programs Alternative would not result in substantially different land use development patterns or circulation patterns within the planning area. Therefore, this alternative would result in a similar amount of average daily traffic and level of service ranges causing similar transportation-related impacts when compared to the General Plan.

Global Climate Change

Implementation of requirements for the Mandatory Conservation Measures and Programs Alternative, such as more energy-efficient design, landscaped "green roofs" (which reflect solar radiation and cool the interior of buildings) and renewable energy production would reduce the amount of nonrenewable energy consumed by new development within the planning area under this alternative. As long-term development

occurs under this alternative, the prevalence of sustainable buildings could significantly decrease the amount of GHG emissions associated with the burning of fossil fuels as consumption of nonrenewable energy decreases relative to long-term development under the General Plan. Therefore, long-term development under for the Mandatory Conservation Measures and Programs Alternative would result in less global climate change impacts when compared to the Draft General Plan.

CONCLUSIONS

The Mandatory Conservation Measures and Programs Alternative would result in similar environmental impacts to the General Plan in the areas of aesthetics, agricultural resources, biological resources, cultural resources, geology and soils, hazards and hazardous materials, population and housing, noise, recreation, and transportation and circulation. Less environmental impacts can be expected to occur under this alternative for air quality, hydrology and water quality, public services and utilities, and global climate change. The Mandatory Conservation Measures and Programs Alternative would not result in greater environmental impacts to any issue area, and this is an environmentally superior alternative.

8.0 REFERENCES

PERSONS RESPONSIBLE FOR PREPARATION OF THE PROGRAM EIR

LEAD AGENCY

City of Laguna Hills
Community Development Department
24035 El Toro Road
Laguna Hills, CA 92653
(949) 707-2670
Contact: Julie Molloy

PREPARERS OF THE PROGRAM EIR

EDAW, Inc.
1420 Kettner Boulevard, Suite 500
San Diego, CA 92101
(619) 233-1454

PRIMARY PREPARERS

John Bridges, FAICP, Principal
Yara Fisher, AICP, Project Manager
Shannon Frattone, Environmental Planner
Patrick Jelsema, Urban and Environmental Planner
Jessica Sisco, Urban and Environmental Planner
Responsibility: Overall preparation and coordination of Program EIR.

SUBCONSULTANTS

Austin-Foust Associates
Wilson Geosciences, Inc.
Stanley R Hoffman Associates

DOCUMENTS

5.1 AESTHETICS AND VISUAL RESOURCES

City of Laguna Hills
2008 City of Laguna Hills General Plan. Conservation and Open Space Element.

5.2 AGRICULTURAL RESOURCES

California Department of Conservation (DOC)
2006 Farmland Mapping and Monitoring Program (FMMP): Geographic Information Systems Data. Available at URL: http://www.consrv.ca.gov/dlrp/fmmp/Pages/Index.aspx.

5.3 AIR QUALITY

California Air Resources Board (ARB)

2003 Hotspots Analysis and Reporting Program User Guide. Available at URL: http://www.arb.ca.gov/toxics/harp/harpug.htm. Accessed in November 2008.

2004 Roseville Rail Yard Study. Available at URL: http://www.arb.ca.gov/diesel/documents/rrstudy.htm. October.

2005 *Air Quality and Land Use Handbook: A Community Health Perspective*. Available at URL: http://www.arb.ca.gov/ch/handbook.pdf. April.

2007 Letter to Mr. Wayne Nastri, EPA, submitting revisions to the California State Implementation Plan, including revisions identified as the 2007 South Coast SIP. November 28.

2008a The California Almanac of Emissions and Air Quality - The 2008 Edition. Sacramento, CA. Available at URL: http://www.arb.ca.gov/aqd/almanac/almanac08/almanac2008all.pdf. Accessed in November.

2008b Area Designation Maps/State and National. Available at URL: http://www.arb.ca.gov/desig/adm/adm.htm/. Accessed in November.

2008c Air Quality Data Statistics. Available at http://www.arb.ca.gov/adam/welcome.html. Accessed in November 2008.

2008d Emissions Inventory for Orange County. Available at URL: http://www.arb.ca.gov/ei/maps/statemap/cntymap.htm. Accessed in November.

2008e State and National Ambient Air Quality Standards. Available at URL: http://www.arb.ca.gov/research/aaqs/aaqs2.pdf. Accessed in November.

2008f State Implementation Plan. Available at URL: http://www.arb.ca.gov/planning/sip/sip.htm. Accessed in September.

California Integrated Waste Management Board (CIWMB)

2008 Solid Waste Facility Listing/Details Page; Facility/Site Summary Details: Golden Rain Foundation Composting Op. (30-AB-0378). Available at URL: http://www.ciwmb.ca.gov/SWIS/30-AB-0378/Detail/. Accessed in December.

Federal Register

2007 *Vol. 72, No. 91 Rules and Regulations, Pages 26718-26721*. May 11.

Godish, T.

2004 *Air Quality*. Lewis Publishers. Boca Raton, FL.

Sacramento Metropolitan Air Quality Management District (SMAQMD)

2004 Guide to Air Quality Assessment in Sacramento County. July.

Salinas, Julio. Staff Toxicologist. Office of Health Hazard Assessment, Sacramento, California.
2004 Telephone conversation with Kurt Legleiter of EDAW regarding exposure period for determining health risk. August 3.

Southern California Association of Governments (SCAG)
2004 Growth Forecast – City Projections. April.

2008 Adopted 2008 Regional Transportation Plan Growth Forecast, by City. Available at URL: www.scag.ca.gov/forecast/index.htm. Accessed in October.

South Coast Air Quality Management District (SCAQMD)
1993 CEQA Air Quality Handbook. April.

2005 Carbon Monoxide Redesignation Request and Maintenance Plan. February.

2006a 2003 Air Quality Management Plan. Available at URL: http://www.aqmd.gov/aqmp/AQMD03AQMP.htm. Accessed in November 2008.

2006b Draft 2007 Air Quality Management Plan. Available at URL: http://www.aqmd.gov/aqmp/07aqmp/draft/07aqmp.pdf. Accessed in November 2008.

2008a Air Quality Significance Thresholds. Available at URL: http://www.aqmd.gov/CEQA/handbook/signthres.pdf. July.

2008b URBEMIS 2007 (Version 9.2.4). Available at URL: http://www.aqmd.gov/ceqa/urbemis.html. February.

U.C. Davis Institute of Transportation Studies (UCD ITS)
1997 *Transportation Project-level Carbon Monoxide Protocol*. December. Davis, California.

U.S. Environmental Protection Agency (USEPA)
2008a Criteria Air Pollutant Information. Available at URL: http://www.epa.gov/air/urbanair/6poll.html. Accessed in November.

2008b The Greenbook Nonattainment Areas for Criteria Pollutants. Available at URL: http://www.epa.gov/air/oaqps/greenbk/index.html. Accessed in November.

Zhu, Yifang, W. C. Hinds, S. Kim, and S. Shen
2002 Study of Ultrafine Particles Near a Major Highway with Heavy-duty Diesel Traffic. *Atmospheric Environment* 36:4323-4335.6.

5.4 BIOLOGICAL RESOURCES

Atwood, J. L.
1990 Status Review of the California Gnatcatcher (*Polioptila californica*). Manomet Bird Observatory, Manomet, Massachusetts. 79 pp.

Atwood, J. L., and D. R. Bontrager
2001 California Gnatcatcher (*Polioptila californica)*, The Birds of North America, No. 574, 32 pp.

California Department of Fish and Game (CDFG)
2008 California Natural Diversity Database search for City of Laguna Hills and surrounding regions.

City of Laguna Hills
2008 Personal communication with Vern Jones, Community Development Director. August.

2008 Personal communication with Ken Rosenfield, Director of Public Services.

County of Orange
1996 Natural Community Conservation Plan and Habitat Conservation Plan (NCCP/HCP): Orange County Central/Coastal.

EDAW, Inc. (EDAW)
2007 Laguna Hills General Plan Update, Biological Resources Working Paper.

Harris, L. D., and P. B. Gallagher
1989 New Initiatives for Wildlife Conservation: The Need for Movement Corridors. Pages 11-34 in G. Mackintosh, ed. Preserving Communities and Corridors. Defenders of Wildlife, Washington, D.C. 96 pp.

Planning Network and LSA Associates
1994 City of Laguna Hills Final Master EIR. June 28.

Salata, L.R.
1984 Status of the least Bell's vireo on Camp Pendleton, California: Report on research done in 1984. Unpubl. Rept., U.S. Fish and Wildlife Service, Laguna Niguel, California.

Tibor, D.P.
2001 Inventory of Rare and Endangered Plants of California, 6th Edition. California Native Plant Society, Sacramento, CA.

U.S. Fish and Wildlife Service (USFWS)
1986 Endangered and threatened wildlife and plants; Least Bell's vireo; Determination of endangered status, and reopening of comment period in the proposed critical habitat designation. Federal Register 51(85):16474-16483.

1991 Summary of the proposed rule to list the coastal California gnatcatcher (*Polioptila californica*) as endangered in California and Baja, Mexico. September. 114 pp.

1993 Endangered and Threatened Wildlife and Plants: Special Rule Concerning Take of the Threatened Coastal California Gnatcatcher. Final Rule. Federal Register 58: 65088-65096.

5.5 CULTURAL RESOURCES

Bean, L. J., and C. R. Smith
1978 Gabrielino. In *California*, edited by R. F. Heizer, pp. 538-549 Handbook of North American Indians, Vol. 8, Smithsonian Institution, Washington.

Cleland, Robert Glass
1944 *From Wilderness to Empire: a History of California, 1542-1900*. Alfred A. Knopf, Inc., New York, NY.

Hallenbeck, Cleve
1926 *Spanish Missions of the Old Southwest*. Garden City, NY: Doubleday.

Kelsey, Harry
1987 The Mission Buildings of San Juan Capistrano: A Tentative Chronology. In *Southern California Quarterly* (a publication of the Historical Society of Southern California) Volume LXIX:1.

McCawley, William
1996 *The First Angelinos: The Gabrielino Indians of Los Angeles*. Malki Museum Press, Banning.

Moratto, M. J.
1984 *California Archaeology*. Academic Press, San Diego.

Planning Network and LSA Associates
1994 *City of Laguna Hills General Plan Final Master EIR*. Prepared for the City of Laguna Hills. Prepared by Planning Network and LSA Associates. On file with the City of Laguna Hills.

Wilson Geosciences, Inc.
2008 Seismic and Geologic Technical Background Report for the City of Laguna Hills General Plan Update, Laguna Hills, Orange County, California. October.

5.6 GEOLOGY, SOILS, AND MINERAL RESOURCES

California Department of Conservation
2000 California Surface Mining and Reclamation Policies and Procedures: Guidelines for Classification and Designation of Mineral Lands. Division of Mines and Geology.

City of Laguna Hills
2008 City of Laguna Hills General Plan. Safety Element.

El Toro Water District
2005 El Toro Water District Urban Water Management Plan. Revised Update 2005. December.

Moulton Niguel Water District
2007 Moulton Niguel Water District Urban Water Management Plan. Revised Update 2005. January.

Wilson Geosciences, Inc.
2008 Seismic and Geologic Technical Background Report for the City of Laguna Hills General Plan Update, Laguna Hills, Orange County, California. October.

5.7 HAZARDS AND HAZARDOUS MATERIALS

California Government Code Section 65962 ("Cortese List")
2008 http://www.calepa.ca.gov/SiteCleanup/CorteseList/. Accessed November 21, 2008.

City of Laguna Hills
2008 City of Laguna Hills General Plan. Safety Element.

5.8 HYDROLOGY AND WATER QUALITY

California Regional Water Quality Control Board, Region 8
1995 Water Quality Control Plan for the Santa Ana River Basin (Region 8). Updated February 2008.

California Regional Water Quality Control Board, Region 9
1994 Water Quality Control Plan for the San Diego Basin (Region 9). September 8.

Wilson Geosciences, Inc.
2008 Seismic and Geologic Technical Background Report for the City of Laguna Hills General Plan Update, Laguna Hills, Orange County, California. October.

OC Watersheds
2008 Introduction to Watersheds, Orange County. http://www.ocwatershed.com/. Accessed November 5.

5.9 LAND USE AND PLANNING

City of Laguna Hills
2008a Laguna Hills General Plan Update. December.

2008b Personal Communication with Kenneth H. Rosenfield, P.E., Director of Public Services, City Engineer. October 31.

Southern California Association of Governments (SCAG)
2004 Compass Southern California Growth Vision Report: Compass Blueprint. June.

2008 Comparison Table of SCAG Policies for Intergovernmental Review. June. http://www.scag.ca.gov/igr/.

5.10 NOISE

Office of Planning and Research (OPR)
2003 General Plan Noise Compatibility Guidelines. Available at URL: http://www.opr.ca.gov/planning/publications/General_Plan_Guidelines_2003.pdf. Accessed in November 2008.

Harris Miller Miller and Hanson, Inc.
1995 Transit Noise and Vibration Impact Assessment: Final Report. April.

Urban Crossroads
2008 *Laguna Hills General Plan Update Traffic Noise Modeling*. November.

5.11 POPULATION AND HOUSING

California Department of Finance
2008 E-5 Population and Housing Estimates for Cities, Counties and the State, 2001-2008, with 2000 Benchmark. Sacramento, California, May 2008.

Center for Demographic Research
2007 Orange County Population Characteristics. Available at URL: http://www.fullerton.edu/cdr/city.asp. Accessed in July.

City of Laguna Hills
1994 City of Laguna Hills General Plan, Appendix A: Population and Housing Assessment, Laguna Hills, Orange County, California.

2008 City of Laguna Hills General Plan. Land Use Element.

Southern California Association of Governments (SCAG)
2008 Adopted 2008 Regional Transportation Plan Growth Forecast, by City. Available at URL: www.scag.ca.gov/forecast/index.htm. Accessed in October.

Stanley R. Hoffman Associates
2007 Memorandum from Stanley R. Hoffman to Yara Fisher: Demographic and Economic Trends and Conditions for the City of Laguna Hills General Plan Update, Laguna Hills, Orange County, California. September 7.

2008 Memorandum from Stanley R. Hoffman to Yara Fisher: City of Laguna Hills General Plan Update – Fiscal Analysis for Preferred Plan, Laguna Hills, Orange County, California. October 10.

U.S. Census Bureau
2000 2000 Decennial Census – Summary File 1 (SF 1) 100-Percent Data. Available at URL: www.census.gov.

5.12 PUBLIC SERVICES AND FACILITIES

California Integrated Waste Management Board (CIWMB)
2008 Jurisdiction Diversion Rate Summary. Accessed on November 14. http://www.ciwmb.ca.gov/lgtools/mars/DrmcMain.asp.

City of Huntington Beach
2005 Final EIR for the Seawater Desalination Project at Huntington Beach. Available at: http://www.ci.huntingtonbeach.ca.us/Government/Departments/Planning/major/poseidon.cfm. Accessed on December 17, 2008.

City of Laguna Hills
2007 City of Laguna Hills City Manager's Year End Report. December 11.

2008 City of Laguna Hills General Plan. Community Services and Facilities Element.

County of Orange
2005 County of Orange General Plan. Public Services and Facilities Element. September.

El Toro Water District
2005 El Toro Water District Urban Water Management Plan Revised Update 2005. December.

Integrated Waste Management Department (IWMD)
2007 Regional Landfill Options for Orange County Strategic Plan Update. November.

Irvine Ranch Water District
2005 Final EIR for the Seawater Desalination Project at Huntington Beach. April 5. Available at: http://www.irwd.com/BusinessCenter/DraftEIR-MWRP/EIR/ExecutiveSummary-combined.pdf. Accessed December 18, 2008.

Moulton Niguel Water District
2007 Moulton Niguel Water District Urban Water Management Plan Revised Update 2005. January.

Orange County Fire Authority (OCFA)
2008a Orange County Fire Authority website

2008b Personal Communication with Bryan Brice, Battalion Chief (Strategic Services). October 23.

Orange County Sheriffs Department (OCSD)
2008a Personal Communication with Steve Doan, Chief of Police. October 21.

2008b Orange County Sheriffs Department Crime Statistics for Laguna Hills. Accessed November 14. http://www.ocsd.org/e_services/crime_stats/crime_statistics/.

Saddleback Valley Unified School District (SVUSD)
2008 Personal Communication with Frank Manzo, Facilities Planning and Construction for Saddleback Valley Unified School District. October 8.

5.13 RECREATION

City of Laguna Hills
2001 Bikeways, Trails, and Open Space Master Plan. November 10.

2008a Personal Communication with Vern Jones, Community Development Director. November.

2008b General Plan Update. Conservation and Open Space Element. October.

Saddleback Valley Union School District
2008 Personal Communication with Debbie Carlimo, Director of Recreation and Community Services. November.

5.14 TRANSPORTATION AND CIRCULATION

Austin-Foust Associates
2008 *City of Laguna Hills Draft Mobility Element Traffic Study*. November.

City of Laguna Hills
2008 City of Laguna Hills General Plan. Mobility Element.

Orange County Transportation Authority (OCTA)
2008 OCTA Bus Routes. Available at URL: http://www.octa.net/Bus_Trip_Planner.aspx. Accessed in November 2008.

6.3 GLOBAL CLIMATE CHANGE

California Climate Change Center
2006 Scenarios of Climate Change in California: An Overview. February.

California Energy Commission (CEC)
2006 Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004. (Staff Final Report). Publication CEC-600-2006-013-SF. December. Available: http://www.climatechange.ca.gov/policies/greenhouse_gas_inventory/index.html.

Henson, Robert
2006 Rough Guide to Climate Change. First Edition. Rough Guides Ltd. London.

Intergovernmental Panel on Climate Change (IPCC)
2007 Climate Change 2007: The Physical Science Basis. Summary for Policymakers. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. February.

State of California
2005 Executive Order #S-3-05 by the Governor of the State of California. June. Available: http://gov.ca.gov/index.php?/executive-order/1861/

2006 Assembly Bill 32, The California Climate Solutions Act of 2006 (Health and Safety Code §38500 et seq.). September. Available: http://www.leginfo.ca.gov/ pub/05-06/bill/asm/ab_00010050/ab_32_bill_ 20060927_chaptered.html.

This page intentionally left blank.

9.0 RESPONSES TO COMMENTS ON DRAFT EIR

This section of the Final EIR contains comments and responses to written comments received during the 45-day public review period on the Draft EIR extending from February 2, 2009 to March 18, 2009. Revisions to the EIR in response to comments are identified by strikeout (~~text removed~~) or underline (text added to the Final EIR).

Table 9-1 shows the comments received that address environmental issues raised in the EIR.

Table 9-1
Comment Letters Regarding the DEIR
Matrix of Comments

Letter #	Commenter	Author of Comment Letter	Date Letter Sent
1	Governor's Office of Planning and Research	Terry Roberts, Director, State Clearinghouse	03/23/09
2	California Department of Transportation	Christopher Herre, Branch Chief, Local Development/ Intergovernmental Review	03/18/09
3	California Regional Water Quality Control Board	Mark G. Adelson, Chief, Regional Planning Programs Section	03/24/09
4	City of Irvine	Sherman Jones, AICP, Associate Planner	03/26/09
5	City of Laguna Woods	Leslie A. Keane, City Manager	04/10/09
6	City of Mission Viejo	Charles E. Wilson, AICP, Director of Community Development	03/20/09
7	Department of Toxic Substances Control	Al Shami, Project Manager, Brownfields and Environmental Restoration Program – Cypress Office	03/11/09
8	Orange County Transportation Authority	Charles Larwood, Manager, Transportation Planning	03/12/09
9	Southern California Edison	Frank Wasko, Region Manager	03/26/09
10	Southern California Gas Company	Paul Simonoff, Technical Services Supervisor	2/13/09
11	Law Offices of Robert C. Hawkins for Golden Rain Foundation	Robert C. Hawkins, ESQ.	5/13/09
12	Airport Land Use Commission for Orange County	Kari A. Rigoni, Executive Officer	6/10/09

A topical response has been developed that responds to a recurring comment received regarding traffic. The responses to comments contain several references to this topical response. Instead of repeating this response for each comment received, the topical response is provided at the beginning of this section for ease of reference.

TOPICAL RESPONSE #1 – Traffic Analysis Outside the City

The primary purpose of the city's traffic study was to determine whether the Mobility Element of the proposed General Plan is in balance with the Land Use Element of the General Plan, as required by State law. The traffic study, in other words, was designed to ensure that the City's transportation planning is adequate to accommodate the growth projected to result from the City's land use planning. The City does not need to consider intersections outside the City in order to achieve this purpose. By its very nature, the Mobility Element only addresses traffic conditions within the boundaries of the City.

The City will consider potential impacts on intersections outside the City before approving specific development projects. For each proposed project, the City will determine a specific "study area" that could potentially be impacted by the project's traffic. Depending on the nature and location of a particular project, the study area may or may not include intersections outside the City. If the study area does extend outside the City, the City will model the project's impacts on intersections outside the City. The traffic study for the General Plan PEIR does not attempt site-specific analysis because no entitlements are under consideration, and site-specific analysis is not necessary or appropriate in a general plan EIR. Section 15146 of the CEQA Guidelines confirms that an EIR for a general plan should not, and indeed cannot, provide as much detail as an EIR for a specific development project. Section 15146 provides as follows:

> "§ 15146. Degree of Specificity.
>
> The degree of specificity required in an EIR will correspond to the degree of specificity involved in the underlying activity which is described in the EIR.
>
> (a) An EIR on a construction project will necessarily be more detailed in the specific effects of the project than will be an EIR on the adoption of a local general plan or comprehensive zoning ordinance because the effects of the construction can be predicted with greater accuracy.
>
> (b) An EIR on a project such as the adoption or amendment of a comprehensive zoning ordinance or a local general plan should focus on the secondary effects that can be expected to follow from the adoption, or amendment, but the EIR need not be as detailed as an EIR on the specific construction projects that might follow."

The EIR here provides a general analysis appropriate for a general plan, by focusing on whether the Mobility Element is adequate to serve the development described in the Land Use Element. Each future project will receive site-specific CEQA review, including but not limited to analysis of any potential traffic impacts that a specific project may have on intersections outside the City.

Moreover, the City specifically determined that the traffic study's projections are consistent with the projections used by neighboring cities in their own planning efforts. The neighboring cities have, in effect, already taken into account the traffic associated with the proposed General Plan. Thus, the transportation planning of neighboring cities is adequate to accommodate the growth projected to result from the General Plan.

In order to understand how neighboring cities have, in effect, already accounted for the proposed General Plan's traffic, one must first understand the distinction between regional and local modeling. The Orange County Transportation Authority (OCTA) performs regional modeling using the "Orange County Transportation Analysis Model" or "OCTAM." OCTAM's traffic projections are based on demographic data known as the "Orange County Projections" (OCP).

At the local level, individual cities model traffic conditions within their boundaries, often using transportation models developed specifically for their cities. The City of Laguna Hills, for example, has developed a local transportation model for use within the City known as the "City of Laguna Hills Traffic Analysis Model" (LHTAM) (December 2008). Local models utilize land use data set forth in the applicable general plan rather than demographic data, but then verify that there is consistency between that land use data and the OCP demographic data. Cities use local models in primarily three ways: (1) to ensure that the land use element and transportation element of the city's general plan are in balance; (2) to predict the traffic impacts that will result from specific proposed development projects; and (3) to analyze transportation improvement funding programs. The relationship between regional and local transportation modeling is described in detail in an OCTA document entitled "Orange County Subarea Modeling Guidelines Manual," Orange County Transportation Authority, July 2005 (Subarea Modeling Guidelines).

Each local model contains detailed information about conditions within the relevant city. In order to take into account regional traffic patterns, however, each city must use OCTAM projections. Each city, in other words, relies on OCTAM to predict the volume of traffic that will enter the city from neighboring cities. Thus, for example, Laguna Hills uses OCTAM projections to estimate the volume of traffic that will enter Laguna Hills from Mission Viejo. By the same token, Mission Viejo uses OCTAM projections to predict the volume of traffic that will enter Mission Viejo from Laguna Hills.

Moreover, each city must demonstrate to OCTA that the city's local modeling is consistent with OCTAM. This ensures that all of the local modeling is based on the same set of regional assumptions. As a result, for example, Mission Viejo's estimate of traffic traveling from Laguna Hills to Mission Viejo is necessarily consistent with Laguna Hill's estimate of traffic traveling from Laguna Hills to Mission Viejo – because both local models must be consistent with OCTAM.

Here, the City determined that the City's model LHTAM was consistent with regional model OCTAM. This determination is documented in the report "City of Laguna Hills Traffic Analysis Model – Traffic Model Description and Validation," Austin-Foust Associates, Inc. (December 2008) (Validation Report). The following chart specifically confirms that the projections set forth in the City's local traffic model and utilized in the General Plan PEIR traffic study are consistent with the OCTAM projections (which are necessarily consistent with the projections of neighboring cities):

CITY OF LAGUNA HILLS DEMOGRAPHIC DATA

	Population	**Housing**	**Employment**
OCP-2006			
2005	32,960	11,188	25,308
2030	36,210	11,508	28,893
Growth	3,250	320	3,585
Growth %	10%	3%	14%
Laguna Hills City Database			
2008	31,904	10,828	19,422
2030	33,119	11,285	22,622
Growth	1,215	457	3,200
Growth %	4%	4%	16%
Difference	**-6%**	**1%**	**2%**

The amount of growth is more important than the absolute numbers, because the absolute numbers depend on land use conversion factors. The growth projections for OCP-2006 (used in OCTAM) and for the City's Database (used in the City's model and therefore the traffic study) are similar, and well within the guidelines which target 10% as the tolerable limit for differences between city and OCP data (See Subarea Modeling Guidelines Section 5.1). In addition, the traffic forecasts between LHTAM and OCTAM as indicated in the Validation Report meet the 10% limit. Tables 4-14 and 4-15 of that document compare projected OCTAM ADT Volumes with projected LHTAM ADT Volumes for specific roadways in order to demonstrate consistency between OCTAM and LHTAM. OCTA considers the comparison between the OCTAM 3.2(1) scenario "Totals" and LHTAM(2) scenario "Totals." The Total differential for Control Point roadways (Table 14-4) is 6.4%. The Total differential for Screenline roadways (Table 14-5) is 1.9%. Both of these figures are well within 10% limit set forth in Subarea Modeling Guidelines. Thus, it is clear that the projections of Laguna Hills traffic used by neighboring cities are consistent with the City's projections of Laguna Hills traffic, and therefore the planning efforts of neighboring cities already take the general plan's traffic into account.

This page intentionally left blank.

Mar-23-09 10:42am From- T-045 P.002/003 F-118

STATE OF CALIFORNIA

GOVERNOR'S OFFICE *of* PLANNING AND RESEARCH

STATE CLEARINGHOUSE AND PLANNING UNIT

ARNOLD SCHWARZENEGGER
GOVERNOR

CYNTHIA BRYANT
DIRECTOR

March 19, 2009

RECEIVED
MAR 23 2009
CITY OF LAGUNA HILLS

Julie Molloy
City of Laguna Hills
24035 El Toro Road
Laguna Hills, CA 92653

Subject: Laguna Hills General Plan Program
SCH#: 2008081100

Dear Julie Molloy:

The State Clearinghouse submitted the above named Draft EIR to selected state agencies for review. The review period closed on March 18, 2009, and no state agencies submitted comments by that date. This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act. 1-1

Please call the State Clearinghouse at (916) 445-0613 if you have any questions regarding the environmental review process. If you have a question about the above-named project, please refer to the ten-digit State Clearinghouse number when contacting this office.

Sincerely,

Terry Roberts

Terry Roberts
Director, State Clearinghouse

RESPONSE TO PUBLIC COMMENT LETTERS RECEIVED FOR LAGUNA HILLS

Letter 1 – OPR

1-1 This letter acknowledges receipt of the Program Environmental Impact Report for the Laguna Hills General Plan (EIR) for review by the State Clearinghouse. The comment acknowledges that the City has complied with the State Clearinghouse review requirements for the EIR pursuant to the California Environmental Quality Act (CEQA). No formal response is required.

State Clearinghouse Data Base

SCH# 2008081100
Project Title Laguna Hills General Plan Program
Lead Agency Laguna Hills, City of

Type EIR Draft EIR

Description The project is the adoption and implementation of the City's General Plan. The GP includes 2 elements: land use, mobility, conservation and open space, community services and facilities, safety, noise, and housing, as well as an implementation Program. The Program EIR analyzes the impacts of implementing the GP and minor Zoning Ordinance text and map amendments needed to carry out the Plan.

Lead Agency Contact

Name Julie Molloy
Agency City of Laguna Hills
Phone 949-707-2600 **Fax**
email
Address 24035 El Toro Road
City Laguna Hills **State** CA **Zip** 92653

Project Location

County Orange
City Laguna Hills
Region
Lat / Long
Cross Streets
Parcel No.
Township **Range** **Section** **Base**

Proximity to:

Highways I-5, I-405, SR-73 (toll)
Airports No
Railways SCRRA
Waterways San diegom Aliso, San Juan Creeks
Schools multiple
Land Use Varied urban development in a mostly built out community

Project Issues Aesthetic/Visual; Agricultural Land; Air Quality; Archaeologic-Historic; Biological Resources; Cumulative Effects; Drainage/Absorption; Flood Plain/Flooding; Forest Land/Fire Hazard; Geologic/Seismic; Growth Inducing; Landuse; Minerals; Noise; Population/Housing Balance; Public Services; Other Issues; Recreation/Parks; Schools/Universities; Sewer Capacity; Soil Erosion/Compaction/Grading; Solid Waste; Toxic/Hazardous; Traffic/Circulation; Vegetation; Water Quality; Water Supply; Wetland/Riparian

Reviewing Agencies Resources Agency; Department of Conservation; Department of Fish and Game, Region 5; Office of Historic Preservation; Department of Parks and Recreation; Department of Water Resources; Office of Emergency Services; California Highway Patrol; Caltrans, District 12; Department of Housing and Community Development; Regional Water Quality Control Board, Region 8; Department of Toxic Substances Control; Native American Heritage Commission

Date Received 02/02/2009 **Start of Review** 02/02/2009 **End of Review** 03/18/2009

Note: Blanks in data fields result from insufficient information provided by lead agency.

STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY ARNOLD SCHWARZENEGGER, Governor

DEPARTMENT OF TRANSPORTATION
District 12
3337 Michelson Drive, Suite 380
Irvine, CA 92612-8894
Tel: (949) 724-2241
Fax: (949) 724-2592

Flex your power!
Be energy efficient!

March 18, 2009

Post-it® Fax Note 7671	Date 3/18/09	# of pages ▶ 2
To Julie Molloy	From Marlon Registford	
Co./Dept. City of Laguna Hills	Co. Caltrans District 12	
Phone # (949) 707-2600	Phone # (949) 724-2241	
Fax # (949) 707-2633	Fax #	

Julie Molloy
City of Laguna Hills
24035 El Toro Road
Laguna Hills, California 92653

Subject: City of Laguna Hills General Plan Program EIR

Dear Ms. Molloy,

Thank you for the opportunity to review and comment on the **Draft Environmental Impact Report (EIR) for the City of Laguna Hills General Plan Update.** The proposed General Plan Update is a comprehensive update of the 1994 General Plan, and will focus on preserving residential neighborhoods, guiding the remaining development and redevelopment opportunities, and encouraging the revitalization of selected areas within the city. The nearest State routes to the project site are I-5 and SR-73. 2-1

The Department of Transportation (Department) is a responsible agency on this project and we have the following comments:

1. The General Plan, specifically the Mobility element, should include language requiring the City to develop policies stressing coordination between the City and Caltrans early in the land use and transportation planning process. 2-2

2. The Department supports General Plans that foster efficient land-use pattern that (a) support improved mobility and reduced dependency on single-occupant vehicle trips, (b) accommodates an adequate supply of housing for all incomes, (c) reduce impacts on valuable habitat, productive farmland, and air quality, (d) increase resource use efficiency, and (e) result in safe and vibrant neighborhoods. The Department recognizes that non-motorized travel is a vital element of the transportation system and therefore, encourages communities to make pedestrian and bicycle activity possible, thus expanding transportation options, and creating a streetscape that better serves a range of users: pedestrians, bicyclists, transit riders, and automobiles. 2-3

3. The Department has interest in working cooperatively to establish a Traffic Impact Fee (TIF) program with local jurisdictions. Local development project applicants would pay their "fair share" to an established fund for future transportation improvement projects. If a traffic impact fee program has been developed, the Department would like a copy for our records. If an existing TIF program will be amended or a new TIF program is being considered, the Department would like an opportunity to participate in the process. 2-4

Letter 2 – Caltrans

2-1 This comment provides introductory remarks, summarizes the project description, and provides the nearest State highway routes to the project. No formal response is required.

2-2 Comment is noted. The proposed General Plan Implementation Program M-8, Orange County Transportation Authority, contains the following language: "In addition, coordinate with Caltrans on all plans, activities, and projects that may affect State roadway facilities."

2-3 Comment is noted. The proposed General Plan Land Use and Mobility Elements contain numerous policies that support improved mobility and alternatives to single-occupant vehicle trips through enhanced walkability, pedestrian connections, beautified streetscapes, and increased bicycling and transit opportunities.

2-4 Comment is noted. The City of Laguna Hills does participate in regional traffic impact fee programs such as the Transportation Corridor Agency San Joaquin Hills Transportation Corridor Fee Program and the County of Orange Coastal Area Road Improvement (and) Traffic Signal Fee Program as well as the City's Urban Village Traffic Impact Fee Program. The City will work cooperatively on the development of traffic mitigation fee programs should programs be proposed by Caltrans.

Please continue to keep us informed of this project and any future developments, which could potentially impact the State Transportation Facilities. If you have any questions or need to contact us, please do not hesitate to call Marlon Regisford at (949) 724-2241. 2-5

Sincerely,

Christopher Herre, Branch Chief
Local Development/Intergovernmental Review

C: Terry Roberts, Office of Planning and Research

2-5 This comment provides closing remarks, and requests that Caltrans be kept informed of the General Plan and EIR process. This comment also provides the telephone number of a contact person at Caltrans. No formal response is required.

California Regional Water Quality Control Board
Santa Ana Region

3737 Main Street, Suite 500, Riverside, California 92501-3348
Phone (951) 782-4130 • FAX (951) 781-6288 • TDD (951) 782-3221
www.waterboards.ca.gov/santaana

Linda S. Adams
Secretary for Environmental Protection

Arnold Schwarzenegger
Governor

March 24, 2009

Julie Molloy, Senior Planner
City of Laguna Hills
24035 El Toro Road
Laguna Hills, CA 92653

DRAFT PROGRAM ENVIRONMENTAL IMPACT REPORT FOR DRAFT GENERAL PLAN, CITY OF LAGUNA HILLS, REGION 8 PORTION, SCH# 2008081100

Dear Ms. Molloy:

Staff of the California Regional Water Quality Control Board, Santa Ana Region (Region 8) have reviewed the City of Laguna Hills (City) Draft Program Environmental Impact Report (DPEIR) for the City's Draft General Plan. The DPEIR analyzes the environmental impacts of adopting the City's General Plan and amending its Zoning Ordinance (Project). Our comments pertain to the portion of the city that is within the jurisdiction of Region 8, essentially a two-square-mile area northwest of Los Alisos Boulevard (General Plan's Northern Section) that drains westerly to Veeh Reservoir, Veeh Creek, and finally San Diego Creek. The greater southeastern portion of the 6.6-square-mile City is divided between the Aliso Creek and San Juan Creek watersheds (San Diego Region 9), which both drain southeasterly into the Pacific Ocean. 3-1

We believe that the DPEIR should incorporate the following comments in order for the Project to best protect water quality standards (water quality objectives and beneficial uses) contained in the Water Quality Control Plan for the Santa Ana River Basin (Region 8 Basin Plan, 1995, as amended):

1. TMDL Compliance

The Hydrology and Water Quality Section 5.8, as well as other areas of the DPEIR, significantly recognize that the primary water quality issue posed by the City is stormwater runoff leaving the City from its built-out, urbanized hilly topography. The DPEIR cites stormwater permitting, Best Management Practices (BMPs) to reduce non-point source pollution and comply with state and federal regulations, the implementation of Low Impact Development (p.5.8-8, Mitigation Measure HWQ-1), Local Implementation Plans, Watershed Action Plans, and the Orange County Drainage Area Management Plan (DAMP). However, the p. 5.8-3 discussion only makes passing mention of the Total Maximum Daily Load (TMDL) for San Diego Creek; the DPEIR should expand on several TMDLs as a unifying reason for the above-referenced planning. 3-2

Both Reaches of San Diego Creek and Upper and Lower Newport Bay have been listed, pursuant to Clean Water Act Section 303(d), as impaired by various pollutants, and the following existing and anticipated TMDLs have been adopted:

Letter 3 – CRQACB

3-1 This comment provides introductory remarks and briefly summarizes the proposed project. Additionally, the commenter indicates that the agency's comments apply to that portion of the City within the jurisdiction of Region 8 of the California Regional Water Quality Control Board. No formal response is required.

3-2 Page 5.8-3 of the Hydrology and Water Quality section of the EIR has been revised to include the following language on the Total Maximum Daily Load (TMDL) for San Diego Creek and Upper and Lower Newport Bay.

"Both Reaches of San Diego Creek and Upper and Lower Newport Bay have been listed, pursuant to Clean Water Act Section 303(d), as impaired by various pollutants, and the following existing and anticipated TMDLs have been adopted:

Siltation (sediments) and nutrients for Lower Newport Bay, Upper Newport Bay, San Diego Creek Reach 1, and San Diego Creek Reach 2.

A fecal coliform TMDL (pathogens) has been adopted for Lower Newport Bay and Upper Newport Bay. A diazinon/chlorpyrifos pesticide TMDL has been adopted for Upper Newport Bay and San Diego Creek Reach 1.

TMDLs for toxic pollutants, including selenium, were promulgated by the U.S. Environmental Protection Agency in June 2002. Future TMDLs are anticipated for selenium and metals (Lower and Upper Newport Bay), selenium and fecal coliform (San Diego Creek Reach 1), and specified metals (San Diego Creek Reach 2). TMDLs for organochlorine compounds (particularly DDT, chlordane, and PCBs) are anticipated for all four of these water bodies (as well as Newport Bay's Rhine Channel), with toxaphene also targeted in San Diego Creek Reaches 1 and 2."

Water quality objectives for San Diego Creek have also been incorporated into the Hydrology and Water Quality Section of the EIR. These changes do not affect the conclusions of the EIR.

Siltation (sediments) and nutrients for Lower Newport Bay, Upper Newport Bay, San Diego Creek Reach 1, and San Diego Creek Reach 2 (see http://www.waterboards.ca.gov/santaana/water_issues/programs/tmdl/index.shtml)

A fecal coliform TMDL (pathogens) has been adopted for Lower Newport Bay and Upper Newport Bay. A diazinon/chlorpyrifos pesticide TMDL has been adopted for Upper Newport Bay and San Diego Creek, Reach 1.

TMDLs for toxic pollutants, including selenium, were promulgated by the U.S. Environmental Protection Agency in June 2002. Future TMDLs are anticipated for selenium and metals (Lower and Upper Newport Bay), selenium and fecal coliform (San Diego Creek Reach 1), and specified metals (San Diego Creek Reach 2). TMDLs for organochlorine compounds (particularly DDT, chlordane, and PCBs) is anticipated for all four of these water bodies (as well as Newport Bay's Rhine Channel), with toxaphene also targeted in San Diego Creek Reaches 1 and 2. 3-2 (Contd)

The above-referenced TMDLs, along with BMPs targeted for meeting compliance with them, should be incorporated into the DPEIR.

2. Surface and Groundwater Beneficial Uses

Table 5.8-1 (p.5.8-3) lists the beneficial uses for San Diego Creek, Reach 1 (below Jeffrey Road) as "intermittent," when correctly they are "access prohibited." These beneficial uses, plus Groundwater Recharge, are actually designated by the Basin Plan as "intermittent" for San Diego Creek and tributaries above Jeffrey Road in Reach 2, which potentially would be the first segment to be impacted by activities within the City. We ask that Table 5.8-1 be revised accordingly. Additionally, the DPEIR should state that surface water objectives for San Diego Creek, Reach 2 are 720 mg/l for TDS and 5 mg/l for total inorganic nitrogen (TIN). 3-3

Where groundwater dewatering is necessary for projects that discharge into storm drains and natural drainages of the San Diego Creek watershed, please note that these discharges require coverage under Order No. R8-2004-0021 (amended by R8-2006-0065), NPDES No. CAG998002, "General Waste Discharge Requirements for Short-Term Groundwater-Related Discharges and De Minimus Wastewater Discharges to Surface Waters Within the San Diego Creek/Newport Bay Watershed." This general permit establishes a waste discharge management program applicable to the project area, for the purpose of reducing selenium, sediment, nutrients, and other pollutants to Upper Newport Bay. This permit is available at: http://www.waterboards.ca.gov/santaana/board_decisions/adopted_orders You may also contact the Region 8 Permitting Section staff at (951) 782-4130. 3-4

The shallow groundwater discussed on p.5.8-3 is said to not overlie a groundwater basin, but in fact it does overlap, or is tributary to, the Irvine Groundwater Management Zone (GMZ; Order No. R8-2004-0001). Beneficial uses of the GMZ are Municipal Supply, Agricultural Supply, Industrial Service Supply, and Industrial Process Supply. The water quality objectives of the Irvine GMZ are 910 mg/l for total dissolved solids and 5.9 mg/l for nitrate-nitrogen (NO3-N). The DPEIR should be revised accordingly. 3-5

3-3 Table 5.8-1 in the Hydrology and Water Quality section of the EIR has been revised to reflect the comment and the information contained in the 1995 Water Quality Control Plan for the Santa Ana River Basin (Region 8), updated February 2008. Water quality objectives for San Diego Creek have also been incorporated into the Hydrology and Water Quality Section of the EIR. These changes do not affect the conclusions of the EIR.

3-4 Section 5.8 Hydrology and Water Quality of the EIR has been revised to add the following information to the Regulatory Framework setting. "Where groundwater dewatering is necessary for projects that discharge into storm drains and natural drainages of the San Diego Creek watershed, these discharges require coverage under Order No. R8-004-0021 (amended by R8-2006-0065), NPDES No. CAG998002, General Waste Discharge Requirements for Short-Term Groundwater-Related Discharges and De Minimus Wastewater Discharges to Surface Waters Within the San Diego Creek /Newport Bay Watershed." This general permit establishes a waste discharge management program applicable to the project area, for the purpose of reducing selenium, sediment, nutrients, and other pollutants to Upper Newport Bay. No formal response is required.

3-5 The Hydrology and Water Quality section of the EIR has been revised to include information on the Irvine Groundwater Management Zone, beneficial uses, and water quality objectives. These changes do not affect the conclusions of the EIR.

3. Status of Natural Drainages

We stress avoidance of natural drainages to the greatest extent possible, and where impacts to beneficial uses cannot be avoided, mitigation for the loss of beneficial uses may be required and should be planned for. Likewise, hydromodification (including erosion) must be prevented by projects both within and outside the City that may affect natural drainages. The DPEIR should include aerial photos, keyed to specific descriptions of the City's remnant riparian areas and other natural habitat fragments[1]. P.6-4 refers to any wildlife corridors being limited to "drainages," but Section 5.4 (Biological Resources) contains no aerial photos or descriptions to indicate whether any of the drainages within the City remain soft-bottomed natural stream segments, other than Veeh Reservoir (p.5.4-9) in the Northern Section. We understand that Veeh Reservoir, and downstream from it, Veeh Creek, contain sensitive southern arroyo-willow forest, coastal brackish marsh, and mulefat scrub; the DPEIR could consider planting additional riparian habitat in these or other appropriate sites as future project mitigation/ restoration projects. 3-6

4. Recycled Water

The DPEIR refers to the widespread use of recycled water, but it does not state whether that water comes from the Irvine Ranch Water District or another local source. All discharges of recycled water must be conducted in accordance with the purveyor's waste discharge requirements for distribution of reclaimed water. 3-7

5. Interpretation of Tiering from Final Adopted PEIR

Mitigation Measure B-1 (p.2-11) states that site-specific reviews, for potential impacts to streambeds and biological resources such as riparian habitat, will be conducted in accordance with the California Environmental Quality Act (CEQA). The DPEIR's references to producing documents in compliance with CEQA, which we agree with, appear to conflict with the City's extrapolation (p.1-1,2) of CEQA Guidelines Section 15152 regarding the tiering of projects from the adopted PEIR. The DPEIR states (p. 1-2) that if "no new effects could occur or new mitigation measures would be required on a subsequent project, the City can approve the activity as being within the scope of the project covered by this Program EIR, and no new environmental documentation would be required." We anticipate that the City could rely on the adopted PEIR too broadly and often as the only CEQA document needed for many new projects, referred to here as "subsequent projects." 3-8

While we understand the intent of Section 15152 to reduce redundancy of analysis, environmental review, and new documents, we have experienced (and expressed) problems with various cities leaving out the step of a Specific Plan, Mitigated Negative Declaration, Supplemental EIR, etc. where new information warranted one. For

[1] The Draft General Plan begins to do this with certain photographs, Figure COS-1, aerial photos in the Housing Element (H-6, H-7).

3-6 Comment is noted. Section 5.8 Hydrology and Water Quality of the EIR provides a program level analysis of hydrology and water quality impacts in the planning area from the implementation of the proposed General Plan. As specific development projects are proposed, additional environmental analysis will be undertaken to determine hydrology and water quality impacts from proposed projects. Additional environmental studies, such as area-specific hydrology, water quality, and biological resource studies could also be required for specific development projects. Appropriate mitigation measures would be required if significant environmental impacts are identified.

3-7 Comment is noted. Section 5.12 Public Services and Utilities of the EIR indicates that Laguna Hills obtains water services from the Moulton Niguel Water District (MNWD) and the El Toro Water District (ETWD). This section explains that both the MNWD and ETWD use recycled or reclaimed water for irrigation instead of expensive and increasingly scarce imported potable water, to help ensure the long-term availability of drinking water to residents. Due to the uncertainty of future statewide water supply and projected cost increases of imported potable water, both the MNWD and ETWD plan to expand their reclaimed water distribution system to offset future development water demands. The recycled water system is completely independent of the drinking water system and requires its own dedicated pipelines, pump stations, and reservoirs. Currently, the City uses reclaimed water from MNWD only, as ETWD has not offered sufficient supply to provide a consistent source of this water. The City complies with the regulations associated with the use of reclaimed water.

3-8 As noted in Section 1.0 Introduction, the EIR provides a first-tier or program-level analysis of the environmental effects of implementation of the proposed General Plan. Section 15152 of the CEQA Guidelines indicates that tiering is appropriate when the sequence of analysis is from an EIR prepared for a general plan, policy, or program to an EIR or negative declaration for another plan, policy, or program of lesser scope, or to a site-specific EIR or negative declaration. Subsequent activities in accordance with the proposed Laguna Hills General Plan will be examined in light of the EIR to determine whether an additional environmental analysis must be conducted and documentation prepared. If a subsequent project or later activity would have effects that were not examined in the EIR, or were not examined at an appropriate level of detail to be used for the later activity, an initial study would need to be prepared, leading to a negative declaration or an EIR.

As outlined in CEQA Guidelines Section 15162, a subsequent EIR would need to be prepared when substantial changes in a project, substantial changes in circumstances, or the discovery of new information of substantial importance occurs after an EIR has been certified.

As outlined in CEQA Guidelines Section 15162 and 15163, when substantial changes in a project, substantial changes in circumstances, or the discovery of new information of substantial importance occurs after an EIR has been certified and when "only minor additions or changes would be necessary to make the previous EIR adequately apply to the project in the changed situation," a supplemental EIR may be prepared.

instance, Regional Board issuance of a Clean Water Act Section 401 Water Quality Standards Certification (Certification) or Waste Discharge Requirements (WDRs) relies on detailed, prior or concurrent CEQA documentation relevant to a project's impacts on waters of the U.S. and on a water body's beneficial uses. We request that this discussion reflect more of a CEQA interpretation intent on identifying each new project's potential impacts and appropriate mitigation through specific CEQA documents. 3-8 (Contd)

If you have any questions, please contact Glenn Robertson at (951) 782-3259, grobertson@waterboards.ca.gov, or me at (951) 782-3234, or madelson@waterboards.ca.gov 3-9

Sincerely,

Glenn Robertson, for

Mark G. Adelson, Chief
Regional Planning Programs Section

cc: State Clearinghouse
U.S. Army Corps of Engineers, Los Angeles -Stephanie Hall
California Department of Fish and Game, Los Alamitos – Erinn Wilson
U.S. Fish and Wildlife Service, Carlsbad – Jonathan Snyder
Orange County RDMD, Flood Control, Santa Ana - Andy Ngo
Orange County Resources and Development Management Department – Lisa Cibellis
N. Watershed Unit – RWQCB-9, San Diego – James Smith

X:Groberts on Magnolia/Data/CEQA/CEQA Responses/ DEIR/ City of Laguna Hills-General Plan.doc

As outlined in CEQA Guidelines Section 15164, an addendum to a previously circulated EIR may be prepared when some changes or additions are necessary but none of the conditions described in CEQA Guidelines Section 15162 calling for the preparation of a subsequent EIR have occurred.

The City will apply applicable CEQA Guidelines to determine the appropriate environmental analysis and appropriate environmental documentation that must be conducted as specific projects are proposed. If the City finds that pursuant to Section 15152 of the CEQA Guidelines, no new effects could occur or new mitigation measures would be required on a subsequent project, the City can approve the activity as being within the scope of the project covered by this EIR, and no new environmental documentation would be required.

3-9 This comment provides closing remarks and provides contact information for the commenter. No formal response is required.

www.cityofirvine.org

City of Irvine, One Civic Center Plaza, P.O. Box 19575, Irvine, California 92623-9575 (949) 724-6000

RECEIVED
MAR 26 2009
CITY OF LAGUNA HILLS

March 24, 2009

Ms. Julie Molloy
Senior Planner
City of Laguna Hills
Community Development Department 3-1
24035 El Toro Road
Laguna Hills, CA 92653

Subject: Draft General Plan and Draft Program Environmental Impact Report (PEIR)

Dear Ms. Molloy:

The City of Irvine has received and reviewed the information on the above referenced project and offers the following comments:

Comment 1
Figure 5.14-1: Lake Forest Drive west of Moulton/Irvine Center Drive should be classified as a Major arterial per the MPAH. The section does not appear to have any classification in this figure. Has there been a change from the approved MPAH? 4-1

Comment 2
Figure 5.14-1: Ridge Route west of Moulton is shown as a Secondary per the MPAH. It is unclear, due to the color of the graphics, what designation is shown in this figure. 4-2

Comment 3
Figure 5.14-4: The LOS number adjacent to each intersection is not consistent with the LOS table (Table 5-14-3). 4-3

Comment 4
Table 5.14-5: Suggest providing a figure to coincide with this table to reflect the existing and proposed Bikeways within the City to present a clear graphic representation of the system. 4-4

PRINTED ON RECYCLED PAPER

Letter 4 – City of Irvine

4-1 Figure 5.14-1 has been corrected to show that Lake Forest Drive west of Irvine Center Drive is a major arterial per the existing Master Plan of Arterial Highways (MPAH).

4-2 In Figure 5.14-1, Ridge Route Drive west of Moulton Parkway is shown as a black/dark grey line correctly signifying it as a secondary arterial.

4-3 The existing ICU values and level of service designations at various intersections are correct in Figure 5.14-4. Some ICU values and existing level of service designations shown in Table 5.14-2 are incorrect and have been revised accordingly. These changes do not affect the conclusions of the EIR.

4-4 Figure M-3 in the Mobility Element of the proposed General Plan illustrates the existing and proposed Class I, II, and III bikeways in Laguna Hills.

Comment 5
Figure 5-14-6: The ICS shown is incorrect for El Toro at Avd de la Carlota. According to Table 5.14-9, it should be .96, not .92. | 4-5

Thank you for the opportunity to review the project. If you have any questions, please contact me at sjones@cityofirivne.org or (949) 724-6559; or Karen Urman, Senior Transportation Analyst, at (949) 724-7643. | 4-6

Sincerely,

Sherman Jones

SHERMAN JONES, AICP
Associate Planner

cc: Karen Urman, Senior Transportation Analyst
Bill Jacobs, Principal Planner

4-5 The 2030 peak hour ICU values for level of service at various intersections are correct in Figure 5.14-4. Some 2030 ICU values and level of service designations shown in Table 5.14-2 are incorrect and have been revised accordingly. These changes do not affect the conclusions of the EIR.

4-6 This comment provides closing remarks and provides the telephone number and email address for a contact person at the City of Irvine. No formal response is required.

CITY of LAGUNA WOODS

RECEIVED
APR 10 2009
CITY OF LAGUNA HILLS

Robert B. Ring
Mayor

Milt Robbins
Mayor Pro Tem

Cynthia Conners
Councilmember

Bert Hack
Councilmember

Marty Rhodes
Councilmember

Leslie A. Keane
City Manager

April 10, 2009

Ms. Julie Molloy
Senior Planner
City of Laguna Hills
24035 El Toro Road
Laguna Hills, CA 92653

SUBJECT: Comments on the City of Laguna Hills Draft General Plan Update and Draft Program Environmental Impact Report

Dear Ms. Molloy:

Thank you for the opportunity to review and comment on the Laguna Hills Draft General Plan Update (DGPU) and related draft Program Environmental Impact Report (PEIR). The City of Laguna Woods (City) offers the following comments on these reports: 5-1

Increased Housing

Urban Village Specific Plan (UVSP)
The current Urban Village Specific Plan (UVSP) has 756 existing residential units which include the Prado apartment complex (360 units) and the Villa Valencia senior residential development (396 units). The DGPU would allow the UVSP to have a minimum of 30 dwelling units per acre and a maximum of 50 dwelling units per acre. Within the UVSP the Oakbrook Village 19.7 acre site includes 400 units. Under the proposed minimum 30 dwelling unit per acre standard, this could potentially increase to a minimum of 591 units or a maximum of 985 units. 5-2

The amount of residential development within the UVSP site raises concerns about traffic, noise, and air quality impacts that could affect residents and businesses in the City of Laguna Woods. Of particular concern are the effects on Laguna Woods' residents who live along Paseo de Valencia.

We recommend that a General Plan Amendment, Specific Plan Amendment, Site Specific Development Plan and Environmental Document be developed concurrently to more adequately analyze the potential impacts from this increase in intensification and the proposed mitigation measures that may be required.

24264 El Toro Road • Laguna Woods, CA 92637 • Phone (949) 639-0500 • Fax (949) 639-0591 • Website: www.lagunawoodscity.org

Letter 5 – City of Laguna Woods

5-1 This comment provides opening remarks and indicates that the City of Laguna Woods has provided comments. No formal response is required.

5-2 Comment noted. The statement that the Oakbrook Village site includes 400 residential units is erroneous. The Oakbrook Village site is part of the Urban Village Specific Plan (UVSP) area and future expansion opportunities for Oakbrook Village are subject to the same limitations as are all potential future development projects in the UVSP. Future development in the UVSP area is limited by peak hour trips generated within the UVSP area and is allocated on a first-come, first-served basis. For planning purposes, the peak hour trips authorized by the EIR are based upon the following breakdown of land uses: 300,000 square feet (SF) of retail uses, a 250-room hotel, 200 residential units, and either 138,000 SF of medical office uses or 380,000 SF of general office uses. The UVSP allows any of the land use categories to exceed the square footage numbers assumed for planning purposes, as long as there is a corresponding decrease in another land use category that has the impact of ensuring that the maximum peak hour trips are not exceeded. It should be noted that any increase in residential development within the UVSP area will result in a corresponding peak hour trip reduction in the other allowed land uses (i.e., office, retail, hotel) within the UVSP area. Increasing residential development in the UVSP area will only potentially reduce commuting trips, not increase them, and thereby should reduce traffic, air quality, and noise impacts within the areas and region (than would otherwise be generated by nonresidential development). The EIR fully considers the increase in the level of development allowed in the UVSP area, as anticipated in the proposed General Plan. No application for a specific development expansion plan has currently been filed for the UVSP area. When specific development projects are proposed, additional project-specific environmental analysis will be conducted. Additional environmental documentation could be required, including noise, air quality, and traffic studies. Additionally, the City will consider the appropriate planning documents that may be required, such as but not limited to Specific Plan and General Plan amendments, and site-specific development plans, as development projects are proposed.

Increased Commercial

Urban Village Specific Plan (UVSP)
The current UVSP includes a mix of retail, office, financial, medical, residential, and transportation uses. The area currently consists of approximately 527,000 sq. ft. medical center use, approximately 633,000 sq. ft. of office space, and 1,124,000 sq. ft. of retail space. The DGPU would allow an additional 117,000 square foot of retail space beyond that currently provided in the UVSP.

The City is concerned that without a project-specific plan proposed, potential impacts from traffic, noise, and air quality cannot be adequately analyzed. We have the same concern here as with the proposed residential intensification over impacts on Laguna Woods' residents who reside along Paseo de Valencia. 5-3

We recommend that a General Plan Amendment, Specific Plan Amendment, and a Site Specific Development Plan be developed concurrently so that the proposed 117,000 square foot increase in retail space can be more adequately analyzed along with appropriate mitigation measures that may be required.

Increased Traffic

Additional analysis of full implementation of the DGPU should be conducted on potential impacts on intersections in Laguna Woods. In particular, the City is concerned with additional trips on El Toro Road and Moulton Parkway from the proposed intensifications of the Urban Village, Via Lomis, and Moulton & LaPaz project areas.

According to Figure 5.14-5, 2030 Average Daily Traffic (ADT) volumes are projected to increase by 65% on Moulton Parkway north of the Laguna Woods city boundary and by 48% to the south of the City's boundary from what currently exists. There are no data provided in the DGPU or PEIR regarding potential impacts that this increased traffic would have on Moulton Parkway or intersections within the City of Laguna Woods. The latest Orange County Congestion Management Program (OC CMP) reports that the Moulton Parkway/El Toro Road intersection already operates at LOS D during both a.m. and p.m. peak hours. With the build-out of the approved Laguna Woods' General Plan, this intersection may reach LOS E. 5-4

Average daily trips for the main intersections serving the Urban Village area are projected to rise by 23,742 trips, but no analysis has been conducted of nearby intersections in or adjacent to Laguna Woods. For example, traffic along Paseo De Valencia is anticipated to increase 27% to 35% which would cause the level of service to rise from A's and B's to C's and D's. Actual traffic numbers may be greater than what is provided in the PEIR; a site specific project has not been proposed and a project specific traffic analysis has not been completed.

5-3 Please refer to response 5-2.

5-4 Please refer to topical response #1. In addition, please consider the following. The purpose of the traffic study conducted for this project is to update the City of Laguna Hills General Plan and analyze the impacts of implementing the proposed General Plan. As future development projects are proposed in Laguna Hills (e.g., specific development proposals in the Urban Village area) project-level environmental analysis, including a traffic analysis, will be conducted. This analysis would include analyzing the project's effect on traffic outside of the City of Laguna Hills (i.e., Laguna Woods intersections).

Changes in traffic volumes on arterial highways are due to growth in the entire region not just the City of Laguna Hills or Laguna Woods. Please refer to topical response #1 for further discussion on this subject. The Laguna Hills Traffic Analysis Model (LHTAM) is consistent with the Orange County Transportation Analysis Model (OCTAM) and the volumes described are anticipated in OCTAM regardless of the Laguna Hills General Plan Update.

The deletion of Santa Maria Avenue and portions of Ridge Route Drive is a proposal being pursued by other agencies and its impact must be independently evaluated. Any concerns regarding these deletions should be evaluated by the proponents of the deletions. The Laguna Hills Traffic Study is consistent with the MPAH that is currently approved, and analysis of the proposed arterial highway deletions is beyond the scope of this EIR.

The traffic analysis should also take into account the recent study of impacts from removing extensions of Santa Maria Avenue and Ridge Route Drive from their current terminuses, and of Bake Parkway beyond Lake Forest Drive. 5-4 (Contd)

As this is a General Plan update and a Program EIR, the City reiterates our desire to review and comment on any proposed specific development project in Laguna Hills that is adjacent to or could impact Laguna Woods. 5-5

Please contact me at 949.639.0500 if you have any questions regarding these comments.

Sincerely,

Leslie A. Keane
City Manager

24264 El Toro Road • Laguna Woods, CA 92637 • Phone (949) 639-0500 • Fax (949) 639-0591 • www.lagunawoodscity.org

5-5 This comment provides closing remarks including the City of Laguna Woods' desire to review and comment on any projects in Laguna Hills adjacent to or affecting Laguna Woods. The comment also provides the contact information for the commenter. No formal response is required.

City of Mission Viejo

Community Development Department

Trish Kelley
Mayor
Frank Ury
Mayor Pro Tem
John Paul "J.P." Ledesma
Council Member
Lance R. MacLean
Council Member
Gail Reavis
Council Member

Sent Via e-mail & facsimile
Original to follow via mail

March 20, 2009

Ms. Julie Molloy
Senior Planner
City of Laguna Hills
24035 El Toro Road
Laguna Hills, CA 92653

REF: Draft Program Environmental Impact Report (EIR) for General Plan

Dear Ms. Molloy:

Thank you for the opportunity to review and comment on the above referenced EIR. The City of Mission Viejo commends the City of Laguna Hills for preparing a comprehensive update to the General Plan and for providing us opportunity to review and comment. Staff has reviewed the document and provides comments in the attached memorandum. 6-1

Please feel from to call me at (949) 470-3025, or the City's Transportation Manager, Shirley Land, directly at (949) 470-3069 in the event you would like clarification or to discuss traffic-related comments further.

I thank you in advance for your consideration of the City's comments.

Sincerely,

Charles E. Wilson, AICP
Director of Community of Community Development

cc: Shirley Land, Transportation Manager
Elaine Lister, Planning Manager
Philip Nitollama, Transportation Engineer

Attachment

200 Civic Center • Mission Viejo, California 92691
http://www.cityofmissionviejo.org
949/470-3053
FAX 949/951-6176

Letter 6 – City of Mission Viejo

March 9, 2009 Letter (Mobility Element Comments)

6-1 This comment provides opening remarks and indicates that the City of Mission Viejo has reviewed the EIR and has provided comments. This comment also provides contact information for the commenter and for the City of Mission Viejo Transportation Manager. No formal response is required.

City of Mission Viejo
Memorandum

Date: March 9, 2009

To: Elaine Lister, Planning Department

From: Philip Nitollama, Transportation Engineer
Shirley Land, Transportation Manager

Subject: City of Laguna Hills General Plan Mobility Element Comments

---

In review of the General Plan Mobility Element for the City of Laguna Hills, the following transportation issues were identified:

1) On page M-3 (Figure M-1), the Existing Roadway Network illustrates Los Alisos Boulevard terminating at Muirlands Boulevard in the City of Mission Viejo. This is inaccurate because Los Alisos Boulevard extends eastward from Muirlands Boulevard until the SR-241 Toll Roads. Please revise the exhibit to correct this error. Also, please label Muirlands Boulevard and Jeronimo Road on the exhibit. 6-2

2) On page M-13, the Transit and Transportation Demand Management section does not mention the Orange County wide "Go Local" program. Laguna Hills has collaborated with Laguna Niguel in the "Go Local" program to design, incorporate and provide additional bus routes from the Metrolink stations (Laguna Niguel / Mission Viejo and Irvine) to the major destination centers of the city. OCTA has also provided funding for this program. Please include a brief description of the "Go Local" program details in this section as appropriate. 6-3

3) On page M-15, the Rail Service section does not mention OCTA's future programmed efforts to improve rail service in the area. OCTA has prepared a Project Study Report (PSR) to identify the Metrolink Service Expansion Program's (MSEP) objectives of increasing rail service frequency, increasing the hours of operation, and improving the facilities at the nearby Metrolink Stations (Laguna / Mission Viejo and Irvine). Please include a brief description of the MSEP efforts in this section as appropriate. 6-4

6-2 Figure M-1 in the Mobility Element of the General Plan has been corrected to show Los Alisos Boulevard eastward from Muirlands Boulevard. Additionally, Muirlands Boulevard and Jeronimo Road have been labeled in Figure M-1 and Figure 5.14-2 of the EIR. These changes do not affect the conclusions of the EIR.

6-3 The City will consider adding the following text to page M-13 of the Mobility Element of the General Plan. "The City participates in the Orange County Transportation Authority's Go Local program to increase access to Metrolink rail facilities. The City of Laguna Hills has joined with the City of Lake Forest in a cooperative effort to further this goal of making connections from major destinations to the Irvine Transportation Center."

6-4 The City will consider adding the following text to page M-15 of the Mobility Element of the proposed General Plan. "The OCTA Board of Directors approved the Metrolink Service Expansion Program (MSEP) in 2005 with the goal of improving the frequency of rail service between the Fullerton and Laguna Niguel/Mission Viejo stations. Service could be expanded to provide trains every 30 minutes between these stations. Included in the program are station enhancements at the two stations nearest Laguna Hills, Irvine and Laguna Niguel/Mission Viejo. Improvements to the Irvine station, including a 1,500-space parking structure, have recently been completed. Future improvements have been identified for the Laguna Niguel/Mission Viejo station."

City of Mission Viejo
Memorandum

Date: March 18, 2009

To: Elaine Lister, Planning Department

From: Philip Nitollama, Transportation Engineer
Shirley Land, Transportation Manager

Subject: City of Laguna Hills General Plan Program Environmental Impact Report (PEIR) Comments

---

In review of the General Plan Program Environmental Impact Report (PEIR) for the City of Laguna Hills, the following are comments relating to the following sections: Section 5.14 Transportation and Circulation and Appendix E – General Plan Update Traffic Study. After reviewing these two sections which were submitted for the proposed study, the following transportation issues were identified: 6-5

1) On page 5.14-2 (Figure 5.14-1), the Existing Roadway Network illustrates Los Alisos Boulevard terminating at Muirlands Boulevard in the City of Mission Viejo. This is inaccurate because Los Alisos Boulevard extends eastward from Muirlands Boulevard until the SR-241 Toll Roads. Please revise the exhibit to correct this error. Also, please label Muirlands Boulevard and Jeronimo Road on the exhibit. 6-6

2) On page 5.14-3, the listing of roadway classifications are not consistent with the designations of the Master Plan of Arterial Highways (MPAH). There are no provisions for "augmented arterials" that was found in the OCTA Strategic Plan Technical Report for the Orange County Master Plan of Arterial Highway – April 2002 or the map. This strategy seems to be avoiding the designation of a problem area that needs mitigation. The streets should be identified per the standard roadway classification with the identification of the modifications that are needed to "augment" or mitigate problems. 6-7

3) Information on page 5.14-7, 15.14-8, and 15.14-9 regarding existing intersections level of service do not match each other and also do not correspond to the traffic study tables and exhibits in the appendix. Intersection 18 is missing on the exhibit on page 5.14-7, level of service for El Toro and Paseo de Carlota is shown as .87 on page 5.14-8 but it is rated at .96 on the table. The .96 "E" level of service is consistent with the OCTA Congestion Management Report for 2007. Again these do not match the traffic study information. 6-8

4) The numbering of the intersections is not sequential. Were there other intersections which were previously included in the traffic analysis and subsequently eliminated? We were wondering why Alicia/Hon and La Paz/McIntyre were not included since the close 6-9

March 18, 2009 Letter

6-5 This comment acknowledges that the City has provided comments on Section 5.14 Transportation and Circulation of the EIR and Appendix E of the EIR. No formal response is required.

6-6 Please refer to response 6-2 for an explanation of this issue.

6-7 The roadway designations are consistent with the MPAH. The proposed General Plan Mobility Element recognizes that the County of Orange MPAH forms the basis for the arterial highway classifications. The Mobility Element applies an "Augmented" concept to certain roadway locations as a capacity and/or streetscape enhancement strategy. The intent is to "customize" such streets for the City of Laguna Hills' Mobility Element, while retaining consistency with the MPAH. The "augmented" sections are not used in place of mitigation measures but form part of the overall improvement program.

6-8 Please refer to response 4-5 for an explanation of this issue.

6-9 In some cases, intersection numbering is not sequential because intersections included in previous traffic analyses were subsequently eliminated. Only intersections that are on the City's Street Network (Circulation Plan) and formed by MPAH roadways are examined at this level of analysis. Hon at Alicia and McIntyre at La Paz are not included as key roads on the Circulation Plan. As future projects are proposed, subsequent project-level traffic analysis will be conducted to address the performance of these local intersections as indicated in Implementation Program M-1 in the proposed General Plan: "Review discretionary development proposals for potential impacts to the mobility and infrastructure systems and to ensure the street system meets City standards. The level of service standards established in the Mobility Element will be used to determine the significance of impacts. Intersection level of service will be determined by the volume to capacity ratio and the Highway Capacity Manual (HCM) calculations. Mitigation in the form of physical improvements and/or impact fees will be required to reduce the significant impacts. As part of this program, the City will coordinate with local jurisdictions to reduce the impacts of development in Laguna Hills on adjacent jurisdictions.

spacing can cause a problem. We also request that at each interchange, all of the ramps be included in the Level of Service analysis since they do not function independent due to their close spacing.

5) On page 5.14-10, the Bus Service section does not mention the Orange County "Go Local" program. Laguna Hills has collaborated with Laguna Niguel in the "Go Local" program to design, incorporate and provide additional bus routes from the Metrolink stations (Laguna Niguel / Mission Viejo and Irvine) to the major destination centers of neighboring cities. OCTA has also provided Laguna Hills with funding for this program. Please include a brief description of the "Go Local" program details in this section as appropriate. Also, please include the same brief description of the "Go Local" program on page 5.14-21 under the Alternative Transportation section. 6-10

6) On page 5.14-11, the Rail Service section does not mention OCTA's future programmed efforts to improve rail service in the area by 2010. OCTA has prepared a Project Study Report (PSR) to identify the Metrolink Service Expansion Program's (MSEP) objectives of increasing rail service frequency, increasing the hours of operation, and improving the facilities at the nearby Metrolink Stations (Laguna / Mission Viejo and Irvine). Please include a brief description of the MSEP efforts in this section as appropriate. 6-11

7) On page 5.14-14, what is the basis for accepting level of service "E" at a freeway ramp when it will impact the operation of the local roadway where level of service "D" is the expected level of operation. We would request that level of service "D" should be maintain for all intersections on Alicia and La Paz Road. We recognize the exceptions for the adopted Congested Management Program. 6-12

8) On page 5.14-14 (Section 5.14.4), the last sentence on the second paragraph indicates that "The Highway Capacity Manual (HCM 2000) delay-based methodology was used to estimate the level of service at intersections." Please revise this statement to indicate that ICU volume-to-capacity methodology was utilized as illustrated on Tables 5.14-8 and 5.14-9. The HCM delay-based methodology was only used on three critical intersections (see Table 5-3 in Appendix E on page 5-10). 6-13

9) On Table 5.14-6 (page 5.14-15), there are several errors with this table when it is compared to the correct Table 4-1 (page 4-2, Appendix E). Please revise and correct to be consistent with Table 4-1. 6-14

10) On Table 5.14-6 (page 5.14-15), please provide more detail information on the level of commitment on these projects. Are they fully funded for design and construction and is there an estimate date of completion? We are most concerned about the La Paz Road improvements and the I-5 Ramp/Alicia projects since the City of Mission Viejo has no knowledge of any current schedules for these improvements and they are immediate to our city boundary. 6-15

6-10 The City will consider adding the following text to page 5.14-10 of the Transportation and Circulation Section of the EIR. "Each City in Orange County received a $100,000 grant by OCTA through their "Go Local" program to explore the possibility of providing additional bus routes from Metrolink stations to major destination centers of the local city. Laguna Hills partnered with the City of Lake Forest on the study report, which evaluated the need to provide bus or shuttle service to the Laguna Niguel/Mission Viejo and Irvine train stations. OCTA is currently in the process of selecting which City's project will receive phase 2 funding." These changes do not affect the conclusions of the EIR.

6-11 The City will consider adding the following text to page 5.14-11 of the Transportation and Circulation Section of the EIR. "The OCTA Board of Directors approved the Metrolink Service Expansion Program (MSEP) in 2005 with the goal of improving the frequency of rail service between the Fullerton and Laguna Niguel/Mission Viejo stations. Service could be expanded to provide trains every 30 minutes between these stations. Included in the program are station enhancements at the two stations nearest Laguna Hills, Irvine and Laguna Niguel/Mission Viejo. Improvements to the Irvine station, including a 1,500-space parking structure, have recently been completed. Future improvements have been identified for the Laguna Niguel/Mission Viejo station.

6-12 Freeway ramps are under the jurisdiction of Caltrans, which is part of the Orange County CMP Highway System. Therefore, LOS "E" has been used as the performance standard for ramps. It should be noted that for those locations where the ramp intersects the local roadways (i.e., ramp intersections) the performance standard used is LOS "D."

6-13 The following text changes have been made to page 5.14-14. "The intersection capacity utilization (ICU) methodology was used to determine the LOS for intersections analyzed in this EIR. The HCM delay methodology was applied for those locations where situations such as physical constraints exist. Physical constraints include, for example, closely spaced intersections that do not allow the theoretical ICU values to be achieved. In such cases, operational analyses are carried out using delay-based procedures as described in the HCM." No formal response is required.

6-14 Table 5.14-6 has been updated to reflect the most current information from Table 4-1 in Appendix E of the Traffic Study. These changes do not affect the conclusions of the EIR.

6-15 At this time, funding sources are being finalized. The La Paz Road improvement planned to be under construction in 2010. Exact completion dates for the other improvements are unknown, but improvements are expected to be completed by year 2030.

11) On page 5.14-15, following the table there is a brief summary of 2030 ADT. This does not include a discussion that El Toro Road is projected to go from an existing 50,000 ADT to 74,000 ADT. In later discussion it is difficult to understand how this significant increase (+24,000 ADT) can be accommodated. While Mission Viejo is not directly impacted by the operation of El Toro, we are concerned about diversion that might occur to Los Alisos Boulevard if this area is congested. Our local traffic on Los Alisos Boulevard did increase during the El Toro construction. It was also our understanding that there are on-going discussions with Caltrans for significant modifications to freeway access at or near El Toro to help eliminate the problems in this region. 6-16

12) On page 5.14-17, an exhibit corresponding to the proposed land use changes would be helpful. It would be helpful to have the locations correspond to the Project Areas defined in the traffic analysis page 2-10. 6-17

13) On page 5.14-17, the presentation that the intersections within the "opportunity areas" are within acceptable levels of services is difficult to understand. We are concerned about Alicia Parkway at both ramps and the problems with the closely spaced intersection at Hon when the proposed development will add 10,510 ADT. The list in Table 5.14-8 again seems to ignore the significant increase on El Toro and does not include the Urban Village which generates 23,742 trips and corresponds to the projected 2030 increase of 24,000 ADT on El Toro. Please provide more details and a clarification of how this is achieved. 6-18

14) On page 5.14-19, the future 2030 level of service at Avenida de Carlota and El Toro is calculated .96 "E" based on an estimate traffic volume of 74,000 ADT. (Does not match the posting on Figure 5.14.6). This is the same level of the existing OCTA CMP intersection capacity utilization with 50,000 ADT vehicles. Please clarify how this is achieved and also provide an analysis of the problems with closely spaced intersections and the relationship to the other ramps and local intersections. We are requesting that all ramps at each interchange be added to your analysis. We are again recommending that the closely spaced intersections of Alicia/Hon and La Paz/McIntyre be added to this list of future intersections. 6-19

15) On page 5.14-21, Please clarify if there are any mitigation measures needed per our previous comments and also include the suggested "augments" that are needed in the segments identified on your map as needing this designation. 6-20

Appendix E – Traffic Study

16) In Appendix E, there are two pages with the same page number – "2-6". Please revise. 6-21

17) Tables 2-1, Figure 2-3 and Figure 2-4 do not match the information contained in the environmental document. 6-22

18) On page 2-6 the report discusses that ICU values do not correctly account for operational problems for closely spaced intersections. This report does not make a recommendation 6-23

6-16 Performance of El Toro Road is based on the peak hour levels of traffic, which showed no deficiencies at the intersections.

6-17 Comment noted. Section 3.0 Project Description of the EIR provides information on the land use changes anticipated in the proposed General Plan. Figure 3-4 depicts the land use opportunity areas and future study areas, i.e., the anticipated land use changes in the proposed General Plan.

6-18 Please refer to topical response #1. In addition, please consider the following. As future projects are proposed, subsequent project-level traffic analysis will be conducted, which could include intersection analysis at Hon Avenue and Alicia Parkway adjacent to the Alicia Gateway Opportunity Area. As indicated in Table 5.14-9 of Section 5.14 Transportation and Circulation, the I-5 Southbound ramps at Alicia Parkway, in proximity to the Alicia Gateway Opportunity Area, operate within acceptable levels of service with implementation of the proposed General Plan. Additionally, Table 5.14-9 indicates that with implementation of the proposed General Plan the intersections in proximity to the Urban Village Future Study Area continue to operate at acceptable levels of service, including the intersections of Avenida de la Carlota and El Toro, Paseo de Valencia and El Toro Road, Avenida de la Carlota and Los Alisos, and Paseo de Valencia and Los Alisos.

6-19 Please refer to response 6-18. The ICU does not change to a large extent at the intersection of Avenida de la Carlota and El Toro Road because committed improvements (i.e., fully funded) are assumed for year 2030.

6-20 No additional mitigation measures are required for the EIR or the Traffic Study. Augmented primary and secondary sections are included in the Street Network (Figure M-1 in the proposed General Plan). Please also refer to response 6-7.

Appendix E – Traffic Study

6-21 Figure 2-3 in the Traffic Study, which is labeled as page 2-6, will be relabeled as page 2-5.

6-22 The tables and figures in the Traffic Study are the most current and correct information. The applicable EIR sections have been corrected. These changes do not affect the conclusions of the EIR.

6-23 The focus of this Traffic Study is the analysis of intersections depicted in the Circulation Plan of the Mobility Element using the ICU methodology to determine intersection performance. However, there are situations that do not allow the theoretical ICU values to be achieved such as the constraints of two closely spaced intersections (e.g., Avenida de la Carlota at Paseo de Valencia and Avenida de la Carlota at El Toro Road) and where inefficient lane utilization occurs (e.g., Paseo de Valencia at Laguna Hills Drive). In such cases, further analysis is carried out that examines the operation of these intersections using delay-based procedures as described in the HCM. Please refer to topical response #1 regarding the intersections analyzed in the study.

regarding a solution which we assume is the Highway Capacity Manual methodology and other locations other than El Toro might need to be added. | 6-23 (Contd)

19) On page 3-2, the Smart Street designation indicates additional capacity of 60,000 versus 54,000 daily traffic volumes. We are not sure the reason for this designation since it is never used to defend the operation of the roadways; however, please provide the technical basis for this assumption since most Major Arterials have the same configurations and traffic signal coordination. It should be noted that the designated Smart Street corridor carries less traffic that other roadways in this same area. | 6-24

6-24 The City of Laguna Hills Street Network is consistent with the MPAH, which shows that Moulton Parkway is a Smart Street.

20) On page 3-7, the argument for augmented arterials is not consistent with the MPAH designations. We recommend that these additional improvements be identified as mitigation measures with the roadways designated per the MPAH. Auxiliary lanes on a local street should just be an additional lane. We are concerned that the practice of widening out with an approach lane to be dropped on the other side of the intersection is not fixing the problem but just moving it to a merge point. Adding a median to a secondary can be done without a different designation but it should not change the functional status to another classification. Requesting the technical support for the assumed higher capacity of each roadway and recommend that it be further discussed under mitigation measures. | 6-25

6-25 Please refer to response 6-7. The auxiliary lanes on La Paz are dropped at appropriate points particularly at intersection approaches. We agree that adding a median to Cabot does not require a different designation. The MPAH and HCM indicate a higher capacity for these augmented sections.

21) On page 4-2, requesting specific information of the level of funding (100% or partial) and the status of these project for design and construction. If partially funded, we would request that it not be consider a committed improvement. We are not familiar with the status for improvements on Alicia and La Paz which are adjacent to our city. | 6-26

6-26 Please refer to response 6-15. By definition, committed improvements are fully funded.

22) On page 4-5, this table 4-2 does not match other exhibits in the report. | 6-27

6-27 Appropriate corrections to the tables in the EIR have been made. These changes do not affect the conclusions of the EIR.

23) On page 5-5, the Ridge Route Drive/I-5 Overcrossing is an appropriate issue and it is assumed to be an un-built segment of the MPAH. We are not sure that we can agree that this analysis has answered the issues on El Toro; however, it would be realistic to include mitigations to the eventual elimination of this connection. | 6-28

6-28 With the planned and committed improvements on El Toro Road and Avenida de la Carlota intersections, there are no deficiencies with or without the Ridge Route Road/I-5 overcrossing (please refer to Chapters 4.0 and 5.0 of the Traffic Study).

24) On page 5-5, it is recommended that Cabot remain the same designation with or without the landscape median. | 6-29

6-29 Please refer to response 6-7.

25) On page 5-5, the La Paz Road should be upgraded to the designation required to handle the additional traffic and the improvements be identified as mitigations for the growth. The La Paz Road widening is on the RTIP as a project but the funding indicates it should currently be under construction. Please provide more details on this project and the status of Caltrans approvals, funding, and construction schedules. | 6-30

6-30 Please refer to response 6-7 regarding no change to the designation of La Paz Road. The local improvement project at I-5/La Paz Road to add an additional eastbound lane on La Paz Road to the I-5 northbound on-ramp, an additional southbound off-ramp lane, and an additional westbound left turn lane to Cabot Road is planned to be under construction in 2010.

26) On page 5-5, the operational analysis should also be applied to Alicia at Interstate 5 and adjacent intersections and also on La Paz Road between McIntyre to Muirlands. | 6-31

6-31 Please refer to response 6-23.

27) On Table 5-3 (Appendix E, page 5-10), it should be noted that the following two intersections: Avenida de la Carlota / El Toro Road and Paseo de Valencia / Laguna Hills Drive both have a volume-to-capacity ratio greater than 1.0 despite their LOS "E" designation. The LOS "E" designation and V/C ratio greater than 1.0 occurs during the PM peak hour analysis of existing conditions and the 2030 Committed improvements conditions for Avenida de la Carlota / El Toro Road. While the intersection of Paseo de Valencia / Laguna Hills Drive has V/C ratio that exceeds 1.0 during the 2030 Committed Network conditions and 2030 MPAH Network conditions. The V/C ratio greater than 1.0 represents high delay levels and oversaturated traffic conditions when arrival flow rates (demand) exceed the capacity of lane groups (supply). Please notate in Table 5-3 for both intersections that the V/C ratio exceeds 1.0.

6-32

6-32 The operational analysis merely shows that the level of service is LOS "E" based on HCM delay methodology (based on seconds not volume-to-capacity ratios). The volume-to-capacity ratios for Avenida de la Carlota/El Toro Road and Paseo de Valencia/Laguna Hills Drive intersections do not exceed 1.00 in any timeframe.

28) On page A-7 (Appendix E Reference A), Location #8 in Table A-1 has a clerical error for the southbound through movement. Please revise the southbound through movement to "1.5" lanes instead of "2" lanes. Also, please remove the "-" sign on all the lanes in Table A-1.

6-33

6-33 As noted at the end of Table A-1 in the Traffic Study, the negative lanes represent split phasing for those approaches. The exhibit will be corrected to show 1.5 lanes.

Linda S. Adams
Secretary for
Environmental Protection

Department of Toxic Substances Control

Maureen F. Gorsen, Director
5796 Corporate Avenue
Cypress, California 90630

Arnold Schwarzenegger
Governor

March 11, 2009

Ms. Julie Molloy
City of Laguna Hills Community Development Department
24035 El Toro Road
Laguna Hills, California 92653
jmolloy@ci.laguna-hills.ca.us

ENVIRONMENTAL IMPACT REPORT (EIR) FOR LAGUNA HILLS GENERAL PLAN (SCH# 2008081100)

Dear Ms. Molloy:

The Department of Toxic Substances Control (DTSC) has received your submitted Environmental Impact Report for the above-mentioned project. The following project description is stated in your document: "The City of Laguna Hills is comprised of approximately 6.6 square miles of land (or about 4,234 acres) and is located in southern Orange County approximately 45 miles southeast of the City of Los Angeles, 68 miles northwest of the City of San Diego, and 6 miles northeast of the Pacific Ocean. The City is bordered to the north by the cites of Irvine and Lake Forest, to the east by the Interstate 5 (I-5) Freeway and the city of Mission Viejo, to the west by the cities of Laguna Woods and Aliso Viejo, and to the south by the City of Laguna Niguel. 7-1

The proposed project analyzed in this Program EIR is the adoption and implementation of the City of Laguna Hills General Plan and associated Zoning Ordinance amendments. The Program EIR provides a program-level assessment of the general environmental impacts resulting from the development of land uses and implementation of policies established within the General Plan and Zoning Ordinance".

DTSC has the following comments:

1) The EIR should evaluate whether conditions within the project area may pose a threat to human health or the environment. Following are the databases of some of the regulatory agencies: 7-2

   - National Priorities List (NPL): A list maintained by the United States Environmental Protection Agency (U.S.EPA).

Letter 7 – Department of Toxic Substances Control

7-1 This comment provides introductory remarks and summarizes the project description contained in the EIR. No formal response is required.

7-2 Section 5.7-4 of the Hazards and Hazardous Materials section of the EIR provides a program level analysis of the threat to human health and the environment from potential hazardous materials conditions in the planning area. The proposed General Plan contains the following Goal and Policy regarding hazardous materials: Goal S-5: "Protect life, structures, and the environment from hazardous materials." Policy S-5.1 states: "Promote and support the proper disposal, handling, transport, delivery, treatment, recovery, recycling, and storage of hazardous materials in accordance with applicable federal, State, and local regulations." Implementation Program S-5 requires that the City coordinate with the Orange County Fire Authority to implement the City's Hazardous Materials Area Plan within Laguna Hills. Implementation Program S-10 encourages residents to participate in the County's Hazardous Waste Reduction Program. Implementation Program LU-2 requires that all projects be reviewed and processed per CEQA. As specific development projects are proposed, additional environmental analysis will be undertaken to determine the threat to human health and the environment from potential hazardous materials. Additional environmental documentation and environmental studies, such as but not limited to investigations, sampling, and/or remediation, could be required for specific development projects. Appropriate mitigation measures could also be required if significant hazardous materials impacts are identified.

- Envirostor (formerly CalSites): A Database primarily used by the California Department of Toxic Substances Control, accessible through DTSC's website (see below).
- Resource Conservation and Recovery Information System (RCRIS): A database of RCRA facilities that is maintained by U.S. EPA.
- Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS): A database of CERCLA sites that is maintained by U.S.EPA.
- Solid Waste Information System (SWIS): A database provided by the California Integrated Waste Management Board which consists of both open as well as closed and inactive solid waste disposal facilities and transfer stations.
- Leaking Underground Storage Tanks (LUST) / Spills, Leaks, Investigations and Cleanups (SLIC): A list that is maintained by Regional Water Quality Control Boards.
- Local Counties and Cities maintain lists for hazardous substances cleanup sites and leaking underground storage tanks.
- The United States Army Corps of Engineers, 911 Wilshire Boulevard, Los Angeles, California, 90017, (213) 452-3908, maintains a list of Formerly Used Defense Sites (FUDS).

7-2 (Contd)

2) The EIR should identify the mechanism to initiate any required investigation and/or remediation for any site that may be contaminated, and the government agency to provide appropriate regulatory oversight. If necessary, DTSC would require an oversight agreement in order to review such documents.

7-3

3) Any environmental investigations, sampling and/or remediation for a site should be conducted under a Workplan approved and overseen by a regulatory agency that has jurisdiction to oversee hazardous substance cleanup. The findings of any investigations, including any Phase I or II Environmental Site Assessment Investigations should be summarized in the document. All sampling results in which hazardous substances were found above regulatory standards should be clearly summarized in a table. All closure, certification or remediation approval reports by regulatory agencies should be included in the EIR.

7-4

7-3 Please refer to response 7-2.

7-4 Please refer to response 7-2.

4) If buildings, other structures, asphalt or concrete-paved surface areas are being planned to be demolished, an investigation should also be conducted for the presence of other hazardous chemicals, mercury, and asbestos containing materials (ACMs). If other hazardous chemicals, lead-based paints (LPB) or products, mercury or ACMs are identified, proper precautions should be taken during demolition activities. Additionally, the contaminants should be remediated in compliance with California environmental regulations and policies. 7-5

5) Future project construction may require soil excavation or filling in certain areas. Sampling may be required. If soil is contaminated, it must be properly disposed and not simply placed in another location onsite. Land Disposal Restrictions (LDRs) may be applicable to such soils. Also, if the project proposes to import soil to backfill the areas excavated, sampling should be conducted to ensure that the imported soil is free of contamination. 7-6

6) Human health and the environment of sensitive receptors should be protected during any construction or demolition activities. If necessary, a health risk assessment overseen and approved by the appropriate government agency should be conducted by a qualified health risk assessor to determine if there are, have been, or will be, any releases of hazardous materials that may pose a risk to human health or the environment. 7-7

7) If it is determined that hazardous wastes are, or will be, generated by the proposed operations, the wastes must be managed in accordance with the California Hazardous Waste Control Law (California Health and Safety Code, Division 20, Chapter 6.5) and the Hazardous Waste Control Regulations (California Code of Regulations, Title 22, Division 4.5). If it is determined that hazardous wastes will be generated, the facility should also obtain a United States Environmental Protection Agency Identification 7-1 lber by contacting (800) 618-6942. Certain hazardous waste treatment proc 7-1 ıs or hazardous materials, handling, storage or uses may require authorization from the local Certified Unified Program Agency (CUPA). Information about the requirement for authorization can be obtained by contacting your local CUPA. 7-8

8) If the project area was used for agricultural, livestock or related activities, onsite soils and groundwater might contain pesticides, agricultural chemical, organic waste or other related residue. Proper investigation, and remedial actions, if necessary, should be conducted under the oversight of and approved by a government agency in the project area prior to construction of the project 7-9

7-5 Please refer to response 7-2.

7-6 Please refer to response 7-2.

7-7 Please refer to response 7-2.

7-8 Please refer to response 7-2.

7-9 Please refer to response 7-2.

If you have any questions regarding this letter, please contact me at ashami@dtsc.ca.gov or by phone at (714) 484-5472.

Sincerely,

Al Shami
Project Manager
Brownfields and Environmental Restoration Program - Cypress Office

cc: Governor's Office of Planning and Research
State Clearinghouse
P.O. Box 3044
Sacramento, California 95812-3044
state.clearinghouse@opr.ca.gov.

CEQA Tracking Center
Department of Toxic Substances Control
Office of Environmental Planning and Analysis
1001 I Street, 22nd Floor, M.S. 22-2
Sacramento, California 95814
gmoskat@dtsc.ca.gov

CEQA#2468

7-10

7-10 This comment provides closing remarks and provides contact information for the commenter. No formal response is required.

RECEIVED
MAR 19 2009
CITY OF LAGUNA HILLS

OCTA

BOARD OF DIRECTORS
Peter Buffa
Chairman
Jerry Amante
Vice Chairman
Patricia Bates
Director
Art Brown
Director
Bill Campbell
Director
Carolyn V. Cavecche
Director
William J. Dalton
Director
Richard Dixon
Director
Paul G. Glaab
Director
Cathy Green
Director
Allen Manoogr
Director
John Moorlach
Director
Janet Nguyen
Director
Chris Norby
Director
Curt Pringle
Director
Miguel Pulido
Director
Gregory T. Winterbottom
Director
Cindy Quon
Governor's
Ex-Officio Member

CHIEF EXECUTIVE OFFICE
Arthur T. Leahy
Chief Executive Officer

March 12, 2009

Ms. Julie Molloy, Senior Planner
City of Laguna Hills
24035 El Toro Road
Laguna Hills, CA 92653

Subject: Draft General Plan and Draft Program EIR

Dear Ms. Molloy:

The Orange County Transportation Authority (OCTA) has reviewed the above referenced document. The following comments are provided for your consideration: 8-1

- Please be aware that the OCTA has completed the South Orange County Major Investment Study. This study has identified a locally preferred strategy (LPS) for general mobility improvements in South Orange County (south of SR-55). The LPS includes elements which involve the addition of one general purpose lane to the I-5 between Avery Parkway and Alicia Parkway. 8-2

- On P. 5.14-13 under County of Orange Master Plan of Arterial Highways, please revise MPAH language to the following:

  - The Orange County Master Plan of Arterial Highways (MPAH) serves as a long range blueprint to ensure consistent standards and coordinated planning for over 1,400 miles of arterial streets in Orange County. The MPAH was initially established in 1956, and is continuously updated to reflect changing development and traffic patterns. Since 1990, consistency of local jurisdiction's General Plan Circulation Elements with the MPAH has been required for the receipt of Measure M funding. As part of the MPAH consistency requirement local jurisdictions must also obtain OCTA approval of proposed changes to MPAH facilities on their General Plan Circulation Elements. In order to ensure that inter-jurisdictional impacts are addressed, a cooperative traffic study is required in cases where the proposed MPAH amendment may have an impact outside the boundary of the requesting agency. 8-3

- On P. M-7 of the Draft General Plan, it is stated under the two bullet points that standard Primary and Secondary arterials have 36,000 and 28,000 ADT capacity, respectively. These capacities are inconsistent with MPAH guidelines and the capacities listed on Pages M-4 and M-6, which both state 8-4

Letter 8 – Orange County Transportation Authority

8-1 This comment indicates the Orange County Transportation Authority has reviewed the EIR and has provided comments. No formal response is required.

8-2 Comment noted. The South Orange County Major Investment Study improvement on the I-5 between Avery Parkway and Alicia Parkway only assumes committed improvements on the I-5 or improvements that are included in the Orange County Transportation Analysis Model (OCTAM), the parent traffic model to the Laguna Hills Traffic Analysis Model (LHTAM).

8-3 Page 5.14-13 of the EIR has been revised to include the following language provided by the commenter on the County of Orange MPAH. "The Orange County Master Plan of Arterial Highways serves as a long range blueprint to ensure consistent standards and coordinated planning for over 1,400 miles of arterial streets in Orange County. The MPAH was initially established in 1956, and is continuously updated to reflect changing development and traffic patterns. Since 1990, consistency of local jurisdiction's General Plan Circulation Elements with the MPAH has been required for the receipt of Measure M funding. As part of the MPAH consistency requirement, local jurisdictions must also obtain OCTA approval of proposed changes to MPAH facilities on their General Plan Circulation Elements. In order to ensure that inter-jurisdictional impacts are addressed, a cooperative traffic study is required in cases where the proposed MPAH amendments may have an impact outside of the boundary of the requesting agency." These changes do not affect the conclusions of the EIR.

8-4 The 28,000 and 36,000 are representative average daily traffic (ADT) volumes for secondary and primary arterials, respectively, at LOS "E" and are used as general guidelines. Actual roadway performance is determined from peak hour intersection volumes. The ADT volumes discussed on pages M-4 and M-6 of the General Plan are in the LOS "C" range. Nevertheless, the ADTs on Page M-7 of the Mobility Element will be revised to match the discussion on page M-4 and M-6 for consistency and clarity.

OCTA

BOARD OF DIRECTORS

Peter Buffa
Chairman

Jerry Amante
Vice Chairman

Patricia Bates
Director

Art Brown
Director

Bill Campbell
Director

Carolyn V. Cavecche
Director

William J. Dalton
Director

Richard Dixon
Director

Paul G. Glaab
Director

Cathy Green
Director

Allan Mansoor
Director

John Moorlach
Director

Janet Nguyen
Director

Chris Norby
Director

Curt Pringle
Director

Miguel Pulido
Director

Gregory T. Winterbottom
Director

Cindy Quon
Governor's
Ex-Officio Member

CHIEF EXECUTIVE OFFICE

Arthur T. Leahy
Chief Executive Officer

that a Primary and Secondary have 20,000-30,000 and 10,000-20,000 ADT capacity at level of service "C," respectively. | 8-4 (Contd)

If you have any questions or comments, please contact me by phone at (714) 560-5683 or by email at clarwood@octa.net. | 8-5

Sincerely,

Charles Larwood
Manager, Transportation Planning

c: Joseph Alcock, OCTA
Glen Campbell, OCTA
Tamara Warren, OCTA

Orange County Transportation Authority
550 South Main Street / P.O. Box 14184 / Orange / California 92863-1584 / (714) 560-OCTA (6282)

8-5 This comment provides the telephone number and email address for the commenter. No formal response is required.

SOUTHERN CALIFORNIA EDISON®
An EDISON INTERNATIONAL® Company

Frank A. Wasko, Ph.D.
Region Manager
Public Affairs

March 26, 2009

Ms. Julie Molloy
Senior Planner
City of Laguna Hills
24035 El Toro Road
Laguna Hills, CA 92653

RE: City of Laguna Hills General Plan Update

Dear Ms. Molloy:

The Southern California Edison Company (SCE) appreciates the opportunity to review and provide comment on the General Plan Update for the City of Laguna Hills. As one of the providers of electricity for the City, we look forward to continuing to provide the community safe and reliable electricity service, planning to serve the growth envisioned by the general plan update and assisting Laguna Hills with its efforts to conserve energy and build a more sustainable community.

SCE currently has the most successful energy efficiency program of any U.S. utility. During the past five years, SCE customers have saved more than four billion kilowatt-hours of energy – enough to power 500,000 homes for an entire year. This translated into reducing greenhouse gas emissions by more than 2 million tons – the equivalent of removing 250,000 cars from the road.

SCE offers green building and energy efficiency programs for developers, which can assist the City of Laguna Hills with meeting its proposed air quality and greenhouse gas mitigation specified in the Draft Program EIR and the policies proposed in the updated General Plan. For example, residential builders have the opportunity to participate in SCE's California New Homes Program, a program awarding a limited number of financial incentives to homebuilders who construct homes exceeding California's energy efficiency standards for new residential development (Title 24). In addition, SCE offers the Sustainable Communities Program, an innovative pilot program targeting developers of large mixed-use, multi-family or multiple building construction projects that are willing to commit to aggressive energy efficiency and sustainable design goals. Financial incentives are also available for this program to off-set the cost of energy efficiency measures.

9-1

Nonresidential developers can participate in the Savings By Design Program, a program sponsored by four of California's largest utilities, including SCE, under the auspices of the California Public Utilities Commission (CPUC). This program

1325 S. Grand Ave.
Santa Ana, CA 92705
714-973-5573/PAX 52573
Fax 714-973-5752
waskofa@sce.com

Letter 9 – Southern California Edison

9-1 This comment provides opening remarks and describes energy efficiency and green buildings programs offered by Southern California Edison. The comments are hereby noted. The City appreciates the suggestion of green building and energy efficiency programs provided by the commenter. The General Plan Implementation Program LU-8, Sustainable Development, contains the following program: "Participate in utility-sponsored (e.g., Southern California Edison) sustainability programs." The City will consider adding the following language to General Plan Implementation Program LU-8. "During the development review process for large development projects (greater than 10 units and/or 10,000 square feet), the City will coordinate with energy providers to determine if additional energy efficiency measures can be incorporated into a project's design." These changes do not affect the conclusions of the EIR.

offers builders and their design team a wide range of services, including design assistance to maximize energy efficiency, incentives to offset costs of energy efficient buildings, and design team incentives, which rewards designers who meet ambitious energy efficiency targets.

In addition to your current proposed general plan policy encouraging the City to participate in utility energy efficiency programs, SCE suggest you consider including a general plan policy encouraging developers of large residential and nonresidential development, mixed-use and specific plans to contact energy providers early in the planning process to determine any additional energy efficiency measures that can be incorporated into a project's design. For more information on these programs and other SCE services, please refer to SCE's website at http://www.sce.com/. 9-1 (Contd)

SCE would also like to take this opportunity to inform the City of Laguna Hills of key electrical service and operational issues relative to land use and development. With regards to proposed general plan land use changes potentially affecting SCE facilities, please be aware SCE purchases its property rights at fair market value with rate payer funds, including both fee owned property and easements, many of which are exclusive. As a state regulated utility company, Public Utilities Code Section 851 prohibits any additional encumbrances that would reduce the value of any land asset, reduce the integrity (terms and conditions) of the asset, or could result in negatively impacting service and operational reliability. For this reason, we would appreciate being informed of any proposed land use changes affecting our facilities and thank you for your understanding in this matter. 9-2

SCE is also concerned when developers propose to incorporate SCE power line transmission corridors and utility easements into a project's design to fulfill active open space, trails or recreational land use requirements instead of impacting their developable land area. SCE refers to these proposals as secondary land uses within our easements. Secondary land uses such as multi-use trails and recreational parks within powerline transmission corridors may be incompatible land uses due to SCE's Operational and Maintenance (O&M) requirements for its facilities, and because such secondary uses may become unavailable to the public for extended periods of time during SCE system construction and/or maintenance. Also, secondary land uses in our easements would require the underlying fee owner to consent to the secondary use, which is most often not feasible. SCE would like to suggest a general plan policy stating any proposed secondary land uses on utility property be addressed directly with the utility provider at the earliest stages of a project's planning and development. SCE will work closely with the City of Laguna Hills where such uses are unavoidable and necessary to support general plan policies and would be compatible with SCE's easement rights and O&M requirements. 9-3

9-2 Comment is noted. Any land use changes proposed by the City of Laguna Hills, including the land uses changes in the proposed General Plan, are subject to public hearings and are noticed in accordance with the City of Laguna Hills Municipal Code.

9-3 The City will consider adding the following policy to the proposed General Plan. "Coordinate with utility providers when development projects propose secondary land uses such as open space, trails, and recreational land uses in utility company property or easements."

SCE recognizes new development may require environmental mitigation, including the creation of new habitat or restoration of degraded habitat. When environmental mitigation is proposed that is adjacent to or would include SCE operating property, SCE's ability to continue to provide safe and reliable electricity service thorough the operation, maintenance, modification or upgrading of facilities may be seriously compromised. For example, legally protected habitat that grows on an SCE transmission corridor could inhibit SCE from performing necessary repairs to existing facilities or upgrading existing facilities to serve increased customer demand. We respectfully request general plan policy language indicating utility lands, including rights of way, are not compatible as locations for environmental mitigation, unless there are specific unique circumstances that have been addressed between the City, SCE and the project proponent. Where environmental mitigation in proximity to SCE lands is unavoidable, we further respectfully request any such mitigation but subject to early joint review between the City and SCE to ensure SCE's ability to operate and maintain its systems will not be compromised and that any approved mitigation is compatible with SCE's operating requirements. 9-4

In addition, for any large scale residential and non-residential development or for specific plans, SCE appreciates being notified early in the development planning process to allow for effective electricity planning to serve the project. Please note, when development plans result in the need to build new or relocate existing SCE electrical facilities that operate at or above 50 kilovolts, the resulting SCE construction may have environmental impacts that could be subject to CEQA review. If the SCE facilities are not adequately addressed in the local agency CEQA review for the larger development project and CPUC review of the relocated or new electric facilities is required, the CPUC permit process and separate CEQA review could delay approval of the SCE power line portion of the project for up to two years or longer. If, however, the SCE facilities are adequately addressed in the CEQA review for the larger development process, SCE may be able to construct or relocate its related facilities exempt from the CPUC permit requirements under Exemption F of GO 131D. 9-5

Once again, SCE appreciates the opportunity to review and provide comment on the updated General Plan for the City of Laguna Hills. If you have any questions regarding our comments, please feel free to contact me at (714) 973-5573. 9-6

Sincerely,

Frank

Frank Wasko
Region Manager
Southern California Edison Company

9-4 The City will consider adding the following policy to the proposed General Plan. "Coordinate with utility providers when development projects propose environmental mitigation land in and adjacent to utility company property or easements."

9-5 Comment is noted. The City will consider revising proposed General Plan Implementation Program CSF-8 as follows: "As part of the development application and review process, coordinate with Southern California Edison, San Diego Gas and Electric, Cox Communications Orange County, The Gas Company, AT&T, cellular telephone service providers, and other local utilities to assess capacity and infrastructure needs to support new development or redevelopment activities."

9-6 This comment provides closing remarks and telephone number for the commenter. No formal response is required.

Southern California Gas Company

A Sempra Energy utility™

1919 S. State College Blvd.
Anaheim, CA 92806-6114

RECEIVED
FEB 13 2009
CITY OF LAGUNA HILLS

February 10, 2009

City of Laguna Hills
24035 El Toro Rd.
Laguna Hills, CA 92653

Attention: Julie Molloy

Subject: EIR for Laguna Hills General Plan.

Thank you for providing the opportunity to respond to this E.I.R. Document. We are pleased to inform you that Southern California Gas Company has facilities in the area where the aforementioned project is proposed. Gas service to the project can be provided from an existing gas main located in various locations. The service will be in accordance with the Company's policies and extension rules on file with the California Public Utilities Commission when the contractual arrangements are made. 10-1

This letter is not a contractual commitment to serve the proposed project but is only provided as an informational service. The availability of natural gas service is based upon conditions of gas supply and regulatory agencies. As a public utility, Southern California Gas Company is under the jurisdiction of the California Public Utilities Commission. Our ability to serve can also be affected by actions of federal regulatory agencies. Should these agencies take any action, which affect gas supply or the conditions under which service is available, gas service will be provided in accordance with the revised conditions. 10-2

This letter is also provided without considering any conditions or non-utility laws and regulations (such as environmental regulations), which could affect construction of a main and/or service line extension (i.e., if hazardous wastes were encountered in the process of installing the line). The regulations can only be determined around the time contractual arrangements are made and construction has begun.

Estimates of gas usage for residential and non-residential projects are developed on an individual basis and are obtained from the Commercial-Industrial/Residential Market Services Staff by calling (800) 427-2000 (Commercial/Industrial Customers) (800) 427-2200 (Residential Customers). We have developed several programs, which are available upon request to provide assistance in selecting the most energy efficient appliances or systems for a particular project. If you desire further information on any of our energy conservation programs, please contact this office for assistance. 10-3

Sincerely,

Paul Simonoff
Technical Services Supervisor
Pacific Coast Region - Anaheim

PS/mr
eir02.doc

Letter 10 – Southern California Gas Company

10-1 The comment provides opening remarks and indicates that gas service can be provided to the proposed General Plan area from an existing gas main located in various locations in the planning area. No formal response is required.

10-2 Comment is noted.

10-3 This comment provides closing remarks and provides contact information for estimates of gas usage for residential and nonresidential projects. Additionally, the comment indicates that energy conservation and energy efficiency information is available from the utility. No formal response is required.

LAW OFFICES OF ROBERT C. HAWKINS

May 13, 2009

Via email (jmolloy@ci.laguna-hills.ca.us) and Messenger

Julie Molloy, Senior Planner
Community Development Department
City of Laguna Hills
24035 El Toro Road
Laguna Hills, California 92653

Re: The City of Laguna Hill's Draft Environmental Impact Report ("DEIR") for the General Plan and DEIR for the General Plan Update and associated Zoning Code Amendments (the "Project")

Greetings:

As you may know, this firm represents the Golden Rain Foundation ("GRF"), a California non-profit mutual benefit corporation, which oversees the management and maintenance of the facilities and services within the senior community of Laguna Woods Village, formerly known as "Leisure World."

On behalf of GRF, we thank you for allowing us to provide comments on the important DEIR and on the Project at this late date. See Attachment 1. We trust that these comments will assist the City of Laguna Hills (the "City") in preparing a full and complete EIR which will comply with all of the requirements of the California Environmental Quality Act, Public Resources Code section 21000 et seq. Further, we hope that these comments will improve the Project and ensure its compliance with the Planning and Zoning Law, Government Code section 65000 et seq. 11-1

In compliance with the requirements of the California Environmental Quality Act, Public Resources Code section 21000 et seq. ("CEQA") and on behalf of GRF, we offer the following comments on the captioned DEIR.

110 Newport Center Drive, Suite 200
Newport Beach, California 92660
(949) 650-5550
Fax: (949) 650-1181

Letter 11 – Law Offices of Robert C. Hawkins for Golden Rain

11-1 This comment provides opening remarks and indicates that the commenter represents the Golden Rain Foundation. No formal response is required.

I. Summary of Concerns.

1. The Program DEIR lacks essential specifics of the Project now known to the City.
2. The DEIR fails to describe the Project fully, completely, and accurately.
3. The DEIR's Project Description is inaccurate and must be revised.
4. The DEIR's discussion of the Environmental Setting fails to explain the environmental baseline for the environmental analysis and fails provide specifics regarding the Project.
5. The DEIR fails to analyze crucial Project traffic impacts in Laguna Woods and fails to consider mitigation for such impacts.

11-2

II. Introduction: EIR Standards.

An EIR constitutes the heart of CEQA, Public Resources Code sections 21000 et seq. CEQA Guidelines section 15149(b) states:

> ". . serves as a public disclosure document explaining the effects of the proposed project on the environment, alternatives to the project, and ways to minimize adverse effects and to increase beneficial effects."

See California Public Resources Code section 21003(b) (requiring that the document must disclose impacts and mitigation so that the document will be meaningful and useful to the public and decision-makers.)

Further, CEQA Guidelines section 15151 sets forth the adequacy standards for an EIR:

11-3

> "An EIR should be prepared with a sufficient degree of analysis to provide decision-makers with information which enables them to make a decision which takes account of the environmental consequences. An evaluation of the environmental effects of a proposed project need not be exhaustive, but sufficiency of an EIR is to be reviewed in the light of what is reasonably feasible. Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among the experts. The courts have looked not for perfection but for adequacy, completeness, and a good faith attempt at full disclosure."

Further, "the EIR must contain facts and analysis, not just the agency's bare conclusions or opinions." Concerned Citizens of Costa Mesa, Inc. v. 32nd District Agricultural Association. (1986) 42 Cal. 3d 929, 935. (Emphasis supplied.)

110 Newport Center Drive, Suite 200
Newport Beach, California 92660
(949) 650-5550
Fax: (949) 650-1181

11-2 This comment summarizes the commenter's concerns about various parts of the EIR. These concerns are addressed in subsequent comments, as follows: Concern number 1 is addressed in comment 11-5, concern numbers 2 and 3 are addressed in comments 11-7 through 11-9, concern number 4 is addressed in comment 11-10, and concern number 5 is addressed in comments 11-11 through 11-15, 11-17 through 11-19, and topical response #1.

11-3 This comment states the commenter's understanding of case law and CEQA guidelines only and does not present any specific comment related to the Laguna Hills General Plan Program EIR for which a specific response can be provided.

An agency's determination in connection with an EIR must be supported by substantial evidence. Public Resources Code sections 21168 and 21168.5. "[S]ubstantial evidence includes fact, a reasonable assumption predicated upon fact, or expert opinion supported by fact." Public Resources Code section 21080(e)(1). However, "[r]elevant personal observations such as [personal observations about noise] can constitute substantial evidence." Oro Fino Gold Mining Corp. v. County of Del Oro (1990) 225 Cal. App. 3d 872, 882.

In addition, an EIR must specifically address the environmental effects and mitigation of the Project. But "[t]he degree of specificity required in an EIR will correspond to the degree of specificity involved in the underlying activity which is described in the EIR." CEQA Guidelines section 15146. The analysis in an EIR must be specific enough to ensure that the public and decisionmakers will understand the Project and its impacts, and make informed decisions about the project, the EIR and project mitigation. The EIR must produce sufficient information and analysis to understand the environmental impacts of the proposed project and to permit a reasonable choice of alternatives so far as environmental aspects are concerned. See Laurel Heights Improvement Association v. Regents of the University of California (1988) 47 Cal. 3d 376.

Further, an agency must address all impacts of its project on the environment. Public Resources Code section 21002.1. A public agency cannot avoid this analysis of project impacts or proposing mitigation for such project impacts, because the impacts on the environment fall in another jurisdiction. City of Marina v. Bd. of Trustees of Cal. State Univ. (2006) 39 Cal.4th 341, 359-60. Of course, CEQA defines the "environment" broadly: "the physical conditions which **exist within the area which will be affected by a proposed project**." Public Resources Code section 21060.5 (Emphasis added.). 11-3 (Contd)

Also, to the extent that an EIR proposes mitigation measures, it must provide specific measures. It cannot defer such measures until some future date or event. "By deferring environmental assessment to a future date, the conditions run counter to that policy of CEQA which requires environmental review at the earliest feasible stage in the planning process." Sundstrom v. County of Mendocino (1988) 202 Cal. App. 3d 296, 308. See Bozung v. Local Agency Formation Com.(1975) 13 Cal.3d 263, 282 (holding that "the principle that the environmental impact should be assessed as early as possible in government planning."); Mount Sutro Defense Committee v. Regents of University of California (1978) 77 Cal. App. 3d 20, 34 (noting that environmental problems should be considered at a point in the planning process "where genuine flexibility remains"). CEQA requires more than a promise of mitigation of significant impacts: mitigation measures must really minimize an identified impact.

"Deferral of the specifics of mitigation is permissible where the local entity commits itself to mitigation and lists the alternatives to be considered, analyzed and possibly incorporated in the mitigation plan. (Citation omitted.) On the other hand, an agency goes too far when it simply requires a project applicant to obtain a biological report and then comply with any recommendations that may be made in the report. (Citation omitted.)" Defend the Bay v. City of Irvine (2004) 119 Cal. App. 4th 1261, 1276.

110 Newport Center Drive, Suite 200
Newport Beach, California 92660
(949) 650-5550
Fax: (949) 650-1181

III. Section 1, "Introduction," and the Story of a Program DEIR.

Section 1, "Introduction," discusses the nature and intent of the Program DEIR. A program EIR may be prepared:

> ". . .on a series of actions that can be characterized as one large project and are related either:
>
> (1) Geographically,
>
> (2) As logical parts in the chain of contemplated actions,
>
> (3) In connection with issuance of rules, regulations, plans, or other general criteria to govern the conduct of a continuing program, or
>
> (4) As individual activities carried out under the same authorizing statutory or regulatory authority and having generally similar environmental effects which can be mitigated in similar ways."

11-4

CEQA Guidelines section 15168(a) (14 California Code of Regulations section 15168(a)) (hereafter "CEQA Guidelines section"). A program EIR may be used in connection with later activities as provided in Section 15168(c):

> "Subsequent activities in the program must be examined in the light of the program EIR to determine whether an additional environmental document must be prepared.
>
> * * *
>
> (5) A program EIR will be most helpful in dealing with subsequent activities if it deals with the effects of the program as specifically and comprehensively as possible. With a good and detailed analysis of the program, many subsequent activities could be found to be within the scope of the project described in the program EIR, and no further environmental documents would be required."

Unfortunately, the Program DEIR lacks essential specifics which are currently available to the City. For instance, the Traffic Study locates the additional square footage which is part of the Project. However, the DEIR fails to provide that information or even to confirm the location of the additional development entitlement. The Program DEIR should be revised and recirculated for public review and comment with as many details and specifics as are available to the City.

11-5

110 Newport Center Drive, Suite 200
Newport Beach, California 92660
(949) 650-5550
Fax: (949) 650-1181

11-4 This comment states the commenter's understanding of case law and CEQA guidelines only and does not present any specific comment related to the Laguna Hills General Plan Program EIR for which a specific response can be provided.

11-5 As noted on page 3-6 of the EIR, "Future development within the planning area will take the form of redevelopment and infill opportunities focused in several areas described as Opportunity Areas and Future Study Areas within the General Plan. Opportunity areas represent sites within the City of Laguna Hills where future land use change is likely to occur throughout the planning horizon of the General Plan." As stated on page 3-8, "the three opportunity areas include Alicia Gateway, Via Lomas, and Moulton and La Paz…Outside of the opportunity areas, no major land use changes are anticipated to occur. Figure 3-4 in the EIR indentifies the location of the opportunity areas. As stated on Page 3-10 of the EIR, "In addition to the opportunity areas…, the City of Laguna Hills contains future study areas that have been considered for revitalization in the future. The Land Use Plan does not change any of the land use designations in the areas identified as future study areas. However, the Plan recognizes that opportunities exist to redevelop, improve, or intensify some of the land uses in the future study areas. The future study areas include the North Business Park, Urban Village, La Paz Gateway, and Alicia Parkway/Aliso Hills Park Triangle."

The development capacity allowed under the General Plan pursuant to the land use changes proposed in the opportunity areas and future study areas is shown in Table 3-3 of the EIR. As explained in the paragraph preceding this table, the development capacity shown in this table takes into account the development that could occur in the opportunity and future study areas consistent with the policies in the Land Use Element. To further illustrate the development capacity of each of the opportunity and future study areas, Table 3-4 has been added to the project description of the EIR. In addition, the anticipated development that is anticipated to occur through the time horizon of the General Plan has been added to the description of each opportunity and future study area in the project description of the EIR. As the commenter notes, this information regarding anticipated square footage of new development by opportunity area and future study area was provided in the traffic report appended to and circulated with the EIR, allowing the public to review and comment upon this information.

The commenter indicates that the EIR fails to confirm the location of additional development entitlement. It is important to note that the Laguna Hills General Plan does not entitle any specific development projects within Laguna Hills. The General Plan assigns all land within the City a land use designation that specifies a maximum density and/or intensity, if applicable, and general use to which areas can be developed, consistent with all other goals policies, and elements in the General Plan. However, the General Plan does not propose any specific development projects or entitle any specific development project.

The commenter also notes that the EIR should be recirculated for public review and comment. CEQA Guidelines Section 15088.5 states "A lead agency is required to recirculate an EIR when significant new information is added to the EIR after public notice is given of the availability of the draft EIR for public review under Section 15087 but before certification. As used in this section, the term "information" can include changes in the project or environmental setting as well as additional data or other information. New information added to an EIR is not "significant" unless the EIR is changed in a way that deprives the public of a meaningful opportunity to comment upon a substantial adverse environmental effect of the project or a feasible way to mitigate or avoid such an effect (including a feasible project alternative) that the project's proponents have declined to implement. "Significant new information" requiring recirculation includes, for example, a disclosure showing that (1) A new significant environmental impact would result from the project or from a new mitigation measure proposed to be implemented. (2) A substantial increase in the severity of an

environmental impact would result unless mitigation measures are adopted that reduce the impact to a level of insignificance. (3) A feasible project alternative or mitigation measure considerably different from others previously analyzed would clearly lessen the environmental impacts of the project, but the project's proponents decline to adopt it. (4) The draft EIR was so fundamentally and basically inadequate and conclusory in nature that meaningful public review and comment were precluded. CEQA Guidelines Section 15088.5(b) states that: Recirculation is not required where the new information added to the EIR merely clarifies or amplifies or makes insignificant modifications in an adequate EIR.

Consistent with CEQA Guidelines Section 15088.5(b), clarifications and amplifications made throughout the EIR have not increased the severity of an impact or resulted in a new significant impact. There are no impacts described as less than significant, in the EIR, that have been reevaluated in the Final EIR as significant and unavoidable as a result of revisions and new information. Also, no substantial increase in the severity of impacts has been identified as a result of information presented in comments on EIR In light of the above, the City has determined that recirculation of the EIR is not required.

IV. Section 2, "Executive Summary," Begins the Problematic Impact Analysis.

Section 2 is the Executive Summary which summarizes the environmental impact analysis in the Program DEIR. Among other things, Section 2 recognizes that the Project will have significant and unmitigated impacts on Air Quality, Public Services– Water Supply, and Climate Change. These significant and unmitigated impacts will require the City to adopt a Statement of Overriding Considerations. However, as discussed below, these impacts can be mitigated or lessened with a Project alternative with lesser intensity. 11-6

Further, these impacts also show much of the Program DEIR's impact analysis is incomplete including its analysis of traffic and transportation. As indicated below, the Project's impacts on traffic and transportation are significant and requires mitigation.

V. Section 3, "Project Description," Fails to Describe the Project Fully and Completely.

Section 3 attempts to describe the Project. Of course, as noted above, the Project is a Program– the City's General Plan and implementing regulations. Section 3.2 discusses the regional setting of the Program. This section notes that the Project is adjacent to the City of Laguna Woods. However, GRF and related associations own property along the City's border. Project impacts likely will affect GRF and its related associations.

Figure 3-2 shows this setting. The City is almost a kidney shaped municipality which wraps around GRF and the City of Laguna Woods. Among other things, Moulton Parkway serves as an important north south arterial which connects two different portions of the City. El Toro Road which is an important east west arterial serves as an important roadway from Interstate 5 to California Route 73 and points west including Laguna Woods. 11-7

Section 3.4 discusses the Program's Objectives and Goals. Among other things, Section 3.4 states:

> "A General Plan stimulates thinking within the community about the City's future and generates many important questions for consideration.":

DEIR, 3-4. This is correct but incomplete. The General Plan does more than "stimulate[] thinking;" it serves to entitle development. As discussed below, the Project's entitlement is significant and has impacts on the environment.

Further, it notes:

> "While the local circulation system is experiencing some congestion, the updated General Plan would strategically link land use and transportation to make efficient use of existing system capacity."

110 Newport Center Drive, Suite 200
Newport Beach, California 92660
(949) 650-5550
Fax: (949) 650-1181

11-6 This comment begins with a summary of the contents of the Executive Summary section of the EIR. As noted by the commenter, a statement of overriding considerations would need to be adopted by the City because of significant and unavoidable impacts that cannot be mitigated below a level of significance for Air Quality, Public Services and Utilities - Water Supply, and Global Climate Change. CEQA Guidelines Section 15126.6(a) states "an EIR shall describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives." Furthermore, Section 15126.6 states "because an EIR must identify ways to mitigate or avoid the significant effects that a project may have on the environment (Public Resources Code Section 21002.1), the discussion of alternatives shall focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly." As noted in Chapter 7.0 of the EIR, the No Change to Urban Village Specific Plan alternative would result in less impact when compared to the project in the environmental issue areas of air quality and global climate change, and a similar impact to public services and utilities. The Mandatory Conservation Measures and Programs alternative would result in less impact when compared to the project in the environmental issue areas of air quality, public services and utilities, and global climate change. Both alternatives were found to be environmentally superior to the project.

The City's decision makers have the option, as part of their consideration of the project, to consider modifications to the project, such as adoption of either the No Change to Urban Village Specific Plan or Mandatory Conservation Measures and Programs alternative presented in the EIR that would reduce some but not all of the impacts when compared with the project. However, adoption of the No Change to Urban Village Specific Plan alternative would not allow for an additional 117,000 square feet of retail space and would not set minimum densities at 30 dwelling units per acre in the UVSP area. Adoption of the Mandatory Conservation Measures and Programs alternative would further reduce the environmental effects of the General Plan but would likely take several years to develop and adopt new or amended regulations and programs to implement the mandatory policies of the alternative.

The commenter's concerns regarding incomplete traffic and transportation analysis are addressed in comments 11-11 through 11-15.

11-7 The first portion of this comment summarizes portions of the project description and provides informational statements that do not raise environmental issues. The commenter then states that the "General Plan…serves to entitle development…The Project's entitlement is significant and has impacts on the environment." As noted in response 11-5, the General Plan does not propose any specific development project or entitle any specific development project. Further, as stated in the Project Description on page 3-11 "Over time, as properties transition from one use to another or property owners rebuild in the opportunity areas, land uses and intensities would gradually shift to align with the intent of the Land Use Element. Given the largely built-out character of Laguna Hills and the good condition of most buildings, significant redevelopment activities may not occur over the life of this General Plan. However, within the opportunity areas and future study areas described above, future land use changes are anticipated." The development capacity allowed under the General Plan is illustrated in Table 3-3 of the EIR. The development capacity takes into account the development that could occur in the future study and opportunity areas consistent with the policies in the Land Use Element. The EIR analysis, including but not limited to the air quality, noise, and traffic analyses, is based upon the development capacity presented in Table 3-3, and therefore considers the growth anticipated in the future study and opportunity areas.

The commenter states that the Program (General Plan) fails to provide a strategic link between land use and transportation. However, the Mobility Element and the Land Use Element of the General Plan contain numerous goals and policies linking land use and mobility (i.e., transportation). Specifically, Policy M-3.1 states “Continue to extend and maintain pedestrian paths, bikeways, and equestrian trails that connect to local and regional activity centers,” Policy M-3.6 states “Make improvements that support safe routes to schools, parks, and neighborhood activity centers” and Policy M-3.7 states “Encourage the provision of bicycle facilities in activity centers, places of employment, and public transit systems.” Please refer to the Mobility Element and Land Use Element for additional examples of policies that promote land use and transportation connectivity. The General Plan also contains specific implementation programs to implement these policies. Implementation Program M-5 states “Update the Bikeways, Trails and & Open Space Master Plan. Identify gaps and major barriers to connectivity in the City and identify appropriate means and locations for overcoming those barriers. Include a pedestrian/walkability component in the updated Plan that identified areas where major barriers to connectivity exist, and measures and/or techniques to improve walkability and safety.” Please refer to the Mobility and Land Use Sections of Appendix A of the General Plan Implementation Program for other examples of programs that serve to connect transportation and land use activities.

Furthermore, the Mobility Element also contains policies and implementation programs that address traffic issues outside of the City of Laguna Hills. Policy M-1 states “consider and address regional traffic generation and impacts from development in surrounding communities when planning improvements to the local circulation system.” Policy M-1.4 states “work with neighboring cities to address impacts of new development that cross jurisdictional boundaries.” The General Plan also contains specific implementation programs that implement these policies. Implementation Program M-1 requires, in part, “…the City will coordinate with local jurisdictions to reduce the impacts of development in Laguna Hills on adjacent jurisdictions.” Implementation Program M-3 requires that the City “continue to participate in inter-jurisdictional forums for Growth Management Areas (GMA) 9 and 10. With other participating jurisdictions, work to maintain a list of GMA transportation improvement projects designed to accommodate General Plan growth projections. The member jurisdictions through the inter-jurisdictional forums have developed a deficient intersection list. The City will establish appropriate mitigation standards for those intersections exceeding the level of service target, or will determine that a given intersection is subject to a finding of special circumstances.”

The commenter’s comments regarding the failure of the EIR to address project-related traffic impacts suffered outside of the City are discussed in topical response #1.

Id. Unfortunately, the Program fails to provide this strategic link between land use and transportation in part because it impermissibly fails to address Project related traffic impacts suffered outside of the City. CEQA requires that the DEIR analyze all of the Project's impacts on the environment, not just those impacts within the City. 11-7 (Contd)

Further, Section 3.4 states that most of the Project development areas are infill areas. Of particular concern is the future study area of the Urban Village Specific Plan:

> "Opportunities in this area include intensification and redevelopment as already allowed under the Urban Village Specific Plan (UVSP). Additionally, the General Plan allows the addition of 117,000 square feet of retail space, above and beyond that specified in the UVSP. The General Plan would also amend the UVSP to allow residential densities between 30 and 50 dwelling units per acre." 11-8

DEIR, 3-10. Both of these changes, the increase of 117,000 in retail space and the increase in residential densities, will result in significant, unanalyzed, and unmitigated impacts in the vicinity of the UVSP. For instance, although Table 3-2 notes that the residential dwelling units will remain the same, 200 dwelling units, the increased density will substantially increase the number of dwelling units. The Program allows a substantial density increase which may result in significant impacts.

Also, Table 3-3 identifies substantial increases in non-residential square footage throughout the City: 1,031,530 square feet. However, except for Table 3-2, it is unclear where this substantial square footage occurs or is located. In addition, Table 3-3 notes that residential units will increase by 457 units. However, it is unclear whether this increase is simply a function of the increased densities allowed under the Project or some new development center within the City. The Traffic Study attempts to locate much of this development but it is absent from the body of the DEIR. 11-9

The DEIR should be revised to address these issues, and be recirculated for public review and comment.

VI. Section 4, "Environmental Setting," Fails to Describe Areas for Additional Development.

Section 4 attempts to discuss the environmental setting of the Project. CEQA Guidelines section 15125(a): 11-10

> "An EIR must include a description of the physical environmental conditions in the vicinity of the project, as they exist at the time the notice of preparation is published, or if no notice of preparation is published, at the time environmental analysis is commenced, from both a local and regional perspective. This environmental setting will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant. The description of the environmental setting shall be

110 Newport Center Drive, Suite 200
Newport Beach, California 92660
(949) 650-5550
Fax: (949) 650-1181

11-8 The commenter incorrectly states that the General Plan would increase residential densities in the UVSP area. The UVSP, adopted in November 1992, already allows residential densities of up to 50 dwelling units per acre (see page 35 of the UVSP). The General Plan would also allow residential densities in the UVSP of up to 50 dwelling units per acre. Therefore, the General Plan does not allow for an increase in the number of dwelling units in the UVSP area. The General Plan does set a floor for residential development in the UVSP area of a minimum 30 dwelling units per acre, whereas the UVSP did not set minimum residential density. Nevertheless, the maximum density is the same in the General Plan as in the 1992 UVSP.

The General Plan does allow an increase of 117,000 square feet of retail space above that allowed in the UVSP. This additional 117,000 square feet of retail development allowed is reflected in the development capacity found in Table 3-3. Therefore, the environmental effects of allowing an additional 117,000 square feet of retail space in the UVSP area has been fully analyzed in the EIR, including the air quality and traffic analyses.

11-9 Refer to response 11-5 for a discussion of nonresidential development allowed under the General Plan. The development capacity allowed under the General Plan, including additional residential units, is shown in Table 3-3 of the EIR. The development capacity shown in this table takes into account the development that could occur in the opportunity and future study areas consistent with the policies in the Land Use Element. The textual descriptions of each opportunity area and future study area further describe whether additional residential development is expected to occur in a particular area. Table 3-4 has been added to the EIR to further illustrate the development capacity of the opportunity areas and future study areas. In addition, the specific anticipated development capacity that is expected to occur through the time horizon of the General Plan has been added to the description of each opportunity and future study area in the project description of the EIR. For residential development, under the General Plan, approximately 200 dwelling units could be built in the UVSP area, as indicated in Table 3-2. Table 3-4, which has been added to the EIR, shows the additional 200 dwelling units in the UVSP area as well as the 250 units allowed in the Via Lomas area. Additionally, seven dwelling units could be built on currently vacant parcels, as indicated in Table 3-3. The expected residential development that is anticipated to occur through the time horizon of the General Plan has been added to the description of the Via Lomas opportunity area in the project description of the EIR. As the commenter notes, the specific information regarding anticipated square footage and residential units of new development by opportunity area and future study area was provided in the traffic report appended to and circulated with the EIR, allowing the public to review and comment upon this information.

11-10 CEQA Guidelines Section 15125 requires that an existing environmental setting presented in an EIR be detailed enough to effectively provide a basis for evaluating whether a proposed action would have a significant effect upon the environment. The existing environmental setting described in the EIR is intended to be broad enough to adequately describe the existing environmental conditions in the geographic vicinity of the project area in order to determine the significance of the project's potential impacts. The environmental setting normally constitutes the baseline conditions against which the significance of any physical change in the environment that may occur as a result of the project will be measured. Chapter 4.0 of the EIR presents an overview of the environmental setting in the vicinity of the project area. It is important to note that each environmental issue area analyzed in the EIR (Aesthetics and Visual Resources; Agricultural Resources; Air Quality; Biological

no longer than is necessary to an understanding of the significant effects of the proposed project and its alternatives."

However, the DEIR contains little discussion of the physical environment including existing residential units, existing non-residential square footage and other uses. The DEIR does state that:

"Existing land uses generate approximately 172,023 average vehicle trips per day."

DEIR, 4-2. However, it provides no discussion of which land uses generate what traffic. The DEIR must be revised to discuss fully the environmental setting, the baseline for the environmental analysis. Without this baseline, the environmental analysis is without foundation. The analysis has nothing with which to compare the Project and its impacts: the baseline is key for this analysis.

Further, Section 4 states that:

"The planning area is almost entirely built out, although there are seven undeveloped large lot residential parcels scattered throughout the southern portion of the City."

DEIR, 4-1. Nonetheless, as indicated above, the Project adds 1,031,530 square feet of non-residential uses throughout the City. Given the environmental setting, it is unclear where this square footage can and/or will go. The DEIR should be revised to discuss and locate where such development would occur. The Traffic Study attempts to locate much of this development but it is absent from the body of the DEIR.

The DEIR should be revised to address these issues, and be recirculated for public review and comment.

11-10 (Contd)

VII. Section 5, "Environmental Impact Analysis," Fails to Identify, Analyze and Propose Mitigation for Project Impacts including Project Traffic Impacts.

Section 5 discusses the Project's environmental impacts on the Project area. As indicated above, CEQA requires that such analysis and mitigation extend to all Project impacts on the environment, not simply impacts within the City.

A. Section 5.14, "Transportation and Circulation," Fails to Discuss Fully the Project's Impacts on the Environment, including Impacts on GRF's Property.

Section 5.14 attempts to discuss the Project's traffic impacts. Unfortunately, the Environmental Impact Analysis of Transportation and Circulation is truncated and incomplete. For instance, Figure 5.14-2 shows the "existing average daily traffic" ("ADT"). Because these figures measure quantities and the Traffic Study uses "trips" rather than "traffic", Section 5.14 should be revised to referr to these as average daily trips. However, Figure 5.14-2 fails to consider or identify for

11-11

110 Newport Center Drive, Suite 200
Newport Beach, California 92660
(949) 650-5550
Fax: (949) 650-1181

Resources; Cultural and Paleontological Resources; Geology, Soils, and Mineral Resources; Hazards and Hazardous Materials; Hydrology and Water Quality; Land Use and Planning; Noise; Population and Housing; Public Services and Utilities; Recreation; and Transportation and Circulation) contains a more detailed discussion of the environmental setting (baseline) for which to conduct the analysis for that specific section.

The environmental setting is described in the EIR at a level of detail appropriate for analysis of a general plan. As CEQA Guidelines Section 15146 explains, "the degree of specificity required in an EIR will correspond to the degree of specificity involved in the underlying activity which is described in the EIR." Section 15146 confirms that an EIR for a general plan need not be as detailed as an EIR for a specific development project. Here, the EIR's description of the environmental setting contains all information necessary to establish the baseline conditions for analysis of all of the plan's environmental impacts.

To provide clarification, the following sentences were added to the Environmental Setting section to provide existing housing units and nonresidential development. "In 2008, 11,186 housing units existed in the City. The City had approximately 5,920,640 square feet of nonresidential development in 2008."

Please refer to responses 11-5, 11-8, and 11-9 for a discussion of the development capacity of the General Plan and general location of anticipated development that could occur.

11-11 Average Daily Traffic is the appropriate terminology used in this figure. Average Daily Traffic refers to the volumes on the roadways. Average Daily Trips refers to the trip generation of a land use. For the explanation of why an analysis of intersections outside the City of Laguna Hills was not conducted, please refer to topical response #1.

study any intersections near GRF's properties in Laguna Woods such as Moulton Parkway and/or El Toro Road. 11-11 (Contd)

Likewise, Figure 5.14-3 shows the study intersections. Again, Figure 5.14-3 shows no intersections outside of the City including no intersections near GRF properties in Laguna Woods. It does show and study intersections which Laguna Hills and Laguna Woods share. The same applies to Figure 5.14-4 which shows the existing level of service ("LOS") for the study intersections: it shows no Laguna Woods intersections. 11-12

Section 5.14.3 discusses the thresholds of significance for Project related traffic impacts. Although Section 5.14.3 recognizes the City has adopted LOS for arterial intersections (LOS D) and for freeway ramps (LOS E), it ignores any level of service standards outside of the City including in Laguna Woods. 11-13

Section 5.14.4 is the analysis of the Project's traffic impacts. Unfortunately, it states:

> "The overall purpose of this traffic analysis is to determine the adequacy of the arterial highway component of the circulation system in relation to the General Plan Land Use Element. For this reason, the study area encompasses only those key roadway segments and intersections within the City of Laguna Hills (Figure 5.14-3)." 11-14

That is, the DEIR fails to address the Project's full environmental affects. As indicated above, Public Resources Code section 21002.1 requires the EIR to address all impacts including those impacts outside of the City. See City of Marina v. Bd. of Trustees of Cal. State Univ. (2006) 39 Cal.4th 341, 359-60 (holding that the trustees were not excused from analysis or mitigation for off-campus effects on traffic, "CEQA requires a public agency to mitigate or avoid its projects' significant effects not just on the agency's own property but 'on the environment'. . ..")

Appendix E to the DEIR, "City of Laguna Hills, General Plan Update, Mobility Element, Traffic Study" dated December 2008, sets forth its scope: "This report presents the results of a **Citywide traffic study** carried out for the City of Laguna Hills." Appendix E, Traffic Study, page 1-1 (Emphasis supplied.). The Traffic Study is likewise improperly restricted. Instead of being "Citywide traffic study," CEQA requires that it study the full extent of Project impacts on the environment including impacts outside the City. 11-15

Further, the Project's traffic impacts likely will be significant. For instance, Section 5.3 addresses air quality impacts of the Project. It states:

> "Based on the modeling conducted, operational activities would result in emissions of ROG, NOX, CO, PM_{10}, and $PM_{2.5}$ that exceed the SCAQMD's applicable thresholds. Thus, operational emissions of these ozone precursors and particulate matter could violate or contribute substantially to an existing or projected air quality violation, and/or 11-16

110 Newport Center Drive, Suite 200
Newport Beach, California 92660
(949) 650-5550
Fax: (949) 650-1181

11-12 For the explanation of why an analysis of intersections outside the City of Laguna Hills was not conducted, please refer to topical response #1.

11-13 For the explanation of why an analysis of intersections outside the City of Laguna Hills was not conducted, please refer to topical response #1.

11-14 For the explanation of why an analysis of intersections outside the City of Laguna Hills was not conducted, please refer to topical response #1.

11-15 For the explanation of why an analysis of intersections outside the City of Laguna Hills was not conducted, please refer to topical response #1.

11-16 The commenter is mixing the analysis of the project's potential effects on air quality and traffic. Air quality and traffic and circulation impacts are analyzed in two separate sections of the EIR. Each respective section contains different significance thresholds with which to measure the project's potential for significance in each respective environmental issue area. A finding of significance for air quality impacts attributable to the project does not automatically translate into findings of significance for transportation and circulation impacts attributable to the project. The environmental impact analysis in the air quality section of the EIR uses the significance thresholds on page 5.14-3 to assess the project's potential conflict with or violation of air quality plans and standards, considerable increases or exposure of sensitive receptors to pollutants, or the creation of objectionable odors. In contrast, the environmental analysis conducted in the transportation and circulation section of the EIR uses the thresholds for significance on page 5.3-15, which measure the project's potential effects on substantially increasing traffic as measured by vehicle trips, volume to capacity ratios, or intersection congestion, or exceeding established levels of service standards. As can be seen, these significance thresholds and subsequent environmental analyses evaluate disparate issues. Therefore, in this case, a significant impact in one environmental issue area (a significant number of mobile sources of air pollution) does not automatically create a significant impact in another environmental issue area (traffic).

expose sensitive receptors to substantial pollutant concentrations. This is a potentially significant impact."

DEIR, 5.3-18. After mitigation, these impacts remain significant:

"Implementation of Mitigation Measures AQ-3 through AQ-18 would reduce operational emissions of criteria air pollutants and precursors from mobile- and area-sources, but not to a less-than-significant level. Operational emissions could violate or contribute substantially to an existing or projected air quality violation, and/or expose sensitive receptors to substantial pollutant concentrations. This impact would remain significant and unavoidable."

11-16 (Contd)

DEIR, 5.3-29. Given that a significant number of mobile sources of air pollution will create significant air quality impacts, it is hard to understand how that mobile sources, e.g. cars, will not also adversely affect traffic.

The traffic tables reflect this potential for impacts. For instance, Table 5.14-3 shows that, at existing levels, the following intersections function at the indicated levels:

- Moulton & Ridge Route functions at LOS A, ICU .46 in the am peak and at LOS A, ICU .54 in the pm peak;
- Paseo de Valencia & El Toro functions at LOS A, ICU.59 in the am peak and at LOS A, ICU .58 in the pm peak;
- Moulton & Glenwood functions at LOS A, ICU .46 in the am peak and at LOS A, ICU .47 in the pm peak; and
- Moulton & Santa Maria functions at LOS A, ICU .43 in the am peak and LOS B, ICU .65 in the pm peak.

11-17

See also Traffic Study, Table 2-1 (same information). Although many of these intersections are on the border between Laguna Hills and Laguna Woods, the DEIR fails to recognize this border and fails to analyze any impacts suffered by important intersections in Laguna Woods itself such as Moulton & El Toro.

Table 5.14-9 shows that, at 2030 projections with committed infrastructure improvements within the City built, traffic is projected to increase at the following intersections:

- Moulton & Ridge Route functions at LOS A, ICU .52 in the am peak and at LOS A, ICU .70 in the pm peak;

11-18

110 Newport Center Drive, Suite 200
Newport Beach, California 92660
(949) 650-5550
Fax: (949) 650-1181

11-17 These intersections operate at LOS “A” or “B” and meet the performance standard and are therefore not considered deficient. For the explanation of why an analysis of intersections outside the City of Laguna Hills was not conducted, please refer to topical response #1.

11-18 The Moulton and Santa Maria intersection meets the performance standard and is not considered deficient. Therefore no mitigation is necessary. For the explanation of why analyses of the Moulton and El Toro Road intersection and other Laguna Woods intersections were not conducted, please refer to topical response #1.

- Paseo de Valencia & El Toro functions at LOS A, ICU.55 in the am peak and at LOS D, ICU .83 in the pm peak;
- Moulton & Glenwood functions at LOS A, ICU .59 in the am peak and at LOS B, ICU .62 in the pm peak; and
- Moulton & Santa Maria functions at LOS B, ICU .65 in the am peak and LOS D, ICU .86 in the pm peak.

See also Traffic Study, Table 4-2 (Same information). As indicated above, for GRF, what is lacking here is an analysis of other important intersections in Laguna Woods including Moulton & El Toro. 11-18 (Contd)

The DEIR notes that:

"For an intersection that is forecast to operate worse than the performance standard, the impact of a given project is considered to be significant if the project increases the ICU by .02 or more."

The performance standard for the City is LOS D (ICU ≥ .90). Although none of the intersections exceed performance standards, the projected traffic volume increases related to the Project are significant in the City especially in the vicinity of GRF. For instance, the intersection of Moulton and Santa Maria changes from LOS B to LOS D.This is troublesome, and the DEIR should be revised to address this potentially significant impact and propose any necessary mitigation.

Moreover, several intersections in Laguna Woods are currently under stress. For instance, the intersection of Moulton and El Toro currently functions at LOS D. Also, the intersection of Laguna Hills and Paseo De Valencia functions at a similar level. The Project likely will cause these troubled intersections to fail completely. The DEIR should be revised to study and, if necessary, mitigate the Project's impacts in Laguna Woods. 11-19

VIII. Conclusion: the DEIR Must be Revised and Recirculated.

As indicated above, the DEIR fails to comply with the requirements of CEQA by failing to describe the Project fully, by failing to discuss fully the Project's environmental setting, and by ignoring any potential Project impacts on the environment which are suffered outside of the City. Of particular concern, the DEIR fails to study the Project's traffic impacts on areas outside of the City and near GRF properties, and fails to provide any mitigation for such impacts. 11-20

110 Newport Center Drive, Suite 200
Newport Beach, California 92660
(949) 650-5550
Fax: (949) 650-1181

11-19 For the explanation of why an analysis of intersections outside the City of Laguna Hills was not conducted, please refer to topical response #1.

11-20 As described in response 11-7, the EIR adequately describes the project in the Project Description of the EIR. In addition, response 11-10 explains that the environmental description section of the EIR is adequate. As demonstrated in topical response #1, the EIR adequately addresses traffic impacts resulting from the project.

The DEIR must be revised to address all of these issues and must be recirculated for public review and comment. 11-21

Again, thank you for the opportunity to provide these comments. Please include GRF and this office on all notices, documents, responses to comments and other items in connection with the Project and the DEIR. Further, please include GRF and this office on all notices, documents, reports, and other items in connection with any individual projects which are part of the overall Project. 11-22

Of course, should you have any questions, do not hesitate to contact me.

Sincerely,

LAW OFFICES OF ROBERT C. HAWKINS

By: Robert C. Hawkins

RCH/kw

Enclosures as indicated

cc: Peggy J. Johns, CMC (via email pjohns@ci.laguna-hills.ca.us)
Vern Jones (via email vjones@ci.laguna-hills.ca.us)

110 Newport Center Drive, Suite 200
Newport Beach, California 92660
(949) 650-5550
Fax: (949) 650-1181

11-21 As discussed in detail in response 11-5, clarifications and amplifications made throughout the EIR have not increased the severity of an impact or resulted in a new significant impact. There are no impacts described as less than significant, in the EIR, that have been reevaluated in the Final EIR as significant and unavoidable as a result of revisions and new information. Also, no substantial increase in the severity of impacts has been identified as a result of information presented in comments on the EIR. In light of the above, the City has determined that recirculation of the EIR is not required.

11-22 The comment provides closing remarks and requests that GRF and the Law Offices of Robert C. Hawkins be notified in connection with all items related to the project and individual projects that are part of the overall project. Laguna Hills intends to comply with this request.

Attachment 1

CITY OF LAGUNA HILLS

April 14, 2009

Robert C. Hawkins, Esq.
Law Offices of Robert C. Hawkins
110 Newport Center Drive, Suite 200
Newport Beach, CA 92660

RE: Request for Notices of all Public Hearings re Planning Projects

Dear Mr. Hawkins:

The City of Laguna Hills is in receipt of your letter dated April 13, 2009, requesting "to receive all notices of any and all projects, environmental documents and other matters concerning community development and planning issues within the City of Laguna Woods." We interpret your request to mean projects occurring within the City of Laguna Hills, not the City of Laguna Woods. We have added your office's address and that of the Golden Rain Foundation (as provided in your letter) to our notification list. Pursuant to Public Resources Code Section 21092.2, you are hereby requested to renew your request for notification in writing annually.

Although the comment period for the City of Laguna Hills' Draft General Plan and Draft Environmental Impact Report (DEIR) has passed, we will respond to any comments regarding the Draft General Plan and DEIR that you provide within the additional thirty (30) day review period (ending May 13, 2009) that you requested. Please understand that the subject "project" is a city-wide General Plan study and not a specific development project involving any individual property. Any specific development project will require a separate review process and discretionary permit from the City.

We look forward to your comments. Should you have any questions, please do not hesitate to contact me.

Sincerely,

VERNON A. JONES, A.I.C.P.
Community Development Director

Cc: City Manager
City Attorney

24035 El Toro Road • Laguna Hills, California 92653 • (949) 707-2600 • FAX (949) 707-2633
website: www.ci.laguna-hills.ca.us

AIRPORT LAND USE COMMISSION
FOR ORANGE COUNTY
3160 Airway Avenue • Costa Mesa, California 92626 • 949.252.5170 fax: 949.252.6012

June 10, 2009

Julie Molloy, Senior Planner
City of Laguna Hills
24035 El Toro Road
Laguna Hills, CA 92653

Subject: City of Laguna Hills Draft General Plan and Program Environmental Impact Report

Dear Ms. Molloy:

Thank you for the opportunity to review the City of Laguna Hills Draft General Plan and Program Environmental Impact Report (EIR). The City of Laguna Hills is not located within an airport planning area. However, there are building height restrictions and regulations related to the development of heliports that should be considered and addressed within the DEIR and draft general plan. 12-1

With respect to building height restrictions, development proposals which include the construction or alteration of structures more than 200 feet above ground level, require filing with the Federal Aviation Administration (FAA) and ALUC notification. Projects meeting this threshold must comply with procedures provided by Federal and State law, with the referral requirements of ALUC, and with all conditions of approval imposed or recommended by FAA and ALUC including filing a Notice of Proposed Construction or Alteration (FAA Form 7460-1). Depending on the maximum building heights that will be allowed in the proposed project area, the City may wish to incorporate a mitigation and condition of approval specifying the 200 feet height threshold within the DEIR and general plan. 12-2

In addition, the DEIR and general plan should identify if the project allows for the development of heliports as defined in the *Airport Environs Land Use Plan (AELUP) for Heliports*. Should the development of heliports occur within your jurisdiction, proposals to develop new heliports must be submitted through the city to the ALUC for review and action pursuant to Public Utilities Code Section 21661.5. Proposed heliport projects must comply fully with the state permit procedure provided by law and with all conditions of approval imposed or recommended by FAA, by the ALUC for Orange County and by Caltrans/Division of Aeronautics. The DEIR and general plan should address whether the development of heliports will be allowed within the City's jurisdiction. 12-3

Included below are more specific suggestions for the City to consider as general plan policies and EIR mitigation measures which would ensure consistency with the *AELUP for Heliports*. 12-4

Heliport Development: If heliport development is allowed in your jurisdiction we recommend that the General Plan address compliance with the *AELUP for Heliports* by including the following language in the document: 12-5

Letter 12 – Airport Land Use Commission

12-1 This comment provides opening remarks and indicates that the City is not located within an airport planning area. However, the commenter indicates that there are building height restrictions and regulations related to the development of heliports in Laguna Hills. No formal response is required.

12-2 The comment indicates that development proposals in Laguna Hills in excess of 200 feet above ground level require compliance with FAA regulations and ALUC notification.

Maximum heights in the City are regulated by the City's Zoning Ordinance. Neither the existing General Plan nor the proposed General Plan regulates height in Laguna Hills. Currently, the maximum building height allowed in Laguna Hills is 75 feet for commercial buildings in the UVSP area. It is not anticipated that any development within Laguna Hills would approach or exceed 200 feet in height. In the unlikely event that proposed development would exceed 200 feet in height over ground level, the City would comply with FAA requirements, i.e., file a Notice of Proposed Construction or Alteration (FAA Form 7460-1), and comply with any subsequent requirements. Since it is highly unlikely that any development within Laguna Hills would exceed 200 feet in height, and existing regulations are in place to address this issue adequately, no policies or implementation programs will be added to the General Plan, and no mitigation measures will be added to the EIR.

12-3 The commenter requests that the General Plan and associated EIR identify whether heliports will be allowed in the City. Additionally, the commenter indicates that information pertaining to proposed heliports be forwarded to the ALUC and comply with State permit procedures, and FAA, ALUC, and Caltrans/Division of Aeronautics conditions of approval.

Although not discussed in the General Plan, the City of Laguna Hills does allow heliports in several zones of the City subject to a Conditional Use Permit. Section 9-10.050 of the City's Zoning Ordinance indicates the zones in the City where heliports are conditionally permitted. Section 9-92.090 of the Zoning Ordinance describes the conditions/findings that may be applied by the approval body for the approval of a Conditional Use Permit for a heliport. As explained in response 12-5 below, the City may consider adding language addressing heliports to its Zoning Ordinance as suggested by the commenter.

12-4 Comment is noted. Commenter requests that policies and EIR mitigation measures be added to the General Plan and EIR to ensure consistency with Airport Environs Land Use Plan for Heliports. Refer to responses 12-3 and 12-5.

12-5 Since the Laguna Hills Zoning Ordinance addresses heliports, rather than the General Plan, the City will consider adding the following language to its Zoning Ordinance: "The City will ensure that each applicant, seeking a Conditional Use Permit or similar approval for the construction or operation of a heliport or helistop, complies fully with the state permit procedure provided by law and with all conditions of approval imposed or recommended by the Federal Aviation Administration (FAA), by the Airport Land Use Commission for Orange County (ALUC) and by Caltrans/Division of Aeronautics. This requirement shall be in addition to all other City development requirements."

"The City will ensure that each applicant, seeking a Conditional Use Permit or similar approval for the construction or operation of a heliport or helistop, complies fully with the state permit procedure provided by law and with all conditions of approval imposed or recommended by the Federal Aviation Administration (FAA), by the Airport Land Use Commission for Orange County (ALUC) and by Caltrans/Division of Aeronautics. This requirement shall be in addition to all other City development requirements."

12-5 (Contd)

Building Height Policy: Include a policy and mitigation measure for buildings 200 feet in height above ground level:

"For development of structures with a height of 200 feet in height above ground level or higher, at a development site, applicants shall file a Notice of Proposed Construction or Alteration with the FAA (FAA Form 7460-1). Following the FAA's Aeronautical Study of the project, projects must comply with conditions of approval imposed or recommended by the FAA. Subsequent to the FAA findings, the City shall forward the FAA Aeronautical Study to the Airport Land Use Commission (ALUC) of Orange County which may result in a consistency analysis with ALUC."

12-6

A referral by the City to the ALUC may be recommended for this project if the development of heliports are allowed within your jurisdiction, and because the proposed project is a general plan amendment under PUC Section 21676(b). In this regard, please note that the Commission wants such referrals to be submitted and agendized by the ALUC staff between the Local Agency's expected Planning Commission and City Council hearings. Since the ALUC meets on the third Thursday afternoon of each month, submittals must be received in the ALUC office by the first of the month to ensure sufficient time for review, analysis and agendizing.

12-7

Thank you for the opportunity to comment on this DEIR and draft general plan. Please contact Lea Umnas at (949) 252-5123 or via email at lumnas@ocair.com if you need any additional details or information regarding the future referral of your project.

12-8

Sincerely,

Kari A. Rigoni
Executive Officer

12-6 Please refer to response 12-2.

12-7 As described in response 12-3, the General Plan does not address heliports. The City's Zoning Ordinance does address heliports and has for many years. No changes to the language in the City's Zoning Ordinance regarding heliports is proposed, although the City will consider adding the language described in response 12-5 recommended by ALUC separately from the General Plan hearing.

The City of Laguna Hills City Council also serves as the City Planning Agency under section 65100 of the California Government Code; therefore, only a City Council hearing will be held and that hearing is scheduled for July 14, 2009. Since the proposed General Plan does not propose any changes that make it inconsistent with airport planning in Orange County, the City may adopt its updated General Plan before the ALUC can consider a referral. However, the City does understand that ALUC consideration may be required and will coordinate with ALUC staff on a formal referral.

12-8 This comment provides closing remarks. This comment also provides the telephone number and email address of a contact person at the ALUC. No formal response is required.

APPENDIX A

NOTICE OF PREPARATION (NOP) AND NOP COMMENT LETTERS

STATE OF CALIFORNIA

GOVERNOR'S OFFICE *of* PLANNING AND RESEARCH

STATE CLEARINGHOUSE AND PLANNING UNIT

ARNOLD SCHWARZENEGGER
GOVERNOR

CYNTHIA BRYANT
DIRECTOR

RECEIVED
SEP 03 2008
CITY OF LAGUNA HILLS

Notice of Preparation

August 26, 2008

To: Reviewing Agencies

Re: City of Laguna Hills General Plan Update and Zoning Amendments
SCH# 2008081100

Attached for your review and comment is the Notice of Preparation (NOP) for the City of Laguna Hills General Plan Update and Zoning Amendments draft Environmental Impact Report (EIR).

Responsible agencies must transmit their comments on the scope and content of the NOP, focusing on specific information related to their own statutory responsibility, within 30 days of receipt of the NOP from the Lead Agency. This is a courtesy notice provided by the State Clearinghouse with a reminder for you to comment in a timely manner. We encourage other agencies to also respond to this notice and express their concerns early in the environmental review process.

Please direct your comments to:

Vern Jones
City of Laguna Hills
24035 El Toro Road
Laguna Hills, CA 92653

with a copy to the State Clearinghouse in the Office of Planning and Research. Please refer to the SCH number noted above in all correspondence concerning this project.

If you have any questions about the environmental document review process, please call the State Clearinghouse at (916) 445-0613.

Sincerely,

Scott Morgan
Project Analyst, State Clearinghouse

Attachments
cc: Lead Agency

Document Details Report
State Clearinghouse Data Base

SCH# 2008081100
Project Title City of Laguna Hills General Plan Update and Zoning Amendments
Lead Agency Laguna Hills, City of

Type NOP Notice of Preparation

Description The proposed project is the comprehensive update and implementation of the City of Laguna Hills General Plan and associated zoning text and map amendments.

Lead Agency Contact

Name Vern Jones
Agency City of Laguna Hills
Phone 949-707-2670 **Fax**
email
Address 24035 El Toro Road
City Laguna Hills **State** CA **Zip** 92653

Project Location

County Orange
City Laguna Hills
Region
Cross Streets Citywide
Lat / Long
Parcel No.
Township **Range** **Section** **Base**

Proximity to:

Highways I-5
Airports
Railways
Waterways
Schools
Land Use

Project Issues Aesthetic/Visual; Agricultural Land; Air Quality; Archaeologic-Historic; Biological Resources; Geologic/Seismic; Toxic/Hazardous; Water Quality; Landuse; Minerals; Noise; Population/Housing Balance; Public Services; Recreation/Parks; Traffic/Circulation

Reviewing Agencies Resources Agency; Department of Conservation; Department of Parks and Recreation; Department of Water Resources; Department of Fish and Game, Region 5; Office of Emergency Services; Native American Heritage Commission; California Highway Patrol; Department of Housing and Community Development; Caltrans, District 12; Regional Water Quality Control Board, Region 8

Date Received 08/26/2008 **Start of Review** 08/26/2008 **End of Review** 09/24/2008

Note: Blanks in data fields result from insufficient information provided by lead agency.

NOP Distribution List

County: Orange SCH# 2008081100

Resources Agency

- [■] **Resources Agency**
  Nadell Gayou
- [ ] **Dept. of Boating & Waterways**
  David Johnson
- [ ] **California Coastal Commission**
  Elizabeth A. Fuchs
- [ ] **Colorado River Board**
  Gerald R. Zimmerman
- [■] **Dept. of Conservation**
  Sharon Howell
- [ ] **California Energy Commission**
  Dale Edwards
- [ ] **Cal Fire**
  Allen Robertson
- [ ] **Office of Historic Preservation**
  Wayne Donaldson
- [■] **Dept of Parks & Recreation**
  Environmental Stewardship Section
- [ ] **Central Valley Flood Protection Board**
  Mark Herald
- [ ] **S.F. Bay Conservation & Dev't. Comm.**
  Steve McAdam
- [■] **Dept. of Water Resources**
  Resources Agency
  Nadell Gayou
- [ ] _____
  Conservancy

Fish and Game

- [ ] **Depart. of Fish & Game**
  Scott Flint
  Environmental Services Division
- [ ] **Fish & Game Region 1**
  Donald Koch
- [ ] **Fish & Game Region 1E**
  Laurie Harnsberger
- [ ] **Fish & Game Region 2**
  Jeff Drongesen
- [ ] **Fish & Game Region 3**
  Robert Floerke
- [ ] **Fish & Game Region 4**
  Julie Vance
- [■] **Fish & Game Region 5**
  Don Chadwick
  Habitat Conservation Program
- [ ] **Fish & Game Region 6**
  Gabrina Gatchel
  Habitat Conservation Program
- [ ] **Fish & Game Region 6 I/M**
  Gabrina Getchel
  Inyo/Mono, Habitat Conservation Program
- [ ] **Dept. of Fish & Game M**
  George Isaac
  Marine Region

Other Departments

- [ ] **Food & Agriculture**
  Steve Shaffer
  Dept. of Food and Agriculture
- [ ] **Depart. of General Services**
  Public School Construction
- [ ] **Dept. of General Services**
  Anna Garbeff
  Environmental Services Section
- [ ] **Dept. of Public Health**
  Veronica Malloy
  Dept. of Health/Drinking Water

Independent Commissions,Boards

- [ ] **Delta Protection Commission**
  Debby Eddy
- [■] **Office of Emergency Services**
  Dennis Castrillo
- [ ] **Governor's Office of Planning & Research**
  State Clearinghouse
- [■] **Native American Heritage Comm.**
  Debbie Treadway
- [ ] **Public Utilities Commission**
  Ken Lewis
- [ ] **Santa Monica Bay Restoration**
  Guangyu Wang
- [ ] **State Lands Commission**
  Marina Brand
- [ ] **Tahoe Regional Planning Agency (TRPA)**
  Cherry Jacques

Business, Trans & Housing

- [ ] **Caltrans - Division of Aeronautics**
  Sandy Hesnard
- [ ] **Caltrans - Planning**
  Terri Pencovic
- [■] **California Highway Patrol**
  Shirley Kelly
  Office of Special Projects
- [■] **Housing & Community Development**
  CEQA Coordinator
  Housing Policy Division

Dept. of Transportation

- [ ] **Caltrans, District 1**
  Rex Jackman
- [ ] **Caltrans, District 2**
  Marcelino Gonzalez
- [ ] **Caltrans, District 3**
  Bruce de Terra
- [ ] **Caltrans, District 4**
  Lisa Carboni
- [ ] **Caltrans, District 5**
  David Murray
- [ ] **Caltrans, District 6**
  Michael Navarro
- [ ] **Caltrans, District 7**
  Elmer Alvarez
- [ ] **Caltrans, District 8**
  Dan Kopulsky
- [ ] **Caltrans, District 9**
  Gayle Rosander
- [ ] **Caltrans, District 10**
  Tom Dumas
- [ ] **Caltrans, District 11**
  Jacob Armstrong
- [■] **Caltrans, District 12**
  Ryan P. Chamberlain

Cal EPA

Air Resources Board

- [ ] Airport Projects
  Jim Lerner
  - [ ] Transportation Projects
    Ravi Ramalingam
  - [ ] Industrial Projects
    Mike Tollstrup
- [ ] **California Integrated Waste Management Board**
  Sue O'Leary
- [ ] **State Water Resources Control Board**
  Regional Programs Unit
  Division of Financial Assistance
- [ ] **State Water Resources Control Board**
  Student Intern, 401 Water Quality Certification Unit
  Division of Water Quality
- [ ] **State Water Resources Control Board**
  Steven Herrera
  Division of Water Rights
- [ ] **Dept. of Toxic Substances Control**
  CEQA Tracking Center
- [ ] **Department of Pesticide Regulation**
  CEQA Coordinator

Regional Water Quality Control Board (RWQCB)

- [ ] **RWQCB 1**
  Cathleen Hudson
  North Coast Region (1)
- [ ] **RWQCB 2**
  Environmental Document Coordinator
  San Francisco Bay Region (2)
- [ ] **RWQCB 3**
  Central Coast Region (3)
- [ ] **RWQCB 4**
  Teresa Rodgers
  Los Angeles Region (4)
- [ ] **RWQCB 5S**
  Central Valley Region (5)
  - [ ] **RWQCB 5F**
    Central Valley Region (5)
    Fresno Branch Office
  - [ ] **RWQCB 5R**
    Central Valley Region (5)
    Redding Branch Office
- [ ] **RWQCB 6**
  Lahontan Region (6)
  - [ ] **RWQCB 6V**
    Lahontan Region (6)
    Victorville Branch Office
- [ ] **RWQCB 7**
  Colorado River Basin Region (7)
- [■] **RWQCB 8**
  Santa Ana Region (8)
- [ ] **RWQCB 9**
  San Diego Region (9)

- [ ] **Other** _____

Last Updated on 08/13/2008

SEP-04-2008 15:14 FROM:CM LAGUNA HILLS 949 707 2614 TO:2330952 P.4/4

NOTICE OF PREPARATION

To: Interested Parties

From: City of Laguna Hills
Community Development
Department
24035 El Toro Road
Laguna Hills, CA 92653

Date: **August 21, 2008**

Subject: **Notice of Preparation of Draft Program Environmental Impact Report**

Project: **City of Laguna Hills General Plan Update and Zoning Amendments**

The City of Laguna Hills, as Lead Agency, is preparing an Environmental Impact Report (EIR) for the updated General Plan and associated zoning text and map amendments. The purpose of this Notice of Preparation (NOP) is to inform agencies and the public that an EIR is being prepared for this project and to invite specific comments on the scope and content of the information to be included and analyzed in the EIR. Agencies should comment on the elements of the environmental information that are relevant to their statutory responsibilities in connection with the proposed project.

Project Location: Figure 1 in the Project Description, Attachment A, depicts the regional and Figure 2 depicts the local vicinity of the project area, as well as the project's boundaries.

Project Description: The proposed project is the comprehensive update and implementation of the City of Laguna Hills General Plan and associated zoning text and map amendments. Attachment A provides a detailed description of the proposed project.

Potential Environmental Effects of the Project: These issues areas will be addressed in the Program EIR.

- Aesthetics
- Agriculture Resources
- Air Quality
- Biological Resources
- Cultural Resources
- Geology/Soils
- Hazards and Hazardous Materials
- Hydrology/Water Quality
- Land Use/Planning
- Mineral Resources
- Noise
- Population and Housing
- Public Services
- Recreation

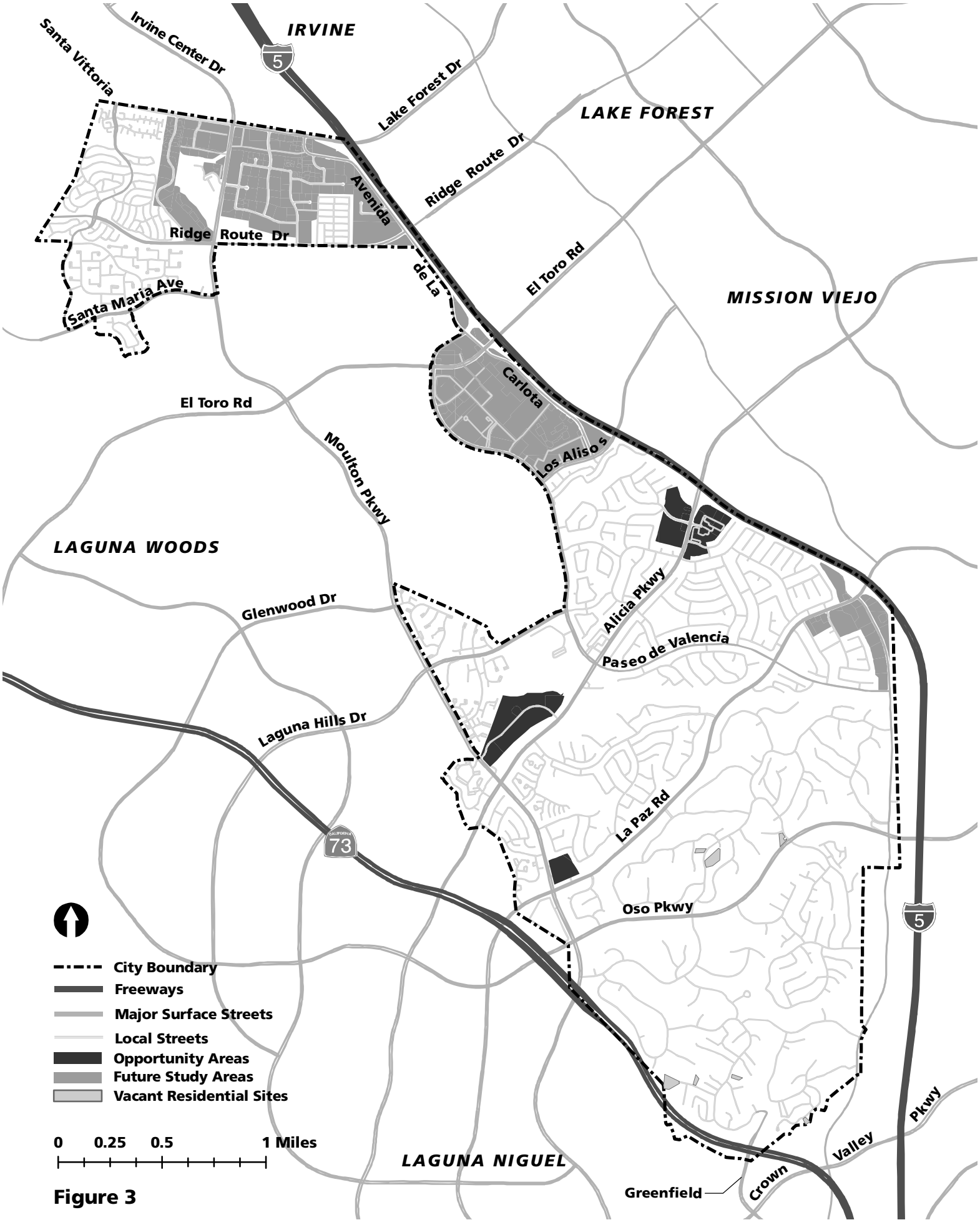

IRVINE
LAKE FOREST
MISSION VIEJO
LAGUNA WOODS
LAGUNA NIGUEL
Santa Vittoria
Irvine Center Dr
Lake Forest Dr
Ridge Route Dr
Avenida De La Carlota
Los Alisos
El Toro Rd
Santa Maria Ave
Moulton Pkwy
Glenwood Dr
Alicia Pkwy
Paseo de Valencia
Laguna Hills Dr
La Paz Rd
Oso Pkwy
Crown Valley Pkwy
Greenfield
5
73
City Boundary
Freeways
Major Surface Streets
Local Streets
Opportunity Areas
Future Study Areas
Vacant Residential Sites
0 0.25 0.5 1 Miles

Figure 3

- Transportation/Traffic
- Utilities/Services Systems

Scoping Meeting: Two scoping meetings will be held at the Laguna Hills City Hall in the Council Chambers on September 3, 2008. The first meeting at 3:30 p.m. is targeted for public agency representatives. The second meeting before the City Council at 6:30 p.m. provides an opportunity for members of the public to learn about the project and provide their input to staff, the Council and consultants regarding the scope and contents of the EIR.

Due to the time limits mandated by State law, your response must be sent at the earliest possible date but *not later than 30 days* after receipt of this notice.

Please send your response to Vern Jones, Community Development Department at the address shown below. With your correspondence, please provide the name for the contact person in your agency.

Date: August 21, 2008 _____

City of Laguna Hills
Vern Jones, Community Development Department
24035 El Toro Road
Laguna Hills, CA 92653
(949) 707-2670

ATTACHMENT A
PROJECT DESCRIPTION

REGIONAL SETTING

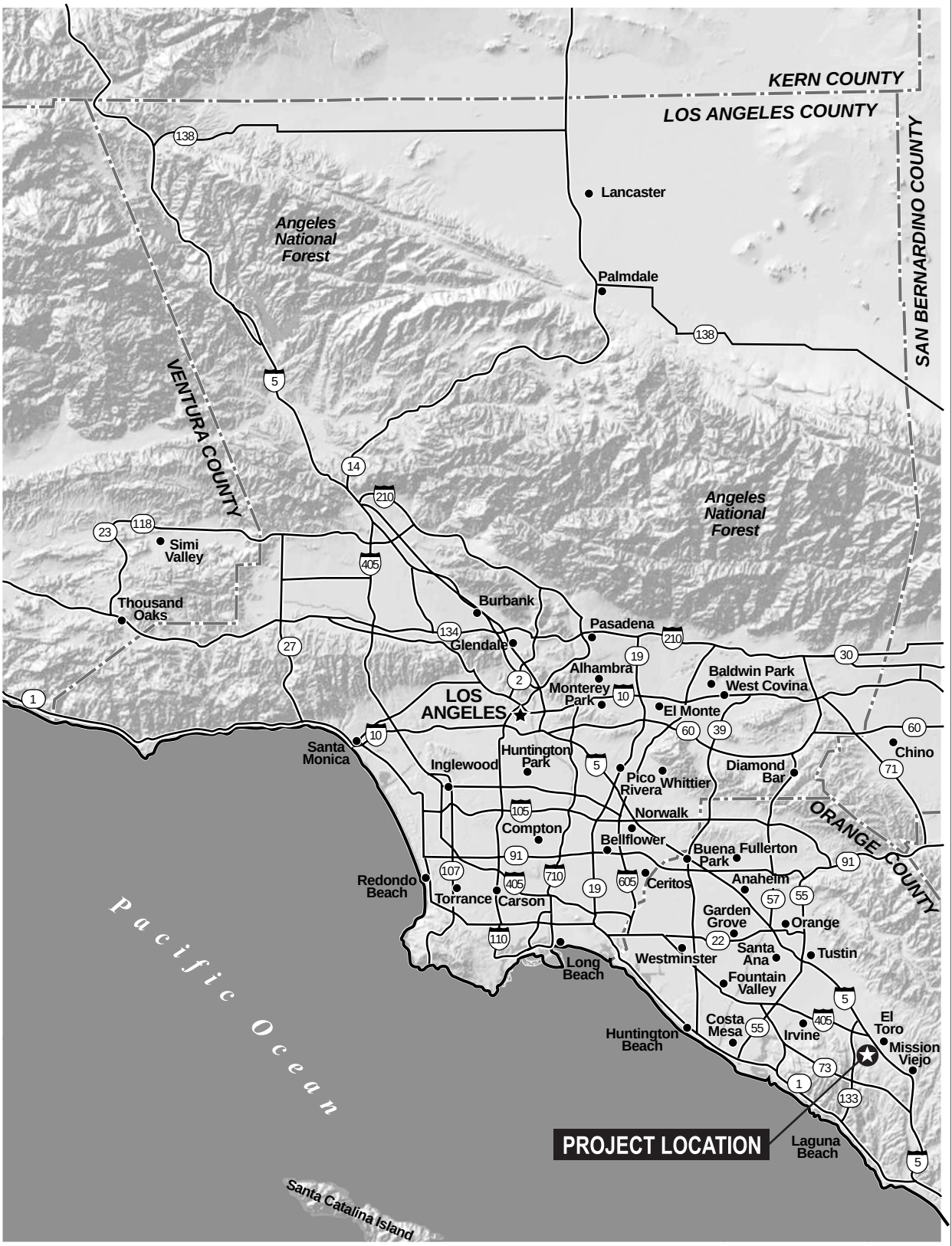
The City of Laguna Hills is comprised of approximately 6.6 square miles of land (or about 4,262 acres) and is located in southern Orange County approximately 45 miles southeast of the City of Los Angeles, 68 miles northwest of the City of San Diego, and 6 miles northeast of the Pacific Ocean. The City is bordered to the north by the cites of Irvine and Lake Forest, to the east by the Interstate 5 (I-5) Freeway and the city of Mission Viejo, to the west by the cities of Laguna Woods and Aliso Viejo, and to the south by the City of Laguna Nigel. Regional access to Laguna Hills is provided by I-5. Figure 1 depicts the regional location of the project area, while Figure 2 shows the project boundaries.

THE PROJECT

California state law requires each City to adopt a comprehensive, long-term general plan to guide the physical development of the incorporated city and any land outside of the city boundaries that bears a relationship to its planning activities. The proposed project analyzed in the Program EIR would consist of a comprehensively updated City of Laguna Hills General Plan and associated amendments to the Zoning Ordinance text and maps needed to implement the Plan. The proposed General Plan Update is divided into seven elements that together meet the requirements for the seven mandatory elements under state law plus an optional community services and facilities element. The elements that meet the requirements for the seven mandatory elements are: 1) land use; 2) mobility; 3) conservation and open space; 4) community services and facilities; 5) safety; 6) noise; and 7) housing.

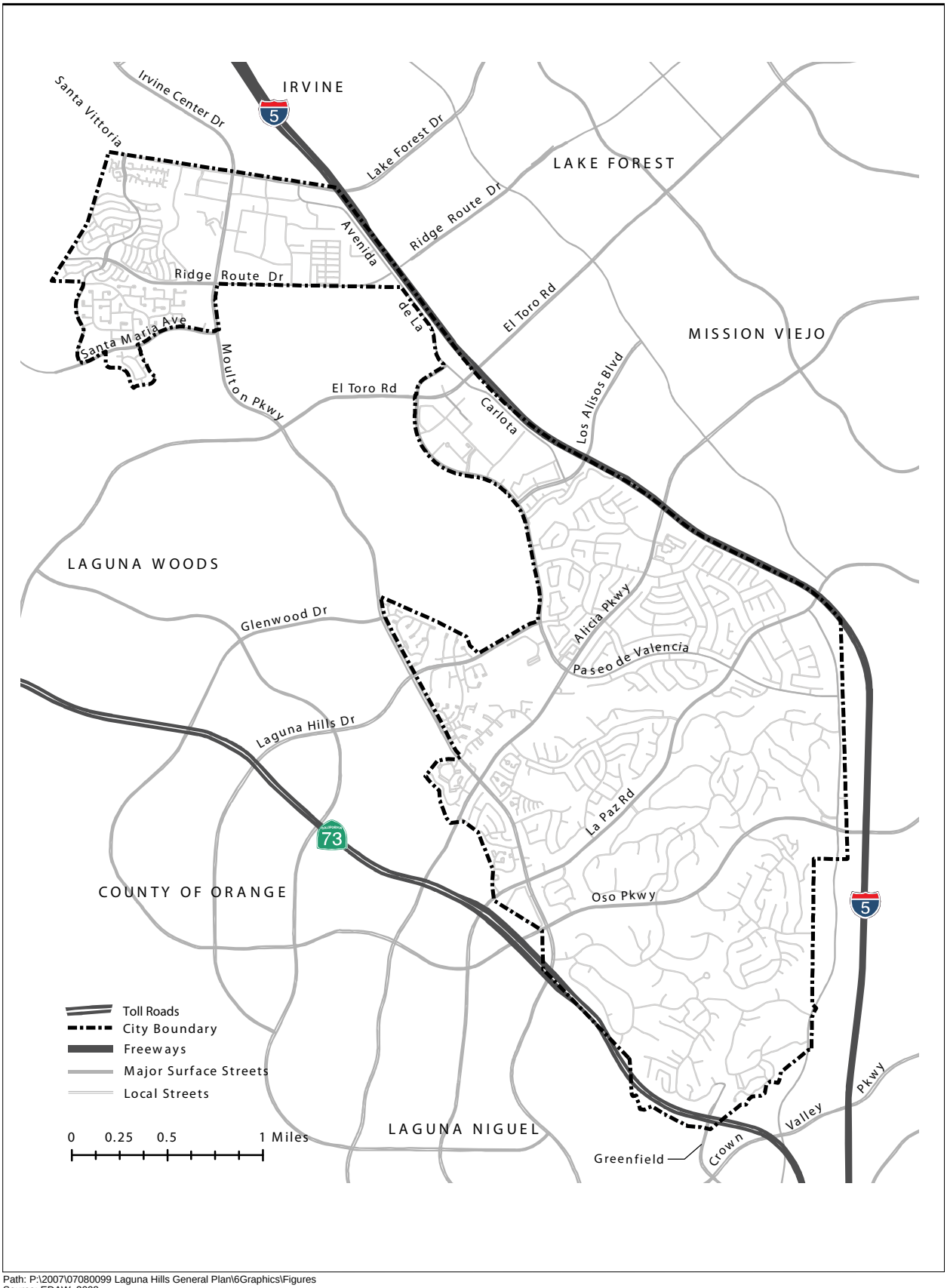
The City of Laguna Hills General Plan serves as a policy guide for determining the appropriate physical development and character of the City. The General Plan establishes the maximum level of development that can occur within the City. Most new development would come in the form of redevelopment and infill opportunities focused within several infill areas described as Opportunity Areas and Future Study Areas within the General Plan (See Figure 3). A small number of vacant Rural Residential sites are also assumed to develop with Rural Residential uses over the lifetime of the Plan. Development and redevelopment of these areas would allow for a variety of residential and non-residential uses needed to support the expected population of the community, which is forecasted to be 36,210 by 2030. The Program EIR would analyze the environmental effects of the expected development in accordance with the General Plan over the next two decades.

The Program EIR would also identify and examine minor Zoning Ordinance text and mapping amendments needed to implement the proposed changes to the General Plan land use designations.



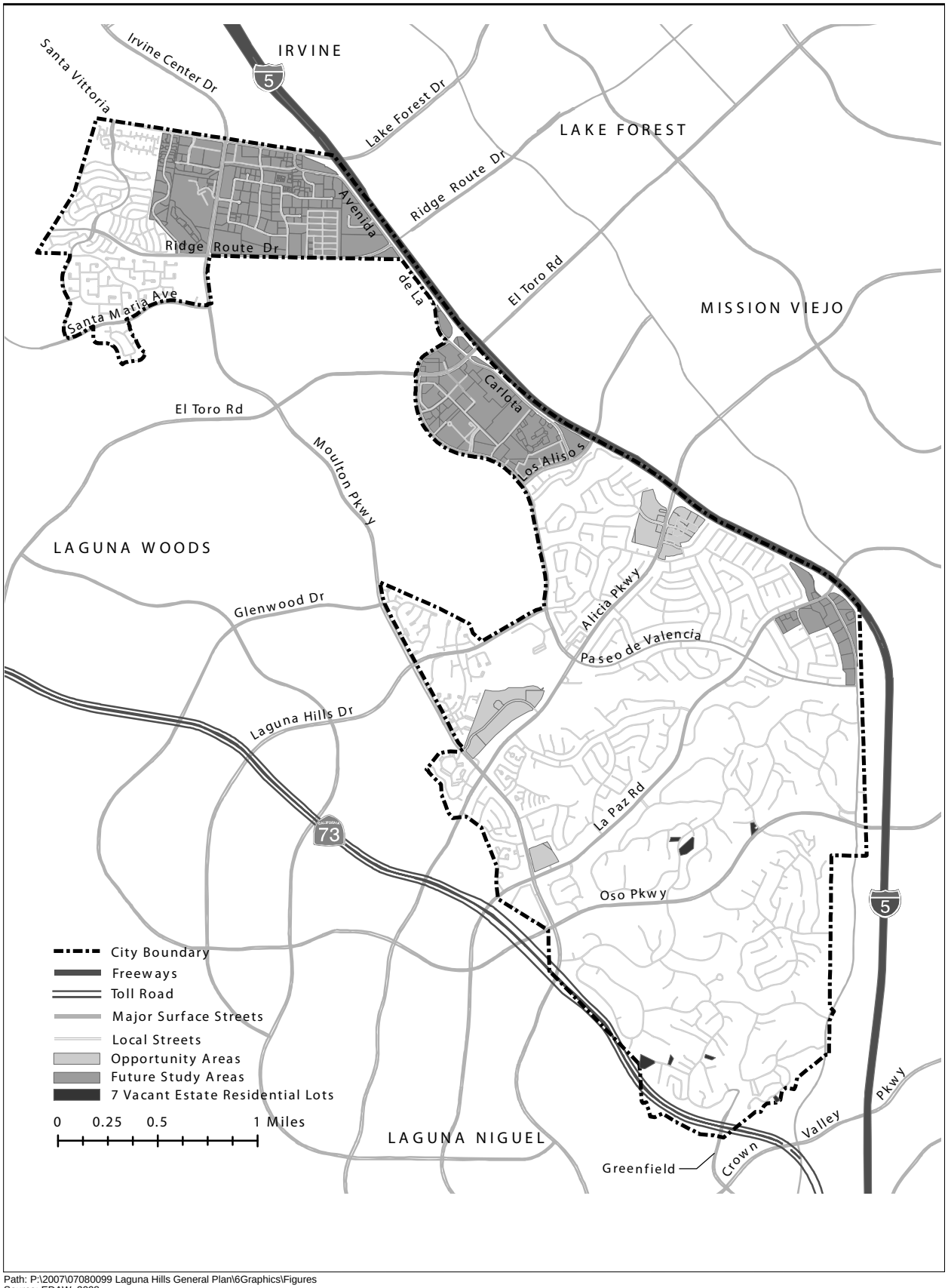
Path: P:\2007\07080099 Laguna Hills General Plan\6Graphics\Figures
Source: EDAW, 2008

Figure 1
Regional Map



Path: P:\2007\07080099 Laguna Hills General Plan\6Graphics\Figures
Source: EDAW, 2008

Figure 2
Planning Area



Path: P:\2007\07080099 Laguna Hills General Plan\6Graphics\Figures
Source: EDAW, 2008

Figure 3
Land Use Opportunity Areas and Future Study Areas

PLANNING AREA

The City of Laguna Hills is approximately 6.6 square miles in size (4,262 acres) and supports a population of approximately 34,000 people. The Planning Area consists of the area within the incorporated City and represents the probable long-term physical boundaries and service area of the City as depicted in Figure 2.

PURPOSE AND OBJECTIVES OF THE GENERAL PLAN

A General Plan serves as the blueprint for future growth and development. As a blueprint for the future, the plan must contain policies and programs designed to provide decision-makers with a solid basis for decisions related to land use and development. The updated Laguna Hills General Plan would be guided by inter-related polices and programs to reinforce and build on the City's small-town feel, sense of connectedness, unique identity, environmental stewardship, community health. The Guiding Themes for Laguna Hills serve as a framework for research, analysis, and are the foundation for the policies and programs of the General Plan. The community's Guiding Themes encapsulate the desires and visions of Laguna Hills' long-term goals and are an expression of what the community wants to maintain or become.

The community of Laguna Hills recognizes and embraces its small-town atmosphere. Community members enjoy knowing their neighborhoods and their neighbors. As the City advances, planning would be focused on fostering a small community feel that creates opportunities for community connections (both social and physical) and is enhanced by well-designed and well-maintained neighborhoods that complement the natural environment. Planning efforts would focus on promoting more community traditions and events, and by creating more community activity centers where residents would be able to congregate.

Laguna Hills is a community that places great importance on the continued safety of its residents and businesses. Laguna Hills also has a very low crime rate and the City maintains this safe environment through a variety of community programs, law enforcement, and fire protection services. Community members actively participate in local government decision-making processes to help foster and maintain and community in which people, including children, are safe walking or bicycling to schools, recreation, or work. Planning would be focused on traffic calming measures in order to improve the overall safety of the community.

While the local circulation system is experiencing some traffic and congestion problems, the updated General Plan would strategically link land use and transportation to make efficient use of existing capacity. Streets significantly contribute to people's day-to-day experience of the City, and high quality and safe roads are essential. The future circulation system would continue to emphasize pedestrian paths, bikeways, equestrian trails, and transit–connecting neighborhoods to commercial districts, other activity centers, and regional transportation systems, with coordinated signalization to ensure smooth flow.

The updated General Plan would promote revitalization that contributes to the community's quality of life, enhances the public realm, expands the City's unique offerings, and cultivates

environmental and economic sustainability. While some of the City's commercial and business centers have aged, they are ripe with opportunities for new activity and redevelopment. Planning would be focused on development that is locally oriented (as opposed to regionally oriented) and small-scale to fit with the existing community character, such as a town square.

Laguna Hills' natural amenities are highly valued and the community aims at protecting its environmental resources and open spaces for generations to come. The quality of the environmental resources, open spaces, parks, trails, and creeks would be protected and revitalized to create a community offing a small town quality with recreational and open space opportunities for all to enjoy. The conservation of energy and water resources, as well as reducing air and noise pollution is also a goal of the community.

Laguna Hills recognizes the value of its community members and strives to maintain a healthy and supportive community for families and people of all ages. Attention to the needs of all community members, including seniors, children, persons with special needs, and residents of all ages is a top priority. This is evident in the great schools, senior activities, and recreation opportunities available in the community. With the General Plan Update, these qualities would be maintained and expanded as Laguna Hills recognizes the need for increased opportunities for physical activity and access to parks and recreational amenities to foster healthy lifestyles within the community.

Bolstering the unique attributes of Laguna Hills is important to creating a strong community identity. The City would benefit from a defined, consistent character that incorporates the City's origins and culture, while reflecting its natural setting. Planning efforts would be focused identifiable local facilities (such as the City Hall and community centers), and defined streetscapes that tie neighborhoods and districts within the City together. Efforts would also focus on City beautification as well as reinforcing City-wide identity help to better knit together the northern and southern portions of the City.

Looking ahead, Laguna Hills recognizes that managing growth is essential to creating a city that is prepared for the future. The City is dedicated to supporting future growth that is compatible with and enhances the existing community, while also maintaining adequate services and facilities (such as water, sewer, trash, library, sports facilities, and animal shelter) as development does occurs. The City recognizes the need to provide a variety of housing opportunities for all segments of the community as they progress through the various stages of life. In addition, the City would continue to look for opportunities to integrate City services with the best technology available.

PROJECT CHARACTERISTICS

General Plan Elements

The updated Laguna Hills General Plan consists of elements that fulfill the state laws for seven subjects related to city planning and an optional community services and facilities element. Each element identifies individual goals and related policies and plans. In addition, the policies and

plans of each element correspond to individual implementation programs located in the General Plan Implementation Program.

In terms of guiding the physical development of the City, the General Plan elements of most importance are the Land Use and Circulation Elements. The other elements or sections of the General Plan address: housing; conservation/open space; safety; noise; and community services and facilities. The issues addressed in each subject area often overlap. A general description of each subject area is provided below.

Land Use Element

The Land Use Element establishes the general permitted uses of both public and private land within the community, providing a guide for both development of the City and protection of open space and sensitive areas. These land use designations serve to provide a rational and ordered approach to land use development and maintenance of public uses and open space by identifying the types and nature of development allowed in particular locations throughout the Planning Area. The proposed General Plan Land Use Element would establish 16 land use designations that are grouped according to the following land uses: Residential; Planned Community; Commercial/Office; Mixed Use; Public/Semi-Public; and Recreational. The residential categories include six designations ranging from estate residential development to high density development. The non-residential categories include a variety of designations that promote a range of revenue and employment generated services, such as Village Commercial, Community Commercial, Freeway Commercial, Office/Professional, and Mixed Use. Other non-residential uses include a Public/Institutional designation that allows for the provision of important public facilities, and a Recreational designation that provides areas for parks and open space.

Two new designations have been developed and are proposed to be added to the 14 existing General Plan Land Use designations. The first proposed land use designation, identified as Neighborhood Mixed Use, would enable the City to redevelop underperforming areas by allowing for the creation of a moderate-density center and gathering place in key, centrally located areas within Laguna Hills. This designation would promote a mix of retail, housing, and office uses, walkable connections, plazas and green space for community gathering, high quality design and architecture, and orientation of buildings towards the street and pedestrian. Allowed uses include commercial, retail, office, and residential; however, stand-alone residential is prohibited. The second proposed land use, identified as Planned Community Residential, would allow new residential communities ranging in density and community-serving amenities such as parks and open spaces. These proposed changes to the land use classification system would require the development of consistent zoning districts and would necessitate additional minor amendments to the existing Zoning Ordinance.

The Land Use Element will expand on the City's plan to embrace the current planning trends such as Smart Growth, Infill, Mixed-Use, and Transit-Oriented Development. Sustainability, economic development and growth management (Measure M) will also be addressed. Amendments to the Urban Village Specific Plan are also proposed in this element.

Mobility
The Mobility Element guides the continued development of the circulation system to support planned growth. The anticipated development identified in the Land Use Element will increase the demand for local and regional roadways and other forms of transportation. The Circulation Element addresses the existing transportation needs of the community and identifies transportation facilities required to accommodate the planned development allowed by the Land Use Element. Level of service and phasing are integral components of the Element. Both local and regional transportation facilities located within the Planning Area are discussed. Public transportation facilities and routes, pedestrian and bicycle access, pedestrian safety and walkability, recreational trails, traffic calming, and parking are also addressed in this Element.

Conservation and Open Space Element
The Conservation and Open Space Element focuses on the protection and enhancement of parks, open space, and recreational trails. This element also discusses biological resources, scenic resources, air quality, greenhouse gases, water resources and conservation, cultural and historic resources (including paleontological resources), energy resources and conservation, community gardens, and local agriculture. It also contains goals and policies to address resource sustainability, recreation, and air quality and climate change.

Community Services & Facilities Element
The purpose of the Community Services & Facilities Element is to ensure that sufficient levels of community services and facilities are provided as development and redevelop occur within the City. This Element addresses a range of community services and facilities including: schools, fire protection and emergency services, police protection, water and sewer services, solid waste disposal, libraries, electricity and natural gas, communications, flood control and stormwater drainage.

Safety Element
The purpose of the Safety Element is to identify and address those features existing in or near the Planning Area that represent a potential danger to the citizens, structures, public facilities, and infrastructure located in the community. The Safety Element establishes goals, policies and plans to minimize dangers to residents, workers, and visitors associated with: seismic and geologic hazards, fires, neighborhood safety, hazardous materials, waste and nuclear power, flood hazards and stormwater management. Emergency preparedness planning, such as identifying actions needed to manage crisis situations, is also addressed.

Noise Element
The Noise Element addresses noise sources in the community and identifies ways to reduce the impact of these noise sources on the community. This Element identifies the effects of noise on the surrounding environment and defines noise standards and land use compatibility guidelines to protect noise sensitive land uses from excessive noise. The Element specifically identifies interior and exterior noise standards as well as construction standards. Goals, policies, and plans to address and control transportation-related noise and non-transportation related noise are also identified.

Housing

The Housing Element identifies the current and future housing needs within the City's Planning Area. This element includes a comprehensive discussion of the community's profile including population, employment, household, and housing stock characteristics. In addition, this element identifies sites within the Planning Area suitable for housing developments and addresses the constraints associated with housing production in the City. An integrated set of goals, policies, and programs are presented in this element that are intended to assist in neighborhood and housing preservation, housing availability, and equal housing opportunities for the Planning Area. Further, policies for the implementation and monitoring of the housing plans set forth in this element are discussed in detail.

Implementation Program

The General Plan update includes an Implementation Program that will serve to ensure the overall direction provided in each General Plan element is translated from general terms to specific actions. The Implementation Program provides strategies to implement the adopted policies and plans identified in each of the General Plan elements. The various programs within the Implementation Program serve as a basis for making future programming decisions related to the assignment of staff and the expenditure of City funds. The programs specifically identify individual program responsibility, funding sources, and time-frame for completion.

Zoning Ordinance Amendment

Text and map amendments to the existing Zoning Ordinance would be required to implement the proposed Neighborhood Mixed Use and Planned Community Residential land use designations. This would include developing standards and use regulations for the two proposed land use designations in order to be consistent with the proposed General Plan Update. Other zoning amendments may be necessary to accommodate for the proposed development discussed in the General Plan Update and those will be discussed in detail in the Program EIR; however, there will not be a comprehensive update to the Zoning Ordinance at this time.

INTENDED USES OF THE PROGRAM EIR

The Program EIR serves as the basis for environmental review and impact mitigation for adoption and implementation of the City of Laguna Hills General Plan. The City will review subsequent implementation projects for consistency with the Program EIR and prepare appropriate environmental documentation pursuant to CEQA provisions for Program EIRs and subsequent projects. Subsequent projects under the Program EIR may include the following implementation activities:

- Rezoning of properties;
- Approval of Specific Plans;
- Approval of development plans, including tentative maps, variances, conditional use permits, and other land use permits;
- Approval of development agreements;

- Approval of facility and service master plans and financing plans;
- Approval and funding of public improvements projects;
- Approval of resource management plans;
- Issuance of municipal bonds;
- Issuance of permits and other approvals necessary for implementation of the General Plan;
- Acquisition of property by purchase or eminent domain; and,
- Issuance of permits and other approvals necessary for public and private development projects.

The following lead, responsible, and trustee agencies may utilize this Program EIR in the adoption of the General Plan and approval of subsequent implementation activities. These agencies may include, but are not limited to, the following:

- City of Laguna Hills
- U.S. Fish and Wildlife Service
- United States Army Corps of Engineers
- California Department of Fish and Game
- California Department of Conservation
- California Department of Housing and Community Development
- California Department of Transportation (Caltrans)
- State Lands Commission
- California Water Resources Control Board
- Southern California Association of Governments
- Western Riverside Council of Governments
- South Coast Air Quality Management District
- County of Orange
- Metropolitan Water District of Southern California

ALTERNATIVES

Several alternatives to the proposed General Plan will be evaluated in the EIR for environmental impacts. The impacts of the alternatives will be compared to the impacts of the proposed General Plan to determine whether any of the alternatives are environmentally superior to the proposed General Plan. Alternatives that may be evaluated in the EIR include, but are not limited to:

- No Project/Existing General Plan
- No Change to Urban Village Specific Plan
- Enhanced Conservation Program/Mandatory Conservation Measures and Programs.

SEP 19 2008

CITY OF LAGUNA HILLS

CITY OF LAKE FOREST

Mayor
Mark Tettemer

Mayor Pro Tem
Peter Herzog

Council Members
Richard Dixon
Kathryn McCullough
Marcia Rudolph

City Manager
Robert C. Dunek

September 17, 2008

Vern Jones, Director
Community Development Department
24035 El Toro Road
Laguna Hills, CA 92653

Subject: Notice of Preparation of Draft PEIR for the City of Laguna Hills General Plan Update and Zoning Amendments

Dear Vern,

Thank you for the opportunity to comment on the Notice of Preparation of a Draft PEIR for the City of Laguna Hills General Plan Update and Zoning Amendments. We look forward to reviewing the Draft PEIR when it becomes available. Please send the document to me at the following address:

Cheryl Kuta, Planning Manager
City of Lake Forest
25550 Commercentre Drive, Suite 100
Lake Forest, CA 92630

As you are aware, the Lake Forest City Council approved the Opportunities Study General Plan Amendment and Zone Change on July 1, 2008. This approval resulted in revisions to the land use designations for approximately 800 acres of vacant land on five separate properties. As of the date of this letter, two of the five participating landowners have submitted project-level applications to the Planning Division. If you need further information regarding the status of the Opportunities Study or the project-level applications currently under review for use in your PEIR, please do not hesitate to contact me at (949) 461-3479 or via email at ckuta@ci.lake-forest.ca.us.

Sincerely,
CITY OF LAKE FOREST

Cheryl Kuta

Cheryl Kuta, AICP
Planning Manager

DRUG USE IS LIFE ABUSE

25550 Commercentre Dr., Suite 100
Lake Forest, CA 92630
(949) 461-3400
City Hall Fax: (949) 461-3511
Building/Planning/Public Works Fax: (949) 461-3512

City of Mission Viejo

Community Development Department

Trish Kelley
Mayor
Frank Ury
Mayor Pro Tem
John Paul "J.P." Ledesma
Council Member
Lance R. MacLean
Council Member
Gail Reavis
Council Member

September 24, 2008

RECEIVED
SEP 26 2008
CITY OF LAGUNA HILLS

Vern Jones
City of Laguna Hills
Community Development Department
24035 El Toro Road
Laguna Hills, CA 92653
(949) 707-2670

Dear Mr. Jones:

Subject: **City of Mission Viejo Comments to the Notice of Preparation of a Draft Program Environmental Impact Report for the City of Laguna Hills General Plan Update and Zoning Amendments**

The City of Mission Viejo has reviewed the Notice of Preparation for the Draft Program Environmental Impact Report for the City of Laguna Hills General Plan Update and Zoning Amendments and has no comments at this time. We thank you for the opportunity to comment on the Notice of Preparation and look forward to reviewing for the Draft Program EIR when it is available.

Sincerely,

Charles E. Wilson

Charles E. Wilson, AICP
Director of Community Development

cc: Dennis Wilberg, City Manager
Elaine Lister, Planning Manager
Shirley Land, Transportation Manager

200 Civic Center • Mission Viejo, California 92691
http://www.cityofmissionviejo.org

949/470-3053
FAX 949/951-6176

STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY ARNOLD SCHWARZENEGGER, Governor

DEPARTMENT OF TRANSPORTATION
District 12
3337 Michelson Drive, Suite 380
Irvine, CA 92612-8894
Tel: (949) 724-2241
Fax: (949) 724-2592

RECEIVED
SEP 25 2008
CITY OF LAGUNA HILLS

Flex your power!
Be energy efficient!

September 18, 2008

Vern Jones
City of Laguna Hills
24035 El Toro Road
Laguna Hills, California 92653

File: IGR/CEQA
SCH#: 2008081100
Log #: 2119
I-5, SR-73

Subject: City of Laguna Hills General Plan Update

Dear Mr. Jones,

Thank you for the opportunity to review and comment on the **Notice of Preparation (NOP) for the City of Laguna Hills General Plan Update.** The proposed General Plan Update is a comprehensive update of the 1994 General Plan, and will focus on preserving residential neighborhoods, guiding the remaining development and redevelopment opportunities, and encouraging the revitalization of selected areas within the city. The nearest State routes to the project site are I-5 and SR-73.

The Department of Transportation (Department) is a responsible agency on this project and we have the following comments:

1. Caltrans has concerns with plans and projects that may impact traffic circulation and increase demand on State Transportation Facilities. For all new developing areas, major new developments, redevelopment areas that may require new or improved access, new signals or any improvements to State Transportation Facilities, particularly I-5, will require close coordination with Caltrans. This requirement should be included in the Land Use and Mobility Elements of the General Plan and the Environmental Impact Report (EIR).

2. The Housing Element should also identify a nexus with goals, strategies and actions identified in the SCAG Regional Blueprint towards housing and resulting transportation impacts and opportunities.

3. Any major oversight project work proposed for Caltrans facilities would require coordination with Caltrans and may require an encroachment permit. For specific details on Caltrans Encroachment Permits procedure, please refer to Caltrans Encroachment Permits Manual, Seventh Edition. This Manual is available on the web site: www.dot.ca.gov/hq/traffops/developserv/permits. If an encroachment permit is required, all environmental concerns must be adequately addressed. Please coordinate with Caltrans to meet requirements for any work within or near Caltrans Right-of-Way. For Projects on our Right-of-Way, Caltrans has the authority to maintain or delegate Lead Agency status for CEQA.

Caltrans protocol.

Please continue to keep us informed of this project and any future developments, which could potentially impact the State Transportation Facilities. If you have any questions or need to contact us, please do not hesitate to call Marlon Regisford at (949) 724-2241.

Sincerely,

Ryan Chamberlain, Branch Chief
Local Development/Intergovernmental Review

C: Terry Roberts, Office of Planning and Research

RECEIVED
AUG 29 2008
CITY OF LAGUNA HILLS

August 27, 2008

Ms. Roxanne J. Bernal
22641 Genova
Laguna Hills, CA 92653

Mr. Vern Jones
City of Laguna Hills, Community Development Dept.
24035 El Toro Road
Laguna Hills, CA 92653

Mr. Jones:

I am sending this correspondence in response to the Notice of Preparation of the Environmental Impact Report (EIR).

I have been receiving announcements and information regarding discussion of the General Plan Update. Generally speaking, I have felt that the scope of the General Plan has been comprehensive and responsible. The General Plan seems to reflect a strong sense of community, which is one the things that attracts my husband & I to Laguna Hills.

There is, however, an element I am strongly concerned about upon reading the Notice of Preparation and that is in regard to eminent domain. I feel eminent domain action can often work against the best interests of a community, which only truly exists if *individuals* have active ownership. I would like to hear more about what quantitative criteria will be implemented in the General Plan in relation to potential eminent domain action. Would you expect that the September 3rd meeting might be an opportunity to gain more insight on this aspect of the General Plan &/or are there other resources you could recommend for more insight?

Thank you for your time and consideration.

Sincerely,

Roxanne J. Bernal

Roxanne J. Bernal
rbernal@cox.net

ARNOLD SCHWARZENEGGER, Governor

STATE OF CALIFORNIA

GOVERNOR'S OFFICE OF EMERGENCY SERVICES
DISASTER ASSISTANCE PROGRAMS BRANCH
3650 SCHRIEVER AVENUE
MATHER, CALIFORNIA 95655
PHONE: (916) 845-8101 FAX: (916) 845-8381

RECEIVED
SEP 08 2008
CITY OF LAGUNA HILLS

September 3, 2008

Vern Jones
City of Laguna Hills
24035 El Toro Road
Laguna Hills, CA 92653

RE: Notice of Preparation for a Draft Environmental Impact Report for the City of Laguna Hills General Plan Update and Zoning Amendments, SCH# 2008081100

Dear Mr. Jones:

Thank you for the opportunity to comment on your Notice of Preparation for a Draft Environmental Impact Report (DEIR) for the city's general plan update. In preparing the general plan and accompanying DEIR, the city should examine the sections of state planning law that involve potential hazards the city may face. For your information, I have underlined specific sections of state planning law where identification and analysis of hazards are discussed (see Attachment A).

Prior to the release of the draft general plan or within the DEIR, city staff or your consultants should examine each of the requirements in state planning law and determine if there are hazard issues within the community which the general plan should address. A table in the DEIR (or general plan) which identifies these specific issues and where they are addressed in the general plan would be helpful in demonstrating the city has complied with these requirements. If the DEIR determines that state planning law requirements have not been met, it should recommend that these issues be addressed in the general plan as a mitigation measure.

We note that state planning law includes a requirement for consultations with state agencies in regard to information related to hazards. OES would be happy to share all available information at our disposal to facilitate the city's ability to comply with state planning and environmental laws.

If you have any questions about these comments, please contact Andrew Rush at (916) 845-8269 or andrew.rush@OES.ca.gov.

Sincerely,

Dennis Castrillo
Environmental Officer

Attachment A
Hazards and State Planning Law Requirements

General Plan Consistency

65300.5. In construing the provisions of this article, the Legislature intends that the general plan and elements and parts thereof comprise an integrated, internally consistent and compatible statement of policies for the adopting agency.

Seven Mandated Elements

65302. The general plan shall consist of a statement of development policies and shall include a diagram or diagrams and text setting forth objectives, principles, standards, and plan proposals. The plan shall include the following elements:

(a) A land use element that designates the proposed general distribution and general location and extent of the uses of the land for housing, business, industry, open space, including agriculture, natural resources, recreation, and enjoyment of scenic beauty, education, public buildings and grounds, solid and liquid waste disposal facilities, and other categories of public and private uses of land. The location and designation of the extent of the uses of the land for public and private uses shall consider the identification of land and natural resources pursuant to paragraph (3) of subdivision (d). The land use element shall include a statement of the standards of population density and building intensity recommended for the various districts and other territory covered by the plan. The land use element shall identify and annually review those areas covered by the plan that are subject to flooding identified by flood plain mapping prepared by the Federal Emergency Management Agency (FEMA) or the Department of Water Resources. The land use element shall also do both of the following:

(1) Designate in a land use category that provides for timber production those parcels of real property zoned for timberland production pursuant to the California Timberland Productivity Act of 1982, Chapter 6.7 (commencing with Section 51100) of Part 1 of Division 1 of Title 5.

(2) Consider the impact of new growth on military readiness activities carried out on military bases, installations, and operating and training areas, when proposing zoning ordinances or designating land uses covered by the general plan for land, or other territory adjacent to military facilities, or underlying designated military aviation routes and airspace.

(A) In determining the impact of new growth on military readiness activities, information provided by military facilities shall be considered. Cities and counties shall address military impacts based on information from the military and other sources.

(B) The following definitions govern this paragraph:

(i) "Military readiness activities" mean all of the following:

(I) Training, support, and operations that prepare the men and women of the military for combat.

(II) Operation, maintenance, and security of any military installation.

(III) Testing of military equipment, vehicles, weapons, and sensors for proper operation or suitability for combat use.

(ii) "Military installation" means a base, camp, post, station, yard, center, homeport facility for any ship, or other activity under the jurisdiction of the United States Department of Defense as defined in paragraph (1) of subsection (e) of Section 2687 of Title 10 of the United States Code.

(b) A circulation element consisting of the general location and extent of existing and proposed major thoroughfares, transportation routes, terminals, any military airports and ports, and other local public utilities and facilities, all correlated with the land use element of the plan.

(c) A housing element as provided in Article 10.6 (commencing with Section 65580).

(d) (1) A conservation element for the conservation, development, and utilization of natural resources including water and its hydraulic force, forests, soils, rivers and other waters, harbors, fisheries, wildlife, minerals, and other natural resources. The conservation element shall consider the effect of development within the jurisdiction, as described in the land use element, on natural resources located on public lands, including military installations. That portion of the conservation element including waters shall be developed in coordination with any countywide water agency and with all district and city agencies, including flood management, water conservation, or groundwater agencies that have developed, served, controlled, managed, or conserved water of any type for any purpose in the county or city for which the plan is prepared. Coordination shall include the discussion and evaluation of any water supply and demand information described in Section 65352.5, if that information has been submitted by the water agency to the city or county.

(2) The conservation element may also cover all of the following:

(A) The reclamation of land and waters.

(B) Prevention and control of the pollution of streams and other waters.

(C) Regulation of the use of land in stream channels and other areas required for the accomplishment of the conservation plan.

(D) Prevention, control, and correction of the erosion of soils, beaches, and shores.

(E) Protection of watersheds.

(F) The location, quantity and quality of the rock, sand and gravel resources.

(3) Upon the next revision of the housing element on or after January 1, 2009, the conservation element shall identify rivers, creeks, streams, flood corridors, riparian habitats, and land that may accommodate floodwater for purposes of groundwater recharge and stormwater management.

(e) An open-space element as provided in Article 10.5 (commencing with Section 65560).

(f) (1) A noise element which shall identify and appraise noise problems in the community. The noise element shall recognize the guidelines established by the Office of Noise Control in the State Department of Health Care Services and shall analyze and quantify, to the extent practicable, as determined by the legislative body, current and projected noise levels for all of the following sources:

(A) Highways and freeways.

(B) Primary arterials and major local streets.

(C) Passenger and freight on-line railroad operations and ground rapid transit systems.

(D) Commercial, general aviation, heliport, helistop, and military airport operations, aircraft overflights, jet engine test stands, and all other ground facilities and maintenance functions related to airport operation.

(E) Local industrial plants, including, but not limited to, railroad classification yards.

(F) Other ground stationary noise sources, including, but not limited to, military installations, identified by local agencies as contributing to the community noise environment.

(2) Noise contours shall be shown for all of these sources and stated in terms of community noise equivalent level (CNEL) or day-night average level (Ldn). The noise contours shall be prepared on the basis of noise monitoring or following generally accepted noise modeling techniques for the various sources identified in paragraphs (1) to (6), inclusive.

(3) The noise contours shall be used as a guide for establishing a pattern of land uses in the land use element that minimizes the exposure of community residents to excessive noise.

(4) The noise element shall include implementation measures and possible solutions that address existing and foreseeable noise problems, if any. The adopted noise element shall serve as a guideline for compliance with the state's noise insulation standards.

(g) (1) A safety element for the protection of the community from any unreasonable risks associated with the effects of seismically induced surface rupture, ground shaking, ground failure, tsunami, seiche, and dam failure; slope instability leading to mudslides and landslides; subsidence, liquefaction, and other seismic hazards identified pursuant to Chapter 7.8 (commencing with Section 2690) of Division 2 of the Public Resources Code, and other geologic hazards known to the legislative body; flooding; and wild land and urban fires. The safety element shall include mapping of known seismic and other geologic hazards. It shall also address evacuation routes, military installations, peakload water supply requirements, and minimum road widths and clearances around structures, as those items relate to identified fire and geologic hazards.

(2) The safety element, upon the next revision of the housing element on or after January 1, 2009, shall also do the following:

(A) Identify information regarding flood hazards, including, but not limited to, the following:

(i) Flood hazard zones. As used in this subdivision, "flood hazard zone" means an area subject to flooding that is delineated as either a special hazard area or an area of moderate or minimal hazard on an official flood insurance rate map issued by the Federal Emergency Management Agency. The identification of a flood hazard zone does not imply that areas outside the flood hazard zones or uses permitted within flood hazard zones will be free from flooding or flood damage.

(ii) National Flood Insurance Program maps published by FEMA.

(iii) Information about flood hazards that is available from the United States Army Corps of Engineers.

(iv) Designated floodway maps that are available from the Central Valley Flood Protection Board.

(v) Dam failure inundation maps prepared pursuant to Section 8589.5 that are available from the Office of Emergency Services.

(vi) Awareness Floodplain Mapping Program maps and 200-year flood plain maps that are or may be available from, or accepted by, the Department of Water Resources.

(vii) Maps of levee protection zones.

(viii) Areas subject to inundation in the event of the failure of project or nonproject levees or floodwalls.

(ix) Historical data on flooding, including locally prepared maps of areas that are subject to flooding, areas that are vulnerable to flooding after wildfires, and sites that have been repeatedly damaged by flooding.

(x) Existing and planned development in flood hazard zones, including structures, roads, utilities, and essential public facilities.

(xi) Local, state, and federal agencies with responsibility for flood protection, including special districts and local offices of emergency services.

(B) Establish a set of comprehensive goals, policies, and objectives based on the information identified pursuant to subparagraph (A), for the protection of the community from the unreasonable risks of flooding, including, but not limited to:

(i) Avoiding or minimizing the risks of flooding to new development.

(ii) Evaluating whether new development should be located in flood hazard zones, and identifying construction methods or other methods to minimize damage if new development is located in flood hazard zones.

(iii) Maintaining the structural and operational integrity of essential public facilities during flooding.

(iv) Locating, when feasible, new essential public facilities outside of flood hazard zones, including hospitals and health care facilities, emergency shelters, fire stations, emergency command centers, and emergency communications facilities or identifying construction methods or other methods to minimize damage if these facilities are located in flood hazard zones.

(v) Establishing cooperative working relationships among public agencies with responsibility for flood protection.

(C) Establish a set of feasible implementation measures designed to carry out the goals, policies, and objectives established pursuant to subparagraph (B).

(3) After the initial revision of the safety element pursuant to paragraph (2), upon each revision of the housing element, the planning agency shall review and, if necessary, revise the safety element to identify new information that was not available during the previous revision of the safety element.

(4) Cities and counties that have flood plain management ordinances that have been approved by FEMA that substantially comply with this section, or have substantially equivalent provisions to this subdivision in their general plans, may use that information in the safety element to comply with this subdivision, and shall summarize and incorporate by reference into the safety element the other general plan provisions or the flood plain ordinance, specifically showing how each requirement of this subdivision has been met.

(5) Prior to the periodic review of its general plan and prior to preparing or revising its safety element, each city and county shall consult the California Geological Survey of the Department of Conservation, the Central Valley Flood Protection Board, if the city or county is located within the boundaries of the Sacramento and San Joaquin Drainage District, as set forth in Section 8501 of the Water Code, and the Office of Emergency Services for the purpose of including information known by and available to the department, the office, and the board required by this subdivision.

(6) To the extent that a county's safety element is sufficiently detailed and contains appropriate policies and programs for adoption by a city, a city may adopt that portion of the county's safety element that pertains to the city's planning area in satisfaction of the requirement imposed by this subdivision.

Consistency with Airport Land Use Plans

65302.3. (a) The general plan, and any applicable specific plan prepared pursuant to Article 8 (commencing with Section 65450), shall be consistent with the plan adopted or amended pursuant to Section 21675 of the Public Utilities Code.

Review of Safety Element

65302.5. (a) At least 45 days prior to adoption or amendment of the safety element, each county and city shall submit to the Division of Mines and Geology of the Department of Conservation one copy of a draft of the safety element or amendment and any technical studies used for

developing the safety element. The division may review drafts submitted to it to determine whether they incorporate known seismic and other geologic hazard information, and report its findings to the planning agency within 30 days of receipt of the draft of the safety element or amendment pursuant to this subdivision. The legislative body shall consider the division's findings prior to final adoption of the safety element or amendment unless the division's findings are not available within the above prescribed time limits or unless the division has indicated to the city or county that the division will not review the safety element. If the division's findings are not available within those prescribed time limits, the legislative body may take the division's findings into consideration at the time it considers future amendments to the safety element. Each county and city shall provide the division with a copy of its adopted safety element or amendments. The division may review adopted safety elements or amendments and report its findings. All findings made by the division shall be advisory to the planning agency and legislative body.

(1) The draft element of or draft amendment to the safety element of a county or a city's general plan shall be submitted to the State Board of Forestry and Fire Protection and to every local agency that provides fire protection to territory in the city or county at least 90 days prior to either of the following:

(A) The adoption or amendment to the safety element of its general plan for each county that contains state responsibility areas.

(B) The adoption or amendment to the safety element of its general plan for each city or county that contains a very high fire hazard severity zone as defined pursuant to subdivision (b) of Section 51177.

(2) A county that contains state responsibility areas and a city or county that contains a very high fire hazard severity zone as defined pursuant to subdivision (b) of Section 51177, shall submit for review the safety element of its general plan to the State Board of Forestry and Fire Protection and to every local agency that provides fire protection to territory in the city or county in accordance with the following dates as specified, unless the local government submitted the element within five years prior to that date:

(A) Local governments within the regional jurisdiction of the San Diego Association of Governments: December 31, 2010.

(B) Local governments within the regional jurisdiction of the Southern California Association of Governments: December 31, 2011.

(C) Local governments within the regional jurisdiction of the Association of Bay Area Governments: December 31, 2012.

(D) Local governments within the regional jurisdiction of the Council of Fresno County Governments, the Kern County Council of Governments, and the Sacramento Area Council of Governments: June 30, 2013.

(E) Local governments within the regional jurisdiction of the Association of Monterey Bay Area Governments: December 31, 2014.

(F) All other local governments: December 31, 2015.

(3) The State Board of Forestry and Fire Protection shall, and a local agency may, review the draft or an existing safety element and report its written recommendations to the planning agency within 60 days of its receipt of the draft or existing safety element. The State Board of Forestry and Fire Protection and local agency shall review the draft or existing safety element and may offer written recommendations for changes to the draft or existing safety element regarding both of the following:

(A) Uses of land and policies in state responsibility areas and very high fire hazard severity zones that will protect life, property, and natural resources from unreasonable risks associated with wildland fires.
(B) Methods and strategies for wildland fire risk reduction and prevention within state responsibility areas and very high hazard severity zones.
(b) Prior to the adoption of its draft element or draft amendment, the board of supervisors of the county or the city council of a city shall consider the recommendations made by the State Board of Forestry and Fire Protection and any local agency that provides fire protection to territory in the city or county. If the board of supervisors or city council determines not to accept all or some of the recommendations, if any, made by the State Board of Forestry and Fire Protection or local agency, the board of supervisors or city council shall communicate in writing to the State Board of Forestry and Fire Protection or to the local agency, its reasons for not accepting the recommendations.

Open Space Plans

65560. (a) "Local open-space plan" is the open-space element of a county or city general plan adopted by the board or council, either as the local open-space plan or as the interim local open-space plan adopted pursuant to Section 65563.
(b) "Open-space land" is any parcel or area of land or water that is essentially unimproved and devoted to an open-space use as defined in this section, and that is designated on a local, regional or state open-space plan as any of the following:
(1) Open space for the preservation of natural resources including, but not limited to, areas required for the preservation of plant and animal life, including habitat for fish and wildlife species; areas required for ecologic and other scientific study purposes; rivers, streams, bays and estuaries; and coastal beaches, lakeshores, banks of rivers and streams, and watershed lands.
(2) Open space used for the managed production of resources, including but not limited to, forest lands, rangeland, agricultural lands and areas of economic importance for the production of food or fiber; areas required for recharge of groundwater basins; bays, estuaries, marshes, rivers and streams which are important for the management of commercial fisheries; and areas containing major mineral deposits, including those in short supply.
(3) Open space for outdoor recreation, including but not limited to, areas of outstanding scenic, historic and cultural value; areas particularly suited for park and recreation purposes, including access to lakeshores, beaches, and rivers and streams; and areas which serve as links between major recreation and open-space reservations, including utility easements, banks of rivers and streams, trails, and scenic highway corridors.
(4) Open space for public health and safety, including, but not limited to, areas which require special management or regulation because of hazardous or special conditions such as earthquake fault zones, unstable soil areas, flood plains, watersheds, areas presenting high fire risks, areas required for the protection of water quality and water reservoirs and areas required for the protection and enhancement of air quality.

STATE OF CALIFORNIA Arnold Schwarzenegger, Governor

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-6251
Fax (916) 657-5390
Web Site www.nahc.ca.gov
e-mail: ds_nahc@pacbell.net

September 12, 2008

Ms. Julie A. Molloy, Senior Planner
CITY OF LAGUNA HILLS
24035 El Toro Road
Laguna Hills, CA 92653

Sent by FAX to: 949-707-2633
Number of pages: 2

Re: Tribal Consultation Per SB 18 (Government Code §§ 65352.3, 65352.4 and 65562.5) and Sacred Lands File Search for Project Per SB 18/Sacred Lands File Search for Project- Laguna Hills General Plan Update; City of Laguna Hills; Orange County, California

Dear Ms. Molloy:

Government Code §65352.3 requires local governments to consult with California Native American tribes identified by the Native American Heritage Commission (NAHC) for the purpose of protecting, and/or mitigating impacts to cultural places. Attached is a Native American Tribal Consultation list of tribes with traditional lands or cultural places located within the requested plan boundaries.

As a part of consultation, the NAHC recommends that local governments conduct record searches through the NAHC and California Historic Resources Information System (CHRIS; contact 916-653-7278 or www.ohp.ca.gov) to determine if any cultural places are located within the area(s) affected by the proposed action.

A NAHC Sacred Lands File search was conducted based on the township, range, and section information included in your request and Native American Cultural Resources sites were found within the area of potential effect (APE) you identified. Therefore, we suggest that you contact David Belardes of the Juaneño Band of Mission Indians at (949) 493-0859 and the other persons on the attached list in order to determine how the identified cultural resource might affect your project. Also, local governments should be aware that records maintained by the NAHC and CHRIS are not exhaustive, and these searches do not preclude the existence of other cultural resources. A tribe may be the only source of information regarding the existence of a cultural place. I suggest you consult with all of those on the accompanying Native American Contacts list, which has been included separately. If they cannot supply information, they might recommend others with specific knowledge about cultural resources in your plan area. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from Tribes, please notify me. With your assistance we are able to assure that our consultation list contains current information.

If you have any questions, please contact me at (916) 653-6251.

Sincerely,

Dave Singleton
Program Analyst

Attachment: Native American Contacts

Orange County
September 12, 2008

Juaneno Band of Mission Indians Acjachemen Nation
David Belardes, Chairperson
31742 Via Belardes Juaneno
San Juan Capistrano , CA 92675
DavidBelardes@hotmail.com
(949) 493-0959

Juaneno Band of Mission Indians Acjachemen Nation
Anthony Rivera, Chairman
31411-A La Matanza Street Juaneno
San Juan Capistrano , CA 92675-2674
arivera@juaneno.com
949-488-3484
949-488-3294 Fax

Juaneno Band of Mission Indians
Adolph "Bud" Sepulveda, Chairperson
P.O. Box 25828 Juaneno
Santa Ana , CA 92799
bssepul@yahoo.net
714-838-3270
714-914-1812 - CELL

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is applicable only for consultation with Native American tribes under Government Code Section 65352.3.

APPENDIX B

BIOLOGICAL RESOURCES TABLES

Appendix B: Sensitive Species with Low Potential to Occur within the City of Laguna Hills

Table B-1
Sensitive Plant Species with Low Potential to Occur Within the City of Laguna Hills

Common Name *Scientific Name*	Sensitivity Status[1]	General Habitat Description	Probability of Occurrence
PLANTS			
aphanisma *Aphanisma blitoides*	CNPS: List 1B.2	Coastal bluff scrub, coastal dunes, and coastal scrub/sandy; elevation 3-1,000 feet. Annual herb blooms March-June.	Low. Marginal habitat present in several small patches of coastal scrub onsite. The closest known occurrence is 8.2 miles northwest of the city limits.
Coulter's saltbush *Atriplex coulteri*	CNPS: List 1B.2	Coastal bluff scrub, coastal dunes, coastal scrub, and valley and foothill grasslands, often on alkaline or clay soils; elevation 10-1,500 feet. Perennial herb, blooms March-October.	Low. Marginal habitat present in several small patches of coastal scrub and annual grassland onsite. The closest known occurrence is 4.6 miles southwest of the city limits.
south coast saltscale *Atriplex pacifica*	CNPS: List 1B.2	Coastal bluff scrub, coastal dunes, coastal scrub and playas; elevation 0-330 feet. Annual herb, blooms March-October.	Low. Marginal habitat present in several small patches of coastal scrub onsite. The closest known occurrence is 8 miles west of the city limits.
thread-leaved brodiaea *Brodiaea filifolia*	USFWS: Threatened CDFG: Endangered CNPS: List 1B.1	Chaparral (openings), cismontane woodland, coastal scrub, playas, valley and foothill grassland, and vernal pools; often on clay soils; elevation 130-4000 feet. Perennial herb (bulbiferous), blooms March-June.	Low. Marginal habitat present in several small patches of coastal scrub and annual grassland onsite. The closest known occurrence is 2.5 miles southwest of the city limits.
Lewis's evening-primrose *Camissonia lewisii*	CNPS: List 3	Coastal bluff scrub, cismontane woodland, coastal dunes, coastal scrub, valley and foothill grasslands, on sandy or clay soils; elevation 0-985 feet. Annual herb, blooms March-June.	Low. Marginal habitat present in several small patches of coastal scrub and annual grassland onsite. The closest known occurrence is 8 miles northwest of the city limits.
southern tarplant *Centromadia parryi* ssp. *australis* (= *Hemizonia parryi* ssp. a*ustralis*)	CNPS: List 1B.1	Marshes and swamps (margins), valley and foothill grassland (vernally mesic), and vernal pools; elevation 0-1,400 feet. Annual herb, blooms May- November.	Low. Marginal habitat present onsite in brackish marsh areas of the Veeh Reservoir. The closest known occurrence is 3.9 miles east of the city limits.

Common Name *Scientific Name*	Sensitivity Status[1]	General Habitat Description	Probability of Occurrence
many-stemmed dudleya *Dudleya multicaulis*	CNPS: List 1B.2	Chaparral, coastal scrub, and valley and foothill grassland, often on clay soils; elevation 50-2,600 feet. Perennial herb, blooms April-July.	Low. Marginal habitat present in several small patches of coastal scrub. The closest known occurrence is 1.4 miles west of the city limits.
Pendleton button-celery *Eryngium pendletonensis*	CNPS: List 1B.1	Coastal bluff scrub, valley and foothill grassland, vernal pools/clay; elevation 45-350 feet. Perennial herb, blooms from April-June.	Low. Marginal habitat present in several small patches of coastal scrub and annual grassland onsite. The closest known occurrence is 14.4 miles southwest of the city limits.
Palmer's grapplinghook *Harpagonella palmeri*	CNPS: List 4.2	Chaparral, coastal scrub, valley and foothill grasslands on clay soils; elevation 70-900 feet. Annual herb, blooms March-May.	Low. Marginal habitat present in several small patches of coastal scrub onsite. The closest known occurrence is 7.8 miles southeast of the city limits.
vernal barley *Hordeum intercedens*	CNPS: List 3.2	Coastal dunes, coastal scrub, valley and foothill grassland, and vernal pools; elevation 15-3,000 feet. Annual herb, blooms March-June.	Low. Marginal habitat present in several small patches of coastal scrub onsite. The closest known occurrence is 3.7 miles northwest of the city limits.
mesa horkelia *Horkelia cuneata* ssp. *puberula*	CNPS: List 1B.1	Chaparral, cismontane woodland, and coastal scrub, on sandy or gravelly soils; elevation 230-2,600 feet. Perennial herb, blooms February-September.	Low. Marginal habitat present in several small patches of coastal scrub onsite. The closest known occurrence is 5.7 miles west of the city limits.
California satintail *Imperata brevifolia*	CNPS: List 2.1	Chaparral, coastal scrub, Mojave desert scrub, meadows and seeps, and riparian scrub; elevation 0-1,500 feet. Rhizomatous herb, blooms September-May.	Low. Marginal habitat present in several small patches of coastal scrub and mule-fat scrub onsite. The closest known occurrence is 4.9 miles southeast of the city limits.
decumbent goldenbush *Isocoma menziesii* var. *decumbens*	CNPS: List 1B.2	Chaparral, coastal scrub, often in disturbed areas; elevation 30-400 feet. Shrub, blooms April-November.	Low. Marginal habitat present in several small patches of coastal scrub onsite. The closest location was recorded in 1946 from the south coastal plains region Corona del Mar, Pacific Ocean drainage area, Orange County.

Common Name *Scientific Name*	Sensitivity Status[1]	General Habitat Description	Probability of Occurrence
Robinson's pepper-grass *Lepidium virginicum* var. *robinsonii*	CNPS: List 1B.2	Chaparral and coastal scrub; elevation 3-1,600 feet. Annual herb, blooms January-July.	Low. Marginal habitat present in several small patches of coastal scrub onsite. The closest known occurrence is 8.4 miles northeast of the city limits.
Santa Catalina Island desert-thorn *Lycium brevipes* var. *hassei*	CNPS: List 1B.1	Coastal bluff scrub, coastal scrub; elevation 30-1,000 feet. Deciduous shrub, blooms June.	Low. Marginal habitat present in several small patches of coastal scrub onsite. The closest known occurrence is 8.5 miles southwest of the city limits.
little mousetail *Myosurus minimus* ssp. *apus* (= *M. minimus*)	CNPS: List 3.1	Valley and foothill grassland, and vernal pools (alkaline); elevation 65-2,100 feet. Annual herb, blooms March-June.	Low. Marginal habitat present in patch of annual grassland onsite. The closest known occurrence is 14.3 miles southwest of the city limits.
mud nama *Nama Stenocarpum*	CNPS: List 2.2	Marshes and swamps; elevation 15-1,500 feet. Annual/Perennial herb, blooms January-July.	Low. Marginal habitat present onsite in brackish marsh areas of the Veeh Reservoir. The closest known occurrence is 4.5 miles northeast of the city limits.
prostrate navarretia *Navarretia prostrata*	CNPS: List 1B.1	Coastal scrub, valley and foothill grassland, vernal pools/mesic soils, at elevation 50-2,300 feet. Annual herb, blooms April-July.	Low. Marginal habitat present in several small patches of coastal scrub onsite. The closest known occurrence is 12.6 miles south of the city limits.
Allen's pentachaeta *Pentachaeta aurea* ssp. *allenii*	CNPS: List 1B.1	Coastal scrub and valley and foothill grassland; elevation 250-1,600 feet. Annual herb, blooms March-June.	Low. Marginal habitat present in several small patches of coastal scrub and annual grassland onsite. The closest known occurrence is 1.5 miles west of the city limits.
Santiago Peak phacelia *Phacelia suaveolens* ssp. *keckii*	CNPS: List 1B.3	Closed-cone coniferous forest and chaparral; elevation 1,600-4,800 feet. Annual herb, blooms May-June.	No potential to occur. Habitat not present onsite. The closest known occurrence is 10.9 miles northeast of the city limits.
white rabbit-tobacco *Pseudognaphalium leucocephalum*	CNPS: List 2.2	Chaparral, cismontane woodland, coastal scrub, riparian woodland/sandy, gravelly; elevation 0 6,500 feet. Perennial herb, blooms August-November.	Low. Marginal habitat present in several small patches of coastal scrub and riparian woodland onsite. The closest known occurrence is 0.7 miles south of the city limits.

Common Name *Scientific Name*	Sensitivity Status[1]	General Habitat Description	Probability of Occurrence
Nuttall's scrub oak *Quercus dumosa*	CNPS: List 1B.1 NCCP/HCP: Target Species	Closed cone coniferous forests, chaparral, and coastal scrub, on sandy and clay loam soils; elevation 50-1,300 feet. Shrub (evergreen), blooms February-April.	Low. Marginal habitat present in several small patches of coastal scrub onsite. The closest known occurrence is 3.6 miles southwest of the city limits.
rayless ragwort *Senecio aphanactis*	CNPS: List 2.2	Chaparral, cismontane woodland, and coastal scrub, usually on alkaline soils; elevation 50-2,700 feet. Annual herb, blooms January-April.	Low. Marginal habitat present in several small patches of coastal scrub onsite. The closest known occurrence is 6.6 miles southwest of the city limits.
estuary seablite *Suaeda esteroa*	CNPS: List 1B.2	Marshes and swamps; elevation 0-20 feet. Perennial herb, blooms May-October.	Low. Marginal habitat present onsite in brackish marsh areas of the Veeh Reservoir. The closest known occurrence is 10 miles west of the city limits.
Parry's tetracoccus *Tetracoccus dioicus*	CNPS: List 1B.2	Chaparral and coastal scrub; elevation 540-3,300 feet. Shrub (deciduous), blooms April-May.	Low. Marginal habitat present in several small patches of coastal scrub onsite. The closest known location was recorded in 1948 in the south coastal plain region Near San Juan Camp, Orange County.
crownbeard *Verbesina dissita*	CNPS: List 1B.1	Chaparral and coastal scrub; elevation 120-650 feet. Perennial herb, blooms April-July.	Low. Marginal habitat present in several small patches of coastal scrub onsite. The closest known occurrence is 2.8 miles west of the city limits.

[1]Sensitivity Status Codes

Federal U.S. Fish and Wildlife Service (USFWS)
State California Department of Fish and Game (CDFG)
Other California Native Plant Society (CNPS):

- 1B: Plants rare, threatened, or endangered in California and elsewhere
- 2: Plants rare, threatened, or endangered in California, but more common elsewhere
- 3: Plants more information is needed for
- 4: Plants of limited distribution – a watch list

NCCP/HCP: Included on the Orange County Conservation Plan & Habitat Conservation Plan (NCCP/HCP) (MSCP) target plant and animal species list (1996).

Common Name *Scientific Name*	Sensitivity Status[1]	General Habitat Description	Probability of Occurrence

SOURCES:

Federal and State Rankings:

California Natural Diversity Database (CDFG) list of Endangered, Threatened, and Rare plants of California (October 2008).

All CNPS Rankings, nomenclature, habitat descriptions, plant habit and blooming period information taken from:

Tibor, D.P. 2001. Inventory of Rare and Endangered Plants of California, 6th ed., California Native Plant Society, Sacramento, Califiornia.

NCCP/HCP Covered Species List:

County of Orange. 1996. Natural Community Conservation Plan & Habitat Conservation Plan (NCCP/HCP), Orange County Central/Coastal.

Table B-2
Sensitive Wildlife Species with Low Potential to Occur Within the City of Laguna Hills

Common Name *Scientific Name*	Sensitivity Status[1]	General Habitat Description	Probability of Occurrence
Invertebrates			
monarch butterfly *Danaus plexippus*	CDFG: Special Animal	Prefers open fields, roadsides, canyons, and suburban areas. Feeds on milkweeds.	Low. Marginally suitable habitat present onsite. Unlikely to occur as a migrant due to overall fragmented and disturbed habitat.
Fish			
arroyo chub *Gila orcuttii*	CDFG: Species of Special Concern	Prefers slow-moving sections of permanent, small to moderate-sized streams with sand or mud substrate with more than half of the habitat as runs and pools ~ 5 in deep and reaches of permanent water more than 1.25 miles long.	Low. Low quality habitat present onsite. Closest known occurrence is 2 miles east of the city limits in 1998.
Amphibians			
western spadefoot toad *Spea hammondii*	CDFG: Species of Special Concern NCCP/HCP: Target Species	Temporary ponds, vernal pools, and backwaters of slow-flowing creeks. Also upland habitats such as grasslands and coastal sage scrub where burrows are constructed.	Low. Low quality habitat present onsite. Unlikely to occur onsite due to relatively fragmented and disturbed wetland habitats. No vernal pools present onsite for breeding.
Reptiles			
orange-throated whiptail *Aspidoscelis hyperythra beldingi*	CDFG: Species of Special Concern NCCP/HCP: Target Species	A variety of habitats including sage scrub, chaparral, riparian and various woodlands. Found on sandy or friable soils with open scrub. Requires open areas, bushes, and fine loose soil.	Low. Marginally suitable habitat present onsite in isolated sage scrub habitat. Closest known occurrence is 1.1 miles west of the city limits on the Laguna Coast Wilderness Park.
coastal western whiptail *Aspidoscelis tigris stejnegeri*	CDFG: Special Animal NCCP/HCP: Target Species	Often associated with dense vegetation such as chaparral and sage scrub especially in and around sandy washes and streambeds.	Low. Marginally suitable habitat present onsite in isolated sage scrub habitat.
Coronado skink *Eumeces skiltonianus interparietalis*	CDFG: Species of Special Concern NCCP/HCP: Target Species	Most commonly found in open areas, sparse brush, and in oak woodlands, usually under rocks, leaf litter, logs, debris, or in the shallow burrows it digs.	Low. Marginally suitable habitat present onsite in limited areas.

Common Name *Scientific Name*	Sensitivity Status[1]	General Habitat Description	Probability of Occurrence
coastal rosy boa *Lichanura trivirgata rosefusca*	CDFG: Species of Special Concern NCCP/HCP: Target Species	Distributed in desert and chaparral habitats, especially in areas with dense vegetation and rocky cover such as those associated with coastal canyons and hillsides, desert canyons, washes and mountains.	Low. Marginally suitable habitat present onsite in isolated sage scrub habitat.
coast patch-nosed snake *Salvadora hexalepis virgultea*	CDFG: Species of Special Concern	A variety of habitats including grasslands, chaparral, coastal sage scrub, riparian, and agricultural fields. Prefers open habitats with friable or sandy soils, burrowing rodents for food, and enough cover to escape predation.	Low. Marginally suitable habitat present onsite in isolated sage scrub habitat.
two-striped gartersnake *Thamnophis hammondii*	CDFG: Species of Special Concern	Aquatic habitats, preferably rocky streams with protected pools, cattle ponds, marshes, vernal pools, and other shallow bodies of water lacking large aquatic predators.	Low. Low quality habitat present onsite in disturbed wetland areas. Closest known occurrence is 1.5 miles east of the city limits in 2005.
northern red-diamond rattlesnake *Crotalus ruber ruber*	CDFG: Species of Special Concern NCCP/HCP: Target Species	Chaparral, coastal sage scrub, along creek banks, and in rock outcrops or piles of debris. Habitat preferences include dense vegetation in rocky areas.	Low. Marginally suitable habitat present onsite in isolated and fragmented sage scrub habitat. Closest known occurrence is 2.2 miles northwest of the city limits in 2001.
southwestern pond turtle *Actinemys marmorata pallida*	CDFG: Species of Special Concern	Inhabits freshwater environments such as streams, lakes, rivers, and ponds with emergent floating vegetation.	Low. Marginally suitable habitat present onsite near Veeh Reservoir, Aliso Creek, and Oso Creek. Unlikely to occur onsite due to habitat fragmentation and disturbance.
San Diego horned lizard *Phrynosoma coronatum blainvillii*	CDFG: Species of Special Concern	Associated with coastal sage scrub, especially areas of level to gently sloping ground with well-drained loose or sandy soil but it can also be found in annual grasslands, chaparral, oak woodland, riparian woodland, and coniferous forest between 30 and 7,030 feet.	Low. Unlikely to occur onsite due to relatively fragmented and disturbed nature of potential habitat.

Common Name *Scientific Name*	Sensitivity Status[1]	General Habitat Description	Probability of Occurrence
Birds			
northern harrier *Circus cyaneus*	CDFG: Species of Special Concern (nesting)	Found mainly in grasslands and marshes year round in San Diego County.	Low. Marginally suitable foraging habitat present near Veeh Reservoir and associated wetlands and grasslands.
white-tailed kite *Elanus leucurus majusculus*	CDFG: fully protected (nesting)	Wide spread over coastal slopes preferring riparian woodlands, oak groves, or sycamore groves, adjacent to grasslands.	Low. Marginally suitable foraging habitat present onsite and adjacent to the city limits.
burrowing owl *Athene cunicularia*	CDFG: Species of Special Concern (Burrow sites and some wintering sites)	Found mainly in grassland and open scrub from the seashore to foothills. Strongly associated with California ground squirrel (*Spermophilus beecheyi*) burrows.	Low. Low quality habitat present onsite. Unlikely to occur onsite due to disturbed and fragmented nature of grasslands and scrub.
southern California rufous-crowned sparrow *Aimophila ruficeps canescens*	CDFG: Watch List NCCP/HCP: Target Species	Grassy or rocky slopes with open scrub at elevations from sea level to about 2000 feet. Occurs mainly in coastal sage scrub.	Low. Marginally suitable habitat present within fragmented coastal sage scrub habitat. Closest known occurrence is 1.8 miles to the west of the city limits in the Laguna Coast Wilderness Park.
grasshopper sparrow *Ammodramus savannarum perpallidus*	CDFG: Species of Special Concern	Restricted to grasslands, typically those dominated by native grasses and forbs.	Low. Marginally suitable grassland habitat present in various fragments throughout the City. Closest known occurrence is 0.5 mile northwest of the city limits in 2003 in the adjacent Laguna Coast Wilderness Park.
tricolored blackbird *Agelaius tricolor*	CDFG: Species of Special Concern	Occupies marshes, swamps, streamside groves, willow and alder thickets, open woodlands with thickets, orchards, gardens, and open mangroves.	Low. Marginally suitable habitat within the wetland marsh around the Veeh Reservoir. Unlikely for the species to occur due to closest known occurrence being 3.6 miles to the east of the city limits in 1990.
California horned lark *Eremophila alpestris actia*	CDFG: Species of Special Concern	Inhabits areas with sparse vegetation, including sandy shores, grasslands, mesas, and agricultural lands.	Low. Unlikely to occur onsite due to fragmented marginally suitable habitat. Closest known occurrence is 0.7 mile to the northwest of the city limits in 2003 in the Laguna Coast Wilderness Park.

Common Name *Scientific Name*	Sensitivity Status[1]	General Habitat Description	Probability of Occurrence
loggerhead shrike *Lanius ludovicianus*	CDFG: Species of Special Concern	Inhabits open habitat with perches for hunting and fairly dense shrubs for nesting. In southern California, loggerhead shrikes inhabit grasslands, agricultural fields, chaparral, and desert scrub	Low. Unlikely to occur onsite due to fragmented and disturbed nature of grasslands and scrub habitat within the city limits.
Mammals			
western red bat	CDFG: Species of Special Concern	Inhabits forested riparian habitats with large mature trees, especially cottonwoods.	Low. Low quality habitat present onsite near Veeh Reservoir.
Yuma myotis *Myotis yumanensis*	CDFG: Special Animal	Open forests and woodlands with water sources. Forages over water and roosts in caves, mines, buildings, or crevasses.	Low. Marginally suitable foraging habitat may occur around Veeh Reservoir. Closest known occurrence is 2.6 miles to the southeast of the city limits in 1997.
northwestern San Diego pocket mouse *Chaetodipus fallax fallax*	CDFG: Species of Special Concern	Inhabits arid habitats with coastal sage scrub, chaparral, oak woodlands, and annual grasslands and in sandy herbaceous areas in association with rocks or coarse gravel.	Low. Marginally suitable habitat occurs along fringes of the city limits and in some fragments of disturbed grassland and coastal sage scrub.
San Diego black-tailed jackrabbit *Lepus californicus bennettii*	CDFG: Species of Special Concern	Prefers open country including grasslands, open scrub, desert washes, open chaparral, and coastal sage scrub.	Low. Marginally suitable habitat occurs along fringes of the city limits and in some fragments of disturbed grassland and coastal sage scrub.

[1]Sensitivity Status Codes
Federal U.S. Fish and Wildlife Service (USFWS)
State California Department of Fish and Game (CDFG)
Other NCCP/HCP: Included on the Orange County Conservation Plan & Habitat conservation Plan (NCCP/HCP) (MSCP) target plant and animal species list (1996).

SOURCES:

Federal and State Rankings:

California Natural Diversity Database (CDFG) list of Endangered, Threatened, and Rare Plants of California (October 2008).

All CNPS Rankings, nomenclature, habitat descriptions, plant habit and blooming period information taken from:

Tibor, D.P. 2001. Inventory of Rare and Endangered Plants of California, 6th ed., California Native Plant Society, Sacramento, California.

NCCP/HCP Covered Species List:

County of Orange. 1996. Natural Community Conservation Plan and Habitat Conservation Plan (NCCP/HCP), Orange County Central/Coastal.

This page intentionally left blank.

APPENDIX C

SEISMIC AND GEOLOGIC TECHNICAL BACKGROUND REPORT

DRAFT

SEISMIC AND GEOLOGIC TECHNICAL BACKGROUND REPORT FOR THE CITY OF LAGUNA HILLS GENERAL PLAN UPDATE, LAGUNA HILLS, ORANGE COUNTY, CALIFORNIA

Prepared for:

EDAW Inc.
1420 Kettner Blvd, Suite 500
San Diego, California 92101

Prepared by:

Wilson Geosciences Inc.
Altadena, California 91001
wilsongeo@earthlink.net

October 2008

DRAFT

TABLE OF CONTENTS

EXECUTIVE SUMMARY *1*

Planning and Regulatory **1**

Seismic and Geologic Conditions **1**

Seismic and Geologic Hazards **2**

Potential Earthquake and Geologic Effects on the City **2**

1. INTRODUCTION *3*

1.1 Overview **3**

1.2 Geologic and Seismic Hazard Planning Considerations **4**

1.3 Geologic and Seismic Hazard Regulations **5**

1.3.1 Alquist-Priolo Earthquake Fault Zoning Act 5
1.3.2 Seismic Hazards Mapping Act 6
1.3.3 Natural Hazards Disclosure Act 6
1.3.4 Federal Disaster Mitigation Act of 2000 7
1.3.5 National Flood Insurance Program 7
1.3.6 California Environmental Quality Act (CEQA) 7
1.3.7 Building Codes 7

2. THE SEISMIC AND GEOLOGIC SETTING *8*

2.1 Seismic Conditions in the City **9**

2.1.1 Faults 9
2.1.2 Historic Earthquakes and Ground Shaking 10
2.1.3 San Joaquin Hills Blind Thrust Scenario Earthquake 12

2.2 Geologic Conditions in the City **13**

2.2.1 Physiography 13
2.2.2 Bedrock Formations 13
2.2.3 Surficial Deposits 14
2.2.4 Groundwater Depth 16
2.2.5 Flooding 16

3 ANALYSIS OF POTENTIAL GEOLOGIC AND SEISMIC HAZARDS *17*

3.1 Seismic Hazards **17**

3.1.1 Overview 17
3.1.2 Ground Shaking 18
3.1.3 Surface Fault Rupture (Including Co-Seismic Deformation) 23
3.1.4 Earthquake-Induced Landslides 24
3.1.5 Liquefaction 25
3.1.6 Dynamic Consolidation and Subsidence 27
3.1.7 Ground Cracking, Ridge Top Spreading, and Fill Slope Deformation 28
3.1.8 Dam Failure Inundation/Flooding 29

3.2 Geologic and Soil Hazards **30**

3.2.1 Overview 30
3.2.2 Landslides, Mudslides, and Debris Flows 31
3.2.3 Collapsible and Expansive Soil Hazards 31

3.2.4 Shallow Groundwater 32

4. POTENTIAL EARTHQUAKE EFFECTS AND HAZARD REDUCTION 32

4.1 Community Facilities 34

4.2 Freeways, Bridges, and Evacuation/Emergency Response Routes 35

4.3 Reservoirs, Dams, Railroads, and Utilities 35

4.4 Potentially Hazardous Buildings 36

4.5 Land Use and Development 36

4.6 Hazard Reduction 37

4.6.1 Building Codes 37

4.6.2 Special Hazard Zones 37

4.6.3 Building Retrofit 37

5 REFERENCES CITED 38

FIGURES (APPENDIX)

Figure G-1 – Regional Fault Locations
Figure G-2 – City Region Geology
Figure G-3 – City Area Geology Map and Explanation
Figure G-4 – Earthquake Epicenter Map for Events Magnitude 4.5 and Greater
Figure G-5 – Quaternary Engineering Geology Units
Figure G-6 – Historically Highest Groundwater, Liquefaction, and Earthquake-Induced Landslide Hazard
Figure G-7 – FEMA Flood Zones
Figure G-8 – Predicted 10% in 50-Year Peak Horizontal Ground Acceleration
Figure G-9 – Dam Inundation Flooding Potential
Figure G-10 – Community Facilities

TABLES (TEXT)

Table G-1 – Top Ten Earthquakes within 100 Miles of Laguna Hills City Hall: 1800-2001 (Blake, 2001) Sorted by Magnitude and Peak Acceleration/Modified Mercalli Intensity) 10

Table G-2 – Statistical Distribution of Earthquakes by Magnitude Within 100-Miles of the Laguna Hills City Hall 1800-2000 11

Table G-3 – Engineering Geologic Units and Unit Characteristics 14

Table G-4 – Major Active Faults within a 50-Mile Radius of Laguna Hills City Hall 19

Table G-5 – Deterministic Earthquake Ground Shaking Parameters for Critical Earthquake Faults (Estimated MMI Intensity ≥VIII) within 50-Miles of Laguna Hills City Hall 20

Table G-6 – Modified Mercalli Intensity Scale (Abridged Version) 21

Table G-7 – Estimated Earthquake Ground Motion Parameters for Three Locations (North, Central, and South) in the City of Laguna Hills 22

Table G-8 –Potential Geologic and Seismic Hazards Effecting Community Facilities in the City of Laguna Hills 33

EXECUTIVE SUMMARY

Planning and Regulatory

Geologic and soils hazards include slope instability, severe erosion, and geotechnical constraints such as expansive, corrosive, organic-rich and collapsible-compressible soils, as well as seismic events (earthquakes). Seismic hazards result from the primary action of an earthquake (e.g., strong ground shaking and surface fault rupture) and the secondary effects caused by the earthquake shaking (e.g., liquefaction, induced settlement, landslides, ground fissures, dam failure inundation, tsunami, and seiche). For planning purposes, geologic, soils, and seismic hazards play an important role in the selection of development locations, the process necessary to develop a safe project, and the studies necessary to design a project to avoid or withstand these natural hazards. The General Plan Safety Element provides guidance to accomplish these steps and information useful to begin the development planning process.

Laws, regulations, and codes are established to ensure that proper precautions are taken in advance of development to prevent unreasonable levels of damage, injuries, or fatalities. The primary applicable regulatory measures are:

--1970 California Environmental Quality Act
--1972 Alquist-Priolo Special Studies Zones Act 1971
--1986 Unreinforced Masonry Law
--1990 Seismic Hazards Mapping Act
--1999 Natural Hazards Disclosure Act
--2001 State Historical Building Code, and
--2007 California Building Code adopted as Laguna Hills Municipal Code Section 10-28.010

Seismic and Geologic Conditions

The City of Laguna Hills shares general geologic and seismic conditions with other cities that lie along the southern slope of the Santa Ana Mountains and foothills, e.g., from Orange on the northwest to San Juan Capistrano on the southeast. For millions of years tectonic movement and uplift along the Elsinore fault system northeast of the Santa Ana Mountains, and frontal faults along the southwest base of the mountains, has juxtaposed the old metasedimentary, volcanic, and crystalline basement rocks in the Santa Ana Mountains against the younger bedrock and alluvial deposits of the Santa Ana Valley sedimentary basin on the south. Examples of active and potentially active faults that are (a) in close proximity to the City are the Newport-Inglewood (onshore and offshore), Chino-Central Avenue, Elsinore, and Whittier faults), (b) underlie the City (e.g., San Joaquin Hills blind thrust), or (c) lie at some distance from the City (e.g., San Andreas, Coronado Bank, and Puente Hills faults). No designated Alquist-Priolo Earthquake Fault Zone is located within or near the City. Smaller, unnamed so-called "young faults" are mapped immediately west of the City and just within the western City boundary south of the intersection of Moulton Parkway and Laguna Hills Drive.

Earthquake shaking has affected the City in the historic past, with a few large, distant earthquakes occurring within the recent memories of many residents. Events centered some distance from the City (e.g., 1992 Landers/Big Bear and 1994 Northridge) were unsettling but caused relatively minor local disruptions. For example, the 1992 magnitude 7.3 Landers earthquake main shock occurred about 135 kilometers (84 miles) east of Laguna Hills and had little damaging effect. Similarly minor effects were experienced from the 1994 Northridge earthquake some 101 kilometers (63 miles) to the northwest. However, the 1933 "Long Beach" earthquake (Mw = 6.4) about 24 kilometers (~15 miles) to the west of the City of Laguna Hills is estimated to have had a Modified Mercalli Intensity of about IV to VI which could have caused some damage to elements of the current City infrastructure.

The City of Laguna Hills is largely built upon the eroded young bedrock of the eastern San Joaquin Hills, and the sloping older alluvial fan deposits south and west of moderately steep foothill areas (e.g., Loma Ridge) and the steeper Santa Ana Mountains to the north. Elevations in the City range from approximately 654 feet above mean sea level (amsl) near Nellie Gale Road and Gallup Circle to about 200 feet near the intersection of Oso and Moulton Parkways. The alluvial fan surface in the northern section of the City and in the City Hall area is underlain by a very old alluvium composed primarily of sand, silt, gravel, and cobbles. Eroded "soft" bedrock formations underlying most of the central and southern portions of the City consist of (a) poorly bedded siltstone and mudstone, (b) interbedded sandstone and conglomerate, and (c) minor siliceous and diatomaceous siltstone and sandstone. These units are cut by several drainages (mainly Aliso Creek, its subsidiary drainages, and Oso Creek) that are filled with younger alluvium consisting of slightly consolidated silt, sand, and gravel.

Seismic and Geologic Hazards

The following seismic and geologic hazards are considered:

- Primary seismic hazards
    - Ground shaking (strong earthquake ground motions)
    - Surface fault rupture
    - Co-seismic uplift, folding, and tilting
- Secondary seismic hazards
    - Earthquake-induced landslides
    - Liquefaction, dynamic consolidation, and differential settlement
    - Ground lurching and cracking, fill mass deformation
    - Dam failure inundation/flooding
    - Flooding from tsunami and seiche
- Slope instability (landslides, mudslides, and debris flows)
- Poor geotechnical/soils engineering properties (expansive, collapsible, and corrosive)
- Shallow groundwater
- Flooding from tsunami and seiche
- Subsidence
- Flooding

Primary and secondary seismic hazards, slope instability, and geotechnical properties have the greatest potential to affect planning decisions in the City, in particular strong ground shaking, liquefaction, earthquake-induced and other landslides, and artificial fill deformation/failure. For most geologic, seismic, and geotechnical conditions there are standard and special design measures available to minimize adverse effects on populations and structures, however in some cases avoidance (setbacks) from a geologic or seismic hazard may be necessary.

Potential Earthquake and Geologic Effects on the City

The potential for damaging earthquakes in the City of Laguna Hills is somewhat less than is typical of most southern California cities, however severe local earthquakes (as large or larger than the 1994 M6.7 Northridge and 1971 M6.4 San Fernando earthquakes) may occur within a relatively short distance, for example less than 25 miles. Such earthquakes would most likely occur more or less aligned with major strike-slip or reverse faults having recognizable surface features (e.g., the Newport-Inglewood, Elsinore, Chino-Central Avenue, Whittier, Sierra Madre, and San Andreas faults), but also on less well understood blind thrust faults (e.g., the Puente Hills [1987 M5.9 Whittier Narrows] and San Joaquin Hills [possibly the 1769 ~M7.3?] blind thrust earthquakes) having more subtle surface expressions. The aforementioned documented San Joaquin Hills blind thrust fault beneath the City poses the most substantial threat. Depending upon the type of source fault, the depth of the energy release, and the magnitude of the earthquake, (a) ground displacements may occur on these surface faults outside the City causing within the near surface geologic and soil formations and (b) there

may be co-seismic folding, ground tilting, and uplift may occur above a blind thrust. Such area-wide and regional uplift was associated with the 1987 and 1994 events.

Earthquake-related hazards and geologic hazards have the potential to cause serious property damage and serious/fatal injuries if the seismic event is large enough to generate short duration high peak ground accelerations, or long duration moderate to high ground accelerations. The earthquake effects on structures and facilities will depend upon the size and location of the earthquake being considered, the specific location within the City, and the condition of the facility. A list of community facilities considered essential, important, or critical by the City of Laguna Hills is considered. These are subdivided into (a) police, fire, and City Hall (b) government buildings and facilities, (c) medical facilities and nursing homes, and (d) schools. Also considered are freeways, bridges, utilities, reservoirs, railroads, and dams. Discussions are qualitative and presented in relative terms. The intent is to highlight facilities and locations where concerns may be high in order to provide an emergency planning tool for the City, and to enhance potential future facility studies and/or upgrades in the context of the report's technical discussions and maps.

1 INTRODUCTION

1.1 Overview

It is necessary to look at a wide range of potential geology, soils, and seismic related topics in order to comply with State Guidelines for environmental impact reports (EIR) and General Plan documents, and to provide an adequate understanding of geotechnical and engineering geologic issues affecting land use planning decisions. These topics include:

- Ground shaking (strong earthquake ground motions)
- Surface fault rupture
- Co-seismic uplift and folding
- Liquefaction, differential compaction and settlement
- Ground lurching and cracking, fill mass deformation
- Earthquake-induced landslides
- Subsidence
- Compressible, collapsible, or expansive soils
- Flooding from dam failure
- Flooding from tsunami and seiche
- Landslides and slope instability
- Groundwater Depth

This document is a technical background report designed to support preparation of the General Plan EIR and the Safety Element for the City of Laguna Hills. As such the document contains up-to-date information on the seismic and geologic conditions within and around the City, which will potentially affect the persons and property in the City in the event of a local geologic hazard or a major earthquake in southern California. Discussion is also provided for the buildings and infrastructure most important to the citizens and City personnel in the event earthquake-related effects are particularly severe in the City.

The technical conditions mentioned above must be taken into account as the City of Laguna Hills undertakes expansion, redevelopment, and in-fill. Existing building codes and land use planning requirements can address most of the hazards inherent in the geologic and seismic setting of the City. As newer, more accurate geologic, soils, and seismic information has been developed since the last General Plan update, it is possible to better identify the hazard areas and to account for them in future development. Sources for this information include generalized regional reports and maps, and some site-specific information obtained from the City.

1.2 Geologic and Seismic Hazard Planning Considerations

Geologic and seismic hazards play an important role in the planning process with regard to the selection of development locations, the definition of processes necessary to develop safe projects, and the studies necessary to design a project to avoid or withstand these two types of natural hazards. The General Plan Safety Element provides guidance to accomplish these steps and information useful to begin the development planning process. Seismic hazards result from the primary action of an earthquake (strong ground shaking and surface fault rupture) and the secondary action affects caused by the earthquake shaking (liquefaction, induced settlement and landslides, ground fissures, seiches). Laws, regulations, and codes are established to ensure that proper precautions are taken in advance of development to prevent unreasonable levels of damage, injuries, or fatalities.

Seismic ground motion (earthquake shaking) hazard concerns increase with the increasing importance of a development or an individual structure. The importance may relate to essential services (hospitals, police and fire, 911 capability, traffic management centers), schools, critical lifelines (pipelines, freeways, aqueducts), high-occupancy (hotel, multi-story office building), or concentrated residential development. Often, engineers and geologists consider in seismic design calculations the largest earthquake that is thought possible for a particular fault to create a "deterministic" earthquake calculation for the maximum considered (most severe) earthquake effects on a development or on a section of a City. This maximum magnitude earthquake (M_{max}), sometimes referred to as the Upper Bound Earthquake (UBE), ground motion has a statistical recurrence interval of 949 years and would produce earthquake ground motion "intensity" with a 10 percent probability of being exceeded in 100 years. This is a stringent design standard used for public schools, hospitals, and other critical facilities (dams, reservoirs, power plants). A lesser although still stringent, standard is the maximum probable earthquake (M_{PE}) or Design Basis Earthquake (DBE), which has a statistical recurrence interval of 475 years and would produce ground motions with a 10 percent probability of being exceeded in 50 years. These two fault-specific design standards are embodied in the building codes adopted by State organizations and local jurisdictions for application to a development project considering the importance of a facility and its proposed use, as well as the projected design life.

Professionals responsible for the planning, design, construction, and operation of development projects use these (and other) earthquake design levels to provide the necessary margin of safety for the project in question. Another approach to defining the seismic design parameters (earthquake peak horizontal and vertical ground acceleration, earthquake wave period, and the duration of strong ground motion) is Probabilistic Seismic Hazard Assessment (PSHA). This method considers all faults, and their characteristic earthquakes, within 100 kilometers of a site or a development area. The seismic design parameters are computed considering the probability of exceeding a certain "intensity" of each parameter (similar to the fault-specific UBE and DBE earthquake ground motions); this approach is generally applied to important facilities and is also embodied in building codes.

Earthquake intensity is often presented as a measure of the effects (either actual or predicted) of an earthquake at a particular location, including actual/potential damage (e.g., light or severe), one's perception of shaking (e.g., felt or unable to stand), and permanent topographic changes (e.g., uplift, landslides, or fault rupture). In the United States the most commonly cited intensity scale in the Modified Mercalli Intensity Scale (MMI) developed in 1931 and modernized over time largely to reflect changes in the types of structure that may be damaged. Roman numerals represent increasingly more intense shaking from MMI I (not felt) through MMI XII (damage total). Seismologists have also related these general categories to ranges of peak ground acceleration and peak ground velocity. Variations in intensities depend on a locations distance from the earthquake, its rock and soil conditions, and variations in the propagation of earthquake waves due to subsurface complexities (e.g., local alluvial basin depth and shape).

Geologic (and soil) hazards and surface fault rupture, in contrast to seismic ground motion hazards, are more susceptible to direct observation and testing to determine the degree of hazard, and to specify a remediation or avoidance strategy. These hazards include potentially unstable slopes, landslides, mudflows, severe erosion or flooding, expansive and compressible soils, shallow groundwater, and several secondary seismic hazards arising from geologic conditions. These secondary hazards may include liquefaction, deformation of large fill masses, dam failure-induced flooding, and seiches.

In summary, geologic and seismic hazards must be considered in all phases of the development cycle from the earliest conceptual planning to the operations and eventual decommissioning of a facility. Building codes and general plan documents provide regulations, specifications, and strategies to cover most hazard conditions, if the proper detailed studies are performed to recognize the hazards, to define their potential severity, and to provide an adequate design that considers the importance, use, and life span of the facility.

1.3 Geologic and Seismic Hazard Regulations

1.3.1 Alquist-Priolo Earthquake Fault Zoning Act

The 1972 Alquist-Priolo Special Studies Zones Act 1971 resulted from the consequences of the Sylmar-San Fernando earthquake and seeks to mitigate the hazard of fault rupture by prohibiting the location of structures for human occupancy across the trace of an active fault. The Act was renamed in 1994 to the Alquist-Priolo Earthquake Fault Zoning (APEFZ) Act. The Sylmar-San Fernando earthquake produced surface fault rupture damage along a zone that might have been identified in advance of the earthquake had the proper studies been mandated.

The best and most feasible surface rupture mitigation is avoidance of the causative fault. Thus, the APEFZ Act mandates that cities and counties (lead agencies) require that within an APEFZ geologic investigations must be performed to demonstrate that potential development sites are not threatened by surface fault displacements from future earthquakes. To aid the various jurisdictions that function as lead agencies for project approvals in California, the California Geological Survey (CGS, formerly the California Division of Mines and Geology-CDMG) must delineate Earthquake Fault Zones on standard U. S. Geological Survey topographic maps (1-inch equals 2000-feet scale) along faults that are "sufficiently active and well defined" as defined in the Act. Quoting from the implementation guide, Special Publication 42 (Hart and Bryant, 1997; a 2007 interim revision has been updated to reflect changes in the index map and the listing of additional effected cities):

> "Zone boundaries on early maps were positioned about 660 feet (200 meters) away from the fault traces to accommodate imprecise locations of the faults and possible existence of active branches. The policy since 1977 is to position the EFZ boundary about 500 feet (150 meters) away from major active faults and about 200 to 300 feet (60 to 90 meters) away from well-defined, minor faults. Exceptions to this policy exist where faults are locally complex or where faults are not vertical."

Lead agencies are responsible to regulate most development projects within the APEFZ as described in the Act, but may enact more stringent regulations. Certain smaller residential developments can be exempt. Laguna Hills currently has no APEFZ within the City. One short "young" fault segment has been mapped at the far western edge of the City near the intersection of Moulton Parkway and Aliso Creek, but to date this has not been determined by the State to be sufficiently active and well-defined to be considered for zoning.

1.3.2 Seismic Hazards Mapping Act

The 1990 Seismic Hazards Mapping Act (SHMA) addresses the primary earthquake hazard, strong ground shaking, as well as the secondary hazards of liquefaction, earthquake-induced landslides, and in some areas zones of amplified shaking. As with the APEFZ Act, the California Geological Survey is the primary State agency charged with implementing the SHMA, and CGS provides local jurisdictions with the 1-inch equals 2000-feet scale seismic hazard zone maps that identify areas susceptible to liquefaction, earthquake-induced landslides, and in some areas amplified shaking. Site-specific hazard investigations are required by the SHMA when a development project is located within one of the Seismic Hazard Mapping Zones (SHMZ) defined as a zone of required investigation.

Lead agencies with the authority to approve projects shall ensure that:

> "The geotechnical report shall be prepared by a registered civil engineer or certified engineering geologist, having competence in the field of seismic hazard evaluation and mitigation. The geotechnical report shall contain site-specific evaluations of the seismic hazard affecting the project, and shall identify portions of the project site containing seismic hazards. The report shall also identify any known off-site seismic hazards that could adversely affect the site in the event of an earthquake."

And:

> "Prior to approving the project, the lead agency shall independently review the geotechnical report to determine the adequacy of the hazard evaluation and proposed mitigation measures and to determine the requirements of Section 3724(a), above, are satisfied. Such reviews shall be conducted by a certified engineering geologist or registered civil engineer, having competence in the field of seismic hazard evaluation and mitigation."

CGS Special Publication 117 (CGS, 2008a) covers the investigation, analysis, implementation, and review processes for liquefaction and earthquake-induced landslides evaluations and reports as updated effective September 2008 in order to provide detailed guidance for lead agencies to review SHMA reports. The overall goal is to protect the public by minimizing property damage and the loss of life.

The City of Laguna Hills has been mapped pursuant to the SHMA and there are zones of required investigation for liquefaction and earthquake-induced landslide hazards in the City (San Juan Capistrano and El Toro Quadrangles).

1.3.3 Natural Hazards Disclosure Act

The Natural Hazards Disclosure Act (effective June 1, 1998), requires:

> "that sellers of real property and their agents provide prospective buyers with a "Natural Hazard Disclosure Statement" when the property being sold lies within one or more state-mapped hazard areas, including a Seismic Hazard Zone."

The SHMA specifies two ways in which this disclosure can be made:

> "c. In all transactions that are subject to Section 1103 of the Civil Code, the disclosure required by subdivision (a) of this section shall be provided by either of the following means:
>
> 1. The Local Option Real Estate Transfer Disclosure Statement as provided in Section 1102.6a of the Civil Code.
> 2. The Natural Hazard Disclosure Statement as provided in Section 1103.2 of the Civil Code."

The Local Option Real Estate Disclosure Statement can be substituted for the Natural Hazards Disclosure Statement if it contains substantially the same information and substantially the same warning as the Natural

Hazards Disclosure Statement. Both the APEFZ Act and the SHMA require that real estate agents, or sellers of real estate acting without an agent, disclose to prospective buyers that the property is located in an APEFZ or SHMZ.

1.3.4 Federal Disaster Mitigation Act of 2000

The Disaster Mitigation Act of 2000 provided a new set of mitigation plan requirements that emphasize State and local jurisdictions to coordinate disaster mitigation planning and implementation. States are encouraged to complete a "Standard" or an "Enhanced" Natural Mitigation Plan. "Enhanced" plans demonstrate increased coordination of mitigation activities at the State level, and if completed and approved, will increase the amount of funding through the Hazard Mitigation Grant Program. California's updated State Hazard Mitigation Plan was adopted on October 8, 2007 and approved by the Federal Emergency Management Agency (FEMA) Region IX on December 17, 2007. The City of Laguna Hills has not completed its hazard mitigation plan and must do so as a part of the Safety Element in order to receive funding from the State and federal government in the event of a natural disaster.

1.3.5 National Flood Insurance Program

FEMA administers the National Flood Insurance Program (NFIP), and participating jurisdictions must exercise land use controls and purchase flood insurance as a prerequisite for receiving funds to purchase or build a structure in a flood hazard area. The NFIP provides federal flood insurance subsidies and federally financed loans for eligible property owners in flood-prone areas. Laguna Hills has participated in the program since 1979 and as of 2004, some special (100-year) flood hazard areas were identified in the City. Laguna Hills is identified on the NFIP Flood Insurance Rate Maps as being within Zone X, areas subject to minimal flooding, Zones AE and A, 100-year flood zones with base elevations determined and not determined, respectively.

1.3.6 California Environmental Quality Act (CEQA)

The 1970 California Environmental Quality Act (CEQA) ensures that local agencies consider and review the environmental impacts of development projects within their jurisdictions. CEQA requires that an environmental document (e.g., Environmental Impact Report [EIR], Mitigated Negative Declaration [MND]) be prepared for projects that are judged in an Initial Study (IS) to have potentially significant effects on the environment. Environmental documents (IS, MND, EIR) must consider, and analyze as deemed appropriate, geologic, soils, and seismic hazards. If impacts are considered potentially significant, recommendations for mitigation measures are made to reduce geologic and seismic hazards to less than significant. This allows early public review of proposed development projects and provides lead agencies the authority to regulate development projects in the early stages of planning.

1.3.7 Building Codes

The Laguna Hills City Council adopted (municipal code Chapter 10-28.010) the California Building Code 2007 Edition (CBC) based on the 2006 International Building Code (IBC)--excluding Appendix Chapter 1--as published by the International Code Council, together with other amendments provided in municipal code Chapter 10-28.030. As of January 1, 2008 all new residential, commercial, and light industrial construction is governed by the CBC, which the City of Laguna Hills has amended and provided additions to. Due to the type, quality, and age of some of the city buildings, the 2001 State Historical Building Code (SHBC; is defined in CCR Part 8 of Title 24) applies to the strengthening of unreinforced historic structures, while the 1986 Unreinforced Masonry Law (Section 8875 *et seq,* of California's Government Code) applies to the identification, reporting, and retrofit of non-historic Unreinforced Masonry (URM) buildings. The 2007

California Building Code (defined in CCR Part 2 of Title 24) includes additions to the previous building code that make it more stringent, in particular with regard to seismic and earthquake conditions for critical structures such as essential facilities, public schools and hospitals. The CBC, which is included in Title 24 of the California Administrative Code, is a compilation of three types of building standards from three different origins:

- Those adopted by state agencies without change from building standards contained in national model codes (e.g., the IBC).
- Those adopted and adapted from the national model code standards to meet California conditions (e.g., most of California is Seismic Design Categories D and E).
- Those authorized by the California legislature that constitutes extensive additions not covered by the model codes that have been adopted to address particular California concerns (e.g., the specification of Certified Engineering Geologist rather than engineering geologist).

International and national model code standards adopted into Title 24 apply to all occupancies in California except for modifications adopted by state agencies and local governing bodies. Facilities and structures such as power plants, freeways, emergency management centers (e.g., traffic management, 911 centers), and dams are regulated under criteria developed by various California and Federal agencies.

2 THE SEISMIC AND GEOLOGIC SETTING

General geologic and seismic conditions in the City of Laguna Hills (Morton and Miller, 2006) are shared with other local cities that lie along the eastern slope of the San Joaquin Hills, and bordering Arroyo Trabuco and San Juan Creek (generally east and west of I-5 south to San Clemente). Several million years of mountain building have occurred due to uplift above the San Joaquin Hills blind thrust from Newport Beach to south of Laguna Beach (Figure G-1), folding the geologic formations in the San Joaquin Hills into a braod anticline. Uplift has also occurred along the Santa Ana Mountains and Loma Ridge (Figure G-2). Erosion of the metasedimentary, volcanic, and crystalline rocks of the Santa Ana Mountains and sediment transport by water and gravity formed alluvial fans and subsequently dissected these fans creating the numerous southerly trending arroyos and canyons draining to the Arroyo Trabuco and Santa Ana River. Natural hillsides are susceptible to landslides due to the relatively weak and clay-rich geologic formations, and young alluvium is susceptible to consolidation/subsidence that can be exacerbated by earthquakes. Man-made water reservoirs and lakes located within, or up slope from, the City have the potential to fail and release floodwaters to local areas, in cases where water is impounded behind them. Groundwater basins are located east and west of the City, but not under the City; historically shallow groundwater is reported within the areas of young alluvium. Where groundwater is shallow and sediments are sufficiently loose, large earthquakes can cause liquefaction of the alluvium and settlement of overlying man-made structures.

Laguna Hills has experienced moderately severe to mild earthquake shaking in the historic past, however generally has a somewhat lower potential for strong ground shaking than other areas of southern California. Events centered some distance from the City (e.g., Landers/Big Bear and Northridge) caused only minor local disruptions. The 1994 6.7 magnitude (M) Northridge earthquake main shock occurred approximately 100 kilometers northwest of Laguna Hills and the 1992 Landers M7.3 approximately 130 kilometers northeast each causing Modified Mercalli Intensity of about V and a peak ground acceleration (PGA) of less than 0.1g (g = force of gravity). The 1933 Long Beach earthquake (Mw = 6.4) about 24 kilometers to the west of the City is estimated to have had a Modified Mercalli Intensity of about V based on contemporaneous reports. Substantial disruption from these earthquakes occurred nearer the epicenters reminding southern California residents that every several years another area of southern California is vulnerable to a "direct hit." With earthquake prediction still a distant goal, it is important that each City and citizen do what is within its means and power to create policies that will maximize the protection to lives and property.

2.1 Seismic Conditions in the City

2.1.1 Faults

Two types of fault impacts are important to consider in Laguna Hills. Fault-generated earthquake ground shaking summarized above is the most critical impact due to its widespread effects, and to the severe damage resulting in economic losses and the injury or death of people. The other important impact relates to ground movement, e.g., surface fault rupture, co-seismic uplift, ground lurching, and ground cracking. While these ground movement effects are more limited in extent than strong ground shaking, the impacts on structures and the public can be severe on or near active or potentially active faults.

In cases where earthquakes are large or hypocenters are shallow, ground rupture can occur along the source fault plane where it intersects the earth's surface. While the potential for surface fault rupture hazards is considered extremely low, it cannot be fully discounted. "Active" faults (demonstrated offset of Holocene materials [less than 10,000-12,000 years ago] or significant seismic activity) and "potentially active" (Pleistocene [greater than 12,000 but less than 1,600,000 years ago]) faults (as defined by the CGS) must be considered as potential sources for fault rupture. In general, the younger the last movement is on a fault, the higher the potential for future movement on that fault.

Only two faults are documented to directly underlie the City of Laguna Hills, each having different potential impacts, and each having differing levels of information regarding their degree of activity and damage-generating potential (see Figure G-1 for locations of regional faults). These active and potentially active faults are:

- San Joaquin Hills blind thrust (Grant et al, 1999), and
- An unnamed "young" fault at the west edge of the City (Morton and Miller, 2006)

2.1.1.1 San Joaquin Hills Blind Thrust

The San Joaquin Hills blind thrust (SJHBT; Figure G-1) is a buried low-angle thrust fault dipping approximately 20- to 30-degrees (Grant et al, 1999; 23-degrees per Wills et al, 2008) to the southwest and underlying the San Joaquin Hills. Models of the subsurface conditions used to approximate the earthquake fault plane/source (CGS, 2002; Figures G-1 and G-2) suggest the fault is most likely bounded by the offshore Newport-Inglewood fault zone on the southwest, and the surface expression extends roughly between the Santa Ana River and San Juan Creek on the northwest and southeast, The northeastern edge of the SJHBT may lie just beyond the northeast extent of the San Joaquin Hills and partially beneath the City of Laguna Hills at a depth of about 2 kilometers (Wills et al, 2008).

It is indicated that the SJHBT is a northeast vergent thrust fault (Grant et al, 1999) that pure thrust movement has caused the uplift of the San Joaquin Hills and the formation of the broad anticlinal (up warp) structure roughly paralleling the coastline. Others have suggested that the San Joaquin Hills uplift may be due to (a) strike-slip movement on the Newport-Inglewood fault or (b) movement along a back thrust (SJHBT) above the northeast dipping Oceanside blind trust. Grant et al (1999) determined that San Joaquin Hills have risen at a rate of 0.7 to 0.9 feet per 1000 years (0.21–0.27 m/k.y.) during the past 122,000 years based on measurements of paleoshoreline elevations and radiometric ages of fossil corals. Using the fault plane geometry and an average uplift per earthquake of 1.3 meters they determined a recurrence interval for this uplift of 1650 to 3100 years. Considering the three uplift interpretations the range for the maximum magnitude earthquake was determined to be Mw = 7.3 to 7.5 (Grant and Shearer, 2004). The more likely maximum probable earthquake used by the USGS for its scenario analysis was M6.6.

The expected return period for such large earthquake events is very long and Grant et al (1999 and 2002) indicate that the large (M7.3?) 1769 earthquake in southern California very likely was centered on the SJHBT suggesting such a large event is very unlikely within the City planning horizon. Various levels of uncertainty relative to the location and the potential for future movement (in a timeframe that may impact planned development in the City) characterize all of the faults discussed above. The California Geological Survey has an active program to determine if further Alquist-Priolo Earthquake Fault Zones (APEFZ) should be defined in southern California, but these efforts are not focused on blind thrust faults. Blind thrust fault hazards are primarily related to strong earthquake ground shaking, liquefaction/dynamic settlement, earthquake-induced landslides, regional uplift, and possibly ground tilting, arching, and cracking.

2.1.1.2 Unnamed Young Fault at the West Edge of the City

Morton and Miller (2006) identify two "young" faults, one oriented roughly north-northwest about feet west of the City and one oriented roughly east-northeast just within the western City boundary south of the intersection of Moulton Parkway and Laguna Hills Drive. As defined by Morton and Miller (2006) a young faults are "Mapped, active fault segments having a surface expression in young (11,000 years or younger) earth surface materials."

2.1.2 Historic Earthquakes and Ground Shaking

Earthquakes generally occur on faults, which are planar features within the earth. Numerous regional and local faults (Figure G-1; CGS, 2002) are capable of producing severe earthquakes of magnitude (M) of 6.0 or greater (Figure G-4; SCEC, 2008). Only one instrumentally recorded earthquake of greater than magnitude 6.0 has occurred near the City of Laguna Hills, the 1933 Long Beach earthquake on the Newport-Inglewood fault zone near Newport Beach (Table G-1). It is estimated that this earthquake caused a Modified Mercalli (MMI) shaking intensity effect of between IV and VI classified as very light damage. A M4.5 event in 1969 in the same general area may have produced a slightly lower MMI value. General background seismicity (SCEC, 2008) is considered low for the southern portion of Orange County with earthquake activity concentrated on faults to the east (Elsinore), north (Whittier and Puente Hills), and west (Newport-Inglewood).

Table G-1 - Top Ten Earthquakes within 100 Miles of Laguna Hills City Hall: 1800-2001 (Blake, 2000) Sorted by Magnitude and Peak Acceleration/Modified Mercalli Intensity (MMI)

FILE CODE	LATITUDE NORTH	LONGITUDE WEST	DATE	TIME (UTC) HR MIN SEC	~DEPTH (km)	MAGNITUDE (~approximate)	ACCELERATION AT SITE (%g)	ESTIMATED SITE MMI	APPROXIMATE DISTANCE Miles (km)
Sorted by Magnitude (within 100 miles)									
GSN	34.2010	116.4360	06/28/1992	115734.1	1.0	7.6 [1]	0.07	VI	83.6 (134.6)
MGI	34.0000	117.5000	12/16/1858	10 0 0.0	0.0	~7.0	0.11	VII	29.3 (47.2)
DMG	34.0000	119.0000	09/24/1827	4 0 0.0	0.0	~7.0	0.05	VI	78.6 (126.5)
DMG	34.3700	117.6500	12/08/1812	15 0 0.0	0.0	~7.0	0.07	VI	52.4 (84.3)
DMG	33.7500	117.0000	04/21/1918	223225.0	0.0	~6.8	0.07	VII	42.0 (67.5)
GSN	34.2030	116.8270	06/28/1992	150530.7	5.0	6.7 [2]	0.05	VI	65.0 (104.6)
GSP	34.2130	118.5370	01/17/1994	123055.4	18.0	6.7 [3]	0.05	VI	62.9 (101.2)
DMG	34.3000	117.5000	07/22/1899	2032 0.0	0.0	~6.5	0.06	VI	48.9 (78.8)
DMG	33.0000	117.3000	11/22/1800	2130 0.0	0.0	~6.5	0.06	VI	48.5 (78.1)
DMG	33.6170	117.9670	03/11/1933	154 7.8	0.0	6.4 [4]	0.13	VIII	14.7 (23.6)

FILE CODE	LATITUDE NORTH	LONGITUDE WEST	DATE	TIME (UTC) HR MIN SEC	~DEPTH (km)	MAGNITUDE (~approximate)	ACCELERATION AT SITE (%g)	ESTIMATED SITE MMI	APPROXIMATE DISTANCE Miles (km)
Notes: A) Kern County; B) Landers; C) Wrightwood; D) Fort Tejon; E) Northridge; F) Big Bear; and G) San Fernando.									
Sorted by Estimated MMI Intensity and Peak Acceleration (within 100 miles)									
DMG	33.6170	117.9670	03/11/1933	154 7.8	0.0	6.4 [4]	0.13	VIII	14.7 (23.6)
DMG	33.5450	117.8070	10/27/1969	1316 2.3	6.5	4.5 [5]	0.08	VII	7.2 (11.6)
DMG	33.7500	117.0000	04/21/1918	223225.0	0.0	~6.8	0.07	VII	42.0 (67.5)
MGI	34.0000	117.5000	12/16/1858	10 0 0.0	0.0	~7.0	0.11	VII	29.3 (47.2)
DMG	33.7000	117.4000	05/15/1910	1547 0.0	0.0	~6.0	0.09	VII	18.9 (30.4)
DMG	33.6990	117.5110	05/31/1938	83455.4	10.0	5.5	0.09	VII	13.0 (20.9)
GSN	34.2010	116.4360	06/28/1992	115734.1	1.0	7.6 [1]	0.07	VI	83.6 (134.6)
DMG	34.0000	119.0000	09/24/1827	4 0 0.0	0.0	~7.0	0.05	VI	78.6 (126.5)
GSN	34.2030	116.8270	06/28/1992	150530.7	5.0	6.7 [2]	0.05	VI	65.0 (104.6)
GSP	34.2130	118.5370	01/17/1994	123055.4	18.0	6.7 [3]	0.05	VI	62.9 (101.2)
Notes: 1) Mainshock Landers; 2) Big Bear aftershock; 3) Mainshock Northridge; 4) Mainshock Long Beach; 5) Offshore Newport Beach; and 6) Whittier Narrows aftershock.									

Several recent historic earthquakes in southern California have been of a sufficiently high magnitude to be felt in Laguna Hills; those notable events generally above magnitude 5.0 are shown on Figure G-4 (SCEC. 2008) and provided in Table G-1. (Magnitudes are generally expressed as M for Richter magnitude (equals M_L for local magnitude); M_W for moment magnitude may be used in some instances. The specific method of computing each magnitude is available from numerous sources.) It is not known that any of the following "felt" earthquakes caused damage or injuries in the City area or in nearby communities. These "felt" earthquakes (Blake, 2000) are the 1933 Long Beach (Mw = 6.4), 1971 San Fernando (Mw = 6.6), the 1987 Whittier Narrows (M_L = 5.9), the 1992 Landers (Mw = 7.3) and Big Bear (M_L = 6.5), and the 1994 Northridge (Mw = 6.7) earthquakes. Estimated Modified Mercalli Intensity values (MMI) in Laguna Hills ranged from IV to VIII.

A list of select historic earthquakes felt in Laguna Hills is provided in Table G-1 and the statistical distribution of earthquakes by magnitude during the same period is shown in Table G-2. Table G-1 shows the "top ten" earthquakes within 100 miles of the intersection of Laguna Hills City Hall (latitude 33.6131 north, longitude 117.7117 west). The ten highest magnitude earthquakes produced only two of the highest estimated Modified Mercalli Intensity (MMI) values, both VII and both prior to modern recordings.(1858 and 1910). The six highest estimated MMI/peak horizontal acceleration values were for earthquakes within 42 miles of City Hall ranging in magnitude from 4.5 to 7.0. The Long Beach earthquake (VIII) had the highest estimated intensity for the instrumentally recorded events, approximately 14.7 miles of City Hall.

These tables illustrate that Laguna Hills has not experienced strong ground motions (MMI of VI to VIII) from many historic local and distant earthquakes. As documented by Grant et al (1999), the 1769 estimated M7.3 event on the San Joaquin Hills blind thrust fault was larger and would have been closer to the City than the Long Brach earthquake. As described in an earlier section, ground motions, intensity, and damaging effects would be much more severe than the 1933 event. A brief summary of the 1933 Long Beach earthquake is presented below.

Table G-2 – Statistical Distribution of Earthquakes by Magnitude Within 100 Miles of Laguna Hills City Hall in the Period 1800-2001

Equal to or Greater Than Earthquake Magnitude	Number of Times Exceeded	Cumulative Number of Earthquakes per Year	~Average Return Period (Years) [1]
4.0	1038	5.1	0.2
4.5	388	1.9	0.5
5.0	138	0.7	1.4
5.5	47	0.2	5
6.0	26	0.1	10
6.5	10	0.05	20
7.0	4	0.02	50
7.5	1	0.005	200

1) For magnitudes equal to or greater than those in the corresponding row of column 1.

The Long Beach earthquake occurred at 5:54 p.m. on March 10, 1933 just off the coast of Newport Beach on the Newport-Inglewood fault zone, a system of right-lateral strike-slip faulting with a closest approach to City Hall of approximately 8.8 miles. The Mw = 6.4 earthquake had a hypocentral depth of 10 kilometers, and from seismic records it determined that the maximum slip was about 1 meter and the total rupture length was about 15 kilometers, although there was no surface rupture. The earthquake lasted 5 seconds, ground shaking lasted somewhat over twice as long, and the maximum recorded ground acceleration was 0.22g, at a distance of 27 kilometers. Liquefaction features, such as soils boils were observed.

Seismic energy from the earthquake was focused to the northwest along the fault zone toward Long Beach, and the quake resulted in 120 deaths and over $50 million in property damage. Most of the damage was to brick buildings with unreinforced masonry walls; engineered buildings and reinforced concrete buildings sustained little or no structural damage. Compton, Long Beach, and Huntington Park suffered the most significant damage. As a direct result of the types of structural failures, earthquake-resistant design and construction were mandated for public schools: K-12 and community colleges through the Field Act.

Several large historic/pre-instrumental (i.e., before modern seismographs) earthquakes shown in Table G-1 are reported to have occurred within the selected 100-mile radius. The epicenter locations of each of these events are considered very uncertain since they are based on damage reports and the felt intensity of shaking. Damage and intensity can be highly affected by local geology and not just distance to the epicenter.

2.1.3 San Joaquin Hills Blind Thrust Scenario Earthquake

The U. S. Geological Survey (2008) "ShakeMaps" present estimates of the geographic distribution of MMI ground shaking intensity, as well as peak ground acceleration and other ground shaking parameters for both historic earthquakes and for potential future "scenario" earthquakes. An analysis of the San Joaquin Hills blind thrust M6.6 scenario earthquake (USGS, 2003) indicates that for planning purposes the City of Laguna Hills may experience an MMI intensity of VIII (approaching IX) and a PGA of 0.36 to 0.42g. A scenario analysis for the more likely M7.8 on the southern San Andreas fault zone suggest much lower values of MMI intensity V and PGA of less than 0.2g, and scenario analyses for M6.9 on the Newport-Inglewood and M6.8 on the Elsinore (and others) have values between the San Joaquin Hills and San Andreas. Future consideration may be given to the northeast dipping Oceanside blind thrust (Wills, et al, 2008; Grant and Shearer, 2004) possibly capable of a M7.3 to M7.5 earthquake located offshore and south of the City. Depending upon the facility or structure being considered it is likely that one of these significant faults would control the earthquake design considerations for the city.

2.2 Geologic Conditions in the City

2.2.1 Physiography

Laguna Hills is located within the Peninsular Ranges geomorphic province, which is characterized by generally northwest trending mountains and valleys, located south of the Transverse Ranges and west of the Mojave and Colorado Deserts. Landforms and topography (physiography) of the City is controlled by the distribution and character of geologic units, by fault movements, and by climate and erosion, all of which contribute to the sculpture of the landscape. The northwest trending Santa Ana Mountains (as influenced by the Elsinore fault zone) lie the north of the City and the City lies along the northeast edge of the San Joaquin Hills (influenced by the SJHBT).

Hilly terrain characterizes most of the City where elevations range from approximately 654 feet above mean sea level (amsl) near Nellie Gale Road and Gallup Circle to about 200 feet near the intersection of Oso and Moulton Parkways (USGS, 1981). Areas of relatively low relief are found in the northeastern area north and east of Veeh Reservoir (20 to 40 feet), and in the central area between El Toro Road and Aliso Creek (40 to 50 feet). Areas in the northwest and southeast have the highest relief (200 to 450 feet). These areas are traversed by various local drainage courses.

In the lower relief areas the surface slope are in the 2 to 4 percent range, while slopes in the intermediate relief areas are about 10 percent, and the higher relief hillside (potentially unstable slopes in ungraded areas) areas are 15 to 60 percent. Within the City where tract grading has created artificial cut and fill slopes these can vary from less than 30 percent to greater than 100 percent.

2.2.2 Bedrock Formations

Based on the Morton and Miller (2006) geologic map the City is underlain by four bedrock formations. From oldest to youngest these are the Sespe Formation (map symbol Ts), the Monterey Formation (Tm), the Capistrano Formation siltstone member (Tcs), and the Niguel Formation (Tn). The formations with the largest surface exposure areas are the Niguel and Capistrano Formations, which occupy at least 90 percent of the City south and east of Aliso Creek. The Monterey Formation is exposed in the area of the Saddleback Medical Center and an area roughly bounded by Aliso Creek, Paseo de Valencia, and Alicia Parkway. Sespe Formation is exposed in the hilly area south and west of Veeh Reservoir.

Sespe Formation bedrock is a non-marine, typically grayish to varicolored (often reddish and pale orange) coarse-grained arkosic sandstone and minor beds of conglomeratic sandstone and mudstone with minor conglomerate, silty sandstone, and clayey sandstone with poorly developed bedding (massive to thickly bedded). Bedding in the northwestern area of the City appears to dip to the west at approximately 26 degrees and the formation is cut by faults not indicated as active (Morton and Miller, 2006). Although not readily detectable, the formation has produced plant, reptile, amphibian, and large and small land vertebrate fossils at localities outside the City.

The Monterey Formation is typically a yellowish-gray, siliceous shale and diatomaceous siltstone, with minor sandstone, sandy limestone, and travertine-limestone near the base. The Monterey Formation is of marine origin and bedding is generally well developed with a locally variable dip orientation in the range of 10 to 25 degrees (Morton and Miller, 2006). This formation has produced a wide variety of plant, marine micro- and macro-fossils, and vertebrate remains.

Capistrano Formation has multiple distinguishable members, one of which is the Capistrano Formation siltstone, and makes up about 50 percent of the bedrock exposed southeast from Aliso Creek to the I-5 Freeway. It is composed of marine yellow-gray to light brownish-gray siltstone with interbedded fine grained sandstone and generally has well developed bedding features. A very high percentage of the bedrock landslides mapped in the City (Morton and Miller, 2006) are within the Capistrano Formation siltstone. Bedding dips in various directions at 10 to 16 degrees. Capistrano Formation siltstone consisting of fine-grained, gray to brown siltstone and claystone with sandstone interbeds was found at the base of landslide debris at a slope repair site near Oso Parkway and Nottingham Court. Bedrock structure was noted as a broad fold with out of slope dips from 10 to 20 degrees and showed no evidence of faulting. The Capistrano siltstone has a wide variety of marine vertebrate and invertebrate fossils.

The youngest bedrock formation in the City is the Niguel Formation a mixed marine/non-marine white to very-light-gray, fine to coarse-grained sandstone with interbedded yellow-gray siltstone, basal reddish-brown conglomerate, conglomeratic sandstone, and light-gray to reddish-brown breccia. Niguel Formation occupies the northeast portion of the City at the bend in the I-5 Freeway and much of the eastern edge along the I-5 overlying the Monterey Formation capping many ridge tops. Well developed bedding dips various directions are about 8 to 10 degrees. A wide variety of near shore marine and non-marine plants are found within and adjacent to the City.

2.2.3 Surficial Deposits

Published geologic maps reviewed for this study include the U. S. Geological Survey (Morton and Miller, 2006; Figures G-2 and G-3) and the California Division of Mines and Geology (CDMG, 2000a and 2001a ; Figure G-5). The U. S. Geological Survey authors compiled geologic maps that provide a reasonably simple view of the distribution of geologic units (distinguishing bedrock and surficial into broad groupings) and faults in the City as shown on Figure G-3.

has been adopted for discussion of surficial mapping in the City (Figure G-5) because CDMG has related this greater detail to engineering geologic/geotechnical properties as shown in Table G-3. This allows potential development project site characteristics (shallow subsurface properties) to be classified on a preliminary planning basis. Three site-specific reports were provided by the City (locations on Sundance Avenue, Rockinghorse Lane, and Nottingham Court) and are considered in the discussions that follow.

Surficial deposits consist of relatively recent (geologically young) sediments formed by alluvial and colluvial processes in streams and swales, and on alluvial fans/basins located down gradient from canyons draining the Santa Ana Mountains foothills. These deposits have been laid down over a range of geologic time; in general the uppermost surficial sediments are Holocene (less than 10000-12000 years old) to late Pleistocene (less than a few hundred thousand years old) in age, although it is likely that few of these deposits within the City have been age-dated by absolute methods. The oldest surficial deposits may be much older approaching 750,000 years old. Except for artificial fill compacted with engineering controls, the younger the age of the surficial deposit generally the less adequate the engineering properties. In the bottom portion of Table G-3, Group 1 materials will in general have better engineering and geotechnical properties related to slope stability than Groups 2 through 6 materials.

CDMG (2000a and 2001a) provides a more detailed breakdown of surficial units based on the USGS and this The distribution of surficial units on Figure G-5 indicates that the majority of deposits within and immediately adjacent to the City is divided into four primary units based on CDMG (2000a and 2001a). The youngest units (Qya and Qyf) are in the northernmost area of the City (Qyfsa) and in the various active drainages across the City (Qya). Colluvium (Qc) occurs mainly on the lower and intermediate slopes adjacent to the young alluvium (Qya) and in lower gradient drainage swales. At a slope repair site near Oso Parkway and Nottingham Court colluvium was found in the side slopes of a landslide repair; the materials consisted of

brown to dark brown, porous silty sand and sandy clay with a maximum observed thickness of approximately 8 feet. Another slope repair near Rockinghorse Lane and Oso Parkway noted 2 to 3 feet of colluvium overlying bedrock; the colluvium consisted of dark brown, slightly moist, desiccated, porous, and firm to stiff silty clay.

Table G-3 – Engineering Geologic Units and Unit Characteristics

Map Unit	Age	Relative Age and Environment of Deposition	Primary Texture/ Grain Size	General Consistency	Susceptible to Liquefaction ? [When saturated]
af	Modern	Recent artificially placed	Variable	Dense to very dense	Not likely
Qc	Holocene	Recent colluvium/ slopewash	Gravel, sand, silt, clay	Loose to medium dense	Yes
Qyfsa	Holocene to late Pleistocene	Recent to old alluvial fan	Sand, sandy silt, silt, clay	Loose to medium dense	Yes
Qya	Holocene to late Pleistocene	Recent to old axial channel/valley deposits	Gravel, sand, silt, clay	Loose to medium dense	Yes
Qvofa	Middle to early Pleistocene	Very old alluvial fans	Silty sand, clayey sand, silt, clay	Loose to very dense	Not likely
Qvofa	Middle to early Pleistocene	Very old alluvial fans	Silty sand, clayey sand, silt, clay	Loose to very dense	Not likely

Note: Refer to CDMG (2000a and 2001a) Table 1.1 for details. On Figure G-5 some unit names indicate "characteristic grain size" (e.g. Qyfsa, Qvofa), a = arenaceous (sand) and s = silty. Map Units: c = colluvial; f = alluvial fan; a = alluvial basin.

Map Units by CDMG Group	Slope Stability Parameters Compiled by the CDMG	
	Mean/Median Group Angle of Internal Friction-phi (degrees)	Mean/Median Group Cohesion-C (pounds per square foot)
GROUP 1: Ts (fbc)	38/38	66/0
GROUP 2: Qvofa (E), Ts (fbc) (E)	34.7/35 (E)	757/410 (E)
GROUP 3: af, Qyfsa (E), Qyaa, Qya, Tn (fbc), Tm (fbc)	31/31	216/100
GROUP 4: Qvof, Tn (abc), Tc, Tm (abc), Ts (abc) (E)	26/26 26.2/27.5 (E)	521/430 611/600 (E)
GROUP 5: Qc, Tm	23/25	810/595
GROUP 6: Qls (landslide)	15/14	456/460

Note: Refer to CDMG (2000a and 2001a). Table 2.1 for details and their application to slope stability analyses; the San Juan Capistrano and El Toro (shown by E) Quadrangle data were combined. Landslide deposits (Qls) were not mapped by the CDMG. abc = adverse bedding condition; fbc = favorable bedding condition.

Artificial fill materials are shown as limited to a few drainage crossings and along the I-5 Freeway; much more artificial fill exists within the developed residential hillside areas, but was not mapped by CDMG. One City geotechnical report evaluated excessive erosion in compacted fill in the area of Sundance Avenue and Moulton Parkway. The fill consisted of slightly moist to moist, soft to stiff, clayey to sandy silt and the study conclusion was that a local repair of the fill slope was adequate since no gross instability was observed.

The oldest surficial units (Qvof and Qvoa) underlie some of the younger deposits in the northern and central areas of the City. It is estimated that the surficial units are exposed over about 20 percent of the City with the remainder underlain by the soft bedrock formations, The oldest surficial units (Qvof and Qvoa) make up

roughly 2 to 4 percent and the younger units (Qyf, Qya, and Qc about divided evenly) make up roughly 16 to 18 percent. Landslides (Qls) are shown on Figure G-3 (Morton and Miller, 2006) and on Plate 2.1 in the CDMG reports (2000a and 2001a). Landslide debris was noted at a slope repair site near Oso Parkway and Nottingham Court; materials observed below the colluvium consisted of fractured siltstone, claystone, and sandstone derived from Capistrano Formation bedrock.

The oldest surficial units (Qvof and Qvoa) and their overlying soils consist of predominantly sand, silt, and clay, are normally well consolidated, and slightly to moderately cemented. Historically high groundwater potential, liquefaction, and dynamic settlement are less than for the young deposits; suitability for construction may range from fair to very good.

Qc, Qya, and Qyf deposits (which include overlying soils) consist of predominantly sand, silt, and clay, with lesser amounts of gravel and cobbles. These deposits are normally poorly consolidated and poorly to slightly cemented. Historically high groundwater (less than 5 to 20 feet deep) has been present in some areas, and the suitability for construction (e.g., slopes, foundation material) may range from acceptable to poor. Liquefaction and dynamic settlement potential is the highest where the Qya, Qyf, and Qc deposits are primarily sand and silty sand with low density, and are at least partially saturated. High ground shaking intensity (site amplification) potential would be associated with these deposits more so than with thinner or denser geologic units.

The California Building Code was updated and revised in 2007. As with past revisions the geologic subgrade classification system (S_A through S_F) is used to classify soil profiles according to their physical properties. Under this subgrade classification the upper less dense units (Qya and Qyf) would likely be classified as S_D or S_E, which is a stiff to soft soil profile. The older, denser units (Qvoa and Qvof) would likely be classified as S_C or S_D, which is a very dense to stiff soil profile. These classifications will affect seismic coefficients for earthquake design as shown by geotechnical design reports.

2.2.4 Groundwater Depth

The City of Laguna Hills does not overlie a named groundwater basin. The El Toro Water District (ETWD) serves the northern area of the City and there are alluvial deposits that likely contain free groundwater. However, the ETWD does not currently have a groundwater storage source (ETWD, 2008). This is also true for the Moulton Niguel Water district (MNWD), which relies on imported water. The Orange County Water District (OCWD) boundary lies just west of the I-5/I-405 "Y" and groundwater depth in June 2007 was reported at 180- to 200-feet below the ground surface at the boundary (OCWD, 2008). This is roughly a depth of 40 feet.

Studies prepared by the CDMG (2000a and 2001a) provide very general groundwater depth estimates compiled from multiple sources (Figure G-6) based primarily on first encountered unconfined groundwater data from geotechnical bores. These maps indicate historically highest groundwater levels (shallowest depths) are found in the creek/canyon areas and range from about 5 feet to less than 20 feet in the City. These groundwater depths are likely based on data from the 1960s through the 1990s, They show several areas where groundwater was within 40 feet or less of the surface. Shallow groundwater was present (a) in the northern part of the City along the south branch of San Diego Creek channel and along a former drainage passing through Veeh Reservoir then extending east roughly parallel to Ridge Route Drive, (b) Aliso Creek and its secondary alluvial/colluvial filled drainages, (c) along the recent alluvial areas extending south from El Toro Reservoir in Mission Viejo to Oso Creek, and (d) Oso Creek along the southeastern edge of the City along the I-5 Freeway. These areas are discussed in the section on liquefaction hazards.

2.2.5 Flooding

Some areas of Laguna Hills are determined to be within a Federal Emergency Management Agency (FEMA)-designated flood zone; therefore, the City participates in the Federal Flood Insurance Study to determine the mandatory insurance necessary for identified properties. As shown on Federal Insurance Rate Maps (FIRMs), flood areas that have a 1 percent annual chance of flooding (the "100-year floodplain") are identified around Aliso Creek, Veeh Reservoir, Mill Creek, and in a zone northwest of Alicia Parkway in the southern portion of the City (Figure G-7). Additional zones in the periphery of these flood areas may pose a flood risk, but since they are outside the designated 1 percent annual chance floodplain they do not require additional flood insurance. The City and Orange County maintain an extensive storm drain system that would normally divert any excessive rainfall into appropriate channels. However, a significant rain event could cause flooding in the zones identified above, or minor, localized flooding elsewhere in the City. The City coordinates with the Orange County Flood Control District to maintain the necessary flood control and stormwater management.

3 ANALYSIS OF POTENTIAL GEOLOGIC AND SEISMIC HAZARDS

Potential hazards have been divided into two categories, seismic and geologic (non-seismic including engineering geology and soil hazards). Seismic hazards require an earthquake. The magnitude of an earthquake should be at least 5.0 for some significant effects to be triggered, although lesser magnitude earthquakes have activated hazards and caused damage. Geologic hazards are those, which may be activated with or without an earthquake due to the nature of the geologic materials, the hydrogeologic regime, or weather. In the City of Laguna Hills, seismic and landslide hazards carry with them the most risk to property and population.

Because of the topography and the nature of the geologic formations present in the City, non-seismic geologic hazards are what would be expected considering the extensive steep hillside terrain and the weak bedrock formations (Figure G-3). The potential for bedrock landslides and surficial deposit mudslides is a significant factor in the City. Geotechnical issues related to weak soils and unstable slopes are present. Large-scale subsidence due to fluid withdrawal (water or oil) is not reported and since the City does not overlie a known groundwater aquifer or oil field large scale subsidence is unlikely. Dam and water tank failure inundation/flooding potential exists, but in very local areas and with relatively small reservoirs within the City. Taken together, geologic and seismic hazard conditions in the City are somewhat lower than or about average for cities in southern California. The following subsections describe in more detail the seismic and geologic hazards that may impact the City.

3.1 Seismic Hazards

3.1.1 Overview

For the seismic component of the Safety Element, the minimum list of potential hazards that must be considered is:

- Primary
  - Ground shaking (strong earthquake ground motions)
  - Surface fault rupture (primary and subsidiary)
  - Co-seismic uplift and ground tilting
- Secondary
  - Liquefaction, differential compaction and settlement
  - Ground lurching and cracking, fill mass deformation
  - Earthquake-induced landslides
  - Flooding from earthquake-induced dam failure

- Flooding from tsunami and seiche

Tsunami hazards are not present for the City due to the elevation and distance to the ocean. Seiching in the impounded waters outside the City, such as El Toro Reservoir, Lake Mission Viejo, and Upper Oso Reservoir, and in water tanks within the City or in neighboring cities could conceivably cause dam or tank failure and flooding. This eventuality is covered in the section for dam failure inundation. The following subsections discuss the potential seismic hazards in the order of most widespread potential effect within the City.

3.1.2 Ground Shaking

3.1.2.1 Data

Several local and regional faults could impact the potential future seismicity of the City and the surrounding region (Figure G-1). The effects of an earthquake originating on any given fault will depend primarily upon its distance from the City and the size earthquake (amount of energy release) that the fault is likely to generate (Tables G-4 and G-5). The effect is most often presented as the severity of ground shaking which is presented as the percentage of the force of gravity, which is termed "1g" for one unit of gravitational force, or 100 percent gravity. Therefore, 0.50g is 50 percent the force of gravity. Both deterministic and probabilistic estimates of future ground motion parameters have a place in design considerations for the city.

Generally there will be less the ground shaking effect the more distant the fault and the smaller the earthquake. However, local geology (e.g., thick alluvium versus shallow bedrock) and sedimentary basin geometry can have dramatic effects on seismic waves that are more extensive than amplifications and resonances caused by near surface soft alluvium alone. Interactions between the structure of the basin and earthquake waves can increase the amplitude and duration of shaking during an earthquake, and can focus the waves from the bottom of the basin. This can increase the intensity of strong shaking in small regions at the surface and diminish it in others, as well as increase the duration of shaking at the edges of basins.

The faults listed on Table G-4 that are nearest to the City should have the most adverse ground shaking effects for the estimated maximum earthquakes. This is shown on Table G-5 where the highest peak ground accelerations and MMI intensities would be produced by the San Joaquin Hills, Newport-Inglewood (Offshore and L. A. Basin), and Chino-Central Avenue faults with anticipated peak ground accelerations of 0.22g to 0.61g, and MMI intensities of IX. For critical facilities it may be necessary to consider a larger maximum considered earthquake and to analyze the San Andreas fault zone (the southern section). Maximum magnitude updates are available from California Geological Survey (e.g., Wills et al, 2008).

It should be noted that the distances in Table G-4 and the data in Table G-5 (below) are taken from a single source (Blake, 2002) for purposes of consistency, utilizing the location of Laguna Hills City Hall (latitude 33.6131°, longitude 117.7117°) as the reference point. These values are suitable for general planning purposes, but should not be used for site-specific design. Ground motions determined for a specific project will vary based on numerous factors, including earthquake location relative to the project location, distance from the causative fault, directivity of energy release, local geologic conditions, and other technical factors. Local active or potentially active faults that do not appear in this table (e.g., El Modeno, Peralta Hills, and "young faults" east of the City) have much less known about their earthquake potential, or they are part of a larger zone, which is evaluated.

Table G-5 presents a deterministic analysis of the potential earthquake ground shaking effects from the maximum magnitude earthquakes for those faults from Table G-4 that would produce Modified Mercalli Intensities of VIII to XI, which ranges from considerable damage to ordinary substantial structures to collapse of most structures (explained in Table G-6). These generally correspond to peak horizontal ground acceleration levels of greater than 30 percent gravity (0.3g). The CGS has produced an analysis of the

TABLE G-4 - Major Faults within an Approximately 50-Mile Radius of Laguna Hills City Hall

FAULT NAME (In Order of Nearest Distance From the Site)	APPROXIMATE DISTANCE FROM SITE [mi (km)]	FAULT LENGTH (km)	FAULT DIP	SLIP RATE (mm/yr.)	TYPE OF FAULT (SENSE OF SLIP)	MAGNITUDE (Mw) OF MAXIMUM EARTHQUAKE	AGE AND EVIDENCE OF LATEST SURFACE FAULTING
San Joaquin Hills	0.0 (0.0)	28	23° S	0.3 to 0.7	Blind Thrust-Reverse	6.6	Late Quaternary uplift San Joaquin Hills
Newport-Inglewood (Offshore)	8.8 (14.1)	66	90°	1.0 to 2.0	Strike Slip	7.1	Historic (1933 Long Beach EQ)
Newport-Inglewood (L. A. Basin)	12.2 (19.7)	66	90°	0.5 to 1.5	Strike Slip	7.1	Historic (1933 Long Beach EQ)
Chino-Central Avenue (Elsinore)	13.2 (21.2)	28	60° - 65° SW	1.0	Reverse Right Oblique	6.8	Late Quaternary
Elsinore (Glen Ivy)	15.3 (24.7)	190	90°	3.0 to 7.0	Strike Slip	7.5	Late Quaternary; Holocene
Whittier	17.2 (27.7)	38	75° NE	1.5 to 3.5	Strike Slip	6.8	Late Quaternary NW of Brea Canyon
Elsinore (Temecula)	21.0 (33.8)	43	90°	3.0 to 7.0	Strike Slip	6.8	Late Quaternary; Holocene
Palos Verdes	22.8 (36.7)	96	90°	2.0 to 4.0	Strike Slip	7.3	Holocene
Puente Hills Blind Thrust	23.5 (37.8)	40	27° N	0.3 to 1.0	Reverse	7.1	No documented surface faulting
Coronado Bank	26.8 (43.2)	185	90°	2.0 to 4.0	Strike Slip	7.6	
San Jose	31.0 (49.9)	22	75° N	0.5 to 1.0	Reverse Oblique	6.4	Late Quaternary
Sierra Madre	35.3 (56.8)	85	55° N	1.0 to 3.0	Reverse	7.2	Holocene and Late Quaternary
Cucamonga	35.4 (57.0)	25	50° N	3.0 to 7.0	Reverse	6.9	Late Quaternary; Historic
Rose Canyon	37.7 (60.7)	70	90°	1.0 to 2.0	Strike Slip	7.2	
Upper Elysian Park Blind Thrust	38.6 (62.1)	34	22° NE	0.9 to 1.7	Blind Thrust - Reverse	6.4	Historic (1987 Whittier Narrows EQ)
San Jacinto (San Bernardino)	39.0 (62.8)	36	90°	12.0 to 24.0	Strike Slip	6.7	Recent seismicity
San Jacinto (San Jacinto Valley)	39.1 (63.0)	43	90°	12.0 to 24.0	Strike Slip	6.9	Recent seismicity
Raymond	41.3 (66.4)	23	80° NE	0.5 to 2.5	Reverse Oblique	6.5	Historic (1988 M4.9 Pasadena EQ)
Clamshell-Sawpit	42.4 (68.2)	16	45° N	0.5 to 1.0	Reverse	6.5	Recent seismicity
Elsinore (Julian)	43.4 (69.8)	76	90°	2.0 to 4.0	Strike Slip	7.1	Late Quaternary; Holocene
Verdugo-Eagle Rock	43.9 (70.7)	27	45° - 60° NE	0.5 to 1.0	Reverse Oblique	6.9	Holocene
Hollywood	46.0 (74.0)	19	65° - 70° N	0.5 to 1.5	Reverse Oblique	6.4	Late Quaternary
San Jacinto-Anza	46.5 (74.9)	91	90°	12.0 to 24.0	Strike Slip	7.2	Recent seismicity
San Andreas (Carrizo-Big Bend)	48.3 (77.8)	345	90°	31.0 to 37.0	Strike Slip	7.8	Historic (1857) SE to Wrightwood

The primary source of information: Cao, et al 2003 and Wills, et al, 2008. Fault distances from Blake 2002; faults beyond 50 miles were not deemed critical to the earthquake risk in the City.

Table G-5 – Deterministic Earthquake Ground shaking Parameters for Potentially Critical Earthquake Faults (Estimated MMI Intensity ≥VIII) within 50-Miles of Laguna Hills City Hall [1]

Fault Name [2]	Distance Miles (Kilometers)	Maximum Magnitude	Peak Horizontal Ground Acceleration	Modified Mercalli Intensity [3]
San Joaquin Hills [4]	0.0 (0.0)	6.6	0.61	X
Newport-Inglewood (Offshore)	8.8 (14.1)	7.1	0.30	IX
Newport-Inglewood (L. A. Basin)	12.2 (19.7)	7.1	0.24	IX
Chino-Central Ave. (Elsinore)	13.2 (21.2)	6.7	0.22	IX
Elsinore (Glen Ivy)	15.3 (24.7)	6.8	0.17	VIII
Whittier	17.2 (27.7)	6.8	0.16	VIII
Elsinore (Temecula)	21.0 (33.8)	6.8	0.13	VIII
Palos Verdes	22.8 (36.7)	7.3	0.16	VIII
Puente Hills Blind Thrust	23.5 (37.8)	7.1	0.18	VIII
Coronado Bank	26.8 (43.2)	7.6	0.17	VIII
Sierra Madre	35.3 (56.8)	7.2	0.14	VIII
San Andreas (Carrizo-Big Bend)	46.2 (74.3)	8.0	0.14	VIII

1. Blake, T. F., 2002, EQFAULT Computer Program for Earthquake Assessments, update of 1989 program; attenuation relationship Boore et al. (1997) Horizontal - NEHRP D (250), median value. Latitude 33.6131, Longitude 117.7117
2. Faults were selected if they may cause a Modified Mercalli Intensity level of VIII or greater.
3. Bolt, B. A., 1993, Abridged Modified Mercalli Intensity Scale, *Earthquakes - Newly Revised and Expanded*, Appendix C, W.H. Freeman and Co., 331 pp.; Table G-6.
4. A blind thrust beneath the City of Laguna Hills.

"scenario earthquake" for all faults in Table G-5, with regard to potential earthquake ground motion parameters, except for the Sierra Madre and Coronado Bank faults.

Another way to view the prediction of earthquake shaking parameters is probabilistically, by assessing the likelihood of one of more ground motion parameters exceeding certain levels. Typically the ground motion assessment considers any or all faults within a specific radius of the project site or a location in the City. For individual essential facilities projects within the City, an analysis would typically consider the earthquake potential for all active faults within a radius of 100 kilometers and integrate the contribution of each fault into a probabilistic seismic hazard assessment (PSHA) to provide design values that would be used for a specific project location. Considering the entire City, a planning level approximation of the peak ground accelerations and the spectral accelerations for 0.2-second and 1.0-second frequencies (short and moderately long periods, respectively) for the three locations (northern, central, and southern) within the City is provided (Table G-7). The values were developed using the California Geological Survey estimation procedures (10% probability of being exceeded in 50 years) for a "design basis earthquake" and should only be used as planning estimates, not for design. The 2007 CBC uses a 2% probability of exceedence in 50 years in seismic design and the USGS has prepared corresponding National Seismic Hazards Maps updated in 2008; these maps indicate somewhat less than double the PGA values for firm rock shown in Table G-7. The specifics of the seismic design method are explained in the 2007 CBC.

Table G-7 lists estimated ground motion, in percent of gravity (g), which has a 10 percent probability of being exceeded during a 50-year period; 2 percent probability of being exceeded during a 50-year period would be substantially higher. Three columns provide estimates for different geologic conditions. Each ground motion value is shown for the three possible site conditions that are found in the 2007 California Building Code: firm rock (conditions on the boundary between building code site categories B and C), soft rock (site category C), and alluvium (site category D). The values for alluvium are most representative for the surficial deposits (Figure G-5) and the soft bedrock values for the majority of the rest of the City. Spectral accelerations for

Table G-6 - Modified Mercalli Intensity Scale (Abridged Version) [1]

Average Peak Velocity (cm/sec)	Intensity Value and Description	Average Peak Acceleration (% gravity)
<0.1	I. Not felt except by a very few under especially favorable circumstances (I Rossi-Forel scale).	<0.17
0.1 – 1.1	II. Felt only by a few persons at rest, especially on upper floors of high-rise buildings. Delicately suspended objects may swing. (I to II Rossi-Forel scale).	0.17 – 1.4
0.1 – 1.1	III. Felt quite noticeably indoors, especially on upper floors of buildings, but many people do not recognize it as an earthquake. Standing automobiles may rock slightly. Vibration like passing of truck. Duration estimated. (III Rossi-Forel scale).	0.17 – 1.4
1.1 – 3.4	IV. During the day felt indoors by many, outdoors by few. At night some awakened. Dishes, windows, doors disturbed; walls make creaking sound. Sensation like a heavy truck striking building. Standing automobiles rocked noticeably. (IV to V Rossi-Forel scale).	1.4 – 3.9
3.4 – 8.1	V. Felt by nearly everyone, many awakened. Some dishes, windows, and so on broken; cracked plaster in a few places; unstable objects overturned. Disturbances of trees, poles, and other tall objects sometimes noticed. Pendulum clocks may stop. (V to VI Rossi-Forel scale).	3.9 – 9.2
8.1 - 16	VI. Felt by all, many frightened and run outdoors. Some heavy furniture moved, few instances of fallen plaster and damaged chimneys. Damage slight. (VI to VII Rossi-Forel scale).	9.2 - 18
16 - 31	VII. Everybody runs outdoors. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken. Noticed by persons driving cars. (VIII Rossi-Forel scale).	18 - 34
31 - 60	VIII. Damage slight in specially designed structures; considerable in ordinary substantial buildings with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monuments, and walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Persons driving cars disturbed. (VIII+ to IX Rossi-Forel scale).	34 - 65
60 - 116	IX. Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings with partial collapse. Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes broken. (IX+ Rossi-Forel scale).	65 – 124
> 116	X. Some well-built wooden structures destroyed; most masonry and frame structures destroyed; ground badly cracked. Rails bent. Landslides considerable from river banks and steep slopes. Shifted sand and mud. Water splashed, slopped over banks. (X Rossi-Forel scale).	> 124
> 116	XI. Few, if any, (masonry) structures remain standing. Bridges destroyed. Broad fissures in ground. Underground pipelines completely out of service. Earth slumps and land slips in soft ground. Rails bent greatly.	> 124
> 116	XII. Damage total. Waves seen on ground surface. Lines of sight and level distorted. Objects thrown into air.	> 124

1. Middle column Bolt (1993); outer columns Wald et al. (1999).

INTENSITY	I	II-III	IV	V	VI	VII-VIII		IX	X+
SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy

design basis earthquake ground motions for soft bedrock across the City indicate 0.79 to 0.81g for 0.2-second period waves and 0.36 to 0.37g for 1.0-second waves. This suggests (as a rule of thumb) that two-story (and slightly higher) structures, which may have natural periods in resonance with the 0.2-second period earthquake waves, could require substantial earthquake design reinforcement when considering the design basis earthquake ground motions. Alluvium in the City is relatively thin. Depending upon the source (direction and distance), and magnitude of a large earthquake, and the presence of alluvium, groundwater, and the site-specific geologic subgrade will have an effect on damage to overlying structures.

TABLE G-7 - Estimated Earthquake Ground Motion Parameters for Three Locations (North, Central, and South) in the City of Laguna Hills (CGS, 2008)

Ground Motion	Firm Rock	Soft Rock	Alluvium
Northern Area – Lake Forest Drive and Irvine Center Drive[1]			
Peak Ground Acceleration (g)	**0.32**	**0.33**	**0.36**
Spectral Acceleration (0.2 sec)	**0.76**	**0.81**	**0.89**
Spectral Acceleration (1.0 sec)	**0.29**	**0.37**	**0.45**
Central City Area – Paseo de Valencia and Alicia Parkway (Near Laguna Hills High School)[2]			
Peak Ground Acceleration (g)	**0.31**	**0.33**	**0.36**
Spectral Acceleration (0.2 sec)	**0.75**	**0.79**	**0.87**
Spectral Acceleration (1.0 sec)	**0.29**	**0.36**	**0.44**
Southern Area – Greenfield Drive and San Joaquin Hills Corridor (Toll Road) [3]			
Peak Ground Acceleration (g)	**0.31**	**0.33**	**0.36**
Spectral Acceleration (0.2 sec)	**0.74**	**0.79**	**0.87**
Spectral Acceleration (1.0 sec)	**0.28**	**0.36**	**0.44**

1. Latitude 33.6294, Longitude 117.7299; 2. 33.5920, 117.6989; and 3. 33.5580, 117.6856.

3.1.2.2 Generally Expected Effects

The potential effects of severe ground shaking can be envisioned given the experience of many citizens with recent earthquakes in southern California. The 1994 Northridge earthquake had a magnitude of 6.7 and occurred on a previously unidentified buried thrust fault beneath the San Fernando Valley. It caused significant structural damage, injury, and loss of life in the San Fernando Valley, Simi Valley, Santa Clarita Valley, Santa Monica, and the northern Los Angeles Basin, with MMI values of VIII-IX. Peak horizontal and vertical ground accelerations exceeded 1g in a few locations.

The 1971 San Fernando earthquake (M6.6) was located on an active section of the reverse Sierra Madre that showed some geomorphic surface expression, although the areas of surface rupture locations (defined by groundwater barriers) were not expected before the earthquake. The ground shaking produced MMI values of VII to XI and cause significant damage in areas as far east as Pasadena and south to downtown Los Angeles; peak ground accelerations were as high a 1g, but mainly less than about 0.5g in populated areas.

Estimates of peak horizontal ground acceleration in Table G-7 account for the effects of the geology at a planning level by evaluating three locations in the City and by providing three geologic materials at each location. For "soil sites" bedrock is assumed to be deep causing some amplification (effective increase) of ground motion as the waves pass from the bedrock through the alluvium. Laguna Hills is not situated in a deep alluvial basin where these effects would be pronounced. However, local differences in subsurface conditions (e.g., density, water content, grain size, subgrade soil profile classification) could increase the effective shaking above the levels stated in Table G-7. Therefore, site-specific geology, geotechnical, and earthquake engineering studies are mandatory for evaluating critical, sensitive, or high-occupancy structures.

Mean peak horizontal ground accelerations (PHGA) for the estimated maximum earthquakes for the four most critical faults (Table G-5) would be expected to be in the range of 0.22 to 0.61 g. The middle of this range is roughly the current "code" seismic design for non-critical structures, including most residential, commercial, and industrial buildings in the previous building code Seismic Zone 4 (nearly all of California). This same information (e.g., PHGA) can be presented in a map format. Peterson et al (2000a) prepared a PSHA in conjunction with the Seismic Hazard Mapping Program for the San Juan Capistrano and El Toro 7.5-minute quadrangles that contain the City. Figure G-8 shows the results of that study for the soft rock case, which agrees reasonably well (it is about 10 percent lower) with the information presented in Table G-7. The distribution of PHGA values is controlled by geologic formation boundaries, fault locations, and earthquake strength.

The more conservative one-sigma standard deviation from the mean peak horizontal ground acceleration values for estimated maximum earthquake levels range from 0.28 to 0.78 g for the faults in Table G-4. Experience with the San Fernando and Northridge earthquakes indicates that even higher accelerations are possible (greater than 1g) associated with large earthquakes on nearby reverse or blind thrust faults, such as the San Joaquin Hills and the Puente Hills blind thrusts.

Considering the deterministic or probabilistic acceleration values for critical faults and earthquake events within about 50 miles of Laguna Hills City Hall, site intensities in the range of VIII to X could be experienced in the City, roughly (but more than) what was experienced in Laguna Hills (MMI of VIII) during the Long Beach earthquake in 1933. At the higher end of possible events (deterministic one-sigma values) intensity would likely exceed what was experienced in the moderate to worst damage areas of 1987 Whittier and 1994 Northridge events, and have MMI damage intensities of X in the City. This damage would be greater in areas where ground failure occurred due to liquefaction, or dynamic consolidation and ground subsidence. These hazards are discussed in a following subsection.

3.1.3 Surface Fault Rupture (Including Co-Seismic Deformation)

3.1.3.1 Data

Laguna Hills currently has no APEFZ within the City. One short, nearly northeast-southwest trending "young" fault segment has been mapped in the City (Miller and Morton, 2006), this at the far western edge south of the intersection of Moulton Parkway and Laguna Hills Drive near Aliso Creek, No determination has been made by the State that this fault is either active or potentially active and the potential for surface fault rupture is unknown. A similarly young fault is mapped approximately 2,000 feet west of, and roughly parallel to the long dimension of, the City (Figure G-3). These faults are unlikely to be capable of independently generating even a moderate-size earthquake. If fault movement were to occur on the "young" fault, this is conjecture, it would likely be in conjunction with a large earthquake on the San Joaquin Hills blind thrust.

The San Joaquin Hills blind thrust (SJHBT) fault underlies the City and surrounding communities; the location and characteristics of this faults is less well known than for surface faults. If movement were to occur on a buried fault, the most likely results would be regional uplift. Shaw et al (2002) studied detailed high-resolution seismic reflection geophysical profiles of the Puente Hills blind thrust (PHBT) that confirmed the fault is active and capable of generating large earthquakes that produce discrete surface fold scarps in areas where the buried leading edge of the main thrust fault is some 2 kilometers deep. These conditions, i.e., an active blind thrust capable of a M7.3 earthquake with a leading edge ~2 kilometers below the surface, are analogous to what are suggested by Grant et al (1999), CGS (2002), and Wills et al (2008) for the SJHBT. The SJHBT subsurface characteristics are not well studied and the PHBT appears to have a somewhat higher slip rate (Wills et al, 2008), therefore without additional characterization of the SJHBT comparisons are speculative.

It is concluded that little, if any, site-specific investigation has been done within the City of Laguna Hills to verify specific locations of the "young" fault or the leading edge of the SJHBT. Morton and Miller (2006) suggest that the "young" fault offsets Monterey Formation (Tm) and younger alluvium (Qya). It is possible that within normal trench exploration depths (typically less than 10 feet) there are opportunities to penetrate Holocene Qya deposits into Quaternary deposits; geophysical studies (to possibly detect faulted bedrock) combined with trench exploration may be an appropriate combination of techniques to define the fault location and age of last movement for the "young" fault. Due to the uncertainties associated with the SJHBT location and depth, and the low likelihood of a large magnitude earthquake, investigation is much more difficult and should be weighed against the risks posed to future development.

3.1.3.2 Generally Expected Effects and Potential Mitigation Methods

Fault rupture and surface fold scarps that pass through a structure would very likely cause irreparable damage and may cause collapse of walls and ceilings. Normal foundations would be dislocated and rendered unusable. Combined with strong ground shaking, this is a very serious hazard. Utilities would likely be severed causing water, natural gas, electrical, storm drain, and sewer system outages. Streets could be passable with some difficulty if fault motion is strike-slip (horizontal). But vertical fault offsets could render streets impassable for emergency traffic, except to high-ground clearance vehicles with 4-wheel drive.

The most reasonable surface fault rupture mitigation method is to avoid placing any structures on, or too close to, active fault traces by establishing a setback distance between the fault and the proposed structure. A geologic investigation, usually including literature and aerial photo review, field mapping and possibly geophysics and/or trench excavations, and alluvial deposit age dating, is required if structures designed for human occupancy are proposed within proximity to an active fault. Even outside an APEFZ, studies may be prudent if the fault is suspected of having Holocene or late Quaternary activity. The State CGS has developed general guidelines for fault hazard evaluations that are contained in CGS Note 49. Essential facilities, public schools, hospitals, and other facilities deemed critical or important are judged to higher standards than residential developments (CGS Note 48).

State and local jurisdictions may establish their own minimum setback distance from a potentially active or active fault. A 50-foot setback distance is generally the assumed de facto (not statutory) standard setback distance used as a starting point before detailed data are developed. While this sometimes becomes a minimum, this distance can be less for a narrow, well-constrained fault and wider for a more significant fault or when the fault is adjacent to a more significant structure. Using the investigation methods mentioned above and the knowing the importance of the facility a reasonable setback can be determined.

Research conducted over the past decade or so has demonstrated that it is possible to develop reasonable design mitigation measures to accommodate some level of fault related deformation without compromising the functionality of the structures. This necessitates determining in some detail the consequences of movement on distinct faults and distributed shearing due to bedrock or alluvial deposit warping associated with faulting (e.g., co-seismic uplift, and surface tilting or folding). Design measures involving specially constructed artificial fill using geogrids and geotextiles, and heavily reinforced foundations and slabs can be developed to accommodate some fault related deformation. Design determinations rely mainly on geologic and geotechnical field data, observations of the performance of similar structures, and some level of numerical modeling.

3.1.4 Earthquake-Induced Landslides

3.1.4.1 Data

The Seismic Hazard Mapping Program delineates the approximate boundaries of areas susceptible to earthquake-induced landslides and other slope failures (e.g., rockfalls). Figure G-6 shows the designated areas

in (a) the extreme northwest corner of Laguna Hills on the hillside just south of Veeh Ranch Park, (b) along the eastern slopes of Aliso Creek west of Paseo de Valencia, and (c) primarily southeast of Alicia Parkway to the I-5 Freeway (CDMG, 2000a and 2001a). These maps do not distinguish level of susceptibility and are not a substitute for geologic and geotechnical study for specific projects. Areas are delineated where there was known earthquake-induced slope failure during historic earthquakes, landslide movement (including both landslide deposits and source areas), and where CGS's analysis indicates ground slope and geologic materials are susceptible to earthquake-induced slope failure.

The delineated areas are not necessarily unstable, but the maps provide an opportunity to consider these areas when planning for new development or redevelopment. Since there is evidence for landslides in the Niguel (Tn) and Capistrano siltstone (Tcs) formations, the basis for the mapping of potential earthquake-induced landslide areas on ground slope and geologic formation characteristics is considered more definitive than for less landslide-prone areas.

3.1.4.2 Generally Expected Effects and Potential Mitigation Methods

Earthquake-induced landslides and shallow surficial failures are possible in hillside terrain and on steep excavation slopes during large earthquakes. Landslides most typically consist of shallow failures involving surficial soils (e.g., colluvium—Qc) and the underlying highly weathered bedrock in moderate to steep terrain. In the three City reports previously cited, such slope movement occurred under static conditions with substantial rainfall. Structures, engineered slopes, roadways, utilities, and the general population located on or below these hazard areas could be subject to severe damage or injury.

A somewhat conservative, yet reasoned approach should be taken with regard to development project evaluation relative to potentially severe ground motion and landslide hazards associated with large earthquakes on nearby faults. Such an approach based on the available data recognizes what geologists have learned through the southern California earthquakes over the past 25 years, that is, to expect the situation to be worse than sparse data indicate. Thousands of new landslides are created after each large earthquake in the general southern California area (e.g., 1971 San Fernando and 1994 Northridge earthquakes) usually in uninhabited areas that cause blockage of roadways.

In hillside terrain an appropriate engineering geology and geotechnical investigation (performed by properly licensed professionals), including field data collection, laboratory testing, and slope stability analysis, should be conducted considering both static and dynamic (earthquake) forces. Development projects within a zone susceptible to earthquake-induced landslides must be evaluated using California Geological Survey guidelines (CGS, 2008) that describe study methods and mitigation options. Mitigation options include, but are not limited to, building setbacks, landslide debris removal/replacement, slope angle reduction, earth or engineered buttresses, protective barriers, retaining/slough walls, debris fences, and run-out/catchment areas.

3.1.5 Liquefaction

Ground failures associated with saturated deposits (liquefaction) can include an entire suite of effects ranging from simple ground cracking to complex lateral spreading landslides.

3.1.5.1 Data

The three key factors that indicate whether an area is potentially susceptible to liquefaction are severe ground shaking, shallow groundwater and low-density granular deposits (mainly sand). In addition to having ground shaking parameters, quantitative estimates of liquefaction potential require specific data from geotechnical borings, laboratory testing, and groundwater level information. The CGS Seismic Hazard Zones maps (CDMG, 2000a and 2001a) delineate areas within the City and adjacent areas that are susceptible to

liquefaction (see Figure G-6); a prime consideration is whether historically highest groundwater levels have been within 40 feet of the ground surface. These are areas where alluvium is sufficiently loose and groundwater is sufficiently shallow that strong earthquake shaking could cause sediments to loose bearing capacity (CDMG, 2000a and 2001a). This could result in severe settlement of surface facilities and in some cases uplift of buried structures (e.g., large pipelines).

Within the City and immediately adjacent areas of influence, there are several liquefaction areas identified. These areas delineated on Figure G-6 generally correspond to alluvial deposits Qya, Qyfsa, and rarely Qc as indicated within the City and historically shallow groundwater. These correspond to the shallow groundwater (a) in the northern part of the City associated with the south branch of San Diego Creek channel, the former drainage through Veeh Reservoir extending east along Ridge Route Drive, (b) Aliso Creek and its associated smaller offshoots mapped as Qya, and (c) recent alluvium extending along the western edge of the I-5 Freeway.

Although there is some potential for deep liquefaction greater than about 50 below ground surface, liquefaction potential is substantially higher where water is less than 50 feet deep. CGS maps use the historically highest groundwater depth of 40 feet in their evaluation and do not separate potentially liquefiable sediments into susceptibility categories based on groundwater depth or sediment type. All other factors being equal (same earthquake, same geologic formation) susceptibility levels may be higher where groundwater is shallower.

Liquefaction areas shown in Figure G-6 are considered to have potential land use constraints. Liquefaction assessments must be made for important projects. The depth and intensity of study will naturally vary depending on the location, type, and importance of the project. It should be a goal to compile such data as it might exist in City, State, or County files, and to update groundwater depth data so that an ongoing assessment is possible. Due to the lack of specific geologic and engineering properties and groundwater depth data across the City, areas of liquefaction potential shown on Figure G-6 should be considered approximate. They should be used as general, not absolute, planning guidelines to indicate where assessments are needed for planned structures or possibly for upgrades to existing critical, essential, and high occupancy facilities.

3.1.5.2 Generally Expected Effects and Mitigation Methods

Liquefaction-induced ground failure can involve a complex interaction among seismic, geologic, soil, topographic, and groundwater factors. Failures can include ground fissures, sand boils, ground settlement, and loss of bearing strength, buoyancy effects, ground oscillation, flow failure, and lateral spread (Bartlett and Youd, 1992). These, in turn, can have effects on surface and subsurface structures. *Ground fissures* may be reflected as linear tensional features which open to widths of a few to several inches, but which may or may not exhibit differential vertical movement. *Sand boils* are built-up sand accumulations often up to three feet across that result from ejected sand and water forced from the subsurface under pressure. *Ground settlement* often occurs as liquefied sand deposits reconsolidate following ejection of the water and sand. A *loss of bearing strength* can cause surface structures to settle, either rather evenly or differentially, causing tilting. *Buoyancy* caused by rapid upward movement of water through sandy soils can cause buried structures to rise (float) when they are founded in the liquefied layer. *Ground oscillation* may not cause permanent ground displacement, but may damage rigid structures beyond the severe ground shaking in a non-liquefied zone. *Flow failure* is found in steeper terrain where liquefied soils near the ground surface flow as a viscous mass down slope similar to a mudflow in rain-saturated soils. *Lateral spread* is a liquefaction-induced landslide of a fairly coherent block of soil and sediment deposits that moves laterally (along the liquefied zone) by gravitational force, sometimes on the order of 10 feet, often toward a topographic low such as a depression or a valley area.

Each type of liquefaction failure can cause damage to surface and subsurface structures, with the severity dependent upon the type and magnitude of failure, and the relative location of the structures. For planning

purposes it is only possible to designate areas where the likelihood of these ground failures, as a group, is greatest (the green areas in Figure G-6). In addition, since liquefaction-induced lateral spread failures are more prevalent adjacent to topographic depressions or valley areas that form unsupported slopes or "free faces", it is possible to conclude for Laguna Hills that slopes into San Diego Creek, Aliso Creek, and Oso Creek would be the most susceptible to a lateral spread landslide failure. These failures have occurred in areas with very low slope gradients; at Juvenile Hall and the Sylmar Converter Station in Sylmar (1971), the average ground surface gradient was 1.5 degrees and the maximum was 3 degrees (O'Rourke, Roth and Hamada, 1992). Lateral spreads in the San Francisco earthquake of 1906 occurred associated with surface gradients of 0.4 to 2.10 percent, or about 0.2 to 1 degree (O'Rourke, Beaujon, and Scawthorn, 1992). In the latter case, the slope of the liquefied subsurface layer may have been as low as zero degrees.

The Seismic Hazards Mapping Program provides published guidelines and implementation procedures for the evaluation and mitigation of liquefaction conditions with a designated liquefaction hazard zone. These guidelines and procedures require registered professionals (California Registered Civil Engineer or Certified Engineering Geologist) to conduct the evaluations, establish the site-specific mitigation, and participate in the implementation process. The evaluation determines the controlling earthquake parameters, the liquefaction depth, the thickness, and lateral extent of the liquefiable layer affecting the proposed development, and the type and estimated amount of vertical and horizontal ground deformation.

Ground improvement (densification and hardening) and structural (foundation) design are the two classes of liquefaction mitigation. Ground densification methods include vibro-compaction, vibro-replacement (also known as vibro-stone columns), deep dynamic compaction, and compaction (pressure) grouting. Hardening methods reduce the void space in the liquefiable soil by introducing grout materials either through permeation grouting, mechanical soil mixing, or jet grouting. Structural mitigation may have little or no effect on strengthening the soil itself. For heavy structures, the preferred mitigation is deep caissons or pile foundations to penetrate through the liquefiable material, or a mat foundation may be feasible. For lighter structures continuous spread footings having isolated footings interconnected with grade beams, mat foundations, and post-tensioned slabs may be appropriate. Dewatering and drainage systems may be part of the mitigation process. Lateral spread hazards are not as readily mitigated with structural solutions and may require use of retaining structures, removal or treatment of liquefiable soils, modification of site geometry, or drainage to lower the groundwater table. Whether a single type of mitigation technique or a combination of techniques is needed will depend on size and scope of the project, and the site-specific geotechnical conditions.

3.1.6 Dynamic Consolidation and Subsidence

3.1.6.1 Data

Dry to partially saturated sediments not susceptible to liquefaction may be susceptible to dynamic consolidation and local ground subsidence. This consolidation or densification occurs in loose cohesionless sediments as the void spaces are diminished due to intense seismic shaking. Hazard maps are not normally created for this condition, and there are no specific data in the City, which allow prediction of the locations or magnitudes of potential consolidation and subsidence.

In general, the youngest alluvium (Qya, Qc, af, and Qyfsa) would be the most susceptible to dynamic consolidation effects. Older alluvium (Qvoa and Qvof) could be much less susceptible, but less so due to the higher in-place density and presence of some cementation. In areas where artificial fill (af) may have been placed without proper engineering controls and inspections, the materials may be susceptible to dynamic consolidation and subsidence. This may be a concern in areas where thick artificial fill masses have been placed against more dense bedrock materials such as in any number of residential and some commercial developments within the City.

3.1.6.2 Generally Expected Effects and Mitigation Methods

Due to the probable heterogeneous nature of the alluvial deposits in the City, the amount of dynamic consolidation and subsidence will not be consistent from location to location. Variations in vertical consolidation may occur within a small area such as an individual lot or beneath an individual structure. This may cause differential settlement of the structure and substantially more damage than if the structure were to settle evenly throughout. Sections of the City with young alluvial deposits and thick artificial fill masses are potentially susceptible to subsidence, although no specific areas of documented past subsidence are identified.

Observations reported in the other areas of southern California suggest that earthquake-induced consolidation, ground subsidence, and building settlement may reach a meter (3+ feet) or more; however, settlements of 5 to 30 centimeters (2 to 12 inches) are rather common. The resultant ground failures are manifest as ground cracks with relative vertical displacements as indicated above. When structures overlie these local subsidence areas, ground cracking may be translated through foundations and slabs causing severe structural damage.

In areas of the City is underlain by younger alluvium, one can assume it is generally composed of loose, unconsolidated granular alluvium, consolidation potential ranges from 2 to 6 percent. In an area with 50 feet of young alluvium, the dynamic consolidation may range from 12 to 36 inches. In areas overlain by thick non-engineered fill, these amounts could be proportionately greater. Even in areas where fill is engineered and properly compacted, the cut/fill contact line (engineered fill against native material) is a primary location for differential dynamic consolidation that can impact structures.

Earthquake-induced consolidation and structure settlements are normally less severe than liquefaction ground deformations; however the previously described mitigation measures for liquefaction could apply. Based on a thorough geotechnical investigation by licensed professionals, recommendations are provided, with the most common being over-excavation of the loose soils and replacement by compacted soils meeting standard geotechnical specifications. The depth of over-excavation will depend on the nature and thickness of the loose soils, but critical areas are the contacts between formations of varying density where differential settlement is most common. For example, where alluvium and bedrock, or artificial fill and any denser geologic formation, are in contact over-excavation is used to provide a uniform surface for recompacted soils or foundations.

3.1.7 Ground Cracking, Ridge Top Spreading, and Fill Slope Deformation

3.1.7.1 Data, and Generally Expected Effects and Mitigation Methods

Strong seismic shaking can cause general ground cracking, ridge top spreading, and deformation of fill slopes. Ground cracking may be widespread depending upon the surface materials and will likely not be a cause of significant earthquake damage. Ridge top spreading (McCalpin and Hart, 2002) can take a number of forms, but all involve antislope scarps with several different characteristic landforms (e.g., troughs, swales, grabens, benches, closed depressions, failed [shattered] ridges). Fill slopes can be permanently deformed during seismic shaking causing slope bulges, surface settlement cracks, and differential settlement cracks along contacts between dissimilar materials.

Potential for ridge top spreading features would be primarily found in the few steeper, less developed slope areas remaining in the City. Although the exact mechanism for the failures is not completely understood, it appears that seismic shaking induces lateral movement and differential settlement of bedrock masses, and in other cases there is topographic amplification of the shaking due to the tall and narrow shape of a ridge. Residential development is possible in these areas, as would the location of utility infrastructure, such as cellular or transmission towers, water tanks, debris dams, roadways, pipelines, etc. Failure of these types of structures may affect emergency communication, water supply, or people and facilities down slope from these ridge areas. Mitigation of effects may be obtained by reducing the height and increasing the width of the ridge

to limit amplification, by removing loose, fractured materials that may be subject to lateral movement and settlement, constructing deeper foundations below the affected zone, avoiding new construction on these ridges, and protecting structures down slope from existing facilities such as water tanks or electrical towers.

Fill slope deformation can occur on slopes of a significant height in the hillside areas of the eastern portion of the City and possibly in flatter areas where elevated construction is desired or necessary, e.g., to avoid potential flooding. On the building pad, cracking and settlement can be lessened by using the over-excavation methods described above. On the fill slopes themselves, the use of geogrid in the outer portions of the slopes and a greater fill placement density criterion should diminish the potential for slope face deformation and surface settlement.

3.1.8 Dam Failure Inundation/Flooding

3.1.8.1 Data

The past failures (Baldwin Hills and St. Francis) and near-failures (Van Norman) of southern California dams point out the importance of considering dam safety. Dams may fail for seismic or geologic reasons, either of which could lead to the results described in this section. Section 8589.5 of the California Government Code requires dam owners to provide the Governor's Office of Emergency Services with an inundation map showing the extent of damage to life and property that would occur, given a complete and sudden dam failure at full capacity. The City lies downstream from dams, reservoirs, and debris basins whose drainages ultimately flow toward the City (Figure G-9). Inundation hazards can range from high to low with increasing distance away from these water containment structures.

A few dam and reservoir structures lie outside and within the City. North of the City (up stream) inundation maps were obtained for El Toro Reservoir and Upper Oso Reservoir/Lake Mission Viejo (California OES, 2008); all of these dams are under the jurisdiction of the State of California. Dam inundation flooding from El Toro Reservoir, with a of capacity 877 acre-feet (AF; California DSOD, 2008), extends south of the I-5 near La Paz Road within the Amtrak/BNSF railroad right-of-way and remains east of, or slightly within, Cabot Road south to just south of Oso Parkway where the City boundary jogs to the west. Upper Oso Reservoir (3,700 AF) occupies Oso Creek up stream from Lake Mission Viejo (4,300 AF). Figure G-9 shows the effect of both reservoirs along Oso Creek which meets the I-5 just south of Oso Parkway. The dam inundation flooding is shown to continue to the west side of the I-5 and is within the east edge of the City along Cabot Road south of Rapid Falls Road..

Smaller reservoirs (e.g., Veeh Reservoir), other holding ponds, and 4 known water tanks are up stream from buildings and populations within the City and do not have inundation maps prepared. Veeh Reservoir has a capacity of approximately 15 MG (46AF) and overflow into Cañada Channel (designated F23) that empties into San Diego Creek channel. Mill Creek is bordered by open space, residential and business park uses. Potential flooding impacts are unknown. A small unnamed reservoir (capacity unknown but at least a few million gallons) is at the southeast corner of Moulton Parkway and Ridge Route Drive adjacent to Laguna Hills Golf Course; a failure would generate flow toward Veeh Reservoir to the north. There is a small dam at a sewage disposal pond site east of the intersection of Moulton Parkway and Alicia Parkway with an unknown capacity.

Four water tanks are noted within the City, one near Mendocino Park, and 3 near Nellie Gale Road and Gallup Circle. At the location of the single tank flow would be to the north and the 3 tanks on the hilltop would potentially allow in any direction.

3.1.8.2 Generally Expected Effects and Mitigation Methods

Based on existing maps, a catastrophic failure of dams outside the City at El Toro Reservoir, Oso Reservoir, or Lake Mission Viejo could reach the City in limited areas within and east of Cabot Road along the I-5 Freeway. Within the City failure of Veeh Reservoir should cause flow to the north to Mill Creek then west along Cañada Channel through the Veeh Ranch Park and out of the City. Flow from the small unnamed reservoir near the golf course should flow north toward Ridge Route Drive then likely into the pit feature north of Ridge Route Drive and southeast of Veeh Reservoir. Failure of the small dam at the sewage disposal pond site should cause pond contents materials to flow west-northwest across Sunnyglen Avenue along Landover Road in the direction of Alicia Parkway.

Specific flooding parameters for the small reservoirs and water tanks within the City are not predicted and would vary in intensity depending upon the site and the amount of water impounded should such an event occur. Water from the single water tank at Mendocino Park should flow north and north-northwest toward the intersection of Alicia Parkway and Paseo de Valencia. Failure into (capacity unknown but at least a few million gallons) is at the southeast corner of Moulton Parkway and Ridge Route Drive adjacent to Laguna Hills Golf Course; a failure would generate flow toward Veeh Reservoir to the north.

Areas immediately along the down stream from water tanks and reservoirs along man-made or natural drainage courses would be the most susceptible to damage from rapidly flowing water, severe erosion, and associated floating debris. Areas more distant from the larger reservoirs, higher elevation areas, and those areas farthest from the flood channels could suffer more from minor sheet flow and rising water. Man-made barriers, such as cross-cutting roadways and closely-spaced buildings, could locally deflect flow in ways not obvious without more investigation and analysis.

The small dams mentioned are not regulated and monitored for structural safety by the California Department of Water Resources Division of Safety of Dams in accordance with Division 3 of the California State Water Code. This is due to dam height being less than 25 feet or storage capacity of less than 50 acre-feet. Lack of regulation of these dams may increase the chance of catastrophic failure; however, under the most severe scenario earthquake on the San Joaquin Hills blind thrust, these dams would be in danger of damage that could cause a release of water. Water tanks are designed to high standards to prevent failure during severe earthquakes. For severe flooding to result from failure of a dam or water tank, the earthquake and the high water levels would have to occur simultaneously, which makes the chances remote. The most effective mitigation of future flooding would entail evaluating the structural integrity of these small dams and water tanks and performing upgrades as needed to provide an added safety margin for all but the most severe earthquake events. In addition, an analysis of flooding potential at each facility could be performed and evacuation procedures could be developed for those facilities where flooding threatens property and populations.

3.2 Geologic and Soil Hazards

3.2.1 Overview

For the geologic component of the Safety Element the minimum list of potential hazards which must be considered are:

- Slope Instability (landslides, mudslides, and debris flows)
- Subsidence
- Groundwater Depth (also discussed under liquefaction above)

Subsidence due to groundwater withdrawal is possible due to substantial pumping of groundwater aquifers; however, the city does not overlie a groundwater basin and there are no known records of such subsidence in the City of Laguna Hills based on the references reviewed. Landslides, dam failure inundation, and shallow groundwater are discussed below.

3.2.2 Landslides, Mudslides, and Debris Flows

3.2.2.1 Data

Slope instability under non-earthquake (static) conditions is considered to be a potentially significant hazard in the hillside and mountain areas of the City. The distribution of mapped landslides in the San Juan Capistrano and El Toro quadrangles shown on Figure G-3 (Morton and Miller, 2006) represent only a small portion of landslides mapped within the City and surrounding areas. Figure G-6 shows potential earthquake induced landslides and includes most other locations where landslides were mapped by the CDMG plus other potentially unstable areas based on ground slope and geologic conditions. The CDMG (2000a and 2001a, Plates 2.1) prepared an inventory of existing landslides in the San Juan Capistrano and El Toro quadrangles using field reconnaissance, analysis of stereo-paired aerial photographs, and a review of previously published landslide mapping. Development activity has stabilized many of the landslides shown on the CDMG Plates 2.1. As with the previous discussion of earthquake-induced landslides, most mapped landslides are found (a) in the Sespe Formation in the northwest corner of the City, (b) in the Monterey Formation (Tm) between Alicia Parkway and Aliso Hills Drive, and (c) within the Niguel (Tn) and Capistrano siltstone (Tcs) formations scattered throughout the City south and east of La Paz Road. Earthquake-induced landslide hazards are discussed in an earlier section.

3.2.2.2 Generally Expected Effects and Mitigation Methods

In hillside terrain an appropriate engineering geology and geotechnical investigation (performed by properly licensed professionals), including field data collection, laboratory testing, and slope stability analysis, should be conducted considering both for both static and dynamic (earthquake) forces. Mitigation options include, but are not limited to, building setbacks; landslide debris removal/replacement, slope angle reduction, earth or engineered buttresses, protective barriers, retaining/slough walls, debris fences, and run-out/catchment areas.

Deep-seated landslides are most often remediated by construction of engineered earth buttresses that replace weak natural materials (e.g., landslide debris) and provide a restraining mass at the toe area of a slide mass to prevent lateral movement. Extensive surface and subsurface drainage devices are required to prevent water from weakening or loading the fill mass. Surficial slope failure impacts can be mitigated by removing vulnerable deposits (e.g., soil, colluvium, fractured/weather bedrock), placing structures outside the path of potential slides, constructing debris basins at canyon mouths to catch the slide material, building barriers to stop or divert surficial slide debris (e.g., impact, diversion or deflection structures—walls or channels).

3.2.3 Collapsible and Expansive Soil Hazards

3.2.3.1 Data, Generally Expected Effects, and Mitigation Methods

Collapsible and expansive soil issues are recognized in standard geotechnical investigations mandated by the city and other regulatory bodies. Expansive soils are found associated with soils, alluvium, and bedrock formations that contain clay minerals susceptible to expansion under wetting conditions and contraction under drying conditions. Depending upon the type and amount of clay present in a geologic deposit, these volume

changes (shrink and swell) can cause severe damage to slabs, foundations, and concrete flatwork. Due to the more granular (sandy) nature of the alluvium (Qya) it is less likely to have expansive clays. Expansive clays do occur in the soils covering the older alluvial deposits and all bedrock formations in the hillside areas and the upper reaches of canyons where colluvium (Qc) is present.

Collapsible soils undergo a volume reduction when the pore spaces become saturated causing loss of grain-to-grain contact and possibly dissolving of interstitial cement holding the grains apart. The weight of overlying structures can cause uniform or differential and damage to foundations and walls. The most likely locations for collapsible soils are the current and pre-development washes and drainage channels, particularly Aliso and Oso Creek drainages.

Expansive and collapsible soil damage can be mitigated by delineation of the soils during a geotechnical investigation, over-excavation of the subject soils and recompaction on new engineered fill material, possibly pre-saturating the subject soils, and provision of proper surface drainage away from structures and building foundations.

3.2.4 Shallow Groundwater

3.2.4.1 Data, Generally Expected Effects and Mitigation Methods

Data on shallow groundwater are discussed in an earlier section and reviewed in the liquefaction discussion. The concern in this section is the potential to intercept shallow or perched groundwater in subsurface excavations, such a basements, utility trenches, deep foundations, or tunnels. In its liquefaction hazard reports, the CGS (CDMG, 2000a and 2001a) delineates at selected locations historic shallow groundwater within the City (Figure G-6) based on data from geotechnical bore holes. All of these areas are within the alluvial channels and creeks where unconfined groundwater existed at depths ranging from 5 to 20 feet. In areas where shallow groundwater is indicated on these maps, planning for each project should consider shallow water levels in determining how to best implement construction or exploration programs.

Surface (open cuts and pits) or underground (tunnels, vertical large-diameter borings) excavations can encounter shallow groundwater inflows, which may be perched and local or widespread in extent. This will affect excavation stability, and therefore short- and long-term safety for workers, as well as post-construction stability of structures associated with these excavation areas. The degree of hazard for the City is generally low, but should be determined on a case-by-case basis if projects requiring deep excavations are proposed in the alluvial areas.

It is important to recognize that shallow groundwater data discussed above are depth estimates based on a "snapshot" in time; the historically highest levels should be considered for planning purposes. Depths to water of less than 15 feet are considered a high hazard because water may be encountered even in routine project excavations; depths of 15 to 30 feet are considered a moderate hazard because only the more significant excavations (e.g., subterranean parking garages) for larger project structures would likely extent to these depths. For water greater than 30 feet deep the hazard is considered insignificant, although for some projects (e.g., deep tunnel or a major high-rise building) this will remain a design issue; it is assumed that such structures will be very carefully studied and with liquefaction as an issue will call attention to the shallow water depths.

4 POTENTIAL EARTHQUAKE EFFECTS AND HAZARD REDUCTION

Hazards discussed in previous sections have the potential to cause serious damage, injury, and death if the seismic event is large enough to generate short duration high peak ground accelerations, or long duration moderate to high ground accelerations. Table G-8 lists community facilities considered essential, important, or critical by the City of Laguna Hills (Figure G-10). These are subdivided into (a) police, fire, and City Hall (b) government buildings and facilities, (c) medical facilities and nursing homes, and (d) schools. Also considered are freeway bridges, and utilities, reservoirs, railroads, and dams.

Concern for linear lifelines (i.e., streets, freeways, high voltage lines) and the other specific important and essential community facilities become even more critical in emergencies and natural disasters. The earthquake effects on structures and facilities will depend upon the size and location of the earthquake being considered for specific facility locations within the City.

For each of the facilities listed there is an indication of the potential for (a) estimated levels of peak horizontal ground acceleration, (b) bedrock and engineering geology units underlying the facility, and (c) earthquake-induced landslide, liquefaction or surface fault rupture potential. Information is derived from maps in this report. The intent of Table G-8 is to highlight potential facilities where concerns may be higher in order to provide a tool for the City with regard to emergency planning and possible facility study and/or upgrade. The table should be considered in the context of the previous technical discussions and maps.

TABLE G-8 – Potential Geologic and Seismic Hazards Effecting Laguna Hills Community Facilities

COMMUNITY FACILITIES AND IMPORTANT STRUCTURES (Considered Essential for City Functionality and/or for Disaster Recovery) [1]	ADDRESS	Estimated PHGA (%g) [2]	Bedrock or Engineering Geology/ Surficial Unit [3]	Earthquake-Induced Landslide (Ls), Liquefaction (Lq) [4] or Fault (F) Potential [5]
COMMUNITY FACILITIES				
Police, Fire, and City Hall				
OC Fire Station #22	24001 Paseo de Valencia	0.28-0.29	Qvofa	None
Police (administrative functions only)	24035 El Toro Rd	0.28-0.29	Qvofa	None
City Hall/Civic Center	24035 El Toro Rd	0.28-0.29	Qvofa	None
Government Buildings and Facilities				
Post Office	24001 Calle de la Magdalena	0.28-0.29	Tm	None
Community Center	25555 Alicia Parkway	0.28-0.29	Tcs and TM	Lq
Technology Library	25555 Alicia Parkway	0.28-0.29	Tcs	Lq
Medical and Nursing Home Facilities				
Florence Sylvester Senior Center	23721 Moulton Parkway	0.29-0.30	Ts	None
Saddleback Memorial Hospital	24451 Health Center Drive	0.29-0.30	Tm and Qya	Lq east edge ?
Schools				
San Joaquin Elementary School	22182 Barbera	0.29-0.30	Ts	None
Lomarena Elementary School	25100 Earhart	0.28-0.29	Tn and Tcs	None
Laguna Hills HS	25401 Paseo de Valencia	0.28-0.29	Tcs	Lq and Ls
Valencia Elementary School	25661 Paseo de Valencia	0.28-0.29	Tn	Ls
IMPORTANT STRUCTURES				
Freeway Bridges				
Lake Forest Drive and I-5 (OC)	--	0.29-0.30	Qvof and Qyfsa	Lq
Ridge Route Drive and I-5 (OC)	Future	0.29-0.30	Qvof and Qyfsa	Lq
El Toro Road and I-5 (UC)	--	0.28-0.29	Qvofa	Lq
Los Alisos Boulevard and I-5 (OC)	--	0.28-0.29	Tn	Lq
Alicia Parkway and I-5 (OC)	Not in the City	0.28-0.29	Tn and Qvoa	None

COMMUNITY FACILITIES AND IMPORTANT STRUCTURES (Considered Essential for City Functionality and/or for Disaster Recovery) [1]	ADDRESS	Estimated PHGA (%g) [2]	Bedrock or Engineering Geology/ Surficial Unit [3]	Earthquake-Induced Landslide (Ls), Liquefaction (Lq) [4] or Fault (F) Potential [5]
COMMUNITY FACILITIES				
Amtrak/BNSF and I-5 (UC)	Not in the City	0.28	Tn, af and Qya	Liq possible
La Paz Road and I-5 (UC)	--	0.28-0.29	Tn	None
El Paseo OC to Cabot Road and RR	--	0.28-0.29	Tcs and Qya	Lq
Oso Parkway I-5 and RR (OC)	--	0.28-0.29	Tcs, Qc, and Qya	Lq
Crown Valley Pkwy and I-5/SR-73 (OC)	Not in the City	0.28-0.29	Tcs and Qya	Lq
Greenfield UC and SR-73	--	0.28-0.29	Tcs and Qya	None
Moulton Parkway UC and SR-73	Not in the City	0.28-0.29	Tcs	Lq partial (?)
Pacific Park Drive UC and SR-73	Not in the City	0.28-0.29	Tcs	None
La Paz Road UC and SR-73	Not in the City	0.28-0.29	Tcs	Ls partial (?)
Santa Vittoria Dr. and Cañada Channel	--	0.29-0.30	Ts and Qyfa	Lq
Mill Creek Dr. and Cañada Channel	--	0.29-0.30	Qvofa and Qyfa	Lq
Four hourse undercrossings	Various	0.28-0.30	Various	Possible
Utilities and Dams/ Reservoirs				
East-West High Voltage Power Lines	West from Paseo de Val./I-5	0.28-0.30	Tn and Tcs	Ls near towers
Several (4) Water Tanks	Various areas	0.28-0.29	Tn and Tcs	Ls nearby
Veeh Reservoir/Dam	Moulton Pkwy/Ridge Route	0.29-0.30	af and Qya	Lq
Sewage Disposal Ponds/Dam	Moulton and Alicia Pkwys	0.28-0.30	Qc	Lq

NOTES: 1. Police, fire, government, medical, nursing, and school facilities are from the City of Laguna Hills database; freeway bridges, utilities, and dams are other important facilities related to earthquake safety (Figure G-10). 2. The peak horizontal ground acceleration is a percent of the force of gravity (estimated to the nearest 0.05g) and derived from Figure G-8 based on the California Geological Survey methodology. 3. Geology and engineering geology units as shown on Figures G-3 and G-4. 4. Liquefaction potential (Figure G-6) is derived from the CDMG (2000a and 2001a). Lq = potential liquefaction. 5. Faults affecting the City are shown on Figures G-1 and G-3.

4.1 Community Facilities

Laguna Hills City Hall was initially constructed in 1969, expanded in 1981, and expanded again in 2003-04, when the City purchased the building. The portion of the building expanded in 2003-04 (approximately 12,000 sq. ft.) was constructed to current seismic standards and this area includes the emergency response center. The emergency response center serves as the location for post-earthquake disaster coordination and response (City of Laguna Hills, 2008), as well as a location for police department administrative functions. (The police department patrol staff are deployed from the City of Aliso Viejo police station located at 12 Journey #100.) The level of geologic, soils and seismic hazard is low for the City Hall facilities.

One medical facility (Saddleback Memorial Hospital) and one nursing home facility were identified by the City. Both appear to have low geologic, soils, and seismic hazard potential, although Saddleback Memorial Hospital is located just to the west of a designated liquefaction investigation zone. The medical and nursing home facilities are critically important for the concentration of infirm and elderly who are not as able to care for themselves in an emergency, and Saddleback Memorial Hospital would be counted on to provide some post-earthquake care for the injured. It is important to understand whether construction of these facilities has accounted for geologic and seismic risk, as they are now understood within the City. The hospital owners in conjunction with the City should undertake an evaluation of these factors and conditions. All facilitates should include an assessment of the earthquake preparedness of the staff, and the vulnerability of the contents and fixtures. In addition, there may be other dependent care facilities (e.g., convalescent, day care, social services,

and retirement facilities) or medical offices in the City that should be identified and evaluated for earthquake safety.

Four schools were identified as being located within the City, three elementary schools and one high school. Valencia Elementary School is located near an earthquake-induced landslide area and Laguna Hills High School is located near a potential liquefaction zone and a small potential earthquake-induced landslide area. Based on the information available neither hazard level is considered to be high. Age of construction and relative seismic stability of the schools are known by the City. In general, schools located in an alluvial deposit (Qya, Qyfsa, or Qc are more susceptible to liquefaction and dynamic settlement potential than schools outside these areas. Since schools are often used as evacuation shelters following an earthquake, these locations could be more at risk and will be generally less suitable for sheltering (from a planning viewpoint) than other locations.

4.2 Freeways, Bridges, and Evacuation/Emergency Response Routes

The freeways and the primary freeway bridges are most vulnerable to damage from seismic shaking, and associated liquefaction and dynamic consolidation for the PHGA values noted in Table G-8. It appears that all freeway bridges have been either seismically retrofitted by the State (I-5) or have been built under the recent Caltrans design standards (State Route 73 or SR-73). All of the 15 bridges are in the same rather moderate PHGA range of 0.28 to 0.30g and nine of the bridges are in liquefaction zones Freeway roadbed sections are subject to settlement due to dynamic consolidation and slope failure, which could cause local disruptions, particularly at the roadway/bridge connections. A large earthquake centered on the San Joaquin Hills blind thrust (SJHBT) could disrupt on or more of these bridges, particularly those potentially susceptible to liquefaction.

The SJHBT could cause surface folding and tilting and/or localized uplift. Close or distant large earthquakes could cause very strong ground shaking lasting for well over one minute. Either could damage the freeway structures (roadway, slopes, and drainage devices) and bridges. Since freeways and bridges have proven to be at least temporary weak links in the post-earthquake regional transportation system, they should be avoided as primary emergency routes where possible. Discussions with Caltrans should be part of earthquake disaster planning.

Primary evacuation and emergency response routes within the City should be along roads which will handle maximum traffic and which lead directly to or from areas where less severe damage is predicted. Roads passing through the hillside areas are subject to temporary total or partial closure from landslides or landslide debris. Paseo de Valencia, Moulton Parkway, and El Toro Road should remain relatively open and passable, therefore appear to be suitable evacuation and emergency response routes within the City based on geology, soils, and seismic hazards identified. Liquefaction may affect Alicia Parkway south of Paseo de Valencia, Landslides may be more likely to impact La Paz Road and Oso Parkway.

4.3 Reservoirs, Dams, Railroads, and Utilities

The Amtrak/BNSF is the only railroad line near the City passing from the northeast corner at the I-5 south along the west side of the I-5. The I-5 bridge and much of the Amtrak/BNSF track to the south are within a liquefaction zone and adjacent to landslide area west of the tracks. Distortions and damage to track can cause derailments, and landslides could temporarily block the tracks.

The reservoirs, dams, and water tanks previously discussed within and near the City are vulnerable to damage from large earthquakes. Flooding (not depicted on Figure G-9) is possible in the areas down stream from these facilities.

Liquefaction, fault rupture, dynamic consolidation, and strong ground shaking can affect buried and aboveground utilities, particularly at points-of-connection. Utility line weakness may be at the entrance to residences or businesses, or at joints, junctions, and valves in the system. In general it can be expected that damage will be more severe due to amplification of ground motions where liquefaction is possible and sediments are thicker and/or less dense (generally in the canyon areas). It is not possible to predict relative frequency of damage more specifically without knowledge of the age of the various systems and the amount of upgrade that has been done. The older systems are clearly the most vulnerable. The largest short-term threat is from fire caused by natural gas leaks at residences and businesses.

An inventory of high-pressure water, natural gas, and liquid petroleum pipelines passing through the City should be compiled; for example, there is a fuel pipeline within the Amtrak/BNSF right-of-way. In general, underground pipelines are not subject to as much damage as surface structures (O'Rourke and Liu, 1999) during large seismic events, absent the potential for permanent ground displacement (PGD; e.g., landslides, fault rupture, and liquefaction). Since these PGD factors do occur in certain areas of the City, it is possible that significant impacts could occur. It is possible that these effects could cause disruption of one or more lines in the most severe earthquake events. If natural gas or petroleum pipelines were to rupture, there would be a distinct possibility of fire or explosion if gas entered confined spaces. This possibility is greatest where the liquefaction and fault rupture potential exist. Under these severe conditions gas line disruptions may affect the use of local streets. The high voltage power lines trend east-west across the south-central part of the city in large part just south of Paseo de Valencia, where they trend to the west out of the City. The failure of a tower due to slope instability is the most likely potential impact along this line.

4.4 Potentially Hazardous Buildings

It is beyond the scope of this study to comment on specific facilities and structures not classified in Table G-8. Generally this includes residences, small apartments and condominiums, businesses, and public facilities such as libraries, agency offices, meeting rooms, theaters, and churches. Many buildings in the City were constructed after 1971, after more stringent seismic design codes were enacted based on the San Fernando earthquake and based on later technology studies.

Potentially hazardous buildings consist of: dilapidated structures regardless of age; pre-1971 concrete tilt-up construction; non-ductile concrete frame buildings; multistory buildings with a soft story; buildings with a complex design/floor plan; and homes with unbolted foundations including mobile homes. Unreinforced masonry (URMs) buildings are especially hazardous; it is understood that as of 2005 Laguna Hills had no URM buildings in the City. The City should do whatever it can to educate and persuade City residents, business owners, and owners of buildings within the City that fall into these categories, to perform seismic strengthening and engage in earthquake preparedness programs.

4.5 Land Use and Development

Land use constraints identified are strong ground shaking, liquefaction, landslides (including earthquake induced), surface fault rupture, and local dam or water tank inundation flooding. Throughout the City no one area is more likely to experience the higher ground shaking levels than another with a narrow estimated range of 0.28 to 0.30g for the 10 percent chance in 50-years value. Therefore ground shaking alone is not considered a constraint to land use since engineering design measures exist to minimize ground shaking damage, particularly for essential facilities. Liquefaction areas overlie parks/open space, residential areas, business/commercial districts, designated community facilities, utilities, and roads/bridges. Future essential, important, or critical facilities as shown in Table G-8 should not be planned for these areas if other acceptable

sites are available; siting such facilities in these areas requires more specialized investigations and design precautions.

Sites susceptible to high levels of ground shaking and those in potential liquefaction prone areas require site-specific geotechnical evaluations and analysis. All recommended engineering design measures included in these studies should be incorporated into building design and construction. As mentioned whenever possible, liquefaction and landslide hazard areas should be avoided for important community facilities. The potential surface fault rupture threat from the one "young" fault is not known with certainty, but does not affect existing designated community facilities. In the future this young fault and possible extensions should require site-specific investigation and may warrant a special City-sponsored investigation project to better define the activity and location of fault now suspected of having some surface rupture potential. Despite these conditions, it is technically feasible to develop the land in the city if precautions are taken, including the proper geologic and geotechnical investigations, analyses, and project design considerations.

4.6 Hazard Reduction

Seismic and geologic hazard reduction will mainly be attained through the proper implementation of existing building codes and regulations related to natural hazards (e.g., 2007 California Building Code and Seismic Hazards Mapping Acts). Certain of the natural hazards that have previously been either unrecognized or not risen to prominence (e.g., surface fault rupture and liquefaction) may require special city zoning and land use policies. Potentially hazardous buildings can be identified and depending upon their quality and use (e.g., medical or nursing home care), may be suitable for retrofit.

4.6.1 Building Codes

Adoption of the most rigorous building codes governing seismic safety and structural design will be the most effective means to mitigate future earthquake damage from strong ground shaking. The most recent 2007 California Building Code incorporates lessons from the most severe earthquakes to hit California in the past 24 years, in particular San Fernando-Sylmar (1971), Loma Prieta (1989), and Northridge (1994) and has been adopted by the City of Laguna Hills. Continued use of the 2001 State Historic Building Code for historic structure seismic retrofit, and the CBC for retrofit of other potentially hazardous structures will continue the trend of reduction in the loss of life in future earthquakes. In addition, as population pressures lead to development in more hazard prone areas of the City and as the existing building inventory ages, the active implementation of these codes will reduce the earthquake hazard risk for the city.

4.6.2 Special Hazard Zones

The State (California Geological Survey--CGS) creates maps for the use of cities and other jurisdictions that define hazardous areas for "active" faults, liquefaction, and earthquake-induced landslides. In addition, the CGS and the USGS create maps that define the potential levels of seismic ground shaking that can be expected. Together these represent "special hazard zones" that have regulatory meaning and require certain studies and precautions before development can be approved. A small portion of the City of Laguna Hills is crossed by a "young" fault trace that is not well located and not sufficiently well studied so that the degree of activity is completely understood. It is suggested that the City carefully consider and explore the possibility of better understanding the nature of this "young" fault, with the goal determining whether it requires future avoidance or special zoning.

4.6.3 Building Retrofit

The City should consider programs to identify potentially hazardous buildings (generally pre-1971 in age and not yet seismically retrofitted) and to identify potential funding sources to rehabilitate and strengthen these structures as redevelopment, infill, and new development proceed. Upgrades should be made that will ensure the survivability and function of these facilities in such an earthquake event.

5 REFERENCES CITED

Bartlett, S. F., and T. L. Youd, 1992, Case Histories of Lateral Spreads Caused by the 1964 Alaska Earthquake, in Case Studies of Liquefaction and Lifeline Performance During Past Earthquakes--Volume 2 United States Cases, edited by O'Rourke and Hamada, pages 2-1 through 2-127.

Blake, Thomas, 2000, EQSEARCH A Computer Program for the Estimation of Peak Horizontal Acceleration From southern California Historical Earthquake Catalogues, Users Manual, 94 pp.

Bolt, B. A., 1993, Abridged Modified Mercalli Intensity Scale, *Earthquakes - Newly Revised and Expanded*, Appendix C, W.H. Freeman and Co., 331 pp.

Boore, D. M., W. B. Joyner, and T. E. Fumal, 1997, Equations for estimating horizontal response spectra and peak acceleration from western North American earthquakes: A summary of recent work, Seismological Research Letters, 68, 128–153.

Bryant, W. A. (compiler), 2005, Digital Database of Quaternary and Younger Faults from the Fault Activity Map of California, version 2.0: California Geological Survey Web Page, <http://www.consrv.ca.gov/CGS/information/publications/QuaternaryFaults_ver2.htm>; (date downloaded from web site).

California Building Standards Commission, 2008, The 2007 California Building Code, http://www.bsc.ca.gov/default.htm.

CDMG, 1996, Draft Guidelines for Evaluating and Mitigating Seismic Hazards--Release for Comment by the State Mining and Geology Board, pages 37-48.

_____, 2000a, Seismic Hazard Evaluation of the El Toro 7.5-Minute Quadrangle, Orange County, California, OFR 047.

_____, 2001a, Seismic Hazard Evaluation of the San Juan Capistrano 7.5-Minute Quadrangle, Orange County, California, OFR 053.

_____, 2001, Seismic Hazard Zones, El Toro Quadrangle, released January 17, 2001.

_____, 2001, Seismic Hazard Zones, San Juan Capistrano Quadrangle, released December 21, 2001 (Details regarding the Seismic Hazards Mapping Act can be found at http://gmw.consrv.ca.gov/shmp/SHMPpgminfo.htm).

California Geological Survey (CGS), 2002, CGS 2002 California Fault Model, Modified for Use with FRISKSP and EQFAULT.

_____, 2007, Note 48 Checklist for the Review of Engineering Geology and Seismology Reports for California Public Schools, Hospitals, and Essential Services Buildings October 2007,

http://www.conservation.ca.gov/cgs/information/publications/cgs_notes/note_48/Documents/note_48.pdf.

_____, 2008a, Special Publication 117 Guidelines for Evaluating and Mitigating Seismic Hazards in California, http://www.conservation.ca.gov/cgs/shzp/webdocs/Documents/sp117.pdf.

_____, 2008b, Note 32, How Earthquake and Their Effects are Measured; http://www.consrv.ca.gov/CGS/information/publications/cgs_notes/note_32/note_32.pdf.

_____, 2008c, Peak Ground Acceleration Map – 10% Probability of Being Exceeded in 50 Years (October 2006), CGS website – http://www.consrv.ca.gov/CGS/rghm/psha/pga.htm#PGA.

California DSOD, 2008, Dams within the Jurisdiction of the State of California, Division of Safety of Dams.

California OES, 2008, Dam Inundation Maps, Office of Emergency Services.

California Seismic Safety Commission, 2006, Status of the Unreinforced Masonry Law, 2006 progress Report to the Legislature, SSC-2006-04, appendices A and B, http://www.seismic.ca.gov/pub/CSSC%202006%20URM%20Report%20Final.pdf.

Cao, T., Bryant W. A., Rowshandel B., Branum D., and Wills, C. J., 2003, Appendix A-The Revised 2002 California Probabilistic Seismic Hazard Maps June 2003.

City of Laguna Hills, 1996, General Plan—Chapter 5 Environmental Hazards, pages 5-1 through 5-8 and 5-16.

_____, 2008, E-mail communication via EDAW Inc., October 2008.

ETWD, 2008, El Toro Water District website.

Grant L. B., K. J. Mueller, E. M. Gath, Hai C., R. L. Edwards, R. Munro, and G. L. Kennedy, 1999, Late Quaternary uplift and earthquake potential of the San Joaquin Hills, southern Los Angeles basin, California, *Geology;* November 1999; v. 27; no. 11; p. 1031–1034; 4 figures; 1 table.

Grant, L. B., L. J. Ballenger, and E. E. Runnerstrom, 2002, Coastal Uplift of the San Joaquin Hills, Southern Los Angeles Basin, California, by a Large Earthquake since A.D. 1635 Bulletin of the Seismological Society of America, Vol. 92, No. 2, pp. 590–599, March 2002.

Grant, L. B. and P. M. Shearer, 2004, Activity of the Offshore Newport–Inglewood Rose Canyon Fault Zone, Coastal Southern California, from Relocated Microseismicity, Bulletin of the Seismological Society of America, Vol. 94, No. 2, pp. 747–752, April 2004.

Hart, E., and W. Bryant, 1997, Fault-Rupture Hazard zones in California--Alquist-Priolo Earthquake Fault (Special Studies) Zones Act (as amended 1994) with Index to Special Studies Zones Maps, California Division of Mines and Geology, Special Publication 42, Supplements 1 and 2 added 1999, Revised 2007 (Details regarding the Alquist-Priolo Earthquake Fault Zone Act can be found at http://www.consrv.ca.gov/CGS/rghm/ap/index.htm).

McCalpin, J. P., Hart, E. W., 2002, Ridgetop Spreading Features And Relationship To Earthquakes, San Gabriel Mountains Region, Southern California --Part A: Distribution And Description Of Ridgetop

Depressions (Sackungen), Final Technical Report Contract 1434-HQ-GR-1026 National Earthquake Hazards Reduction Program U.S. Geological Survey

Morton, D. M. and Miller, F. K., 2006, Preliminary Geologic Map of the San Bernardino and Santa Ana 30' x 60' Quadrangles, California, U.S. Geological Survey, Open-File Report 2006-1217, Version 1.0.

OCWD, 2008, Orange County Water District, website, groundwater elevation contours.

O'Rourke, T. D., and P. A. Beaujon, and C. R., Scawthorne, 1992, Large Ground Deformations and Their Effects on Lifeline Facilities: 1906 San Francisco Earthquake, in Case Studies of Liquefaction and Lifeline Performance During Past Earthquakes--Volume 2 United States Cases, edited by O'Rourke and Hamada, pages 1-1 through 1-129.

O'Rourke, T. D., and B. L. Roth, and M. Hamada, 1992, Large Ground Deformations and Their Effects on Lifeline Facilities: 1971 San Fernando Earthquake, in Case Studies of Liquefaction and Lifeline Performance During Past Earthquakes--Volume 2 United States Cases, edited by O'Rourke and Hamada, pages 3-1 through 3-85.

O'Rourke and Liu, 1999, Response of Buried Pipelines Subject to Earthquake Affects, MCEER Monograph No. 3.

Petersen M. D, Cramer, C. H., Faneros, G. A., Real, C. R., and Reichle M. S., , 2001,. SECTION 3 GROUND SHAKING EVALUATION REPORT Potential Ground Shaking in the San Juan Capistrano 7.5-Minute Quadrangle, Orange County, California, in Seismic Hazard Zone Report 053.

SCEC, 2008, Southern California Earthquake Center Website.

Shaw, J. H., et al, 2002, Puente Hills Blind-Thrust System, Los Angeles, California, Bulletin of the Seismological Society of America, Vol. 92, No. 8, pp. 2946–2960, December 2002.

U. S. Geological Survey, 1981, San Juan Capistrano and El Toro 7.5-Minute Quadrangle topographic maps.

_____, 1996,

_____, 2003, ShakeMap Earthquake Scenario San Joaquin Hills Blind Thrust M6.6, http://earthquake.usgs.gov/eqcenter/shakemap/sc/shake/San_Joaquin_Hills_sc/.

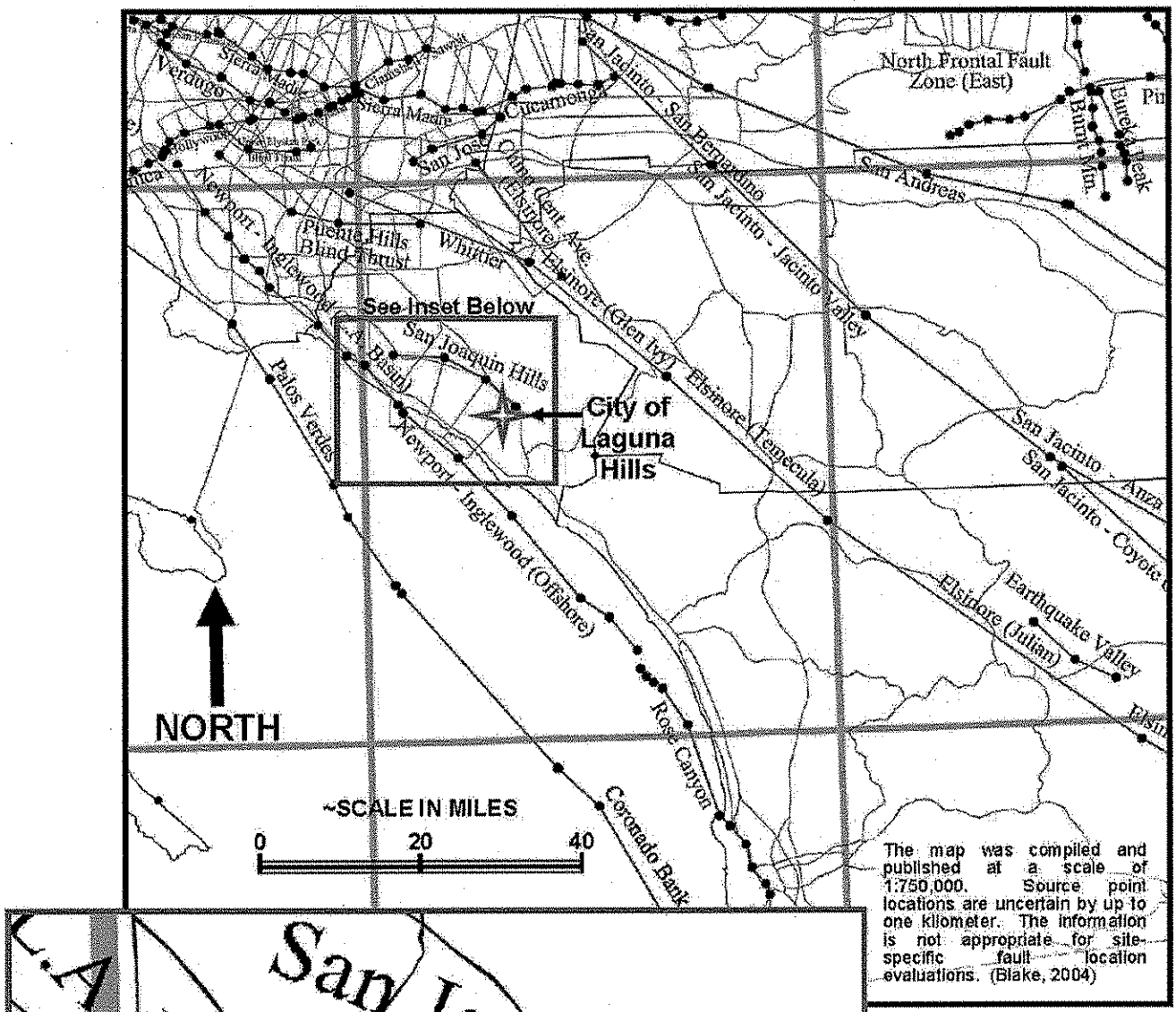
_____, 2008, National Seismic Hazard Maps—2008, http://gldims.cr.usgs.gov/nshmp2008/viewer.htm.

Wald, D.J., Quitoriano, V., and Heaton, T.H., 1999 Relationships between peak ground acceleration, peak ground velocity, and Modified Mercalli Intensity in California. Earthquake Spectra, 15, 557-564

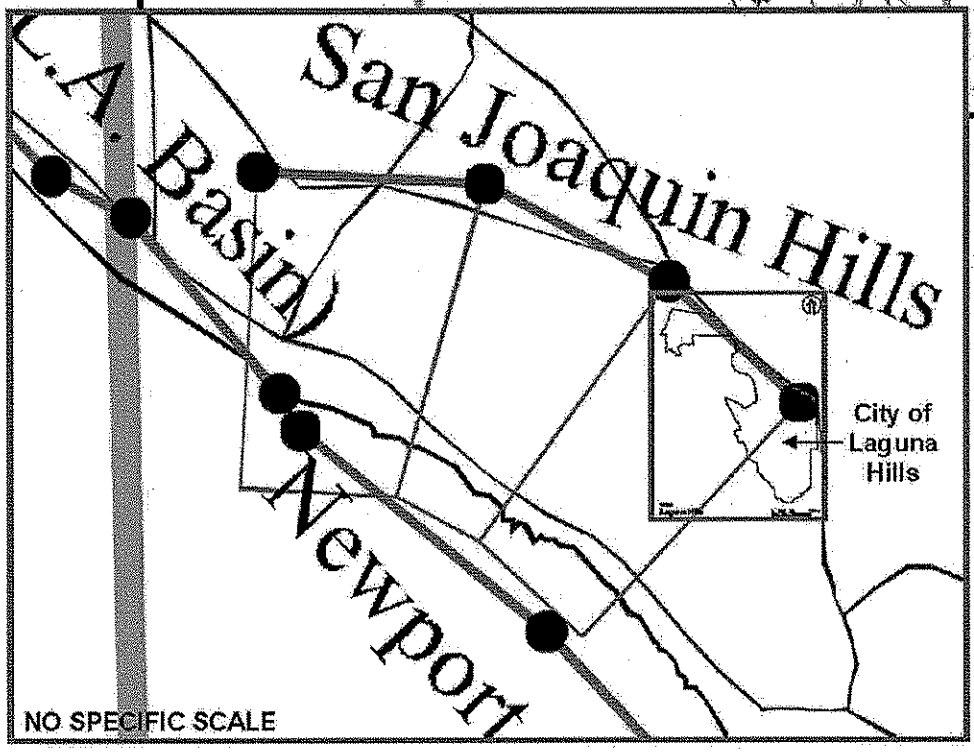
Wills, C. J, Weldon, R. J., and Bryant, W. A., 2008, Appendix A: California Fault Parameters for the National Seismic Hazard Maps and Working Group on California Earthquake Probabilities 2007 USGS Open File Report 2007-1437A CGS Special Report 203A SCEC Contribution #1138A Version 1.0.

APPENDIX

FIGURES G-1 through G-10



The map was compiled and published at a scale of 1:750,000. Source point locations are uncertain by up to one kilometer. The information is not appropriate for site-specific fault location evaluations. (Blake, 2004)

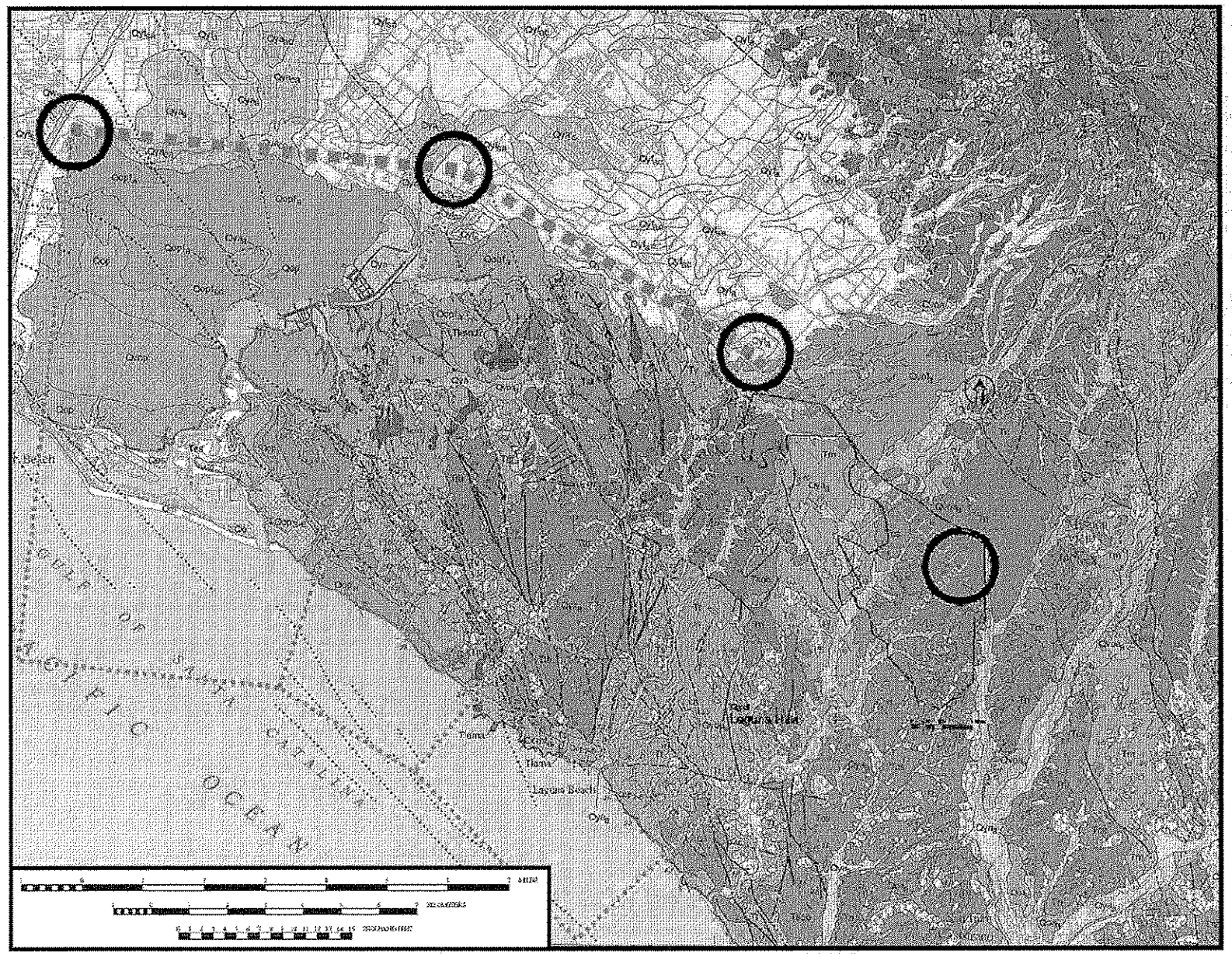


California Geological Survey 2002 Fault Model Modified for Use with FRISKSP and EQFAULT

Thicker red lines are surface faults or the shallow leading edges of buried (blind) thrust faults. Black dots separate fault segments used in the FRISK and EQFAULT models. Thinner red lines form the boundaries of non-vertical faults and fault segments to a depth of

DRAFT

FIGURE G-1 – Regional and Local Area Fault Map



ABBREVIATED MAP EXPLANATION

This map presents the surface geologic conditions in the region around the City of Laguna Hills and shows a possible location of the San Joaquin Hills blind (buried, i.e., the fault does not reach the ground surface) thrust (SJHBT) fault in relation to the surface geology, including surface faults near the City and throughout the San Joaquin Hills.

The SJHBT is a possible earthquake source. Its location is based on one of a few possible models developed by Grant at the University of California at Irvine and adopted by the California Geological Survey for a map issued in 2002 (Blake, 2004). The thicker light red dotted lines show the shallower leading edge of the buried fault. The thinner light red dotted lines show the edges of idealized fault plane segments. The black circles represent the junctions of the leading edge of these segments. Overall accuracy is considered to be no greater than one kilometer.

Future updates of the SJHBT location are likely and should be considered. This map should be used for planning purposes only and not for site-specific analysis or design purposes.

Source: Morton and Miller, 2006, USGS OFR 2006-1217 and CGS, 2002. The SJHBT was overlaid on the geology map for this report and the location is considered approximate.
NOTE: See geology unit and map symbol descriptions at http://pubs.usgs.gov/of/2006/1217/of2006-1217_pamphlet_nophotos.pdf.

FIGURE G-2 – South Orange County Geology Map

EXPLANATION FOR FIGURES G-2 AND G-3

Contact—Solid where accuracy of location ranges from well located to approximately located; dashed where very poorly located or inferred.

Fault—Solid where accurately located, dashed where approximately located, dotted where concealed. Includes strike slip, normal, reverse, oblique, and unspecified slip. Arrow and number indicate direction and amount of dip.

Thrust fault—Teeth on upper plate; solid where accurately located, dashed where approximately located, dotted where concealed. Arrow and number indicate direction and amount of dip.

Rotational slip normal fault—Bars on hanging wall side; solid where accurately located, dashed where approximately located, dotted where concealed.

Topographic lineaments—Aligned saddles, swales, and canyons.

Suture—Location approximate

Ground fissures—San Jacinto Valley area

Anticline—Solid where accurately located; dashed where approximately located; dotted where concealed. Arrowhead on axis shows direction of plunge

Syncline—Solid where accurately located; dashed where approximately located; dotted where concealed. Arrowhead on axis shows direction of plunge

Overturned anticline—Solid where accurately located; dashed where approximately located; dotted where concealed. Arrowhead on axis shows direction of plunge

Overturned syncline—Solid where accurately located; dashed where approximately located; dotted where concealed. Arrowhead on axis shows direction of plunge

Monocline—Well located

Strike and dip of bedding

- Horizontal
- Inclined
- Vertical
- Overturned

Strike and dip of foliation, primary igneous

- Inclined
- Vertical

Strike and dip of foliation, metamorphic

- Inclined
- Vertical

Bearing and plunge of linear features

- Inclined

Qls **Very young landslide deposits (late Holocene)**—Slope-failure deposits consisting of chaotically mixed soil and rubble and (or) displaced bedrock blocks; most are debris slides and rock slumps or earth slumps.

Qya **Young axial-channel deposits (Holocene and late Pleistocene)**—Slightly to moderately consolidated silt, sand, and gravel deposits.

Qoa **Old axial-channel deposits, (late Pleistocene)**—Moderately indurated, slightly dissected gravel, sand, silt, and clay-bearing alluvium.

Qvof **Very old alluvial-fan deposits (middle to early Pleistocene)**—Moderately to well consolidated silt, sand, gravel, and conglomerate.

Qvoa **Very old axial-channel deposits (middle to early Pleistocene)**—Alluvial deposits dominated by sand, but containing scattered gravel and pebble layers, and silt, and clay-bearing alluvium.

Qvop **Very old paralic deposits (middle to early Pleistocene)**—Paralic deposits consisting of interfingered strandline, beach, estuarine and colluvial deposits. Mostly poorly sorted, moderately permeable, reddish-brown silt, sand and cobbles.

Tn **Niguel Formation (Pliocene)**—Marine interbedded sandstone, conglomeratic sandstone, and conglomerate

Tc **Capistrano Formation (early Pliocene and Miocene)**—Marine sandstone and siltstone; widespread in San Joaquin Hills area.

Tcs **Siltstone facies**—White to pale gray, massive to crudely bedded, friable, siltstone and mudstone.

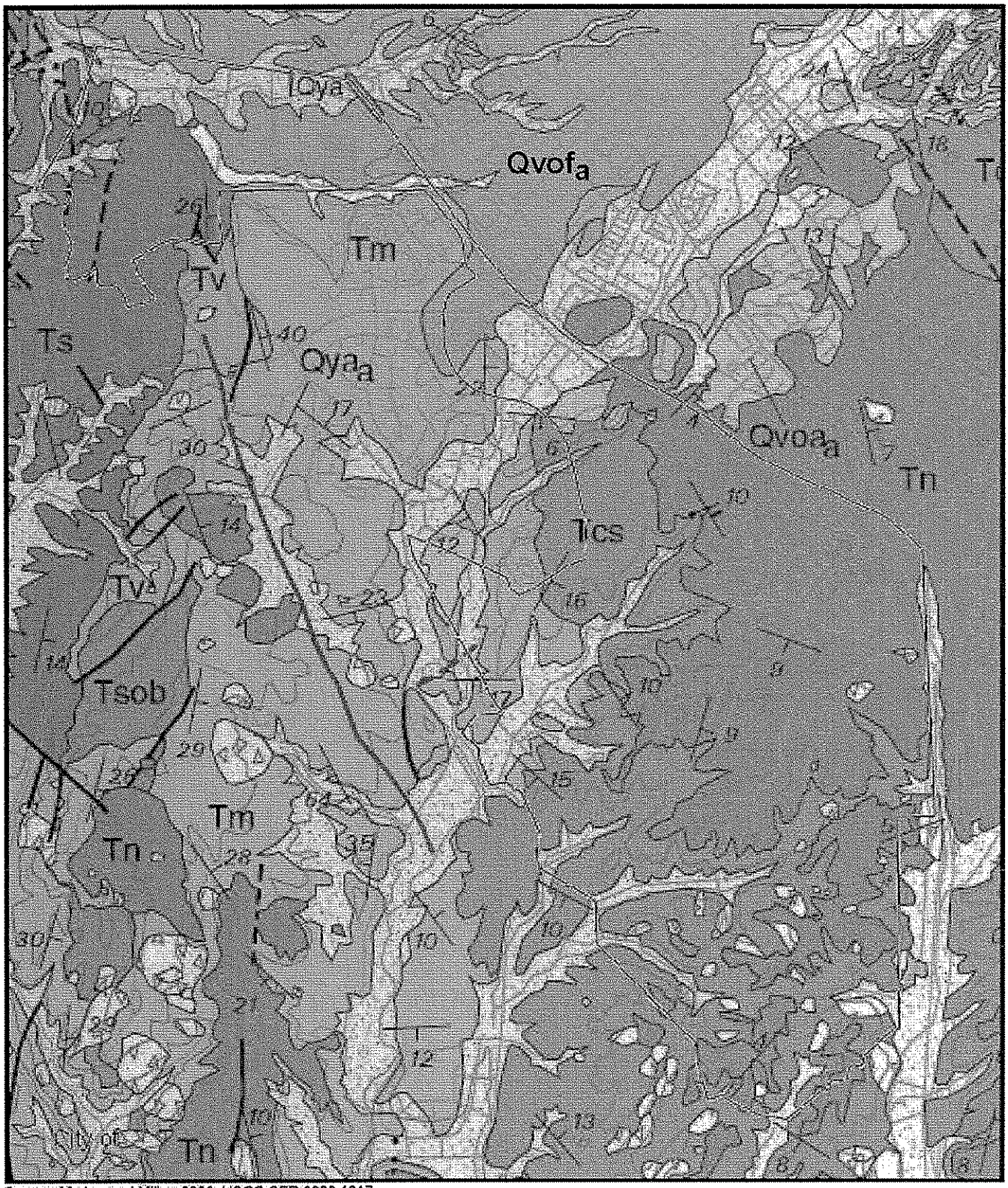
Tm **Monterey Formation (Miocene)**—Siliceous and diatomaceous marine siltstone and sandstone

Tscb **San Onofre Breccia (middle Miocene)**—Chiefly marine sedimentary breccia, conglomerate, and lithic sandstone

Tt **Topanga Group (middle Miocene)**—Marine sandstone, siltstone, and shale.

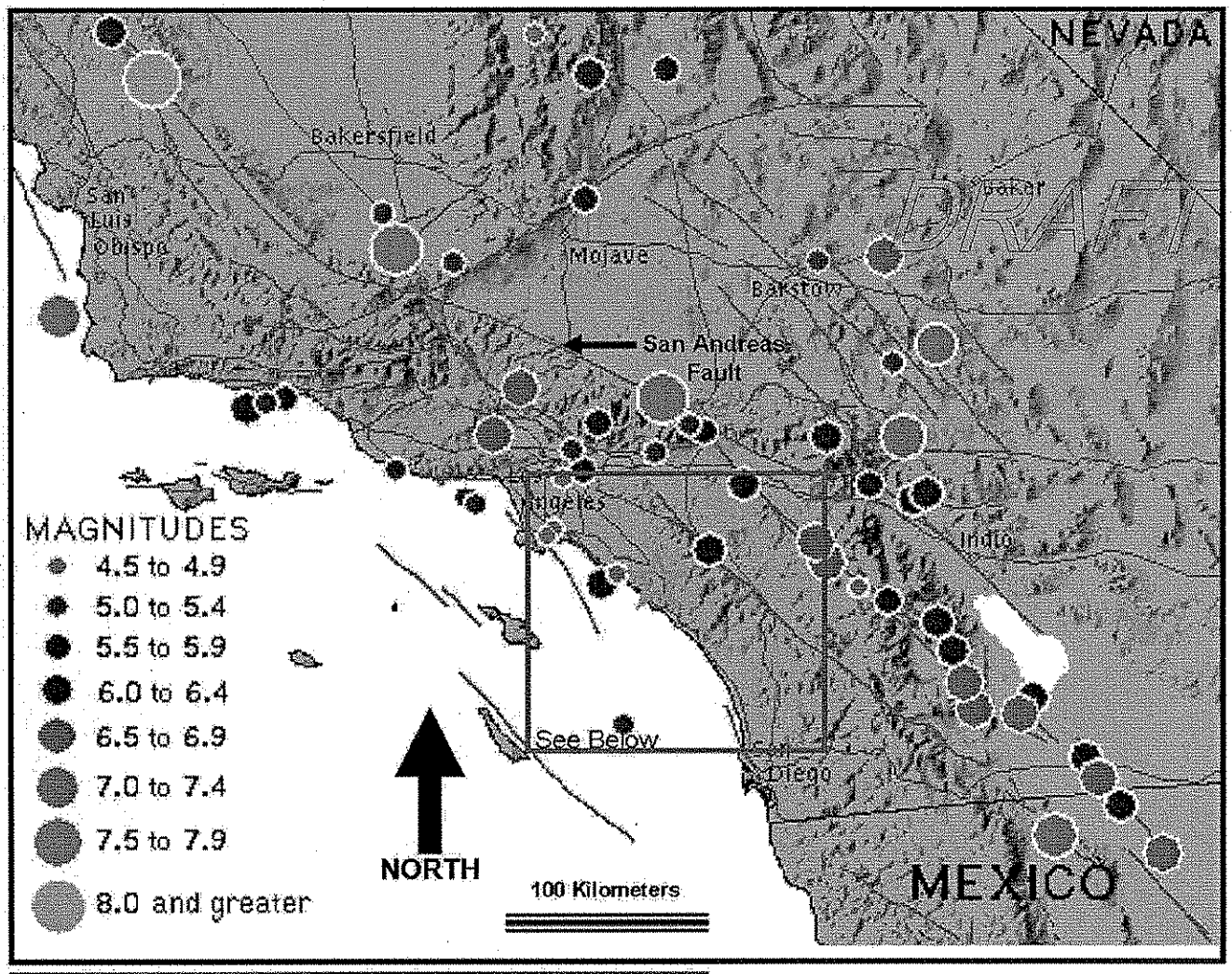
Tv **Vaqueros Formation (early Miocene, Oligocene, and late Eocene)**—Predominantly sandstone.

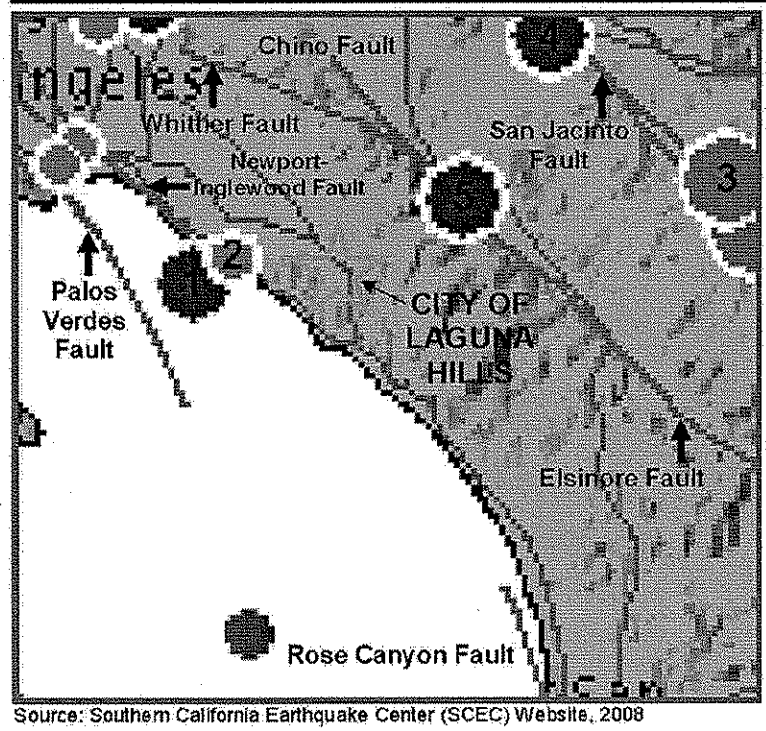
Ts **Sespe Formation (early Miocene, Oligocene, and late Eocene)**—In San Joaquin Hills area, Sespe is varied colored from gray , massive to thick bedded, nonmarine conglomerate , conglomeratic sandstone and clayey and silty sandstone. Bedforms are poorly developed.



Source: Morton and Miller, 2006, USGS OFR 2006-1217.

FIGURE G-3- City Area Geology Map





1. Long Beach EQ 1933 M6.3
2. Huntington Beach 1969 M4.5
3. San Jacinto 1918 ~M6.8
4. Wrightwood 1858 ~M7.0
5. Lake Elsinore 1910 ~M6.0

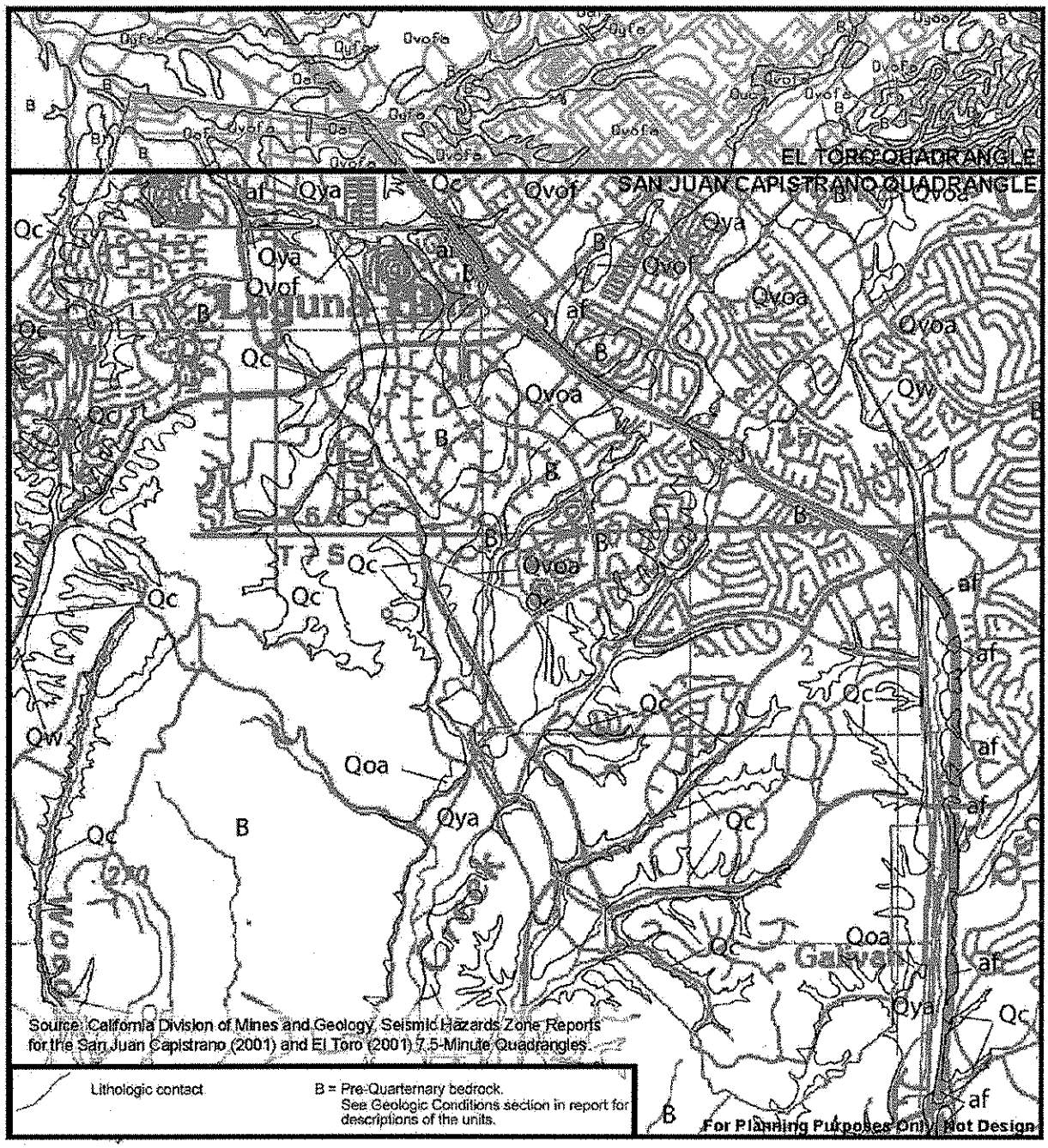
100 Kilometers

Source: Southern California Earthquake Center (SCEC) Website, 2008

DRAFT

FIGURE G-4 – Earthquake Epicenter Map

DRAFT

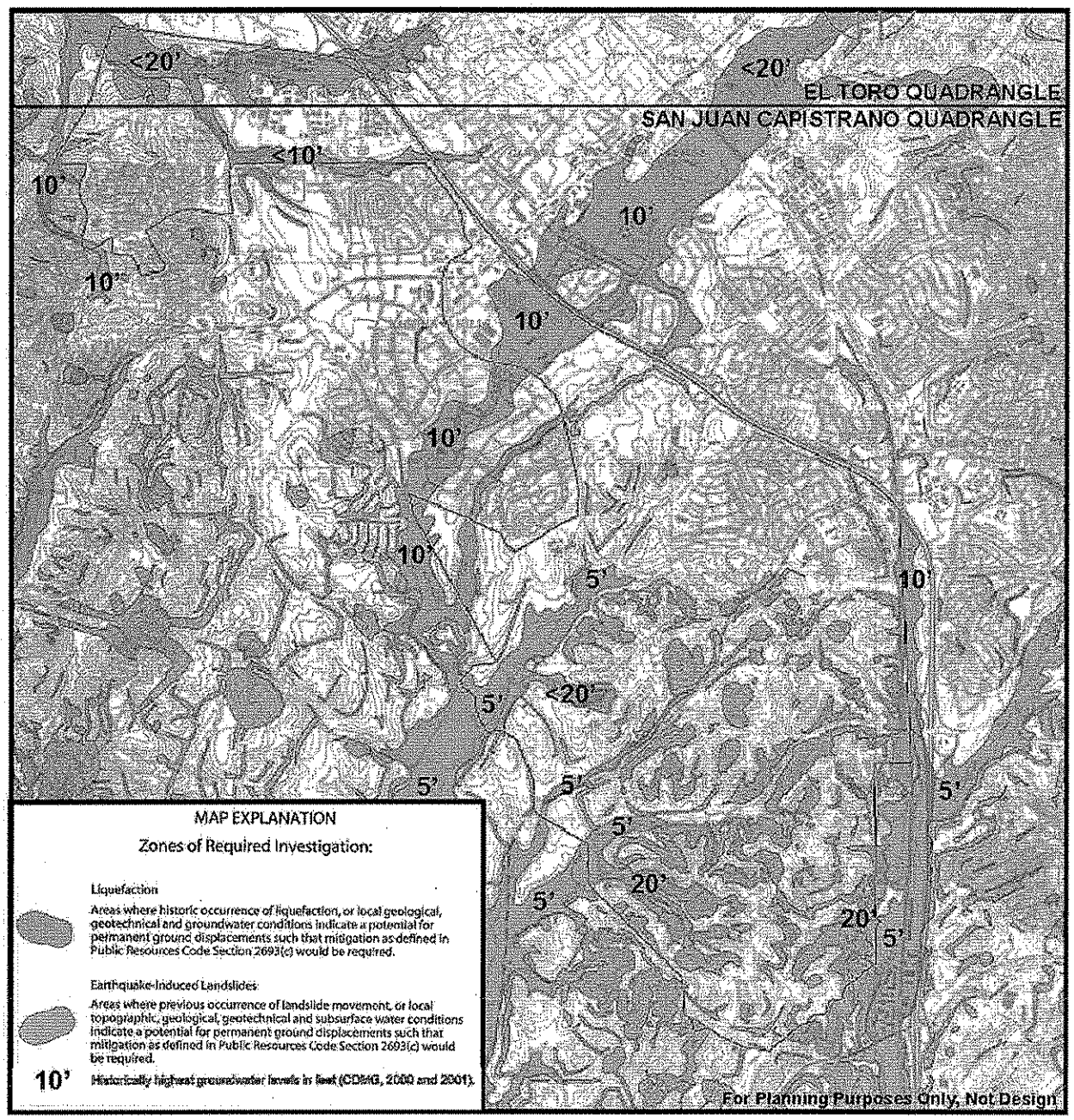


NOTES: (1) See Table 6.6-2 for engineering geologic unit descriptions. (2) There are minor boundary line mismatches in unit contacts between the San Juan Capistrano and El Toro Quadrangles.

~SCALE IN FEET

0 4000 8000

FIGURE G-5 – Quaternary/Engineering Geology Units

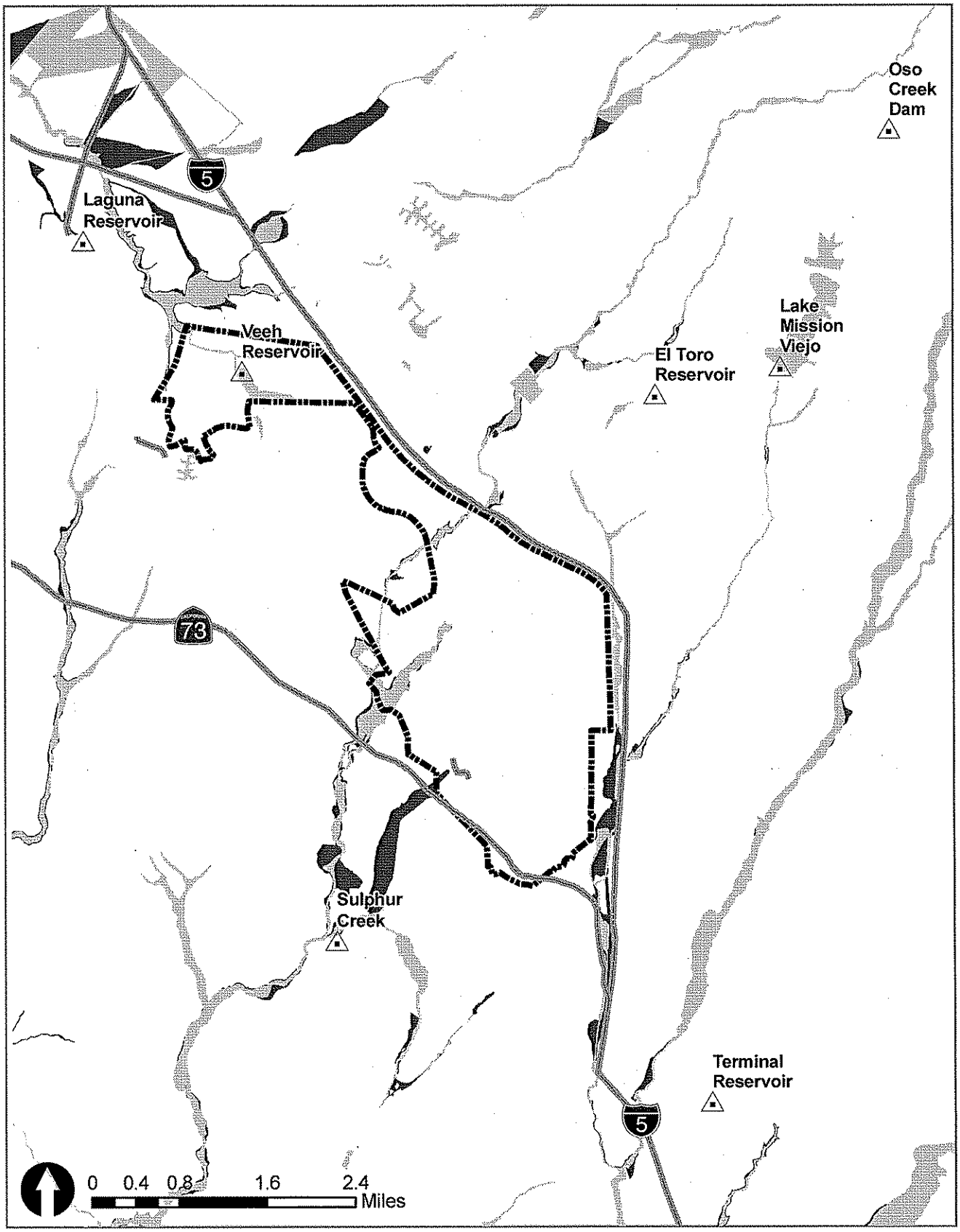


Source: California Division of Mines and Geology, Seismic Hazards Zones Map, San Juan Capistrano and El Toro 7.5-Minute Quadrangles, 2001.

~SCALE IN FEET
0 4000 8000

FIGURE G-6 – Historically Highest Groundwater Levels, and Liquefaction and Earthquake-Induced Landslide Hazard Potential

DRAFT



Legend

City Boundary

Freeways

Dams & Reservoirs

FEMA Flood Zones

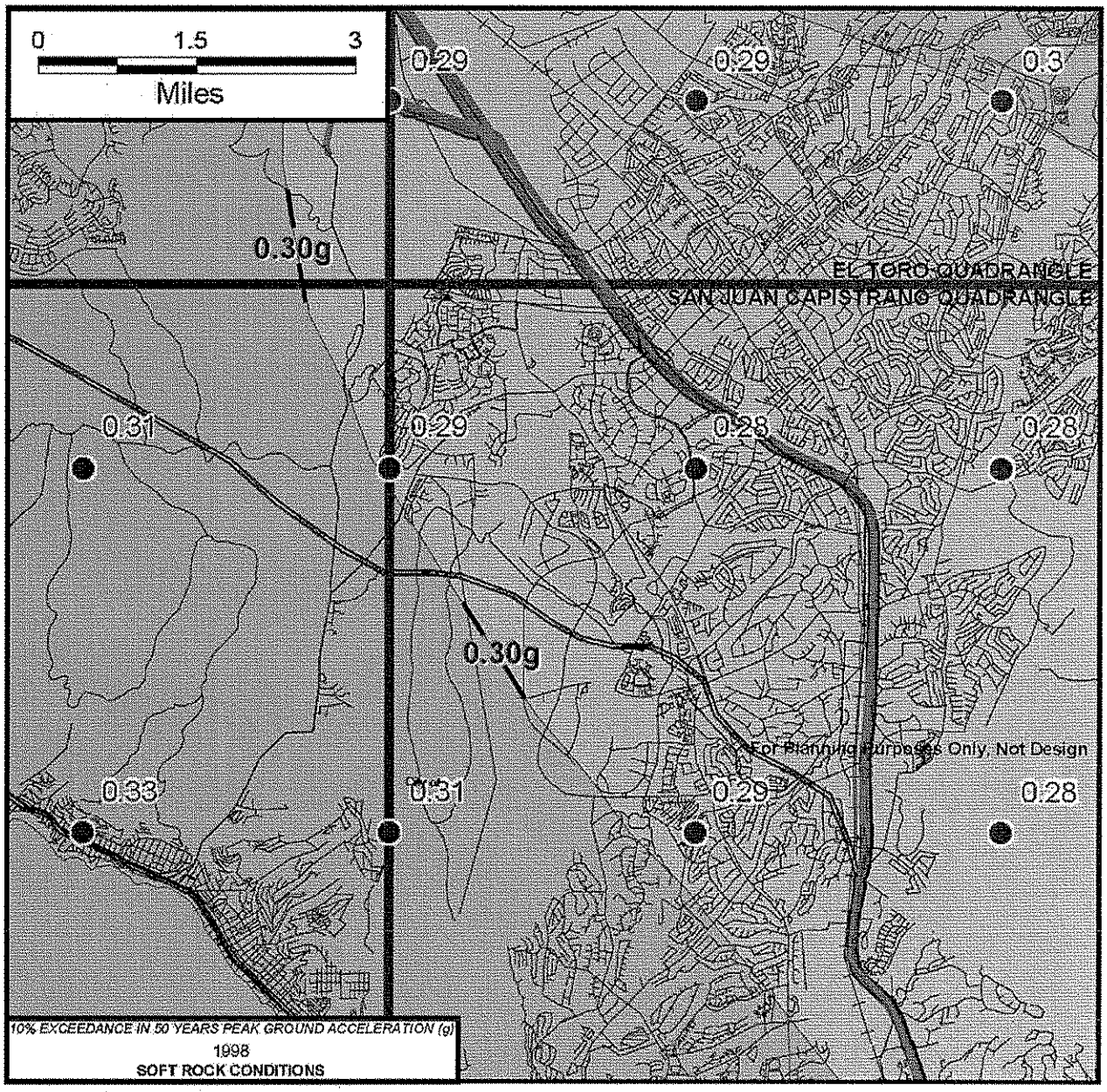
100-year Floodplain

500-year Floodplain

City of Laguna Hills General Plan

Figure G-7
Flood Hazards

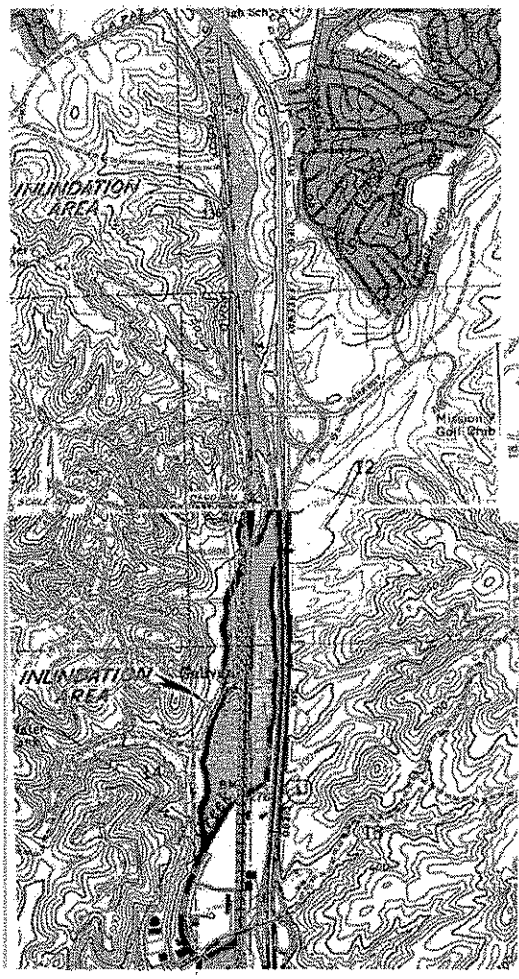
DRAFT



Source: California Division of Mines and Geology, Seismic Hazards Zone Report for the San Juan Capistrano (2001) 7.5-Minute Quadrangle.

FIGURE G-8 – Predicted 10% in 50-Year Peak Horizontal Ground Acceleration (g)

EL TORO RESERVOIR INUNDATION



UPPER OSO RESERVOIR INUNDATION

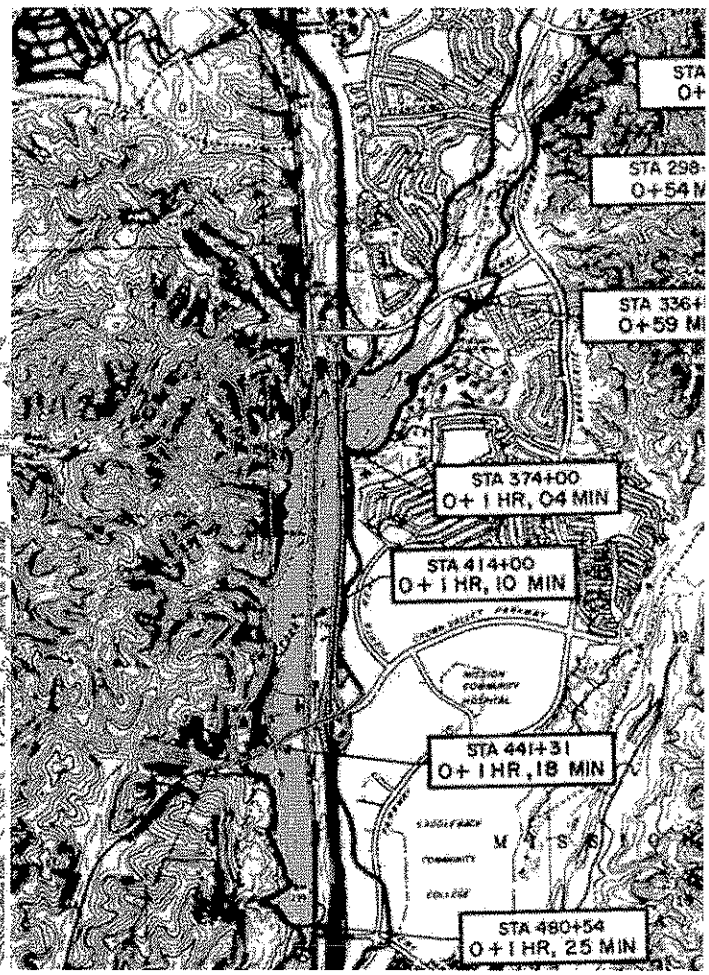


FIGURE G-9 – Potential Dam Inundation from El Toro and Upper Oso Reservoirs

THIS IS STILL A PLACEHOLDER UNTIL A FINAL INUNDATION MAP IS PREPARED.

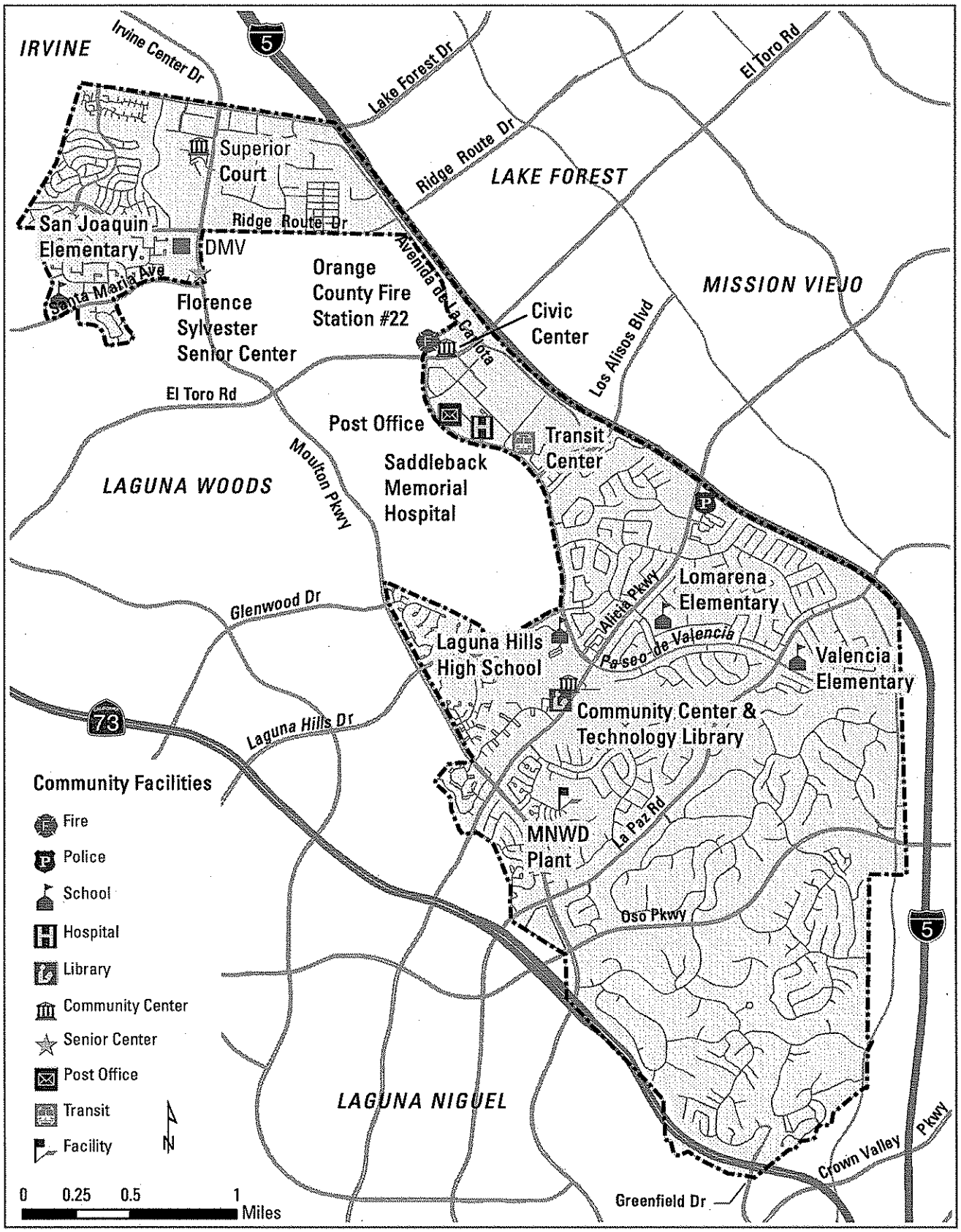


Figure G-10
Community Facilities

APPENDIX D

GENERAL PLAN UPDATE
NOISE MODELING

URBAN CROSSROADS
5411 Avenida Encinas, Suite 100 Carlsbad, CA 92008 760.931.0664 main 760.931.1741 fax www.urbanxroads.com

December 2, 2008

Mr. Bill Maddux
EDAW
1420 Kettner Boulevard, Suite 500
San Diego, CA 92101

Subject: Laguna Hills General Plan Update Traffic Noise Modeling

Dear Mr. Maddux:

The purpose of this Technical Appendix is to provide background and supporting information for the City of Laguna Hills General Plan Noise Element. The noise element identifies noise sensitive land uses and noise sources, and defines areas of noise impact for the purpose of developing programs to insure that the residents of within the community will be protected from excessive noise intrusion. The State of California has mandated that each county and city prepare a Noise Element as part of its General Plan. Section 65302 (f) of the California Government Code requires that the noise element recognize the guidelines established by the Office of Noise Control in the State Department of Health Services and shall analyzed and quantify, current and projected noise levels for all noise sources. According to California Government Code, noise contours shall be used as a guide for establishing a pattern of land uses in the land use element that minimizes the exposure of community residents to excessive noise.

TRAFFIC NOISE IMPACT ASSESSMENT

The following section outlines the methods and procedures used to model and analyze the future noise environment and to develop noise contour boundaries for existing and 2030 conditions.

FHWA Traffic Noise Prediction Model

The projected roadway noise impacts from vehicular traffic were projected using a computer program that replicates the Federal Highway Administration (FHWA) Traffic Noise Prediction Model- FHWA-RD-77-108

(the "FHWA Model"). The FHWA Model arrives at a predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level (REMEL). Adjustments are then made to the reference energy mean emission level to account for; the roadway classification (e.g., collector, secondary, major and arterial), the roadway active width (i.e., the distance between the center of the outermost travel lanes on each side of the roadway), the total average daily traffic (ADT), the travel speed, the percentages of automobiles, medium trucks and heavy trucks in the traffic volume, the roadway grade, the angle of view (e.g., whether the roadway view is blocked), the site conditions ("hard" or "soft" relates to the absorption of the ground, pavement or landscaping) and the percentage of total average daily traffic (ADT) which flows each hour throughout a 24-hour period.

To account for the ground-effect attenuation, soft site conditions were used to calculate all noise contours. Soft site conditions account for the sound propagation loss over natural surfaces such as normal earth and ground vegetation. A drop-off rate of 4.5 dBA per doubling of distance is typically observed over soft ground, as compared with a 3.0 dBA drop-off rate over hard ground such as concrete, stone and very hard packed earth. In addition, soft site conditions account for the effect of existing topography, noise barriers or buildings that may alter the roadway noise levels. Soft site conditions are appropriate for the development of noise contours boundaries.

Traffic Noise Prediction Model Inputs

The average daily traffic volumes used for this study are presented in Table 1. The traffic volumes shown in Table 1 were obtained fro the Traffic Analysis for the City of Villa Park Mobility Element Update prepared by Austin-Foust Associates, Inc. dated October 2008. Table 2 presents the hourly traffic flow distribution percentages of automobile, medium trucks and heavy trucks for input into the FHWA Model, which is a typical vehicle mix observed in Laguna Hills California. The traffic noise prediction model outputs are provided in Appendix “A” to this letter.

Traffic Noise Contours

Noise contours represent the distance to noise levels of a constant value and are measured from the center of the roadway. Tables 3 and 4 present the CNEL noise contour boundaries for the 55, 60, 65 and 70 dBA noise levels for existing and 2030 conditions, respectively. Each table presents a summary of the

predicted noise contours and the estimated CNEL exterior noise level at a distance of 100 feet throughout the City of Laguna Hills.

The values given in Tables 3 and 4 are based upon flat site conditions and do not take into account the effects of any noise barriers, topography or final roadway grades that may affect ambient noise levels. These are appropriate assumptions for this level of noise analysis. Final noise studies should be prepared at the time future noise sensitive development occurs. These studies should take into account the effect of noise barriers and actual topography.

Traffic Noise Contours Comparison

The 2030 contours were compared by the dBA CNEL at 100 feet values against their existing levels presented in Table 5. The dBA CNEL at 100 feet comparison summary indicates that the existing noise levels range from 60 to 82 dBA CNEL 100 feet from the street centerline and for the 2030 conditions, noise levels will also range from 60 to 82 dBA CNEL 100 feet from the street centerline. For 2030 conditions, noise levels are projected to increase from existing conditions by 5.4 dBA CNEL along Lake Forest Drive East of Santa Vittoria to the City limit once Lake Forest Drive is extended. All other roadway segments will experience a noise increase by less than 3.0 dBA. In community noise assessment, changes in noise levels less than 3 dBA are less than significant.

If you have any questions, please contact me directly at (760) 931-0664 ext. 210.

Respectfully submitted,

URBAN CROSSROADS, INC.

Jeremy Louden
Associate Principal

Attachments: Tables 1-5
Traffic Noise Contour Model Outputs

TABLE 1 (Page 1 of 2)

AVERAGE DAILY TRAFFIC (1000's)[1]

ROADWAY	SEGMENT	EXISTING	2030
Lake Forest	East of Santa Vittoria	4.0	14.0
Lake Forest	West of Irvine Center	8.0	13.0
Lake Forest	East of Irvine Center	20.0	22.0
Lake Forest	West of Interstate 5	29.0	30.0
Ridge Route	East of Santa Vittoria	4.0	4.0
Ridge Route	West of Irvine Center	6.0	6.0
Ridge Route	East of Irvine Center	8.0	8.0
Ridge Route	West of Interstate 5	8.0	8.0
Santa Maria	East of Santa Vittoria	7.0	8.0
El Toro	West of Avd Carlota	30.0	34.0
El Toro	West of Interstate 5	59.0	74.0
Paseo De Valencia	West of Interstate 5	14.0	16.0
Paseo De Valencia	South of El Toro	23.0	31.0
Paseo De Valencia	El Toro to Los Alisos	18.0	23.0
Paseo De Valencia	South of Los Alisos	33.0	44.0
Paseo De Valencia	North of Laguna Hills	34.0	46.0
Paseo De Valencia	South of Laguna Hills	27.0	33.0
Paseo De Valencia	Alicia to La Paz	11.0	12.0
Paseo De Valencia	La Paz to Cabot	6.0	7.0
Los Alisos	East of Paseo De Valencia	23.0	27.0
Los Alisos	West of Interstate 5	25.0	32.0
Laguna Hills	Moulton to Paseo De Valencia	23.0	25.0
Alicia	West of Moulton	39.0	47.0
Alicia	East of Moulton	40.0	51.0
Alicia	West of Paseo De Valencia	45.0	57.0
Alicia	East of Paseo De Valencia	43.0	50.0
Alicia	West of Interstate 5	51.0	62.0
La Paz	West of Moulton	18.0	19.0
La Paz	East of Moulton	15.0	15.0
La Paz	East of Alameda	16.0	16.0
La Paz	West of Paseo De Valencia	18.0	19.0
La Paz	East of Paseo De Valencia	19.0	19.0
La Paz	West of Interstate 5	41.0	43.0
Oso	West of Moulton	24.0	28.0
Oso	East of Moulton	32.0	38.0
Oso	West of Bridlewood	30.0	34.0
Oso	East of Bridlewood	30.0	34.0
Oso	West of Interstate 5	42.0	48.0
Greenfield	North of SR-73	2.0	2.0
Irvine Center/Moulton	Lake Forest to Ridge Route	27.0	47.0

AVERAGE DAILY TRAFFIC (1000's)[1]

ROADWAY	SEGMENT	EXISTING	2030
Irvine Center/Moulton	South of Ridge Route	31.0	51.0
Irvine Center/Moulton	Glenwood to Laguna Hills	23.0	34.0
Irvine Center/Moulton	Laguna Hills to Alicia	23.0	28.0
Irvine Center/Moulton	Alicia to La Paz	21.0	30.0
Irvine Center/Moulton	La Paz to Oso	17.0	25.0
Avd Carlota	Lake Forest to Ridge Route	9.0	12.0
Avd Carlota	South of Ridge Route	16.0	19.0
Avd Carlota	Paseo De Valencia to El Toro	29.0	38.0
Avd Carlota	El Toro to Los Alisos	13.0	15.0
Cabot	South of La Paz	10.0	12.0
Cabot	South of Paseo De Valencia	15.0	19.0
Cabot	North of Oso	19.0	24.0
Cabot	South of Oso	14.0	17.0
Interstate 5	El Toro to Alicia	318.0	343.0
Interstate 5	Alicia to La Paz	286.0	301.0
Interstate 5	La Paz to Oso	275.0	300.0
Interstate 5	Oso to Crown Valley	253.0	278.0
State Route 73	Interstate 5 to El Toro	66.0	79.8

[1] Source: Traffic Analysis for The City of Laguna Hills Mobility Element Update

TABLE 2

HOURLY TRAFFIC FLOW DISTRIBUTION

MOTOR-VEHICLE TYPE	DAYTIME (7 AM TO 7 PM)	EVENING (7 PM TO 10 PM)	NIGHT (10 PM TO 7 AM)	TOTAL % TRAFFIC FLOW
Automobiles	77.5%	12.9%	9.6%	97.00%
Medium Trucks	84.8%	4.9%	10.3%	2.00%
Heavy Trucks	86.5%	2.7%	10.8%	1.00%

TABLE 3 (Page 1 of 2)

EXISTING CONDITIONS NOISE CONTOURS

ROAD	SEGMENT	CNEL AT 100 FEET (dBA)	DISTANCE TO CONTOUR (FEET)			
			70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	55 dBA CNEL
Lake Forest	East of Santa Vittoria	65.4	21	66	207	656
Lake Forest	West of Irvine Center	68.4	41	131	415	1,312
Lake Forest	East of Irvine Center	72.4	104	328	1,037	3,279
Lake Forest	West of Interstate 5	74.0	150	476	1,504	4,755
Ridge Route	East of Santa Vittoria	63.4	13	42	132	419
Ridge Route	West of Irvine Center	67.4	33	104	329	1,042
Ridge Route	East of Irvine Center	68.6	44	139	439	1,389
Ridge Route	West of Interstate 5	68.6	44	139	439	1,389
Santa Maria	East of Santa Vittoria	65.9	23	73	232	733
El Toro	West of Avd Carlota	74.1	156	492	1,556	4,919
El Toro	West of Interstate 5	77.1	306	967	3,059	9,674
Paseo De Valencia	West of Interstate 5	70.8	73	230	726	2,296
Paseo De Valencia	South of El Toro	73.0	119	377	1,193	3,771
Paseo De Valencia	El Toro to Los Alisos	71.9	93	295	933	2,951
Paseo De Valencia	South of Los Alisos	74.6	171	541	1,711	5,411
Paseo De Valencia	North of Laguna Hills	74.7	176	557	1,763	5,575
Paseo De Valencia	South of Laguna Hills	73.7	140	443	1,400	4,427
Paseo De Valencia	Alicia to La Paz	69.8	57	180	570	1,804
Paseo De Valencia	La Paz to Cabot	65.2	20	63	199	628
Los Alisos	East of Paseo De Valencia	73.0	119	377	1,193	3,771
Los Alisos	West of Interstate 5	73.3	130	410	1,296	4,099
Laguna Hills	Moulton to Paseo De Valencia	73.2	126	399	1,263	3,994
Alicia	West of Moulton	75.3	202	639	2,022	6,395
Alicia	East of Moulton	75.4	207	656	2,074	6,559
Alicia	West of Paseo De Valencia	75.9	233	738	2,333	7,378
Alicia	East of Paseo De Valencia	75.7	223	705	2,230	7,051
Alicia	West of Interstate 5	76.4	264	836	2,644	8,362
La Paz	West of Moulton	71.9	93	295	933	2,951
La Paz	East of Moulton	71.4	82	260	824	2,605
La Paz	East of Alameda	71.7	88	278	879	2,778
La Paz	West of Paseo De Valencia	72.2	99	313	988	3,126
La Paz	East of Paseo De Valencia	72.4	104	330	1,043	3,299
La Paz	West of Interstate 5	75.7	225	712	2,251	7,119
Oso	West of Moulton	73.2	124	394	1,244	3,935
Oso	East of Moulton	74.4	166	525	1,659	5,247
Oso	West of Bridlewood	74.1	156	492	1,556	4,919
Oso	East of Bridlewood	74.1	156	492	1,556	4,919
Oso	West of Interstate 5	75.6	218	689	2,178	6,887
Greenfield	North of SR-73	60.4	7	21	66	209

EXISTING CONDITIONS NOISE CONTOURS

ROAD	SEGMENT	CNEL AT 100 FEET (dBA)	DISTANCE TO CONTOUR (FEET)			
			70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	55 dBA CNEL
Lake Forest	East of Santa Vittoria	65.4	21	66	207	656
Irvine Center/Moulton	Lake Forest to Ridge Route	73.7	140	443	1,400	4,427
Irvine Center/Moulton	South of Ridge Route	74.3	161	508	1,607	5,083
Irvine Center/Moulton	Glenwood to Laguna Hills	73.0	119	377	1,193	3,771
Irvine Center/Moulton	Laguna Hills to Alicia	73.0	119	377	1,193	3,771
Irvine Center/Moulton	Alicia to La Paz	72.6	109	344	1,089	3,443
Irvine Center/Moulton	La Paz to Oso	71.7	88	279	881	2,787
Avd Carlota	Lake Forest to Ridge Route	67.0	30	94	298	942
Avd Carlota	South of Ridge Route	69.5	53	167	529	1,674
Avd Carlota	Paseo De Valencia to El Toro	72.0	96	303	960	3,035
Avd Carlota	El Toro to Los Alisos	68.6	43	136	430	1,360
Cabot	South of La Paz	67.4	33	105	331	1,046
Cabot	South of Paseo De Valencia	69.2	50	157	496	1,570
Cabot	North of Oso	70.2	63	199	629	1,988
Cabot	South of Oso	71.1	77	243	769	2,431
Interstate 5	El Toro to Alicia	81.7	3,084	9,753	30,843	97,533
Interstate 5	Alicia to La Paz	81.2	2,774	8,772	27,739	87,719
Interstate 5	La Paz to Oso	81.0	2,667	8,434	26,672	84,345
Interstate 5	Oso to Crown Valley	80.7	2,454	7,760	24,538	77,597
State Route 73	Interstate 5 to El Toro	73.3	449	1,421	4,495	14,214

TABLE 4 (Page 1 of 2)

2030 CONDITIONS NOISE CONTOURS

ROAD	SEGMENT	CNEL AT 100 FEET (dBA)	DISTANCE TO CONTOUR (FEET)			
			70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	55 dBA CNEL
Lake Forest	East of Santa Vittoria	70.8	73	230	726	2,296
Lake Forest	West of Irvine Center	70.5	67	213	674	2,132
Lake Forest	East of Irvine Center	72.8	114	361	1,141	3,607
Lake Forest	West of Interstate 5	74.1	156	492	1,556	4,919
Ridge Route	East of Santa Vittoria	63.4	13	42	132	419
Ridge Route	West of Irvine Center	67.4	33	104	329	1,042
Ridge Route	East of Irvine Center	68.6	44	139	439	1,389
Ridge Route	West of Interstate 5	68.6	44	139	439	1,389
Santa Maria	East of Santa Vittoria	66.4	26	84	265	837
El Toro	West of Avd Carlota	74.7	176	557	1,763	5,575
El Toro	West of Interstate 5	78.1	384	1,213	3,837	12,133
Paseo De Valencia	West of Interstate 5	71.4	83	262	830	2,623
Paseo De Valencia	South of El Toro	74.3	161	508	1,607	5,083
Paseo De Valencia	El Toro to Los Alisos	73.0	119	377	1,193	3,771
Paseo De Valencia	South of Los Alisos	75.8	228	721	2,281	7,214
Paseo De Valencia	North of Laguna Hills	76.0	239	754	2,385	7,542
Paseo De Valencia	South of Laguna Hills	74.6	171	541	1,711	5,411
Paseo De Valencia	Alicia to La Paz	70.2	62	197	622	1,968
Paseo De Valencia	La Paz to Cabot	65.9	23	73	232	733
Los Alisos	East of Paseo De Valencia	73.7	140	443	1,400	4,427
Los Alisos	West of Interstate 5	74.4	166	525	1,659	5,247
Laguna Hills	Moulton to Paseo De Valencia	73.6	137	434	1,373	4,341
Alicia	West of Moulton	76.1	244	771	2,437	7,706
Alicia	East of Moulton	76.4	264	836	2,644	8,362
Alicia	West of Paseo De Valencia	76.9	296	935	2,955	9,346
Alicia	East of Paseo De Valencia	76.4	259	820	2,593	8,198
Alicia	West of Interstate 5	77.3	321	1,017	3,215	10,166
La Paz	West of Moulton	72.2	99	312	985	3,115
La Paz	East of Moulton	71.4	82	260	824	2,605
La Paz	East of Alameda	71.7	88	278	879	2,778
La Paz	West of Paseo De Valencia	72.4	104	330	1,043	3,299
La Paz	East of Paseo De Valencia	72.4	104	330	1,043	3,299
La Paz	West of Interstate 5	75.9	236	747	2,361	7,467
Oso	West of Moulton	73.8	145	459	1,452	4,591
Oso	East of Moulton	75.2	197	623	1,970	6,231
Oso	West of Bridlewood	74.7	176	557	1,763	5,575
Oso	East of Bridlewood	74.7	176	557	1,763	5,575
Oso	West of Interstate 5	76.2	249	787	2,489	7,870
Greenfield	North of SR-73	60.4	7	21	66	209

TABLE 4 (Page 2 of 2)

2030 CONDITIONS NOISE CONTOURS

ROAD	SEGMENT	CNEL AT 100 FEET (dBA)	DISTANCE TO CONTOUR (FEET)			
			70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	55 dBA CNEL
Lake Forest	East of Santa Vittoria	70.8	73	230	726	2,296
Irvine Center/Moulton	Lake Forest to Ridge Route	76.1	244	771	2,437	7,706
Irvine Center/Moulton	South of Ridge Route	76.4	264	836	2,644	8,362
Irvine Center/Moulton	Glenwood to Laguna Hills	74.7	176	557	1,763	5,575
Irvine Center/Moulton	Laguna Hills to Alicia	73.8	145	459	1,452	4,591
Irvine Center/Moulton	Alicia to La Paz	74.1	156	492	1,556	4,919
Irvine Center/Moulton	La Paz to Oso	73.3	130	410	1,296	4,099
Avd Carlota	Lake Forest to Ridge Route	68.2	40	126	397	1,256
Avd Carlota	South of Ridge Route	70.2	63	199	629	1,988
Avd Carlota	Paseo De Valencia to El Toro	73.2	126	398	1,258	3,977
Avd Carlota	El Toro to Los Alisos	69.2	50	157	496	1,570
Cabot	South of La Paz	68.2	40	126	397	1,256
Cabot	South of Paseo De Valencia	70.2	63	199	629	1,988
Cabot	North of Oso	71.2	79	251	794	2,512
Cabot	South of Oso	71.9	93	295	933	2,952
Interstate 5	El Toro to Alicia	82.0	3,327	10,520	33,268	105,201
Interstate 5	Alicia to La Paz	81.4	2,919	9,232	29,194	92,319
Interstate 5	La Paz to Oso	81.4	2,910	9,201	29,097	92,013
Interstate 5	Oso to Crown Valley	81.1	2,696	8,527	26,963	85,265
State Route 73	Interstate 5 to El Toro	74.1	543	1,719	5,435	17,186

TRAFFIC NOISE INCREASES OVER EXISTING CONDITIONS

ROAD	SEGMENT	CNEL AT 100 FEET (dBA)		INCREASE	POTENTIAL SIGNIFICANT IMPACT?[1]
		EXISTING	2030		
Lake Forest	East of Santa Vittoria	65.4	70.8	**5.4**	**YES**
Lake Forest	West of Irvine Center	68.4	70.5	2.1	NO
Lake Forest	East of Irvine Center	72.4	72.8	0.4	NO
Lake Forest	West of Interstate 5	74.0	74.1	0.1	NO
Ridge Route	East of Santa Vittoria	63.4	63.4	0.0	NO
Ridge Route	West of Irvine Center	67.4	67.4	0.0	NO
Ridge Route	East of Irvine Center	68.6	68.6	0.0	NO
Ridge Route	West of Interstate 5	68.6	68.6	0.0	NO
Santa Maria	East of Santa Vittoria	65.9	66.4	0.5	NO
El Toro	West of Avd Carlota	74.1	74.7	0.6	NO
El Toro	West of Interstate 5	77.1	78.1	1.0	NO
Paseo De Valencia	West of Interstate 5	70.8	71.4	0.6	NO
Paseo De Valencia	South of El Toro	73.0	74.3	1.3	NO
Paseo De Valencia	El Toro to Los Alisos	71.9	73.0	1.1	NO
Paseo De Valencia	South of Los Alisos	74.6	75.8	1.2	NO
Paseo De Valencia	North of Laguna Hills	74.7	76.0	1.3	NO
Paseo De Valencia	South of Laguna Hills	73.7	74.6	0.9	NO
Paseo De Valencia	Alicia to La Paz	69.8	70.2	0.4	NO
Paseo De Valencia	La Paz to Cabot	65.2	65.9	0.7	NO
Los Alisos	East of Paseo De Valencia	73.0	73.7	0.7	NO
Los Alisos	West of Interstate 5	73.3	74.4	1.1	NO
Laguna Hills	Moulton to Paseo De Valencia	73.2	73.6	0.4	NO
Alicia	West of Moulton	75.3	76.1	0.8	NO
Alicia	East of Moulton	75.4	76.4	1.0	NO
Alicia	West of Paseo De Valencia	75.9	76.9	1.0	NO
Alicia	East of Paseo De Valencia	75.7	76.4	0.7	NO
Alicia	West of Interstate 5	76.4	77.3	0.9	NO
La Paz	West of Moulton	71.9	72.2	0.3	NO
La Paz	East of Moulton	71.4	71.4	0.0	NO
La Paz	East of Alameda	71.7	71.7	0.0	NO
La Paz	West of Paseo De Valencia	72.2	72.4	0.2	NO
La Paz	East of Paseo De Valencia	72.4	72.4	0.0	NO
La Paz	West of Interstate 5	75.7	75.9	0.2	NO
Oso	West of Moulton	73.2	73.8	0.6	NO
Oso	East of Moulton	74.4	75.2	0.8	NO
Oso	West of Bridlewood	74.1	74.7	0.6	NO
Oso	East of Bridlewood	74.1	74.7	0.6	NO
Oso	West of Interstate 5	75.6	76.2	0.6	NO

TABLE 5 (Page 2 of 2)

Greenfield	North of SR-73	60.4	60.4	0.0	NO
Irvine Center/Moulton	Lake Forest to Ridge Route	73.7	76.1	2.4	NO
Irvine Center/Moulton	South of Ridge Route	74.3	76.4	2.1	NO
Irvine Center/Moulton	Glenwood to Laguna Hills	73.0	74.7	1.7	NO
Irvine Center/Moulton	Laguna Hills to Alicia	73.0	73.8	0.8	NO
Irvine Center/Moulton	Alicia to La Paz	72.6	74.1	1.5	NO
Irvine Center/Moulton	La Paz to Oso	71.7	73.3	1.6	NO
Avd Carlota	Lake Forest to Ridge Route	67.0	68.2	1.2	NO
Avd Carlota	South of Ridge Route	69.5	70.2	0.7	NO
Avd Carlota	Paseo De Valencia to El Toro	72.0	73.2	1.2	NO
Avd Carlota	El Toro to Los Alisos	68.6	69.2	0.6	NO
Cabot	South of La Paz	67.4	68.2	0.8	NO
Cabot	South of Paseo De Valencia	69.2	70.2	1.0	NO
Cabot	North of Oso	70.2	71.2	1.0	NO
Cabot	South of Oso	71.1	71.9	0.8	NO
Interstate 5	El Toro to Alicia	81.7	82.0	0.3	NO
Interstate 5	Alicia to La Paz	81.2	81.4	0.2	NO
Interstate 5	La Paz to Oso	81.0	81.4	0.4	NO
Interstate 5	Oso to Crown Valley	80.7	81.1	0.4	NO
State Route 73	Interstate 5 to El Toro	73.3	74.1	0.8	NO

APPENDIX A

TRAFFIC NOISE PREDICTION MODELS
EXISTING AND 2030

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Lake Forest
Road Segment: East of Santa Vittoria

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	400 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	-6.41	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-23.26	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-26.27	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	64.0	62.1	60.3	54.2	62.9	63.5
Medium Trucks:	57.9	56.4	50.0	48.5	57.0	57.2
Heavy Trucks:	59.3	57.9	48.8	50.1	58.4	58.5
Vehicle Noise:	66.0	64.2	61.0	56.4	64.9	65.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	19	59	187	592
CNEL:	21	66	207	656

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Lake Forest
Road Segment: West of Irvine Center

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	800 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	-3.40	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-20.25	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-23.26	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.0	65.1	63.3	57.2	65.9	66.5
Medium Trucks:	60.9	59.4	53.0	51.5	60.0	60.2
Heavy Trucks:	62.3	60.9	51.8	53.1	61.4	61.6
Vehicle Noise:	69.0	67.2	64.0	59.4	68.0	68.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	37	118	374	1,184
CNEL:	41	131	415	1,312

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Lake Forest
Road Segment: East of Irvine Center

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,000 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	0.58	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-16.27	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-19.28	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.9	69.0	67.3	61.2	69.8	70.4
Medium Trucks:	64.9	63.4	57.0	55.5	63.9	64.2
Heavy Trucks:	66.3	64.8	55.8	57.1	65.4	65.5
Vehicle Noise:	73.0	71.2	67.9	63.4	71.9	72.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	94	296	936	2,960
CNEL:	104	328	1,037	3,279

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Lake Forest
Road Segment: West of Interstate 5

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	29,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,900 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	2.20	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-14.66	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-17.67	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	72.6	70.7	68.9	62.8	71.5	72.1
Medium Trucks:	66.5	65.0	58.6	57.1	65.6	65.8
Heavy Trucks:	67.9	66.5	57.4	58.7	67.0	67.2
Vehicle Noise:	74.6	72.8	69.6	65.0	73.5	74.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	136	429	1,357	4,292
CNEL:	150	476	1,504	4,755

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Ridge Route
Road Segment: East of Santa Vittoria

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	400 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	57.454
Medium Trucks:	57.300
Heavy Trucks:	57.315

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-5.95	-0.67	0.00	*-0.95*	0.000	0.000
Medium Trucks:	79.45	-22.81	-0.66	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	84.25	-25.82	-0.66	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	61.8	59.9	58.2	52.1	60.7	61.3
Medium Trucks:	56.0	54.5	48.1	46.6	55.0	55.3
Heavy Trucks:	57.8	56.4	47.3	48.6	56.9	57.0
Vehicle Noise:	64.0	62.3	58.9	54.5	63.0	63.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	12	38	120	379
CNEL:	13	42	132	419

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Ridge Route
Road Segment: West of Irvine Center

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	600 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	40 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	56.789
Medium Trucks:	56.633
Heavy Trucks:	56.648

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	-5.06	-0.62	0.00	*-0.95*	0.000	0.000
Medium Trucks:	82.40	-21.92	-0.61	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	86.40	-24.93	-0.61	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.1	64.2	62.4	56.4	65.0	65.6
Medium Trucks:	59.9	58.4	52.0	50.5	58.9	59.2
Heavy Trucks:	60.9	59.4	50.4	51.6	60.0	60.1
Vehicle Noise:	68.0	66.2	63.1	58.4	66.9	67.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	30	94	297	938
CNEL:	33	104	329	1,042

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Ridge Route
Road Segment: East of Irvine Center

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	800 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	40 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	56.789
Medium Trucks:	56.633
Heavy Trucks:	56.648

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	-3.81	-0.62	0.00	*-0.95*	0.000	0.000
Medium Trucks:	82.40	-20.67	-0.61	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	86.40	-23.68	-0.61	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.3	65.5	63.7	57.6	66.3	66.9
Medium Trucks:	61.1	59.6	53.3	51.7	60.2	60.4
Heavy Trucks:	62.1	60.7	51.6	52.9	61.3	61.4
Vehicle Noise:	69.2	67.5	64.3	59.7	68.2	68.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	40	125	396	1,251
CNEL:	44	139	439	1,389

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Ridge Route
Road Segment: West of Interstate 5

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	800 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	40 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	56.789
Medium Trucks:	56.633
Heavy Trucks:	56.648

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	-3.81	-0.62	0.00	*-0.95*	0.000	0.000
Medium Trucks:	82.40	-20.67	-0.61	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	86.40	-23.68	-0.61	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.3	65.5	63.7	57.6	66.3	66.9
Medium Trucks:	61.1	59.6	53.3	51.7	60.2	60.4
Heavy Trucks:	62.1	60.7	51.6	52.9	61.3	61.4
Vehicle Noise:	69.2	67.5	64.3	59.7	68.2	68.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	40	125	396	1,251
CNEL:	44	139	439	1,389

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Santa Maria
Road Segment: East of Santa Vittoria

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	700 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	57.454
Medium Trucks:	57.300
Heavy Trucks:	57.315

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-3.52	-0.67	0.00	*-0.95*	0.000	0.000
Medium Trucks:	79.45	-20.38	-0.66	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	84.25	-23.39	-0.66	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	64.3	62.4	60.6	54.5	63.2	63.8
Medium Trucks:	58.4	56.9	50.5	49.0	57.5	57.7
Heavy Trucks:	60.2	58.8	49.7	51.0	59.4	59.5
Vehicle Noise:	66.4	64.7	61.3	56.9	65.4	65.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	21	66	210	663
CNEL:	23	73	232	733

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: El Toro
Road Segment: West of Avd Carlota

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	30,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,000 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	2.34	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-14.51	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-17.52	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	72.7	70.8	69.0	63.0	71.6	72.2
Medium Trucks:	66.7	65.2	58.8	57.2	65.7	65.9
Heavy Trucks:	68.0	66.6	57.6	58.8	67.2	67.3
Vehicle Noise:	74.7	73.0	69.7	65.2	73.7	74.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	140	444	1,404	4,440
CNEL:	156	492	1,556	4,919

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: El Toro
Road Segment: West of Interstate 5

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	59,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	5,900 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	5.28	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-11.58	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-14.59	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	75.6	73.7	72.0	65.9	74.5	75.1
Medium Trucks:	69.6	68.1	61.7	60.2	68.6	68.9
Heavy Trucks:	71.0	69.5	60.5	61.8	70.1	70.2
Vehicle Noise:	77.7	75.9	72.6	68.1	76.6	77.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	276	873	2,761	8,732
CNEL:	306	967	3,059	9,674

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Paseo De Valencia
Road Segment: West of Interstate 5

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,400 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	-0.97	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-17.82	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-20.83	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	69.4	67.5	65.7	59.7	68.3	68.9
Medium Trucks:	63.3	61.8	55.5	53.9	62.4	62.6
Heavy Trucks:	64.7	63.3	54.3	55.5	63.9	64.0
Vehicle Noise:	71.4	69.7	66.4	61.8	70.4	70.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	66	207	655	2,072
CNEL:	73	230	726	2,296

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Paseo De Valencia
Road Segment: South of El Toro

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	23,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,300 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	1.19	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-15.67	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-18.68	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	71.5	69.6	67.9	61.8	70.5	71.1
Medium Trucks:	65.5	64.0	57.6	56.1	64.6	64.8
Heavy Trucks:	66.9	65.4	56.4	57.7	66.0	66.1
Vehicle Noise:	73.6	71.8	68.5	64.0	72.5	73.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	108	340	1,076	3,404
CNEL:	119	377	1,193	3,771

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Paseo De Valencia
Road Segment: El Toro to Los Alisos

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,800 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	0.13	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-16.73	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-19.74	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.5	68.6	66.8	60.8	69.4	70.0
Medium Trucks:	64.4	62.9	56.6	55.0	63.5	63.7
Heavy Trucks:	65.8	64.4	55.3	56.6	65.0	65.1
Vehicle Noise:	72.5	70.8	67.5	62.9	71.5	71.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	84	266	842	2,664
CNEL:	93	295	933	2,951

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Paseo De Valencia
Road Segment: South of Los Alisos

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	33,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,300 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	2.76	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-14.10	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-17.11	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	73.1	71.2	69.5	63.4	72.0	72.6
Medium Trucks:	67.1	65.6	59.2	57.7	66.1	66.4
Heavy Trucks:	68.4	67.0	58.0	59.2	67.6	67.7
Vehicle Noise:	75.1	73.4	70.1	65.6	74.1	74.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	154	488	1,544	4,884
CNEL:	171	541	1,711	5,411

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Paseo De Valencia
Road Segment: North of Laguna Hills

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	34,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,400 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	2.89	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-13.97	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-16.98	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	73.2	71.3	69.6	63.5	72.1	72.8
Medium Trucks:	67.2	65.7	59.3	57.8	66.2	66.5
Heavy Trucks:	68.6	67.1	58.1	59.4	67.7	67.8
Vehicle Noise:	75.3	73.5	70.2	65.7	74.2	74.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	159	503	1,591	5,032
CNEL:	176	557	1,763	5,575

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Paseo De Valencia
Road Segment: South of Laguna Hills

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,700 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	1.89	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-14.97	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-17.98	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	72.2	70.3	68.6	62.5	71.1	71.8
Medium Trucks:	66.2	64.7	58.3	56.8	65.2	65.5
Heavy Trucks:	67.6	66.1	57.1	58.4	66.7	66.8
Vehicle Noise:	74.3	72.5	69.2	64.7	73.2	73.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	126	400	1,264	3,996
CNEL:	140	443	1,400	4,427

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Paseo De Valencia
Road Segment: Alicia to La Paz

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,100 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	-2.01	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-18.87	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-21.88	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.3	66.4	64.7	58.6	67.2	67.9
Medium Trucks:	62.3	60.8	54.4	52.9	61.3	61.6
Heavy Trucks:	63.7	62.2	53.2	54.5	62.8	62.9
Vehicle Noise:	70.4	68.6	65.3	60.8	69.3	69.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	51	163	515	1,628
CNEL:	57	180	570	1,804

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Paseo De Valencia
Road Segment: La Paz to Cabot

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	600 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	57.454
Medium Trucks:	57.300
Heavy Trucks:	57.315

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-4.19	-0.67	0.00	*-0.95*	0.000	0.000
Medium Trucks:	79.45	-21.05	-0.66	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	84.25	-24.06	-0.66	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	63.6	61.7	59.9	53.9	62.5	63.1
Medium Trucks:	57.7	56.2	49.9	48.3	56.8	57.0
Heavy Trucks:	59.5	58.1	49.1	50.3	58.7	58.8
Vehicle Noise:	65.8	64.1	60.7	56.2	64.8	65.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	18	57	180	568
CNEL:	20	63	199	628

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Los Alisos
Road Segment: East of Paseo De Valencia

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	23,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,300 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	1.19	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-15.67	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-18.68	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	71.5	69.6	67.9	61.8	70.5	71.1
Medium Trucks:	65.5	64.0	57.6	56.1	64.6	64.8
Heavy Trucks:	66.9	65.4	56.4	57.7	66.0	66.1
Vehicle Noise:	73.6	71.8	68.5	64.0	72.5	73.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	108	340	1,076	3,404
CNEL:	119	377	1,193	3,771

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Los Alisos
Road Segment: West of Interstate 5

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,500 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	1.55	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-15.31	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-18.32	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	71.9	70.0	68.2	62.2	70.8	71.4
Medium Trucks:	65.9	64.4	58.0	56.5	64.9	65.1
Heavy Trucks:	67.2	65.8	56.8	58.0	66.4	66.5
Vehicle Noise:	73.9	72.2	68.9	64.4	72.9	73.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	117	370	1,170	3,700
CNEL:	130	410	1,296	4,099

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Laguna Hills
Road Segment: Moulton to Paseo De Valencia

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	23,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,300 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	40 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	56.789
Medium Trucks:	56.633
Heavy Trucks:	56.648

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	0.78	-0.62	0.00	*-0.95*	0.000	0.000
Medium Trucks:	82.40	-16.08	-0.61	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	86.40	-19.09	-0.61	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	71.9	70.0	68.3	62.2	70.8	71.4
Medium Trucks:	65.7	64.2	57.8	56.3	64.8	65.0
Heavy Trucks:	66.7	65.3	56.2	57.5	65.8	66.0
Vehicle Noise:	73.8	72.1	68.9	64.2	72.8	73.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	114	360	1,137	3,597
CNEL:	126	399	1,263	3,994

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Alicia
Road Segment: West of Moulton

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	39,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,900 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	3.48	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-13.37	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-16.38	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	73.8	71.9	70.2	64.1	72.7	73.3
Medium Trucks:	67.8	66.3	59.9	58.4	66.8	67.1
Heavy Trucks:	69.2	67.7	58.7	60.0	68.3	68.4
Vehicle Noise:	75.9	74.1	70.8	66.3	74.8	75.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	183	577	1,825	5,772
CNEL:	202	639	2,022	6,395

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Alicia
Road Segment: East of Moulton

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	40,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	4,000 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	3.59	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-13.26	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-16.27	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	74.0	72.1	70.3	64.2	72.9	73.5
Medium Trucks:	67.9	66.4	60.0	58.5	67.0	67.2
Heavy Trucks:	69.3	67.9	58.8	60.1	68.4	68.5
Vehicle Noise:	76.0	74.2	71.0	66.4	74.9	75.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	187	592	1,872	5,920
CNEL:	207	656	2,074	6,559

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Alicia
Road Segment: West of Paseo De Valencia

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	45,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	4,500 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	4.10	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-12.75	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-15.76	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	74.5	72.6	70.8	64.7	73.4	74.0
Medium Trucks:	68.4	66.9	60.5	59.0	67.5	67.7
Heavy Trucks:	69.8	68.4	59.3	60.6	68.9	69.1
Vehicle Noise:	76.5	74.7	71.5	66.9	75.5	75.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	211	666	2,106	6,660
CNEL:	233	738	2,333	7,378

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Alicia
Road Segment: East of Paseo De Valencia

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	43,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	4,300 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	3.91	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-12.95	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-15.96	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	74.3	72.4	70.6	64.5	73.2	73.8
Medium Trucks:	68.2	66.7	60.4	58.8	67.3	67.5
Heavy Trucks:	69.6	68.2	59.1	60.4	68.7	68.9
Vehicle Noise:	76.3	74.5	71.3	66.7	75.3	75.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	201	636	2,013	6,364
CNEL:	223	705	2,230	7,051

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Alicia
Road Segment: West of Interstate 5

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	51,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	5,100 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	4.65	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-12.21	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-15.22	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	75.0	73.1	71.3	65.3	73.9	74.5
Medium Trucks:	69.0	67.5	61.1	59.5	68.0	68.2
Heavy Trucks:	70.3	68.9	59.9	61.1	69.5	69.6
Vehicle Noise:	77.0	75.3	72.0	67.5	76.0	76.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	239	755	2,387	7,548
CNEL:	264	836	2,644	8,362

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: La Paz
Road Segment: West of Moulton

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,800 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	0.13	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-16.73	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-19.74	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.5	68.6	66.8	60.8	69.4	70.0
Medium Trucks:	64.4	62.9	56.6	55.0	63.5	63.7
Heavy Trucks:	65.8	64.4	55.3	56.6	65.0	65.1
Vehicle Noise:	72.5	70.8	67.5	62.9	71.5	71.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	84	266	842	2,664
CNEL:	93	295	933	2,951

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: La Paz
Road Segment: East of Moulton

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,500 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	40 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	56.789
Medium Trucks:	56.633
Heavy Trucks:	56.648

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	-1.08	-0.62	0.00	*-0.95*	0.000	0.000
Medium Trucks:	82.40	-17.94	-0.61	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	86.40	-20.95	-0.61	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.1	68.2	66.4	60.4	69.0	69.6
Medium Trucks:	63.9	62.3	56.0	54.4	62.9	63.1
Heavy Trucks:	64.8	63.4	54.4	55.6	64.0	64.1
Vehicle Noise:	71.9	70.2	67.0	62.4	70.9	71.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	74	235	742	2,346
CNEL:	82	260	824	2,605

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: La Paz
Road Segment: East of Alameda

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,600 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	40 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	56.789
Medium Trucks:	56.633
Heavy Trucks:	56.648

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	-0.80	-0.62	0.00	*-0.95*	0.000	0.000
Medium Trucks:	82.40	-17.66	-0.61	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	86.40	-20.67	-0.61	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.4	68.5	66.7	60.6	69.3	69.9
Medium Trucks:	64.1	62.6	56.3	54.7	63.2	63.4
Heavy Trucks:	65.1	63.7	54.7	55.9	64.3	64.4
Vehicle Noise:	72.2	70.5	67.3	62.7	71.2	71.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	79	250	791	2,502
CNEL:	88	278	879	2,778

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: La Paz
Road Segment: West of Paseo De Valencia

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,800 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	40 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	56.789
Medium Trucks:	56.633
Heavy Trucks:	56.648

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	-0.29	-0.62	0.00	*-0.95*	0.000	0.000
Medium Trucks:	82.40	-17.15	-0.61	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	86.40	-20.16	-0.61	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.9	69.0	67.2	61.2	69.8	70.4
Medium Trucks:	64.6	63.1	56.8	55.2	63.7	63.9
Heavy Trucks:	65.6	64.2	55.2	56.4	64.8	64.9
Vehicle Noise:	72.7	71.0	67.8	63.2	71.7	72.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	89	281	890	2,815
CNEL:	99	313	988	3,126

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: La Paz
Road Segment: East of Paseo De Valencia

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,900 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	40 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	56.789
Medium Trucks:	56.633
Heavy Trucks:	56.648

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	-0.05	-0.62	0.00	*-0.95*	0.000	0.000
Medium Trucks:	82.40	-16.91	-0.61	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	86.40	-19.92	-0.61	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	71.1	69.2	67.4	61.4	70.0	70.6
Medium Trucks:	64.9	63.4	57.0	55.5	63.9	64.2
Heavy Trucks:	65.9	64.4	55.4	56.7	65.0	65.1
Vehicle Noise:	73.0	71.2	68.1	63.4	71.9	72.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	94	297	940	2,971
CNEL:	104	330	1,043	3,299

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: La Paz
Road Segment: West of Interstate 5

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	41,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	4,100 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	40 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	56.789
Medium Trucks:	56.633
Heavy Trucks:	56.648

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	3.29	-0.62	0.00	*-0.95*	0.000	0.000
Medium Trucks:	82.40	-13.57	-0.61	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	86.40	-16.58	-0.61	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	74.4	72.5	70.8	64.7	73.3	74.0
Medium Trucks:	68.2	66.7	60.4	58.8	67.3	67.5
Heavy Trucks:	69.2	67.8	58.7	60.0	68.4	68.5
Vehicle Noise:	76.3	74.6	71.4	66.7	75.3	75.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	203	641	2,028	6,412
CNEL:	225	712	2,251	7,119

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Oso
Road Segment: West of Moulton

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	24,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,400 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	1.37	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-15.48	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-18.49	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	71.7	69.8	68.1	62.0	70.6	71.2
Medium Trucks:	65.7	64.2	57.8	56.3	64.7	65.0
Heavy Trucks:	67.1	65.6	56.6	57.8	66.2	66.3
Vehicle Noise:	73.7	72.0	68.7	64.2	72.7	73.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	112	355	1,123	3,552
CNEL:	124	394	1,244	3,935

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Oso
Road Segment: East of Moulton

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	32,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,200 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	2.62	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-14.23	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-17.24	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	73.0	71.1	69.3	63.3	71.9	72.5
Medium Trucks:	66.9	65.4	59.1	57.5	66.0	66.2
Heavy Trucks:	68.3	66.9	57.8	59.1	67.5	67.6
Vehicle Noise:	75.0	73.3	70.0	65.4	74.0	74.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	150	474	1,498	4,736
CNEL:	166	525	1,659	5,247

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Oso
Road Segment: West of Bridlewood

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	30,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,000 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	2.34	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-14.51	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-17.52	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	72.7	70.8	69.0	63.0	71.6	72.2
Medium Trucks:	66.7	65.2	58.8	57.2	65.7	65.9
Heavy Trucks:	68.0	66.6	57.6	58.8	67.2	67.3
Vehicle Noise:	74.7	73.0	69.7	65.2	73.7	74.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	140	444	1,404	4,440
CNEL:	156	492	1,556	4,919

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Oso
Road Segment: East of Bridlewood

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	30,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,000 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	2.34	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-14.51	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-17.52	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	72.7	70.8	69.0	63.0	71.6	72.2
Medium Trucks:	66.7	65.2	58.8	57.2	65.7	65.9
Heavy Trucks:	68.0	66.6	57.6	58.8	67.2	67.3
Vehicle Noise:	74.7	73.0	69.7	65.2	73.7	74.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	140	444	1,404	4,440
CNEL:	156	492	1,556	4,919

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Oso
Road Segment: West of Interstate 5

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	42,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	4,200 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	3.81	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-13.05	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-16.06	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	74.2	72.3	70.5	64.4	73.1	73.7
Medium Trucks:	68.1	66.6	60.3	58.7	67.2	67.4
Heavy Trucks:	69.5	68.1	59.0	60.3	68.6	68.8
Vehicle Noise:	76.2	74.4	71.2	66.6	75.2	75.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	197	622	1,966	6,216
CNEL:	218	689	2,178	6,887

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Greenfield
Road Segment: North of SR-73

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	200 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	57.454
Medium Trucks:	57.300
Heavy Trucks:	57.315

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-8.96	-0.67	0.00	*-0.95*	0.000	0.000
Medium Trucks:	79.45	-25.82	-0.66	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	84.25	-28.83	-0.66	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	58.8	56.9	55.2	49.1	57.7	58.3
Medium Trucks:	53.0	51.5	45.1	43.6	52.0	52.3
Heavy Trucks:	54.8	53.3	44.3	45.6	53.9	54.0
Vehicle Noise:	61.0	59.3	55.9	51.5	60.0	60.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	6	19	60	189
CNEL:	7	21	66	209

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Irvine Center/Moulton
Road Segment: Lake Forest to Ridge Route

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,700 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	1.89	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-14.97	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-17.98	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	72.2	70.3	68.6	62.5	71.1	71.8
Medium Trucks:	66.2	64.7	58.3	56.8	65.2	65.5
Heavy Trucks:	67.6	66.1	57.1	58.4	66.7	66.8
Vehicle Noise:	74.3	72.5	69.2	64.7	73.2	73.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	126	400	1,264	3,996
CNEL:	140	443	1,400	4,427

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Irvine Center/Moulton
Road Segment: South of Ridge Route

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	31,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,100 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	2.49	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-14.37	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-17.38	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	72.8	70.9	69.2	63.1	71.7	72.4
Medium Trucks:	66.8	65.3	58.9	57.4	65.8	66.1
Heavy Trucks:	68.2	66.7	57.7	59.0	67.3	67.4
Vehicle Noise:	74.9	73.1	69.8	65.3	73.8	74.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	145	459	1,451	4,588
CNEL:	161	508	1,607	5,083

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Irvine Center/Moulton
Road Segment: Glenwood to Laguna Hills

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	23,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,300 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	1.19	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-15.67	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-18.68	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	71.5	69.6	67.9	61.8	70.5	71.1
Medium Trucks:	65.5	64.0	57.6	56.1	64.6	64.8
Heavy Trucks:	66.9	65.4	56.4	57.7	66.0	66.1
Vehicle Noise:	73.6	71.8	68.5	64.0	72.5	73.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	108	340	1,076	3,404
CNEL:	119	377	1,193	3,771

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Irvine Center/Moulton
Road Segment: Laguna Hills to Alicia

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	23,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,300 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	1.19	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-15.67	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-18.68	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	71.5	69.6	67.9	61.8	70.5	71.1
Medium Trucks:	65.5	64.0	57.6	56.1	64.6	64.8
Heavy Trucks:	66.9	65.4	56.4	57.7	66.0	66.1
Vehicle Noise:	73.6	71.8	68.5	64.0	72.5	73.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	108	340	1,076	3,404
CNEL:	119	377	1,193	3,771

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Irvine Center/Moulton
Road Segment: Alicia to La Paz

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,100 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	0.79	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-16.06	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-19.07	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	71.2	69.3	67.5	61.4	70.1	70.7
Medium Trucks:	65.1	63.6	57.2	55.7	64.2	64.4
Heavy Trucks:	66.5	65.1	56.0	57.3	65.6	65.7
Vehicle Noise:	73.2	71.4	68.2	63.6	72.1	72.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	98	311	983	3,108
CNEL:	109	344	1,089	3,443

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Irvine Center/Moulton
Road Segment: La Paz to Oso

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,700 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	-0.12	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-16.98	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-19.99	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.2	68.3	66.6	60.5	69.1	69.7
Medium Trucks:	64.2	62.7	56.3	54.8	63.2	63.5
Heavy Trucks:	65.6	64.1	55.1	56.3	64.7	64.8
Vehicle Noise:	72.2	70.5	67.2	62.7	71.2	71.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	80	252	796	2,516
CNEL:	88	279	881	2,787

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Avd Carlota
Road Segment: Lake Forest to Ridge Route

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	900 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	57.454
Medium Trucks:	57.300
Heavy Trucks:	57.315

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-2.43	-0.67	0.00	*-0.95*	0.000	0.000
Medium Trucks:	79.45	-19.28	-0.66	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	84.25	-22.30	-0.66	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.4	63.5	61.7	55.6	64.3	64.9
Medium Trucks:	59.5	58.0	51.6	50.1	58.6	58.8
Heavy Trucks:	61.3	59.9	50.8	52.1	60.4	60.6
Vehicle Noise:	67.5	65.8	62.4	58.0	66.5	67.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	27	85	270	852
CNEL:	30	94	298	942

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Avd Carlota
Road Segment: South of Ridge Route

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,600 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	57.454
Medium Trucks:	57.300
Heavy Trucks:	57.315

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	0.07	-0.67	0.00	*-0.95*	0.000	0.000
Medium Trucks:	79.45	-16.79	-0.66	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	84.25	-19.80	-0.66	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.9	66.0	64.2	58.1	66.8	67.4
Medium Trucks:	62.0	60.5	54.1	52.6	61.0	61.3
Heavy Trucks:	63.8	62.4	53.3	54.6	62.9	63.1
Vehicle Noise:	70.0	68.3	64.9	60.5	69.0	69.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	48	152	479	1,515
CNEL:	53	167	529	1,674

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Avd Carlota
Road Segment: Paseo De Valencia to El Toro

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	29,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,900 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	57.454
Medium Trucks:	57.300
Heavy Trucks:	57.315

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	2.65	-0.67	0.00	*-0.95*	0.000	0.000
Medium Trucks:	79.45	-14.20	-0.66	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	84.25	-17.21	-0.66	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.4	68.5	66.8	60.7	69.3	70.0
Medium Trucks:	64.6	63.1	56.7	55.2	63.6	63.9
Heavy Trucks:	66.4	65.0	55.9	57.2	65.5	65.7
Vehicle Noise:	72.6	70.9	67.5	63.1	71.6	72.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	87	275	869	2,746
CNEL:	96	303	960	3,035

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Avd Carlota
Road Segment: El Toro to Los Alisos

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,300 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	57.454
Medium Trucks:	57.300
Heavy Trucks:	57.315

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-0.83	-0.67	0.00	*-0.95*	0.000	0.000
Medium Trucks:	79.45	-17.69	-0.66	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	84.25	-20.70	-0.66	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.0	65.1	63.3	57.2	65.9	66.5
Medium Trucks:	61.1	59.6	53.2	51.7	60.1	60.4
Heavy Trucks:	62.9	61.5	52.4	53.7	62.0	62.2
Vehicle Noise:	69.1	67.4	64.0	59.6	68.1	68.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	39	123	389	1,231
CNEL:	43	136	430	1,360

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Cabot
Road Segment: South of La Paz

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,000 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	57.454
Medium Trucks:	57.300
Heavy Trucks:	57.315

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-1.97	-0.67	0.00	*-0.95*	0.000	0.000
Medium Trucks:	79.45	-18.83	-0.66	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	84.25	-21.84	-0.66	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.8	63.9	62.2	56.1	64.7	65.3
Medium Trucks:	60.0	58.5	52.1	50.5	59.0	59.2
Heavy Trucks:	61.8	60.3	51.3	52.5	60.9	61.0
Vehicle Noise:	68.0	66.3	62.9	58.5	67.0	67.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	30	95	299	947
CNEL:	33	105	331	1,046

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Cabot
Road Segment: South of Paseo De Valencia

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,500 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	57.454
Medium Trucks:	57.300
Heavy Trucks:	57.315

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-0.21	-0.67	0.00	*-0.95*	0.000	0.000
Medium Trucks:	79.45	-17.07	-0.66	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	84.25	-20.08	-0.66	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.6	65.7	63.9	57.9	66.5	67.1
Medium Trucks:	61.7	60.2	53.9	52.3	60.8	61.0
Heavy Trucks:	63.5	62.1	53.1	54.3	62.7	62.8
Vehicle Noise:	69.8	68.0	64.6	60.2	68.7	69.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	45	142	449	1,421
CNEL:	50	157	496	1,570

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Cabot
Road Segment: North of Oso

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,900 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	57.454
Medium Trucks:	57.300
Heavy Trucks:	57.315

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	0.82	-0.67	0.00	*-0.95*	0.000	0.000
Medium Trucks:	79.45	-16.04	-0.66	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	84.25	-19.05	-0.66	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.6	66.7	64.9	58.9	67.5	68.1
Medium Trucks:	62.7	61.2	54.9	53.3	61.8	62.0
Heavy Trucks:	64.5	63.1	54.1	55.3	63.7	63.8
Vehicle Noise:	70.8	69.1	65.7	61.2	69.8	70.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	57	180	569	1,799
CNEL:	63	199	629	1,988

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Cabot
Road Segment: South of Oso

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,400 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	40 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	56.789
Medium Trucks:	56.633
Heavy Trucks:	56.648

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	-1.38	-0.62	0.00	*-0.95*	0.000	0.000
Medium Trucks:	82.40	-18.24	-0.61	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	86.40	-21.25	-0.61	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	69.8	67.9	66.1	60.1	68.7	69.3
Medium Trucks:	63.6	62.0	55.7	54.1	62.6	62.8
Heavy Trucks:	64.5	63.1	54.1	55.3	63.7	63.8
Vehicle Noise:	71.6	69.9	66.7	62.1	70.6	71.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	69	219	692	2,189
CNEL:	77	243	769	2,431

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Interstate 5
Road Segment: El Toro to Alicia

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	318,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	31,800 vehicles
Vehicle Speed:	65 mph
Near/Far Lane Distance:	150 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	200.0 feet
Centerline Dist. to Observer:	210.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	96.22%
Medium Trucks:	84.8%	4.9%	10.3%	1.65%
Heavy Trucks:	86.5%	2.7%	10.8%	2.13%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	196.214
Medium Trucks:	196.169
Heavy Trucks:	196.173

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	74.55	11.42	-6.01	0.00	*-1.10*	0.000	0.000
Medium Trucks:	84.86	-6.24	-6.01	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	88.18	-5.13	-6.01	0.00	*-1.29*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	80.0	78.1	76.3	70.2	78.9	79.5
Medium Trucks:	72.6	71.1	64.8	63.2	71.7	71.9
Heavy Trucks:	77.0	75.6	66.6	67.8	76.2	76.3
Vehicle Noise:	82.3	80.5	77.0	72.7	81.2	81.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	2,800	8,853	27,995	88,529
CNEL:	3,084	9,753	30,843	97,533

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Interstate 5
Road Segment: Alicia to La Paz

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	286,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	28,600	vehicles
Vehicle Speed:	65	mph
Near/Far Lane Distance:	150	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	200.0	feet
Centerline Dist. to Observer:	210.0	feet
Barrier Distance to Observer:	10.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	96.22%
Medium Trucks:	84.8%	4.9%	10.3%	1.65%
Heavy Trucks:	86.5%	2.7%	10.8%	2.13%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	196.214
Medium Trucks:	196.169
Heavy Trucks:	196.173

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	74.55	10.96	-6.01	0.00	*-1.10*	0.000	0.000
Medium Trucks:	84.86	-6.70	-6.01	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	88.18	-5.59	-6.01	0.00	*-1.29*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	79.5	77.6	75.8	69.8	78.4	79.0
Medium Trucks:	72.2	70.7	64.3	62.7	71.2	71.4
Heavy Trucks:	76.6	75.2	66.1	67.4	75.7	75.9
Vehicle Noise:	81.8	80.1	76.5	72.3	80.8	81.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	2,518	7,962	25,178	79,620
CNEL:	2,774	8,772	27,739	87,719

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Interstate 5
Road Segment: La Paz to Oso

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	275,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	27,500 vehicles
Vehicle Speed:	65 mph
Near/Far Lane Distance:	150 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	200.0 feet
Centerline Dist. to Observer:	210.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	96.22%
Medium Trucks:	84.8%	4.9%	10.3%	1.65%
Heavy Trucks:	86.5%	2.7%	10.8%	2.13%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	196.214
Medium Trucks:	196.169
Heavy Trucks:	196.173

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	74.55	10.79	-6.01	0.00	*-1.10*	0.000	0.000
Medium Trucks:	84.86	-6.87	-6.01	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	88.18	-5.76	-6.01	0.00	*-1.29*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	79.3	77.4	75.7	69.6	78.2	78.8
Medium Trucks:	72.0	70.5	64.1	62.6	71.0	71.3
Heavy Trucks:	76.4	75.0	66.0	67.2	75.6	75.7
Vehicle Noise:	81.6	79.9	76.4	72.1	80.6	81.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	2,421	7,656	24,210	76,558
CNEL:	2,667	8,434	26,672	84,345

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: Interstate 5
Road Segment: Oso to Crown Valley

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	253,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	25,300 vehicles
Vehicle Speed:	65 mph
Near/Far Lane Distance:	150 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	200.0 feet
Centerline Dist. to Observer:	210.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	96.22%
Medium Trucks:	84.8%	4.9%	10.3%	1.65%
Heavy Trucks:	86.5%	2.7%	10.8%	2.13%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	196.214
Medium Trucks:	196.169
Heavy Trucks:	196.173

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	74.55	10.43	-6.01	0.00	*-1.10*	0.000	0.000
Medium Trucks:	84.86	-7.23	-6.01	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	88.18	-6.12	-6.01	0.00	*-1.29*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	79.0	77.1	75.3	69.2	77.9	78.5
Medium Trucks:	71.6	70.1	63.8	62.2	70.7	70.9
Heavy Trucks:	76.1	74.6	65.6	66.8	75.2	75.3
Vehicle Noise:	81.3	79.6	76.0	71.7	80.3	80.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	2,227	7,043	22,273	70,433
CNEL:	2,454	7,760	24,538	77,597

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Conditions
Road Name: State Route 73
Road Segment: Interstate 5 to El Toro

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	66,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	6,600 vehicles
Vehicle Speed:	65 mph
Near/Far Lane Distance:	150 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	200.0 feet
Centerline Dist. to Observer:	210.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	99.00%
Medium Trucks:	84.8%	4.9%	10.3%	0.75%
Heavy Trucks:	86.5%	2.7%	10.8%	0.25%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	196.214
Medium Trucks:	196.169
Heavy Trucks:	196.173

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	74.55	4.72	-6.01	0.00	*-1.10*	0.000	0.000
Medium Trucks:	84.86	-16.49	-6.01	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	88.18	-21.26	-6.01	0.00	*-1.29*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	73.3	71.4	69.6	63.5	72.2	72.8
Medium Trucks:	62.4	60.9	54.5	53.0	61.4	61.6
Heavy Trucks:	60.9	59.5	50.5	51.7	60.1	60.2
Vehicle Noise:	73.8	72.0	69.8	64.2	72.8	73.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	396	1,251	3,956	12,510
CNEL:	449	1,421	4,495	14,214

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Lake Forest
Road Segment: East of Santa Vittoria

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,400 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	-0.97	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-17.82	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-20.83	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	69.4	67.5	65.7	59.7	68.3	68.9
Medium Trucks:	63.3	61.8	55.5	53.9	62.4	62.6
Heavy Trucks:	64.7	63.3	54.3	55.5	63.9	64.0
Vehicle Noise:	71.4	69.7	66.4	61.8	70.4	70.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	66	207	655	2,072
CNEL:	73	230	726	2,296

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Lake Forest
Road Segment: West of Irvine Center

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,300 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	-1.29	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-18.15	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-21.16	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	69.1	67.2	65.4	59.4	68.0	68.6
Medium Trucks:	63.0	61.5	55.2	53.6	62.1	62.3
Heavy Trucks:	64.4	63.0	53.9	55.2	63.5	63.7
Vehicle Noise:	71.1	69.4	66.1	61.5	70.1	70.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	61	192	608	1,924
CNEL:	67	213	674	2,132

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Lake Forest
Road Segment: East of Irvine Center

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	22,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,200 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	1.00	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-15.86	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-18.87	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	71.4	69.5	67.7	61.6	70.3	70.9
Medium Trucks:	65.3	63.8	57.4	55.9	64.4	64.6
Heavy Trucks:	66.7	65.3	56.2	57.5	65.8	66.0
Vehicle Noise:	73.4	71.6	68.4	63.8	72.3	72.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	103	326	1,030	3,256
CNEL:	114	361	1,141	3,607

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Lake Forest
Road Segment: West of Interstate 5

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	30,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,000 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	2.34	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-14.51	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-17.52	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	72.7	70.8	69.0	63.0	71.6	72.2
Medium Trucks:	66.7	65.2	58.8	57.2	65.7	65.9
Heavy Trucks:	68.0	66.6	57.6	58.8	67.2	67.3
Vehicle Noise:	74.7	73.0	69.7	65.2	73.7	74.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	140	444	1,404	4,440
CNEL:	156	492	1,556	4,919

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Ridge Route
Road Segment: East of Santa Vittoria

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	400 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	57.454
Medium Trucks:	57.300
Heavy Trucks:	57.315

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-5.95	-0.67	0.00	*-0.95*	0.000	0.000
Medium Trucks:	79.45	-22.81	-0.66	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	84.25	-25.82	-0.66	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	61.8	59.9	58.2	52.1	60.7	61.3
Medium Trucks:	56.0	54.5	48.1	46.6	55.0	55.3
Heavy Trucks:	57.8	56.4	47.3	48.6	56.9	57.0
Vehicle Noise:	64.0	62.3	58.9	54.5	63.0	63.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	12	38	120	379
CNEL:	13	42	132	419

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Ridge Route
Road Segment: West of Irvine Center

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	600 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	40 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	56.789
Medium Trucks:	56.633
Heavy Trucks:	56.648

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	-5.06	-0.62	0.00	*-0.95*	0.000	0.000
Medium Trucks:	82.40	-21.92	-0.61	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	86.40	-24.93	-0.61	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.1	64.2	62.4	56.4	65.0	65.6
Medium Trucks:	59.9	58.4	52.0	50.5	58.9	59.2
Heavy Trucks:	60.9	59.4	50.4	51.6	60.0	60.1
Vehicle Noise:	68.0	66.2	63.1	58.4	66.9	67.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	30	94	297	938
CNEL:	33	104	329	1,042

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Ridge Route
Road Segment: East of Irvine Center

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	800 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	40 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	56.789
Medium Trucks:	56.633
Heavy Trucks:	56.648

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	-3.81	-0.62	0.00	*-0.95*	0.000	0.000
Medium Trucks:	82.40	-20.67	-0.61	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	86.40	-23.68	-0.61	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.3	65.5	63.7	57.6	66.3	66.9
Medium Trucks:	61.1	59.6	53.3	51.7	60.2	60.4
Heavy Trucks:	62.1	60.7	51.6	52.9	61.3	61.4
Vehicle Noise:	69.2	67.5	64.3	59.7	68.2	68.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	40	125	396	1,251
CNEL:	44	139	439	1,389

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Ridge Route
Road Segment: West of Interstate 5

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	800 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	40 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	56.789
Medium Trucks:	56.633
Heavy Trucks:	56.648

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	-3.81	-0.62	0.00	*-0.95*	0.000	0.000
Medium Trucks:	82.40	-20.67	-0.61	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	86.40	-23.68	-0.61	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.3	65.5	63.7	57.6	66.3	66.9
Medium Trucks:	61.1	59.6	53.3	51.7	60.2	60.4
Heavy Trucks:	62.1	60.7	51.6	52.9	61.3	61.4
Vehicle Noise:	69.2	67.5	64.3	59.7	68.2	68.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	40	125	396	1,251
CNEL:	44	139	439	1,389

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Santa Maria
Road Segment: East of Santa Vittoria

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	800 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	57.454
Medium Trucks:	57.300
Heavy Trucks:	57.315

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-2.94	-0.67	0.00	*-0.95*	0.000	0.000
Medium Trucks:	79.45	-19.80	-0.66	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	84.25	-22.81	-0.66	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	64.8	63.0	61.2	55.1	63.8	64.4
Medium Trucks:	59.0	57.5	51.1	49.6	58.0	58.3
Heavy Trucks:	60.8	59.4	50.3	51.6	59.9	60.1
Vehicle Noise:	67.0	65.3	61.9	57.5	66.0	66.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	24	76	240	758
CNEL:	26	84	265	837

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: El Toro
Road Segment: West of Avd Carlota

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	34,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,400 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	2.89	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-13.97	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-16.98	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	73.2	71.3	69.6	63.5	72.1	72.8
Medium Trucks:	67.2	65.7	59.3	57.8	66.2	66.5
Heavy Trucks:	68.6	67.1	58.1	59.4	67.7	67.8
Vehicle Noise:	75.3	73.5	70.2	65.7	74.2	74.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	159	503	1,591	5,032
CNEL:	176	557	1,763	5,575

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: El Toro
Road Segment: West of Interstate 5

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	74,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	7,400 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	6.26	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-10.59	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-13.60	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	76.6	74.7	73.0	66.9	75.5	76.1
Medium Trucks:	70.6	69.1	62.7	61.2	69.6	69.9
Heavy Trucks:	71.9	70.5	61.5	62.7	71.1	71.2
Vehicle Noise:	78.6	76.9	73.6	69.1	77.6	78.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	346	1,095	3,463	10,952
CNEL:	384	1,213	3,837	12,133

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Paseo De Valencia
Road Segment: West of Interstate 5

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,600 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	-0.39	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-17.24	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-20.25	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.0	68.1	66.3	60.3	68.9	69.5
Medium Trucks:	63.9	62.4	56.1	54.5	63.0	63.2
Heavy Trucks:	65.3	63.9	54.8	56.1	64.4	64.6
Vehicle Noise:	72.0	70.3	67.0	62.4	71.0	71.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	75	237	749	2,368
CNEL:	83	262	830	2,623

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Paseo De Valencia
Road Segment: South of El Toro

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	31,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,100 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	2.49	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-14.37	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-17.38	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	72.8	70.9	69.2	63.1	71.7	72.4
Medium Trucks:	66.8	65.3	58.9	57.4	65.8	66.1
Heavy Trucks:	68.2	66.7	57.7	59.0	67.3	67.4
Vehicle Noise:	74.9	73.1	69.8	65.3	73.8	74.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	145	459	1,451	4,588
CNEL:	161	508	1,607	5,083

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Paseo De Valencia
Road Segment: El Toro to Los Alisos

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	23,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,300 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	1.19	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-15.67	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-18.68	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	71.5	69.6	67.9	61.8	70.5	71.1
Medium Trucks:	65.5	64.0	57.6	56.1	64.6	64.8
Heavy Trucks:	66.9	65.4	56.4	57.7	66.0	66.1
Vehicle Noise:	73.6	71.8	68.5	64.0	72.5	73.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	108	340	1,076	3,404
CNEL:	119	377	1,193	3,771

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Paseo De Valencia
Road Segment: South of Los Alisos

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	44,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	4,400 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	4.01	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-12.85	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-15.86	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	74.4	72.5	70.7	64.6	73.3	73.9
Medium Trucks:	68.3	66.8	60.5	58.9	67.4	67.6
Heavy Trucks:	69.7	68.3	59.2	60.5	68.8	69.0
Vehicle Noise:	76.4	74.6	71.4	66.8	75.4	75.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	206	651	2,059	6,512
CNEL:	228	721	2,281	7,214

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Paseo De Valencia
Road Segment: North of Laguna Hills

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	46,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	4,600 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	4.20	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-12.66	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-15.67	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	74.6	72.7	70.9	64.8	73.5	74.1
Medium Trucks:	68.5	67.0	60.6	59.1	67.6	67.8
Heavy Trucks:	69.9	68.5	59.4	60.7	69.0	69.2
Vehicle Noise:	76.6	74.8	71.6	67.0	75.5	76.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	215	681	2,153	6,808
CNEL:	239	754	2,385	7,542

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Paseo De Valencia
Road Segment: South of Laguna Hills

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	33,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,300 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	2.76	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-14.10	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-17.11	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	73.1	71.2	69.5	63.4	72.0	72.6
Medium Trucks:	67.1	65.6	59.2	57.7	66.1	66.4
Heavy Trucks:	68.4	67.0	58.0	59.2	67.6	67.7
Vehicle Noise:	75.1	73.4	70.1	65.6	74.1	74.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	154	488	1,544	4,884
CNEL:	171	541	1,711	5,411

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Paseo De Valencia
Road Segment: Alicia to La Paz

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,200 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	-1.64	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-18.49	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-21.50	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.7	66.8	65.1	59.0	67.6	68.2
Medium Trucks:	62.7	61.2	54.8	53.3	61.7	62.0
Heavy Trucks:	64.0	62.6	53.6	54.8	63.2	63.3
Vehicle Noise:	70.7	69.0	65.7	61.2	69.7	70.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	56	178	562	1,776
CNEL:	62	197	622	1,968

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Paseo De Valencia
Road Segment: La Paz to Cabot

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	700 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	57.454
Medium Trucks:	57.300
Heavy Trucks:	57.315

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-3.52	-0.67	0.00	*-0.95*	0.000	0.000
Medium Trucks:	79.45	-20.38	-0.66	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	84.25	-23.39	-0.66	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	64.3	62.4	60.6	54.5	63.2	63.8
Medium Trucks:	58.4	56.9	50.5	49.0	57.5	57.7
Heavy Trucks:	60.2	58.8	49.7	51.0	59.4	59.5
Vehicle Noise:	66.4	64.7	61.3	56.9	65.4	65.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	21	66	210	663
CNEL:	23	73	232	733

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Los Alisos
Road Segment: East of Paseo De Valencia
Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,700 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	1.89	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-14.97	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-17.98	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	72.2	70.3	68.6	62.5	71.1	71.8
Medium Trucks:	66.2	64.7	58.3	56.8	65.2	65.5
Heavy Trucks:	67.6	66.1	57.1	58.4	66.7	66.8
Vehicle Noise:	74.3	72.5	69.2	64.7	73.2	73.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	126	400	1,264	3,996
CNEL:	140	443	1,400	4,427

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Los Alisos
Road Segment: West of Interstate 5
Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	32,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,200 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	2.62	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-14.23	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-17.24	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	73.0	71.1	69.3	63.3	71.9	72.5
Medium Trucks:	66.9	65.4	59.1	57.5	66.0	66.2
Heavy Trucks:	68.3	66.9	57.8	59.1	67.5	67.6
Vehicle Noise:	75.0	73.3	70.0	65.4	74.0	74.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	150	474	1,498	4,736
CNEL:	166	525	1,659	5,247

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Laguna Hills
Road Segment: Moulton to Paseo De Valencia

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,500 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	40 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	56.789
Medium Trucks:	56.633
Heavy Trucks:	56.648

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	1.14	-0.62	0.00	*-0.95*	0.000	0.000
Medium Trucks:	82.40	-15.72	-0.61	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	86.40	-18.73	-0.61	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	72.3	70.4	68.6	62.6	71.2	71.8
Medium Trucks:	66.1	64.6	58.2	56.7	65.1	65.4
Heavy Trucks:	67.1	65.6	56.6	57.8	66.2	66.3
Vehicle Noise:	74.2	72.4	69.3	64.6	73.1	73.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	124	391	1,236	3,909
CNEL:	137	434	1,373	4,341

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Alicia
Road Segment: West of Moulton
Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	47,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	4,700 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	4.29	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-12.56	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-15.57	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	74.7	72.8	71.0	64.9	73.6	74.2
Medium Trucks:	68.6	67.1	60.7	59.2	67.7	67.9
Heavy Trucks:	70.0	68.6	59.5	60.8	69.1	69.2
Vehicle Noise:	76.7	74.9	71.7	67.1	75.6	76.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	220	696	2,200	6,956
CNEL:	244	771	2,437	7,706

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Alicia
Road Segment: East of Moulton
Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	51,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	5,100 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	4.65	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-12.21	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-15.22	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	75.0	73.1	71.3	65.3	73.9	74.5
Medium Trucks:	69.0	67.5	61.1	59.5	68.0	68.2
Heavy Trucks:	70.3	68.9	59.9	61.1	69.5	69.6
Vehicle Noise:	77.0	75.3	72.0	67.5	76.0	76.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	239	755	2,387	7,548
CNEL:	264	836	2,644	8,362

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Alicia
Road Segment: West of Paseo De Valencia
Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	57,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	5,700 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	5.13	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-11.73	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-14.74	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	75.5	73.6	71.8	65.8	74.4	75.0
Medium Trucks:	69.4	67.9	61.6	60.0	68.5	68.7
Heavy Trucks:	70.8	69.4	60.4	61.6	70.0	70.1
Vehicle Noise:	77.5	75.8	72.5	67.9	76.5	76.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	267	844	2,668	8,436
CNEL:	296	935	2,955	9,346

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Alicia
Road Segment: East of Paseo De Valencia

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	50,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	5,000 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	4.56	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-12.30	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-15.31	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	74.9	73.0	71.3	65.2	73.8	74.4
Medium Trucks:	68.9	67.4	61.0	59.5	67.9	68.2
Heavy Trucks:	70.2	68.8	59.8	61.0	69.4	69.5
Vehicle Noise:	76.9	75.2	71.9	67.4	75.9	76.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	234	740	2,340	7,400
CNEL:	259	820	2,593	8,198

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Alicia
Road Segment: West of Interstate 5
Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	62,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	6,200 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	5.50	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-11.36	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-14.37	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	75.9	74.0	72.2	66.1	74.8	75.4
Medium Trucks:	69.8	68.3	61.9	60.4	68.9	69.1
Heavy Trucks:	71.2	69.8	60.7	62.0	70.3	70.5
Vehicle Noise:	77.9	76.1	72.9	68.3	76.8	77.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	290	918	2,902	9,176
CNEL:	321	1,017	3,215	10,166

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: La Paz
Road Segment: West of Moulton

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,900 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	0.36	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-16.50	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-19.51	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.7	68.8	67.1	61.0	69.6	70.2
Medium Trucks:	64.7	63.2	56.8	55.3	63.7	64.0
Heavy Trucks:	66.0	64.6	55.6	56.8	65.2	65.3
Vehicle Noise:	72.7	71.0	67.7	63.2	71.7	72.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	89	281	889	2,812
CNEL:	99	312	985	3,115

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: La Paz
Road Segment: East of Moulton

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,500 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	40 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	56.789
Medium Trucks:	56.633
Heavy Trucks:	56.648

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	-1.08	-0.62	0.00	*-0.95*	0.000	0.000
Medium Trucks:	82.40	-17.94	-0.61	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	86.40	-20.95	-0.61	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.1	68.2	66.4	60.4	69.0	69.6
Medium Trucks:	63.9	62.3	56.0	54.4	62.9	63.1
Heavy Trucks:	64.8	63.4	54.4	55.6	64.0	64.1
Vehicle Noise:	71.9	70.2	67.0	62.4	70.9	71.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	74	235	742	2,346
CNEL:	82	260	824	2,605

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: La Paz
Road Segment: East of Alameda

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,600 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	40 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	56.789
Medium Trucks:	56.633
Heavy Trucks:	56.648

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	-0.80	-0.62	0.00	*-0.95*	0.000	0.000
Medium Trucks:	82.40	-17.66	-0.61	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	86.40	-20.67	-0.61	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.4	68.5	66.7	60.6	69.3	69.9
Medium Trucks:	64.1	62.6	56.3	54.7	63.2	63.4
Heavy Trucks:	65.1	63.7	54.7	55.9	64.3	64.4
Vehicle Noise:	72.2	70.5	67.3	62.7	71.2	71.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	79	250	791	2,502
CNEL:	88	278	879	2,778

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: La Paz
Road Segment: West of Paseo De Valencia

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,900 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	40 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	56.789
Medium Trucks:	56.633
Heavy Trucks:	56.648

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	-0.05	-0.62	0.00	*-0.95*	0.000	0.000
Medium Trucks:	82.40	-16.91	-0.61	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	86.40	-19.92	-0.61	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	71.1	69.2	67.4	61.4	70.0	70.6
Medium Trucks:	64.9	63.4	57.0	55.5	63.9	64.2
Heavy Trucks:	65.9	64.4	55.4	56.7	65.0	65.1
Vehicle Noise:	73.0	71.2	68.1	63.4	71.9	72.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	94	297	940	2,971
CNEL:	104	330	1,043	3,299

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: La Paz
Road Segment: East of Paseo De Valencia
Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,900 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	40 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	56.789
Medium Trucks:	56.633
Heavy Trucks:	56.648

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	-0.05	-0.62	0.00	*-0.95*	0.000	0.000
Medium Trucks:	82.40	-16.91	-0.61	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	86.40	-19.92	-0.61	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	71.1	69.2	67.4	61.4	70.0	70.6
Medium Trucks:	64.9	63.4	57.0	55.5	63.9	64.2
Heavy Trucks:	65.9	64.4	55.4	56.7	65.0	65.1
Vehicle Noise:	73.0	71.2	68.1	63.4	71.9	72.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	94	297	940	2,971
CNEL:	104	330	1,043	3,299

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: La Paz
Road Segment: West of Interstate 5
Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	43,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	4,300 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	40 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	56.789
Medium Trucks:	56.633
Heavy Trucks:	56.648

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	3.49	-0.62	0.00	*-0.95*	0.000	0.000
Medium Trucks:	82.40	-13.36	-0.61	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	86.40	-16.37	-0.61	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	74.7	72.8	71.0	64.9	73.6	74.2
Medium Trucks:	68.4	66.9	60.6	59.0	67.5	67.7
Heavy Trucks:	69.4	68.0	59.0	60.2	68.6	68.7
Vehicle Noise:	76.5	74.8	71.6	67.0	75.5	75.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	213	672	2,126	6,724
CNEL:	236	747	2,361	7,467

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Oso
Road Segment: West of Moulton

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,800 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	2.04	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-14.81	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-17.82	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	72.4	70.5	68.7	62.7	71.3	71.9
Medium Trucks:	66.4	64.9	58.5	56.9	65.4	65.6
Heavy Trucks:	67.7	66.3	57.3	58.5	66.9	67.0
Vehicle Noise:	74.4	72.7	69.4	64.9	73.4	73.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	131	414	1,310	4,144
CNEL:	145	459	1,452	4,591

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Oso
Road Segment: East of Moulton

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	38,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,800 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	3.37	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-13.49	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-16.50	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	73.7	71.8	70.1	64.0	72.6	73.2
Medium Trucks:	67.7	66.2	59.8	58.3	66.7	67.0
Heavy Trucks:	69.1	67.6	58.6	59.8	68.2	68.3
Vehicle Noise:	75.7	74.0	70.7	66.2	74.7	75.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	178	562	1,778	5,624
CNEL:	197	623	1,970	6,231

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Oso
Road Segment: West of Bridlewood

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	34,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,400 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	2.89	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-13.97	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-16.98	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	73.2	71.3	69.6	63.5	72.1	72.8
Medium Trucks:	67.2	65.7	59.3	57.8	66.2	66.5
Heavy Trucks:	68.6	67.1	58.1	59.4	67.7	67.8
Vehicle Noise:	75.3	73.5	70.2	65.7	74.2	74.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	159	503	1,591	5,032
CNEL:	176	557	1,763	5,575

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Oso
Road Segment: East of Bridlewood

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	34,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,400 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	2.89	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-13.97	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-16.98	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	73.2	71.3	69.6	63.5	72.1	72.8
Medium Trucks:	67.2	65.7	59.3	57.8	66.2	66.5
Heavy Trucks:	68.6	67.1	58.1	59.4	67.7	67.8
Vehicle Noise:	75.3	73.5	70.2	65.7	74.2	74.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	159	503	1,591	5,032
CNEL:	176	557	1,763	5,575

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Oso
Road Segment: West of Interstate 5
Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	48,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	4,800 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	4.39	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-12.47	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-15.48	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	74.7	72.8	71.1	65.0	73.6	74.3
Medium Trucks:	68.7	67.2	60.8	59.3	67.7	68.0
Heavy Trucks:	70.1	68.6	59.6	60.9	69.2	69.3
Vehicle Noise:	76.8	75.0	71.7	67.2	75.7	76.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	225	710	2,247	7,104
CNEL:	249	787	2,489	7,870

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Greenfield
Road Segment: North of SR-73

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	200 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	57.454
Medium Trucks:	57.300
Heavy Trucks:	57.315

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-8.96	-0.67	0.00	*-0.95*	0.000	0.000
Medium Trucks:	79.45	-25.82	-0.66	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	84.25	-28.83	-0.66	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	58.8	56.9	55.2	49.1	57.7	58.3
Medium Trucks:	53.0	51.5	45.1	43.6	52.0	52.3
Heavy Trucks:	54.8	53.3	44.3	45.6	53.9	54.0
Vehicle Noise:	61.0	59.3	55.9	51.5	60.0	60.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	6	19	60	189
CNEL:	7	21	66	209

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Irvine Center/Moulton
Road Segment: Lake Forest to Ridge Route

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	47,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	4,700 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	4.29	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-12.56	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-15.57	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	74.7	72.8	71.0	64.9	73.6	74.2
Medium Trucks:	68.6	67.1	60.7	59.2	67.7	67.9
Heavy Trucks:	70.0	68.6	59.5	60.8	69.1	69.2
Vehicle Noise:	76.7	74.9	71.7	67.1	75.6	76.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	220	696	2,200	6,956
CNEL:	244	771	2,437	7,706

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Irvine Center/Moulton
Road Segment: South of Ridge Route

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	51,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	5,100 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	4.65	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-12.21	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-15.22	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	75.0	73.1	71.3	65.3	73.9	74.5
Medium Trucks:	69.0	67.5	61.1	59.5	68.0	68.2
Heavy Trucks:	70.3	68.9	59.9	61.1	69.5	69.6
Vehicle Noise:	77.0	75.3	72.0	67.5	76.0	76.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	239	755	2,387	7,548
CNEL:	264	836	2,644	8,362

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Irvine Center/Moulton
Road Segment: Glenwood to Laguna Hills

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	34,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,400 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	2.89	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-13.97	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-16.98	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	73.2	71.3	69.6	63.5	72.1	72.8
Medium Trucks:	67.2	65.7	59.3	57.8	66.2	66.5
Heavy Trucks:	68.6	67.1	58.1	59.4	67.7	67.8
Vehicle Noise:	75.3	73.5	70.2	65.7	74.2	74.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	159	503	1,591	5,032
CNEL:	176	557	1,763	5,575

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Irvine Center/Moulton
Road Segment: Laguna Hills to Alicia

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,800 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	2.04	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-14.81	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-17.82	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	72.4	70.5	68.7	62.7	71.3	71.9
Medium Trucks:	66.4	64.9	58.5	56.9	65.4	65.6
Heavy Trucks:	67.7	66.3	57.3	58.5	66.9	67.0
Vehicle Noise:	74.4	72.7	69.4	64.9	73.4	73.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	131	414	1,310	4,144
CNEL:	145	459	1,452	4,591

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Irvine Center/Moulton
Road Segment: Alicia to La Paz

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	30,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,000 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	2.34	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-14.51	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-17.52	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	72.7	70.8	69.0	63.0	71.6	72.2
Medium Trucks:	66.7	65.2	58.8	57.2	65.7	65.9
Heavy Trucks:	68.0	66.6	57.6	58.8	67.2	67.3
Vehicle Noise:	74.7	73.0	69.7	65.2	73.7	74.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	140	444	1,404	4,440
CNEL:	156	492	1,556	4,919

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Irvine Center/Moulton
Road Segment: La Paz to Oso

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,500 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	74 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	47.497
Medium Trucks:	47.311
Heavy Trucks:	47.329

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	1.55	0.15	0.00	*-0.95*	0.000	0.000
Medium Trucks:	81.00	-15.31	0.17	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	85.38	-18.32	0.17	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	71.9	70.0	68.2	62.2	70.8	71.4
Medium Trucks:	65.9	64.4	58.0	56.5	64.9	65.1
Heavy Trucks:	67.2	65.8	56.8	58.0	66.4	66.5
Vehicle Noise:	73.9	72.2	68.9	64.4	72.9	73.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	117	370	1,170	3,700
CNEL:	130	410	1,296	4,099

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Avd Carlota
Road Segment: Lake Forest to Ridge Route

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,200 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	57.454
Medium Trucks:	57.300
Heavy Trucks:	57.315

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-1.18	-0.67	0.00	*-0.95*	0.000	0.000
Medium Trucks:	79.45	-18.04	-0.66	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	84.25	-21.05	-0.66	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.6	64.7	62.9	56.9	65.5	66.1
Medium Trucks:	60.8	59.2	52.9	51.3	59.8	60.0
Heavy Trucks:	62.5	61.1	52.1	53.3	61.7	61.8
Vehicle Noise:	68.8	67.1	63.7	59.2	67.8	68.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	36	114	359	1,136
CNEL:	40	126	397	1,256

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Avd Carlota
Road Segment: South of Ridge Route

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,900 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	57.454
Medium Trucks:	57.300
Heavy Trucks:	57.315

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	0.82	-0.67	0.00	*-0.95*	0.000	0.000
Medium Trucks:	79.45	-16.04	-0.66	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	84.25	-19.05	-0.66	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.6	66.7	64.9	58.9	67.5	68.1
Medium Trucks:	62.7	61.2	54.9	53.3	61.8	62.0
Heavy Trucks:	64.5	63.1	54.1	55.3	63.7	63.8
Vehicle Noise:	70.8	69.1	65.7	61.2	69.8	70.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	57	180	569	1,799
CNEL:	63	199	629	1,988

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Avd Carlota
Road Segment: Paseo De Valencia to El Toro

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	38,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,800 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	57.454
Medium Trucks:	57.300
Heavy Trucks:	57.315

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	3.83	-0.67	0.00	*-0.95*	0.000	0.000
Medium Trucks:	79.45	-13.03	-0.66	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	84.25	-16.04	-0.66	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	71.6	69.7	68.0	61.9	70.5	71.1
Medium Trucks:	65.8	64.3	57.9	56.3	64.8	65.0
Heavy Trucks:	67.6	66.1	57.1	58.3	66.7	66.8
Vehicle Noise:	73.8	72.1	68.7	64.3	72.8	73.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	114	360	1,138	3,599
CNEL:	126	398	1,258	3,977

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Avd Carlota
Road Segment: El Toro to Los Alisos

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,500 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	57.454
Medium Trucks:	57.300
Heavy Trucks:	57.315

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-0.21	-0.67	0.00	*-0.95*	0.000	0.000
Medium Trucks:	79.45	-17.07	-0.66	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	84.25	-20.08	-0.66	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.6	65.7	63.9	57.9	66.5	67.1
Medium Trucks:	61.7	60.2	53.9	52.3	60.8	61.0
Heavy Trucks:	63.5	62.1	53.1	54.3	62.7	62.8
Vehicle Noise:	69.8	68.0	64.6	60.2	68.7	69.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	45	142	449	1,421
CNEL:	50	157	496	1,570

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Cabot
Road Segment: South of La Paz

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,200 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	57.454
Medium Trucks:	57.300
Heavy Trucks:	57.315

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-1.18	-0.67	0.00	*-0.95*	0.000	0.000
Medium Trucks:	79.45	-18.04	-0.66	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	84.25	-21.05	-0.66	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.6	64.7	62.9	56.9	65.5	66.1
Medium Trucks:	60.8	59.2	52.9	51.3	59.8	60.0
Heavy Trucks:	62.5	61.1	52.1	53.3	61.7	61.8
Vehicle Noise:	68.8	67.1	63.7	59.2	67.8	68.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	36	114	359	1,136
CNEL:	40	126	397	1,256

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Cabot
Road Segment: South of Paseo De Valencia
Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,900 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	57.454
Medium Trucks:	57.300
Heavy Trucks:	57.315

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	0.82	-0.67	0.00	*-0.95*	0.000	0.000
Medium Trucks:	79.45	-16.04	-0.66	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	84.25	-19.05	-0.66	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.6	66.7	64.9	58.9	67.5	68.1
Medium Trucks:	62.7	61.2	54.9	53.3	61.8	62.0
Heavy Trucks:	64.5	63.1	54.1	55.3	63.7	63.8
Vehicle Noise:	70.8	69.1	65.7	61.2	69.8	70.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	57	180	569	1,799
CNEL:	63	199	629	1,988

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Cabot
Road Segment: North of Oso

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	24,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,400 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	57.454
Medium Trucks:	57.300
Heavy Trucks:	57.315

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	1.83	-0.67	0.00	*-0.95*	0.000	0.000
Medium Trucks:	79.45	-15.03	-0.66	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	84.25	-18.04	-0.66	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	69.6	67.7	66.0	59.9	68.5	69.1
Medium Trucks:	63.8	62.3	55.9	54.3	62.8	63.0
Heavy Trucks:	65.6	64.1	55.1	56.3	64.7	64.8
Vehicle Noise:	71.8	70.1	66.7	62.3	70.8	71.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	72	227	719	2,273
CNEL:	79	251	794	2,512

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Cabot
Road Segment: South of Oso

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,700 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	40 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.00%
Medium Trucks:	84.8%	4.9%	10.3%	2.00%
Heavy Trucks:	86.5%	2.7%	10.8%	1.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	56.789
Medium Trucks:	56.633
Heavy Trucks:	56.648

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	-0.54	-0.62	0.00	*-0.95*	0.000	0.000
Medium Trucks:	82.40	-17.39	-0.61	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	86.40	-20.40	-0.61	0.00	*-1.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.6	68.7	67.0	60.9	69.5	70.1
Medium Trucks:	64.4	62.9	56.5	55.0	63.4	63.7
Heavy Trucks:	65.4	64.0	54.9	56.2	64.5	64.7
Vehicle Noise:	72.5	70.8	67.6	62.9	71.5	71.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	84	266	841	2,658
CNEL:	93	295	933	2,952

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Interstate 5
Road Segment: El Toro to Alicia

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	343,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	34,300 vehicles
Vehicle Speed:	65 mph
Near/Far Lane Distance:	150 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	200.0 feet
Centerline Dist. to Observer:	210.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	96.22%
Medium Trucks:	84.8%	4.9%	10.3%	1.65%
Heavy Trucks:	86.5%	2.7%	10.8%	2.13%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	196.214
Medium Trucks:	196.169
Heavy Trucks:	196.173

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	74.55	11.75	-6.01	0.00	*-1.10*	0.000	0.000
Medium Trucks:	84.86	-5.91	-6.01	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	88.18	-4.80	-6.01	0.00	*-1.29*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	80.3	78.4	76.6	70.6	79.2	79.8
Medium Trucks:	73.0	71.4	65.1	63.5	72.0	72.2
Heavy Trucks:	77.4	76.0	66.9	68.2	76.5	76.7
Vehicle Noise:	82.6	80.9	77.3	73.1	81.6	82.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	3,020	9,549	30,196	95,489
CNEL:	3,327	10,520	33,268	105,201

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Interstate 5
Road Segment: Alicia to La Paz

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	301,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	30,100 vehicles
Vehicle Speed:	65 mph
Near/Far Lane Distance:	150 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	200.0 feet
Centerline Dist. to Observer:	210.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	96.22%
Medium Trucks:	84.8%	4.9%	10.3%	1.65%
Heavy Trucks:	86.5%	2.7%	10.8%	2.13%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	196.214
Medium Trucks:	196.169
Heavy Trucks:	196.173

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	74.55	11.18	-6.01	0.00	*-1.10*	0.000	0.000
Medium Trucks:	84.86	-6.47	-6.01	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	88.18	-5.37	-6.01	0.00	*-1.29*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	79.7	77.8	76.1	70.0	78.6	79.2
Medium Trucks:	72.4	70.9	64.5	63.0	71.4	71.7
Heavy Trucks:	76.8	75.4	66.4	67.6	76.0	76.1
Vehicle Noise:	82.0	80.3	76.8	72.5	81.0	81.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	2,650	8,380	26,499	83,796
CNEL:	2,919	9,232	29,194	92,319

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Interstate 5
Road Segment: La Paz to Oso

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	300,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	30,000	vehicles
Vehicle Speed:	65	mph
Near/Far Lane Distance:	150	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	200.0	feet
Centerline Dist. to Observer:	210.0	feet
Barrier Distance to Observer:	10.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	96.22%
Medium Trucks:	84.8%	4.9%	10.3%	1.65%
Heavy Trucks:	86.5%	2.7%	10.8%	2.13%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	196.214
Medium Trucks:	196.169
Heavy Trucks:	196.173

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	74.55	11.17	-6.01	0.00	*-1.10*	0.000	0.000
Medium Trucks:	84.86	-6.49	-6.01	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	88.18	-5.38	-6.01	0.00	*-1.29*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	79.7	77.8	76.0	70.0	78.6	79.2
Medium Trucks:	72.4	70.9	64.5	63.0	71.4	71.6
Heavy Trucks:	76.8	75.4	66.3	67.6	75.9	76.1
Vehicle Noise:	82.0	80.3	76.8	72.5	81.0	81.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	2,641	8,352	26,411	83,518
CNEL:	2,910	9,201	29,097	92,013

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: Interstate 5
Road Segment: Oso to Crown Valley

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	278,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	27,800 vehicles
Vehicle Speed:	65 mph
Near/Far Lane Distance:	150 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	200.0 feet
Centerline Dist. to Observer:	210.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	96.22%
Medium Trucks:	84.8%	4.9%	10.3%	1.65%
Heavy Trucks:	86.5%	2.7%	10.8%	2.13%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	196.214
Medium Trucks:	196.169
Heavy Trucks:	196.173

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	74.55	10.84	-6.01	0.00	*-1.10*	0.000	0.000
Medium Trucks:	84.86	-6.82	-6.01	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	88.18	-5.71	-6.01	0.00	*-1.29*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	79.4	77.5	75.7	69.7	78.3	78.9
Medium Trucks:	72.0	70.5	64.2	62.6	71.1	71.3
Heavy Trucks:	76.5	75.0	66.0	67.3	75.6	75.7
Vehicle Noise:	81.7	80.0	76.4	72.1	80.7	81.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	2,447	7,739	24,474	77,393
CNEL:	2,696	8,527	26,963	85,265

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2030 Buildout
Road Name: State Route 73
Road Segment: Interstate 5 to El Toro

Project Name: Laguna Hills GP
Job Number: 6461
Analyst: A. Stalker

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	79,800 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	7,980 vehicles
Vehicle Speed:	65 mph
Near/Far Lane Distance:	150 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	200.0 feet
Centerline Dist. to Observer:	210.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	10
Medium Trucks (2 Axles):	10
Heavy Trucks (3+ Axles):	10

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	99.00%
Medium Trucks:	84.8%	4.9%	10.3%	0.75%
Heavy Trucks:	86.5%	2.7%	10.8%	0.25%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	196.214
Medium Trucks:	196.169
Heavy Trucks:	196.173

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	74.55	5.54	-6.01	0.00	*-1.10*	0.000	0.000
Medium Trucks:	84.86	-15.66	-6.01	0.00	*-1.15*	0.000	0.000
Heavy Trucks:	88.18	-20.44	-6.01	0.00	*-1.29*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	74.1	72.2	70.4	64.4	73.0	73.6
Medium Trucks:	63.2	61.7	55.3	53.8	62.2	62.5
Heavy Trucks:	61.7	60.3	51.3	52.5	60.9	61.0
Vehicle Noise:	74.6	72.8	70.6	65.0	73.6	74.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	478	1,513	4,783	15,125
CNEL:	543	1,719	5,435	17,186

APPENDIX E

GENERAL PLAN UPDATE
TRAFFIC STUDY

City of Laguna Hills
GENERAL PLAN UPDATE
MOBILITY ELEMENT

Traffic Study

December 2008

AUSTIN-FOUST ASSOCIATES, INC.

DRAFT

City of Laguna Hills

GENERAL PLAN UPDATE MOBILITY ELEMENT
Traffic Study

Prepared by:

Austin-Foust Associates, Inc.
2223 East Wellington Avenue, Suite 300
Santa Ana, California 92701-3161
(714) 667-0496

December 8, 2008

Table of Contents

Chapter Page

1.0 INTRODUCTION
Background and Scope 1-1
Performance Criteria 1-2
Study Area for the Traffic Analysis 1-6
Information in This Report 1-6
Definitions 1-7
References 1-8

2.0 TRANSPORTATION SETTING
Existing Circulation System 2-1
Existing Peak Hour Traffic Conditions 2-1
Future Growth 2-6
OCP-2006 Demographic Data Projections 2-8
Growth Areas 2-8

3.0 ARTERIAL ROADWAY PLAN
Roadway Classifications 3-1
Six Lane Smart Street 3-1
Six Lane Major Arterial 3-6
Four Lane Primary Arterial 3-6
Four Lane Secondary Arterial 3-6
Two Lane Collector/Commuter Arterial 3-7
Augmented Arterials 3-7
Roadway Dimensions 3-7
Intersection Dimensions 3-8

4.0 ARTERIAL HIGHWAY ANALYSIS
Highway Network 4-1
2030 Analysis 4-1

5.0 SPECIAL FEATURES
Principal Intersections 5-1
2030 MPAH Conditions 5-1
Circulation Alternatives 5-5
Ridge Route Drive/I-5 Overcrossing 5-5
Cabot Road Roadway Classification 5-8
La Paz Road Roadway Classification 5-8
Paseo de Valencia between El Toro Road and Laguna Hills Drive 5-8
Operational Analysis 5-8
Traffic Calming 5-9
Transportation System Management 5-12

Appendices:
A: Intersection Capacity Utilization (ICU) Worksheets
B: Zonal Land Use Summaries
C: HCM Delay Worksheets

List of Figures

Figure		Page
2-1	Existing (2007) Circulation System	2-2
2-2	Existing (2007) ADT Volumes (000s)	2-3
2-3	Existing Intersection Location Map	2-6
2-4	Existing (2007) Peak Hour ICUs – Highest AM/PM LOS Value	2-7
2-5	Project Areas	2-10
3-1	Typical Cross-Sections	3-3
3-2	City of Laguna Hills Circulation Plan	3-4
3-3	Orange County Master Plan of Arterial Highways	3-5
4-1	2030 ADT Volumes (000s) – With Proposed Land Use Changes (Committed Network)	4-4
4-2	2030 Intersection Location Map	4-6
4-3	2030 Peak Hour ICUs – Highest AM/PM LOS Value (Committed Network)	4-7
5-1	Principal Intersections	5-2
5-2	2030 ADT Volumes (000s) – With Proposed Land Use Changes (MPAH Network)	5-4
5-3	2030 Peak Hour ICUs – Highest AM/PM LOS Value (MPAH Network)	5-7
A-1	2030 Intersection Location Map	A-5
B-1	Laguna Hills Traffic Analysis Model (LHTAM) Zone System	B-2

List of Tables

Table		Page
1-1	Arterial Intersection Performance Criteria	1-4
1-2	Level of Service Descriptions	1-5
2-1	Existing (2007) LOS Summary	2-4
2-2	Proposed Land Use Changes and Trip Generation Summary	2-10
2-3	Project Alternative Trip Generation Comparison (Sites 1 and 2)	2-16
3-1	Roadway Classifications	3-2
3-2	Intersection Lane Guidelines	3-9
4-1	Year 2030 Committed Improvements (Laguna Hills and Vicinity)	4-2
4-2	2030 LOS Summary – Committed Network	4-5
5-1	Year 2030 MPAH Non-Committed and Partially Funded Improvements (Laguna Hills and Vicinity)	5-3
5-2	2030 LOS Summary – MPAH Network	5-6
5-3	Operational Analysis PM Peak Hour LOS Summary	5-10
5-4	Traffic Calming Toolbox	5-13
A-1	Existing and Future Intersection Lane Geometrics	A-6

Chapter 1.0
INTRODUCTION

This report presents the results of a Citywide traffic study carried out for the City of Laguna Hills. It contains existing and future traffic information and is intended to provide resource material for the General Plan update and accompanying EIR.

BACKGROUND AND SCOPE

The information contained in this traffic study provides a comprehensive evaluation of the Citywide arterial highway system. The purpose is to determine the adequacy of the arterial highway component of the circulation system in relation to the General Plan Land Use Element. Work carried out and subject areas covered in the traffic study are as follows:

1. Preparation of a Citywide traffic forecasting model
2. Preparation of long-range traffic forecasts
3. Evaluation of the arterial highway system
4. Identification of long-range improvements needed to implement the Mobility Element
5. Mobility Element features and special issues

To derive traffic forecasts, use is made of the City of Laguna Hills Traffic Analysis Model (LHTAM). This traffic model produces average daily traffic (ADT) forecasts for the roadway system and peak hour forecasts for major intersections. Buildout land use data from the General Plan Land Use Element has been used as the basis for the traffic forecasts, thereby showing future circulation system needs in relation to future land use projections.

The long-range traffic forecasts produced by the LHTAM use land use projections for year 2030 are quantified according to traffic analysis zones (TAZ's). Within the City, this data depicts the development potential of the updated Land Use Element. Outside the City, year 2030 demographic data as given in OCP-2004 is used except recent nearby approved projects have been incorporated. OCP-2006 is the latest however it has not been incorporated into the Orange County Traffic Analysis Model (OCTAM) model which the LHTAM is derived. (See Reference 1 at the end of this chapter and the

discussion on OCP-2006 in Chapter 2.0). This land use database information can be found in the Technical Resource Notebook. (See Reference 4 at the end of this chapter.)

The highway system evaluation uses specified performance criteria to identify future traffic improvements needed to serve the future traffic. These improvements thereby represent the mitigation measures that are necessary to build out the General Plan Land Use Element.

PERFORMANCE CRITERIA

To evaluate the roadway system in relation to future land use in the City, use is made of performance criteria. These criteria include "performance standards" which form part of City Policy (e.g., in the Mobility Element) and represent desired operating conditions for the City's roadway system. For a Mobility Element to be in "balance" with the Land Use Element of the General Plan, the circulation system must achieve such criteria.

The performance criteria used here are based on two primary measures. The first is "capacity" which establishes the vehicle carrying ability of a roadway and the second is "volume." The volume measure is either a traffic count (in the case of existing volumes) or a forecast for a future point in time. The ratio between the volume and the capacity gives a volume/capacity (V/C) ratio and based on that V/C ratio, a corresponding level of service (LOS) is defined. Peak hour data (AM and PM) is used to establish V/C and LOS measures and to define the performance criteria. For the arterial system, the peak hour is the accepted time period used for roadway performance evaluation and a number of techniques are available to establish suitable V/C ratios and define the corresponding LOS's. Those defined here are considered appropriate for planning level analyses (rather than detailed traffic operations analyses) and also apply to EIR impact analyses.

The analysis of the arterial road system is based on intersection capacity since this is the defining capacity limitation on an arterial roadway system. Levels of service for arterial roadway intersections are based on operating conditions during the AM and PM peak hours. The intersection capacity utilization (ICU) methodology defines peak hour performance, and is applied using peak hour volumes and the geometric configuration of the intersection. This methodology sums the V/C ratios for the critical movements of an intersection to give an overall V/C and corresponding LOS (see Reference 2 at the end of this chapter).

The calculation methodology and performance criteria used for the study area arterial system are summarized in Table 1-1. The ICU saturation flow rate and clearance interval parameters used here are representative values for planning purposes. Table 1-2 summarizes the LOS descriptions for arterial intersections. These descriptions are taken from material contained in the Highway Capacity Manual (HCM) 2000.

Various level of service policy standards have been established to evaluate observed traffic conditions, future development plans, and street network modifications. At the regional planning level, the statewide Congestion Management Program (CMP) specifies LOS E (V/C ratio less than or equal to 1.00) as the operating standard for CMP intersections in Orange County. The only CMP designated intersection in the City of Laguna Hills where LOS "E" is acceptable per the CMP is:

- Avenida de la Carlota at El Toro Road (near I-5 southbound ramps)

At the local level, evaluation of volumes, capacities, and levels of service on the City street system is based on peak hour intersection data, since intersections are the primary limiting factor affecting traffic flow on City streets. The City uses peak hour intersection capacity utilization (ICU) values to calculate the performance of intersections within its jurisdiction. The City's performance standard for intersections is LOS "D" which is an ICU value of .90 or less. This LOS "D" policy represents a desirable threshold for attaining acceptable mobility on the City's arterial street system over time. It is recognized however, that not all traffic growth is attributable to land use decisions made by the City and that specific intersections may have physical or other constraints that create difficulties in making the necessary improvements. Under such circumstances, a finding can be made that a specific location is a "critical intersection" with LOS able to degrade below "D." At the same time, any such critical intersections are to be monitored over time to determine if 1) improvements at nearby locations direct enough traffic from the critical intersection to bring it to an acceptable LOS or 2) changes occur that reduce traffic at the intersection or create opportunities for making physical improvements.

As shown in later chapters of this report, there are situations where constraints such as closely spaced intersections do not allow the theoretical ICU values to be achieved. In such cases, operational analyses are carried out using delay-based procedures as described in the HCM.

Table 1-1

ARTERIAL INTERSECTION PERFORMANCE CRITERIA

SIGNALIZED INTERSECTIONS

Methodology

Level of service based on peak hour intersection capacity utilization (ICU) values calculated using the following assumptions:

Saturation Flow Rate: 1,700 vehicles/hour/lane
Clearance Interval: .05

Performance Standard

Level of Service "D" (peak hour ICU less than or equal to .90), except for specially designated intersections (i.e., Congestion Management Program (CMP) intersections) where level of service "E" is acceptable.

LEVELS OF SERVICE

Level of service ranges are as follows:

ICU	LEVEL OF SERVICE (LOS)
.00 – .60	A
.61 – .70	B
.71 – .80	C
.81 – .90	D
.91 – 1.00	E
Above 1.00	F

Table 1-2

LEVEL OF SERVICE DESCRIPTIONS

Levels of service (LOS) is defined in terms of either "control delay" (HCM methodology) or "volume/capacity ratios" (for signalized intersections using the ICU methodology) as follows:

LOS	*Description	HCM[1] Delay Per Vehicle (sec.)		ICU or V/C[2] (Volume/ Capacity)
		Signalized	Unsignalized	
A	LOS "A" describes operations with low control delay, up to 10 seconds per vehicle. This LOS occurs when progression is extremely favorable and most vehicles arrive during the green phase. Many vehicles do not stop at all. Short cycle lengths may tend to contribute to low delay values.	≤ 10.0	≤ 10.0	≤ .60
B	LOS "B" describes operations with control delay greater than 10 and up to 20 seconds per vehicle. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than the LOS "A," causing higher levels of delay.	10.1 – 20.0	10.1 – 15.0	.61 - .70
C	LOS "C" describes operations with control delay greater than 20 and up to 35 seconds per vehicle. These higher delays may result from only fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. Cycle failure occurs when a given green phase does not serve queued vehicles, and overflows occur. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.	20.1 – 35.0	15.1 – 25.0	.71 - .80
D	LOS "D" describes operations with control delay greater than 35 and up to 55 seconds per vehicle. At LOS "D," the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, and high V/C ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	35.1 – 55.0	25.1 – 35.0	.81 - .90
E	LOS "E" describes operations with control delay greater than 55 and up to 80 seconds per vehicle. These high delay values generally indicate poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent.	55.1 – 80.0	35.1 – 50.0	.91 – 1.00
F	LOS "F" describes operations with control delay in excess of 80 seconds per vehicle. This level, considered unacceptable to most drivers, often occurs with oversaturation, that is, when arrival flow rates exceed the capacity of lane groups. It may also occur at high V/C ratios with many individual cycle failures. Poor progression and long cycle lengths may also contribute significantly to high delay levels.	> 80.0	> 50.0	> 1.00

[1] Source: *Highway Capacity Manual 2000 (HCM 2000)*, Transportation Research Board, National Research Council.
[2] Source: Orange County Congestion Management Program (CMP).

STUDY AREA FOR THE TRAFFIC ANALYSIS

The purpose of this traffic study is to determine the adequacy of the arterial highway component of the circulation system in relation to the General Plan Land Use Element. For this reason, the study area encompasses only roadway segments and intersections within the City of Laguna Hills. With respect to using this study area definition for the EIR, the following should be noted:

1) The 2030 setting used for the analysis assumes the General Plans of the adjacent cities as portrayed in the OCP-2004 demographic data (OCP-2006 has been approved but has not yet been incorporated into the county traffic model) as well as any recently approved projects in these cities. Hence the 2030 analysis gives a cumulative setting in which all cities evaluate their General Plan in a consistent manner.
2) The land uses being depicted for year 2030 (long-range buildout of the City General Plan) are not compared to a "No-Project" scenario as would occur in a typical project EIR. This is appropriate for a General Plan study since no actual entitlement is given by the adoption of a General Plan.
3) Entitlement for each of the proposed land use changes is not being sought at this time, and as each opportunity area submits an application for project entitlement, an analysis will be required to determine the extent of the project's impact (i.e., study area). Significance criteria will be defined to determine project impacts, and the study area will include areas outside the City and Caltrans facilities such as freeway interchange ramps and freeway mainline segments. Appropriate performance criteria and analysis methodology will be determined at that time (e.g., the use of Caltrans methodology for Sate Highway facilities).

INFORMATION IN THIS REPORT

The information presented in this report is arranged as follows:

Chapter 1.0 Introduction – background and scope plus a description of the performance criteria used in the traffic analysis.

Chapter 2.0 Transportation Setting – describes existing conditions with respect to circulation and future growth forecasts.

Chapter 3.0 Arterial Roadways – presents the proposed roadway component of the Circulation Plan.

Chapter 4.0 Traffic Analysis – discusses future traffic volumes and levels of service, and shows the improvements needed to implement the proposed roadway plan.

Chapter 5.0 Special Issues – addresses a number of circulation issues and their relationship to the Circulation Plan.

Technical appendices contain tabular data as appropriate, and traffic model data can be found in the traffic model description report and the previously referenced technical notebook (References 3 and 4 at the end of this chapter).

DEFINITIONS

Certain terms used throughout this report are defined below to clarify their intended meaning:

ADT Average Daily Traffic. Generally used to measure the total two-directional traffic volumes passing a given point on a roadway.

DU Dwelling Unit. Used in quantifying residential land use.

ICU Intersection Capacity Utilization. A measure of the volume to capacity ratio for an intersection. Typically used to determine the peak hour level of service for a given set of intersection volumes.

LOS Level of Service. A scale used to evaluate circulation system performance based on intersection ICU values or volume/capacity ratios of arterial segments.

Peak Hour This refers to the hour during the AM peak period (typically 7 AM - 9 AM) or the PM peak period (typically 3 PM - 6 PM) in which the greatest number of vehicle trips are generated by a given land use or are traveling on a given roadway.

Tripend A trip generation measure which represents the total trips entering and leaving a location.

TSF Thousand Square Feet. Used in quantifying non-residential land uses, and refers to building floor area.

V/C Volume to Capacity Ratio. This is typically used to describe the percentage of capacity utilized by existing or projected traffic on a segment of an arterial or intersection.

VPD Vehicles Per Day. Similar to ADT, but more typically applied to trip generation (i.e., the amount of traffic generated by a given amount of land use).

VPH Vehicles Per Hour. Used for roadway volumes (counts or forecasts) and trip generation estimates. Measures the number of vehicles in a one-hour period, typically the AM or PM peak hour.

REFERENCES

1. "Orange County Projections 2006," Center for Demographic Research, November 2006.

2. "Highway Capacity Manual 2000," Transportation Research Board, National Research Council.

3. "City of Laguna Hills Traffic Analysis Model Description and Validation," Austin-Foust Associates, Inc., December 2008.

4. "City of Laguna Hills General Plan Update Technical Notebook," Austin-Foust Associates, Inc., December 2008.

Chapter 2.0
TRANSPORTATION SETTING

This chapter describes the existing circulation system and traffic conditions for the City of Laguna Hills. Recent traffic volumes are summarized together with the existing operating conditions. Future growth is then discussed in relation to the General Plan Land Use Element.

EXISTING CIRCULATION SYSTEM

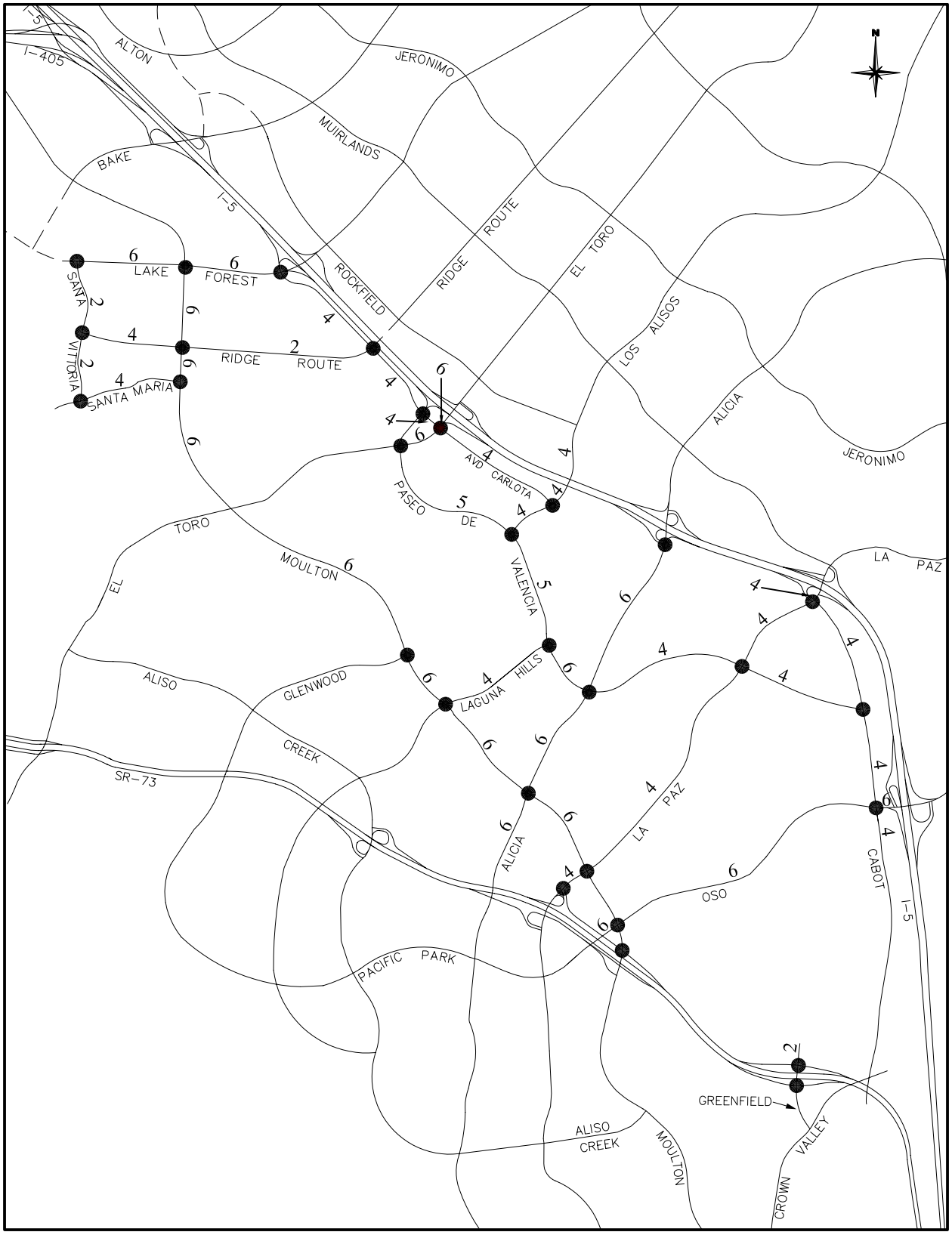
The existing arterial highway network system is illustrated in Figure 2-1. Included here are all the Mobility Element roadways together with the number of midblock travel lanes on individual roadway segments. The I-405 Freeway traverses the northern portion of the City and freeway interchanges serving the City are located at Lake Forest Drive, El Toro Road, Alicia Parkway, La Paz Road and Oso Parkway. Los Alisos Boulevard has an overcrossing of the I-5 Freeway. Additionally, the SR-73 toll road can be accessed near the City Limits at Moulton Parkway and La Paz Road.

The existing average daily traffic (ADT) volumes on the circulation system are illustrated in Figure 2-2. The volumes for the arterial roads in the City are from traffic counts collected in 2007. Moulton Parkway is a six lane arterial traversing the City with volumes ranging from 27,000 at the north end to 17,000 at the boundary with Laguna Niguel. Alicia Parkway, a four to six lane arterial, carries volumes ranging from 51,000 at the I-5 Freeway to 39,000 where it crosses at the SR-73. Other high volume roadways include Paseo de Valencia with 34,000 ADT north of Laguna Hills Drive and Oso Parkway with 30,000 ADT west of Cabot Road.

As discussed in Chapter 1.0 under the Performance Criteria, the ADT volumes are a useful measure to show general levels of traffic on circulation facilities within the City, but are not used as the basis for determining operating conditions on the circulation system. The reason is that traffic performance is largely an AM and PM peak occurrence and ADT does not always reflect peak conditions.

EXISTING PEAK HOUR TRAFFIC CONDITIONS

The existing intersection capacity utilization (ICU) values are summarized in Table 2-1 for the



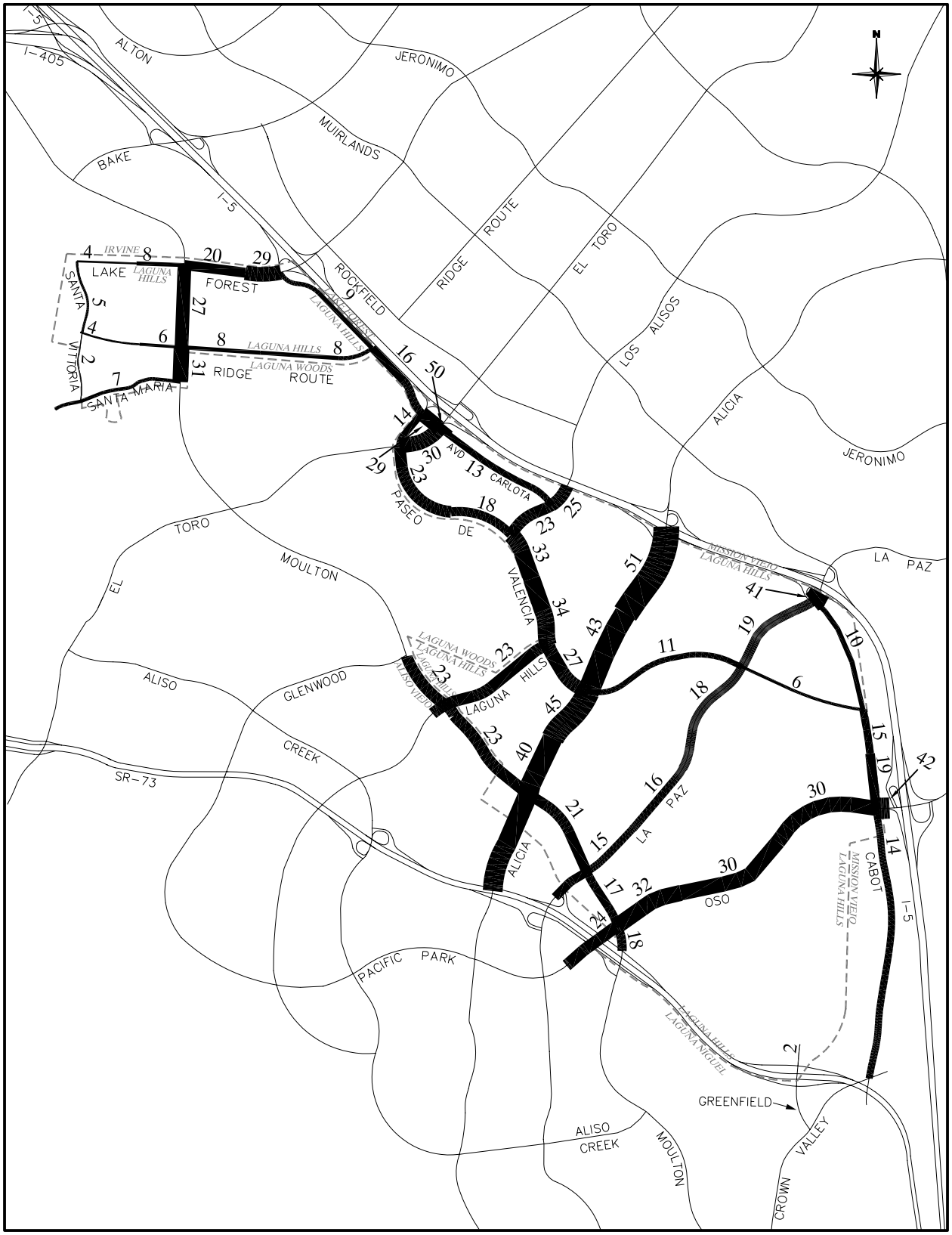
Legend

X Midblock Lanes

● Signalized Intersection analyzed in the traffic study

Figure 2-1

EXISTING (2007) CIRCULATION SYSTEM



Legend

10 20 30 40 50 ADT Volumes

City Limits

Figure 2-2

EXISTING (2007) ADT VOLUMES (000s)

Table 2-1

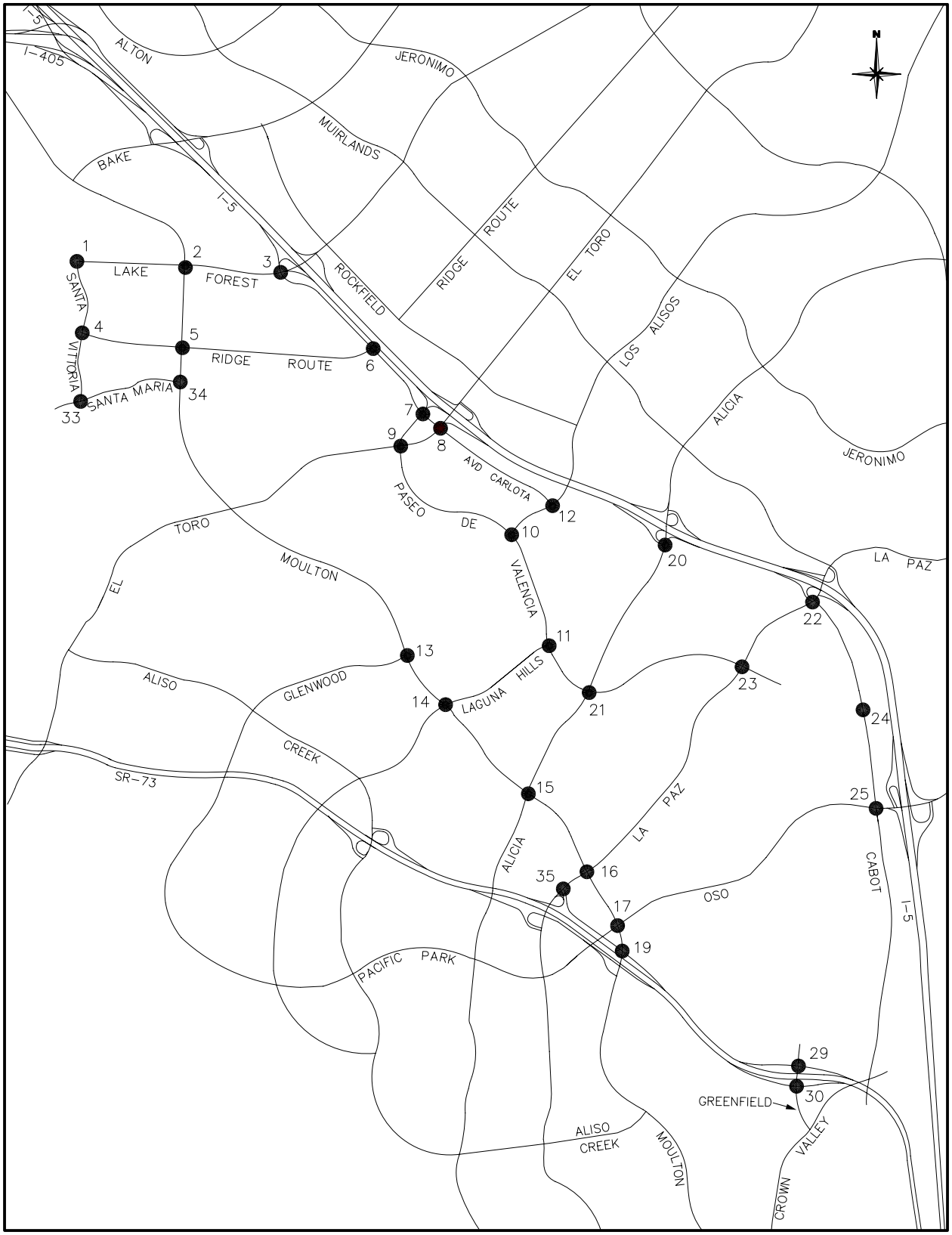
EXISTING (2007) LOS SUMMARY

Intersection*	AM Peak Hour		PM Peak Hour	
	ICU	**LOS**	**ICU**	**LOS**
1. Santa Vittoria Dr & Lake Forest Dr	.28	A	.33	A
2. Moulton Pkwy & Lake Forest Dr	.46	A	.44	A
3. I-5/Avd de la Carlota & Lake Forest Dr	.52	A	.72	C
4. Santa Vittoria Dr & Ridge Route Dr	.36	A	.32	A
5. Moulton Pkwy & Ridge Route Dr	.45	A	.54	A
6. Avd de la Carlota & Ridge Route Dr	.32	A	.49	A
7. Avd de la Carlota & Paseo de Valencia	.53	A	.58	A
8. Avd de la Carlota & El Toro Rd (a)	.65	B	.87	D
9. Paseo de Valencia & El Toro Rd	.59	A	.58	A
10. Paseo de Valencia & Los Aliso Blvd	.41	A	.52	A
11. Paseo de Valencia & Laguna Hills Dr	.58	A	.66	B
12. Avd de la Carlota & Los Alisos Blvd	.41	A	.55	A
13. Moulton Pkwy & Glenwood Dr	.46	A	.47	A
14. Moulton Pkwy & Laguna Hills Dr	.55	A	.57	A
15. Moulton Pkwy & Alicia Pkwy	.54	A	.58	A
16. Moulton Pkwy & La Paz Rd	.40	A	.39	A
17. Moulton Pkwy & Oso Pkwy	.40	A	.51	A
19. Moulton Pkwy & SR-73 WB Ramp	.36	A	.28	A
20. I-5 SB Ramps & Alicia Pkwy	.79	C	.91	E*
21. Paseo de Valencia & Alicia Pkwy	.58	A	.62	B
22. I-5 SB Ramps/Cabot & La Paz Rd	.84	D	1.01	F*
23. Paseo de Valencia & La Paz Rd	.43	A	.44	A
24. Cabot Rd & Paseo de Valencia	.38	A	.38	A
25. Cabot Rd & Oso Pkwy	.51	A	.60	A
29. Greenfield Dr & SR-73 Ramps	.54	A	.45	A
30. Greenfield Dr & SR-73 ES Ramps	.43	A	.59	A
33. Santa Vittoria Dr & Santa Maria	.16	A	.17	A
34. Moulton Pkwy & Santa Maria	.43	A	.65	B
35. Merienda/SR-73 WB Ramps & La Paz Rd	.43	A	.32	A

* See intersection location map in Figure 2-3.

Note: (a) LOS "E" is acceptable at this location. LOS "D" is the City's adopted standard for the remaining study area intersections.

Abbreviations: ICU - intersection capacity utilization, LOS - level of service
ICU LOS ranges: .00 – .60 A
.61 – .70 B
.71 – .80 C
.81 – .90 D
.91 – 1.00 E
Above 1.00 F



Legend

XX Intersection location and reference number

Figure 2-3

EXISTING INTERSECTION LOCATION MAP

intersections shown in Figure 2-3. Actual AM and PM peak hour turn volumes and ICU calculation worksheets are included in Appendix A.

Figure 2-4 illustrates the existing peak hour intersection ICU and level of service (LOS) values throughout the City. For each intersection location, the highest peak hour ICU value during the AM or PM peak hour is shown here together with the corresponding LOS. Currently, two intersections operate worse than the acceptable LOS "D" threshold (ICU to not exceed .90). Both intersections are at I-5 Freeway interchanges (Alicia Parkway and La Paz Road). It should be noted that Avenida de la Carlota at El Toro Road is operating at LOS "E" (ICU between .91 and 1.00) which is acceptable since it is an intersection in the Congestion Management Program (CMP).

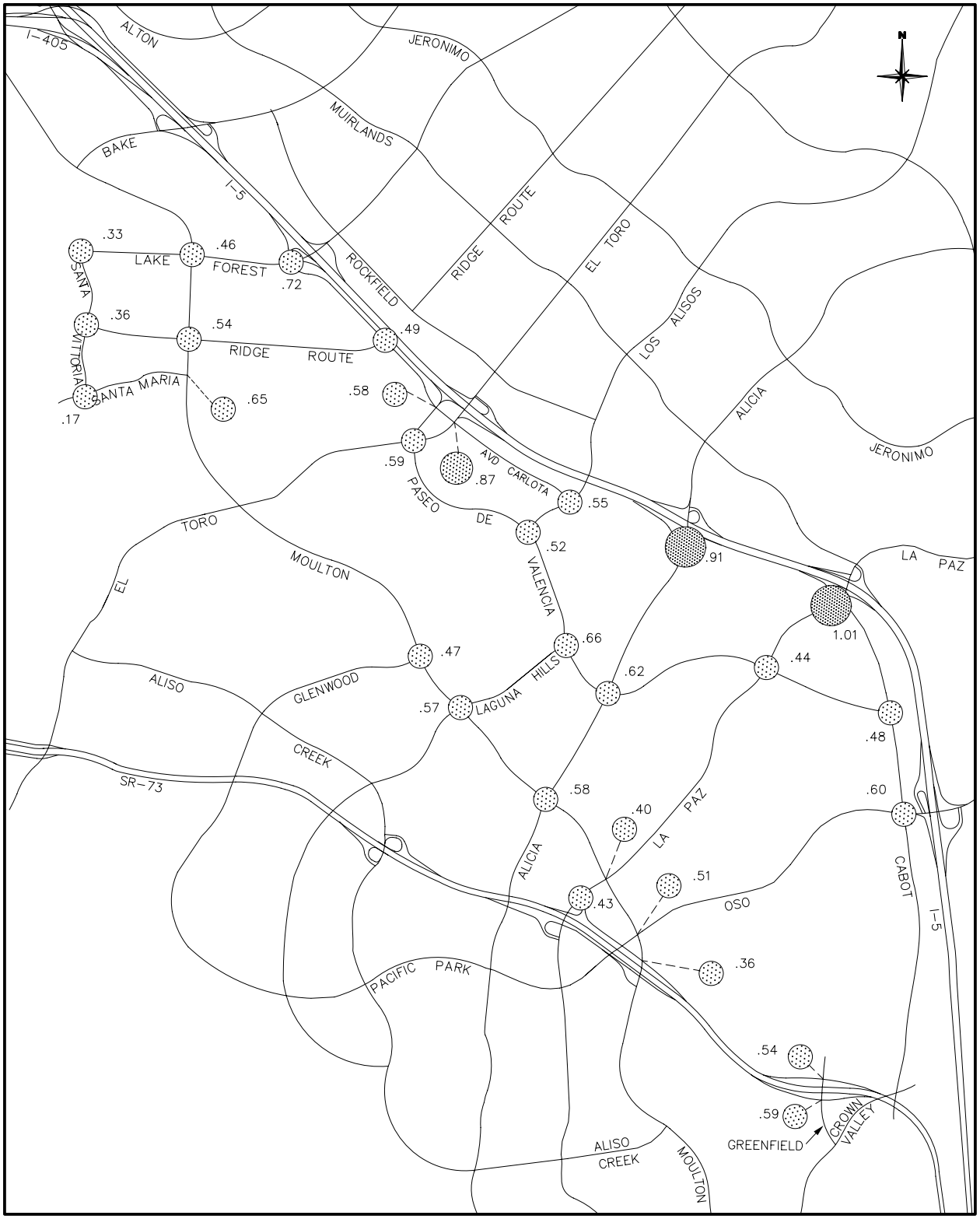
It should be noted that the ICU values are calculated on the assumption of ideal operating conditions. Certain conditions such as short roadway sections, which cause vehicle queues to block adjacent intersections, high pedestrian volumes, or uneven lane utilization can prevent ideal conditions from occurring. The most prominent operational deficiency where the theoretical ICU values do not portray actual conditions is on the section of Avenida de la Carlota between the I-5 southbound ramp intersection and El Toro Road. Conditions related to operational deficiencies include short intersection spacing and weaving movements within this roadway segment.

FUTURE GROWTH

The Laguna Hills Traffic Analysis Model (LHTAM) uses geographically defined land use databases as primary inputs to the modeling process. The information is quantified by traffic analysis zones (TAZ's), of which there are 100 such zones in the City (for more information, see the LHTAM Model Description and Validation report (Reference 3).

The existing land use database represents January 2008 conditions. The year 2030 land uses represent a future scenario as defined by long-range development plans depicted in the Land Use Element. Such assumptions enable future land use by type to be projected and allocated to the Citywide traffic zone system in a manner that portrays potential growth in the City.

The following section discusses Citywide growth as projected by the Countywide demographic data forecasting process and by the Land Use Element quantifications noted above. The former provides a comparison check for the corresponding information derived from the Citywide land use projections.



Legend

.80 and below
LOS A - C

.81 - .90
LOS D

.91 and above
LOS E - F

Figure 2-4

EXISTING (2007) PEAK HOUR ICUs
- HIGHEST AM/PM LOS VALUE

OCP-2006 Demographic Data Projections

The Orange County Projections 2006 (known as OCP-2006), approved by the Orange County Council of Governments (OCCOG) on November 30, 2006, is the tenth in a series of such projections dating back to 1978 (see Reference 1 at the end of Chapter 1.0). The OCP series is developed by the Cal State University, Fullerton, Center for Demographic Research (CDR) to provide a consistent set of projections of population, housing and employment for use in a variety of activities, including transportation planning. In addition, the information provides Southern California Association of Governments (SCAG) with a set of projections for inclusion in their regional growth forecasts.

In OCP-2006, population, housing and employment (jobs) are projected through the year 2035 in five year increments using year 2003 as the base year. Those projections include totals for each of the 10 Regional Statistical Areas into which the County is subdivided, these being the geographic levels at which the projections are formally adopted by OCCOG. Additionally, projections are presented for a variety of other geographic areas including the 34 general government jurisdictions (Cities), the County's 70 Community Analysis Areas (CAAs), and the 577 census tracts in the County.

A summary of the OCP-2006 projections from 2005 to 2030 for the City of Laguna Hills follows:

OCP-2006 DEMOGRAPHIC DATA
CITY OF LAGUNA HILLS

Land Use	2005	2030	Growth	Growth (%)
Population	32,960	36,210	3,250	10%
Housing	11,188	11,508	320	3%
Employment	25,308	28,893	3,585	14%

These projections show a 10 percent growth in population and a 14 percent growth in employment by year 2030.

GROWTH AREAS

Most of the potential growth implied by the General Plan Land Use Element occurs in a few selected areas within the City of Laguna Hills. These growth areas are illustrated in Figure 2-5. Table 2-2 summarizes the proposed land use changes and resulting trip generation for each growth area/site. As can be seen here, the total trip generation for all project areas is 40,626 ADT with five and nine percent generated in the AM and PM peak hours, respectively.

Legend

① Urban Village
② Alicia Gateway
③ Moulton/Ridge Route
④ Via Lomas
⑤ Moulton/La Paz
⑥ La Paz Gateway
⑦ Vacant Residential Sites

Source: EDAW

Figure 2-5

PROJECT AREAS

Table 2-2

PROPOSED LAND USE CHANGES AND TRIP GENERATION SUMMARY

Land Use	Units	AM Peak Hour			PM Peak Hour			ADT
		In	Out	Total	In	Out	Total	
SITE 1 – URBAN VILLAGE (ALTERNATIVE 1 - GENERAL OFFICE)								
EXISTING								
1. Single Family Detached	76 DU	14	42	56	48	28	76	727
3. Apartments	360 DU	36	147	183	144	79	223	2,419
6. Convalescent Home	267 Bed	32	19	51	19	27	46	633
8. General Comm (~200 TSF)	1,254.03 TSF	979	627	1,606	2,789	3,023	5,812	66,815
9. Strip Comm (~100 TSF)	37.28 TSF	32	21	53	91	98	189	2,169
10. General Office	408.32 TSF	555	78	633	102	506	608	4,497
11. Medical Office	309.84 TSF	743	185	928	464	1,085	1,549	15,492
13. Hospital	127.40 TSF	102	51	153	50	101	151	2,238
14. Church/Synagogue	27.00 TSF	11	9	20	9	9	18	246
16. Private School (PreK-8)	126 Stu	63	52	115	37	40	77	137
Total		**2,567**	**1,231**	**3,798**	**3,753**	**4,996**	**8,749**	**95,373**
PROPOSED FUTURE								
1. Single Family Detached	76 DU	14	42	56	48	28	76	727
3. Apartments	560 DU	56	229	285	224	123	347	3,763
6. Convalescent Home	267 Bed	32	19	51	19	27	46	633
8. General Comm (~200 TSF)	1,554.03 TSF	1,213	777	1,990	3,457	3,746	7,203	82,799
9. Strip Comm (~100 TSF)	37.28 TSF	32	21	53	91	98	189	2,169
10. General Office	788.32 TSF	1,072	150	1,222	197	977	1,174	8,681
11. Medical Office	309.84 TSF	743	185	928	464	1,085	1,549	15,492
13. Hospital	127.40 TSF	102	51	153	50	101	151	2,238
14. Church/Synagogue	27.00 TSF	11	9	20	9	9	18	246
16. Private School (PreK-8)	126 Stu	63	52	115	37	40	77	137
21. Hotel	250 Room	100	68	168	103	88	191	2,230
Total		**3,438**	**1,603**	**5,041**	**4,699**	**6,322**	**11,021**	**119,115**
NET CHANGE								
1. Single Family Detached	0 DU	0	0	0	0	0	0	0
3. Apartments	200 DU	20	82	102	80	44	124	1,344
6. Convalescent Home	0 Bed	0	0	0	0	0	0	0
8. General Comm (~200 TSF)	300.00 TSF	234	150	384	668	723	1,391	15,984
9. Strip Comm (~100 TSF)	0 TSF	0	0	0	0	0	0	0
10. General Office	380.00 TSF	517	72	589	95	471	566	4,184
11. Medical Office	0 TSF	0	0	0	0	0	0	0
13. Hospital	0 TSF	0	0	0	0	0	0	0
14. Church/Synagogue	0 TSF	0	0	0	0	0	0	0
16. Private School (PreK-8)	0 Stu	0	0	0	0	0	0	0
21. Hotel	250 Room	100	68	168	103	88	191	2,230
Net Difference		**871**	**372**	**1,243**	**946**	**1,326**	**2,272**	**23,742**
SITE 2 – ALICIA GATEWAY (ALTERNATIVE 1 - GENERAL OFFICE)								
EXISTING								
8. General Comm (~200 TSF)	222.62 TSF	173	111	284	495	536	1,031	11,861
10. General Office	106.65 TSF	145	20	165	27	132	159	1,174
Total		**318**	**131**	**449**	**522**	**668**	**1,190**	**13,035**

Table 2-2 (cont.)
PROPOSED LAND USE CHANGES AND TRIP GENERATION SUMMARY

Land Use	Units	AM Peak Hour			PM Peak Hour			ADT
		In	Out	Total	In	Out	Total	
SITE 2 – ALICIA GATEWAY (ALTERNATIVE 1 - GENERAL OFFICE) (cont.)								
PROPOSED FUTURE								
8. General Comm (~200 TSF)	420.80 TSF	328	210	538	936	1,014	1,950	22,420
10. General Office	102.20 TSF	139	19	158	26	127	152	1,125
Total		**467**	**229**	**696**	**962**	**1,141**	**2,102**	**23,545**
NET CHANGE								
8. General Comm (~200 TSF)	198.19 TSF	155	99	254	441	478	919	10,559
10. General Office	-4.45 TSF	-6	-1	-7	-1	-5	-7	-49
Net Difference		**149**	**98**	**247**	**440**	**473**	**912**	**10,510**
SITE 3 – NORTH BUSINESS PARK								
EXISTING								
5. Mobile Home	252 DU	20	81	101	88	53	141	1,257
8. General Comm (~200 TSF)	355.37 TSF	277	177	454	790	857	1,647	18,934
10. General Office	374.47 TSF	510	71	581	94	464	558	4,123
11. Medical Office	40.00 TSF	96	24	120	60	140	200	2,000
12. Business Park	1,496.62 TSF	1,796	344	2,140	450	1,482	1,932	19,097
Total		**2,699**	**697**	**3,396**	**1,482**	**2,996**	**4,478**	**45,411**
PROPOSED FUTURE								
5. Mobile Home	252 DU	20	81	101	88	53	141	1,257
8. General Comm (~200 TSF)	373.14 TSF	291	186	477	830	899	1,729	19,880
10. General Office	393.20 TSF	535	75	610	98	487	585	4,329
11. Medical Office	42.00 TSF	101	25	126	63	147	210	2,100
12. Business Park	1,571.45 TSF	1,886	361	2,247	473	1,556	2,029	20,052
Total		**2,833**	**728**	**3,561**	**1,552**	**3,142**	**4,694**	**47,618**
NET CHANGE								
5. Mobile Home	0 DU	0	0	0	0	0	0	0
8. General Comm (~200 TSF)	17.77 TSF	14	9	23	40	42	82	946
10. General Office	18.72 TSF	25	4	29	4	23	27	206
11. Medical Office	2.00 TSF	5	1	6	3	7	10	100
12. Business Park	74.83 TSF	90	17	107	23	74	97	955
Net Difference		**134**	**31**	**165**	**70**	**146**	**216**	**2,207**
SITE 4 – VIA LOMAS								
EXISTING								
3. Apartments	102 DU	10	42	52	41	22	63	685
4. Multi-Family	248 DU	42	124	166	112	82	194	2,021
20. Park	2.26 Acre	0	0	0	0	0	0	4
Total		**52**	**166**	**218**	**153**	**104**	**257**	**2,710**
PROPOSED FUTURE								
2. Condominiums	498 DU	85	249	334	224	164	388	4,059
3. Apartments	102 DU	10	42	52	41	22	63	685
20. Park	13.00 Acre	0	0	0	0	0	0	21
Total		**95**	**291**	**386**	**265**	**186**	**451**	**4,765**

Table 2-2 (cont.)
PROPOSED LAND USE CHANGES AND TRIP GENERATION SUMMARY

Land Use	Units	AM Peak Hour			PM Peak Hour			ADT
		In	Out	Total	In	Out	Total	
SITE 4 – VIA LOMAS (cont.)								
NET CHANGE								
2. Condominiums	498 DU	85	249	334	224	164	388	4,059
3. Apartments	0 DU	0	0	0	0	0	0	0
4. Multi-Family	-248 DU	-42	-124	-166	-112	-82	-194	-2,021
20. Park	10.74 Acre	0	0	0	0	0	0	17
Net Difference		**43**	**125**	**168**	**112**	**82**	**194**	**2,055**
SITE 5 – MOULTON & LA PAZ								
EXISTING								
8. General Comm (~200 TSF)	54.70 TSF	43	27	70	122	132	254	2,914
Total		**43**	**27**	**70**	**122**	**132**	**254**	**2,914**
PROPOSED FUTURE								
8. General Comm (~200 TSF)	84.70 TSF	67	42	108	189	204	393	4,512
Total		**67**	**42**	**108**	**189**	**204**	**393**	**4,512**
NET CHANGE								
8. General Comm (~200 TSF)	30.00 TSF	24	15	38	67	72	139	1,598
Net Difference		**24**	**15**	**38**	**67**	**72**	**139**	**1,598**
SITE 6 – LA PAZ GATEWAY								
EXISTING								
1. Single Family Detached	15 DU	3	8	11	10	6	16	144
8. General Comm (~200 TSF)	124.10 TSF	97	62	159	276	299	575	6,612
9. Strip Comm (~100 TSF)	6.99 TSF	6	4	10	17	19	36	406
10. General Office	172.92 TSF	235	33	268	43	214	257	1,904
14. Church/Synagogue	19.50 TSF	8	6	14	7	6	13	178
21. Hotel	147 Room	59	40	99	60	51	111	1,311
23. Child Care Center	5.00 TSF	41	35	76	23	54	77	396
Total		**449**	**188**	**637**	**436**	**649**	**1,085**	**10,951**
PROPOSED FUTURE								
1. Single Family Detached	15 DU	3	8	11	10	6	16	144
8. General Comm (~200 TSF)	130.31 TSF	102	65	167	290	314	604	6,943
9. Strip Comm (~100 TSF)	7.34 TSF	6	4	10	18	19	37	427
10. General Office	181.56 TSF	246	34	280	45	225	270	1,999
14. Church/Synagogue	19.50 TSF	8	6	14	7	6	13	178
21. Hotel	147 Room	59	40	99	60	51	111	1,311
23. Child Care Center	5.00 TSF	41	35	76	23	54	77	396
Total		**465**	**192**	**657**	**453**	**675**	**1,128**	**11,398**
NET CHANGE								
1. Single Family Detached	0 DU	0	0	0	0	0	0	0
8. General Comm (~200 TSF)	6.21 TSF	5	3	8	14	15	29	331
9. Strip Comm (~100 TSF)	.35 TSF	0	0	0	1	0	1	21
10. General Office	8.65 TSF	11	1	12	2	11	13	95
14. Church/Synagogue	0 TSF	0	0	0	0	0	0	0
21. Hotel	0 Room	0	0	0	0	0	0	0
23. Child Care Center	0 TSF	0	0	0	0	0	0	0
Net Difference		**16**	**4**	**20**	**17**	**26**	**43**	**447**

Table 2-2 (cont.)
PROPOSED LAND USE CHANGES AND TRIP GENERATION SUMMARY

Land Use	Units	AM Peak Hour			PM Peak Hour			ADT
		In	Out	Total	In	Out	Total	
SITE 7 – VACANT RESIDENTIAL SITES								
EXISTING								
1. Single Family Detached	168 DU	32	94	126	108	62	170	1,607
20. Park	13.63 Acre	0	0	0	0	0	0	22
Total		**32**	**94**	**126**	**108**	**62**	**170**	**1,629**
PROPOSED FUTURE								
1. Single Family Detached	175 DU	34	98	132	112	64	176	1,675
20. Park	13.63 Acre	0	0	0	0	0	0	22
Total		**34**	**98**	**132**	**112**	**64**	**176**	**1,697**
NET CHANGE								
1. Single Family Detached	7 DU	2	4	6	4	2	6	68
20. Park	0 Acre	0	0	0	0	0	0	0
Net Difference		**2**	**4**	**6**	**4**	**2**	**6**	**68**
EXISTING								
1. Single Family	259 DU	49	144	193	166	96	262	2,478
3. Apartments	462 DU	46	189	235	185	101	286	3,104
4. Multi-Family	248 DU	42	124	166	112	82	194	2,021
5. Mobile Homes	252 DU	20	81	101	88	53	141	1,257
6. Convalescent Home	267 Beds	32	19	51	19	27	46	633
8. General Commercial	2,010.81 TSF	1,569	1,004	2,573	4,472	4,847	9,319	107,136
9. Strip Commercial	44.27 TSF	38	25	63	108	117	225	2,575
10. General Office	1,062.36 TSF	1,445	202	1,647	266	1,316	1,582	11,698
11. Medical Office	349.84 TSF	839	209	1,048	524	1,225	1,749	17,492
12. Business Park	1,496.62 TSF	1,796	344	2,140	450	1,482	1,932	19,097
13. Hospital	127.4 TSF	102	51	153	50	101	151	2,238
14. Church/Synagogue	46.50 TSF	19	15	34	16	15	31	424
16. School	126 STU	63	52	115	37	40	77	137
20. Park	15.90 Acre	0	0	0	0	0	0	26
21. Hotel	147 Room	59	40	99	60	51	111	1,311
23. Child Care Center	5.00 TSF	41	35	76	23	54	77	396
Existing Total		6,160	2,534	8,694	6,576	9,607	16,183	172,023
PROPOSED FUTURE								
1. Single Family	266 DU	51	148	199	170	98	268	2,546
2. Condominiums	498 DU	85	249	334	224	164	388	4,059
3. Apartments	662 DU	66	271	337	265	145	410	4,448
5. Mobile Homes	252 DU	20	81	101	88	53	141	1,257
6. Convalescent Home	267 Beds	32	19	51	19	27	46	633
8. General Commercial	2,562.97 TSF	2,000	1,280	3,280	5,701	6,177	11,878	136,555
9. Strip Commercial	44.62 TSF	38	25	63	109	117	226	2,596
10. General Office	1,465.08 TSF	1,992	278	2,270	366	1,815	2,181	16,132
11. Medical Office	351.84 TSF	844	210	1,054	527	1,232	1,759	17,592
12. Business Park	1,571.45 TSF	1,886	361	2,247	473	1,556	2,029	20,052
13. Hospital	127.40 TSF	102	51	153	50	101	151	2,238
14. Church/Synagogue	46.50 TSF	19	15	34	16	15	31	424
16. School	126 STU	63	52	115	37	40	77	137
20. Park	26.63 Acre	0	0	0	0	0	0	43

Table 2-2 (cont.)
PROPOSED LAND USE CHANGES AND TRIP GENERATION SUMMARY

Land Use	Units	AM Peak Hour			PM Peak Hour			ADT
		In	Out	Total	In	Out	Total	
PROPOSED FUTURE (cont.)								
21. Hotel	397 Room	159	108	267	163	139	302	3,541
23. Child Care Center	5.00 TSF	41	35	76	23	54	77	396
Proposed Total		7,398	3,183	10,581	8,231	11,733	19,964	212,649
NET CHANGE								
1. Single Family	7 DU	2	4	6	4	2	6	68
2. Condominiums	498 DU	85	249	334	224	164	388	4,059
3. Apartments	200 DU	20	82	102	80	44	124	1,344
4. Multi-Family	-248 DU	-42	-124	-166	-112	-82	-194	-2,021
5. Mobile Homes	0 DU	0	0	0	0	0	0	0
6. Convalescent Home	0 Beds	0	0	0	0	0	0	0
8. General Commercial	552 TSF	431	276	707	1,229	1,330	2,559	29,419
9. Strip Commercial	0 TSF	0	0	0	1	0	1	21
10. General Office	403 TSF	547	76	623	100	499	599	4,434
11. Medical Office	2 TSF	5	1	6	3	7	10	100
12. Business Park	75 TSF	90	17	107	23	74	97	955
13. Hospital	0 TSF	0	0	0	0	0	0	0
14. Church/Synagogue	0 TSF	0	0	0	0	0	0	0
16. School	0 STU	0	0	0	0	0	0	0
20. Park	11 Acre	0	0	0	0	0	0	17
21. Hotel	250 Room	100	68	168	103	88	191	2,230
23. Child Care Center	0 TSF	0	0	0	0	0	0	0
Net Difference		1,238	649	1,887	1,655	2,126	3,781	40,626

Abbreviations: ADT – average daily traffic
DU – dwelling unit
TSF – thousand square feet

The proposed land use changes replace or intensify the uses that currently exist. Land uses listed above for Sites 1, 3, 5, 6 and 7 are added to the existing land uses, and the land uses in Sites 2 and 4 would replace the existing land uses.

There are two alternatives for Sites 1 and 2. Besides other proposed land uses, Site 1, referred to as the Urban Village, will either have general office or medical office, and Site 2, referred to as Alicia Gateway, will either have general office or apartments. However as shown in Table 2-3, Alternative 1 at both sites generates a higher trip generation than Alternative 2 in the PM peak hour. Therefore Alternative 1 reflects the worst case traffic conditions and has been used in the analysis presented in this report.

The City land uses were translated into demographic data to provide a comparison with the OCP-2006 projections presented previously. For residential uses, representative population/housing factors were applied to the dwelling units in each type of residential use. For non-residential land uses, employment factors were applied to the building area square footages, converting the square footage by land use into the respective demographic components of retail, service and other employment.

A comparison between OCP-2006 and the City land use database is presented in the following table which shows that the City's land uses generally compare to the OCP projections with the exception of employment. This could be due to differences in the employment factors used here. The amount of growth is comparable.

CITY OF LAGUNA HILLS DEMOGRAPHIC DATA

	2005	**2030**	**Growth**	**Growth (%)**
OCP-2006				
Population	32,960	36,210	3,250	10%
Housing	11,188	11,508	320	3%
Employment	25,308	28,893	3,585	14%
	2008	**2030**	**Growth**	**Growth (%)**
Laguna Hills City Database				
Population	31,904	33,119	1,215	4%
Housing	10,828	11,285	457	4%
Employment	19,422	22,622	3,200	16%

Table 2-3

PROJECT ALTERNATIVE TRIP GENERATION COMPARISON (SITES 1 AND 2)

Land Use	Units	AM Peak Hour			PM Peak Hour			ADT
		In	Out	Total	In	Out	Total	
Site 1 – Urban Village (Alternative 1 – General Office)								
Apartments	200 DU	20	82	102	80	44	124	1,344
General Commercial	300 DU	234	150	384	668	723	1,391	15,984
General Office	380 TSF	517	72	589	95	471	566	4,184
Hotel	250 Room	100	68	168	103	88	191	2,230
Site 1 – Urban Village (Alt. 1) Total		871	372	1,243	946	1,326	2,272	23,742
Site 1 – Urban Village (Alternative 2 – Medical Office)								
Apartments	200 DU	20	82	102	80	44	124	1,344
General Commercial	300 DU	234	150	384	668	723	1,391	15,984
Medical Office	138 TSF	268	67	335	136	369	505	4,986
Hotel	250 Room	100	68	168	103	88	191	2,230
Site 1 – Urban Village (Alt. 2) Total		622	367	989	987	1,224	2,211	24,544
Site 2 – Alicia Gateway (Alternative 1 – General Office)								
General Commercial	420.8 TSF	328	210	538	936	1,014	1,950	22,420
General Office	102.2 TSF	139	19	158	26	127	152	1,125
Site 2 – Alicia Gateway (Alt. 1) Total		467	229	696	962	1,141	2,102	23,545
Site 2 – Alicia Gateway (Alternative 2 – Apartments)								
Apartments	110 DU	11	45	56	44	24	68	739
General Commercial	420.8 TSF	328	210	538	936	1,014	1,950	22,420
Site 2 – Alicia Gateway (Alt. 2) Total		339	255	594	980	1,038	2,018	23,159

Chapter 3.0
ARTERIAL ROADWAY PLAN

This chapter discusses the arterial roadway component of the Mobility Element. It presents the proposed arterial roadway classifications to be included in the updated Mobility Element, and shows the arterial highway plan as represented by the different classifications.

ROADWAY CLASSIFICATIONS

The roadway plan is defined using a hierarchy of arterial roadway classifications. Each is described by size and function with specific physical dimensions. These classifications are listed in Table 3-1. Also shown here are representative daily volumes for each roadway. As noted in Chapter 1.0, these volumes are not used for determining performance and are listed here for informational purposes.

Conceptual cross-sections for each classification are illustrated in Figure 3-1. These are to be used as general guidelines and individual dimensions may vary depending on physical constraints, and other factors such as landscaping and aesthetics.

The Circulation Plan for the City of Laguna Hills is illustrated in Figure 3-2. The four arterial highway classifications are shown here and are consistent with the Orange County Master Plan of Arterial Highways (MPAH) which is illustrated in Figure 3-3. A proposal to amend the MPAH has recently been initiated by the City of Irvine to delete the unbuilt sections of Bake Parkway (south of Lake Forest Drive), Ridge Route Drive and the built and unbuilt sections of Santa Maria Avenue that are currently shown in the MPAH. Also included in the amendment is to add the currently existing Santa Vittoria Drive between Lake Forest Drive and Ridge Route Drive to the MPAH as a Collector. The following are brief descriptions of each roadway classification:

Six Lane Smart Street

This classification applies to six lane roadways with raised landscaped medians and with special operational characteristics. Their function is to carry high volumes of local and regional traffic. Access may vary depending on where the facility is located, but is typically limited to adjacent commercial properties at signal-controlled intersections. Curbside parking is prohibited. Traffic carrying capacities

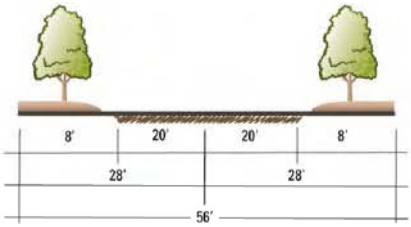
Table 3-1

ROADWAY CLASSIFICATIONS

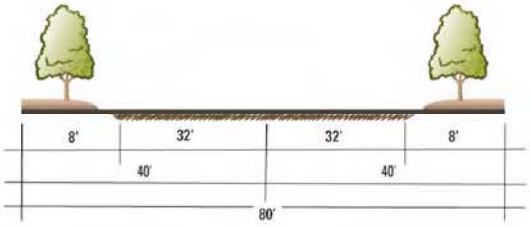
Functional Classification	Definition	Width/ ROW (Pavement)*	Configuration	Representative Average Daily Traffic Volume**
6 Lane Smart Street	Roadways carrying high volumes of regional and local traffic. Priority is given to through traffic flow, and access is generally limited to signalized intersections.	120′ (102′)	6 lanes with raised median and with high capacity signalized intersections. Side street access is signalized to the extent feasible. No parking is allowed.	60,000
6 Lane Major Arterial	Roadways acting as main thoroughfares and providing access to activity centers and to the regional freeway system. Direct access to adjacent properties is discouraged, except at signalized intersections.	120′ (102′)	6 lanes with median and high capacity signalized intersections. Median width may vary from 4' to 16'. Side street access is signalized to the extent possible. No parking is allowed.	54,000
4 Lane Primary Arterial	Roadways that complement the Major Arterials by providing a medium capacity backbone system. Only limited access is provided, typically to commercial properties (i.e., not to residential homes).	100′ (84′)	4 lanes with raised median and additional turn lanes at intersections. Most side street access is signalized. No parking is allowed.	36,000
4 Lane Secondary Arterial	Roadways intended to carry high volumes of traffic and also serve the adjacent land uses (typically commercial).	80′ (64′)	4 lanes with no median. Left turn lanes are provided at intersections.	28,000
2 Lane Collector/Commuter Arterial	Roadways intended to carry low volumes of traffic from local streets that primarily serve the adjacent land uses (both commercial and residential).	56′ (40′)	2 lanes with left turn lanes or median provided where necessary for adequate safety.	12,000

* ROW – Right-of-way including pavement and parkway. May be greater for augmented sections (applicable to Primary and Secondary classifications).

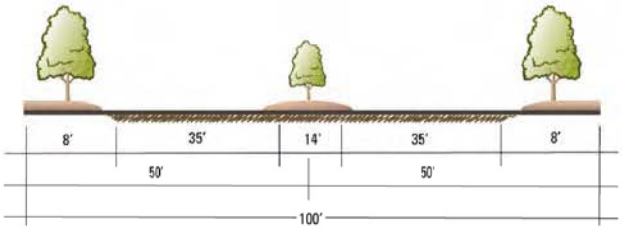
** Used as a general guideline only. Actual roadway performance is determined from peak hour intersection volumes. Augmented sections can be 20 – 25 percent higher.



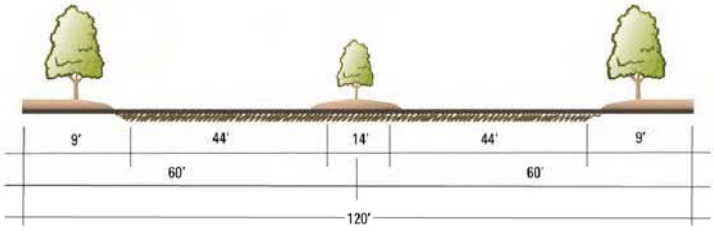
COLLECTOR/COMMUTER ARTERIAL - 2 lane undivided roadway



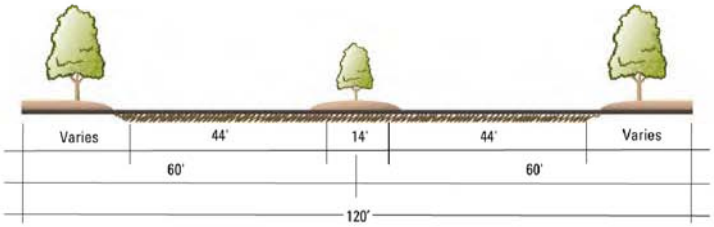
SECONDARY ARTERIAL - 4 lane undivided roadway



PRIMARY ARTERIAL - 4 lane divided roadway



MAJOR ARTERIAL - 6 lane divided roadway

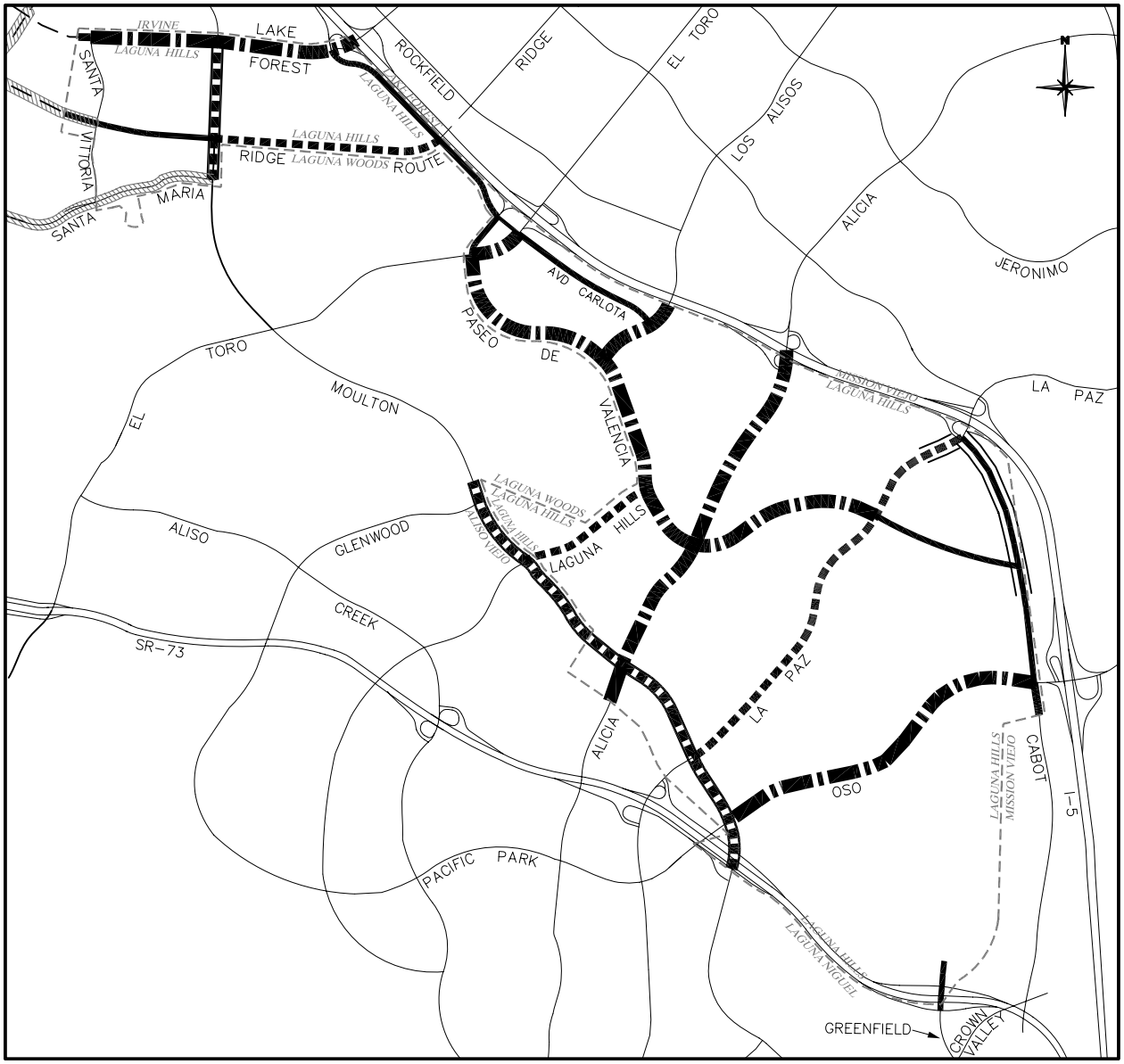


SMART STREET - 6 lane divided roadway

Source: EDAW

Figure 3-1

TYPICAL CROSS-SECTIONS

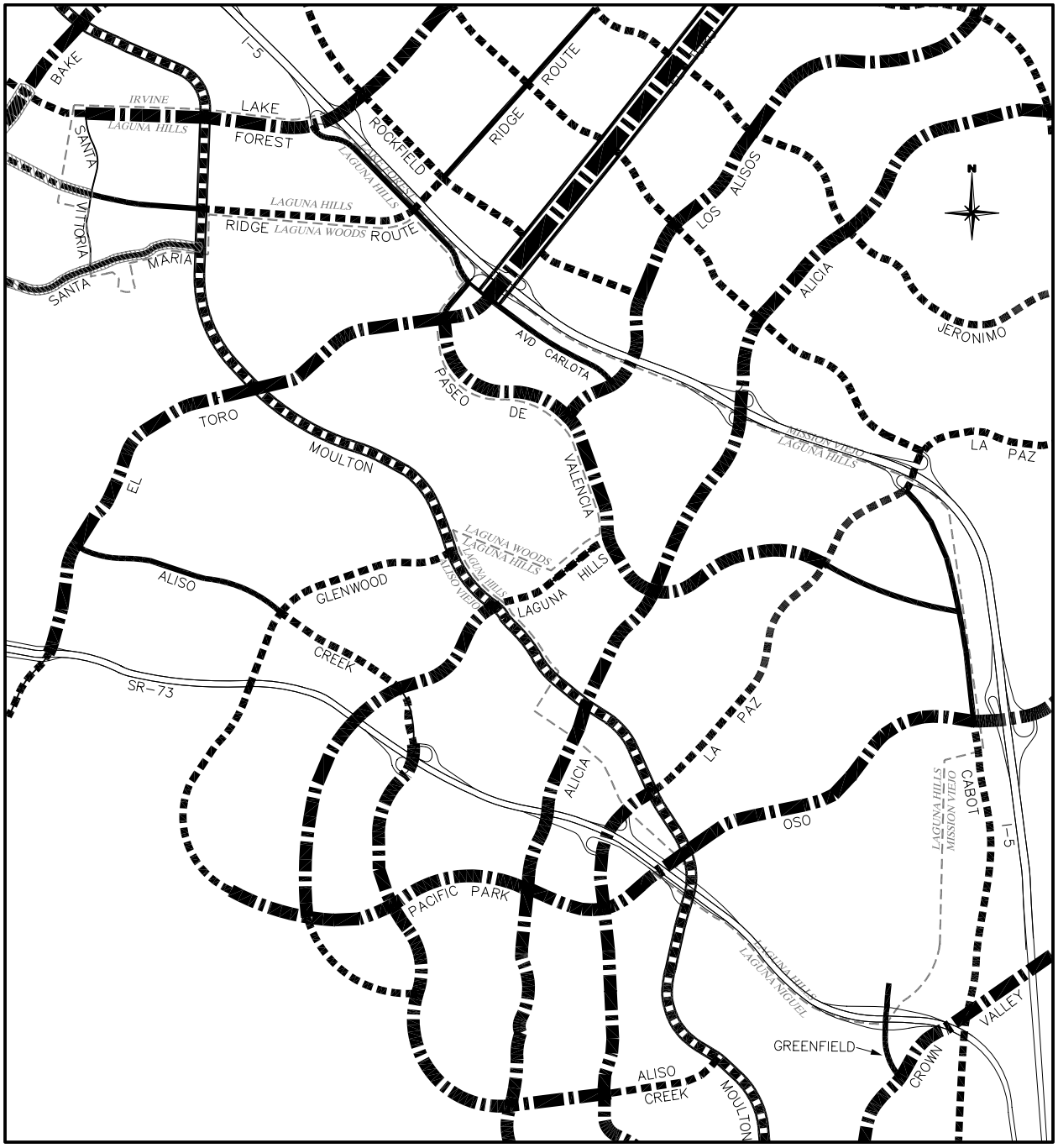


Legend

- Smart Street (6 lane roadway)
- Major (6 lane divided roadway)
- Primary (4 lane divided roadway)
- Secondary (4 lane undivided roadway)
- City Limit
- Deleted with proposed MPAH Amendments
- Augmented Primary (4 lane divided roadway with auxiliary lanes)
- Augmented Secondary (4 lane undivided roadway with auxiliary lanes)
- Santa Vittoria Drive added as 2 lane Collector with proposed MPAH Amendments.

Figure 3-2

CITY OF LAGUNA HILLS
CIRCULATION PLAN



Legend

	Principal	(8 lane divided roadway)
	Smart Street	(6 lane roadway)
	Major	(6 lane divided roadway)
	Primary	(4 lane divided roadway)
	Secondary	(4 lane undivided roadway)
	City Limit	
	Deleted with proposed MPAH Amendments	
	Santa Vittoria Drive added as 2 lane Collector with proposed MPAH Amendments.	

Figure 3-3

ORANGE COUNTY MASTER PLAN OF ARTERIAL HIGHWAYS

of around 60,000 ADT can be achieved depending on the degree of access control, peak period traffic loadings, and lane configurations at the major intersections. Within the City of Laguna Hills, Moulton Parkway is designated as a Smart Street, and accordingly has special operational features, such as signal coordination, to maximize traffic flow.

Six Lane Major Arterial

These are six lane roadways with raised medians. Unsignalized minor street and driveway access may be allowed but signalized access is preferred, and left-turn restrictions may be placed at unsignalized access locations. Curbside parking is prohibited. Traffic carrying capacities of around 54,000 ADT can be achieved depending on the degree of access control, the peak period loadings, and the lane configurations of the major intersections. Major Arterials in the City include El Toro Road, Alicia Parkway, Lake Forest Drive, Los Alisos Boulevard, Oso Parkway and Paseo de Valencia between El Toro Road and La Paz Road.

Four Lane Primary Arterial

This classification applies to four lane roadways with raised medians. Such roadways complement the Major Arterial classification by providing a medium capacity backbone system. Left turn restrictions will generally be placed at minor unsignalized driveways (i.e., median breaks will typically only be provided at intersections). As a primary traffic carrier, curbside parking is prohibited. Traffic carrying capacities of around 36,000 ADT can be achieved depending on the degree of access control, the peak period loadings, and the signalized intersection lane configurations. Primary Arterials in the City include Laguna Hills Drive, La Paz Road and Ridge Route Drive between Moulton Parkway and East City Limits.

Four Lane Secondary Arterial

This is similar to the Four Lane Primary Arterial but typically without a median. In some sections, a painted median may allow for two-way left turns and left turn lanes are provided at signalized intersections. This classification is generally less restrictive with respect to access to adjacent property. Traffic carrying capacity varies according to the degree of access control but is typically around 28,000 ADT. Secondary Arterials in the City include Avenida de la Carlota, Cabot Road, Paseo de Valencia between Avenida de la Carlota and El Toro Road and between La Paz Road and Cabot Road, and Ridge Route Drive between Moulton Parkway and West City Limits.

Two Lane Collector/Commuter Arterial

Collector or commuter arterials are two lane roads, typically without a median and with few access restrictions. A road with this classification acts as a collector for traffic from local streets that are then distributed to roads with higher classification. The traffic carrying capacity is typically around 12,000 ADT. Within the City, Aliso Hills Drive is a Collector/Commuter arterial and a portion of Santa Vitotria is planned to be a collector arterial as part of the Bake Parkway/Ridge Route Drive/Santa Maria MPAH Amendment.

Augmented Arterials

The City's Mobility Element recognizes that the County of Orange MPAH forms the basis for the arterial highway classifications. In addition, the Mobility Element applies an "Augmented" concept to certain roadway locations as a capacity enhancement strategy. The intent is to "customize" such streets for the Mobility Element, while retaining the essential characteristics for consistency with the MPAH.

Two roadway segments that are designated with the "Augmented" classification are as follows:

La Paz Road between I-5 and McIntyre Street is designated as an **Augmented Primary**. The augmentation is in the form of auxiliary lanes on each side of the four-lane road. Such lanes provide space for weaving, merging and queuing, thereby enhancing the roadway to a representative ADT capacity of around 45,000 (compared to 36,000 for a standard Primary).

Cabot Road from La Paz Road to Nellie Gail Road is classified as an **Augmented Secondary**. The augmentation is in the form of a raised median complementing the four-lane road. The median provides an aesthetic and functional treatment, essentially allowing the arterial to function somewhat like a Primary Arterial, but retaining the Secondary classification. As a result, a representative ADT volume of 32,000 can be achieved (compared to 28,000 for a standard Secondary).

ROADWAY DIMENSIONS

The preceding discussion on roadway classifications included general ranges for right-of-way (ROW) and pavement width. While the maximum value represents a desirable standard, variations in right-of-way width and specific roadway improvements will occur in certain cases due to physical constraints and/or right-of-way limitations. Hence, the roadway classifications may deviate from the

standards where physical constraints exist, where preservation of community character dictates special treatment, or on approaches to Principal Intersections (discussed below). Bikeways and sidewalks also affect the specific standards applied to various roadways. However, the overriding circulation goal is that all roadways carry the designed volumes of traffic at desired performance standards.

Intersection Dimensions

The standard cross-sections presented earlier show midblock dimensions. Right-of-way needs at intersections are typically greater than for the midblock. Table 3-2 presents guidelines of the number of intersection lanes for each classification.

In most cases, the right-of-way shown on the midblock cross-section will be adequate to accommodate the through and left turn lanes shown here. Right turn lanes will typically require some additional right-of-way on one side (the entering side of the intersection). The additional right-of-way should be a minimum of 10 feet or more and should extend for at least 250 feet back from the intersection curb face.

Table 3-2

INTERSECTION LANE GUIDELINES

Design Classification	Number Of Entering Lanes			Comments
	Through Lanes	Left Turn Lanes	Right Turn Lanes	
Major Arterial	3	2 [(1)]	1 [(2)]	At specific locations, two right turn lanes or a free right turn may be needed.
Primary Arterial	2	1 or 2	1 [(2)]	At specific locations, a free right turn may be needed.
Secondary Arterial	2	1	0 or 1	Right turn lane should be provided for turns onto a Major or Primary Arterial, or where intersection augmentation is needed.
Collector/Commuter Arterial	1	0 or 1	0 or 1	Right turn and left turn lanes should be provided for turns onto a Major or Primary Arterial, or where intersection augmentation is needed.

Notes: [(1)] Only one left turn lane may be needed if left turn is into a Collector or commercial driveway

[(2)] If a roadway is changing to a lower classification on the far side of the intersection (e.g., Major to Primary/Secondary or Major/Secondary to a Collector) then a right turn lane drop (trap lane) can act as a separate right turn lane, and an additional right turn lane would not be needed.

Chapter 4.0
ARTERIAL HIGHWAY ANALYSIS

This chapter summarizes the results of a year 2030 analysis of the Citywide arterial highway network for Laguna Hills. It forms the basis for identifying long-range transportation improvements for the General Plan Update EIR.

HIGHWAY NETWORK

The analysis results presented here are based on the proposed roadway system presented in the previous chapter. For EIR purposes, a comparison is made between this roadway network (with associated intersection improvements) and a network in which only currently committed improvements are included. Long-range deficiencies and potential improvements to address these deficiencies are then identified.

The "committed" network represents a year 2030 scenario in which only currently programmed improvements are made to the City's arterial system (i.e., projects that are fully funded and thereby have reasonable assurance of being completed by the year 2030). The purpose of this analysis is to understand the implications of the year 2030 traffic forecasts in relation to this roadway network, and thereby provide a baseline for EIR purposes. Implementation of the long-range transportation improvements identified here is mitigation for buildout of the General Plan Land Use Element.

Table 4-1 summarizes the current committed improvements in or near the City of Laguna Hills. Also listed here are the funding sources for implementing these improvements.

2030 ANALYSIS

The year 2030 traffic forecasts were derived from the City of Laguna Hills Traffic Analysis Model (LHTAM) which uses a specially prepared land use database within the City (see discussion in Chapter 2.0) and OCP-2004 demographic data outside the City (i.e., for the remainder of the region) with the exception of nearby recent approved projects (i.e., Irvine's Planning Area 18/39 and Lake Forest's Vacant Land Opportunities Study) that have been incorporated.

Table 4-1

YEAR 2030 COMMITTED IMPROVEMENTS (LAGUNA HILLS AND VICINITY)

Location	Improvement	Source
Roadway		
Lake Forest Drive	Extend from existing terminus at Tesla/Santa Vittoria Drive to Laguna Canyon Road as a four lane primary arterial.	Irvine Planning Area 18 and Planning Area 39
Bake Parkway	Extend from existing terminus at Irvine Center Drive to future extension of Lake Forest Drive as a six lane major arterial.	Irvine Planning Area 34
La Paz Road	Third eastbound lane added from McIntyre Street to the I-5 ramps.	OCTA
Intersection (NS & EW)		
Santa Vittoria & Lake Forest	Add SBR	Irvine Planning Area 39
I-5 Southbound Ramps/Avenida de la Carlota & Lake Forest Drive	Restripe shared 3rd SBL/2nd SBT to 3rd SBL and SBT to shared SBT/2nd SBR, add 2nd NBL and NB right-turn overlap	NITM
Moulton Parkway & Ridge Route Drive	Add 2nd SBL, SBR, 2nd WBL, 2nd NBL and 4th NBT	County
Avenida de la Carlota & Paseo de Valencia	Restripe 2nd WBT to shared 3rd WBL/2nd WBT	NITM and LFTM Programs and Laguna Hills
Avenida de la Carlota & El Toro	Add full 2nd SBL and 2nd NBR, restripe NBL to NBL/2nd NBT	NITM and LFTM Programs and Laguna Hills
I-5 Southbound Ramps & Alicia	Add full 2nd SBL	County (Aliso Creek deletion)
I-5 Southbound Ramps/Cabot & La Paz	Restripe SB to 2 SBL, shared SBT/2nd SBR and full SBR, add 3rd EBT, 2nd WBL and free WBR, restripe 2nd NBR to shared 2nd NBL/2nd NBR	OCTA

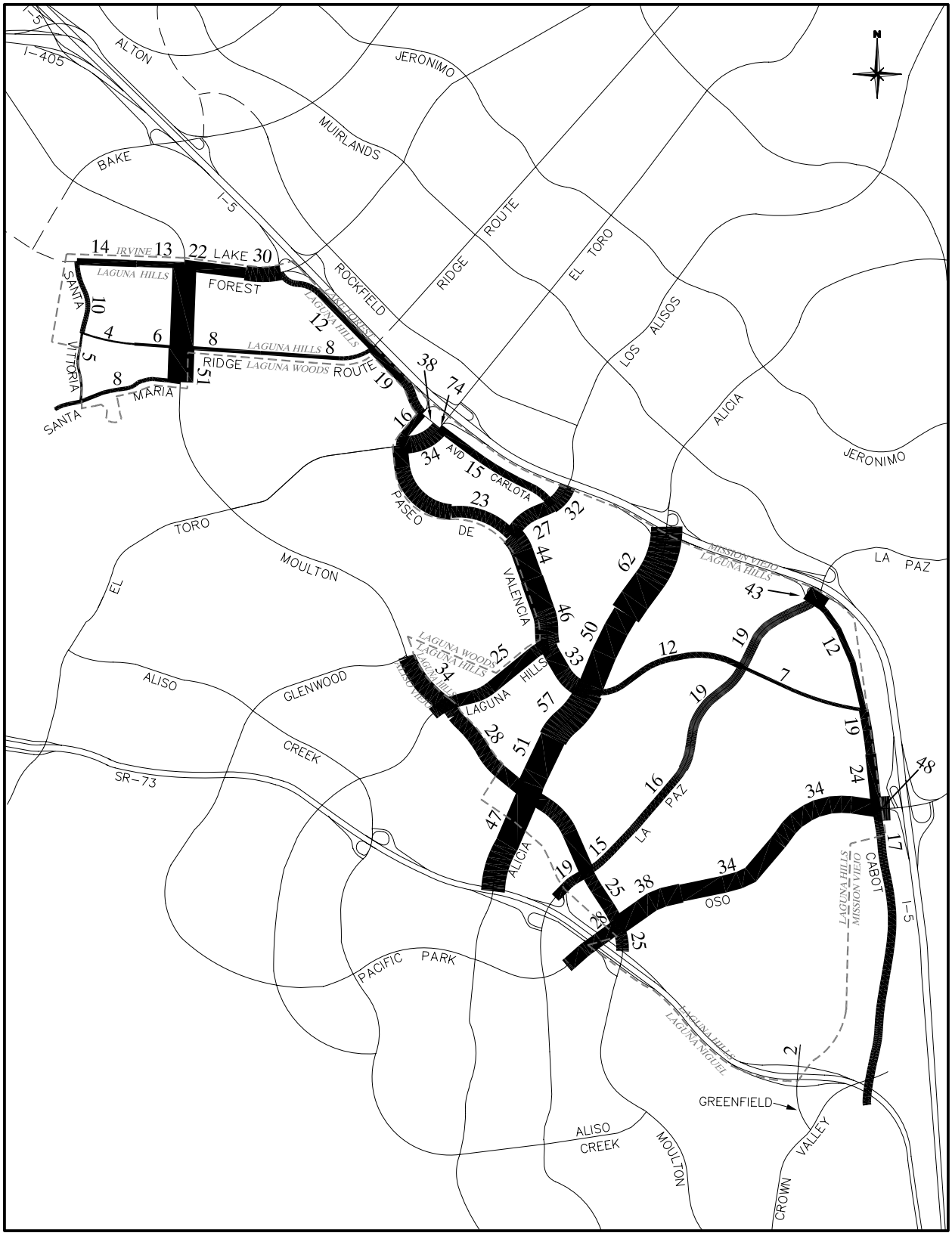
Abbreviations:

L,T,R – left, through, right
LFTM – Lake Forest Transportation Mitigation Program
NITM – North Irvine Transportation Mitigation Program
OCTA – Orange County Transportation Authority
SB, NB, WB, EB – southbound, northbound, westbound, eastbound

As mentioned earlier, for purposes of analyzing worst case conditions, the traffic analysis is based on a roadway system similar to existing conditions with only committed improvements assumed (i.e., the Lake Forest Drive extension from its existing terminus to Laguna Canyon Road). Therefore, the unbuilt and non-committed roads that are the subject of the MPAH Amendment described in Chapter 3.0 do not affect the analysis findings presented in this report, which assume 2030 "committed" network conditions.

Figure 4-1 shows the year 2030 average daily traffic (ADT) volumes on the City's arterial roadway system. The ADT volumes on Moulton Parkway range from 51,000 at the north end near City of Irvine to 25,000 at the south end boundary with Laguna Niguel. Alicia Parkway carries volumes ranging from 62,000 at the I-5 Freeway to 47,000 where it crosses at the SR-73. Other high volume roadways include Paseo de Valencia with 46,000 ADT north of Laguna Hills Drive and Oso Parkway with 38,000 ADT east of Moulton Parkway.

The corresponding year 2030 peak hour intersection capacity utilization (ICU) values and levels of service (LOS) for the committed network are summarized in Table 4-2 (an intersection location map is provided in Figure 4-2). Figure 4-3 illustrates the peak hour ICUs and LOS for the highest AM/PM peak hour. As shown, no location is forecast to be deficient based on ICU values. Also as previously noted, LOS "E" at Avenida de la Carlota and El Toro Road intersection is acceptable since it is an intersection in the Congestion Management Program (CMP).



Legend

10 20 30 40 50 ADT Volumes

City Limits

Future committed roadway

Figure 4-1

2030 ADT VOLUMES (000s)
- WITH PROPOSED LAND USE CHANGES
(COMMITTED NETWORK)

Table 4-2

2030 LOS SUMMARY – COMMITTED NETWORK

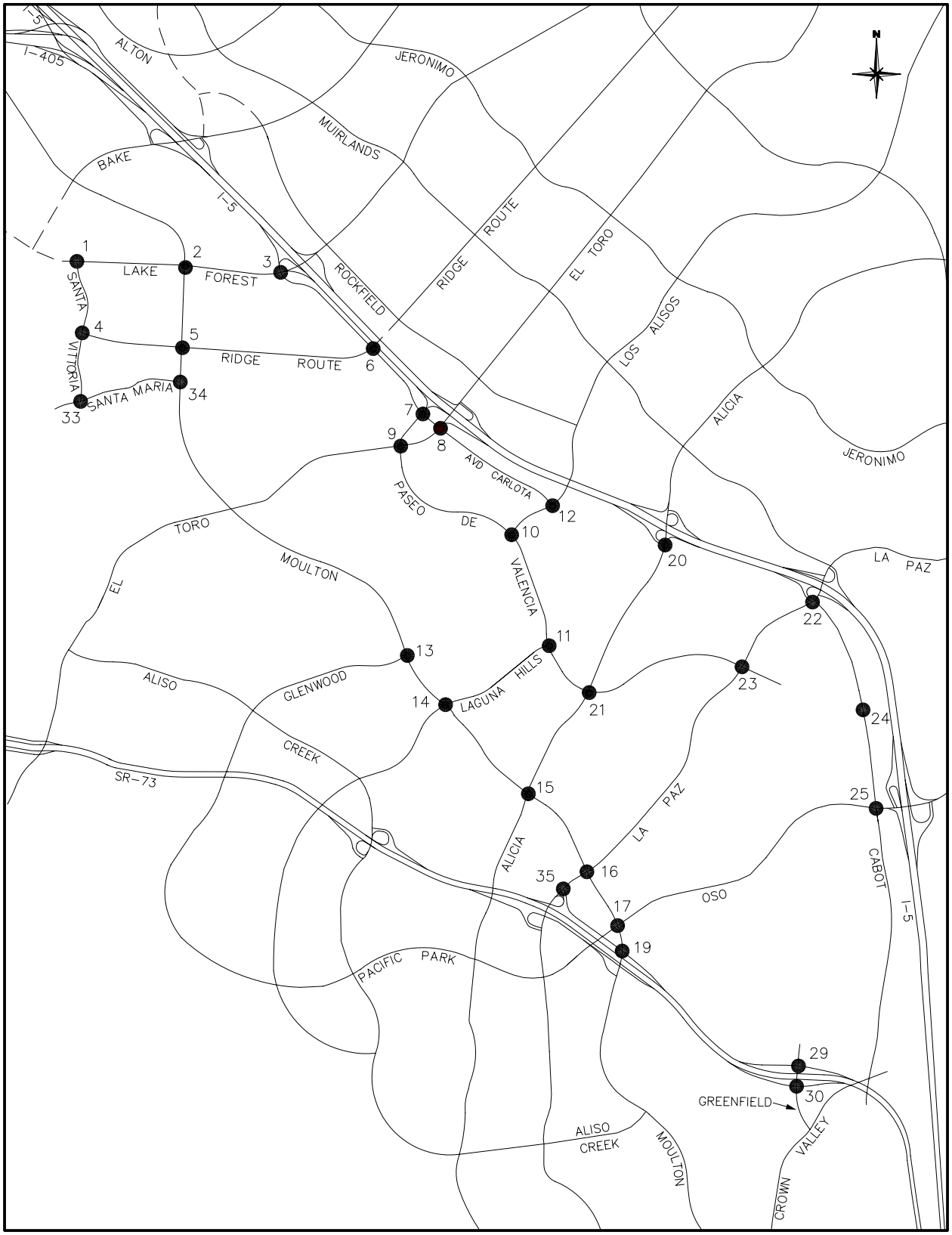
Intersection*	AM Peak Hour		PM Peak Hour	
	ICU	**LOS**	**ICU**	**LOS**
1. Santa Vittoria & Lake Forest	.78	C	.78	C
2. Irvine Center/Moulton & Lake Forest	.59	A	.79	C
3. I-5 SB/Avd Carlota & Lake Forest	.55	A	.84	D
4. Santa Vittoria & Ridge Route	.49	A	.41	A
5. Moulton & Ridge Route	.52	A	.70	B
6. Avd Carlota & Ridge Route	.36	A	.57	A
7. Avd Carlota & Paseo de Valencia	.67	B	.76	C
8. Avd Carlota & El Toro (a)	.67	B	.92	E
9. Paseo de Valencia & El Toro	.55	A	.83	D
10. Paseo de Valencia & Los Alisos	.67	B	.73	C
11. Paseo de Valencia & Laguna Hills	.71	C	.90	D
12. Avd Carlota & Los Alisos	.46	A	.67	B
13. Moulton & Glenwood	.59	A	.62	B
14. Moulton & Laguna Hills	.65	B	.78	C
15. Moulton & Alicia	.74	C	.76	C
16. Moulton & La Paz	.54	A	.53	A
17. Moulton & Oso	.53	A	.65	B
19. Moulton & SR-73 WB Ramps	.52	A	.41	A
20. I-5 SB Ramps & Alicia	.88	D	.90	D
21. Paseo de Valencia & Alicia	.77	C	.81	D
22. I-5 Ramps/Cabot & La Paz	.62	B	.80	C
23. La Paz & Paseo de Valencia	.49	A	.47	A
24. Cabot & Paseo de Valencia	.51	A	.46	A
25. Cabot & Oso	.61	B	.74	C
29. Greenfield & SR-73 WB Ramps	.62	B	.49	A
30. Greenfield & SR-73 EB Ramps	.49	A	.66	B
33. Santa Vittoria & Santa Maria	.29	A	.26	A
34. Moulton Pkwy & Santa Maria	.65	B	.86	D
35. Merienda/SR-73 WB Ramps & La Paz	.61	B	.34	A

* See intersection location map in Figure 4-2.

Note: (a) LOS "E" is acceptable at this location. LOS "D" is the City's adopted standard for the remaining study area intersections.

Abbreviations: ICU - intersection capacity utilization, LOS - level of service

ICU LOS ranges: .00 – .60 A
.61 – .70 B
.71 – .80 C
.81 – .90 D
.91 – 1.00 E
Above 1.00 F



Legend

Future committed roadway

XX Intersection location and reference number

Figure 4-2

2030 INTERSECTION LOCATION MAP

Figure 4-3

2030 PEAK HOUR ICUs
- HIGHEST AM/PM LOS VALUE
(COMMITTED NETWORK)

Chapter 5.0
SPECIAL FEATURES

This chapter discusses a number of special features relative to the update of the Mobility Element. The information is intended to provide background material for the Goals, Policies and implementation measures contained in the Element.

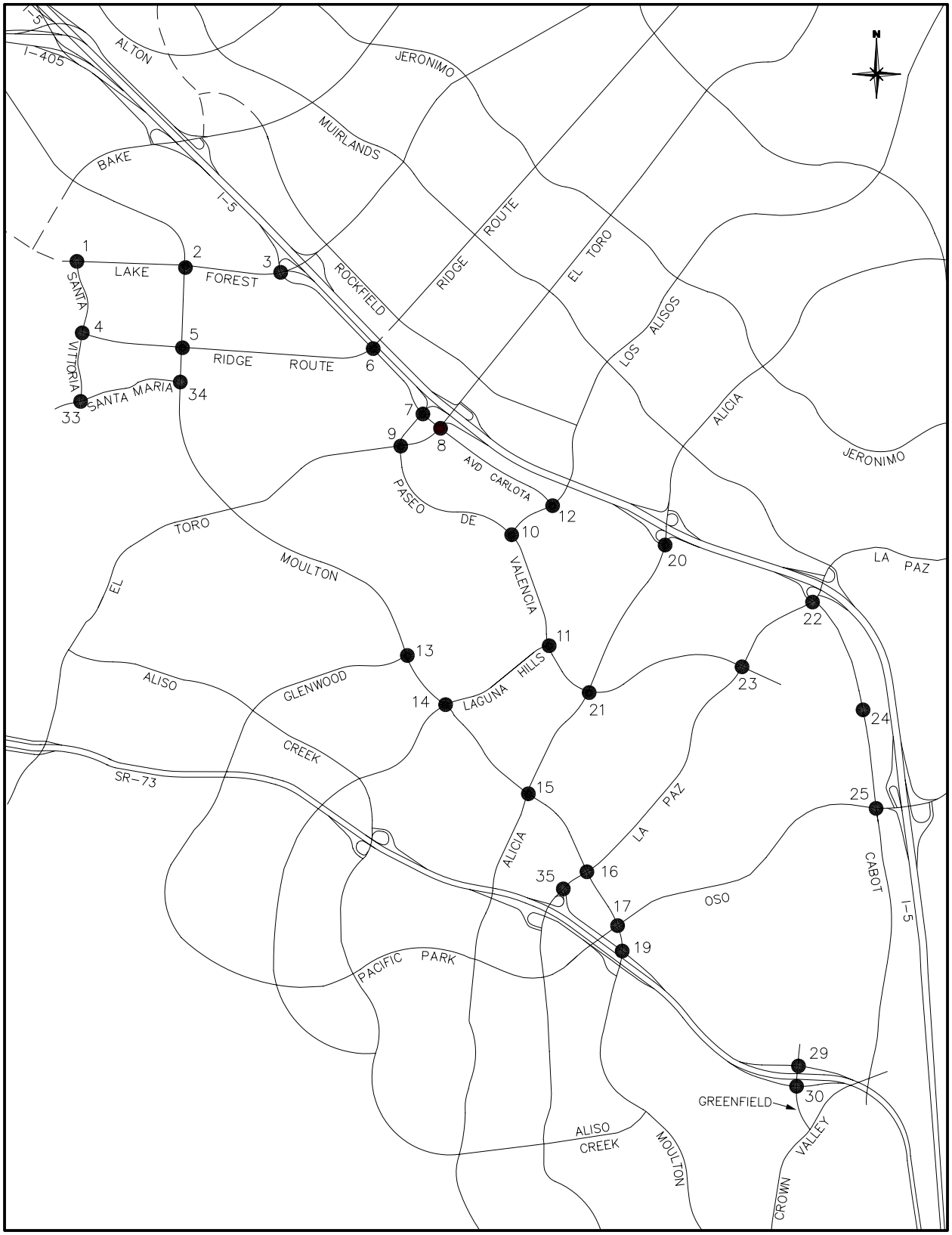
PRINCIPAL INTERSECTIONS

It is proposed that the General Plan Mobility Element includes a reference to a set of Principal Intersections. These generally determine the overall performance of the City's roadway system, and are thereby considered to have strategic importance within the overall Roadway Plan. The intent is that these intersections be regularly monitored and that priority be given to them in implementing roadway improvements. Figure 5-1 shows the study area intersections analyzed in this report that are all considered Principal Intersections. Changes to this initial set may occur over time, and such changes are intended to be undertaken as an administrative function rather than as a General Plan Amendment.

2030 MPAH CONDITIONS

The 2030 conditions analyzed in Chapter 4.0 are based on a roadway with only committed improvements assumed. These are improvements that are either currently under construction or fully funded, and were described in the previous chapter. This section presents data in which the Orange County Master Plan of Arterial Highways (MPAH) is completed. Table 5-1 lists the improvements that will complete the MPAH network. They include new and widened roadways plus associated intersection improvements.

Figure 5-2 shows the year 2030 average daily traffic (ADT) volumes on the City's arterial roadway system assuming MPAH conditions. The ADT volumes on Moulton Parkway range from 43,000 at the north end near City of Irvine to 25,000 at the south end boundary with Laguna Niguel. Alicia Parkway carries volumes ranging from 62,000 at the I-5 Freeway to 47,000 where it crosses at the SR-73. Other high volume roadways include Paseo de Valencia with 46,000 ADT north of Laguna Hills



Legend

Future committed roadway

XX Intersection location and reference number

Figure 5-1

PRINCIPAL INTERSECTIONS

Table 5-1

YEAR 2030 MPAH NON-COMMITTED AND PARTIALLY FUNDED IMPROVEMENTS
(LAGUNA HILLS AND VICINITY)

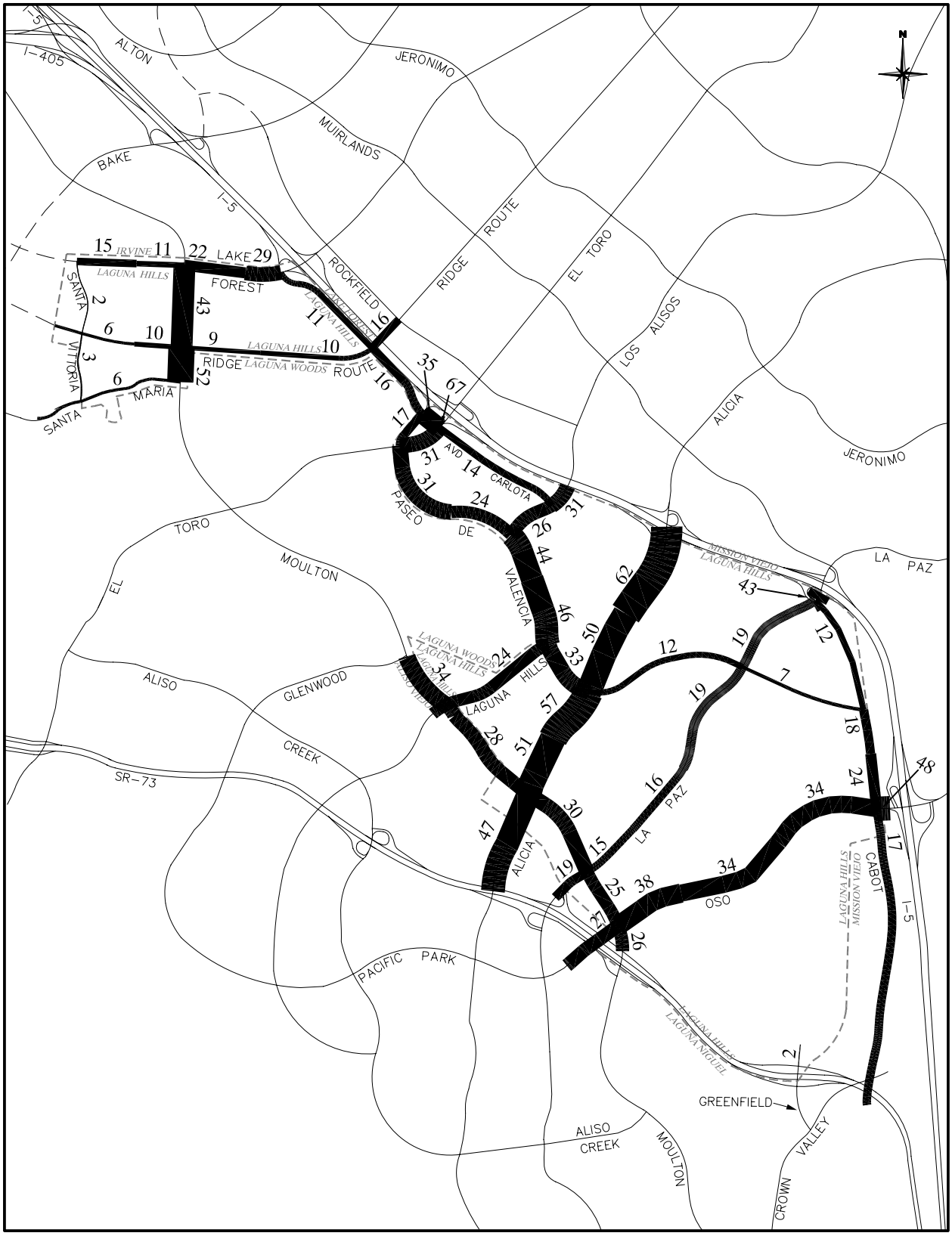
Location	**Improvement**
Roadway	
Bake Parkway[1]	Extend from Lake Forest Drive to Laguna Canyon Road as a six lane major arterial.
Ridge Route Drive[1]	Extend from existing terminus just west of Santa Vittoria Drive to future extension of Bake Parkway as a four lane secondary arterial.
Ridge Route Drive	Extend from existing terminus just west of Rockfield Boulevard to Avenida de la Carlota as a four lane primary arterial.
Santa Maria Avenue[1]	Extend from existing terminus just west of Santa Vittoria Drive to Laguna Canyon Road as a four lane secondary arterial.
Ridge Route Drive	Widen from Avenida de la Carlota to Moulton Parkway from two to four lanes (primary arterial).
Paseo de Valencia	Widen from El Toro Road to Laguna Hills Drive from four to six lanes (major arterial).
Intersection (NS & EW)	
Avenida de la Carlota and Ridge Route Drive	Add SBL, dual WBL, WBT, shared 2nd WBT/WBR, and dual EBT.
Moulton Parkway and Alicia Parkway	Add 4th EBT.
Moulton Parkway and Santa Maria Avenue	Add shared 4th SBT/SBR and shared 4th NBT/NBR.

Notes:

[1] Deleted with proposed MPAH Amendments. Also Santa Vittoria Drive is added as a two lane collector with the proposed MPAH Amendments.

Abbreviations:

L,T,R – left, through, right
LFTM – Lake Forest Transportation Mitigation Program
NITM – North Irvine Transportation Mitigation Program
OCTA – Orange County Transportation Authority
SB, NB, WB, EB – southbound, northbound, westbound, eastbound



Legend

10 20 30 40 50 ADT Volumes

City Limits

Future committed roadway

Figure 5-2

2030 ADT VOLUMES (000s)
- WITH PROPOSED LAND USE CHANGES
(MPAH NETWORK)

Drive and Oso Parkway with 38,000 ADT east of Moulton Parkway. All volumes are similar to 2030 Committed Network conditions with the exception of the area affected by the extensions of Bake Parkway, Ridge Route Drive and Santa Maria Avenue (i.e., Moulton Parkway just south of Lake Forest Drive).

The corresponding year 2030 peak hour intersection capacity utilization (ICU) values and levels of service (LOS) for the MPAH network are summarized in Table 5-2. Figure 5-3 illustrates the peak hour ICUs and LOS for the highest AM/PM peak hour. As shown, all intersection locations are forecast to operate at acceptable level based on ICU values and no mitigation is required should the MPAH be fully implemented. With Ridge Route Drive overcrossing providing additional east-west capacity, El Toro Road and Lake Forest Drive experience slightly lower volumes, and the intersection of Avenida de la Carlota and El Toro Road improves to LOS "D."

CIRCULATION ALTERNATIVES

Several highway facilities are discussed in this section. Most are related to unbuilt and non-committed roadway segments of the MPAH that were presented in the previous section. They are as follows:

1) Ridge Route Drive/I-5 Overcrossing
2) Cabot Road Roadway Classification
3) La Paz Road Roadway Classification
4) Paseo de Valencia between El Toro Road and Laguna Hills Drive

The following discussion addresses each of these and provides findings in relation to the Mobility Element.

Ridge Route Drive/I-5 Overcrossing

In the MPAH network, Ridge Route Drive over the I-5 Freeway is designated as a four-lane primary arterial. As presented in the previous section, the Ridge Route Drive overcrossing would cause a slight reduction in traffic on El Toro Road by providing additional east-west capacity. However, Chapter 4.0 showed no significant deficiencies without the overcrossing, and hence, it is not needed to serve the 2030 traffic demand. The estimated volume on the overcrossing is around 16,000 ADT which could be adequately served by two lanes with appropriate treatment to the intersections at either end of the overcrossing.

Table 5-2

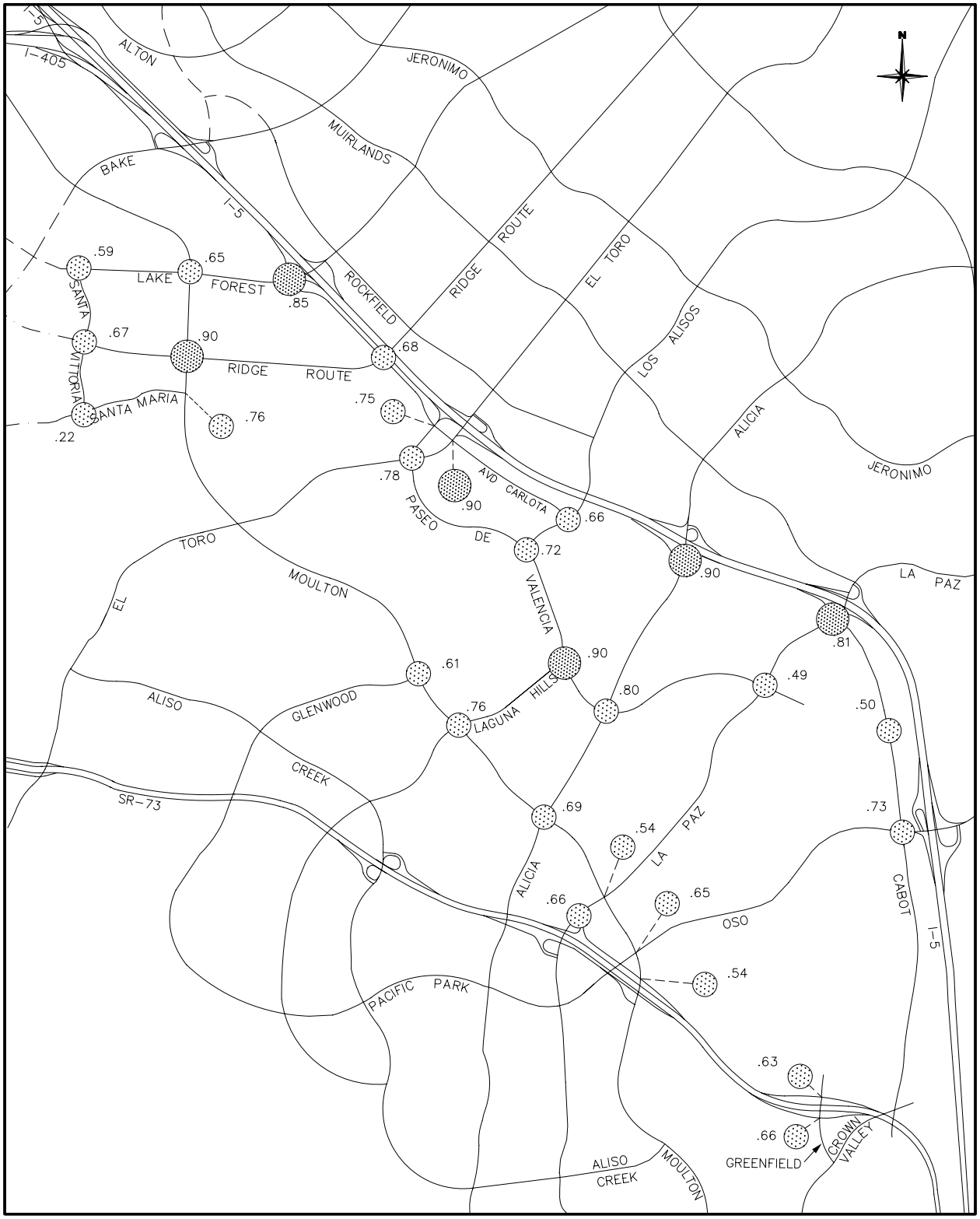
2030 LOS SUMMARY – MPAH NETWORK

Intersection*	AM Peak Hour		PM Peak Hour	
	ICU	LOS	ICU	LOS
1. Santa Vittoria & Lake Forest	.51	A	.59	A
2. Irvine Center/Moulton & Lake Forest	.63	B	.65	B
3. I-5 SB/Avd Carlota & Lake Forest	.55	A	.85	D
4. Santa Vittoria & Ridge Route	.67	B	.67	B
5. Moulton & Ridge Route	.54	A	.90	D
6. Avd Carlota & Ridge Route	.49	A	.68	B
7. Avd Carlota & Paseo de Valencia	.65	B	.75	C
8. Avd Carlota & El Toro (a)	.62	B	.90	D
9. Paseo de Valencia & El Toro	.56	A	.78	C
10. Paseo de Valencia & Los Alisos	.64	B	.72	C
11. Paseo de Valencia & Laguna Hills	.72	C	.90	D
12. Avd Carlota & Los Alisos	.42	A	.66	B
13. Moulton & Glenwood	.61	B	.61	B
14. Moulton & Laguna Hills	.66	B	.76	C
15. Moulton & Alicia	.67	B	.69	B
16. Moulton & La Paz	.54	A	.53	A
17. Moulton & Oso	.54	A	.65	B
19. Moulton & SR-73 WB Ramps	.54	A	.41	A
20. I-5 SB Ramps & Alicia	.87	D	.90	D
21. Paseo de Valencia & Alicia	.75	C	.80	C
22. I-5 Ramps/Cabot & La Paz	.62	B	.81	D
23. La Paz & Paseo de Valencia	.49	A	.47	A
24. Cabot & Paseo de Valencia	.50	A	.46	A
25. Cabot & Oso	.61	B	.73	C
29. Greenfield & SR-73 WB Ramps	.63	B	.49	A
30. Greenfield & SR-73 EB Ramps	.51	A	.66	B
33. Santa Vittoria & Santa Maria	.22	A	.20	A
34. Moulton Pkwy & Santa Maria	.55	A	.76	C
35. Merienda/SR-73 WB Ramps & La Paz	.66	B	.34	A

* See intersection location map in Figure 5-1.

Note: (a) LOS "E" is acceptable at this location. LOS "D" is the City's adopted standard for the remaining study area intersections.

Abbreviations: ICU - intersection capacity utilization, LOS - level of service
ICU LOS ranges: .00 – .60 A
.61 – .70 B
.71 – .80 C
.81 – .90 D
.91 – 1.00 E
Above 1.00 F



Legend

- .80 and below LOS A - C
- .81 - .90 LOS D
- .91 and above LOS E - F
- Future committed roadway
- Future non-committed roadway

Figure 5-3

2030 PEAK HOUR ICUs
- HIGHEST AM/PM LOS VALUE
(MPAH NETWORK)

Cabot Road Roadway Classification

Currently on the MPAH as a secondary arterial, Cabot Road between La Paz Road and Paseo de Valencia is forecast to carry 12,000 ADT in 2030 with the Committed and MPAH networks, a volume that is within the capacity of a secondary arterial. The capacity will be augmented when the City's plan to install a median for landscaping purposes is implemented. It is recommended that a designation of an augmented secondary arterial be used to classify this section of Cabot Road.

La Paz Road Roadway Classification

La Paz Road is currently a primary arterial on the City Circulation Plan and in the County MPAH. This roadway classification is appropriate for the majority of La Paz Road with the highest volume forecast at 19,000 ADT in 2030 with the Committed and MPAH networks which is within the capacity of a primary arterial. However, the volume increases to 43,000 east of Cabot Road. A currently committed improvement plan for the Cabot Road intersection and the I-5 interchange will improve capacity. To be fully effective, the widening of La Paz Road from McIntyre to Cabot Road will be needed. Therefore, La Paz Road between I-5 and McIntyre Street will be classified as an augmented primary arterial. Review of the intersections along La Paz Road with the improvements near the I-5 ramps showed that there are no intersection deficiencies in 2030 with the Committed and MPAH networks.

Paseo de Valencia between El Toro Road and Laguna Hills Drive

The number of lanes on Paseo de Valencia between El Toro Road and Laguna Hills Drive currently varies from four to five lanes and is designated as a major arterial according to the City Circulation Plan and County MPAH. As previously noted, the analysis of the arterial road system is based on intersection capacity since this is the defining capacity limitation on an arterial roadway system. The levels of service at intersections along Paseo de Valencia indicate no deficiencies in 2030 with the Committed and MPAH networks. Therefore, the need for the six lanes will be monitored over time and implemented if and when such widening is needed.

OPERATIONAL ANALYSIS

As previously noted in other chapters of this report, there are situations that do not allow the theoretical ICU values to be achieved such as the constraints of two closely spaced intersections (e.g.,

Avenida de la Carlota at Paseo de Valencia and Avenida de la Carlota at El Toro Road) and where inefficient lane utilization occurs (e.g., Paseo de Valencia at Laguna Hills Drive). In such cases, operational analyses are carried out using delay-based procedures as described in the Highway Capacity Manual (HCM). The peak hour traffic data in combination with the lane configurations of each location are analyzed to compare delay and V/C (ICU) based on the LOS values.

The PM peak hour HCM delay and ICU results for these two intersections are presented in Table 5-3 which summarizes the peak hour LOS values for existing and 2030 under the committed network. The ICU calculation and HCM delay worksheets are provided in Appendices A and C, respectively.

As the summary table indicates, the intersection of Avenida de la Carlota at El Toro Road in the PM peak hour currently operates at LOS "E" using the HCM versus LOS "D" using the ICU methodology. In 2030 with the Committed Network, both methodologies show LOS "E" and according to the Congestion Management Program (CMP) guidelines of which this intersection is a part, LOS "E" is acceptable. The intersection of Paseo de Valencia at Laguna Hills Drive in 2030 with the Committed and MPAH networks operates at LOS "E" using the HCM versus LOS "D" using the ICU methodology. In this case, the high southbound right-turn and the high eastbound left-turn cause operational problems not reflected in the ICUs. Consideration could be given for allowing southbound right-turns from the third through lane thereby adding capacity for this move and at the same time providing more capacity for the eastbound left-turn.

TRAFFIC CALMING

Traffic calming involves the deployment of street design features that cause motorists to drive with more care, to drive more slowly or perhaps via another route. The majority of traffic calming devices make alterations to a street's geometry, reducing its real or perceived width, or causing the driver to negotiate curvature or pavement texture. These modifications are almost always made within the public right-of-way, and are usually accompanied by extensive landscaping, thereby serving as neighborhood landmarks as well as traffic calming devices.

Traffic calming measures are generally implemented in response to specific problems. The problem or problems may involve a neighborhood or simply a street or part of a street. Examples of typical problems are as follows:

Table 5-3

OPERATIONAL ANALYSIS PM PEAK HOUR LOS SUMMARY

Intersection[1]	Existing		2030 Committed		2030 MPAH	
	ICU	**LOS[2]**	**ICU**	**LOS[2]**	**ICU**	**LOS[2]**
ICU						
7. Avd Carlota & Paseo de Valencia	.58	A	.76	C	.75	C
8. Avd Carlota & El Toro[3]	.87	D	.92	E	.90	D
11. Paseo de Valencia & Laguna Hills	.66	B	.90	D	.90	D
	Delay	**LOS[2]**	**Delay**	**LOS[2]**	**Delay**	**LOS[2]**
HCM Delay						
7. Avd Carlota & Paseo de Valencia	38.9	D	49.9	D	51.5	D
8. Avd Carlota & El Toro[3]	59.0	E	61.3	E	56.1	E
11. Paseo de Valencia & Laguna Hills	37.4	D	75.0	E	72.2	E

Notes:

[1]See Intersection Location Map in Figure 5-1.

[2]See Table 1-2 for LOS ranges.

[3]LOS "E" is acceptable at this location per CMP guidelines.

Abbreviations: CMP – Congestion Management Program, HCM – Highway Capacity Manual, LOS – Level of Service, SB – southbound

Cut-Through Traffic – Cut-through traffic has neither origin nor destination within the neighborhood, but rather is passing through on local streets. Cut-through trips seek out local streets, sometimes because they are faster, and sometimes because they are more pleasant and therefore seem to be faster.

Speeding – Many motorists (neighborhood residents as well as "cut-through") drive too fast on local streets. While some speeding is by irresponsible drivers, the majority is by normally responsible drivers unintentionally speeding due to design features such as excessively wide pavement, straight sections of road and absence of landscaping. In addition to safety issues, speeding vehicles degrade the quality of the street for other users and particularly for residents.

Safety – While largely related to speeding, safety also involves factors such as road geometry, safe road crossing locations, etc.

Aesthetics – Wide expanses of pavement devoted solely to the moving of traffic can take over a street in response to providing adequate "traffic service." Traffic calming provides the opportunity to use streets not only for moving cars but also as an aesthetically pleasing focal point for the community.

Although there are a number of traffic calming devices, they generally derive from some combination of a few basic principles:

Narrowing the street – This tends to reduce the speed that most drivers find reasonable and comfortable. Narrowing is done through reducing the pavement width, either at the sides or by adding a median or both. At intersections, narrowing can be achieved or complemented by extending the curbs. The perception of narrowing, which can be as effective as actual narrowing, is gained with street trees along the curb, overhead tree canopy, buildings brought close to the street and "gateways" along the street (i.e., short sections along which the curb-to-curb street width is narrowed).

Deflecting the vehicle path – Deflection usually terminates long, straight street views, thereby reducing speeds. Deflection is done through curving the travel path of the vehicle, and thereby causing the driver to reduce speed. Features incorporated into the street to cause deflection can also enhance the visual character of a street.

Diverting the driver's route – This is a more extreme measure, and makes vehicular access more difficult, thereby encouraging drivers to use another route. Diagonal street closures, one-way streets, median closings and turning movement restrictions are examples of diversion.

Changing the pavement surface – This feature demands attention from drivers, and reduces the comfortable driving speed. When deployed at intersections, it can enhance pedestrian safety.

Standard traffic control devices – These slow traffic through regulation. Turn movement prohibitions, traffic signals and posted speed limits are examples of these more conventional traffic calming strategies.

Table 5-4 provides a toolbox of commonly used traffic calming actions. Typically three steps are undertaken to implement a traffic calming program:

1. Identify the issue (i.e., location and problem) and apply some form of warrant/justification for proceeding with a study.
2. Identify potential tools that might be applicable.
3. Evaluate the tools and establish an implementation plan.

Traffic calming measures, while simple in concept, give a new balance between traffic service and important neighborhood values, such as noise, safety, walking and bicycling. Part of step three above is to recognize the trade-offs that can occur in this regard and achieve the desired balance between what may often be competing objectives. The City's existing adopted policy, "Residential Streets Management Policy," provides an implementation plan that addresses traffic calming and safety issues that arise on City streets.

TRANSPORTATION SYSTEM MANAGEMENT

Transportation System Management (TSM) covers a broad range of strategies design to maximize the use of the transportation system. One set of strategies involves the operation of the arterial street system and another seeks to reduce the demand on that street system by Transportation Demand Management (TDM) features applied to land use development. The Mobility Element contains Goals and Policies for TSM and also outlines a number of implementing mechanisms.

Table 5-4

TRAFFIC CALMING TOOLBOX

Tool	Spot Location	Intersection	Roadway
Bulbout (curb extension)	✓	✓	✓
Chicane	--	--	✓
Choker (neckdown)	✓	✓	✓
Diverter	--	✓	--
Driveway Link	--	--	✓
Full Street Closure	--	--	✓
Gateway	✓	✓	✓
Intermediate Median Barrier	--	✓	✓
Landscaping Treatments	✓	✓	✓
Median	--	--	✓
Modified Intersection	--	✓	--
Partial Street Closure	--	✓	✓
Pedestrian Refuge Islands	✓	✓	✓
Pavement Surface Changes	✓	✓	--
Roadway Narrowing	--	--	✓
Roundabout	--	✓	--

Examples of features that can be incorporated into the Element as policies or implementing mechanisms are as follows:

- Incorporate design features that reduce air pollution from motor vehicles, such as transit facilities and park-and-ride sites; bus benches, shelters, pads, or turnouts; bicycle racks and lockers; and preferred parking for ride sharers.

- Encourage and support the use of low emission and alternative fuel vehicles within the City.

- Provide employee incentives for using alternatives to the single occupancy automobile, including carpools, vanpools, buses, bicycles, walking, and telecommuting.

- Support the efforts of businesses to use flextime, staggered working hours and other means to lessen commuter traffic during peak hours.

- Support the promotion of ride sharing through publicity and public education.

- Continue to enforce the City's TDM ordinance and amend the ordinance as needed to reflect changes in technology and work habits.

Appendix A
Intersection Capacity Utilization (ICU) Worksheets

This appendix summarizes information pertaining to the intersection analysis presented in this traffic report.

ICU Calculation Methodology

The intersection capacity utilization (ICU) procedure is based on a critical movement methodology that shows the amount of capacity utilized by each critical movement at an intersection. Consistent with the Congestion Management Program's (CMP) guidelines for preparing ICU calculations, a capacity of 1,700 vehicles per hour per lane is assumed together with a .05 clearance interval. A "de facto" right-turn lane is used in the ICU calculation for cases where a curb lane is wide enough to separately serve both through and right-turn traffic (typically with a width of 19 feet or more from curb to outside of through-lane with parking prohibited during peak periods). Such lanes are treated the same as striped right-turn lanes during the ICU calculations, but they are denoted on the ICU calculation worksheets using the letter "d" in place of a numerical entry for right-turn lanes.

The methodology also incorporates a check for right-turn capacity utilization. Both right-turn-on-green (RTOG) and right-turn-on-red (RTOR) capacity availability are calculated and checked against the total right-turn capacity need. If insufficient capacity is available, then an adjustment is made to the total capacity utilization value. The following example shows how this adjustment is made.

Example for Northbound Right

1. Right-Turn-On-Green (RTOG)

If NBT is critical move, then:
RTOG = V/C (NBT)
Otherwise,
RTOG = V/C (NBL) + V/C (SBT) - V/C (SBL)

2. Right-Turn-On-Red (RTOR)

If WBL is critical move, then:
RTOR = V/C (WBL)
Otherwise,
RTOR = V/C (EBL) + V/C (WBT) - V/C (EBT)

3. Right-Turn Overlap Adjustment

If the northbound right is assumed to overlap with the adjacent westbound left, adjustments to the RTOG and RTOR values are made as follows:

RTOG = RTOG + V/C (WBL)
RTOR = RTOR - V/C (WBL)

4. Total Right-Turn Capacity (RTC) Availability For NBR

RTC = RTOG + factor x RTOR
Where factor = RTOR saturation flow factor (0% for County intersections, 75% for intersections in all other jurisdictions within the study area)

Right-turn adjustment is then as follows: Additional ICU = V/C (NBR) – RTC

A zero or negative value indicates that adequate capacity is available and no adjustment is necessary. A positive value indicates that the available RTOR and RTOG capacity does not adequately accommodate the right-turn V/C, therefore the right-turn is essentially considered to be a critical movement. In such cases, the right-turn adjustment is noted on the ICU worksheet and it is included in the total capacity utilization value. When it is determined that a right-turn adjustment is required for more than one right-turn movement, the word "multi" is printed on the worksheet instead of an actual right-turn movement reference, and the right-turn adjustments are cumulatively added to the total capacity utilization value. In such cases, further operational evaluation is typically carried out to determine if under actual operational conditions, the critical right-turns would operate simultaneously, and therefore a right-turn adjustment credit should be applied.

Shared Lane V/C Methodology

For intersection approaches where shared usage of a lane is permitted by more than one turn movement (e.g., left/through, through/right, left/through/right), the individual turn volumes are evaluated to determine whether dedication of the shared lane is warranted to any one given turn movement. The following example demonstrates how this evaluation is carried out:

Example for Shared Left/Through Lane

1. Average Lane Volume (ALV)

$$ALV = \frac{\text{Left-Turn Volume + Through Volume}}{\text{Total Left + Through Approach Lanes (including shared lane)}}$$

2. ALV for Each Approach

$$ALV\ (Left) = \frac{\text{Left-Turn Volume}}{\text{Left Approach Lanes (including shared lane)}}$$

$$ALV\ (Through) = \frac{\text{Through Volume}}{\text{Through Approach Lanes (including shared lane)}}$$

3. Lane Dedication is Warranted

If ALV (Left) is greater than ALV then full dedication of the shared lane to the left-turn approach is warranted. Left-turn and through V/C ratios for this case are calculated as follows:

$$V/C\ (Left) = \frac{\text{Left-Turn Volume}}{\text{Left Approach Capacity (including shared lane)}}$$

$$V/C\ (Through) = \frac{\text{Through Volume}}{\text{Through Approach Capacity (excluding shared lane)}}$$

Similarly, if ALV (Through) is greater than ALV then full dedication to the through approach is warranted, and left-turn and through V/C ratios are calculated as follows:

$$V/C\ (Left) = \frac{\text{Left-Turn Volume}}{\text{Left Approach Capacity (excluding shared lane)}}$$

$$V/C\ (Through) = \frac{\text{Through Volume}}{\text{Through Approach Capacity (including shared lane)}}$$

4. Lane Dedication is not Warranted

If ALV (Left) and ALV (Through) are both less than ALV, the left/through lane is assumed to be truly shared and each left, left/through or through approach lane carries an evenly distributed volume of traffic equal to ALV. A combined left/through V/C ratio is calculated as follows:

$$V/C\ (Left/Through) = \frac{\text{Left-Turn Volume + Through Volume}}{\text{Total Left + Through Approach Capacity (including shared lane)}}$$

This V/C (Left/Through) ratio is assigned as the V/C (Through) ratio for the critical movement analysis and ICU summary listing.

If split phasing has not been designated for this approach, the relative proportion of V/C (Through) that is attributed to the left-turn volume is estimated as follows:

If approach has more than one left-turn (including shared lane), then:

V/C (Left) = V/C (Through)

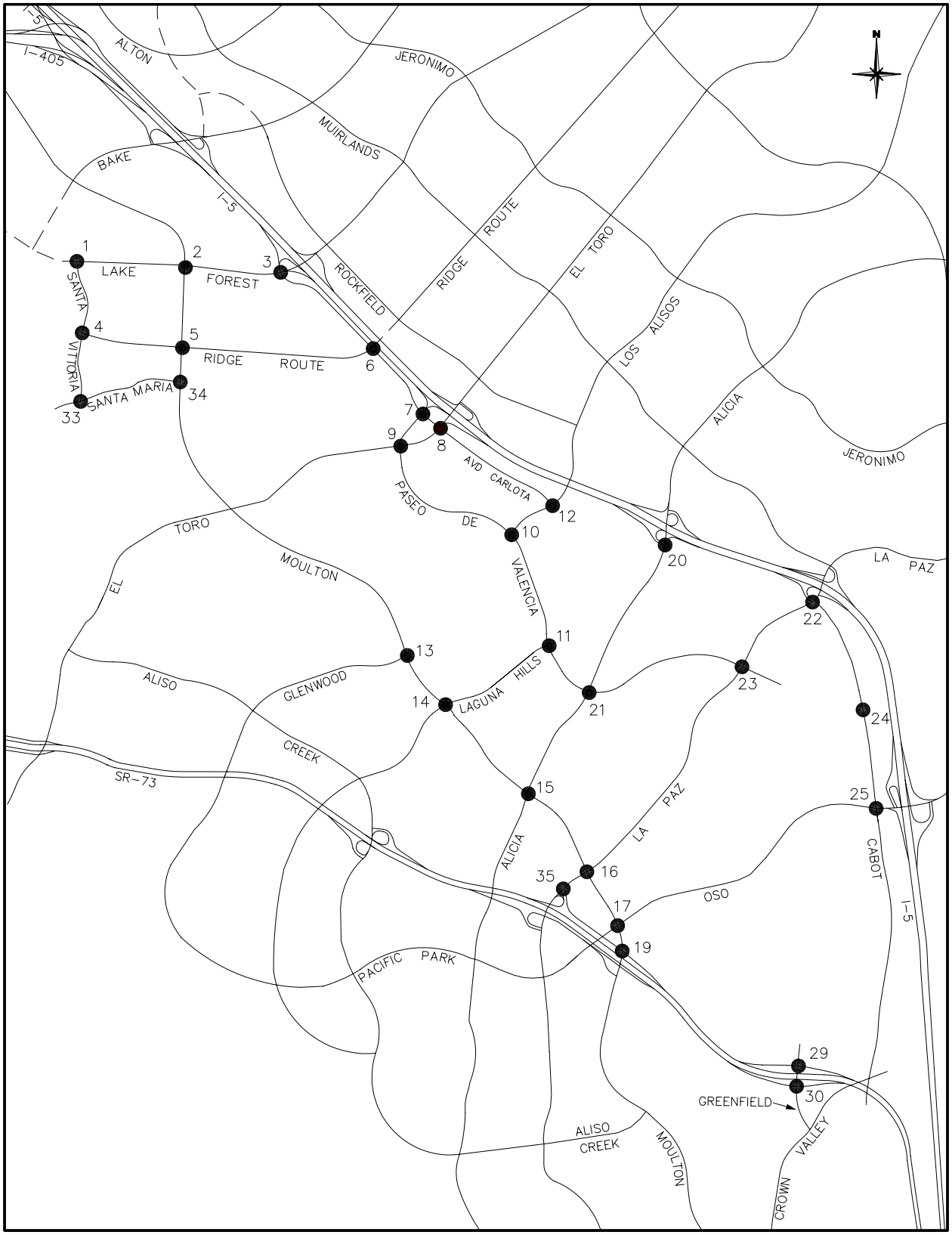
If approach has only one left-turn lane (shared lane), then:

$$\text{V/C (Left)} = \frac{\text{Left-Turn Volume}}{\text{Single Approach Lane Capacity}}$$

If this left-turn movement is determined to be a critical movement, the V/C (Left) value is posted in brackets on the ICU summary printout.

These same steps are carried out for shared through/right lanes. If full dedication of a shared through/right lane to the right-turn movement is warranted, the right-turn V/C value calculated in step three is checked against the RTOR and RTOG capacity. When an approach contains more than one shared lane (e.g., left/through and through/right), steps one and two listed above are carried out for the three turn movements combined. Step four is carried out if dedication is not warranted for either of the shared lanes. If dedication of one of the shared lanes is warranted to one movement or another, step three is carried out for the two movements involved, and then steps one through four are repeated for the two movements involved in the other shared lane.

Figure A-1 illustrates the intersections that were analyzed in this study, and Table A-1 summarizes the existing and future lane geometric configurations for the intersections that were analyzed. The AM and PM peak hour ICU worksheets then follow for existing and year 2030 conditions with the proposed land use changes.



Legend

Future committed roadway

XX Intersection location and reference number

Figure A-1

2030 INTERSECTION LOCATION MAP

Table A-1

EXISTING AND FUTURE INTERSECTION LANE GEOMETRICS

Loc. #	Intersection (NS & EW)	Intersection Approach Lanes												Source
		Southbound			Westbound			Northbound			Eastbound			
		L	T	R	L	T	R	L	T	R	L	T	R	
1	**Santa Vittoria & Lake Forest**													
	Existing Conditions	1	1	0	1	0	1	0	1	1	0	0	0	
	2030 Improvements			1		3	d	1		0	1	3	d	Irvine Planning Area 39
	Buildout MPAH Improvements													
	Final Buildout Conditions	1	1	1	1	3	d	1	1	0	1	3	d	
2	**Irvine Center/Moulton & Lake Forest**													
	Existing Conditions	2	3	d	2	3	f	2	3	1	2	3	1	
	2030 Improvements													
	Buildout MPAH Improvements													
	Final Buildout Conditions	2	3	d	2	3	f	2	3	1	2	3	1	
3	**I-5 SB/Avd Carlota & Lake Forest**													
	Existing Conditions	-2.5	-1.5	-1	2	3	f	-1	0	-2	0	4	0	
	2030 Improvements	-3	-0.5	-1.5				-2		-2>				NITM Program (fully funded)
	Buildout MPAH Improvements													
	Final Buildout Conditions	-3	-0.5	-1.5	2	3	f	-2	0	-2>	0	4	0	
4	**Santa Vittoria & Ridge Route**													
	Existing Conditions	1	1	0	1	0	1	0	1	0	0	0	0	
	2030 Improvements													
	Buildout MPAH Improvements													
	Final Buildout Conditions	1	1	0	1	0	1	0	1	0	0	0	0	
5	**Moulton & Ridge Route**													
	Existing Conditions	1	3	0	1	2	1	1	3	1	1	2	1	
	2030 Improvements	2		1	2			2	4					County
	Buildout MPAH Improvements													
	Final Buildout Conditions	2	3	1	2	2	1	2	4	1	1	2	1	

Table A-1 (cont.)
EXISTING AND FUTURE INTERSECTION LANE GEOMETRICS

Loc. #	Intersection (NS & EW)	Intersection Approach Lanes												Source
		Southbound			Westbound			Northbound			Eastbound			
		L	T	R	L	T	R	L	T	R	L	T	R	
6	**Avd Carlota & Ridge Route**													
	Existing Conditions	0	2	0	0	0	0	1	2	0	1	0	1	
	2030 Improvements													
	Buildout MPAH Improvements	1			1 2	2						2		Unfunded General Plan Imp. County (Aliso Creek deletion)
	Final Buildout Conditions	1	2	0	2	2	0	1	2	0	1	2	1	
7	**Avd Carlota & Paseo de Valencia**													
	Existing Conditions	2	2	1	-2	-2	0	1	2	1	-2	-1	-1	
	2030 Improvements				-2.5	-1.5								NITM and LFTM Programs and Laguna Hills
	Buildout MPAH Improvements													
	Final Buildout Conditions	2	2	1	-2.5	-1.5	0	1	2	1	-2	-1	-1	
8	**Avd Carlota & El Toro**													
	Existing Conditions	-1.5	-1.5	-1	2	3	1>	-1	-1	-1>	0	4	d	
	2030 Improvements	-2.5						-0.5	-1.5	-2>				NITM and LFTM Programs and Laguna Hills
	Buildout MPAH Improvements													
	Final Buildout Conditions	-2.5	-1.5	1	2	3	1>	-0.5	-1.5	-2>	0	4	d	
9	**Paseo de Valencia & El Toro**													
	Existing Conditions	1	2	1>	2	3	0	2	2	1>	2	3	1>	
	2030 Improvements													
	Buildout MPAH Improvements													
	Final Buildout Conditions	1	2	1>	2	3	0	2	2	1>	2	3	1>	
10	**Paseo de Valencia & Los Alisos**													
	Existing Conditions	2	2	0	3	0	1>	0	2	2>	0	0	0	
	2030 Improvements													
	Buildout MPAH Improvements													
	Final Buildout Conditions	2	2	0	3	0	1>	0	2	2>	0	0	0	

Table A-1 (cont.)
EXISTING AND FUTURE INTERSECTION LANE GEOMETRICS

Loc. #	Intersection (NS & EW)	Intersection Approach Lanes												Source
		Southbound			Westbound			Northbound			Eastbound			
		L	T	R	L	T	R	L	T	R	L	T	R	
11	**Paseo de Valencia & Laguna Hills**													
	Existing Conditions	1	3	1	-1	-1	0	2	3	0	-1.5	-0.5	-1	
	2030 Improvements													
	Buildout MPAH Improvements													
	Final Buildout Conditions	1	3	1	-1	-1	0	2	3	0	-1.5	-0.5	-1	
12	**Avd Carlota & Los Alisos**													
	Existing Conditions	-1.5	-0.5	-1	1	2	1>	0	-1	-d	2	3	0	
	2030 Improvements													
	Buildout MPAH Improvements													
	Final Buildout Conditions	-1.5	-0.5	-1	1	2	1>	0	-1	-d	2	3	0	
13	**Moulton & Glenwood**													
	Existing Conditions	1	3	1	0	-1	-d	2	3	d	-1.5	-0.5	-1	
	2030 Improvements													
	Buildout MPAH Improvements													
	Final Buildout Conditions	1	3	1	0	-1	-d	2	3	d	-1.5	-0.5	-1	
14	**Moulton & Laguna Hills**													
	Existing Conditions	2	3	1	1	2	1	2	4	1	2	3	1	
	2030 Improvements										3	2		NITM Program (partially funded)
	Buildout MPAH Improvements													
	Final Buildout Conditions	2	3	1	1	2	1	2	4	1	3	2	1	
15	**Moulton & Alicia**													
	Existing Conditions	2	3	1	2	3	1	2	3	1	2	3	f	
	2030 Improvements											4		County (Aliso Creek deletion)
	Buildout MPAH Improvements													
	Final Buildout Conditions	2	3	1	2	3	1	2	3	1	2	4	f	
16	**Moulton & La Paz**													
	Existing Conditions	2	3	f	2	3	1	2	3	1	2	3	1	
	2030 Improvements													
	Buildout MPAH Improvements													
	Final Buildout Conditions	2	3	f	2	3	1	2	3	1	2	3	1	

Table A-1 (cont.)
EXISTING AND FUTURE INTERSECTION LANE GEOMETRICS

Loc. #	Intersection (NS & EW)	Intersection Approach Lanes												Source
		Southbound			Westbound			Northbound			Eastbound			
		L	T	R	L	T	R	L	T	R	L	T	R	
17	**Moulton & Oso**													
	Existing Conditions	2	3	1	2	3	1	2	3	1	2	3	1	
	2030 Improvements													
	Buildout MPAH Improvements													
	Final Buildout Conditions	2	3	1	2	3	1	2	3	1	2	3	1	
18	**Moulton & Nellie Gail Rd**													
	Existing Conditions	1	4	0	1	1	0	1	3	0	1	1	0	
	2030 Improvements													
	Buildout MPAH Improvements													
	Final Buildout Conditions	1	4	0	1	1	0	1	3	0	1	1	0	
19	**Moulton & SR-73 WB Ramps**													
	Existing Conditions	0	3	1	0	0	0	2	3	0	0	0	0	
	2030 Improvements													
	Buildout MPAH Improvements													
	Final Buildout Conditions	0	3	1	0	0	0	2	3	0	0	0	0	
20	**I-5 SB Ramps & Alicia**													
	Existing Conditions	1.5	0	1.5	0	3	f	0	0	0	0	3	f	
	2030 Improvements	2.5												County (Aliso Creek deletion)
	Buildout MPAH Improvements													
	Final Buildout Conditions	2.5	0	1.5	0	3	f	0	0	0	0	3	f	
21	**Paseo de Valencia & Alicia**													
	Existing Conditions	2	2	2	1	3	1	2	3	1	2	3	0	
	2030 Improvements													
	Buildout MPAH Improvements													
	Final Buildout Conditions	2	2	2	1	3	1	2	3	1	2	3	0	
22	**I-5 SB Ramps/Cabot & La Paz**													
	Existing Conditions	1.5	0.5	1	1	2	0	1	0	2	0	2	1	
	2030 Improvements	2		1.5	2		f	1.5		1.5		3		OCTA
	Buildout MPAH Improvements													
	Final Buildout Conditions	2	0.5	1.5	2	2	f	1.5	0	1.5	0	3	1	

Table A-1 (cont.)
EXISTING AND FUTURE INTERSECTION LANE GEOMETRICS

Loc. #	Intersection (NS & EW)	Intersection Approach Lanes												Source
		Southbound			Westbound			Northbound			Eastbound			
		L	T	R	L	T	R	L	T	R	L	T	R	
23	**La Paz & Paseo de Valencia**													
	Existing Conditions	1	2	1	1	2	0	1	2	1	1	2	1	
	2030 Improvements													
	Buildout MPAH Improvements													
	Final Buildout Conditions	1	2	1	1	2	0	1	2	1	1	2	1	
24	**Cabot & Paseo de Valencia**													
	Existing Conditions	0	2	0	0	0	0	1	2	0	1	0	f	
	2030 Improvements													
	Buildout MPAH Improvements													
	Final Buildout Conditions	0	2	0	0	0	0	1	2	0	1	0	f	
25	**Cabot & Oso**													
	Existing Conditions	2	2	1	2	3	1	2	2	1	2	3	1	
	2030 Improvements													
	Buildout MPAH Improvements													
	Final Buildout Conditions	2	2	1	2	3	1	2	2	1	2	3	1	
29	**Greenfield & SR-73 WB Ramps**													
	Existing Conditions	0	1	1	1	0	1	2	1	0	0	0	0	
	2030 Improvements													
	Buildout MPAH Improvements													
	Final Buildout Conditions	0	1	1	1	0	1	2	1	0	0	0	0	
30	**Greenfield & SR-73 EB Ramps**													
	Existing Conditions	1	2	0	0	0	0	0	2	0	0.5	0	1.5	
	2030 Improvements													
	Buildout MPAH Improvements													
	Final Buildout Conditions	1	2	0	0	0	0	0	2	0	0.5	0	1.5	
31	**Scientific/Mill Creek & Lake Forest**													
	Existing Conditions	1	1	1	1	3	0	1	1	0	1	3	0	
	2030 Improvements													
	Buildout MPAH Improvements													
	Final Buildout Conditions	1	1	1	1	3	0	1	1	0	1	3	0	

Table A-1 (cont.)
EXISTING AND FUTURE INTERSECTION LANE GEOMETRICS

Loc. #	Intersection (NS & EW)	Intersection Approach Lanes												Source
		Southbound			Westbound			Northbound			Eastbound			
		L	T	R	L	T	R	L	T	R	L	T	R	
32	**Mill Creek & Ridge Route**													
	Existing Conditions	0	1	0	0	2	1	0	0	0	1	2	0	
	2030 Improvements													
	Buildout MPAH Improvements													
	Final Buildout Conditions	0	1	0	0	2	1	0	0	0	1	2	0	
33	**Santa Vittoria & Santa Maria**													
	Existing Conditions	0	1	0	0	2	0	0	0	0	0	2	0	
	2030 Improvements													
	Buildout MPAH Improvements													
	Final Buildout Conditions	0	1	0	0	2	0	0	0	0	0	2	0	
34	**Moulton & Santa Maria**													
	Existing Conditions	0	3	0	0	0	0	1	3	0	1.5	0	1.5	
	2030 Improvements													
	Buildout MPAH Improvements		4						4					NITM Program (partially funded) NITM Program & PA18/39 GPA (partially funded)
	Final Buildout Conditions	0	4	0	0	0	0	1	4	0	1.5	0	1.5	
35	**Merienda/SR-73 WB Ramps & La Paz**													
	Existing Conditions	0	1	0	2	3	0	1	1	0	1	3	1	
	2030 Improvements													
	Buildout MPAH Improvements													
	Final Buildout Conditions	0	1	0	2	3	0	1	1	0	1	3	1	

Note: Only committed improvements are assumed in year 2030.

Lane entry notations: d = de-facto right-turn lane (curb lane 19 feet or wider)
f = free right-turn lane
Negative lane entries denote split phasing.
Right-turn lane entry followed by ">" denotes a right-turn overlap signal phase.

1. Santa Vittoria & Lake Forest

Existing Count

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	0		0	
NBT	1	1700	270	.16*	150	.09*
NBR	1	1700	120	.07	80	.05
SBL	1	1700	20	.01*	120	.07*
SBT	1	1700	20	.01	170	.10
SBR	0	0	0		0	
EBL	0	0	0		0	
EBT	0	0	0		0	
EBR	0	0	0		0	
WBL	1	1700	70	.04*	210	.12*
WBT	0	0	0		0	
WBR	1	1700	120	.07	50	.03
Right Turn Adjustment			WBR	.02*		
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.28**		**.33**

2030 Committed Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	820	.48*	500	.29*
NBT	1	1700	280	.24	160	.15
NBR	0	0	130		90	
SBL	1	1700	20	.01	130	.08
SBT	1	1700	20	.01*	180	.11*
SBR	1	1700	30	.02	130	.08
EBL	1	1700	60	.04*	20	.01
EBT	3	5100	310	.06	640	.13*
EBR	d	1700	280	.16	720	.42
WBL	1	1700	80	.05	220	.13*
WBT	3	5100	1000	.20*	880	.17
WBR	d	1700	130	.08	50	.03
Right Turn Adjustment					EBR	.07*
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.78**		**.78**

2030 MPAH Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	390	.23	190	.11
NBT	1	1700	280	.24*	160	.15*
NBR	0	0	130		90	
SBL	1	1700	20	.01*	130	.08*
SBT	1	1700	20	.01	180	.11
SBR	1	1700	40	.02	150	.09
EBL	1	1700	80	.05*	20	.01
EBT	3	5100	290	.06	910	.18*
EBR	d	1700	100	.06	330	.19
WBL	1	1700	80	.05	220	.13*
WBT	3	5100	840	.16*	880	.17
WBR	d	1700	130	.08	60	.04
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.51**		**.59**

2. Irvine Center/Moulton & Lake Forest

Existing Count

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	50	.01	40	.01*
NBT	3	5100	1280	.25*	580	.11
NBR	1	1700	300	.18	350	.21
SBL	2	3400	40	.01*	160	.05
SBT	3	5100	290	.06	840	.16*
SBR	d	1700	20	.01	10	.01
EBL	2	3400	10	.00	30	.01
EBT	3	5100	210	.04*	260	.05*
EBR	1	1700	10	.01	10	.01
WBL	2	3400	390	.11*	590	.17*
WBT	3	5100	240	.05	210	.04
WBR	1	1700	60	.04	40	.02
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.46**		**.44**

2030 Committed Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	680	.20	160	.05*
NBT	3	5100	1700	.33*	1110	.22
NBR	1	1700	530	.31	360	.21
SBL	2	3400	130	.04*	170	.05
SBT	3	5100	800	.16	1570	.31*
SBR	d	1700	30	.02	10	.01
EBL	2	3400	10	.00	40	.01
EBT	3	5100	220	.04*	430	.08*
EBR	1	1700	30	.02	310	.18
WBL	2	3400	440	.13*	810	.24*
WBT	3	5100	360	.07	220	.04
WBR	f		70		60	
Right Turn Adjustment					EBR	.06*
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.59**		**.79**

2030 MPAH Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	270	.08	140	.04*
NBT	3	5100	1930	.38*	1030	.20
NBR	1	1700	390	.23	360	.21
SBL	2	3400	150	.04*	410	.12
SBT	3	5100	790	.15	1440	.28*
SBR	d	1700	30	.02	10	.01
EBL	2	3400	10	.00	40	.01
EBT	3	5100	220	.04*	370	.07*
EBR	1	1700	20	.01	10	.01
WBL	2	3400	400	.12*	720	.21*
WBT	3	5100	410	.08	220	.04
WBR	f		100		120	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.63**		**.65**

3. I-5 SB/Avd Carlota & Lake Forest

Existing Count

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	130	.08*	170	.10*
NBT	0	0	0		0	
NBR	2	3400	160	.05	390	.11
SBL	2.5		550		1440	
SBT	1.5	6800	270	.12*	560	.29*
SBR	1	1700	390	.23	310	.18
EBL	0	0	0		0	
EBT	4	6800	580	.09*	1290	.21*
EBR	0	0	60		130	
WBL	2	3400	300	.09*	230	.07*
WBT	3	5100	760	.15	590	.12
WBR	f		220		420	
Right Turn Adjustment			SBR	.09*		
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION **.52** **.72**

2030 Committed Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	310	.09*	360	.11*
NBT	0	0	0		0	
NBR	2	3400	200	.06	400	.12
SBL	3	5100	560	.11	1450	.28
SBT	0.5	3400	280	{.19}*	570	.34*
SBR	1.5		400		320	.19
EBL	0	0	0		0	
EBT	4	6800	780	.13*	1550	.26*
EBR	0	0	100		250	
WBL	2	3400	310	.09*	260	.08*
WBT	3	5100	970	.19	600	.12
WBR	f		230		430	
Clearance Interval				.05*		.05*

Note: Assumes N/S Split Phasing
Note: Assumes Right-Turn Overlap for NBR

TOTAL CAPACITY UTILIZATION **.55** **.84**

2030 MPAH Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	330	.10*	370	.11*
NBT	0	0	0		0	
NBR	2	3400	170	.05	400	.12
SBL	3	5100	560	.11	1450	.28
SBT	0.5	3400	280	{.19}*	570	.34*
SBR	1.5		400		320	.19
EBL	0	0	0		0	
EBT	4	6800	720	.12*	1620	.28*
EBR	0	0	90		270	
WBL	2	3400	310	.09*	240	.07*
WBT	3	5100	920	.18	600	.12
WBR	f		230		430	
Clearance Interval				.05*		.05*

Note: Assumes N/S Split Phasing
Note: Assumes Right-Turn Overlap for NBR

TOTAL CAPACITY UTILIZATION **.55** **.85**

4. Santa Vittoria & Ridge Route

Existing Count

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	0		0	
NBT	1	1700	210	.19*	120	.14*
NBR	0	0	120		120	
SBL	1	1700	130	.08*	130	.08*
SBT	1	1700	150	.09	160	.09
SBR	0	0	0		0	
EBL	0	0	0		0	
EBT	0	0	0		0	
EBR	0	0	0		0	
WBL	1	1700	60	.04*	80	.05*
WBT	0	0	0		0	
WBR	1	1700	50	.03	60	.04
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.36**		**.32**

2030 Committed Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	0		0	
NBT	1	1700	410	.32*	260	.23*
NBR	0	0	140		130	
SBL	1	1700	140	.08*	140	.08*
SBT	1	1700	280	.16	310	.18
SBR	0	0	0		0	
EBL	0	0	0		0	
EBT	0	0	0		0	
EBR	0	0	0		0	
WBL	1	1700	70	.04*	90	.05*
WBT	0	0	0		0	
WBR	1	1700	50	.03	70	.04
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.49**		**.41**

2030 MPAH Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	390	.23*	260	.15*
NBT	1	1700	220	.21	130	.15
NBR	0	0	130		130	
SBL	1	1700	140	.08	140	.08
SBT	1	1700	160	.12*	170	.11*
SBR	0	0	40		20	
EBL	1	1700	10	.01*	40	.02
EBT	1	1700	110	.14	250	.31*
EBR	0	0	120		270	
WBL	1	1700	70	.04	90	.05*
WBT	1	1700	380	.26*	110	.11
WBR	0	0	60		70	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.67**		**.67**

5. Moulton & Ridge Route

Existing Count

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	160	.09	120	.07*
NBT	3	5100	1520	.30*	810	.16
NBR	1	1700	150	.09	80	.05
SBL	1	1700	30	.02*	70	.04
SBT	3	5100	580	.14	1290	.26*
SBR	0	0	110		60	
EBL	1	1700	60	.04	100	.06
EBT	2	3400	100	.03*	180	.05*
EBR	1	1700	70	.04	100	.06
WBL	1	1700	90	.05*	180	.11*
WBT	2	3400	120	.04	130	.04
WBR	1	1700	30	.02	30	.02
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.45**		**.54**

2030 Committed Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	160	.05	270	.08*
NBT	4	6800	2600	.38*	1390	.20
NBR	1	1700	160	.09	100	.06
SBL	2	3400	40	.01*	100	.03
SBT	3	5100	1060	.21	2290	.45*
SBR	1	1700	120	.07	110	.06
EBL	1	1700	70	.04*	110	.06
EBT	2	3400	110	.03	190	.06*
EBR	1	1700	80	.05	110	.06
WBL	2	3400	100	.03	190	.06*
WBT	2	3400	130	.04*	140	.04
WBR	1	1700	40	.02	40	.02
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.52**		**.70**

2030 MPAH Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	730	.21*	390	.11*
NBT	4	6800	2320	.34	1250	.18
NBR	1	1700	160	.09	130	.08
SBL	2	3400	30	.01	90	.03
SBT	3	5100	960	.19*	1880	.37*
SBR	1	1700	130	.08	70	.04
EBL	1	1700	70	.04*	120	.07
EBT	2	3400	110	.03	230	.07*
EBR	1	1700	120	.07	670	.39
WBL	2	3400	170	.05	190	.06*
WBT	2	3400	160	.05*	130	.04
WBR	1	1700	40	.02	30	.02
Right Turn Adjustment					EBR	.24*
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.54**		**.90**

6. Avd Carlota & Ridge Route

Existing Count

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	300	.18*	250	.15*
NBT	2	3400	300	.09	350	.10
NBR	0	0	0		0	
SBL	0	0	0		0	
SBT	2	3400	110	.06*	500	.19*
SBR	0	0	80		140	
EBL	1	1700	50	.03*	130	.08*
EBT	0	0	0		0	
EBR	1	1700	260	.15	350	.21
WBL	0	0	0		0	
WBT	0	0	0		0	
WBR	0	0	0		0	
Right Turn Adjustment					EBR	.02*
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.32**		**.49**

2030 Committed Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	360	.21*	250	.15*
NBT	2	3400	590	.17	530	.16
NBR	0	0	0		0	
SBL	0	0	0		0	
SBT	2	3400	150	.07*	650	.24*
SBR	0	0	90		150	
EBL	1	1700	50	.03*	130	.08*
EBT	0	0	0		0	
EBR	1	1700	270	.16	400	.24
WBL	0	0	0		0	
WBT	0	0	0		0	
WBR	0	0	0		0	
Right Turn Adjustment					EBR	.05*
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.36**		**.57**

2030 MPAH Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	310	.18*	260	.15
NBT	2	3400	330	.19	400	.24*
NBR	0	0	460	.27	450	.26
SBL	1	1700	60	.04	300	.18*
SBT	2	3400	120	.06*	510	.19
SBR	0	0	90		150	
EBL	1	1700	60	.04*	140	.08
EBT	2	3400	140	.04	330	.10*
EBR	1	1700	270	.16	360	.21
WBL	2	3400	260	.08	380	.11*
WBT	2	3400	340	.16*	210	.09
WBR	0	0	190		110	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.49**		**.68**

7. Avd Carlota & Paseo de Valencia

Existing Count

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	40	.02	60	.04*
NBT	2	3400	400	.12*	380	.11
NBR	1	1700	520	.31	480	.28
SBL	2	3400	120	.04*	340	.10
SBT	2	3400	190	.06	650	.19*
SBR	1	1700	110	.06	340	.20
EBL	2	3400	280	.08*	200	.06
EBT	1	1700	50	.03	140	.08*
EBR	1	1700	50	.03	160	.09
WBL	2	3400	750	.22*	750	.22*
WBT	2	3400	590	.18	410	.14
WBR	0	0	30		60	
Right Turn Adjustment			NBR	.02*		
Clearance Interval				.05*		.05*

Note: Assumes E/W Split Phasing

TOTAL CAPACITY UTILIZATION **.53** **.58**

2030 Committed Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	40	.02	80	.05
NBT	2	3400	610	.18*	500	.15*
NBR	1	1700	520	.31	510	.30
SBL	2	3400	130	.04*	520	.15*
SBT	2	3400	220	.06	750	.22
SBR	1	1700	110	.06	350	.21
EBL	2	3400	340	.10*	200	.06
EBT	1	1700	160	.09	150	.09*
EBR	1	1700	60	.04	170	.10
WBL	2.5		1290		1140	
WBT	1.5	6800	700	.30*	920	.32*
WBR	0		60		100	
Clearance Interval				.05*		.05*

Note: Assumes E/W Split Phasing

TOTAL CAPACITY UTILIZATION **.67** **.76**

2030 MPAH Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	40	.02	80	.05
NBT	2	3400	400	.12*	450	.13*
NBR	1	1700	530	.31	490	.29
SBL	2	3400	140	.04*	530	.16*
SBT	2	3400	200	.06	660	.19
SBR	1	1700	200	.12	410	.24
EBL	2	3400	490	.14*	330	.10*
EBT	1	1700	100	.06	150	.09
EBR	1	1700	60	.04	170	.10
WBL	2.5		1340		1260	
WBT	1.5	6800	660	.30*	750	.31*
WBR	0		60		90	
Clearance Interval				.05*		.05*

Note: Assumes E/W Split Phasing

TOTAL CAPACITY UTILIZATION **.65** **.75**

8. Avd Carlota & El Toro

Existing Count

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	20	.01	40	.02
NBT	1	1700	100	.06*	120	.07*
NBR	1	1700	230	.14	490	.29
SBL	1.5		700	.21*	820	
SBT	1.5	5100	240	.14	630	.28*
SBR	1	1700	100	.06	100	.06
EBL	0	0	0		0	
EBT	4	6800	950	.14	1700	.25*
EBR	d	1700	20	.01	60	.04
WBL	2	3400	90	.03	300	.09*
WBT	3	5100	870	.17*	820	.16
WBR	1	1700	840	.49	600	.35
Right Turn Adjustment			Multi	.16*	NBR	.13*
Clearance Interval				.05*		.05*

Note: Assumes N/S Split Phasing
Note: Assumes Right-Turn Overlap for WBR NBR

TOTAL CAPACITY UTILIZATION **.65** **.87**

2030 Committed Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0.5		40		80	
NBT	1.5	3400	240	.08*	200	.08*
NBR	2	3400	240	.07	570	.17
SBL	2.5		770		1120	
SBT	1.5	6800	340	.16*	850	.29*
SBR	1	1700	270	.16	110	.06
EBL	0	0	0		0	
EBT	4	6800	1520	.22*	2320	.34*
EBR	d	1700	30	.02	70	.04
WBL	2	3400	230	.07*	560	.16*
WBT	3	5100	880	.17	910	.18
WBR	1	1700	920	.54	640	.38
Right Turn Adjustment			WBR	.09*		
Clearance Interval				.05*		.05*

Note: Assumes N/S Split Phasing
Note: Assumes Right-Turn Overlap for WBR NBR

TOTAL CAPACITY UTILIZATION **.67** **.92**

2030 MPAH Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0.5		40		80	
NBT	1.5	3400	190	.07*	280	.11*
NBR	2	3400	240	.07	500	.15
SBL	2.5		710		1000	
SBT	1.5	6800	350	.16*	880	.28*
SBR	1	1700	270	.16	110	.06
EBL	0	0	0		0	
EBT	4	6800	1320	.19*	2190	.32*
EBR	d	1700	30	.02	70	.04
WBL	2	3400	230	.07*	490	.14*
WBT	3	5100	880	.17	830	.16
WBR	1	1700	850	.50	610	.36
Right Turn Adjustment			WBR	.08*		
Clearance Interval				.05*		.05*

Note: Assumes N/S Split Phasing
Note: Assumes Right-Turn Overlap for WBR NBR

TOTAL CAPACITY UTILIZATION **.62** **.90**

9. Paseo de Valencia & El Toro

Existing Count

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	320	.09*	310	.09*
NBT	1	1700	190	.11	230	.14
NBR	1	1700	310	.18	350	.21
SBL	1	1700	20	.01	40	.02
SBT	2	3400	540	.21*	580	.19*
SBR	0	0	170		70	
EBL	1	1700	180	.11*	140	.08
EBT	3	5100	770	.15	980	.19*
EBR	1	1700	300	.18	170	.10
WBL	2	3400	190	.06	200	.06*
WBT	3	5100	640	.13*	560	.11
WBR	0	0	20		20	
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION **.59** **.58**

2030 Committed Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	330	.10*	480	.14*
NBT	2	3400	330	.10	240	.07
NBR	1	1700	480	.28	530	.31
SBL	1	1700	30	.02	50	.03
SBT	2	3400	560	.16*	970	.29*
SBR	1	1700	270	.16	100	.06
EBL	2	3400	190	.06	150	.04
EBT	3	5100	850	.17*	1160	.23*
EBR	1	1700	470	.28	270	.16
WBL	2	3400	190	.06*	400	.12*
WBT	3	5100	660	.14	570	.12
WBR	0	0	30		20	
Right Turn Adjustment		EBR	.01*			
Clearance Interval				.05*		.05*

Note: Assumes Right-Turn Overlap for SBR NBR EBR

TOTAL CAPACITY UTILIZATION **.55** **.83**

2030 MPAH Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	330	.10*	470	.14*
NBT	2	3400	410	.12	310	.09
NBR	1	1700	440	.26	540	.32
SBL	1	1700	30	.02	50	.03
SBT	2	3400	600	.18*	940	.28*
SBR	1	1700	270	.16	90	.05
EBL	2	3400	190	.06	150	.04
EBT	3	5100	780	.15*	1060	.21*
EBR	1	1700	460	.27	260	.15
WBL	2	3400	200	.06*	350	.10*
WBT	3	5100	650	.13	570	.12
WBR	0	0	30		20	
Right Turn Adjustment		EBR	.02*			
Clearance Interval				.05*		.05*

Note: Assumes Right-Turn Overlap for SBR NBR EBR

TOTAL CAPACITY UTILIZATION **.56** **.78**

10. Paseo de Valencia & Los Alisos

Existing Count

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	0		0	
NBT	2	3400	660	.19*	550	.16*
NBR	2	3400	670	.20	800	.24
SBL	2	3400	320	.09*	360	.11*
SBT	2	3400	520	.15	750	.22
SBR	0	0	0		0	
EBL	0	0	0		0	
EBT	0	0	0		0	
EBR	0	0	0		0	
WBL	3	5100	420	.08*	1030	.20*
WBT	0	0	0		0	
WBR	1	1700	200	.12	130	.08
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION **.41** **.52**

2030 Committed Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	0		0	
NBT	2	3400	1250	.37*	730	.21
NBR	2	3400	820	.24	940	.28
SBL	2	3400	500	.15*	430	.13
SBT	2	3400	570	.17	1590	.47*
SBR	0	0	0		0	
EBL	0	0	0		0	
EBT	0	0	0		0	
EBR	0	0	0		0	
WBL	3	5100	500	.10*	1090	.21*
WBT	0	0	0		0	
WBR	1	1700	210	.12	140	.08
Clearance Interval				.05*		.05*

Note: Assumes Right-Turn Overlap for WBR NBR

TOTAL CAPACITY UTILIZATION **.67** **.73**

2030 MPAH Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	0		0	
NBT	2	3400	1240	.36*	730	.21
NBR	2	3400	850	.25	910	.27
SBL	2	3400	450	.13*	360	.11
SBT	2	3400	570	.17	1580	.46*
SBR	0	0	0		0	
EBL	0	0	0		0	
EBT	0	0	0		0	
EBR	0	0	0		0	
WBL	3	5100	500	.10*	1080	.21*
WBT	0	0	0		0	
WBR	1	1700	210	.12	130	.08
Clearance Interval				.05*		.05*

Note: Assumes Right-Turn Overlap for WBR NBR

TOTAL CAPACITY UTILIZATION **.64** **.72**

11. Paseo de Valencia & Laguna Hills

Existing Count

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	320	.09*	280	.08*
NBT	3	5100	750	.15	580	.12
NBR	0	0	20		50	
SBL	1	1700	20	.01	40	.02
SBT	3	5100	460	.09*	1230	.24*
SBR	1	1700	540	.32	770	.45
EBL	1.5		780		800	
EBT	0.5	3400	0	.23*	0	.24*
EBR	1	1700	340	.20	460	.27
WBL	1	1700	100	.06*	40	.02
WBT	1	1700	10	.04	10	.02*
WBR	0	0	50		20	
Right Turn Adjustment			SBR	.06*	SBR	.03*
Clearance Interval				.05*		.05*
Note: Assumes E/W Split Phasing						
TOTAL CAPACITY UTILIZATION				**.58**		**.66**

2030 Committed Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	330	.10	280	.08*
NBT	3	5100	1180	.24*	850	.18
NBR	0	0	30		50	
SBL	1	1700	30	.02*	40	.02
SBT	3	5100	620	.12	1720	.34*
SBR	1	1700	550	.32	1150	.68
EBL	1.5		1150		800	
EBT	0.5	3400	20	.34*	10	.24*
EBR	1	1700	350	.21	470	.28
WBL	1	1700	110	.06*	50	.03*
WBT	1	1700	10	.04	20	.02
WBR	0	0	60		20	
Right Turn Adjustment					SBR	.16*
Clearance Interval				.05*		.05*
Note: Assumes E/W Split Phasing						
TOTAL CAPACITY UTILIZATION				**.71**		**.90**

2030 MPAH Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	330	.10	290	.09*
NBT	3	5100	1170	.24*	840	.17
NBR	0	0	30		50	
SBL	1	1700	30	.02*	40	.02
SBT	3	5100	640	.13	1740	.34*
SBR	1	1700	550	.32	1140	.67
EBL	1.5		1170		810	
EBT	0.5	3400	20	.35*	10	.24*
EBR	1	1700	350	.21	470	.28
WBL	1	1700	110	.06*	50	.03
WBT	1	1700	10	.04	20	.03*
WBR	0	0	60		30	
Right Turn Adjustment					SBR	.15*
Clearance Interval				.05*		.05*
Note: Assumes E/W Split Phasing						
TOTAL CAPACITY UTILIZATION				**.72**		**.90**

12. Avd Carlota & Los Alisos

Existing Count

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	10		10	
NBT	1	1700	10	.02*	10	.02*
NBR	0	0	10		10	
SBL	1.5		180		550	
SBT	0.5	3400	10	.06*	40	.17*
SBR	1	1700	90	.05	340	.20
EBL	2	3400	200	.06*	190	.06*
EBT	3	5100	730	.15	1010	.20
EBR	0	0	10		10	
WBL	1	1700	10	.01	10	.01
WBT	2	3400	760	.22*	840	.25*
WBR	1	1700	220	.13	200	.12
Clearance Interval				.05*		.05*

Note: Assumes N/S Split Phasing
Note: Assumes Right-Turn Overlap for WBR

TOTAL CAPACITY UTILIZATION **.41** **.55**

2030 Committed Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	10		10	
NBT	1	1700	10	.01*	10	.01*
NBR	d	1700	10	.01	10	.01
SBL	1.5		190		790	
SBT	0.5	3400	10	.06*	40	.24*
SBR	1	1700	90	.05	350	.21
EBL	2	3400	210	.06*	220	.06*
EBT	3	5100	1100	.22	1210	.24
EBR	0	0	10		10	
WBL	1	1700	10	.01	10	.01
WBT	2	3400	820	.24*	1070	.31*
WBR	1	1700	570	.34	340	.20
Right Turn Adjustment			WBR	.04*		
Clearance Interval				.05*		.05*

Note: Assumes N/S Split Phasing
Note: Assumes Right-Turn Overlap for WBR

TOTAL CAPACITY UTILIZATION **.46** **.67**

2030 MPAH Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	10		10	
NBT	1	1700	10	.01*	10	.01*
NBR	d	1700	10	.01	10	.01
SBL	1.5		190		740	
SBT	0.5	3400	10	.06*	40	.23*
SBR	1	1700	90	.05	350	.21
EBL	2	3400	210	.06*	210	.06*
EBT	3	5100	1030	.20	1120	.22
EBR	0	0	10		10	
WBL	1	1700	10	.01	10	.01
WBT	2	3400	820	.24*	1050	.31*
WBR	1	1700	450	.26	280	.16
Clearance Interval				.05*		.05*

Note: Assumes N/S Split Phasing
Note: Assumes Right-Turn Overlap for WBR

TOTAL CAPACITY UTILIZATION **.42** **.66**

13. Moulton & Glenwood

Existing Count

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	200	.06	200	.06*
NBT	3	5100	1130	.22*	770	.15
NBR	d	1700	10	.01	20	.01
SBL	1	1700	10	.01*	40	.02
SBT	3	5100	620	.12	1250	.25*
SBR	1	1700	320	.19	410	.24
EBL	1.5		440		290	
EBT	0.5	3400	10	.13*	10	.09*
EBR	1	1700	140	.08	230	.14
WBL	0	0	60		30	
WBT	1	1700	20	.05*	10	.02*
WBR	d	1700	20	.01	10	.01
Clearance Interval				.05*		.05*
Note: Assumes E/W Split Phasing						

TOTAL CAPACITY UTILIZATION **.46** **.47**

2030 Committed Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	310	.09	280	.08*
NBT	3	5100	1600	.31*	1110	.22
NBR	d	1700	30	.02	20	.01
SBL	1	1700	10	.01*	40	.02
SBT	3	5100	980	.19	1730	.34*
SBR	1	1700	330	.19	420	.25
EBL	1.5		560		300	
EBT	0.5	3400	10	.17*	10	.09*
EBR	1	1700	190	.11	310	.18
WBL	0	0	60		40	
WBT	1	1700	30	.05*	10	.03*
WBR	d	1700	20	.01	10	.01
Right Turn Adjustment					EBR	.03*
Clearance Interval				.05*		.05*
Note: Assumes E/W Split Phasing						

TOTAL CAPACITY UTILIZATION **.59** **.62**

2030 MPAH Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	290	.09	300	.09*
NBT	3	5100	1650	.32*	1110	.22
NBR	d	1700	30	.02	20	.01
SBL	1	1700	10	.01*	40	.02
SBT	3	5100	970	.19	1810	.35*
SBR	1	1700	330	.19	410	.24
EBL	1.5		610		300	
EBT	0.5	3400	10	.18*	10	.09*
EBR	1	1700	190	.11	280	.16
WBL	0	0	60		40	
WBT	1	1700	30	.05*	10	.03*
WBR	d	1700	20	.01	10	.01
Clearance Interval				.05*		.05*
Note: Assumes E/W Split Phasing						

TOTAL CAPACITY UTILIZATION **.61** **.61**

14. Moulton & Laguna Hills

Existing Count

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	300	.09	230	.07*
NBT	4	6800	920	.14*	480	.07
NBR	1	1700	120	.07	70	.04
SBL	2	3400	220	.06*	180	.05
SBT	3	5100	350	.07	1020	.20*
SBR	1	1700	140	.08	200	.12
EBL	2	3400	290	.09*	230	.07*
EBT	3	5100	650	.13	850	.17
EBR	1	1700	150	.09	290	.17
WBL	1	1700	50	.03	140	.08
WBT	2	3400	720	.21*	620	.18*
WBR	1	1700	130	.08	110	.06
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.55**		**.57**

2030 Committed Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	310	.09	240	.07*
NBT	4	6800	1370	.20*	680	.10
NBR	1	1700	140	.08	70	.04
SBL	2	3400	240	.07*	190	.06
SBT	3	5100	480	.09	1360	.27*
SBR	1	1700	390	.23	360	.21
EBL	2	3400	420	.12*	370	.11*
EBT	3	5100	930	.18	860	.17
EBR	1	1700	160	.09	300	.18
WBL	1	1700	60	.04	150	.09
WBT	2	3400	730	.21*	950	.28*
WBR	1	1700	150	.09	140	.08
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.65**		**.78**

2030 MPAH Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	310	.09	240	.07*
NBT	4	6800	1420	.21*	690	.10
NBR	1	1700	140	.08	70	.04
SBL	2	3400	240	.07*	190	.06
SBT	3	5100	470	.09	1340	.26*
SBR	1	1700	380	.22	420	.25
EBL	2	3400	420	.12*	380	.11*
EBT	3	5100	950	.19	860	.17
EBR	1	1700	160	.09	300	.18
WBL	1	1700	60	.04	150	.09
WBT	2	3400	730	.21*	920	.27*
WBR	1	1700	140	.08	140	.08
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.66**		**.76**

15. Moulton & Alicia

Existing Count

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	40	.01	80	.02*
NBT	3	5100	790	.15*	520	.10
NBR	1	1700	250	.15	190	.11
SBL	2	3400	130	.04*	140	.04
SBT	3	5100	650	.13	720	.14*
SBR	1	1700	100	.06	210	.12
EBL	2	3400	320	.09	240	.07
EBT	3	5100	1280	.25*	1250	.25*
EBR	1	1700	30	.02	10	.01
WBL	2	3400	170	.05*	420	.12*
WBT	3	5100	980	.19	1370	.27
WBR	1	1700	100	.06	30	.02
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.54**		**.58**

2030 Committed Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	50	.01	100	.03*
NBT	3	5100	1140	.22*	660	.13
NBR	1	1700	510	.30	390	.23
SBL	2	3400	140	.04*	150	.04
SBT	3	5100	820	.16	910	.18*
SBR	1	1700	130	.08	380	.22
EBL	2	3400	430	.13	270	.08
EBT	3	5100	1680	.33*	1430	.28*
EBR	1	1700	30	.02	10	.01
WBL	2	3400	280	.08*	750	.22*
WBT	3	5100	1100	.22	1570	.31
WBR	1	1700	110	.06	40	.02
Right Turn Adjustment			NBR	.02*		
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.74**		**.76**

2030 MPAH Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	50	.01	100	.03*
NBT	3	5100	1170	.23*	670	.13
NBR	1	1700	500	.29	390	.23
SBL	2	3400	140	.04*	150	.04
SBT	3	5100	820	.16	910	.18*
SBR	1	1700	120	.07	380	.22
EBL	2	3400	450	.13*	270	.08
EBT	4	6800	1680	.25	1430	.21*
EBR	f		30		10	
WBL	2	3400	280	.08	750	.22*
WBT	3	5100	1100	.22*	1570	.31
WBR	1	1700	110	.06	40	.02
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.67**		**.69**

16. Moulton & La Paz

Existing Count

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	40	.01	40	.01*
NBT	3	5100	880	.17*	490	.10
NBR	1	1700	140	.08	100	.06
SBL	2	3400	80	.02*	90	.03
SBT	3	5100	520	.10	860	.17*
SBR	f		170		220	
EBL	2	3400	180	.05*	220	.06*
EBT	3	5100	340	.07	630	.12
EBR	1	1700	30	.02	70	.04
WBL	2	3400	60	.02	150	.04
WBT	3	5100	540	.11*	520	.10*
WBR	1	1700	40	.02	70	.04
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.40**		**.39**

2030 Committed Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	140	.04	50	.01*
NBT	3	5100	1410	.28*	910	.18
NBR	1	1700	310	.18	110	.06
SBL	2	3400	80	.02*	100	.03
SBT	3	5100	760	.15	1320	.26*
SBR	f		200		290	
EBL	2	3400	260	.08*	230	.07
EBT	3	5100	350	.07	640	.13*
EBR	1	1700	80	.05	80	.05
WBL	2	3400	70	.02	270	.08*
WBT	3	5100	550	.11*	580	.11
WBR	1	1700	50	.03	70	.04
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.54**		**.53**

2030 MPAH Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	90	.03	50	.01*
NBT	3	5100	1440	.28*	930	.18
NBR	1	1700	310	.18	110	.06
SBL	2	3400	90	.03*	100	.03
SBT	3	5100	760	.15	1340	.26*
SBR	f		200		280	
EBL	2	3400	240	.07*	230	.07
EBT	3	5100	350	.07	640	.13*
EBR	1	1700	80	.05	80	.05
WBL	2	3400	70	.02	270	.08*
WBT	3	5100	550	.11*	580	.11
WBR	1	1700	50	.03	70	.04
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.54**		**.53**

17. Moulton & Oso

Existing Count

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	90	.03	100	.03*
NBT	3	5100	670	.13*	400	.08
NBR	1	1700	120	.07	130	.08
SBL	2	3400	120	.04*	200	.06
SBT	3	5100	430	.08	800	.16*
SBR	1	1700	70	.04	80	.05
EBL	2	3400	60	.02*	70	.02
EBT	3	5100	510	.10	980	.19*
EBR	1	1700	40	.02	70	.04
WBL	2	3400	150	.04	270	.08*
WBT	3	5100	720	.14*	700	.14
WBR	1	1700	330	.19	160	.09
Right Turn Adjustment			WBR	.02*		
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.40**		**.51**

2030 Committed Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	120	.04	150	.04*
NBT	3	5100	1140	.22*	570	.11
NBR	1	1700	130	.08	130	.08
SBL	2	3400	210	.06*	250	.07
SBT	3	5100	550	.11	1250	.25*
SBR	1	1700	110	.06	140	.08
EBL	2	3400	170	.05*	290	.09
EBT	3	5100	520	.10	1170	.23*
EBR	1	1700	70	.04	90	.05
WBL	2	3400	250	.07	270	.08*
WBT	3	5100	760	.15*	790	.15
WBR	1	1700	330	.19	170	.10
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.53**		**.65**

2030 MPAH Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	130	.04	150	.04*
NBT	3	5100	1190	.23*	570	.11
NBR	1	1700	130	.08	130	.08
SBL	2	3400	210	.06*	250	.07
SBT	3	5100	550	.11	1260	.25*
SBR	1	1700	110	.06	140	.08
EBL	2	3400	170	.05*	290	.09
EBT	3	5100	520	.10	1160	.23*
EBR	1	1700	70	.04	90	.05
WBL	2	3400	310	.09	280	.08*
WBT	3	5100	750	.15*	790	.15
WBR	1	1700	340	.20	160	.09
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.54**		**.65**

19. Moulton & SR-73 WB Ramps

Existing Count

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	430	.13*	100	.03*
NBT	3	5100	1000	.20	920	.18
NBR	0	0	0		0	
SBL	0	0	0		0	
SBT	3	5100	400	.08*	1040	.20*
SBR	1	1700	310	.18	90	.05
EBL	0	0	0		0	
EBT	0	0	0		0	
EBR	0	0	0		0	
WBL	0	0	0		0	
WBT	0	0	0		0	
WBR	0	0	0		0	
Right Turn Adjustment			SBR	.10*		
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.36**		**.28**

2030 Committed Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	730	.21*	270	.08*
NBT	3	5100	1440	.28	1100	.22
NBR	0	0	0		0	
SBL	0	0	0		0	
SBT	3	5100	490	.10*	1440	.28*
SBR	1	1700	450	.26	130	.08
EBL	0	0	0		0	
EBT	0	0	0		0	
EBR	0	0	0		0	
WBL	0	0	0		0	
WBT	0	0	0		0	
WBR	0	0	0		0	
Right Turn Adjustment			SBR	.16*		
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.52**		**.41**

2030 MPAH Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	650	.19*	270	.08*
NBT	3	5100	1490	.29	1100	.22
NBR	0	0	0		0	
SBL	0	0	0		0	
SBT	3	5100	490	.10*	1450	.28*
SBR	1	1700	510	.30	110	.06
EBL	0	0	0		0	
EBT	0	0	0		0	
EBR	0	0	0		0	
WBL	0	0	0		0	
WBT	0	0	0		0	
WBR	0	0	0		0	
Right Turn Adjustment			SBR	.20*		
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.54**		**.41**

20. I-5 SB Ramps & Alicia

Existing Count

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	0		0	
NBT	0	0	0		0	
NBR	0	0	0		0	
SBL	1.5		1110	.33*	1520	
SBT	0	5100	0		0	{.48}*
SBR	1.5		810	{.32}	1060	
EBL	0	0	0		0	
EBT	3	5100	2110	.41*	1960	.38*
EBR	f		230		230	
WBL	0	0	0		0	
WBT	3	5100	1030	.20	1420	.28
WBR	f		910		750	
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION **.79** **.91**

2030 Committed Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	0		0	
NBT	0	0	0		0	
NBR	0	0	0		0	
SBL	2.5		1240		1540	
SBT	0	6800	0	{.28}*	0	{.42}*
SBR	1.5		1090		1520	
EBL	0	0	0		0	
EBT	3	5100	2820	.55*	2210	.43*
EBR	f		240		300	
WBL	0	0	0		0	
WBT	3	5100	1040	.20	1480	.29
WBR	f		980		870	
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION **.88** **.90**

2030 MPAH Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	0		0	
NBT	0	0	0		0	
NBR	0	0	0		0	
SBL	2.5		1200		1550	
SBT	0	6800	0	{.27}*	0	{.42}*
SBR	1.5		1090		1510	
EBL	0	0	0		0	
EBT	3	5100	2790	.55*	2210	.43*
EBR	f		240		290	
WBL	0	0	0		0	
WBT	3	5100	1040	.20	1460	.29
WBR	f		1000		880	
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION **.87** **.90**

21. Paseo de Valencia & Alicia

Existing Count

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	60	.02	90	.03*
NBT	3	5100	370	.07*	340	.07
NBR	1	1700	30	.02	50	.03
SBL	2	3400	350	.10*	320	.09
SBT	2	3400	270	.08	600	.18*
SBR	2	3400	170	.05	340	.10
EBL	2	3400	240	.07	330	.10*
EBT	3	5100	1560	.32*	1220	.25
EBR	0	0	70		80	
WBL	1	1700	70	.04*	150	.09
WBT	3	5100	1080	.21	1320	.26*
WBR	1	1700	320	.19	200	.12
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.58**		**.62**

2030 Committed Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	70	.02	100	.03*
NBT	3	5100	540	.11*	410	.08
NBR	1	1700	30	.02	70	.04
SBL	2	3400	360	.11*	370	.11
SBT	2	3400	280	.08	770	.23*
SBR	2	3400	340	.10	550	.16
EBL	2	3400	430	.13	560	.16*
EBT	3	5100	2260	.46*	1330	.28
EBR	0	0	80		90	
WBL	1	1700	70	.04*	160	.09
WBT	3	5100	1160	.23	1720	.34*
WBR	1	1700	330	.19	210	.12
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.77**		**.81**

2030 MPAH Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	70	.02	100	.03*
NBT	3	5100	520	.10*	410	.08
NBR	1	1700	40	.02	80	.05
SBL	2	3400	360	.11*	370	.11
SBT	2	3400	280	.08	760	.22*
SBR	2	3400	350	.10	570	.17
EBL	2	3400	440	.13	560	.16*
EBT	3	5100	2230	.45*	1340	.28
EBR	0	0	80		90	
WBL	1	1700	70	.04*	160	.09
WBT	3	5100	1160	.23	1710	.34*
WBR	1	1700	330	.19	210	.12
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.75**		**.80**

22. I-5 SB Ramps/Cabot & La Paz

Existing Count

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	240	.14*	490	.29*
NBT	0	0	0		0	
NBR	2	3400	250	.07	430	.13
SBL	1.5		100	.06	220	.13
SBT	0.5	3400	100	.06*	220	.13*
SBR	1	1700	100	.06	300	.18
EBL	0	0	0		0	
EBT	2	3400	1530	.45*	930	.27
EBR	1	1700	210	.12	200	.12
WBL	1	1700	240	.14*	330	.19
WBT	2	3400	760	.35	1280	.49*
WBR	0	0	440		380	
Right Turn Adjustment					SBR	.05*
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.84**		**1.01**

2030 Committed Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1.5		250	{.10}*	500	.15*
NBT	0	5100	0	{.10}	0	
NBR	1.5		350		480	{.12}
SBL	2	3400	130	.04	320	.09
SBT	0.5	3400	120	.07*	350	.21*
SBR	1.5		100		360	
EBL	0	0	0		0	
EBT	3	5100	1700	.33*	940	.18
EBR	1	1700	220	.13	210	.12
WBL	2	3400	250	.07*	410	.12
WBT	2	3400	770	.23	1340	.39*
WBR	f		450		390	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.62**		**.80**

2030 MPAH Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1.5		260	{.10}*	500	.15*
NBT	0	5100	0	{.10}	0	
NBR	1.5		340		480	{.12}
SBL	2	3400	130	.04	320	.09
SBT	0.5	3400	120	.07*	370	.22*
SBR	1.5		100		350	.21
EBL	0	0	0		0	
EBT	3	5100	1690	.33*	940	.18
EBR	1	1700	220	.13	210	.12
WBL	2	3400	250	.07*	400	.12
WBT	2	3400	770	.23	1340	.39*
WBR	f		450		390	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.62**		**.81**

23. La Paz & Paseo de Valencia

Existing Count

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	50	.03*	10	.01
NBT	2	3400	530	.16	530	.16*
NBR	1	1700	140	.08	100	.06
SBL	1	1700	110	.06	90	.05*
SBT	2	3400	690	.20*	620	.18
SBR	1	1700	120	.07	30	.02
EBL	1	1700	80	.05	200	.12*
EBT	2	3400	260	.08*	320	.09
EBR	1	1700	90	.05	80	.05
WBL	1	1700	120	.07*	40	.02
WBT	2	3400	180	.08	180	.06*
WBR	0	0	80		20	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.43**		**.44**

2030 Committed Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	60	.04	10	.01*
NBT	2	3400	640	.19*	540	.16
NBR	1	1700	150	.09	110	.06
SBL	1	1700	120	.07*	100	.06
SBT	2	3400	690	.20	780	.23*
SBR	1	1700	130	.08	50	.03
EBL	1	1700	90	.05*	210	.12*
EBT	2	3400	270	.08	460	.14
EBR	1	1700	100	.06	90	.05
WBL	1	1700	140	.08	50	.03
WBT	2	3400	370	.13*	180	.06*
WBR	0	0	80		30	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.49**		**.47**

2030 MPAH Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	60	.04	10	.01*
NBT	2	3400	640	.19*	540	.16
NBR	1	1700	150	.09	110	.06
SBL	1	1700	120	.07*	100	.06
SBT	2	3400	690	.20	770	.23*
SBR	1	1700	130	.08	50	.03
EBL	1	1700	90	.05*	210	.12*
EBT	2	3400	270	.08	440	.13
EBR	1	1700	100	.06	90	.05
WBL	1	1700	140	.08	50	.03
WBT	2	3400	360	.13*	180	.06*
WBR	0	0	80		30	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.49**		**.47**

24. Cabot & Paseo de Valencia

Existing Count

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	410	.24*	220	.13*
NBT	2	3400	720	.21	430	.13
NBR	0	0	0		0	
SBL	0	0	0		0	
SBT	2	3400	190	.07*	560	.18*
SBR	0	0	40		40	
EBL	1	1700	30	.02*	40	.02*
EBT	0	0	0		0	
EBR	f		210		380	
WBL	0	0	0		0	
WBT	0	0	0		0	
WBR	0	0	0		0	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.38**		**.38**

2030 Committed Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	620	.36*	270	.16*
NBT	2	3400	840	.25	440	.13
NBR	0	0	0		0	
SBL	0	0	0		0	
SBT	2	3400	220	.08*	740	.23*
SBR	0	0	40		40	
EBL	1	1700	40	.02*	40	.02*
EBT	0	0	0		0	
EBR	f		220		500	
WBL	0	0	0		0	
WBT	0	0	0		0	
WBR	0	0	0		0	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.51**		**.46**

2030 MPAH Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	600	.35*	270	.16*
NBT	2	3400	830	.24	440	.13
NBR	0	0	0		0	
SBL	0	0	0		0	
SBT	2	3400	220	.08*	750	.23*
SBR	0	0	40		40	
EBL	1	1700	40	.02*	40	.02*
EBT	0	0	0		0	
EBR	f		220		490	
WBL	0	0	0		0	
WBT	0	0	0		0	
WBR	0	0	0		0	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.50**		**.46**

25. Cabot & Oso

Existing Count

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	60	.02	140	.04
NBT	2	3400	400	.12*	270	.08*
NBR	1	1700	290	.17	260	.15
SBL	2	3400	190	.06*	510	.15*
SBT	2	3400	170	.05	390	.11
SBR	1	1700	50	.03	150	.09
EBL	2	3400	110	.03	90	.03
EBT	3	5100	850	.17*	1190	.23*
EBR	1	1700	50	.03	50	.03
WBL	2	3400	360	.11*	320	.09*
WBT	3	5100	1200	.24	1020	.20
WBR	1	1700	340	.20	340	.20
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.51**		**.60**

2030 Committed Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	70	.02	230	.07
NBT	2	3400	530	.16*	280	.08*
NBR	1	1700	400	.24	330	.19
SBL	2	3400	200	.06*	700	.21*
SBT	2	3400	180	.05	550	.16
SBR	1	1700	50	.03	170	.10
EBL	2	3400	120	.04	100	.03
EBT	3	5100	940	.18*	1400	.27*
EBR	1	1700	130	.08	60	.04
WBL	2	3400	550	.16*	340	.10*
WBT	3	5100	1350	.26	1030	.20
WBR	1	1700	590	.35	480	.28
Right Turn Adjustment					NBR	.03*
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.61**		**.74**

2030 MPAH Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	70	.02	230	.07
NBT	2	3400	530	.16*	280	.08*
NBR	1	1700	460	.27	330	.19
SBL	2	3400	210	.06*	690	.20*
SBT	2	3400	170	.05	540	.16
SBR	1	1700	50	.03	180	.11
EBL	2	3400	120	.04	100	.03
EBT	3	5100	940	.18*	1390	.27*
EBR	1	1700	140	.08	60	.04
WBL	2	3400	560	.16*	350	.10*
WBT	3	5100	1350	.26	1030	.20
WBR	1	1700	570	.34	470	.28
Right Turn Adjustment					NBR	.03*
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.61**		**.73**

29. Greenfield & SR-73 WB Ramps

Existing Count

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	930	.27*	350	.10*
NBT	1	1700	10	.01	100	.06
NBR	0	0	0		0	
SBL	0	0	0		0	
SBT	1	1700	40	.02*	100	.06*
SBR	1	1700	10	.01	10	.01
EBL	0	0	0		0	
EBT	0	0	0		0	
EBR	0	0	0		0	
WBL	1	1700	340	.20*	400	.24*
WBT	0	0	0		10	
WBR	1	1700	10	.01	30	.02
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.54**		**.45**

2030 Committed Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	1110	.33*	470	.14*
NBT	1	1700	10	.01	100	.06
NBR	0	0	0		0	
SBL	0	0	0		0	
SBT	1	1700	50	.03*	110	.06*
SBR	1	1700	10	.01	10	.01
EBL	0	0	0		0	
EBT	0	0	0		0	
EBR	0	0	0		0	
WBL	1	1700	350	.21*	410	.24*
WBT	0	0	0		10	
WBR	1	1700	10	.01	30	.02
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.62**		**.49**

2030 MPAH Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	1140	.34*	470	.14*
NBT	1	1700	10	.01	100	.06
NBR	0	0	0		0	
SBL	0	0	0		0	
SBT	1	1700	50	.03*	110	.06*
SBR	1	1700	10	.01	10	.01
EBL	0	0	0		0	
EBT	0	0	0		0	
EBR	0	0	0		0	
WBL	1	1700	350	.21*	410	.24*
WBT	0	0	0		10	
WBR	1	1700	10	.01	30	.02
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.63**		**.49**

30. Greenfield & SR-73 EB Ramps

Existing Count

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	0		0	
NBT	2	3400	940	.36*	420	.25*
NBR	0	0	300		830	.49
SBL	1	1700	30	.02*	20	.01*
SBT	2	3400	350	.10	490	.14
SBR	0	0	0		0	
EBL	0.5		0		30	
EBT	0	3400	0		0	{.05}*
EBR	1.5		180	{.00}	280	
WBL	0	0	0		0	
WBT	0	0	0		0	
WBR	0	0	0		0	
Right Turn Adjustment					NBR	.23*
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.43**		**.59**

2030 Committed Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	0		0	
NBT	2	3400	1110	.41*	560	.33*
NBR	0	0	300		860	.51
SBL	1	1700	40	.02*	30	.02*
SBT	2	3400	380	.11	510	.15
SBR	0	0	0		0	
EBL	0.5		10	.01*	40	
EBT	0	3400	0		0	{.10}*
EBR	1.5		290	{.00}	540	
WBL	0	0	0		0	
WBT	0	0	0		0	
WBR	0	0	0		0	
Right Turn Adjustment					NBR	.16*
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.49**		**.66**

2030 MPAH Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	0		0	
NBT	2	3400	1140	.43*	570	.34*
NBR	0	0	310		860	.51
SBL	1	1700	40	.02*	30	.02*
SBT	2	3400	380	.11	510	.15
SBR	0	0	0		0	
EBL	0.5		10	.01*	40	
EBT	0	3400	0		0	{.10}*
EBR	1.5		280	{.00}	560	
WBL	0	0	0		0	
WBT	0	0	0		0	
WBR	0	0	0		0	
Right Turn Adjustment					NBR	.15*
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.51**		**.66**

33. Santa Vittoria & Santa Maria

Existing Count

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	0		0	
NBT	0	0	0		0	
NBR	0	0	0		0	
SBL	0	0	60		20	
SBT	1	1700	0	.05*	0	.04*
SBR	0	0	20		40	
EBL	0	0	20	{.01}*	10	{.01}*
EBT	2	3400	140	.05	180	.06
EBR	0	0	0		0	
WBL	0	0	0		0	
WBT	2	3400	100	.05*	240	.07*
WBR	0	0	70		10	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.16**		**.17**

2030 Committed Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	0		0	
NBT	0	0	0		0	
NBR	0	0	0		0	
SBL	0	0	70		30	
SBT	1	1700	0	.10*	0	.07*
SBR	0	0	100		90	
EBL	0	0	150	{.09}*	100	{.06}*
EBT	2	3400	150	.09	190	.09
EBR	0	0	0		0	
WBL	0	0	0		0	
WBT	2	3400	110	.05*	250	.08*
WBR	0	0	70		10	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.29**		**.26**

2030 MPAH Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	0		0	
NBT	0	0	0		0	
NBR	0	0	0		0	
SBL	0	0	70		30	
SBT	1	1700	0	.08*	0	.04*
SBR	0	0	60		40	
EBL	0	0	60	{.04}*	50	{.03}*
EBT	2	3400	150	.06	190	.07
EBR	0	0	0		0	
WBL	0	0	0		0	
WBT	2	3400	110	.05*	250	.08*
WBR	0	0	70		10	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.22**		**.20**

34. Moulton Pkwy & Santa Maria

Existing Count

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	270	.16	240	.14*
NBT	3	5100	1630	.32*	720	.14
NBR	0	0	0		0	
SBL	0	0	0		0	
SBT	3	5100	580	.13	1890	.40*
SBR	0	0	90		130	
EBL	1.5		190	.06*	210	.06*
EBT	0	5100	0		0	
EBR	1.5		310	{.04}	260	{.05}
WBL	0	0	0		0	
WBT	0	0	0		0	
WBR	0	0	0		0	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.43**		**.65**

2030 Committed Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	280	.16	250	.15*
NBT	3	5100	2740	.54*	1460	.29
NBR	0	0	0		0	
SBL	0	0	0		0	
SBT	3	5100	1060	.23	2950	.60*
SBR	0	0	100		130	
EBL	1.5		200	.06*	220	.06*
EBT	0	5100	0		0	
EBR	1.5		320	{.00}	270	{.05}
WBL	0	0	0		0	
WBT	0	0	0		0	
WBR	0	0	0		0	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.65**		**.86**

2030 MPAH Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	280	.16	250	.15*
NBT	4	6800	3000	.44*	1530	.23
NBR	0	0	0		0	
SBL	0	0	0		0	
SBT	4	6800	1080	.17	3260	.50*
SBR	0	0	100		140	
EBL	1.5		200	.06*	220	.06*
EBT	0	5100	0		0	
EBR	1.5		320	{.00}	270	{.05}
WBL	0	0	0		0	
WBT	0	0	0		0	
WBR	0	0	0		0	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.55**		**.76**

35. Merienda/SR-73 WB Ramps & La Paz

Existing Count

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	70	.04*	60	.04*
NBT	1	1700	10	.04	10	.03
NBR	0	0	50		40	
SBL	0	0	20		10	
SBT	1	1700	10	.03*	10	.02*
SBR	0	0	20		20	
EBL	1	1700	20	.01	50	.03
EBT	3	5100	470	.09*	900	.18*
EBR	1	1700	430	.25	120	.07
WBL	2	3400	320	.09*	90	.03*
WBT	3	5100	470	.09	730	.15
WBR	0	0	10		20	
Right Turn Adjustment			EBR	.13*		
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.43**		**.32**

2030 Committed Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	100	.06*	90	.05*
NBT	1	1700	10	.05	10	.04
NBR	0	0	80		50	
SBL	0	0	20		10	
SBT	1	1700	10	.03*	10	.02*
SBR	0	0	20		20	
EBL	1	1700	20	.01	80	.05
EBT	3	5100	520	.10*	910	.18*
EBR	1	1700	710	.42	330	.19
WBL	2	3400	330	.10*	140	.04*
WBT	3	5100	490	.10	810	.16
WBR	0	0	10		20	
Right Turn Adjustment			EBR	.27*		
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.61**		**.34**

2030 MPAH Network w/Proposed LU Changes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	100	.06*	90	.05*
NBT	1	1700	10	.05	10	.03
NBR	0	0	70		40	
SBL	0	0	20		10	
SBT	1	1700	10	.03*	10	.02*
SBR	0	0	20		20	
EBL	1	1700	30	.02	80	.05
EBT	3	5100	500	.10*	910	.18*
EBR	1	1700	800	.47	330	.19
WBL	2	3400	330	.10*	130	.04*
WBT	3	5100	510	.10	800	.16
WBR	0	0	10		20	
Right Turn Adjustment			EBR	.32*		
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.66**		**.34**

Appendix B
Zonal Land Use Summaries

This appendix summarizes the land use data within the City of Laguna Hills for existing (2007) and buildout (2030) conditions according to the traffic analysis zones shown in Figure B-1. The following presents the correspondence of zones for each of the project areas that are summarized in Table 2-2 of this report.

Project Area Zonal Correspondence

Project Sites	Corresponding Zones
1: Urban Village	24-26, 28-42
2: Alicia Gateway	50, 57
3: North Business Park	17-23
4: Via Lomas	46
5: Moulton & La Paz	67
6: La Paz Gateway	59, 61-63
7: Vacant Residential Sites	78, 82

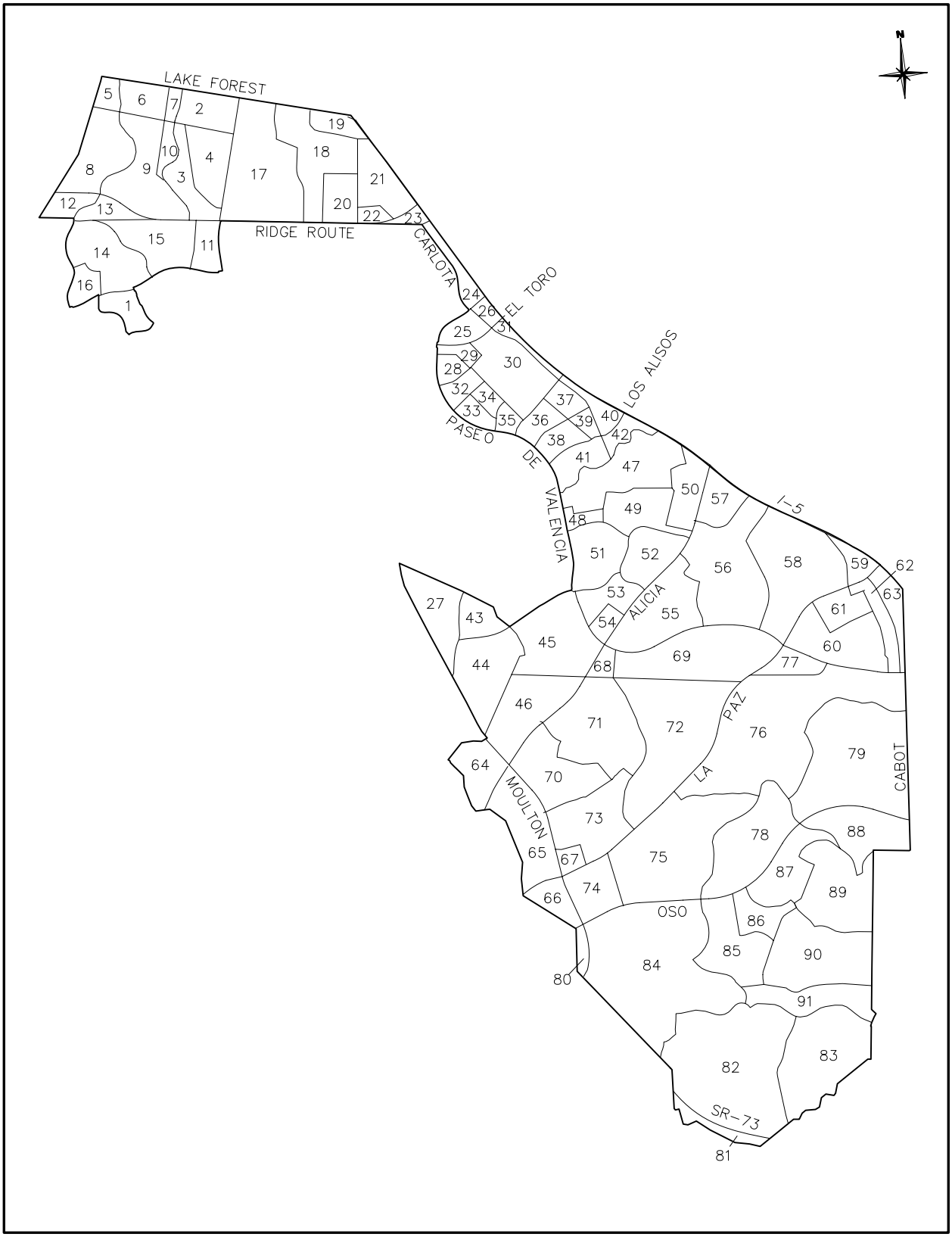


Figure B-1

LAGUNA HILLS TRAFFIC ANALYSIS MODEL
(LHTAM) ZONE SYSTEM

2008 Laguna Hills Land Use and Trip Generation Summary

Zone	Land Use Type	Units	Amount	AM Peak Hour			PM Peak Hour			ADT
				Inbound	Outbound	Total	Inbound	Outbound	Total	
1	7 Congregate Care	DU	152	6	3	9	12	12	24	307
	20 Park	Acre	0	0	0	0	0	0	0	0
	Sub-Total			6	3	9	12	12	24	307
2	10 General Office	TSF	61	84	12	96	15	76	91	676
	12 Business Park	TSF	264	317	61	378	79	261	340	3,367
	Sub-Total			401	73	474	94	337	431	4,043
3	9 Strip Commercial (~100 TSF)	TSF	21	17	11	28	50	54	104	1,192
	10 General Office	TSF	319	434	61	495	80	395	475	3,510
	Sub-Total			451	72	523	130	449	579	4,702
4	10 General Office	TSF	42	57	8	65	10	52	62	461
	14 Church/Synagogue	TSF	28	11	9	20	10	9	19	256
	Sub-Total			68	17	85	20	61	81	717
5	2 Condominiums	DU	54	9	27	36	24	18	42	440
	Sub-Total			9	27	36	24	18	42	440
6	2 Condominiums	DU	172	29	86	115	77	57	134	1,402
	Sub-Total			29	86	115	77	57	134	1,402
7	10 General Office	TSF	56	76	11	87	14	69	83	617
	Sub-Total			76	11	87	14	69	83	617
8	2 Condominiums	DU	457	78	229	307	206	151	357	3,725
	Sub-Total			78	229	307	206	151	357	3,725
9	2 Condominiums	DU	365	62	183	245	164	120	284	2,975
	Sub-Total			62	183	245	164	120	284	2,975
10	10 General Office	TSF	126	172	24	196	32	157	189	1,392
	Sub-Total			172	24	196	32	157	189	1,392
11	8 General Commercial (~200 TSF)	TSF	162	126	81	207	360	390	750	8,620
	Sub-Total			126	81	207	360	390	750	8,620
12	2 Condominiums	DU	46	8	23	31	21	15	36	375
	Sub-Total			8	23	31	21	15	36	375
13	2 Condominiums	DU	46	8	23	31	21	15	36	375
	Sub-Total			8	23	31	21	15	36	375
14	1 Single Family Detached	DU	248	47	139	186	159	92	251	2,373
	20 Park	Acre	0	0	0	0	0	0	0	0
	Sub-Total			47	139	186	159	92	251	2,373
15	1 Single Family Detached	DU	217	41	122	163	139	80	219	2,077
	20 Park	Acre	2	0	0	0	0	0	0	3
	Sub-Total			41	122	163	139	80	219	2,080
16	18 Elementary/Middle School	STU	683	123	82	205	14	34	48	744
	20 Park	Acre	5	0	0	0	0	0	0	9
	Sub-Total			123	82	205	14	34	48	753
17	8 General Commercial (~200 TSF)	TSF	214	167	107	274	475	515	990	11,379
	11 Medical Office	TSF	40	96	24	120	60	140	200	2,000
	12 Business Park	TSF	802	963	184	1,147	241	794	1,035	10,235
	Sub-Total			1,226	315	1,541	776	1,449	2,225	23,614
18	8 General Commercial (~200 TSF)	TSF	49	38	24	62	109	118	227	2,608
	10 General Office	TSF	264	360	50	410	66	328	394	2,912
	12 Business Park	TSF	291	349	67	416	87	288	375	3,710
	Sub-Total			747	141	888	262	734	996	9,230
19	8 General Commercial (~200 TSF)	TSF	3	2	1	3	6	7	13	152
	10 General Office	TSF	110	150	21	171	28	136	164	1,211
	Sub-Total			152	22	174	34	143	177	1,363
20	5 Mobile Home	DU	252	20	81	101	88	53	141	1,257
	Sub-Total			20	81	101	88	53	141	1,257
21	8 General Commercial (~200 TSF)	TSF	90	70	45	115	200	217	417	4,795
	12 Business Park	TSF	275	330	63	393	83	272	355	3,511
	Sub-Total			400	108	508	283	489	772	8,306
22	12 Business Park	TSF	83	99	19	118	25	82	107	1,053
	Sub-Total			99	19	118	25	82	107	1,053
23	12 Business Park	TSF	46	55	11	66	14	46	60	588
	Sub-Total			55	11	66	14	46	60	588
24	14 Church/Synagogue	TSF	27	11	9	20	9	9	18	246
	16 Private School (PreK-8)	STU	126	63	52	115	37	40	77	137
	Sub-Total			74	61	135	46	49	95	383

2008 Laguna Hills Land Use and Trip Generation Summary

Zone	Land Use Type	Units	Amount	AM Peak Hour			PM Peak Hour			ADT
				Inbound	Outbound	Total	Inbound	Outbound	Total	
25	8 General Commercial (~200 TSF)	TSF	96	75	48	123	213	231	444	5,102
	9 Strip Commercial (~100 TSF)	TSF	3	3	2	5	7	8	15	172
	10 General Office	TSF	50	68	10	78	13	62	75	551
	Sub-Total			146	60	206	233	301	534	5,825
26	8 General Commercial (~200 TSF)	TSF	24	19	12	31	53	57	110	1,271
	9 Strip Commercial (~100 TSF)	TSF	12	10	7	17	30	32	62	715
	Sub-Total			29	19	48	83	89	172	1,986
27	1 Single Family Detached	DU	223	42	125	167	143	83	226	2,134
	Sub-Total			42	125	167	143	83	226	2,134
28	8 General Commercial (~200 TSF)	TSF	14	11	7	18	30	33	63	729
	10 General Office	TSF	102	138	19	157	25	126	151	1,118
	11 Medical Office	TSF	5	13	3	16	8	19	27	266
	Sub-Total			162	29	191	63	178	241	2,113
29	8 General Commercial (~200 TSF)	TSF	14	11	7	18	32	35	67	767
	9 Strip Commercial (~100 TSF)	TSF	2	2	1	3	5	5	10	119
	Sub-Total			13	8	21	37	40	77	886
30	8 General Commercial (~200 TSF)	TSF	914	713	457	1,170	2,034	2,204	4,238	48,715
	Sub-Total			713	457	1,170	2,034	2,204	4,238	48,715
31	10 General Office	TSF	14	19	3	22	4	17	21	155
	Sub-Total			19	3	22	4	17	21	155
32	9 Strip Commercial (~100 TSF)	TSF	20	17	11	28	49	53	102	1,163
	10 General Office	TSF	121	165	23	188	30	150	180	1,335
	11 Medical Office	TSF	152	365	91	456	228	533	761	7,613
	Sub-Total			547	125	672	307	736	1,043	10,111
33	11 Medical Office	TSF	100	240	60	300	150	350	500	5,000
	Sub-Total			240	60	300	150	350	500	5,000
34	13 Hospital	TSF	127	102	51	153	50	101	151	2,238
	Sub-Total			102	51	153	50	101	151	2,238
35	6 Convalescent Home	BED	208	25	15	40	15	21	36	493
	11 Medical Office	TSF	52	125	31	156	78	183	261	2,613
	Sub-Total			150	46	196	93	204	297	3,106
36	6 Convalescent Home	BED	59	7	4	11	4	6	10	140
	8 General Commercial (~200 TSF)	TSF	101	79	50	129	224	243	467	5,363
	Sub-Total			86	54	140	228	249	477	5,503
37	8 General Commercial (~200 TSF)	TSF	91	71	46	117	203	220	423	4,868
	Sub-Total			71	46	117	203	220	423	4,868
38	3 Apartments	DU	254	25	104	129	102	56	158	1,707
	Sub-Total			25	104	129	102	56	158	1,707
39	3 Apartments	DU	106	11	43	54	42	23	65	712
	Sub-Total			11	43	54	42	23	65	712
40	10 General Office	TSF	121	165	23	188	30	151	181	1,338
	Sub-Total			165	23	188	30	151	181	1,338
41	1 Single Family Detached	DU	63	12	35	47	40	23	63	603
	Sub-Total			12	35	47	40	23	63	603
42	1 Single Family Detached	DU	13	2	7	9	8	5	13	124
	Sub-Total			2	7	9	8	5	13	124
43	1 Single Family Detached	DU	99	19	55	74	63	37	100	947
	Sub-Total			19	55	74	63	37	100	947
44	1 Single Family Detached	DU	447	85	250	335	286	165	451	4,278
	20 Park	Acre	0	0	0	0	0	0	0	0
	Sub-Total			85	250	335	286	165	451	4,278
45	15 Library	TSF	10	8	2	10	23	25	48	455
	17 High School	STU	1,870	524	243	767	37	112	149	2,581
	20 Park	Acre	15	0	0	0	0	0	0	24
	24 Government Facility	TSF	20	39	5	44	18	39	57	558
	Sub-Total			571	250	821	78	176	254	3,618
46	3 Apartments	DU	102	10	42	52	41	22	63	685
	4 Multi-Family (Affordable)	DU	248	42	124	166	112	82	194	2,021
	20 Park	Acre	2	0	0	0	0	0	0	4
	Sub-Total			52	166	218	153	104	257	2,710
47	1 Single Family Detached	DU	286	54	160	214	183	106	289	2,737
	20 Park	Acre	3	0	0	0	0	0	0	6
	Sub-Total			54	160	214	183	106	289	2,743

2008 Laguna Hills Land Use and Trip Generation Summary

Zone	Land Use Type		Units	Amount	AM Peak Hour			PM Peak Hour			ADT
					Inbound	Outbound	Total	Inbound	Outbound	Total	
48	11	Medical Office	TSF	63	150	38	188	94	219	313	3,130
		Sub-Total			150	38	188	94	219	313	3,130
49	1	Single Family Detached	DU	142	27	80	107	91	53	144	1,359
	20	Park	Acre	3	0	0	0	0	0	0	4
		Sub-Total			27	80	107	91	53	144	1,363
50	8	General Commercial (~200 TSF)	TSF	202	157	101	258	449	486	935	10,754
		Sub-Total			157	101	258	449	486	935	10,754
51	1	Single Family Detached	DU	68	13	38	51	44	25	69	651
	2	Condominiums	DU	99	17	50	67	45	33	78	807
	3	Apartments	DU	252	25	103	128	101	55	156	1,693
	20	Park	Acre	4	0	0	0	0	0	0	6
		Sub-Total			55	191	246	190	113	303	3,157
52	1	Single Family Detached	DU	163	31	91	122	104	60	164	1,560
		Sub-Total			31	91	122	104	60	164	1,560
53	1	Single Family Detached	DU	58	11	32	43	37	21	58	555
	3	Apartments	DU	206	21	84	105	82	45	127	1,384
		Sub-Total			32	116	148	119	66	185	1,939
54	8	General Commercial (~200 TSF)	TSF	63	49	31	80	140	151	291	3,349
	22	Chapel/Mortuary	TSF	9	4	3	7	3	3	6	85
		Sub-Total			53	34	87	143	154	297	3,434
55	1	Single Family Detached	DU	276	52	155	207	177	102	279	2,641
	18	Elementary/Middle School	STU	669	120	80	200	13	33	46	729
		Sub-Total			172	235	407	190	135	325	3,370
56	1	Single Family Detached	DU	410	78	230	308	262	152	414	3,924
	20	Park	Acre	4	0	0	0	0	0	0	6
		Sub-Total			78	230	308	262	152	414	3,930
57	8	General Commercial (~200 TSF)	TSF	21	16	10	26	46	50	96	1,107
	10	General Office	TSF	107	145	20	165	27	132	159	1,174
		Sub-Total			161	30	191	73	182	255	2,281
58	1	Single Family Detached	DU	470	89	263	352	301	174	475	4,498
	20	Park	Acre	3	0	0	0	0	0	0	4
		Sub-Total			89	263	352	301	174	475	4,502
59	8	General Commercial (~200 TSF)	TSF	102	80	51	131	227	246	473	5,447
	10	General Office	TSF	9	12	2	14	2	11	13	101
		Sub-Total			92	53	145	229	257	486	5,548
60	1	Single Family Detached	DU	161	31	90	121	103	60	163	1,541
	18	Elementary/Middle School	STU	674	121	81	202	13	34	47	735
	20	Park	Acre	4	0	0	0	0	0	0	6
		Sub-Total			152	171	323	116	94	210	2,282
61	1	Single Family Detached	DU	15	3	8	11	10	6	16	144
	8	General Commercial (~200 TSF)	TSF	124	97	62	159	276	299	575	6,612
	9	Strip Commercial (~100 TSF)	TSF	2	2	1	3	5	6	11	129
	14	Church/Synagogue	TSF	20	8	6	14	7	6	13	178
	23	Child Care Center	TSF	5	41	35	76	23	54	77	396
	25	Office (EQ)	TSF	16	41	6	47	8	37	45	332
		Sub-Total			192	118	310	329	408	737	7,791
62	9	Strip Commercial (~100 TSF)	TSF	5	4	3	7	12	13	25	277
	10	General Office	TSF	67	91	13	104	17	83	100	735
		Sub-Total			95	16	111	29	96	125	1,012
63	10	General Office	TSF	81	110	15	125	20	100	120	887
		Sub-Total			110	15	125	20	100	120	887
64	3	Apartments	DU	324	32	133	165	130	71	201	2,177
		Sub-Total			32	133	165	130	71	201	2,177
65	1	Single Family Detached	DU	185	35	104	139	118	68	186	1,770
	2	Condominiums	DU	248	42	124	166	112	82	194	2,021
		Sub-Total			77	228	305	230	150	380	3,791
66	2	Condominiums	DU	306	52	153	205	138	101	239	2,494
		Sub-Total			52	153	205	138	101	239	2,494
67	8	General Commercial (~200 TSF)	TSF	55	43	27	70	122	132	254	2,914
		Sub-Total			43	27	70	122	132	254	2,914
68	8	General Commercial (~200 TSF)	TSF	66	51	33	84	146	159	305	3,507
		Sub-Total			51	33	84	146	159	305	3,507

2008 Laguna Hills Land Use and Trip Generation Summary

Zone	Land Use Type	Units	Amount	AM Peak Hour			PM Peak Hour			ADT
				Inbound	Outbound	Total	Inbound	Outbound	Total	
69	1 Single Family Detached	DU	274	52	153	205	175	101	276	2,622
	20 Park	Acre	2	0	0	0	0	0	0	3
	Sub-Total			52	153	205	175	101	276	2,625
70	2 Condominiums	DU	372	63	186	249	167	123	290	3,032
	20 Park	Acre	1	0	0	0	0	0	0	1
	24 Government Facility	TSF	35	69	8	77	31	69	100	983
	Sub-Total			132	194	326	198	192	390	4,016
71	1 Single Family Detached	DU	264	50	148	198	169	98	267	2,526
	20 Park	Acre	7	0	0	0	0	0	0	11
	Sub-Total			50	148	198	169	98	267	2,537
72	1 Single Family Detached	DU	351	67	197	264	225	130	355	3,359
	20 Park	Acre	0	0	0	0	0	0	0	1
	Sub-Total			67	197	264	225	130	355	3,360
73	1 Single Family Detached	DU	119	23	67	90	76	44	120	1,139
	20 Park	Acre	2	0	0	0	0	0	0	3
	Sub-Total			23	67	90	76	44	120	1,142
74	1 Single Family Detached	DU	88	17	49	66	56	33	89	842
	Sub-Total			17	49	66	56	33	89	842
75	1 Single Family Detached	DU	187	36	105	141	120	69	189	1,790
	Sub-Total			36	105	141	120	69	189	1,790
76	1 Single Family Detached	DU	269	51	151	202	172	100	272	2,574
	20 Park	Acre	11	0	0	0	0	0	0	17
	Sub-Total			51	151	202	172	100	272	2,591
77	1 Single Family Detached	DU	54	10	30	40	35	20	55	517
	Sub-Total			10	30	40	35	20	55	517
78	1 Single Family Detached	DU	90	17	50	67	58	33	91	861
	20 Park	Acre	5	0	0	0	0	0	0	8
	Sub-Total			17	50	67	58	33	91	869
79	1 Single Family Detached	DU	204	39	114	153	131	75	206	1,952
	Sub-Total			39	114	153	131	75	206	1,952
80	8 General Commercial (~200 TSF)	TSF	41	32	21	53	92	100	192	2,209
	Sub-Total			32	21	53	92	100	192	2,209
81	1 Single Family Detached	DU	254	48	142	190	163	94	257	2,431
	20 Park	Acre	2	0	0	0	0	0	0	4
	Sub-Total			48	142	190	163	94	257	2,435
82	1 Single Family Detached	DU	78	15	44	59	50	29	79	746
	20 Park	Acre	9	0	0	0	0	0	0	14
	Sub-Total			15	44	59	50	29	79	760
83	1 Single Family Detached	DU	224	43	125	168	143	83	226	2,144
	20 Park	Acre	2	0	0	0	0	0	0	4
	Sub-Total			43	125	168	143	83	226	2,148
84	1 Single Family Detached	DU	48	9	27	36	31	18	49	459
	20 Park	Acre	18	0	0	0	0	0	0	28
	Sub-Total			9	27	36	31	18	49	487
85	1 Single Family Detached	DU	51	10	29	39	33	19	52	488
	20 Park	Acre	4	0	0	0	0	0	0	6
	Sub-Total			10	29	39	33	19	52	494
86	1 Single Family Detached	DU	82	16	46	62	52	30	82	785
	Sub-Total			16	46	62	52	30	82	785
87	2 Condominiums	DU	88	15	44	59	40	29	69	717
	20 Park	Acre	9	0	0	0	0	0	0	14
	Sub-Total			15	44	59	40	29	69	731
88	1 Single Family Detached	DU	222	42	124	166	142	82	224	2,125
	20 Park	Acre	0	0	0	0	0	0	0	0
	Sub-Total			42	124	166	142	82	224	2,125
89	1 Single Family Detached	DU	224	43	125	168	143	83	226	2,144
	Sub-Total			43	125	168	143	83	226	2,144
90	1 Single Family Detached	DU	52	10	29	39	33	19	52	498
	Sub-Total			10	29	39	33	19	52	498

2008 Laguna Hills Land Use and Trip Generation Summary

Zone	Land Use Type		Units	Amount	AM Peak Hour			PM Peak Hour			ADT
					Inbound	Outbound	Total	Inbound	Outbound	Total	
Total	1	Single Family Detached	DU	6,679	1,270	3,739	5,009	4,275	2,472	6,747	63,918
	2	Condominiums	DU	2,253	383	1,128	1,511	1,015	744	1,759	18,363
	3	Apartments	DU	1,244	124	509	633	498	272	770	8,358
	4	Multi-Family (Affordable)	DU	248	42	124	166	112	82	194	2,021
	5	Mobile Home	DU	252	20	81	101	88	53	141	1,257
	6	Convalescent Home	BED	267	32	19	51	19	27	46	633
	7	Congregate Care	DU	152	6	3	9	12	12	24	307
	8	General Commercial (~200 TSF)	TSF	2,445	1,907	1,221	3,128	5,437	5,893	11,330	130,268
	9	Strip Commercial (~100 TSF)	TSF	65	55	36	91	158	171	329	3,767
	10	General Office	TSF	1,650	2,246	315	2,561	413	2,045	2,458	18,173
	11	Medical Office	TSF	412	989	247	1,236	618	1,444	2,062	20,622
	12	Business Park	TSF	1,761	2,113	405	2,518	529	1,743	2,272	22,464
	13	Hospital	TSF	127	102	51	153	50	101	151	2,238
	14	Church/Synagogue	TSF	75	30	24	54	26	24	50	680
	15	Library	TSF	10	8	2	10	23	25	48	455
	16	Private School (PreK-8)	STU	126	63	52	115	37	40	77	137
	17	High School	STU	1,870	524	243	767	37	112	149	2,581
	18	Elementary/Middle School	STU	2,026	364	243	607	40	101	141	2,208
	20	Park	Acre	117	0	0	0	0	0	0	186
	22	Chapel/Mortuary	TSF	9	4	3	7	3	3	6	85
	23	Child Care Center	TSF	5	41	35	76	23	54	77	396
	24	Government Facility	TSF	55	108	13	121	49	108	157	1,541
	25	Office (EQ)	TSF	16	41	6	47	8	37	45	332
	Grand-Total				10,472	8,499	18,971	13,470	15,563	29,033	300,990

2030 Laguna Hills Land Use and Trip Generation Summary

Zone	Land Use Type		Units	Amount	AM Peak Hour			PM Peak Hour			ADT
					Inbound	Outbound	Total	Inbound	Outbound	Total	
1	7	Congregate Care	DU	152	6	3	9	12	12	24	307
	33	Park	Acre	0.009	0	0	0	0	0	0	0
		Sub-Total			6	3	9	12	12	24	307
2	8	Commercial (EQ)	TSF	21	36	23	59	103	112	215	2,468
	15	Auto Center	TSF	22	30	13	43	23	34	57	1,043
	18	Office (EQ)	TSF	237	320	44	364	60	291	351	2,597
		Sub-Total			386	80	466	186	437	623	6,108
3	8	Commercial (EQ)	TSF	21	36	23	59	101	110	211	2,428
	18	Office (EQ)	TSF	172	249	34	283	46	227	273	2,022
		Sub-Total			285	57	342	147	337	484	4,450
4	18	Office (EQ)	TSF	42	84	12	96	16	77	93	685
	24	Church/Synagogue	TSF	69	27	23	50	24	22	46	632
		Sub-Total			111	35	146	40	99	139	1,317
5	2	Condominiums	DU	150	26	75	101	68	50	118	1,223
	33	Park	Acre	1	0	0	0	0	0	0	2
		Sub-Total			26	75	101	68	50	118	1,225
6	2	Condominiums	DU	75	13	38	51	34	25	59	611
	33	Park	Acre	1	0	0	0	0	0	0	1
		Sub-Total			13	38	51	34	25	59	612
7	18	Office (EQ)	TSF	35	74	10	84	14	67	81	598
	33	Park	Acre	0	0	0	0	0	0	0	0
		Sub-Total			74	10	84	14	67	81	598
8	2	Condominiums	DU	308	52	154	206	139	102	241	2,510
	33	Park	Acre	3	0	0	0	0	0	0	4
		Sub-Total			52	154	206	139	102	241	2,514
9	2	Condominiums	DU	380	65	190	255	171	125	296	3,097
	33	Park	Acre	12	0	0	0	0	0	0	19
		Sub-Total			65	190	255	171	125	296	3,116
10	2	Condominiums	DU	57	10	29	39	26	19	45	465
	33	Park	Acre	1	0	0	0	0	0	0	1
		Sub-Total			10	29	39	26	19	45	466
11	8	Commercial (EQ)	TSF	119	111	71	182	317	343	660	7,587
	17	Bank	TSF	8	50	39	89	168	182	350	2,122
	26	Government Facility	TSF	35	69	8	77	31	69	100	983
		Sub-Total			230	118	348	516	594	1,110	10,692
12	2	Condominiums	DU	84	14	42	56	38	28	66	685
		Sub-Total			14	42	56	38	28	66	685
13	2	Condominiums	DU	86	15	43	58	39	28	67	701
		Sub-Total			15	43	58	39	28	67	701
14	1	Single Family Detached	DU	216	41	121	162	138	80	218	2,068
	33	Park	Acre	0	0	0	0	0	0	0	0
		Sub-Total			41	121	162	138	80	218	2,068
15	1	Single Family Detached	DU	191	36	107	143	122	71	193	1,826
	33	Park	Acre	2	0	0	0	0	0	0	3
		Sub-Total			36	107	143	122	71	193	1,829
16	1	Single Family Detached	DU	58	11	33	44	37	22	59	557
	30	Elementary/Middle School	STU	683	123	82	205	14	34	48	744
	33	Park	Acre	5	0	0	0	0	0	0	9
		Sub-Total			134	115	249	51	56	107	1,310
17	8	Commercial (EQ)	TSF	215	164	105	269	466	505	971	11,169
	16	Auto Repair	TSF	28	31	13	44	25	37	62	562
	18	Office (EQ)	TSF	580	636	87	723	119	579	698	5,164
	19	Medical Office	TSF	40	96	24	120	60	140	200	2,000
	20	Manufacturing	TSF	97	71	5	76	39	34	73	373
	21	Mini-Warehouse	TSF	97	9	6	15	13	13	26	243
		Sub-Total			1,007	240	1,247	722	1,308	2,030	19,511
18	9	Hotel	ROOM	76	30	21	51	31	27	58	678
	10	Restaurant	TSF	32	251	251	502	281	239	520	4,069
	16	Auto Repair	TSF	30	34	15	49	27	40	67	605
	18	Office (EQ)	TSF	550	611	83	694	114	556	670	4,959
		Sub-Total			926	370	1,296	453	862	1,315	10,311

2030 Laguna Hills Land Use and Trip Generation Summary

Zone	Land Use Type		Units	Amount	AM Peak Hour			PM Peak Hour			ADT
					Inbound	Outbound	Total	Inbound	Outbound	Total	
19	9	Hotel	ROOM	136	54	37	91	56	48	104	1,213
	11	Fast Food Restaurant	TSF	4	110	106	216	74	68	142	1,923
		Sub-Total			164	143	307	130	116	246	3,136
20	5	Mobile Home	DU	252	20	81	101	88	53	141	1,257
		Sub-Total			20	81	101	88	53	141	1,257
21	8	Commercial (EQ)	TSF	70	79	50	129	225	244	469	5,386
	10	Restaurant	TSF	30	236	236	472	263	224	487	3,815
	16	Auto Repair	TSF	12	13	6	19	11	16	27	240
	18	Office (EQ)	TSF	250	333	45	378	62	303	365	2,701
		Sub-Total			661	337	998	561	787	1,348	12,142
22	8	Commercial (EQ)	TSF	20	35	22	57	100	108	208	2,386
	18	Office (EQ)	TSF	50	96	13	109	18	88	106	782
	31	Child Care Center	TSF	5	41	35	76	23	54	77	396
		Sub-Total			172	70	242	141	250	391	3,564
23	8	Commercial (EQ)	TSF	10	19	12	31	54	59	113	1,300
	18	Office (EQ)	TSF	50	96	13	109	18	88	106	782
		Sub-Total			115	25	140	72	147	219	2,082
24	24	Church/Synagogue	TSF	27	11	9	20	9	9	18	246
	28	Private School (PreK-8)	STU	126	63	52	115	37	40	77	137
	31	Child Care Center	TSF	5	41	35	76	23	54	77	396
		Sub-Total			115	96	211	69	103	172	779
25	8	Commercial (EQ)	TSF	61	72	46	118	205	222	427	4,899
	9	Hotel	ROOM	122	49	33	82	50	43	93	1,088
	10	Restaurant	TSF	14	110	110	220	123	105	228	1,780
	13	Gas Station	SITE	1	44	44	88	61	61	122	1,012
	26	Government Facility	TSF	50	99	12	111	44	99	143	1,396
		Sub-Total			374	245	619	483	530	1,013	10,175
26	10	Restaurant	TSF	12	96	96	192	108	92	200	1,562
	13	Gas Station	SITE	1	44	44	88	61	61	122	1,012
		Sub-Total			140	140	280	169	153	322	2,574
27	1	Single Family Detached	DU	223	42	125	167	143	83	226	2,134
		Sub-Total			42	125	167	143	83	226	2,134
28	17	Bank	TSF	14	86	67	153	287	311	598	3,630
	18	Office (EQ)	TSF	102	166	23	189	31	151	182	1,350
	19	Medical Office	TSF	5	13	3	16	8	19	27	266
		Sub-Total			265	93	358	326	481	807	5,246
29	8	Commercial (EQ)	TSF	49	63	40	103	178	193	371	4,271
	10	Restaurant	TSF	14	113	113	226	126	108	234	1,830
	13	Gas Station	SITE	1	44	44	88	61	61	122	1,012
		Sub-Total			220	197	417	365	362	727	7,113
30	8	Commercial (EQ)	TSF	773	376	240	616	1,072	1,161	2,233	25,667
	10	Restaurant	TSF	70	550	550	1,100	615	524	1,139	8,901
	11	Fast Food Restaurant	TSF	10	283	272	555	190	175	365	4,961
	12	Cinema	SEAT	1,500	0	0	0	150	60	210	2,700
	16	Auto Repair	TSF	12	13	6	19	11	16	27	240
		Sub-Total			1,222	1,068	2,290	2,038	1,936	3,974	42,469
31	18	Office (EQ)	TSF	14	36	5	41	7	33	40	294
		Sub-Total			36	5	41	7	33	40	294
32	17	Bank	TSF	14	86	67	153	287	311	598	3,630
	18	Office (EQ)	TSF	58	108	15	123	20	98	118	875
	19	Medical Office	TSF	160	385	96	481	240	561	801	8,015
	26	Government Facility	TSF	10	20	2	22	9	20	29	279
		Sub-Total			599	180	779	556	990	1,546	12,799
33	19	Medical Office	TSF	100	240	60	300	150	350	500	5,000
		Sub-Total			240	60	300	150	350	500	5,000
34	22	Hospital	TSF	127	102	51	153	50	101	151	2,238
		Sub-Total			102	51	153	50	101	151	2,238
35	6	Convalescent Home	BED	208	25	15	40	15	21	36	493
	19	Medical Office	TSF	52	125	31	156	78	183	261	2,613
		Sub-Total			150	46	196	93	204	297	3,106

2030 Laguna Hills Land Use and Trip Generation Summary

Zone	Land Use Type		Units	Amount	AM Peak Hour			PM Peak Hour			ADT
					Inbound	Outbound	Total	Inbound	Outbound	Total	
36	6	Convalescent Home	BED	59	7	4	11	4	6	10	140
	8	Commercial (EQ)	TSF	101	100	64	164	285	309	594	6,820
	10	Restaurant	TSF	15	114	114	228	128	109	237	1,852
		Sub-Total			221	182	403	417	424	841	8,812
37	8	Commercial (EQ)	TSF	64	74	47	121	212	229	441	5,069
	10	Restaurant	TSF	10	79	79	158	88	75	163	1,277
	17	Bank	TSF	3	19	15	34	63	68	131	796
		Sub-Total			172	141	313	363	372	735	7,142
38	3	Apartments	DU	253	25	104	129	101	56	157	1,700
		Sub-Total			25	104	129	101	56	157	1,700
39	3	Apartments	DU	106	11	43	54	42	23	65	712
		Sub-Total			11	43	54	42	23	65	712
40	18	Office (EQ)	TSF	121	191	26	217	36	174	210	1,550
		Sub-Total			191	26	217	36	174	210	1,550
41	1	Single Family Detached	DU	50	10	28	38	32	19	51	479
	31	Child Care Center	TSF	2	16	14	30	9	22	31	159
		Sub-Total			26	42	68	41	41	82	638
42	1	Single Family Detached	DU	26	5	15	20	17	10	27	249
		Sub-Total			5	15	20	17	10	27	249
43	1	Single Family Detached	DU	99	19	55	74	63	37	100	947
		Sub-Total			19	55	74	63	37	100	947
44	1	Single Family Detached	DU	447	85	250	335	286	165	451	4,278
	33	Park	Acre	0	0	0	0	0	0	0	0
		Sub-Total			85	250	335	286	165	451	4,278
45	26	Government Facility	TSF	20	39	5	44	18	39	57	558
	27	Library	TSF	10	8	2	10	23	25	48	455
	29	High School	STU	1,870	524	243	767	37	112	149	2,581
	33	Park	Acre	15	0	0	0	0	0	0	24
		Sub-Total			571	250	821	78	176	254	3,618
46	3	Apartments	DU	102	10	42	52	41	22	63	685
	4	Multi-Family (Affordable)	DU	248	42	124	166	112	82	194	2,021
	33	Park	Acre	2	0	0	0	0	0	0	4
		Sub-Total			52	166	218	153	104	257	2,710
47	1	Single Family Detached	DU	286	54	160	214	183	106	289	2,737
	33	Park	Acre	3	0	0	0	0	0	0	6
		Sub-Total			54	160	214	183	106	289	2,743
48	19	Medical Office	TSF	63	150	38	188	94	219	313	3,130
		Sub-Total			150	38	188	94	219	313	3,130
49	1	Single Family Detached	DU	142	27	80	107	91	53	144	1,359
	33	Park	Acre	3	0	0	0	0	0	0	4
		Sub-Total			27	80	107	91	53	144	1,363
50	8	Commercial (EQ)	TSF	179	145	93	238	414	448	862	9,909
	10	Restaurant	TSF	20	157	157	314	176	150	326	2,543
	11	Fast Food Restaurant	TSF	6	170	163	333	114	105	219	2,977
	13	Gas Station	SITE	2	87	87	174	122	122	244	2,024
	14	Car Wash	SITE	1	18	18	36	41	41	82	900
		Sub-Total			577	518	1,095	867	866	1,733	18,353
51	1	Single Family Detached	DU	68	13	38	51	44	25	69	651
	2	Condominiums	DU	99	17	50	67	45	33	78	807
	3	Apartments	DU	252	25	103	128	101	55	156	1,693
	33	Park	Acre	4	0	0	0	0	0	0	6
		Sub-Total			55	191	246	190	113	303	3,157
52	1	Single Family Detached	DU	163	31	91	122	104	60	164	1,560
	31	Child Care Center	TSF	2	16	14	30	9	22	31	159
		Sub-Total			47	105	152	113	82	195	1,719
53	1	Single Family Detached	DU	58	11	32	43	37	21	58	555
	3	Apartments	DU	206	21	84	105	82	45	127	1,384
		Sub-Total			32	116	148	119	66	185	1,939
54	8	Commercial (EQ)	TSF	58	70	45	115	199	215	414	4,759
	10	Restaurant	TSF	5	39	39	78	44	37	81	636
	25	Chapel/Mortuary	ACRE	9	1	1	2	2	2	4	39
		Sub-Total			110	85	195	245	254	499	5,434

2030 Laguna Hills Land Use and Trip Generation Summary

Zone	Land Use Type		Units	Amount	AM Peak Hour			PM Peak Hour			ADT
					Inbound	Outbound	Total	Inbound	Outbound	Total	
55	1	Single Family Detached	DU	276	52	155	207	177	102	279	2,641
	30	Elementary/Middle School	STU	669	120	80	200	13	33	46	729
	31	Child Care Center	TSF	2	16	14	30	9	22	31	159
		Sub-Total			188	249	437	199	157	356	3,529
56	1	Single Family Detached	DU	410	78	230	308	262	152	414	3,924
	33	Park	Acre	4	0	0	0	0	0	0	6
		Sub-Total			78	230	308	262	152	414	3,930
57	15	Auto Center	TSF	21	29	12	41	22	32	54	995
	18	Office (EQ)	TSF	102	166	23	189	31	151	182	1,351
	31	Child Care Center	TSF	5	41	35	76	23	54	77	396
		Sub-Total			236	70	306	76	237	313	2,742
58	1	Single Family Detached	DU	470	89	263	352	301	174	475	4,498
	33	Park	Acre	3	0	0	0	0	0	0	4
		Sub-Total			89	263	352	301	174	475	4,502
59	9	Hotel	ROOM	147	59	40	99	60	51	111	1,311
		Sub-Total			59	40	99	60	51	111	1,311
60	1	Single Family Detached	DU	161	31	90	121	103	60	163	1,541
	30	Elementary/Middle School	STU	674	121	81	202	13	34	47	735
	33	Park	Acre	4	0	0	0	0	0	0	6
		Sub-Total			152	171	323	116	94	210	2,282
61	1	Single Family Detached	DU	15	3	8	11	10	6	16	144
	8	Commercial (EQ)	TSF	40	55	35	90	157	170	327	3,755
	10	Restaurant	TSF	30	236	236	472	263	224	487	3,815
	18	Office (EQ)	TSF	16	41	6	47	8	37	45	332
	23	Health Club	TSF	56	54	36	90	121	81	202	2,245
	24	Church/Synagogue	TSF	20	8	6	14	7	6	13	178
	31	Child Care Center	TSF	5	41	35	76	23	54	77	396
		Sub-Total			438	362	800	589	578	1,167	10,865
62	18	Office (EQ)	TSF	50	97	13	110	18	88	106	786
		Sub-Total			97	13	110	18	88	106	786
63	8	Commercial (EQ)	TSF	61	72	46	118	205	222	427	4,903
	10	Restaurant	TSF	20	157	157	314	176	150	326	2,548
	11	Fast Food Restaurant	TSF	4	119	114	233	80	74	154	2,084
	13	Gas Station	SITE	1	44	44	88	61	61	122	1,012
	14	Car Wash	SITE	1	18	18	36	41	41	82	900
		Sub-Total			410	379	789	563	548	1,111	11,447
64	3	Apartments	DU	324	32	133	165	130	71	201	2,177
		Sub-Total			32	133	165	130	71	201	2,177
65	1	Single Family Detached	DU	185	35	104	139	118	68	186	1,770
	2	Condominiums	DU	248	42	124	166	112	82	194	2,021
		Sub-Total			77	228	305	230	150	380	3,791
66	2	Condominiums	DU	306	52	153	205	138	101	239	2,494
		Sub-Total			52	153	205	138	101	239	2,494
67	8	Commercial (EQ)	TSF	45	59	38	97	168	182	350	4,018
	10	Restaurant	TSF	10	79	79	158	89	76	165	1,284
		Sub-Total			138	117	255	257	258	515	5,302
68	8	Commercial (EQ)	TSF	64	74	47	121	211	229	440	5,061
	10	Restaurant	TSF	2	16	16	32	18	15	33	254
	11	Fast Food Restaurant	TSF	1	34	33	67	23	21	44	595
		Sub-Total			124	96	220	252	265	517	5,910
69	1	Single Family Detached	DU	274	52	153	205	175	101	276	2,622
	31	Child Care Center	TSF	2	16	14	30	9	22	31	159
	33	Park	Acre	2	0	0	0	0	0	0	3
		Sub-Total			68	167	235	184	123	307	2,784
70	2	Condominiums	DU	372	63	186	249	167	123	290	3,032
	26	Government Facility	TSF	35	69	8	77	31	69	100	983
	33	Park	Acre	1	0	0	0	0	0	0	1
		Sub-Total			132	194	326	198	192	390	4,016
71	1	Single Family Detached	DU	264	50	148	198	169	98	267	2,526
	33	Park	Acre	7	0	0	0	0	0	0	11
		Sub-Total			50	148	198	169	98	267	2,537

2030 Laguna Hills Land Use and Trip Generation Summary

Zone	Land Use Type		Units	Amount	AM Peak Hour			PM Peak Hour			ADT
					Inbound	Outbound	Total	Inbound	Outbound	Total	
72	1	Single Family Detached	DU	351	67	197	264	225	130	355	3,359
	33	Park	Acre	0	0	0	0	0	0	0	1
		Sub-Total			67	197	264	225	130	355	3,360
73	1	Single Family Detached	DU	119	23	67	90	76	44	120	1,139
	33	Park	Acre	2	0	0	0	0	0	0	3
		Sub-Total			23	67	90	76	44	120	1,142
74	1	Single Family Detached	DU	88	17	49	66	56	33	89	842
		Sub-Total			17	49	66	56	33	89	842
75	1	Single Family Detached	DU	187	36	105	141	120	69	189	1,790
		Sub-Total			36	105	141	120	69	189	1,790
76	1	Single Family Detached	DU	269	51	151	202	172	100	272	2,574
	33	Park	Acre	11	0	0	0	0	0	0	17
		Sub-Total			51	151	202	172	100	272	2,591
77	1	Single Family Detached	DU	54	10	30	40	35	20	55	517
		Sub-Total			10	30	40	35	20	55	517
78	1	Single Family Detached	DU	90	17	50	67	58	33	91	861
	33	Park	Acre	5	0	0	0	0	0	0	8
		Sub-Total			17	50	67	58	33	91	869
79	1	Single Family Detached	DU	204	39	114	153	131	75	206	1,952
		Sub-Total			39	114	153	131	75	206	1,952
80	8	Commercial (EQ)	TSF	26	42	27	69	119	129	248	2,857
	10	Restaurant	TSF	15	118	118	236	132	113	245	1,915
		Sub-Total			160	145	305	251	242	493	4,772
81	1	Single Family Detached	DU	254	48	142	190	163	94	257	2,431
	33	Park	Acre	2	0	0	0	0	0	0	4
		Sub-Total			48	142	190	163	94	257	2,435
82	1	Single Family Detached	DU	78	15	44	59	50	29	79	746
	33	Park	Acre	9	0	0	0	0	0	0	14
		Sub-Total			15	44	59	50	29	79	760
83	1	Single Family Detached	DU	224	43	125	168	143	83	226	2,144
	33	Park	Acre	2	0	0	0	0	0	0	4
		Sub-Total			43	125	168	143	83	226	2,148
84	1	Single Family Detached	DU	48	9	27	36	31	18	49	459
	33	Park	Acre	18	0	0	0	0	0	0	28
		Sub-Total			9	27	36	31	18	49	487
85	1	Single Family Detached	DU	51	10	29	39	33	19	52	488
	33	Park	Acre	4	0	0	0	0	0	0	6
		Sub-Total			10	29	39	33	19	52	494
86	1	Single Family Detached	DU	82	16	46	62	52	30	82	785
		Sub-Total			16	46	62	52	30	82	785
87	2	Condominiums	DU	88	15	44	59	40	29	69	717
	33	Park	Acre	9	0	0	0	0	0	0	14
		Sub-Total			15	44	59	40	29	69	731
88	1	Single Family Detached	DU	222	42	124	166	142	82	224	2,125
	33	Park	Acre	0	0	0	0	0	0	0	0
		Sub-Total			42	124	166	142	82	224	2,125
89	1	Single Family Detached	DU	224	43	125	168	143	83	226	2,144
		Sub-Total			43	125	168	143	83	226	2,144
90	1	Single Family Detached	DU	52	10	29	39	33	19	52	498
		Sub-Total			10	29	39	33	19	52	498

2030 Laguna Hills Land Use and Trip Generation Summary

Zone		Land Use Type	Units	Amount	AM Peak Hour			PM Peak Hour			ADT
					Inbound	Outbound	Total	Inbound	Outbound	Total	
Total	1	Single Family Detached	DU	6,679	1,271	3,740	5,011	4,275	2,474	6,749	63,920
	2	Condominiums	DU	2,253	384	1,128	1,512	1,017	745	1,762	18,363
	3	Apartments	DU	1,243	124	509	633	497	272	769	8,351
	4	Multi-Family (Affordable)	DU	248	42	124	166	112	82	194	2,021
	5	Mobile Home	DU	252	20	81	101	88	53	141	1,257
	6	Convalescent Home	BED	267	32	19	51	19	27	46	633
	7	Congregate Care	DU	152	6	3	9	12	12	24	307
	8	Commercial (EQ)	TSF	1,995	1,682	1,074	2,756	4,791	5,190	9,981	114,712
	9	Hotel	ROOM	481	192	131	323	197	169	366	4,290
	10	Restaurant	TSF	299	2,351	2,351	4,702	2,630	2,241	4,871	38,081
	11	Fast Food Restaurant	TSF	25	716	688	1,404	481	443	924	12,540
	12	Cinema	SEAT	1,500	0	0	0	150	60	210	2,700
	13	Gas Station	SITE	6	263	263	526	366	366	732	6,072
	14	Car Wash	SITE	2	36	36	72	82	82	164	1,800
	15	Auto Center	TSF	43	59	25	84	45	66	111	2,038
	16	Auto Repair	TSF	82	91	40	131	74	109	183	1,647
	17	Bank	TSF	38	241	188	429	805	872	1,677	10,178
	18	Office (EQ)	TSF	2,430	3,304	452	3,756	618	3,008	3,626	26,828
	19	Medical Office	TSF	420	1,009	252	1,261	630	1,472	2,102	21,024
	20	Manufacturing	TSF	97	71	5	76	39	34	73	373
	21	Mini-Warehouse	TSF	97	9	6	15	13	13	26	243
	22	Hospital	TSF	127	102	51	153	50	101	151	2,238
	23	Health Club	TSF	56	54	36	90	121	81	202	2,245
	24	Church/Synagogue	TSF	116	46	38	84	40	37	77	1,056
	25	Chapel/Mortuary	ACRE	9	1	1	2	2	2	4	39
	26	Government Facility	TSF	150	296	35	331	133	296	429	4,199
	27	Library	TSF	10	8	2	10	23	25	48	455
	28	Private School (PreK-8)	STU	126	63	52	115	37	40	77	137
	29	High School	STU	1,870	524	243	767	37	112	149	2,581
	30	Elementary/Middle School	STU	2,026	364	243	607	40	101	141	2,208
	31	Child Care Center	TSF	28	228	196	424	128	304	432	2,220
	33	Park	Acre	134	0	0	0	0	0	0	213
		Grand-Total			13,589	12,012	25,601	17,552	18,889	36,441	354,969

Appendix C

HCM Delay Worksheets

7. Avd Carlota & Paseo de Valencia
Existing Count PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	8
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	0.97	1.00	1.00	0.97	0.95		1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583	3433	3472		1770	3539	1583	3433	3539	1372
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	1863	1583	3433	3472		1770	3539	1583	3433	3539	1372
Volume (vph)	200	140	160	750	410	60	60	380	480	340	650	340
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	211	147	168	789	432	63	63	400	505	358	684	358
RTOR Reduction (vph)	0	0	143	0	11	0	0	0	359	0	0	90
Lane Group Flow (vph)	211	147	25	789	484	0	63	400	146	358	684	268
Turn Type	Split		Perm	Split			Prot		Perm	Prot		Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4						2			6
Actuated Green, G (s)	15.2	15.2	15.2	30.1	30.1		6.5	30.9	30.9	17.8	42.2	42.2
Effective Green, g (s)	16.2	16.2	16.2	31.1	31.1		7.5	31.9	31.9	18.8	43.2	43.2
Actuated g/C Ratio	0.15	0.15	0.15	0.28	0.28		0.07	0.29	0.29	0.17	0.39	0.39
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	506	274	233	971	982		121	1026	459	587	1390	539
v/s Ratio Prot	0.06	c0.08		c0.23	0.14		c0.04	0.11		c0.10	0.19	
v/s Ratio Perm			0.02						0.09			c0.19
v/c Ratio	0.42	0.54	0.11	0.81	0.49		0.52	0.39	0.32	0.61	0.49	0.50
Uniform Delay, d1	42.6	43.4	40.6	36.7	32.9		49.5	31.3	30.6	42.2	25.1	25.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.98	1.06	1.75	1.00	1.00	1.00
Incremental Delay, d2	2.5	7.3	0.9	5.3	0.4		3.8	1.1	1.7	1.8	1.2	3.2
Delay (s)	45.1	50.8	41.5	42.0	33.3		52.6	34.2	55.3	44.0	26.4	28.4
Level of Service	D	D	D	D	C		D	C	E	D	C	C
Approach Delay (s)		45.6			38.6			46.4			31.4	
Approach LOS		D			D			D			C	

Intersection Summary

HCM Average Control Delay	38.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	15.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	8
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	0.97	1.00	1.00	0.86	0.86		1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583	3044	3149		1770	3539	1583	3433	3539	1372
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	1863	1583	3044	3149		1770	3539	1583	3433	3539	1372
Volume (vph)	200	150	170	1140	920	100	80	500	510	520	750	350
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	211	158	179	1200	968	105	84	526	537	547	789	368
RTOR Reduction (vph)	0	0	105	0	5	0	0	0	335	0	0	77
Lane Group Flow (vph)	211	158	74	1114	1154	0	84	526	202	547	789	291
Turn Type	Split		Perm	Split			Prot		Perm	Prot		Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4						2			6
Actuated Green, G (s)	14.2	14.2	14.2	51.9	51.9		7.9	22.0	22.0	20.9	35.0	35.0
Effective Green, g (s)	15.2	15.2	15.2	52.9	52.9		8.9	23.0	23.0	21.9	36.0	36.0
Actuated g/C Ratio	0.12	0.12	0.12	0.42	0.42		0.07	0.18	0.18	0.18	0.29	0.29
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	417	227	192	1288	1333		126	651	291	601	1019	395
v/s Ratio Prot	0.06	c0.08		0.37	c0.37		0.05	c0.15		c0.16	c0.22	
v/s Ratio Perm			0.05						0.13			0.21
v/c Ratio	0.51	0.70	0.39	0.86	0.87		0.67	0.81	0.69	0.91	0.77	0.74
Uniform Delay, d1	51.4	52.7	50.6	32.8	32.8		56.6	48.9	47.7	50.6	40.8	40.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.06	0.97	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	8.9	1.3	7.9	7.7		11.3	9.4	11.5	18.0	5.7	11.6
Delay (s)	52.4	61.6	51.9	40.7	40.5		71.1	56.8	58.9	68.6	46.5	51.8
Level of Service	D	E	D	D	D		E	E	E	E	D	D
Approach Delay (s)		54.9			40.6			58.8			54.7	
Approach LOS		D			D			E			D	

Intersection Summary

HCM Average Control Delay	49.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	9.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	8
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	0.97	1.00	1.00	0.86	0.86		1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	0.99		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583	3044	3130		1770	3539	1583	3433	3539	1372
Flt Permitted	0.95	1.00	1.00	0.95	0.99		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	1863	1583	3044	3130		1770	3539	1583	3433	3539	1372
Volume (vph)	330	150	170	1260	750	90	80	450	490	530	660	410
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	347	158	179	1326	789	95	84	474	516	558	695	432
RTOR Reduction (vph)	0	0	104	0	5	0	0	0	358	0	0	102
Lane Group Flow (vph)	347	158	75	1084	1121	0	84	474	158	558	695	330
Turn Type	Split		Perm	Split			Prot		Perm	Prot		Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4						2			6
Actuated Green, G (s)	15.4	15.4	15.4	50.6	50.6		8.0	22.0	22.0	21.0	35.0	35.0
Effective Green, g (s)	16.4	16.4	16.4	51.6	51.6		9.0	23.0	23.0	22.0	36.0	36.0
Actuated g/C Ratio	0.13	0.13	0.13	0.41	0.41		0.07	0.18	0.18	0.18	0.29	0.29
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	450	244	208	1257	1292		127	651	291	604	1019	395
v/s Ratio Prot	c0.10	0.08		0.36	c0.36		0.05	0.13		c0.16	0.20	
v/s Ratio Perm			0.05						0.10			c0.24
v/c Ratio	0.77	0.65	0.36	0.86	0.87		0.66	0.73	0.54	0.92	0.68	0.84
Uniform Delay, d1	52.5	51.6	49.5	33.5	33.6		56.5	48.1	46.2	50.7	39.4	41.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.09	0.96	1.33	1.00	1.00	1.00
Incremental Delay, d2	8.0	5.8	1.1	8.0	8.1		9.4	5.4	5.4	19.9	3.7	18.6
Delay (s)	60.5	57.4	50.6	41.4	41.6		70.9	51.7	66.7	70.6	43.1	60.3
Level of Service	E	E	D	D	D		E	D	E	E	D	E
Approach Delay (s)		57.2			41.5			60.4			56.6	
Approach LOS		E			D			E			E	

Intersection Summary

HCM Average Control Delay	51.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	9.0
Analysis Period (min)	15		

c Critical Lane Group

8. Avd Carlota & El Toro Rd
Existing Count PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	8	12	12	12	12	12	12	12	12	12
Total Lost time (s)		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor		0.86	1.00	0.97	0.91	1.00	1.00	1.00	1.00	0.91	0.91	1.00
Frt		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.98	1.00
Satd. Flow (prot)		6408	1372	3433	5085	1583	1770	1863	1583	1610	3330	1583
Flt Permitted		1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.98	1.00
Satd. Flow (perm)		6408	1372	3433	5085	1583	1770	1863	1583	1610	3330	1583
Volume (vph)	0	1700	60	300	820	600	40	120	490	820	630	100
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1789	63	316	863	632	42	126	516	863	663	105
RTOR Reduction (vph)	0	0	12	0	0	108	0	0	5	0	0	29
Lane Group Flow (vph)	0	1789	51	316	863	524	42	126	511	491	1035	76
Turn Type			Perm	Prot		pm+ov	Split		pm+ov	Split		Perm
Protected Phases		4		3	8	6	2	2	3	6	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)		31.0	31.0	16.0	51.0	80.0	18.0	18.0	34.0	29.0	29.0	29.0
Effective Green, g (s)		32.0	32.0	17.0	52.0	82.0	19.0	19.0	36.0	30.0	30.0	30.0
Actuated g/C Ratio		0.29	0.29	0.15	0.47	0.75	0.17	0.17	0.33	0.27	0.27	0.27
Clearance Time (s)		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1864	399	531	2404	1223	306	322	518	439	908	432
v/s Ratio Prot		c0.28		0.09	0.17	0.12	0.02	0.07	c0.15	0.30	c0.31	
v/s Ratio Perm			0.04			0.21			0.17			0.05
v/c Ratio		0.96	0.13	0.60	0.36	0.43	0.14	0.39	0.99	1.12	1.14	0.18
Uniform Delay, d1		38.4	28.7	43.3	18.4	5.2	38.6	40.4	36.8	40.0	40.0	30.6
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.06	1.06	1.23
Incremental Delay, d2		12.5	0.1	1.8	0.1	0.2	0.9	3.5	35.8	74.5	73.5	0.7
Delay (s)		50.9	28.9	45.1	18.5	5.5	39.5	43.9	72.6	117.1	115.9	38.3
Level of Service		D	C	D	B	A	D	D	E	F	F	D
Approach Delay (s)		50.1			18.6			65.3			111.2	
Approach LOS		D			B			E			F	

Intersection Summary

HCM Average Control Delay	59.0	HCM Level of Service	E
HCM Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	8	12	12	12	12	12	12	12	12	12
Total Lost time (s)		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Util. Factor		*0.90	1.00	0.97	*0.90	1.00		0.95	0.88	*0.90	*0.90	1.00
Frt		1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	1.00		0.99	1.00	0.95	0.99	1.00
Satd. Flow (prot)		6706	1372	3433	5029	1583		3490	2787	3185	3327	1583
Flt Permitted		1.00	1.00	0.95	1.00	1.00		0.99	1.00	0.95	0.99	1.00
Satd. Flow (perm)		6706	1372	3433	5029	1583		3490	2787	3185	3327	1583
Volume (vph)	0	2320	70	560	910	640	80	200	570	1120	850	110
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	2442	74	589	958	674	84	211	600	1179	895	116
RTOR Reduction (vph)	0	0	9	0	0	5	0	0	2	0	0	27
Lane Group Flow (vph)	0	2442	65	589	958	669	0	295	598	1011	1063	89
Turn Type			Perm	Prot		pm+ov	Split		pm+ov	Split		Perm
Protected Phases		4		3	8	6	2	2	3	6	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)		46.0	46.0	18.0	68.0	104.0		9.0	27.0	36.0	36.0	36.0
Effective Green, g (s)		47.0	47.0	19.0	69.0	106.0		10.0	29.0	37.0	37.0	37.0
Actuated g/C Ratio		0.38	0.38	0.15	0.55	0.85		0.08	0.23	0.30	0.30	0.30
Clearance Time (s)		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		2521	516	522	2776	1380		279	647	943	985	469
v/s Ratio Prot		c0.36		c0.17	0.19	0.14		c0.08	0.14	0.32	c0.32	
v/s Ratio Perm			0.05			0.28			0.07			0.06
v/c Ratio		0.97	0.13	1.13	0.35	0.48		1.06	0.92	1.07	1.08	0.19
Uniform Delay, d1		38.3	25.5	53.0	15.5	2.5		57.5	46.9	44.0	44.0	32.8
Progression Factor		1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.95	0.95	0.99
Incremental Delay, d2		11.4	0.1	79.7	0.1	0.3		69.8	18.9	44.3	46.5	0.5
Delay (s)		49.7	25.6	132.7	15.6	2.7		127.3	65.9	86.0	88.2	33.1
Level of Service		D	C	F	B	A		F	E	F	F	C
Approach Delay (s)		49.0			42.7			86.1			84.3	
Approach LOS		D			D			F			F	

Intersection Summary			
HCM Average Control Delay	61.3	HCM Level of Service	E
HCM Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	12.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	8	12	12	12	12	12	12	12	12	12
Total Lost time (s)		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Util. Factor		*0.90	1.00	0.97	*0.90	1.00		0.95	0.88	*0.90	*0.90	1.00
Frt		1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	1.00		0.99	1.00	0.95	1.00	1.00
Satd. Flow (prot)		6706	1372	3433	5029	1583		3500	2787	3185	3338	1583
Flt Permitted		1.00	1.00	0.95	1.00	1.00		0.99	1.00	0.95	1.00	1.00
Satd. Flow (perm)		6706	1372	3433	5029	1583		3500	2787	3185	3338	1583
Volume (vph)	0	2190	70	490	830	610	80	280	500	1000	880	110
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	2305	74	516	874	642	84	295	526	1053	926	116
RTOR Reduction (vph)	0	0	10	0	0	1	0	0	5	0	0	28
Lane Group Flow (vph)	0	2305	64	516	874	641	0	379	521	964	1015	88
Turn Type			Perm	Prot		pm+ov	Split		pm+ov	Split		Perm
Protected Phases		4		3	8	6	2	2	3	6	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)		46.0	46.0	18.0	68.0	104.0		9.0	27.0	36.0	36.0	36.0
Effective Green, g (s)		47.0	47.0	19.0	69.0	106.0		10.0	29.0	37.0	37.0	37.0
Actuated g/C Ratio		0.38	0.38	0.15	0.55	0.85		0.08	0.23	0.30	0.30	0.30
Clearance Time (s)		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		2521	516	522	2776	1380		280	647	943	988	469
v/s Ratio Prot		c0.34		c0.15	0.17	0.14		c0.11	0.12	0.30	c0.30	
v/s Ratio Perm			0.05			0.27			0.06			0.06
v/c Ratio		0.91	0.12	0.99	0.31	0.46		1.35	0.81	1.02	1.03	0.19
Uniform Delay, d1		37.1	25.5	52.9	15.2	2.4		57.5	45.3	44.0	44.0	32.8
Progression Factor		1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.87	0.87	0.89
Incremental Delay, d2		5.7	0.1	36.0	0.1	0.2		180.8	7.3	28.4	29.4	0.5
Delay (s)		42.8	25.6	88.9	15.2	2.6		238.3	52.6	66.6	67.6	29.6
Level of Service		D	C	F	B	A		F	D	E	E	C
Approach Delay (s)		42.2			30.0			130.4			65.0	
Approach LOS		D			C			F			E	

Intersection Summary

HCM Average Control Delay	56.1	HCM Level of Service	E
HCM Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	12.0
Analysis Period (min)	15		

c Critical Lane Group

11. Paseo de Valencia & Laguna Hills Dr
Existing Count PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		0.97	0.91		1.00	0.91	1.00
Frt	1.00	1.00	0.85	1.00	0.90		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1681	1583	1770	1679		3433	5024		1770	5085	1583
Flt Permitted	0.95	0.95	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1681	1583	1770	1679		3433	5024		1770	5085	1583
Volume (vph)	800	0	460	40	10	20	280	580	50	40	1230	770
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	842	0	484	42	11	21	295	611	53	42	1295	811
RTOR Reduction (vph)	0	0	264	0	20	0	0	8	0	0	0	154
Lane Group Flow (vph)	421	421	220	42	12	0	295	656	0	42	1295	657
Turn Type	Split		Perm	Split			Prot			Prot		Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	27.1	27.1	27.1	6.6	6.6		10.0	51.9		3.5	45.4	45.4
Effective Green, g (s)	27.1	27.1	27.1	6.6	6.6		10.0	51.9		3.5	45.4	45.4
Actuated g/C Ratio	0.27	0.27	0.27	0.07	0.07		0.10	0.51		0.03	0.45	0.45
Clearance Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	451	451	424	116	110		340	2579		61	2283	711
v/s Ratio Prot	c0.25	0.25		c0.02	0.01		c0.09	0.13		0.02	0.25	
v/s Ratio Perm			0.14									c0.41
v/c Ratio	0.93	0.93	0.52	0.36	0.11		0.87	0.25		0.69	0.57	0.92
Uniform Delay, d1	36.1	36.1	31.5	45.2	44.5		44.9	13.8		48.3	20.6	26.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	26.4	26.4	1.1	1.9	0.5		20.1	0.2		27.7	1.0	19.5
Delay (s)	62.5	62.5	32.5	47.2	44.9		65.0	14.0		75.9	21.6	45.8
Level of Service	E	E	C	D	D		E	B		E	C	D
Approach Delay (s)		51.6			46.2			29.7			31.8	
Approach LOS		D			D			C			C	

Intersection Summary

HCM Average Control Delay	37.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	101.1	Sum of lost time (s)	12.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		0.97	0.91		1.00	0.91	1.00
Frt	1.00	1.00	0.85	1.00	0.92		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1687	1583	1770	1723		3433	5043		1770	5085	1583
Flt Permitted	0.95	0.95	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1687	1583	1770	1723		3433	5043		1770	5085	1583
Volume (vph)	800	10	470	50	20	20	280	850	50	40	1720	1150
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	842	11	495	53	21	21	295	895	53	42	1811	1211
RTOR Reduction (vph)	0	0	213	0	20	0	0	5	0	0	0	166
Lane Group Flow (vph)	421	432	282	53	22	0	295	943	0	42	1811	1045
Turn Type	Split		Perm	Split			Prot			Prot		Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	23.1	23.1	23.1	7.2	7.2		8.3	55.9		3.5	51.1	51.1
Effective Green, g (s)	23.1	23.1	23.1	7.2	7.2		8.3	55.9		3.5	51.1	51.1
Actuated g/C Ratio	0.23	0.23	0.23	0.07	0.07		0.08	0.55		0.03	0.50	0.50
Clearance Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	382	383	360	125	122		280	2772		61	2555	795
v/s Ratio Prot	0.25	c0.26		c0.03	0.01		c0.09	0.19		0.02	0.36	
v/s Ratio Perm			0.18									c0.66
v/c Ratio	1.10	1.13	0.78	0.42	0.18		1.05	0.34		0.69	0.71	1.31
Uniform Delay, d1	39.3	39.3	36.9	45.3	44.5		46.7	12.7		48.6	19.6	25.3
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	76.5	85.5	10.6	2.3	0.7		68.6	0.3		27.7	1.7	150.3
Delay (s)	115.8	124.8	47.5	47.6	45.2		115.3	13.0		76.2	21.2	175.6
Level of Service	F	F	D	D	D		F	B		E	C	F
Approach Delay (s)		93.6			46.5			37.3			83.0	
Approach LOS		F			D			D			F	

Intersection Summary

HCM Average Control Delay	75.0	HCM Level of Service	E
HCM Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	101.7	Sum of lost time (s)	12.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		0.97	0.91		1.00	0.91	1.00
Frt	1.00	1.00	0.85	1.00	0.91		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1687	1583	1770	1694		3433	5042		1770	5085	1583
Flt Permitted	0.95	0.95	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1687	1583	1770	1694		3433	5042		1770	5085	1583
Volume (vph)	810	10	470	50	20	30	290	840	50	40	1740	1140
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	853	11	495	53	21	32	305	884	53	42	1832	1200
RTOR Reduction (vph)	0	0	213	0	30	0	0	5	0	0	0	163
Lane Group Flow (vph)	427	437	282	53	23	0	305	932	0	42	1832	1037
Turn Type	Split		Perm	Split			Prot			Prot		Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	23.1	23.1	23.1	7.2	7.2		8.3	55.9		3.5	51.1	51.1
Effective Green, g (s)	23.1	23.1	23.1	7.2	7.2		8.3	55.9		3.5	51.1	51.1
Actuated g/C Ratio	0.23	0.23	0.23	0.07	0.07		0.08	0.55		0.03	0.50	0.50
Clearance Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	382	383	360	125	120		280	2771		61	2555	795
v/s Ratio Prot	0.25	c0.26		c0.03	0.01		c0.09	0.18		0.02	0.36	
v/s Ratio Perm			0.18									c0.66
v/c Ratio	1.12	1.14	0.78	0.42	0.19		1.09	0.34		0.69	0.72	1.30
Uniform Delay, d1	39.3	39.3	36.9	45.3	44.5		46.7	12.7		48.6	19.7	25.3
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	81.9	90.2	10.6	2.3	0.8		79.7	0.3		27.7	1.8	146.2
Delay (s)	121.2	129.5	47.5	47.6	45.3		126.4	13.0		76.2	21.4	171.5
Level of Service	F	F	D	D	D		F	B		E	C	F
Approach Delay (s)		97.0			46.4			40.8			80.8	
Approach LOS		F			D			D			F	

Intersection Summary

HCM Average Control Delay	75.4	HCM Level of Service	E
HCM Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	101.7	Sum of lost time (s)	12.0
Analysis Period (min)	15		

c Critical Lane Group

APPENDIX F

AIR QUALITY AND GLOBAL CLIMATE CHANGE CALCULATIONS

12/15/2008 09:12:52 AM

Urbemis 2007 Version 9.2.4

Summary Report for Summer Emissions (Pounds/Day)

File Name: C:\Work\Projects\Laguna Hills General Plan Update\EIR\Laguna Hills GP Operational.urb924

Project Name: Laguna Hills GP 2030

Project Location: Orange County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	33.28	15.26	25.00	0.00	0.08	0.08	18,450.75

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	107.66	113.46	1,246.08	3.95	648.10	125.59	388,501.64

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	140.94	128.72	1,271.08	3.95	648.18	125.67	406,952.39

12/15/2008 09:13:03 AM

Urbemis 2007 Version 9.2.4

Detail Report for Summer Area Source Unmitigated Emissions (Pounds/Day)

File Name: C:\Work\Projects\Laguna Hills General Plan Update\EIR\Laguna Hills GP Operational.urb924

Project Name: Laguna Hills GP 2030

Project Location: Orange County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

AREA SOURCE EMISSION ESTIMATES (Summer Pounds Per Day, Unmitigated)

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	1.11	15.07	10.78	0.00	0.03	0.03	18,424.97
Hearth - No Summer Emissions							
Landscape	1.16	0.19	14.22	0.00	0.05	0.05	25.78
Consumer Products	23.44						
Architectural Coatings	7.57						
TOTALS (lbs/day, unmitigated)	33.28	15.26	25.00	0.00	0.08	0.08	18,450.75

Area Source Changes to Defaults

12/15/2008 09:13:09 AM

Urbemis 2007 Version 9.2.4

Detail Report for Summer Operational Unmitigated Emissions (Pounds/Day)

File Name: C:\Work\Projects\Laguna Hills General Plan Update\EIR\Laguna Hills GP Operational.urb924

Project Name: Laguna Hills GP 2030

Project Location: Orange County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Summer Pounds Per Day, Unmitigated)

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	0.21	0.21	2.36	0.01	1.19	0.23	716.18
Apartments mid rise	4.45	4.09	46.67	0.14	23.44	4.55	14,146.86
Condo/townhouse general	6.55	6.19	70.74	0.22	35.53	6.90	21,446.59
City park	0.08	0.05	0.51	0.00	0.27	0.05	159.98
Hotel	6.37	6.12	66.84	0.21	34.94	6.77	20,923.77
Strip mall	0.05	0.06	0.62	0.00	0.33	0.06	194.58
Supermarket	73.08	79.87	869.26	2.77	455.32	88.20	272,561.95
General office building	13.61	13.54	151.63	0.48	77.92	15.11	46,828.16
Office park	3.01	3.05	34.42	0.11	17.58	3.41	10,577.48
Medical office building	0.25	0.28	3.03	0.01	1.58	0.31	946.09
TOTALS (lbs/day, unmitigated)	107.66	113.46	1,246.08	3.95	648.10	125.59	388,501.64

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2030 Temperature (F): 80 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

12/15/2008 09:13:09 AM

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	2.33	9.72	dwelling units	7.00	68.04	687.39
Apartments mid rise	5.26	6.72	dwelling units	200.00	1,344.00	13,578.16
Condo/townhouse general	15.62	8.15	dwelling units	250.00	2,037.50	20,584.45
City park		1.55	acres	11.00	17.05	154.86
Hotel		8.92	rooms	250.00	2,230.00	20,253.97
Strip mall		60.00	1000 sq ft	0.35	21.00	188.43
Supermarket		53.29	1000 sq ft	552.00	29,416.08	263,950.48
General office building		11.01	1000 sq ft	403.00	4,437.03	45,157.87
Office park		12.75	1000 sq ft	75.00	956.25	10,185.98
Medical office building		50.00	1000 sq ft	2.00	100.00	915.55
					40,626.95	375,657.14

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	49.1	0.0	100.0	0.0
Light Truck < 3750 lbs	7.0	0.0	100.0	0.0
Light Truck 3751-5750 lbs	25.1	0.0	100.0	0.0
Med Truck 5751-8500 lbs	11.4	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.9	0.0	78.9	21.1
Lite-Heavy Truck 10,001-14,000 lbs	0.5	0.0	60.0	40.0
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.3	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0

Motorcycle	2.4	33.3	66.7	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.0	0.0	90.0	10.0

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	13.3	7.4	8.9
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
City park				5.0	2.5	92.5
Hotel				5.0	2.5	92.5
Strip mall				2.0	1.0	97.0
Supermarket				2.0	1.0	97.0
General office building				35.0	17.5	47.5
Office park				48.0	24.0	28.0
Medical office building				7.0	3.5	89.5

Operational Changes to Defaults

12/15/2008 09:13:16 AM

Urbemis 2007 Version 9.2.4

Summary Report for Winter Emissions (Pounds/Day)

File Name: C:\Work\Projects\Laguna Hills General Plan Update\EIR\Laguna Hills GP Operational.urb924

Project Name: Laguna Hills GP 2030

Project Location: Orange County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	103.70	20.52	209.09	0.55	30.77	29.62	25,771.06

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	120.15	136.07	1,165.90	3.29	648.10	125.59	350,503.19

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	223.85	156.59	1,374.99	3.84	678.87	155.21	376,274.25

12/15/2008 09:13:24 AM

Urbemis 2007 Version 9.2.4

Detail Report for Winter Area Source Unmitigated Emissions (Pounds/Day)

File Name: C:\Work\Projects\Laguna Hills General Plan Update\EIR\Laguna Hills GP Operational.urb924

Project Name: Laguna Hills GP 2030

Project Location: Orange County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

AREA SOURCE EMISSION ESTIMATES (Winter Pounds Per Day, Unmitigated)

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	1.11	15.07	10.78	0.00	0.03	0.03	18,424.97
Hearth	71.58	5.45	198.31	0.55	30.74	29.59	7,346.09
Landscaping - No Winter							
Consumer Products	23.44						
Architectural Coatings	7.57						
TOTALS (lbs/day, unmitigated)	103.70	20.52	209.09	0.55	30.77	29.62	25,771.06

Area Source Changes to Defaults

12/15/2008 09:13:30 AM

Urbemis 2007 Version 9.2.4

Detail Report for Winter Operational Unmitigated Emissions (Pounds/Day)

File Name: C:\Work\Projects\Laguna Hills General Plan Update\EIR\Laguna Hills GP Operational.urb924

Project Name: Laguna Hills GP 2030

Project Location: Orange County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Winter Pounds Per Day, Unmitigated)

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	0.23	0.25	2.20	0.01	1.19	0.23	646.65
Apartments mid rise	4.66	4.90	43.52	0.12	23.44	4.55	12,773.40
Condo/townhouse general	6.96	7.43	65.97	0.18	35.53	6.90	19,364.43
City park	0.07	0.06	0.48	0.00	0.27	0.05	144.31
Hotel	6.76	7.34	62.59	0.18	34.94	6.77	18,875.04
Strip mall	0.06	0.07	0.58	0.00	0.33	0.06	175.52
Supermarket	83.04	95.77	814.71	2.30	455.32	88.20	245,862.85
General office building	14.78	16.26	141.07	0.40	77.92	15.11	42,260.36
Office park	3.30	3.66	31.95	0.09	17.58	3.41	9,547.15
Medical office building	0.29	0.33	2.83	0.01	1.58	0.31	853.48
TOTALS (lbs/day, unmitigated)	120.15	136.07	1,165.90	3.29	648.10	125.59	350,503.19

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2030 Temperature (F): 60 Season: Winter

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

12/15/2008 09:13:30 AM

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	2.33	9.72	dwelling units	7.00	68.04	687.39
Apartments mid rise	5.26	6.72	dwelling units	200.00	1,344.00	13,578.16
Condo/townhouse general	15.62	8.15	dwelling units	250.00	2,037.50	20,584.45
City park		1.55	acres	11.00	17.05	154.86
Hotel		8.92	rooms	250.00	2,230.00	20,253.97
Strip mall		60.00	1000 sq ft	0.35	21.00	188.43
Supermarket		53.29	1000 sq ft	552.00	29,416.08	263,950.48
General office building		11.01	1000 sq ft	403.00	4,437.03	45,157.87
Office park		12.75	1000 sq ft	75.00	956.25	10,185.98
Medical office building		50.00	1000 sq ft	2.00	100.00	915.55
					40,626.95	375,657.14

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	49.1	0.0	100.0	0.0
Light Truck < 3750 lbs	7.0	0.0	100.0	0.0
Light Truck 3751-5750 lbs	25.1	0.0	100.0	0.0
Med Truck 5751-8500 lbs	11.4	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.9	0.0	78.9	21.1
Lite-Heavy Truck 10,001-14,000 lbs	0.5	0.0	60.0	40.0
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.3	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0

Motorcycle	2.4	33.3	66.7	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.0	0.0	90.0	10.0

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	13.3	7.4	8.9
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
City park				5.0	2.5	92.5
Hotel				5.0	2.5	92.5
Strip mall				2.0	1.0	97.0
Supermarket				2.0	1.0	97.0
General office building				35.0	17.5	47.5
Office park				48.0	24.0	28.0
Medical office building				7.0	3.5	89.5

Operational Changes to Defaults

12/4/2008 10:20:52 AM

Urbemis 2007 Version 9.2.4

Summary Report for Annual Emissions (Tons/Year)

File Name: C:\Work\Projects\Laguna Hills General Plan Update\EIR\Laguna Hills GP Mobile Source Existing.urb924

Project Name: Laguna Hills GP 2030 Existing Mobile Source

Project Location: Orange County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	325.25	431.63	4,071.18	3.15	546.59	105.39	314,178.52

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	325.25	431.63	4,071.18	3.15	546.59	105.39	314,178.52

12/4/2008 10:21:04 AM

Urbemis 2007 Version 9.2.4

Detail Report for Annual Operational Unmitigated Emissions (Tons/Year)

File Name: C:\Work\Projects\Laguna Hills General Plan Update\EIR\Laguna Hills GP Mobile Source Existing.urb924

Project Name: Laguna Hills GP 2030 Existing Mobile Source

Project Location: Orange County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Annual Tons Per Year, Unmitigated)

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	325.25	431.63	4,071.18	3.15	546.59	105.39	314,178.52
TOTALS (tons/year, unmitigated)	325.25	431.63	4,071.18	3.15	546.59	105.39	314,178.52

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2007 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	33.33	1,720.23	dwelling units	100.00	172,023.00	1,737,913.94
					172,023.00	1,737,913.94

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	51.8	1.9	97.7	0.4
Light Truck < 3750 lbs	7.1	4.2	91.6	4.2

Light Truck 3751-5750 lbs	23.5	0.4	99.6	0.0
Med Truck 5751-8500 lbs	10.6	0.9	99.1	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.5	0.0	80.0	20.0
Lite-Heavy Truck 10,001-14,000 lbs	0.5	0.0	60.0	40.0
Med-Heavy Truck 14,001-33,000 lbs	0.9	0.0	22.2	77.8
Heavy-Heavy Truck 33,001-60,000 lbs	0.2	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.0	0.0	0.0	0.0
Motorcycle	2.9	82.8	17.2	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	0.8	12.5	75.0	12.5

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	13.3	7.4	8.9
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			

% of Trips - Commercial (by land use)

Operational Changes to Defaults

Existing GHG Emissions

Mobile Sources												
Use only one of the following	Fuel Use			GHG Emissions								
				CO2		CH4		N2O		CO2e		
Option 1 Insert Fuel Use	0.00	gallons	Aviation Gasoline	0.00	kg	n/a	kg	n/a	kg	0.00	metric tons	
	0.00	gallons	Biodiesel	0.00	kg	n/a	kg	n/a	kg	0.00	metric tons	
	0.00	gallons	CA Low Sulfur Diesel	0.00	kg	n/a	kg	n/a	kg	0.00	metric tons	
	0.00	gallons	CA Reform. Gasoline	0.00	kg	n/a	kg	n/a	kg	0.00	metric tons	
	0.00	gallons	Crude Oil	0.00	kg	n/a	kg	n/a	kg	0.00	metric tons	
	0.00	gallons	Non-CA Diesel/Diesel No. 2	0.00	kg	n/a	kg	n/a	kg	0.00	metric tons	
	0.00	gallons	Ethanol (E85)	0.00	kg	n/a	kg	n/a	kg	0.00	metric tons	
	0.00	gallons	Fischer Tropsch Diesel	0.00	kg	n/a	kg	n/a	kg	0.00	metric tons	
	0.00	gallons	Jet Fuel, Kerosene (Jet A or A-1)	0.00	kg	n/a	kg	n/a	kg	0.00	metric tons	
	0.00	gallons	Jet Fuel, Naphtha (Jet B)	0.00	kg	n/a	kg	n/a	kg	0.00	metric tons	
	0.00	gallons	Kerosene	0.00	kg	n/a	kg	n/a	kg	0.00	metric tons	
	0.00	gallons	Liquefied Natural Gas (LNG)	0.00	kg	n/a	kg	n/a	kg	0.00	metric tons	
	0.00	gallons	Liquefied Petroleum Gas (LPG)	0.00	kg	n/a	kg	n/a	kg	0.00	metric tons	
	0.00	gallons	Methanol	0.00	kg	n/a	kg	n/a	kg	0.00	metric tons	
	0.00	gallons	Motor Gasoline (Non CA and off-road)	0.00	kg	n/a	kg	n/a	kg	0.00	metric tons	
	0.00	gallons	Propane	0.00	kg	n/a	kg	n/a	kg	0.00	metric tons	
	0.00	gallons	Residual Oil	0.00	kg	n/a	kg	n/a	kg	0.00	metric tons	
				0.00	kg	n/a	kg	n/a	kg	0.00	metric tons	
<<< OR >>>												
Option 2 Insert CO2 from URBEMIS	314,178.52	annual CO2 (tons per year)		285,017,958.98	kg	n/a	kg	n/a	kg	285,017.96	metric tons	

Existing GHG Emissions

Southern California Edision (SCE)															
Residential															
new single family	0.00	dwelling units	0.00	kwh	0.00	kBtu	**0**	kg	**0**	kg	**0**	kg	**0**	metric tons	
new multi family	0.00	dwelling units	0.00	kwh	0.00	kBtu	**0**	kg	**0**	kg	**0**	kg	**0**	metric tons	
existing single family	6,194.00	dwelling units	43,865,908.00	kwh	327,584,368.88	kBtu	**33,298,029**	kg	**2,066**	kg	**106**	kg	**33,374**	metric tons	
existing multi family	4,992.00	dwelling units	20,412,288.00	kwh	141,239,870.20	kBtu	**14,903,762**	kg	**895**	kg	**48**	kg	**14,938**	metric tons	
						Total, Residential	**48,201,791**	**kg**	**2,961**	**kg**	**155**	**kg**	**48,312**	**metric tons**	
Non-residential (use Option 1 or Option 2)															
Option 1: General Project Data															
All Commercial	0.00	square feet	0.00	kwh	0.00	kBtu	**0**	kg	**0**	kg	**0**	kg	**0**	metric tons	
All Offices	3,353,190.00	square feet	53,651,040.00	kwh	36,750,962.40	kBtu	**21,518,762**	kg	**380**	kg	**94**	kg	**21,556**	metric tons	
All Warehouses	0.00	square feet	0.00	kwh	0.00	kBtu	**0**	kg	**0**	kg	**0**	kg	**0**	metric tons	
Option 2: Detailed Project Data															
Small Office (<30k ft2)	331,720.00	square feet	4,395,290.00	kwh	2,670,346.00	kBtu	**1,744,928**	kg	**29**	kg	**8**	kg	**1,748**	metric tons	
Large Office (>= 30k ft2)	0.00	square feet	0.00	kwh	0.00	kBtu	**0**	kg	**0**	kg	**0**	kg	**0**	metric tons	
Restaurant	0.00	square feet	0.00	kwh	0.00	kBtu	**0**	kg	**0**	kg	**0**	kg	**0**	metric tons	
Retail	2,567,450.00	square feet	39,436,032.00	kwh	6,315,927.00	kBtu	**14,724,872**	kg	**157**	kg	**67**	kg	**14,749**	metric tons	
Food Store	0.00	square feet	0.00	kwh	0.00	kBtu	**0**	kg	**0**	kg	**0**	kg	**0**	metric tons	
Refrigerated Warehouse	0.00	square feet	0.00	kwh	0.00	kBtu	**0**	kg	**0**	kg	**0**	kg	**0**	metric tons	
Unrefrigerated Warehouse	0.00	square feet	0.00	kwh	0.00	kBtu	**0**	kg	**0**	kg	**0**	kg	**0**	metric tons	
School	0.00	square feet	0.00	kwh	0.00	kBtu	**0**	kg	**0**	kg	**0**	kg	**0**	metric tons	
College	0.00	square feet	0.00	kwh	0.00	kBtu	**0**	kg	**0**	kg	**0**	kg	**0**	metric tons	
Health	0.00	square feet	0.00	kwh	0.00	kBtu	**0**	kg	**0**	kg	**0**	kg	**0**	metric tons	
Lodging	0.00	square feet	0.00	kwh	0.00	kBtu	**0**	kg	**0**	kg	**0**	kg	**0**	metric tons	
						Total, Non-Residential	**37,988,562**	**kg**	**566**	**kg**	**168**	**kg**	**38,053**	**metric tons**	
						Total, Residential and Non-Residential	**86,190,354**	**kg**	**3,528**	**kg**	**323**	**kg**	**86,365**	**metric tons**	

California Green Building Code Standard Water Baseline Calculations - Laguna Hills Existing

RESIDENTIAL WATER USE

Assumption: All residential uses use wash fountains and not metering faucets.

Development Type: Residential
Residents: 33,421

Fixture Type	Flow Rate	Flow Rate Units	Duration	Duration Units	Daily Uses	Total Occupants	Male Occupants	Female Occupants	Water Use (gallons/day)	Water Use (gallons/year)
Showerheads Residential	2.5	gpm @ 80 psi	8	minutes	1	33421			668,420.0	243,973,300.0
Lavatory Faucets Residential	2.2	gpm @ 60 psi	0.25	minutes	3	33421			55,144.7	20,127,797.3
Kitchen Faucets	2.2	gpm @ 60 psi	4	minutes	1	33421			294,104.8	107,348,252.0
Wash Fountains	2.2	rim space/20 gpm @ 60 psi	0.25	minutes	3	33421			55,144.7	20,127,797.3
Water Closet	1.6	gallons/flush	1	flush	1 male 3 female	33421	16710.5	16710.5	106,947.2	39,035,728.0
									Total	430,612,874.50

COMMERCIAL WATER USE

Assumptions
- All new commercial uses will use metering faucets in restrooms
- Wash fountains account for kitchen faucet and other miscellaneous wash fountains

Development Type: Commercial
Employees: 25,000

Fixture Type	Flow Rate	Flow Rate Units	Duration	Duration Units	Daily Uses	Total Occupants	Male Occupants	Female Occupants	Water Use (gallons/day)	Water Use (gallons/year)
Showerheads	2.5	gpm @ 80 psi	5	minutes	0.025	25000			7812.5	2851562.5
Wash Fountains	2.2	rim space/20 gpm @ 60 psi	0.25	minutes	3	25000			41250	15056250
Metering Faucets	0.25	gallons/cycle	0.25	minutes	3	25000			4687.5	1710937.5
Water Closet	1.6	gallons/flush	1	flush	1 male 3 female	25000	12500	12500	80000	29200000
Urinals	1	gallons/flush	1	flush	2 male	25000	12500	12500	25000	9125000
									Total	57,943,750.00

Indirect Emissions from Water Use (includes conveyance, treatment, distribution, and wastewater treatment) - CALI Region

KWh/million gallons/year	Gallons/Year	Total KWh	MWh	Emission Factor (lb CO2/MWh)	GWP	Emission Factor (lb CH4/MWh)	GWP	Emission Factor (lb N2O/MWh)	GWP	Total CO2e (Metric Tons/year)
12,700	488,556,625	6,204,669	6,205	804.54	1	0.0067	23	0.0037	296	**2,268**

12/4/2008 10:22:26 AM

Urbemis 2007 Version 9.2.4

Summary Report for Annual Emissions (Tons/Year)

File Name: C:\Work\Projects\Laguna Hills General Plan Update\EIR\Laguna Hills GP Mobile Source 2030.urb924

Project Name: Laguna Hills GP 2030 Mobile Source

Project Location: Orange County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	112.62	125.85	1,317.16	3.92	676.70	131.36	395,275.46

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	112.62	125.85	1,317.16	3.92	676.70	131.36	395,275.46

12/4/2008 10:22:44 AM

Urbemis 2007 Version 9.2.4

Detail Report for Annual Operational Unmitigated Emissions (Tons/Year)

File Name: C:\Work\Projects\Laguna Hills General Plan Update\EIR\Laguna Hills GP Mobile Source 2030.urb924

Project Name: Laguna Hills GP 2030 Mobile Source

Project Location: Orange County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Annual Tons Per Year, Unmitigated)

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	112.62	125.85	1,317.16	3.92	676.70	131.36	395,275.46
TOTALS (tons/year, unmitigated)	112.62	125.85	1,317.16	3.92	676.70	131.36	395,275.46

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2030 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	33.33	2,126.49	dwelling units	100.00	212,649.00	2,148,350.30
					212,649.00	2,148,350.30

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	49.1	0.0	100.0	0.0
Light Truck < 3750 lbs	7.0	0.0	100.0	0.0

Light Truck 3751-5750 lbs	25.1	0.0	100.0	0.0
Med Truck 5751-8500 lbs	11.4	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.9	0.0	78.9	21.1
Lite-Heavy Truck 10,001-14,000 lbs	0.5	0.0	60.0	40.0
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.3	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.4	33.3	66.7	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.0	0.0	90.0	10.0

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	13.3	7.4	8.9
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			

% of Trips - Commercial (by land use)

Operational Changes to Defaults

Build Out GHG Emissions

Mobile Sources												
Use only one of the following	Fuel Use			GHG Emissions								
				CO2		CH4		N2O		CO2e		
Option 1 Insert Fuel Use	0.00	gallons	Aviation Gasoline	0.00	kg	n/a	kg	n/a	kg	0.00	metric tons	
	0.00	gallons	Biodiesel	0.00	kg	n/a	kg	n/a	kg	0.00	metric tons	
	0.00	gallons	CA Low Sulfur Diesel	0.00	kg	n/a	kg	n/a	kg	0.00	metric tons	
	0.00	gallons	CA Reform. Gasoline	0.00	kg	n/a	kg	n/a	kg	0.00	metric tons	
	0.00	gallons	Crude Oil	0.00	kg	n/a	kg	n/a	kg	0.00	metric tons	
	0.00	gallons	Non-CA Diesel/Diesel No. 2	0.00	kg	n/a	kg	n/a	kg	0.00	metric tons	
	0.00	gallons	Ethanol (E85)	0.00	kg	n/a	kg	n/a	kg	0.00	metric tons	
	0.00	gallons	Fischer Tropsch Diesel	0.00	kg	n/a	kg	n/a	kg	0.00	metric tons	
	0.00	gallons	Jet Fuel, Kerosene (Jet A or A-1)	0.00	kg	n/a	kg	n/a	kg	0.00	metric tons	
	0.00	gallons	Jet Fuel, Naphtha (Jet B)	0.00	kg	n/a	kg	n/a	kg	0.00	metric tons	
	0.00	gallons	Kerosene	0.00	kg	n/a	kg	n/a	kg	0.00	metric tons	
	0.00	gallons	Liquefied Natural Gas (LNG)	0.00	kg	n/a	kg	n/a	kg	0.00	metric tons	
	0.00	gallons	Liquefied Petroleum Gas (LPG)	0.00	kg	n/a	kg	n/a	kg	0.00	metric tons	
	0.00	gallons	Methanol	0.00	kg	n/a	kg	n/a	kg	0.00	metric tons	
	0.00	gallons	Motor Gasoline (Non CA and off-road)	0.00	kg	n/a	kg	n/a	kg	0.00	metric tons	
	0.00	gallons	Propane	0.00	kg	n/a	kg	n/a	kg	0.00	metric tons	
	0.00	gallons	Residual Oil	0.00	kg	n/a	kg	n/a	kg	0.00	metric tons	
				0.00	kg	n/a	kg	n/a	kg	0.00	metric tons	
<<< OR >>>												
Option 2 Insert CO2 from URBEMIS	395,275.46	annual CO2 (tons per year)		358,587,865.41	kg	n/a	kg	n/a	kg	358,587.87	metric tons	

Build Out GHG Emissions

Southern California Edision (SCE)																
Residential																
new single family	6,201.00	dwelling units	47,493,459.00	kwh	314,935,589.56	kBtu	**33,954,241**	kg	**2,002**	kg	**111**	kg	**34,031**	metric tons		
new multi family	5,442.00	dwelling units	44,640,726.00	kwh	132,209,026.88	kBtu	**23,268,876**	kg	**916**	kg	**88**	kg	**23,315**	metric tons		
existing single family	0.00	dwelling units	0.00	kwh	0.00	kBtu	**0**	kg	**0**	kg	**0**	kg	**0**	metric tons		
existing multi family	0.00	dwelling units	0.00	kwh	0.00	kBtu	**0**	kg	**0**	kg	**0**	kg	**0**	metric tons		
					Total, Residential		**57,223,116**	**kg**	**2,918**	**kg**	**199**	**kg**	**57,346**	**metric tons**		
Non-residential (use Option 1 or Option 2)																
Option 1: General Project Data																
All Commercial	0.00	square feet	0.00	kwh	0.00	kBtu	**0**	kg	**0**	kg	**0**	kg	**0**	metric tons		
All Offices	3,843,190.00	square feet	61,491,040.00	kwh	42,121,362.40	kBtu	**24,663,288**	kg	**435**	kg	**107**	kg	**24,706**	metric tons		
All Warehouses	0.00	square feet	0.00	kwh	0.00	kBtu	**0**	kg	**0**	kg	**0**	kg	**0**	metric tons		
Option 2: Detailed Project Data																
Small Office (<30k ft2)	331,720.00	square feet	4,395,290.00	kwh	2,670,346.00	kBtu	**1,744,928**	kg	**29**	kg	**8**	kg	**1,748**	metric tons		
Large Office (>= 30k ft2)	0.00	square feet	0.00	kwh	0.00	kBtu	**0**	kg	**0**	kg	**0**	kg	**0**	metric tons		
Restaurant	0.00	square feet	0.00	kwh	0.00	kBtu	**0**	kg	**0**	kg	**0**	kg	**0**	metric tons		
Retail	3,096,280.00	square feet	47,558,860.80	kwh	7,616,848.80	kBtu	**17,757,825**	kg	**189**	kg	**81**	kg	**17,787**	metric tons		
Food Store	0.00	square feet	0.00	kwh	0.00	kBtu	**0**	kg	**0**	kg	**0**	kg	**0**	metric tons		
Refrigerated Warehouse	0.00	square feet	0.00	kwh	0.00	kBtu	**0**	kg	**0**	kg	**0**	kg	**0**	metric tons		
Unrefrigerated Warehouse	0.00	square feet	0.00	kwh	0.00	kBtu	**0**	kg	**0**	kg	**0**	kg	**0**	metric tons		
School	0.00	square feet	0.00	kwh	0.00	kBtu	**0**	kg	**0**	kg	**0**	kg	**0**	metric tons		
College	0.00	square feet	0.00	kwh	0.00	kBtu	**0**	kg	**0**	kg	**0**	kg	**0**	metric tons		
Health	0.00	square feet	0.00	kwh	0.00	kBtu	**0**	kg	**0**	kg	**0**	kg	**0**	metric tons		
Lodging	0.00	square feet	0.00	kwh	0.00	kBtu	**0**	kg	**0**	kg	**0**	kg	**0**	metric tons		
					Total, Non-Residential		**44,166,041**	**kg**	**654**	**kg**	**196**	**kg**	**44,240**	**metric tons**		
					Total, Residential and Non-Residential		**101,389,157**	**kg**	**3,572**	**kg**	**395**	**kg**	**101,587**	**metric tons**		

California Green Building Code Standard Water Baseline Calculations - Laguna Hills 2030

RESIDENTIAL WATER USE

Assumption: All residential uses use wash fountains and not metering faucets.

Project: Residential
Residents: 34,650

Fixture Type	Flow Rate	Flow Rate Units	Duration	Duration Units	Daily Uses	Total Occupants	Male Occupants	Female Occupants	Water Use (gallons/day)	Water Use (gallons/year)
Showerheads Residential	2.5	gpm @ 80 psi	8	minutes	1	34650			693,000.0	252,945,000.0
Lavatory Faucets Residential	2.2	gpm @ 60 psi	0.25	minutes	3	34650			57,172.5	20,867,962.5
Kitchen Faucets	2.2	gpm @ 60 psi	4	minutes	1	34650			304,920.0	111,295,800.0
Wash Fountains	2.2	rim space/20 gpm @ 60 psi	0.25	minutes	3	34650			57,172.5	20,867,962.5
Water Closet	1.6	gallons/flush	1	flush	1 male 3 female	34650	17325	17325	110,880.0	40,471,200.0
									Total	446,447,925.00

COMMERCIAL WATER USE

Assumptions
- All new commercial uses will use metering faucets in restrooms
- Wash fountains account for kitchen faucet and other miscellaneous wash fountains

Project: Commercial
Employees: 27,677

Fixture Type	Flow Rate	Flow Rate Units	Duration	Duration Units	Daily Uses	Total Occupants	Male Occupants	Female Occupants	Water Use (gallons/day)	Water Use (gallons/year)
Showerheads	2.5	gpm @ 80 psi	5	minutes	0.025	27677			8649.0625	3156907.813
Wash Fountains	2.2	rim space/20 gpm @ 60 psi	0.25	minutes	3	27677			45667.05	16668473.25
Metering Faucets	0.25	gallons/cycle	0.25	minutes	3	27677			5189.4375	1894144.688
Water Closet	1.6	gallons/flush	1	flush	1 male 3 female	27677	13838.5	13838.5	88566.4	32326736
Urinals	1	gallons/flush	1	flush	2 male	27677	13838.5	13838.5	27677	10102105
									Total	64,148,366.75

Indirect Emissions from Water Use (includes conveyance, treatment, distribution, and wastewater treatment) - CALI Region

KWh/million gallons/year	Gallons/Year	Total KWh	MWh	Emission Factor (lb CO2/MWh)	GWP	Emission Factor (lb CH4/MWh)	GWP	Emission Factor (lb N2O/MWh)	GWP	Total CO2e (Metric Tons/year)
12,700	510,596,292	6,484,573	6,485	804.54	1	0.0067	23	0.0037	296	**2,370**

Build Out GHG Emissions

Construction								
		GHG Emissions						
Instructions:		CO2		CH4		N2O		CO2e
Insert CO2 from URBEMIS	19,404.00 annual CO2 (tons per year)	**17,603,013**	**kg**	**n/a**	**kg**	**n/a**	**kg**	**17,603** **metric tons**

NELLIE GAIL RANCH