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Air Quality Assessment Report
Ortega Highway (SR-74), Widening Project
(Lower Ortega)

Prepared By: _____ Date: 11/13/2008

Keith Lay
Associate, Air Quality Services
(949) 553-0666
LSA Associates, Inc.
20 Executive Park, Suite 200
Irvine, California 92614

Approved By: _____ Date: _____

Reza Aurasteh, Ph.D., Chief,
Environmental Engineering Branch
(714) 724-2738
California Department of Transportation
District 12

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

Chapter 1 Executive Summary

The State of California Department of Transportation (Department) proposes to widen State Route 74 (SR-74) from two lanes to four lanes from Calle Entradero (Post Mile [PM] 1.0) to the City of San Juan Capistrano (City)/County of Orange (County) limits (eastern City limit) PM 1.9. The Department is the Lead Agency for the California Environmental Quality Act (CEQA) and the City is a Responsible Agency under CEQA.

This air quality analysis provides a discussion of the project, the physical setting of the project area, and the regulatory framework for air quality. The analysis provides data on current air quality, evaluates potential air quality impacts associated with the project, and identifies mitigation measures.

Historical air quality data show that current carbon monoxide (CO) levels for the project area and the general vicinity do not exceed either the State or federal ambient air quality standards. The project will help to improve traffic flow and reduce congestion on roadway links in the project vicinity. The project is located in an attainment area for federal CO standards. Using the Caltrans Transportation Project-Level Carbon Monoxide Protocol (Protocol), a screening level CO hot-spot analysis was conducted to determine whether the project would result in any CO hot spots. It was determined that the project would not result in any exceedances of the 1-hour or 8-hour CO standards.

Compliance with South Coast Air Quality Management District (SCAQMD) Rules and Regulations during construction will reduce construction-related air quality impacts from fugitive dust emissions and construction equipment emissions. The proposed project may have a beneficial effect in helping to reduce congestion on roadway links in the project vicinity and, therefore, reduce the regional vehicle emissions.

The project is located in Orange County, which is not among the counties listed as containing serpentine and ultramafic rock. Therefore, the impact from Naturally Occurring Asbestos (NOA) during project construction would be minimal to none.

The proposed project will not generate new vehicular traffic trips since it will not construct new homes or businesses. However, there is a possibility that some traffic currently utilizing other routes would be attracted to use the improved facility, thus

resulting in slight increases in vehicle miles traveled (VMT) within the region. However, it is not anticipated that the proposed project would result in any significant increase in regional vehicle emissions, including those that contribute to global warming/climate change.

Chapter 2 Introduction

The State of California Department of Transportation (Department) proposes to widen State Route 74 (SR-74) from two lanes to four lanes from Calle Entradero (Post Mile [PM] 1.0) to the City of San Juan Capistrano (City)/County of Orange (County) limits (eastern City limit) PM 1.9. The Department is the Lead Agency for the California Environmental Quality Act (CEQA) and the City is a Responsible Agency under CEQA. The total length of the project is approximately 0.9 mile (mi). Figures 1 and 2 show the regional location and project vicinity maps.

SR-74, also known as Ortega Highway, is a major east-west arterial in south Orange County extending from Interstate 5 (I-5) in the City of San Juan Capistrano northeast to Riverside County, where it intersects with Interstate 15 (I-15). SR-74 then extends further northeast toward the City of Palm Desert in Riverside County.

The existing SR-74 alignment consists of four through lanes from I-5, then turns into three through lanes, and then at approximately 330 feet (ft) east of Calle Entradero, it transitions to two through lanes. The alignment of the existing roadway imposes driving restrictions such as limited sight distance and difficulties in negotiating sharp curves.

2.1 Funding and Planning

Projects must be listed in the Regional Transportation Improvement Program (RTIP) in order to acquire funding. The 2006 RTIP lists the project as being privately funded and is part of the 2006 State Transportation Implementation Program (STIP) Augmentation.

2.2 Purpose and Need

2.2.1 Project Purpose

The purpose of the project is to accomplish the following specific objectives:

- Relieve existing and future traffic congestion and improve the flow of traffic on SR-74
- Accommodate planned growth and development in the surrounding areas
- Provide improvements consistent with local planning documents
- Gap closure

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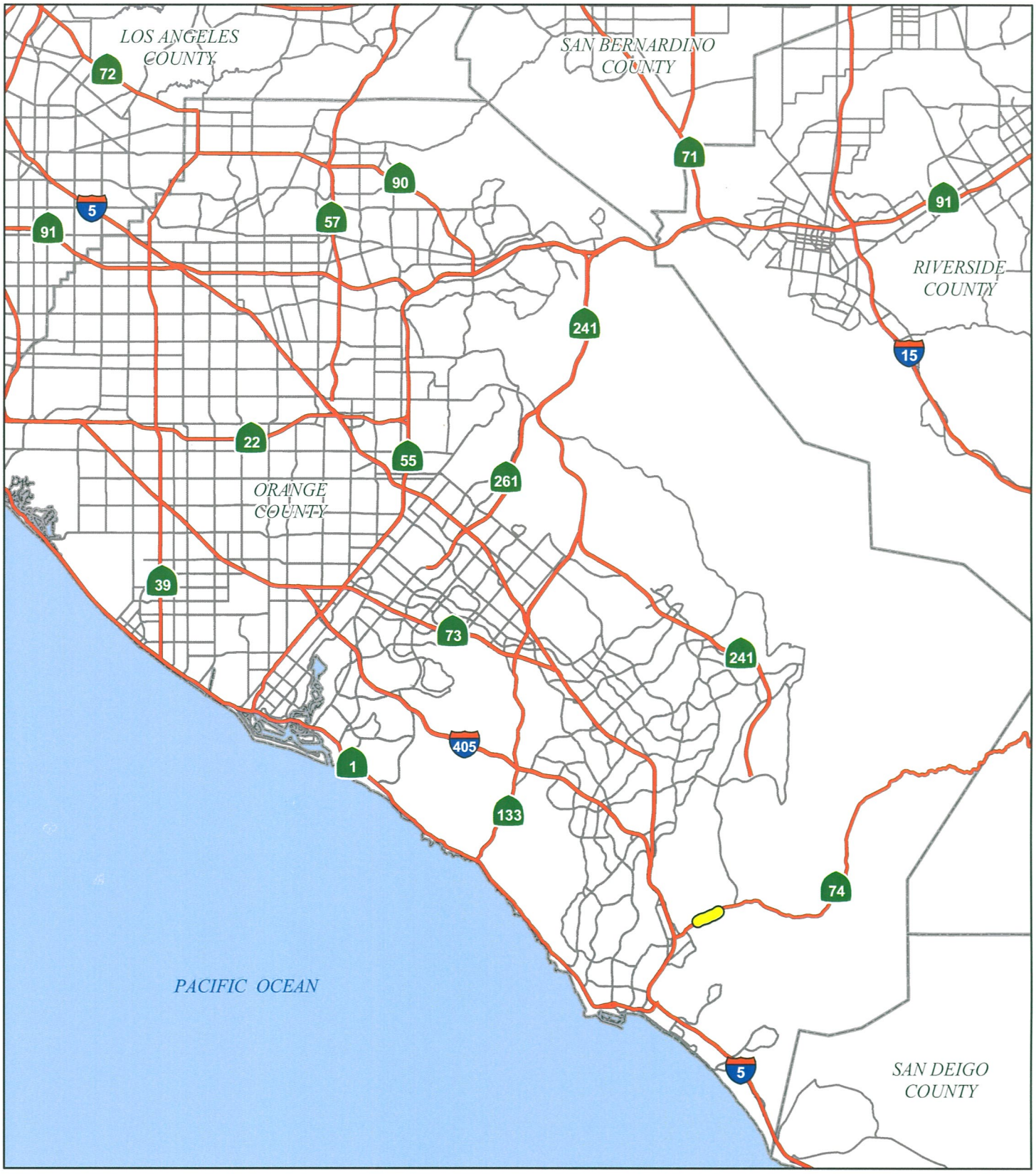

FIGURE 1

N

Project Area

0 2.5 5 Miles

Lower SR-74 Widening Project

Regional Location Map

12-ORA-74 PM 1.0/1.9 (KP 1.7/3.0)
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SOURCE: Thomas Bros, (2007).

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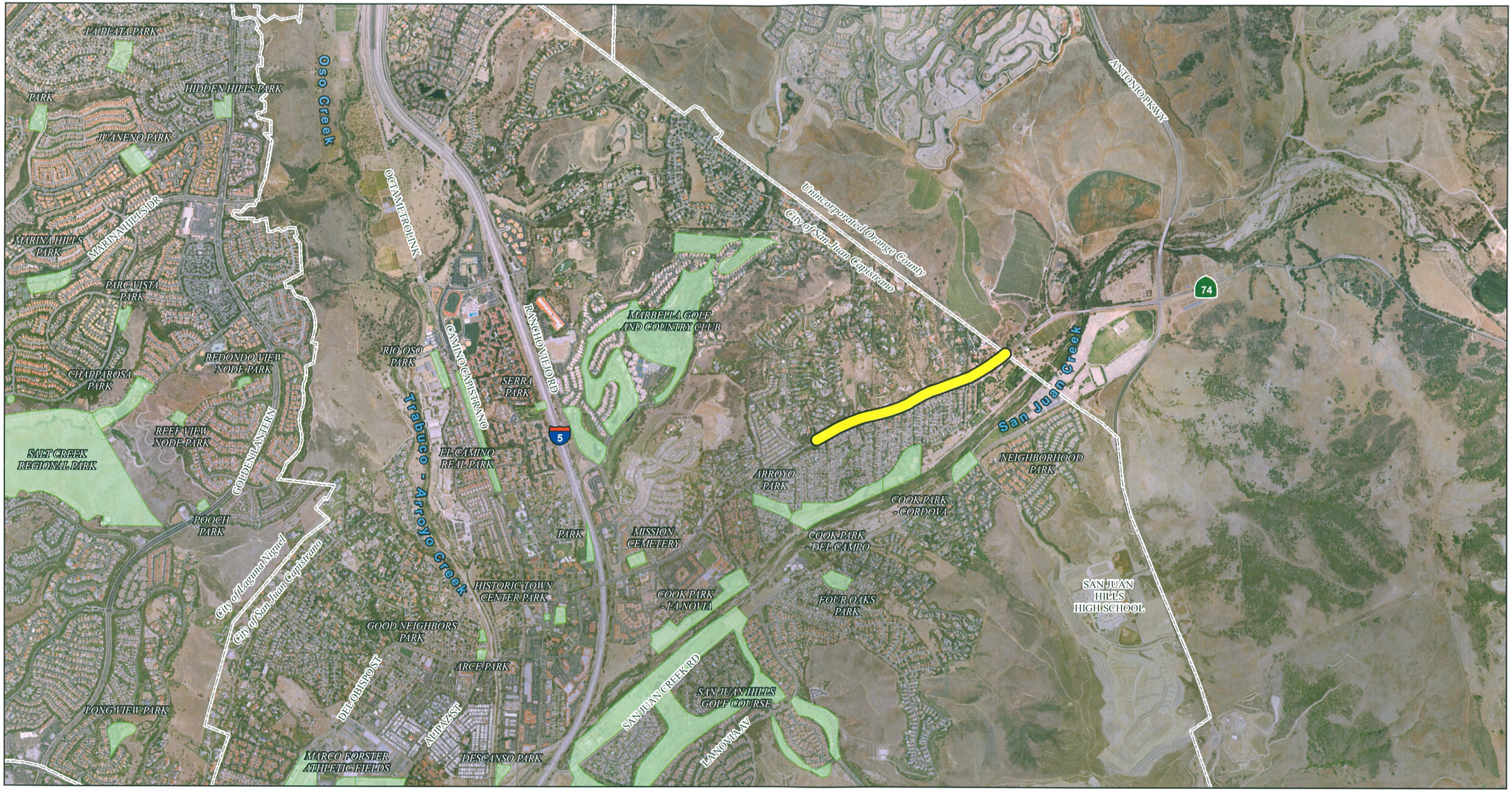

FIGURE 2

N

Project Study Area

0 1,000 2,000 Feet

SOURCE: Air Photo USA (2007), Thomas Bros (2007).

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Lower SR-74 Widening Project

Project Vicinity Map

12-ORA-74 PM 1.0/1.9 (KP 1.7/3.0)

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The project is a proposed solution to the deficiency identified in the need statement below.

2.2.2 Project Need

As previously indicated, SR-74 serves as a key connection route between Orange and Riverside Counties. The closest other roadways that provide this connection are State Route 91 (SR-91), approximately 26 miles to the north, and State Route 76 (SR-76), approximately 32 miles to the south. Both of these facilities are heavily traveled. As a result of the distance to alternative connectors, SR-74 experiences a consistent amount of regional traffic despite the rural design of much of the roadway. In addition to serving this regional demand, the subject segment of SR-74 also serves as a primary access to the City of San Juan Capistrano. Because of topography, SR-74 is one of the few arterial highways within the City that extends to the east beyond I-5.

The City of San Juan Capistrano developed a Circulation Element as part of the General Plan for City planning policies. The plan evaluates the transportation needs of the community within the framework of the planned transportation network of the County, region, and State. The Orange County Master Plan of Arterial Highways and the City of San Juan Capistrano designate Ortega Highway as a primary arterial highway and a four-lane divided roadway. In Table C-6 of the City's Circulation Element, the widening of the Ortega Highway is planned as a long-range roadway improvement and is to be widened to four lanes, from Calle Entradero to the east City limits.

The City of San Juan Capistrano has a 2002 Strategic Transportation Plan (STP) that includes the widening of Ortega Highway. The plan evaluated local and regional transportation issues and land development projects to assess the significant traffic impacts on the City's streets and State highways.

The need for this project is based on an assessment of the existing and future transportation demand, and current and predicted future traffic on SR-74 as measured by level of service (LOS). LOS is based on the ratio of traffic volume to the design capacity of the facility. It is expressed as a range from LOS A (free traffic flow with low volumes and high speeds, resulting in low densities) to LOS F (traffic volumes exceeding capacity and resulting in forced flow operations at low speeds, resulting in high densities). The following discussion demonstrates existing and forecast traffic demand on SR-74.

2.2.1.1 Project Deficiencies

Increasing traffic on SR-74 has degraded the highway LOS, particularly during the peak hours. The highway experiences between LOS D and LOS E during the a.m. peak hour and LOS D during the p.m. peak period (see Table 2.2-1).

Table 2.2-1 Existing and Future Levels of Service (LOS)

Location		Existing LOS	2035 LOS (No Build)	2035 LOS (Build)
SR-74 west of Via Cordova	AM	E	F	C
	PM	D	F	C
SR-74 west of Via Cristal	AM	D	F	C
	PM	D	F	B
SR-74 west of Avenida Siega	AM	D	F	C
	PM	D	F	B
SR-74 east of Avenida Siega	AM	D	F	C
	PM	D	F	B

Source: *Draft State Route 74 Lower Ortega Highway Widening Traffic Study* (Austin-Foust Associates, April 2008)
LOS = levels of service
SR-74 = State Route 74

The existing SR-74 is four through lanes (two travel lanes in each direction) from I-5 to approximately 330 ft east of Calle Entradero, where it transitions to three through lanes and then to two through lanes (one travel lane in each direction). The widening of SR-74 east of the City limits, known as the Lower 74 Widening Project – County Portion, will widen SR-74 to four through lanes from 2,000 ft east of the Antonio Parkway/La Pata Avenue intersection to San Juan Capistrano City limits. Following construction of the County widening project, SR-74 will be four through lanes both east and west of the City limits. Therefore, the two-lane section of SR-74 proposed to be widened to four lanes under the City widening project is an existing choke point that results in traffic congestion as the roadway narrows to two lanes east of Calle Entradero. The City widening project would provide a gap closure that would relieve traffic congestion by widening SR-74 to four lanes through the project limits. Following construction of the City widening project, SR-74 would be four through lanes from I-5 to 2,000 ft east of the Antonio Parkway/La Pata Avenue intersection.

2.2.1.2 Projected Deficiencies

Traffic congestion through the project area is expected to increase with the continued growth in the region. As shown in Table 2.2-1, by 2035, the LOS on SR-74 is projected to deteriorate to substandard levels. The mainline would operate at LOS F

in 2035 in the peak hours if SR-74 is not improved. There would be considerable delays, and the operating speed would be less than 35 miles per hour (mph).

2.3 Project Description

This section describes the Proposed Action and the design alternatives that were developed to achieve the project purpose and need while avoiding or minimizing environmental impacts. The proposed project would widen SR-74 by adding one through lane in each direction, east- and westbound from Calle Entradero to the City/County line. This environmental document has evaluated the two Build Alternatives: Alternative 1, Northside Widening, Eliminating Existing Sidewalk North of SR-74; Alternative 2, Northside Widening, a Straight Sidewalk Replacement north of SR-74; and the No Build Alternative.

2.4 Project Alternatives

2.4.1 Common Features of the Build Alternatives

The following project features are common design elements for both of the Build Alternatives:

2.4.1.1 Reconstructed Sidewalk

Currently, there are two 12 ft general-purpose lanes in each direction and no median throughout the project area. Both Build Alternatives would widen SR-74, primarily on the north side, to minimize removal of mature trees and avoid removal of the existing sidewalk on the south side of SR-74. These alternatives would result in the roadbed changing from the current varying width of 62.3 ft at Calle Entradero and 24.6 ft at the City/County Line to a width varying from 78 ft to 79 ft, including lanes, shoulders, and median. Both Build Alternatives would provide one additional 12 ft wide general-purpose lane in each direction as well as a 12 ft wide painted median. A paved 5 ft wide shoulder would be provided on each side of the roadway to accommodate Class II (striped on-road) bicycle facilities, except from Avenida Siega to the City/County limits, where the shoulder would transition to an 8 ft wide shoulder to merge with the County portion of the project. The edge of the pavement would have concrete curbs on each side of the roadway. The proposed additional lanes, shoulders, median, drainages, driveways, and sidewalk have been developed consistent with the standards in the Department's Highway Design Manual.

2.4.1.2 Intersection Improvements

There are five roadways that intersect with SR-74 from the south within the project limits: Calle Entradero, Via Cordova, Via Cristal, Via Errecarte, and Avenida Siega. North of SR-74, Via Cordova becomes Hunt Club Drive, and Avenida Siega becomes Shade Tree Lane. Additionally, to the north, Palm Hill Drive and Toyon Drive provide access to private property. Each intersection would be modified/widened to accommodate the additional lanes, median, and shoulders. At intersections where there are existing right-turn pockets (Via Cordova and Via Cristal), the right-turn pocket would remain. No new intersections are proposed.

2.4.1.3 Driveways

On the north side of SR-74 within the project limits, there are 11 existing driveways. Each of the 11 driveways would be modified to meet the grade of the widened roadway and to include reconstruction of the curb return. These driveways would be designed in order to maintain sight distance and to avoid safety issues. Along the south side east of the project limits, there are currently two paved driveways. These would be paved and modified to be compliant with the Americans with Disabilities Act (ADA). No new driveways are proposed.

Alternatives 1 and 2 would construct a retaining wall that would prevent access to SR-74 from an existing unpaved driveway located east of Shade Tree Lane and approximately 300 ft west of the City/County limits. When this parcel was subdivided, the vehicular access rights were relinquished with City approval. Additionally, this driveway is nonoperational for residential use due to its steep slope and unpaved condition.

2.4.1.4 Pedestrian and Bicycle Facilities

The existing sidewalk on the south side of SR-74 would be maintained in its current location, with the exception of a portion of sidewalk at the intersection of Via Cordova, where the sidewalk would be shifted to the south and reconstructed to provide for the right-turn pocket at this intersection. A new sidewalk would be constructed to the east beyond Avenida Siega and would connect to the planned County sidewalk system to provide continuity.

Class II bicycle facilities are planned and would be provided on each side of the roadway as part of the 5 ft wide paved shoulders throughout the project limits. These facilities would be in conformance with the Orange County Transportation Authority (OCTA) Commuters Bikeways Strategic Plan (CBSP). The City's General Plan states in its Circulation Element that there is the need to promote an extensive public

bicycle, pedestrian, and equestrian trails network. These bicycle facilities would comply with the City's goals.

2.4.1.5 Right-of-Way Acquisitions

The project would require sliver acquisitions from approximately 10 parcels adjacent to SR-74. No displacements or relocations would be required.

2.4.1.6 Cut and Fill

The roadway widening within the project limits would require cut slopes approximately 20 ft deep on the south side of SR-74 east of Via Cordova and between Via Cristal and Via Errecarte and a 700 ft long fill slope east of Avenida Siega up to 8 ft high. The designed cut slopes on the north side of SR-74 would require buttress keyways approximately 3 to 5 ft deep by 15 ft wide.

2.4.1.7 Drainage Improvements

Since most of the widening would occur on the north side of SR-74, all existing drainage facilities would be modified and extended to intercept flows at the proposed edge of pavement. An additional seven drainage culverts would be added on the north side of SR-74 throughout the project limits. There would be no drainage systems added to the south side. However, existing drainage on the south side from Avenida Siega, where widening would occur to the City/County line, would be modified to intercept flows at the proposed edge of pavement.

2.4.1.8 Retaining Walls

There are five retaining walls on the north side of SR-74 under consideration, all of which will be designed to meet Caltrans Division of Structures requirements. They are:

- A 160 ft long, 2 to 16 ft high retaining wall on the north side of Palm Hill Drive
- A 560 ft long, 2 to 20 ft high retaining wall from Palm Hill Drive to an access road
- A 100 ft long, 2 to 10 ft high retaining wall just east of the aforementioned access road
- A 280 ft long, 2 to 14 ft high retaining wall between Toyon Drive and an access road
- A 960 ft long, 8 to 24 ft high retaining wall between Shade Tree Lane and the City/County limits

The wall type will be finalized during the design phase.

2.4.1.9 Noise Attenuation

Two noise barriers are recommended for the Build Alternatives. They are:

- A 747 ft long, maximum 16 ft high noise barrier on the south side of SR-74 from Via Cordova to Via Cristal
- A 1,228 ft long, maximum 16 ft high noise barrier on the south side of SR-74 from Via Cristal to Via Errecarte

Both noise barriers would follow the alignment of the existing garden wall and construction would occur from the highway side, thereby requiring minimal removal of existing vegetation.

2.4.1.10 Signals and Lighting

Currently, there are no traffic signals within the project limits. This project does not warrant any signals at the existing intersections (see Intersection Improvements above for details). However, in the future, should there be a need for a signal/pedestrian crossing, the current design does not preclude the opportunity to install a signal. All streetlights affected by the widening of SR-74 would be relocated and replaced in kind.

2.4.1.11 Utilities

All utilities such as power, gas, sewer, and telephone lines impacted by this project would be relocated or replaced in kind within the project limits.

2.4.1.12 Pavement Rehabilitation

The project would also rehabilitate the existing pavement. The remaining existing pavement would be ground and overlaid with new asphalt concrete pavement to provide adequate strength to accommodate the projected traffic demand.

2.4.1.13 Construction

Construction for this project is expected to start in fall 2011 and be completed in fall 2013. No area is available within the project limits for exclusive use by the contractor (for staging). The highway right-of-way shall be used only for the purposes that are necessary to perform the required work.

A Traffic Management Plan (TMP), a standard condition placed on all construction projects, is designed to minimize construction-activity-related motorist delays, queuing, and accidents by the effective application of traditional traffic-handling practices and innovative approaches. The TMP aims to relieve congestion and

maintain traffic flow throughout the alternative routing and surrounding area within Riverside and Orange Counties. The preliminary TMP includes proposed lane closure charts and detour plans. The TMP will be finalized by the time final designs are prepared. However, it is certain that one lane in each direction would be kept open at all times.

The TMP evaluates traffic mitigation strategies for the duration of construction, addresses lane closure requirements, and seeks to inform the public and motorists. The TMP strategies include: project phasing, a detour plan, provision of temporary lanes/shoulders, and reversible lanes. Traffic management strategies will also include a public awareness campaign, traffic systems and signage, and traffic support and safety elements. The public awareness element usually involves brochures, mailers, and/or media releases to educate and inform the public of the construction activities. The motorist information strategies include message signage and a highway advisory radio to alert the motorists of road closures and/or detours. Construction alerts, detailing the project information, alternative routes, and the Transportation Helpline telephone number, would be made available to residents, businesses, local officials, city halls, and the chambers of commerce throughout local communities.

The traffic support and safety elements involve incident management. The Transportation Management Center (TMC) aids in facilitating communication between construction personnel, the traffic management team, traffic control officers, and the TMP Coordinator. The TMP would include provisions to minimize delays and give access to emergency personnel such as police and fire departments. Serving as a communications center, the TMC would help expedite the removal of minor and major incidents, help make decisions concerning the closing and opening of lanes, and manage traffic by providing traffic information to the media.

2.4.2 Unique Features of Build Alternatives

2.4.2.1 Build Alternative 1

Build Alternative 1 would remove the existing meandering sidewalk on the north side of SR-74, east of Calle Entradero. This alternative would widen SR-74 on the north side to avoid reconstructing the south side sidewalk.

2.4.2.2 Build Alternative 2

Reconstructed Sidewalk

The existing sidewalk on the north side of SR-74 between Calle Entradero and Via Cordova would be reconstructed to the north. The existing meandering sidewalk

would be reconstructed as a straight sidewalk (not curvilinear) within the existing public right-of-way.

2.4.2.3 Retaining Walls

In addition to the five retaining walls discussed in Section 1.5.1, two additional short retaining walls would be constructed north of the new reconstructed sidewalk along the south edge of the existing equestrian trail.

2.4.2.4 No Build Alternative

The No Build Alternative would not include any improvements to the project and would result in LOS F operating conditions for the mainline, as shown in Table 2.4-1. SR-74 traffic would flow at less than 35 mph and result in significant delays. SR-74 would be maintained in its existing two-lane condition and would continue to be used by commuters, recreation traffic, and commercial trucks. The No Build Alternative is not consistent with regional and local transportation plans, would not alleviate existing and projected congestion in the study area, and would not meet the project purpose and need. The No Build Alternative provides a baseline for comparing the effects associated with the Build Alternatives since the environmental document must consider the effects of not implementing the project.

Table 2.4-1 Summary of Project Alternatives

Alternative	Width of Project	Partial Acquisitions	Trees to be Removed	Retaining Walls	Sound Walls	Consistent with Plans	LOS (2035)
1	Varies from 78 to 79 ft	10 parcels	185	5	2	Yes	B and C
2	Varies from 78 to 79 ft	10 parcels	185	7	2	Yes	B and C
No Build	No change	None	None	None	None	No	F

Source: *Draft State Route 74 Lower Ortega Highway Widening Traffic Study*, Austin-Foust Associates, May 2008.
ft = feet
LOS = levels of service

2.4.3 Comparison of Alternatives

As shown in Table 2.4-1, Build Alternatives 1 and 2 are the same, with the exception of the removal of the sidewalk along the north side of SR-74 between Calle Entradero and Via Cordova and the number of retaining walls. Alternative 1 would require five retaining walls, whereas Alternative 2 would require seven retaining walls due to the reconstruction of the sidewalk on the north side of SR-74 between Calle Entradero and Via Cordova. The No Build Alternative would not be consistent with City and regional plans and would result in LOS F on SR-74 within the project limits. Therefore, the No Build Alternative would not meet the project purpose and need.

2.4.3.1 Environmental Decision Process

After the public circulation period, all comments will be considered, and the Department will select a preferred alternative and make the final determination of the project's effect on the environment. In accordance with CEQA, the Department will certify that the project complies with CEQA, prepare findings for all significant impacts identified, prepare a Statement of Overriding Considerations for impacts that will not be mitigated below a level of significance, and certify that the findings and Statement of Overriding Considerations have been considered prior to project approval. The Department will then file a Notice of Determination with the State Clearinghouse that will identify whether the project will have significant impacts, mitigation measures were included as conditions of project approval, findings were made, and a Statement of Overriding Considerations was adopted.

2.4.4 Alternatives Considered but Eliminated

Four alternatives were considered but eliminated from further study and are discussed below. These decisions were based on the current roadway configurations. SR-74 from I-5 to Calle Entradero is a four-lane facility. The County of Orange is widening SR-74 from the City/County limits to east of La Pata Avenue. This project to widen SR-74 from Calle Entradero to the City/County limits is considered a gap closure and there are no other alternatives to redirect traffic within this segment of SR-74 without having significant impacts to the adjacent residential community.

2.4.4.1 Nonstandard Roadway Widening (widening on both sides)

This Alternative involves rehabilitating and widening the existing roadway from Calle Entradero at PM 1.0 to the City of San Juan Capistrano limit at PM 1.86 to match the existing cross-section width west of Calle Entradero. The roadway cross-section consists of four 12 ft lanes, a 12 ft painted median, two 2 ft curbs and gutter, and two 5 ft sidewalks. Right-turn lanes would be provided for Via Cristal, Via Errecarte, and Avenida Siega.

Under this Alternative, the roadway would be widened on both sides; therefore, it would impact the mature trees and existing meandering sidewalks. The roadway would not provide standard shoulders and bike lanes and would be a safety issue.

2.4.4.2 Standard Roadway Widening (widening on both sides)

This Alternative involves rehabilitating and widening the existing roadway from Calle Entradero at PM 1.0 to the City of San Juan Capistrano limit at PM 1.86, with a standard geometric cross-section that includes four 12 ft lanes, a 12 ft painted median,

and 8 ft shoulders. Right-turn lanes would be provided for Via Cristal, Via Errecarte, and Avenida Siega.

Under this Alternative, the roadway would be widened on both sides, which would require more right-of-way than Alternative 1. In addition, this Alternative would also affect the historical resource on the south, the existing equestrian trail, the existing driveways, and the environmentally sensitive areas on the north.

2.4.4.3 Multimodal Alternative

There is a need for a multimodal transportation corridor to connect Riverside County to State Route 241 (SR-241) and I-5. No infrastructure for multimodal transportation presently exists. Construction of new infrastructure could have substantial impacts to environmental resources and would require large amounts of property acquisition. New routes to circumnavigate SR-74 would increase travel time for east- and westbound travelers.

Among the widening of SR-74, other facilities are being improved to accommodate traffic generated by the Ranch Plan and other development in the area. The area immediately served by SR-74 within the City of San Juan Capistrano is generally built out. However, land to the east in unincorporated Orange County is primarily undeveloped. The Ranch Plan EIR identifies traffic improvements to the areas surrounding the City of San Juan Capistrano to alleviate anticipated growth from the development within unincorporated Orange County.

This alternative did not contain elements to enhance the capacity of SR-74 to better accommodate the current and future traffic demands.

2.4.4.4 Nonstandard Roadway Widening (widening to the north)

This Alternative involves rehabilitating and widening the existing roadway from Calle Entradero at PM 1.06 to the City of San Juan Capistrano limit at PM 1.86. Most of the road widening would be to the north. However, the portion from Avenida Siega to the City limits will require widening to the north and south. The roadway cross section consists of four 12 ft lanes, a 12 ft painted median, and two 2 ft shoulders. Right-turn lanes would be provided for Via Cristal, Via Errecarte, and Avenida Siega.

Under this Alternative, the roadway would not provide standard shoulders and bike lanes. The Department Project Development Coordinator did not approve the proposed 2 ft nonstandard shoulders.

Chapter 3 Environmental Setting

A region's topographic features have a direct correlation with air pollution flow; therefore, they are used by the California Air Resources Board (ARB) to determine the boundary of air basins. A local air district is then formed for each air basin; the district is responsible for providing air quality strategies to bring the air basin into compliance with the national ambient air quality standards (NAAQS).

The project site is located in Orange County, an area within the South Coast Air Basin (SCAB) that includes Orange County and the nondesert portions of Los Angeles, Riverside, and San Bernardino Counties. Air quality regulation in the SCAB is administered by the South Coast Air Quality Management District (SCAQMD), a regional agency created for the SCAB.

3.1 Meteorology

3.1.1 Climate

The SCAB climate is determined by its terrain and geographical location. The SCAB is a coastal plain with connecting broad valleys and low hills. The Pacific Ocean forms the southwestern boundary, and high mountains surround the rest of the SCAB. The region lies in the semipermanent high-pressure zone of the eastern Pacific. The resulting climate is mild and tempered by cool ocean breezes. This climatological pattern is rarely interrupted. However, periods of extremely hot weather, winter storms, and Santa Ana wind conditions do occur.

The annual average temperature varies little throughout the SCAB, ranging from the low to middle 60s, measured in degrees Fahrenheit (°F). With a more pronounced oceanic influence, coastal areas show less variability in annual minimum and maximum temperatures than inland areas. The climatological station closest to the site monitoring temperature is the Laguna Beach Station.[1] The annual average maximum temperature recorded at this station is 71.2°F, and the annual average minimum is 51.0°F. January is typically the coldest month in this area of the SCAB.

The majority of annual rainfall in the SCAB occurs between November and April. Summer rainfall is minimal and generally limited to scattered thundershowers in coastal regions and slightly heavier showers in the eastern portion of the SCAB along

[1] Western Regional Climatic Center. http://www. wrcc.dri.edu (accessed April 9, 2008).

the coastal side of the mountains. The climatological station closest to the site that monitors precipitation is the Laguna Beach Station. Average rainfall measured at this station varied from 2.80 inches (in) in February to 0.49 in or less between May and October, with an average annual total of 12.71 in. Patterns in monthly and yearly rainfall totals are unpredictable due to fluctuations in the weather.

The SCAB experiences a persistent temperature inversion (increasing temperature with increasing altitude) as a result of the Pacific high. This inversion limits the vertical dispersion of air contaminants, holding them relatively near the ground. As the sun warms the ground and the lower air layer, the temperature of the lower air layer approaches the temperature of the base of the inversion (upper) layer until the inversion layer finally breaks, allowing vertical mixing with the lower layer. This phenomenon is observed from midafternoon to late afternoon on hot summer days, when the smog appears to clear up suddenly. Winter inversions frequently break by midmorning.

Inversion layers are significant in determining ozone (O_3) formation. O_3 and its precursors will mix and react to produce higher concentrations under an inversion. The inversion will also simultaneously trap and hold directly emitted pollutants such as carbon monoxide (CO). Particulate matter less than 10 microns in size (PM_{10}) is both directly emitted and created indirectly in the atmosphere as a result of chemical reactions. Concentration levels are directly related to inversion layers due to the limitation of mixing space.

Surface or radiation inversions are formed when the ground surface becomes cooler than the air above it during the night. The earth's surface goes through a radiative process on clear nights, when heat energy is transferred from the ground to a cooler night sky. As the earth's surface cools during the evening hours, the air directly above it also cools, while air higher up remains relatively warm. The inversion is destroyed when heat from the sun warms the ground, which in turn heats the lower layers of air; this heating stimulates the ground level air to float up through the inversion layer.

The combination of stagnant wind conditions and low inversions produces the greatest concentration of pollutants. On days of no inversion or high wind speeds, ambient air pollutant concentrations are the lowest. During periods of low inversions and low wind speeds, air pollutants generated in urbanized areas are transported predominantly onshore into Riverside and San Bernardino Counties. In the winter, the greatest pollution problems are CO and oxides of nitrogen (NO_x) because

of extremely low inversions and air stagnation during the night and early morning hours. In the summer, the longer daylight hours and the brighter sunshine combine to cause a reaction between hydrocarbons and NO_x to form photochemical smog.

3.1.2 Climate Change

While climate change has been a concern since at least 1988, as evidenced by the establishment of the United Nations and World Meteorological Organization's Intergovernmental Panel on Climate Change (IPCC), the efforts devoted to greenhouse gas[1] (GHG) emissions reduction and climate change research and policy has increased dramatically in recent years. In 2002, with the passage of Assembly Bill (AB) 1493, California launched an innovative and proactive approach to dealing with GHG emissions and climate change at the State level. AB 1493 requires the ARB to develop and implement regulations to reduce automobile and light truck GHG emissions; these regulations will apply to automobiles and light trucks beginning with the 2009 model year.

On June 1, 2005, Governor Arnold Schwarzenegger signed Executive Order (EO) S-3-05. The goal of this EO is to reduce California's GHG emissions to: (1) 2000 levels by 2010, (2) 1990 levels by 2020, and (3) to 80 percent below the 1990 levels by 2050. In 2006, this goal was further reinforced with the passage of AB 32, the Global Warming Solutions Act of 2006. AB 32 sets the same overall GHG emissions reduction goals while further mandating that ARB create a plan that includes market mechanisms and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases." EO S-17-06 further directs State agencies to begin implementing AB 32, including the recommendations made by the State's Climate Action Team.

With Executive Order S-01-07, Governor Schwarzenegger set forth the low carbon fuel standard for California. Under this executive order, the carbon intensity of California's transportation fuels is to be reduced by at least 10 percent by 2020.

Climate change and GHG reduction is also a concern at the federal level; at this time, no legislation or regulations have been enacted specifically addressing GHG emissions reductions and climate change. However, California, in conjunction with several environmental organizations and several other states, sued to force the United

[1] Greenhouse gases related to human activity include: carbon dioxide, methane, nitrous oxide, tetrafluoromethane, hexafluoroethane, sulfur hexafluoride, HFC-23, HFC-134a*, and HFC-152a*.

States Environmental Protection Agency (EPA) to regulate GHGs as a pollutant under the Clean Air Act (*Massachusetts vs. Environmental Protection Agency et al.*, U.S. Supreme Court No. 05–1120. 549 U.S. Argued November 29, 2006—Decided April 2, 2007). The court ruled that GHGs do fit within the Clean Air Act's definition of a pollutant and that the EPA does have the authority to regulate GHGS. Despite the Supreme Court ruling, there are no promulgated federal regulations to date limiting GHG emissions.

3.2 Air Quality Management

Pursuant to the federal Clean Air Act (CAA) of 1970, the EPA established NAAQS. The NAAQS were established for six major pollutants, termed criteria pollutants. Criteria pollutants are defined as those pollutants for which the federal and State governments have established ambient air quality standards, or criteria, for outdoor concentrations in order to protect public health. The NAAQS are two-tiered: primary, to protect public health, and secondary, to prevent degradation to the environment (e.g., impairment of visibility, damage to vegetation and property).

The six criteria pollutants are O_3, CO, particulate matter (PM), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead. PM includes particulate matter less than 2.5 microns in diameter ($PM_{2.5}$) and PM_{10}. The primary standards for these pollutants are shown in Table 3.2-1, and the health effects from exposure to the criteria pollutants are described later in this analysis.

3.3 2004 Transportation Conformity Rule

The EPA, in conjunction with the United States Department of Transportation (DOT), established the Transportation Conformity Rule on November 30, 1993. The rule implements the CAA conformity provision, which mandates that the federal government not engage, support, or provide financial assistance for licensing or permitting or approve any activity not conforming to an approved CAA implementation plan. As part of the Clean Air Rules of 2004, the EPA published a final rule in the Federal Register on July 1, 2004, to amend the Transportation Conformity Rule to include criteria and procedures for the new eight-hour O_3 and fine particulate matter ($PM_{2.5}$) NAAQS. The final rule addressed a March 2, 1999, court decision by incorporating the EPA and DOT guidance. On July 20, 2004, the EPA published a technical correction notice to correct two minor errors in the July 1, 2004, notice. To remain consistent with the stricter federal standards, ARB approved a new

Table 3.2-1 National and California Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[1]		Federal Standards[2]		
		Concentration[3]	Method[4]	Primary[2,5]	Secondary[3,6]	Method[7]
Ozone (O_3)	1-Hour	0.09 ppm (180 µg/m^3)	Ultraviolet Photometry	No federal standard	Same as Primary Standard	Ultraviolet Photometry
	8-Hour	0.07 ppm (137 µg/m^3)		0.075 ppm (147 µg/m^3)		
Respirable Particulate Matter (PM_{10})	24-Hour	50 µg/m^3	Gravimetric or Beta Attenuation	150 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m^3		–		
Fine Particulate Matter ($PM_{2.5}$)	24-Hour	No Separate State Standard		35 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m^3	Gravimetric or Beta Attenuation	15 µg/m^3		
Carbon Monoxide (CO)	8-Hour	9.0 ppm (10 mg/m^3)	Nondispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m^3)	None	Nondispersive Infrared Photometry (NDIR)
	1-Hour	20 ppm (23 mg/m^3)		35 ppm (40 mg/m^3)		
	8-Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		–		
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.030 ppm (56 µg/m^3)	Gas Phase Chemiluminescence	0.053 ppm (100 µg/m^3)	Same as Primary Standard	Gas Phase Chemiluminescence
	1-Hour	0.18 ppm (338 µg/m^3)		–		
Lead	30-day average	1.5 µg/m^3	Atomic Absorption	–	–	High-Volume Sampler and Atomic Absorption
	Calendar Quarter	–		1.5 µg/m^3	Same as Primary Standard	
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	–	Ultraviolet Fluorescence	0.030 ppm (80 µg/m^3)	–	Spectrophotometry (Pararosaniline Method)
	24-Hour	0.04 ppm (105 µg/m^3)		0.14 ppm (365 µg/m^3)	–	
	3-Hour	–		–	0.5 ppm (1300 µg/m^3)	
	1-Hour	0.25 ppm (655 µg/m^3)		–	–	
Visibility-Reducing Particles	8-Hour	Extinction coefficient of 0.23 per kilometer - visibility of 10 miles or more (0.07–30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.		No Federal Standards		
Sulfates	24-Hour	25 µg/m^3	Ion Chromatography			
Hydrogen Sulfide	1-Hour	0.03 ppm (42 µg/m^3)	Ultraviolet Fluorescence			
Vinyl Chloride[8]	24-Hour	0.01 ppm (26 µg/m^3)	Gas Chromatography			

Source: ARB, June 23, 2008.

See footnotes on next page.

Footnotes:

[1] California standards for ozone; carbon monoxide (except Lake Tahoe); sulfur dioxide (1- and 24-hour); nitrogen dioxide; suspended particulate matter, PM_{10}; and visibility-reducing particles are values not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

[2] National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth-highest 8-hour concentration in a year, averaged over three 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 mg/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 three years, are equal to or less than the standard. Contact the EPA for further clarification and current federal policies.

[3] Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25□C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25□C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

[4] Any equivalent procedure that can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.

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

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

[7] Reference method as described by the EPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the EPA.

[8] The 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.

eight-hour O_3 standard (0.07 parts per million [ppm], not to be exceeded) for O_3 on April 28, 2005. Additionally, ARB retained the current one-hour-average standard for O_3 (0.09 ppm) and the current monitoring method for O_3, which uses the ultraviolet (UV) photometry method.

In April 2003, the EPA was cleared by the White House Office of Management & Budget (OMB) to implement the eight-hour ground-level O_3 standard. ARB provided the EPA with California's recommendations for eight-hour O_3 area designations on July 15, 2003. The recommendations and supporting data were an update to a report submitted to the EPA in July 2000. On December 3, 2003, the EPA published its proposed designations. The EPA's proposal differs from the State's recommendations primarily on the appropriate boundaries for several nonattainment areas. ARB responded to the EPA's proposal on February 4, 2004. On April 15, 2004, the EPA announced the new nonattainment areas for the eight-hour O_3 standard. The designation and classification became effective on June 15, 2004. The Transportation Conformity requirement became effective on June 15, 2005.

The EPA proposed a $PM_{2.5}$ implementation rule in September 2003 and made final designations in December 2004. The $PM_{2.5}$ standard complements existing national and State ambient air quality standards that target the full range of inhalable PM_{10}.

Air quality monitoring stations are located throughout the nation and maintained by the local air districts and State air quality regulating agencies. Data collected at permanent monitoring stations are used by the EPA to identify regions as "attainment" or "nonattainment," depending on whether the regions met the requirements stated in the primary NAAQS. Nonattainment areas are imposed with additional restrictions as required by the EPA. In addition, different classifications of attainment, such as marginal, moderate, serious, severe, and extreme, are used to classify each air basin in the State on a pollutant-by-pollutant basis. The classifications are used as a foundation to create air quality management strategies to improve air quality and comply with the NAAQS. The SCAB's attainment status for each of the criteria pollutants is listed in Table 3.3-1.

Table 3.3-1 Attainment Status of Criteria Pollutants in the South Coast Air Basin

Pollutant	State	Federal
O_3 (1-hour)	Nonattainment	Revoked June 2005
O_3 (8-hour)	Not established	Severe 17 Nonattainment[1]
PM_{10}	Nonattainment	Serious Nonattainment[2]
$PM_{2.5}$	Nonattainment	Nonattainment[3]
CO	Attainment	Attainment/Maintenance
NO_2	Attainment	Attainment/Maintenance
All others	Attainment/Unclassified	Attainment/Unclassified

Source: California Air Resources Board, 2008 (http://www.arb.ca.gov/desig/desig.htm).

1 The SCAQMD has requested that the federal 8-hour O_3 attainment status be changed to extreme with an attainment date of 2023.

2 In October 2006, the EPA, in its final rule revision, eliminated the annual PM_{10} standard.

3 The $PM_{2.5}$ nonattainment designation is based on the 1997 standard. In 2006, the EPA revised the 24-hour standard. The 2006 $PM_{2.5}$ new standard of 35 $\mu g/m^3$ applies one year after the effective date of the new designation (April 2010).

CO = Carbon monoxide
NO_2 = Nitrogen dioxide
O_3 = Ozone
$PM_{2.5}$ = Particulate matter less than 2.5 microns in diameter
PM_{10} = Particulate matter less than 10 microns in diameter

3.4 Sensitive Receptors

Sensitive populations are more susceptible to the effects of air pollution than is the general population. Sensitive populations (sensitive receptors) that are in proximity to localized sources of toxics and CO are of particular concern. Land uses considered sensitive receptors include residences, schools, playgrounds, child care centers, athletic facilities, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes. The majority of the sensitive receptors within or adjacent to the project study area are residential uses.

Chapter 4 Regulatory Framework

4.1 Federal Clean Air Act

The CAA (1977 amendments–42 United States Code [USC] 7401 et seq.) states that the federal government is prohibited from engaging in, supporting, providing financial assistance for, licensing, permitting, or approving any activity that does not conform to an applicable SIP. Federal actions relating to transportation plans, programs, and projects developed, funded, or approved under 23 USC of the Federal Transit Act (40 USC 1601 et seq.) are covered under separate regulations for transportation conformity.

In the 1990 CAA amendments, the EPA included provisions requiring federal agencies to ensure that actions undertaken in nonattainment or attainment-maintenance areas are consistent with applicable State Implementation Plans (SIPs). The process of determining whether or not a federal action is consistent with an applicable SIP is called conformity.

The EPA General Conformity Rule applies only to federal actions that result in emissions of nonattainment or maintenance pollutants, or their precursors, in federally designated nonattainment or maintenance areas. The EPA General Conformity Rule establishes a process to demonstrate that federal actions would be consistent with applicable SIPs and would not cause or contribute to new violations of the NAAQS, increase the frequency or severity of existing violations of the NAAQS, or delay the timely attainment of the NAAQS. The emissions thresholds that trigger requirements of the Conformity Rule for federal actions emitting nonattainment or maintenance pollutants, or their precursors, are called *de minimis* levels. The general conformity *de minimis* thresholds are defined in 40 Code of Federal Regulations (CFR) 93.153(b). The federal General Conformity Rule does not apply to federal actions in areas designated as nonattainment of only the California ambient air quality standards (CAAQS).

4.2 California Clean Air Act

ARB administers the air quality policy in California. The CAAQS were established in 1969 pursuant to the Mulford-Carrell Act. These standards, included with the NAAQS in Table 3.2-1, are generally more stringent and apply to more pollutants than the NAAQS. In addition to the criteria pollutants, CAAQS have been established

for visibility-reducing particulates, hydrogen sulfide, and sulfates. The California Clean Air Act (CCAA), which was approved in 1988, requires that each local air district prepare and maintain an Air Quality Management Plan (AQMP) to achieve compliance with CAAQS. These AQMPs also serve as the basis for preparation of the SIP for the State of California.

ARB establishes policy and statewide standards and administers the State's mobile source emissions control program. In addition, ARB oversees air quality programs established by State statute, such as AB 2588, the Air Toxics "Hot Spots" Information and Assessment Act of 1987.

4.3 California State Implementation Plan

Federal clean air laws require areas with unhealthy levels of O_3, CO, NO_2, SO_2, and inhalable particulate matter to develop plans, known as SIPs, describing how they will attain NAAQS. The 1990 amendments to the federal CAA set new deadlines for attainment based on the severity of the pollution problem and launched a comprehensive planning process for attaining the NAAQS. The promulgation of the new national eight-hour O_3 standard and the $PM_{2.5}$ standards in 1997 will result in additional statewide air quality SIPs, which are not single documents, but a compilation of new and previously submitted plans, programs (such as monitoring, modeling, permitting), district rules, State regulations, and federal controls. Many of California's SIPs rely on the same core set of control strategies, including emission standards for cars and heavy trucks, fuel regulations, and limits on emissions from consumer products. State law makes the ARB the Lead Agency for all purposes related to the SIP. Local air districts and other agencies, such as the Bureau of Automotive Repair, prepare SIP elements and submit them to the ARB for review and approval. The ARB then forwards SIP revisions to the EPA for approval and publication in the Federal Register. CFR Title 40, Chapter I, Part 52, Subpart F, Section 52.220 lists all of the items included in the California SIP. Many additional California submittals are pending EPA approval.

4.4 South Coast Air Quality Management District

The SCAQMD and the Southern California Association of Governments (SCAG) are responsible for formulating and implementing the AQMP for the SCAB. Every 3 years, the SCAQMD prepares a new AQMP, updating the previous plan and having a 20-year horizon. The SCAQMD adopted the 2003 AQMP in August 2003 and forwarded it to the ARB for review and approval. The ARB approved a modified

version of the 2003 AQMP and forwarded it to the EPA in October 2003 for review and approval.

The 2003 AQMP updates the attainment demonstration for the federal standards for O_3 and PM_{10}, replaces the 1997 attainment demonstration for the federal CO standard, 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 SCAB has met since 1992.

The 2003 AQMP proposes policies and measures to achieve federal and State standards for healthful air quality in the SCAB.

This revision to the AQMP also addresses several State and federal planning requirements and incorporates significant new scientific data, primarily in the form of updated emissions inventories, ambient measurements, new meteorological episodes, and new air quality modeling tools. This AQMP is consistent with and builds upon the approaches taken in the 1997 AQMP and the 1999 Amendments to the O_3 SIP for the SCAB for the attainment of the federal O_3 air quality standard. However, this revision points to the urgent need for additional emission reductions (beyond those incorporated in the 1997/1999 Plan) to offset increased emission estimates from mobile sources and meet all federal criteria pollutant standards within the time frames allowed under the federal CAA.

The SCAQMD adopted the 2007 AQMP on June 1, 2007, which it describes as a regional and multiagency effort (i.e., the SCAQMD Governing Board, ARB, SCAG, and EPA). State and federal planning requirements will include developing control strategies, attainment demonstration, reasonable further progress, and maintenance plans. The 2007 AQMP also incorporates significant new scientific data, primarily in the form of updated emissions inventories, ambient measurements, new meteorological episodes, and new air quality modeling tools. The 2007 AQMP includes a request to have the SCAB's federal eight-hour O_3 attainment status changed from severe to extreme. This change would extend the attainment deadline from 2021 to 2023. The ARB approved the 2007 AQMP on September 27, 2007, and adopted it as part of the 2007 SIP. The ARB has forwarded the 2007 AQMP to the EPA for its review and approval.

SCAG is responsible under the CAA for determining the conformity of projects, plans, and programs with the SCAQMD AQMP. As indicated in the CEQA Air Quality Handbook, there are two main indicators of consistency:

- Whether the project would result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations, or delay timely attainment of air quality standards or the interim emission reductions specified in the AQMP
- Whether the project would exceed the AQMP's assumptions for 2020 or increments based on the year of project build out and phase

Chapter 5 Monitored Air Quality

The SCAQMD operates several air quality monitoring stations within the SCAB (see Table 5.0-1). The closest monitoring station is located at 26081 Via Pera, Mission Viejo, California.

Table 5.0-1 Local Air Quality Levels

Pollutant	Primary Standard		Year	Maximum Concentration[1]		Number of Days State/Federal Standard Exceeded
	California	Federal				
Carbon Monoxide (CO)	9.0 ppm for 8 hours	9 ppm for 8 hours	2005	1.6	ppm	0/0
			2006	1.6	ppm	0/0
			2007	2.2	ppm	0/0
Ozone (O_3) (1-Hour)	0.09 ppm for 1 hour	N/A	2005	0.125	ppm	3/NA
			2006	0.123	ppm	13/NA
			2007	0.108	ppm	5/NA
Ozone (O_3) (8-Hour)	0.07 ppm for 8 hour	0.08 ppm for 8 hour	2005	0.085	ppm	NA/1
			2006	0.105	ppm	NA/6
			2007	0.090	ppm	NA/2
Nitrogen Dioxide (NO_2)[2]	0.25 ppm for 1 hour	N/A	2005	0.085	ppm	0/NA
			2006	0.101	ppm	0/NA
			2007	0.074	ppm	0/NA
Sulfur Dioxide (SO_2)[2]	0.25 ppm for 1 hour	0.14 ppm for 24 hours or 0.03 ppm annual arithmetic mean	2005	0.008	ppm	0/0
			2006	0.005	ppm	0/0
			2007	0.004	ppm	0/0
Particulate Matter (PM_{10})[3]	50 $\mu g/m^3$ for 24 hours	150 $\mu g/m^3$ for 24 hours	2005	41	ug/m^3	0/0
			2006	57	ug/m^3	1/0
			2007	74	ug/m^3	3/0
Fine Particulate Matter ($PM_{2.5}$)[4]	NA	65 $\mu g/m^3$ for 24 hours	2005	35.3	ug/m^3	NA/0
			2006	46.9	ug/m^3	NA/0
			2007	34.3	ug/m^3	NA/0

Source: California Air Resources Board, ADAM Air Quality Data Statistics, www.arb.ca.gov/adam/welcome.html

[1] Max concentration is measured over the same period as the California Standard.

[2] Measurement taken at the Costa Mesa Monitoring Station.

[3] PM_{10} and $PM_{2.5}$ exceedances are derived from the number of samples exceeded, not days.

[4] $PM_{2.5}$ exceedances are based on the old 65 $\mu g/m^3$ standard. In 2006, the EPA revised the standard to 35 $\mu g/m^3$.

ppm = parts per million
$\mu g/m^3$ = micrograms per cubic meter
PM_{10} = particulate matter 10 microns in diameter or less
$PM_{2.5}$ = particulate matter 2.5 micron or less
NA = not applicable

The following air quality information briefly describes the various types of pollutants monitored within the vicinity of the Project Study Area.

5.1 Carbon Monoxide

CO is formed by the incomplete combustion of fossil fuels, almost entirely from automobiles. It is a colorless, odorless gas that can cause dizziness, fatigue, and impairments to central nervous system functions. The entire SCAB is in attainment/ maintenance for the federal CO standard and attainment for the State CO attainment standard. State and federal standards were not exceeded between 2005 and 2007.

5.2 Ozone

O_3, a colorless gas with a sharp odor, is one of a number of substances called photochemical oxidants (highly reactive secondary pollutants). These oxidants are formed when hydrocarbons, NO_X, and related compounds, interact in the presence of ultraviolet sunlight. The State standard for O_3 is 0.09 ppm, averaged over one hour, and 0.07 ppm, averaged over eight hours. Both federal and State standards designate the SCAB as a nonattainment area. The federal standard for O_3 was revoked as of June 5, 2005, and therefore no longer applies. The State one-hour O_3 standard was exceeded 3 to 13 times per year in the last three years. The federal eight-hour O_3 standard was exceeded 1 to 6 times per year in the last three years.

5.3 Nitrogen Dioxide

NO_2 is a reddish-brown gas with an odor similar to bleach and is the byproduct of fuel combustion, which results from mobile and stationary sources. It has complex diurnal concentrations that are typically higher at night. The SCAB has relatively low NO_2 concentrations, as very few monitoring stations have exceeded the State standard of 0.25 ppm (one hour) since 1988. NO_2 is itself a regulated pollutant, but it also reacts with hydrocarbons in the presence of sunlight to form O_3 and other compounds that make up photochemical smog. NO_2 decreases lung function and may reduce resistance to infection. The entire SCAB has not exceeded either federal or State standards for NO_2 in the past five years with published monitoring data. It is designated as a maintenance area under the federal standards and an attainment area under the State standards.

5.4 Sulfur Dioxide

SO_2 is a colorless, irritating gas formed primarily from incomplete combustion of fuels containing sulfur. Industrial facilities also contribute to gaseous SO_2 levels. SO_2 irritates the respiratory tract, can injure lung tissue when combined with fine

particulate matter, and reduces visibility and the level of sunlight. The entire SCAB is in attainment with both federal and State SO_2 standards.

5.5 Coarse Particulate Matter

PM_{10} refers to suspended particulate matter that is smaller than 10 microns or 10 one-millionths of a meter. PM_{10} occurs from sources such as road dust, diesel soot, combustion products, construction operations, and dust storms. PM_{10} scatters light and significantly reduces visibility. In addition, these particulates penetrate into lungs and can potentially damage the respiratory tract. On June 19, 2003, the ARB adopted amendments to the statewide 24-hour particulate matter standards based on requirements set forth in the Children's Environmental Health Protection Act (Senate Bill 25). The federal 24-hour standard of 150 micrograms per cubic meter ($\mu g/m^3$) was retained. The State 24-hour PM_{10} standard was exceeded once in 2006 and three times in 2007 but has not exceeded the federal 24-hour standard since 1999. Tiny airborne particles or aerosols that are less than 100 micrometers are collectively referred to as total suspended particulate matter (TSP). These particles constantly enter the atmosphere from many natural sources, including soil, bacteria, viruses, fungi, molds, yeast, and pollen. Manmade sources of TSP also include combustion products from space heating, industrial processes, power generation, and motor vehicle use.

Over 99 percent of inhaled particulate matter is either exhaled or trapped in the upper areas of the respiratory system and expelled. The balance enters the windpipe and lungs, where some particulates cling to protective mucous and are removed. Other mechanisms, such as coughing, also filter out or remove particles. Collectively, these "pulmonary clearance" mechanisms protect the lungs from the majority of inhalable particles.

Irritating odors are often associated with particulates. Some examples of sources are gasoline and diesel engine exhausts, large-scale coffee roasting, paint spraying, street paving, and trash burning.

The EPA replaced TSP as the indicator for both the annual and 24-hour primary (i.e., health-related) standards in 1987. The indicator includes only those particles with an aerodynamic diameter smaller than or equal to a nominal 10 micrometers (PM_{10}).

5.6 Fine Particulate Matter

Due to recent increased concerns over health impacts related to fine particulate matter ($PM_{2.5}$), both State and federal $PM_{2.5}$ standards have been created. Particulate matter impacts primarily affect infants, children, the elderly, and those with preexisting cardiopulmonary disease. In 1997, the EPA announced new $PM_{2.5}$ standards. Industry groups challenged the new standard in court, and implementation of the standard was blocked. However, upon appeal by the EPA, the United States Supreme Court reversed this decision and upheld the EPA's new standards.

On January 5, 2005, the EPA published a Final Rule in the Federal Register that designates the Orange County portion of the SCAB as a nonattainment area for federal $PM_{2.5}$ standards. On June 20, 2002, ARB adopted amendments for statewide annual ambient particulate matter air quality standards. These standards were revised/established due to increasing concerns by ARB that previous standards were inadequate, as almost everyone in California is exposed to levels at or above the current State standards during some parts of the year, and the statewide potential for significant health impacts associated with particulate matter exposure was determined to be large and wide-ranging. The federal standard was not exceeded between 2005 and 2007.

5.7 Volatile Organic Compounds or Reactive Organic Gases

Hydrocarbon compounds are any compounds containing various combinations of hydrogen and carbon atoms that exist in the ambient air. Volatile organic compounds (VOCs) contribute to the formation of smog and/or may themselves be toxic. VOCs often have an odor, and some examples include gasoline, alcohol, and the solvents used in paints. There are no specific State or federal VOC thresholds, as they are regulated by individual air districts as O_3 precursors.

5.8 Lead

Lead is found in old paints and coatings, plumbing, and a variety of other materials. Once in the bloodstream, lead can cause damage to the brain, nervous system, and other body systems. Children are highly susceptible to the effects of lead. The entire SCAB is in attainment for federal and State lead standards.

Chapter 6 Potential Air Quality Impacts

6.1 Short-Term Impacts

Construction activities produce combustion emissions from various sources such as site grading, utility engines, on-site heavy-duty construction vehicles, equipment hauling materials to and from the site, and motor vehicles transporting the construction crew. Exhaust emissions during the construction envisioned on site will vary daily as construction activity levels change. The use of construction equipment on site will result in localized exhaust emissions. The Caltrans Standard Specifications for construction (Sections 10 and 18 for dust control and Section 39-3.06 for asphalt concrete plants) will be adhered to in order to reduce emissions as a result of construction equipment.

Additionally, the SCAQMD has established Rule 403 for reducing fugitive dust emissions (PM_{10}). The best available control measures (BACM), as specified in SCAQMD Rule 403, shall be incorporated into the project commitments. With the implementation of standard construction measures (providing 50 percent effectiveness) such as frequent watering (e.g., minimum twice per day), fugitive dust emissions from construction activities would not result in adverse air quality impacts.

6.2 Regional Analysis

A consistency analysis determination plays an essential role in local agency project review by linking local planning and unique individual projects to the AQMP in the following ways: it fulfills the CEQA goal of fully informing local agency decision-makers of the environmental costs of the project under consideration at a stage early enough to ensure that air quality concerns are fully addressed, and it provides the local agency with ongoing information, assuring local decision-makers that they are making real contributions to clean air goals defined in the most current AQMP (adopted 2003). Because the AQMP is based on projections from local General Plans, projects that are consistent with the local General Plan are considered consistent with the AQMP. The implementation of the proposed project would also not delay timely implementation of the Transportation Control Measures (TCMs) identified in the AQMP. As shown above, the proposed project would not significantly contribute to or cause deterioration of existing air quality; therefore, mitigation measures are not required for the long-term operation of the project.

6.3 CO Screening Analysis

The scope required for CO local analysis is summarized in the Transportation Project-Level Carbon Monoxide Protocol (Protocol), Section 3 (Determination of Project Requirements), and Section 4 (Local Analysis); refer to Appendix B (CO Screening). In Section 3, the Protocol provides two conformity requirement decision flowcharts that are designed to assist the project sponsor(s) in evaluating the requirements that apply to specific projects. The flowchart in Figure 1 (Appendix A) of the Protocol applies to new projects and was used in this local analysis conformity decision. Below is a step-by-step explanation of the flow chart. Each level cited is followed by a response, which would determine the next applicable level of the flowchart for the project. The flowchart begins with Section 3.1.1:

- **3.1.1 Is this project exempt from all emissions analyses?**
  NO.
  Table 1 of the Protocol is Table 2 of Section 93.126. Section 3.1.1 is inquiring if the project is exempt. Such projects appear in Table 1 of the Protocol. The proposed project does not appear in Table 1. It is not exempt from all emissions analyses.

- **3.1.2. Is the project exempt from regional emissions analyses?**
  NO.
  Table 2 of the Protocol is Table 3 of Section 93.127. The question is attempting to determine whether the project is listed in Table 2. The project will widen an existing highway. Therefore, it is not exempt from regional emissions analysis.

- **3.1.3. Is the project locally defined as regionally significant?**
  YES.
  As mentioned above, the project will widen SR-74. Therefore, the project is potentially significant.

- **3.1.4. Is the project in a federal attainment area?**
  NO.
  The project is located within an attainment/maintenance area for the federal CO standard.

- **3.1.5. Are there a currently conforming Regional Transportation Plan (RTP) and Transportation Improvement Program (TIP)?**
  YES.

- **3.1.6. Is the project included in the regional emissions analysis supporting the currently conforming RTP and TIP?**
  YES.
  The project is included in the SCAG 2008 RTP and the 2008 Regional Transportation Improvement Program (RTIP) (Project ID: ORA120507, San Juan Capistrano – Ortega Highway Widen from two to four lanes; Calle Entradero to Antonio Parkway [lower Ortega]).

- **3.1.7. Has the project design concept and/or scope changed significantly from that in the regional analysis?**
  NO.

- **3.1.9. Examine local impacts.**
  Section 3.1.9 of the flowchart directs the project evaluation to Section 4 (Local Analysis) of the Protocol. This concludes Figure 1.

Likewise, Section 4 contains Figure 3 (Local CO Analysis [Appendix A]). This flowchart is used to determine the type of CO analysis required for the Build Alternative. Below is a step-by-step explanation of the flowchart. Each level cited is followed by a response, which would determine the next applicable level of the flowchart for the Build Alternative. The flowchart begins at level 1:

- **Level 1. Is the project in a CO non-attainment area?**
  NO.
  The project site is located in an area that has demonstrated attainment with the federal CO standard.

- **Level 1 (cont.). Was the area redesignated as "attainment" after the 1990 Clean Air Act?**
  YES.

- **Level 1 (cont.). Has "continued attainment" been verified with the local Air District, if appropriate?**
  YES.
  The SCAB was designated as attainment by the EPA on June 11, 2007. (Proceed to Level 7.)

- **Level 7. Does the project worsen air quality?**
  YES.

Because one of the following conditions (listed in Section 4.7.1 of the CO Protocol) is met, the project would potentially worsen air quality.

a. *The project significantly increases the percentage of vehicles operating in cold start mode. Increasing the number of vehicles operating in cold start mode by as little as 2% should be considered potentially significant.*

   The percentage of vehicles operating in cold-start mode is the same or lower for the intersection under study compared to those used for the intersection in the attainment plan. It is assumed that all vehicles on SR-74 are in a fully warmed-up mode. Therefore, this criterion is not met.

b. *The project significantly increases traffic volumes. Increases in traffic volumes in excess of 5% should be considered potentially significant. Increasing the traffic volume by less than 5% may still be potentially significant if there is also a reduction in average speeds.*

   Based on the Traffic Study (Austin-Foust Associates, Inc., May 2008), the proposed project would not increase the daily traffic volumes along SR-74. This is due to there being few alternative routes within the project vicinity. As shown in Table 6.3-1, the project would not increase the traffic volumes along SR-74. Therefore, this criterion is not met.

Table 6.3-1 Peak-Hour Traffic Volumes[1]

Roadway Link	AM Peak Hour	Change from No Build	PM Peak Hour	Change from No Build
South of La Nova	4,148	0	3,635	0
Between La Nova and Belford	3,510	0	3,505	0
Between Belford and Sundance	3,477	0	3,456	0
Between Sundance and Cuartel	3,503	0	3,462	0
Between Cuartel and Linda Vista	3,475	0	3,415	0
Between Linda Vista and Entradero	3,466	0	3,396	0
Between Entradero and Cordova	3,446	0	3,319	0
Between Cordova and Cristal	3,382	0	3,236	0
Between Cristal and Strawberry	3,366	0	3,224	0
Between Strawberry and Errecarte	3,363	0	3,219	0
Between Errecarte and Siega	3,351	0	3,198	0
North of Siega	3,347	0	3,193	0

Source: Austin-Foust Associates, Inc., May 2008.
[1] Traffic volumes apply to Alternative 1 and Alternative 2.

c. *The project worsens traffic flow. For uninterrupted roadway segments, a reduction in average speeds (within a range of 3 to 50 mph) should be regarded as worsening traffic flow. For intersection segments, a reduction in average speed or an increase in average delay should be considered as worsening traffic flow.*

As shown in Table 6.3-2, the project would improve the vehicle speed along SR-74 by improving the LOS. Therefore, this criterion is not met.

Table 6.3-2 Roadway Segment LOS

Roadway Segment	2035 No Build LOS		2035 Build LOS	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
West of Via Cordova/Hunt Club	F	F	C	C
West of Via Cristal	F	F	C	B
West of Avenida Siega	F	F	C	B
East of Avenida Siega	F	F	C	B

Source: Austin-Foust Associates, Inc., May 2008.

The project is not expected to result in any concentrations exceeding the one-hour or eight-hour CO standards. Therefore, a detailed CALINE4 CO hot-spot analysis was not required.

6.4 Naturally Occurring Asbestos/Structural Asbestos

Chrysotile and amphibole asbestos (such as tremolite) occur naturally in certain geologic settings in California, most commonly in association with ultramafic rocks and along associated faults. Asbestos is a known carcinogen, and inhalation of asbestos may result in the development of lung cancer or mesothelioma. The asbestos contents of many manufactured products have been regulated in the United States for a number of years. For example, CARB has regulated the amount of asbestos in crushed serpentinite used in surfacing applications, such as for gravel on unpaved roads, since 1990. In 1998, new concerns were raised about possible health hazards from activities that disturb rocks and soil containing asbestos and may result in the generation of asbestos-laden dust. These concerns recently led to CARB revising its asbestos limit for crushed serpentinite and ultramafic rock in surfacing applications from 5 percent to less than 0.25 percent, and adopting a new rule requiring best practices dust control measures for activities that disturb rock and soil containing naturally occurring asbestos (NOA).

The United States Geological Service (USGS) Geological Map Index was searched for available geological maps that cover the Project Study Area and surrounding areas. These geological maps indicate geological formations that are overlaid on a topographic map. Some maps focus on specific issues (i.e., bedrock, sedimentary rocks) while others may identify artificial fills (including landfills). Geological maps can be effective in estimating permeability and other factors that influence the spread of contamination. According to the GeoCheck search, the Project Study Area is generally underlain by urban land and a stratified sequence from the Cenozoic Era. Depth to bedrock is reported to be greater than 10 inches.

NOA in bedrock is typically associated with serpentine and peridotite deposits. Note that during demolition activities, the likelihood of encountering structural asbestos is low due to the nature of the demolished materials. The material would consist of concrete and metal piping. Therefore, the potential for NOA to be present within the project limits is considered to be low. Furthermore, prior to the commencement of construction, qualified geologists would further examine the soils and makeup of the existing structure. Should the project geologist encounter asbestos during the analysis, proper steps shall be executed to handle the materials.

NOA in bedrock is typically associated with serpentine and peridotite deposits. Note that during demolition activities, the likelihood of encountering structural asbestos is low due to the nature of the demolished materials. The material would consist of concrete and metal piping. Therefore, the potential for NOA to be present within the project limits is considered to be low. Furthermore, prior to the commencement of construction, qualified geologists would further examine the soils and makeup of the existing structure. Should the project geologist encounter asbestos during the analysis, proper steps shall be executed to handle the materials.

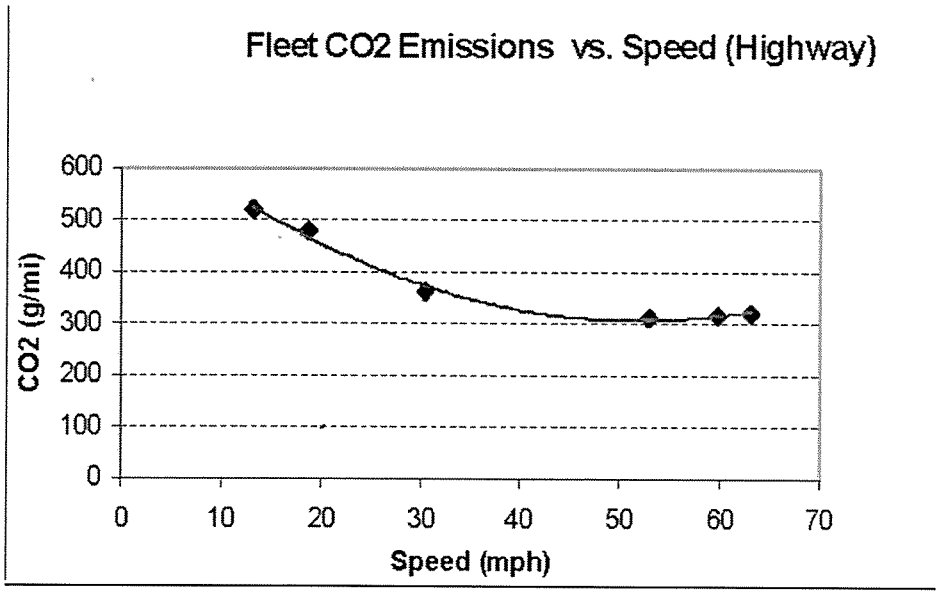
6.5 Climate Change/GHGs

According to a recent white paper by the Association of Environmental Professionals,[1] an individual project does not generate enough GHG emissions to significantly influence global climate change. Global climate change is a cumulative impact; a project participates in this potential impact through its incremental contribution combined with the cumulative increase of all other sources of GHG.

[1] Hendrix, Michael, and Cori Wilson. *Recommendations by the Association of Environmental Professionals (AEP) on How to Analyze Greenhouse Gas Emissions and Global Climate Change in CEQA Documents* (March 5, 2007), p. 2.

Caltrans and its parent agency, the Business, Transportation, and Housing Agency, have taken an active role in addressing GHG emissions reduction and climate change. Recognizing that 98 percent of California's GHG emissions are from the burning of fossil fuels and that 40 percent of all human-made GHG emissions are from transportation, Caltrans has created and is implementing the *Climate Action Program at Caltrans* (December 2006).

One of the main strategies in the Caltrans Climate Action Program to reduce GHG emissions is to make California's transportation system more efficient. The highest levels of carbon dioxide (CO_2) from mobile sources, such as automobiles, occur at stop-and-go speeds (0–25 mph) and speeds over 55 mph. Relieving congestion by enhancing operations and improving travel times in high congestion travel corridors would lead to an overall reduction in GHG emissions.



Source: Center for Clean Air Policy— http://www.ccap.org/Presentations/Winkelman%20TRB%202004%20(1-13-04).pdf

6.5.1 Long-Term Global Warming Impact

The purpose of the proposed project is to alleviate existing and future traffic congestion along SR-74 during peak hours. The proposed project will not generate new vehicular traffic trips since it will not construct new homes or businesses. However, there is a possibility that some traffic currently utilizing other routes would be attracted to use the improved facility, thus resulting in slight increases in vehicle miles traveled (VMT). The impact of GHG emissions is a global rather than a local issue. Therefore, the impact of the Build Alternative on GHG emissions was

calculated using traffic data for the Southern California Association of Governments (SCAG) region.

A supplemental traffic analysis prepared by Austin-Foust Associates, Inc. (October 23, 2008) estimated the impact that the proposed project would have on regional VMT and regional vehicle hours traveled (VHT). As shown in Table 6.5-1, the proposed project would result in an increase in VMT and VHT in 2013 and 2035.

Table 6.5-1 Change in Regional VMT and VHT

Year	Regional VMT	Regional VHT
2013 Increase	1,430	240
2035 Increase	4,297	714
2035 Regional No Build	344,523,122	10,453,545
2035 Regional Build	344,527,419	10,454,259

Source: Austin-Foust Associates, Inc., October 2008.
VHT = vehicle hours traveled
VMT = vehicle miles traveled

The VMT and VHT data listed in Table 6.5-1, along with the EMFAC2007 emission rates, were used to calculate the CO_2 and CH_4 emissions for the 2035 regional conditions. The results of the modeling were used to calculate the CO_2 equivalent (CO_{2eq}) emissions listed in Table 6.5-2. As shown in Table 6.5-2, the proposed project would increase the CO_{2eq} emissions within the region. However, the percentage increase in emissions is very small. Therefore, the proposed project would not contribute significantly to global warming.

Table 6.5-2 Change in Regional VMT and VHT

Alternative	Daily CO_{2eq} Emissions (lbs/day)	Increase from No Build (lbs/day)	Percent Increase from No Build
2035 No Build	339,303,325	-	-
2035 Build	339,318,068	14,743	0.004

Source: LSA Associates, Inc., October 2008.
CO_{2eq} = carbon dioxide equivalent
lbs/day = pounds per day

6.5.2 Environmental Consequences

Based on the *Traffic Study* (May 2008), the Build Alternatives would reduce congestion and improve LOS. The Build Alternatives would not substantially change the regional VMT. Therefore, the project would not contribute to global warming.

Caltrans recognizes the concern that CO_2 emissions raise for climate change. However, accurate modeling of GHG emission levels, including CO_2 at the project level, is not currently possible. No federal, State, or regional regulatory agency has provided methodology or criteria for GHG emission and climate change impact analysis. Therefore, Caltrans is unable to provide a scientific or regulatory based conclusion regarding whether the project's contribution to climate change is cumulatively considerable.

Caltrans continues to be actively involved on the Governor's Climate Action Team as ARB works to implement AB 1493 and AB 32. As part of the *Climate Action Program at Caltrans* (December 2006), Caltrans is supporting efforts to reduce VMT by planning and implementing smart land use strategies: job/housing proximity, developing transit-oriented communities, and high-density housing along transit corridors. Caltrans is working closely with local jurisdictions on planning activities; however, Caltrans does not have local land use planning authority. However, the Department will be planting trees as part of this proposed proposed project. Caltrans is also supporting efforts to improve the energy efficiency of the transportation sector by increasing vehicle fuel economy in new cars, and light and heavy-duty trucks. It is important to note that the control of the fuel economy standards is held by the EPA and ARB. Last, the use of alternative fuels is also being considered; Caltrans is participating in funding for alternative fuel research at the University of California, Davis.

6.6 Long-term Vehicle Emission Impact

The purpose of the proposed project is to alleviate existing and future traffic congestion along SR-74 during peak hours. The proposed project would not generate new vehicular traffic trips since it would not construct new homes or businesses. However, there is a possibility that some traffic currently utilizing other routes would be attracted to use the improved facility, thus resulting in slight increases in VMT. Therefore, the potential impact of the proposed roadway widening project on regional vehicle emissions was calculated using traffic data for the SCAG region and emission rates from the EMFAC2007 emission model.

A supplemental traffic analysis prepared by Austin-Foust Associates, Inc. (October 23, 2008) estimated the impact that the proposed project would have on regional VMT and VHT. As shown in Table 6.5-1, the proposed project would result in an increase in VMT and VHT in 2013 and 2035.

The VMT and VHT data listed in Table 6.5-1, along with the EMFAC2007 emission rates, were used to calculate the CO, ROG, NO_X, SO_X, PM_{10}, and $PM_{2.5}$ emissions for the 2035 regional conditions. The results of the modeling are listed in Table 6.6-1. As shown in Table 6.6-1, the proposed project would increase the emissions within the region. However, the increases are very small and less than the SCAQMD's significance thresholds. Therefore, the proposed project would not contribute significantly to regional vehicle emissions.

Table 6.6-1 Change in Regional Vehicle Emissions (lbs/day)

Pollutant	2035 Baseline Emissions	2035 With Project Emissions	Project-Related Increase	SCAQMD Threshold (lb/day)
CO	626,518	626,542	24	550
ROG	30,413	30,415	2	55
NO_X	146,654	146,659	5	55
SO_X	3,348	3,349	1	150
PM_{10}	32,072	32,073	1	150
$PM_{2.5}$	19,919	19,920	1	55

Source: LSA Associates, Inc., November 2008.
CO = carbon monoxide
NO_X = nitrogen oxides
$PM_{2.5}$ = fine particulate matter
PM_{10} = coarse particulate matter
ROG = reactive organic compounds
SCAQMD = Southern California Air Quality Management District
SO_X = sulfur oxides

6.7 Cumulative Impacts Relating to Air Quality

Cumulative projects include local development as well as general growth within the project area. However, as with most development, the greatest source of emissions is from vehicular traffic that can travel well out of the local area. Therefore, from an air quality standpoint, the cumulative analysis would extend beyond any local projects and when wind patterns are considered, would cover an even larger area. Accordingly, the cumulative analysis for a project's air quality analysis must be regional by nature.

Construction and operation of cumulative projects would further degrade the local air quality, as well as the air quality of the SCAB. Air quality would be temporarily degraded during construction activities that occur separately or simultaneously. However, the greatest cumulative impact on the quality of regional air would be the incremental addition of pollutants from increased traffic from residential, commercial, and industrial development and the use of heavy equipment and trucks

associated with the construction of these projects. Note that the proposed project is a transportation improvement and not a direct trip generator.

With respect to emissions that may contribute to exceeding State and federal standards, a CO and PM_{10} screening analysis was performed. The results of this analysis illustrate that localized levels would not violate published air quality standards and therefore do not present a significant cumulative impact. In addition, due to the project's relatively small scale, the contribution to the SCAB air emissions is not "cumulatively considerable."

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Chapter 7 Standard Construction Practices

7.1 Construction Impacts

AQ1 During clearing, grading, earth moving, or excavation operations, excessive fugitive dust emissions shall be controlled by regular watering or other dust preventive measures using the following procedures, as specified in the South Coast Air Quality Management District (SCAQMD) Rule 403. All material excavated or graded shall be sufficiently watered to prevent excessive amounts of dust. Watering shall occur at least twice daily with complete coverage, preferable in the late morning and after work is done for the day. All material transported on site or off site shall be either sufficiently watered or securely covered to prevent excessive amounts of dust. The area disturbed by clearing, grading, earth moving, or excavation operations shall be minimized so as to prevent excessive amounts of dust. These control techniques shall be indicated in project specifications. Compliance with this measure shall be subject to periodic site inspections by the County. Visible dust beyond the property line emanating from the project shall be prevented to the maximum extent feasible.

AQ2 Project grading plans shall show the duration of construction. Ozone precursor missions from construction equipment vehicles shall be controlled by maintaining equipment engines in good condition and in proper tune per manufacturer's specifications, to the satisfaction of the City Engineer. Compliance with this measure shall be subject to periodic inspections of construction equipment vehicles by the Department/City of Anaheim.

AQ3 All trucks that are to haul excavated or graded material on-site shall comply with State Vehicle Code Section 23114, with special attention to Sections 23114(b)(F), (e)(2) and (e)(4) as amended, regarding the prevention of such material spilling onto public streets and roads.

AQ4 The contractor shall adhere to Caltrans Standard Specifications for Construction (Sections 10 and 18 [Dust Control] and Section 39-3.06 [Asphalt Concrete Plant Emissions]).

AQ5 Should the project geologist determine that asbestos-containing materials (ACMs) are present at the project study area during final inspection prior to construction, the appropriate methods shall be implemented to remove ACMs.

7.2 Operational Impacts

There are no mitigation measures required, as the Build Alternative would not result in significant operational air quality impacts.

Chapter 8 References

Austin-Foust Associates, Inc., State Route 74 Lower Ortega Highway Widening Traffic Analysis, April 2, 2008.

California Air Resources Board Web site: http://www.arb.ca.gov.

Institute of Transportation Studies-University of California Davis, *Transportation Project-Level Carbon Monoxide Protocol*, December 1997.

South Coast Air Quality Management Agency, *2003 Air Quality Management Plan, South Coast Air Basin,* August 1, 2003.

South Coast Air Quality Management District, *CEQA Air Quality Handbook*, 1993.

Western Regional Climatic Center, 2008.

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Appendix A CO Protocol

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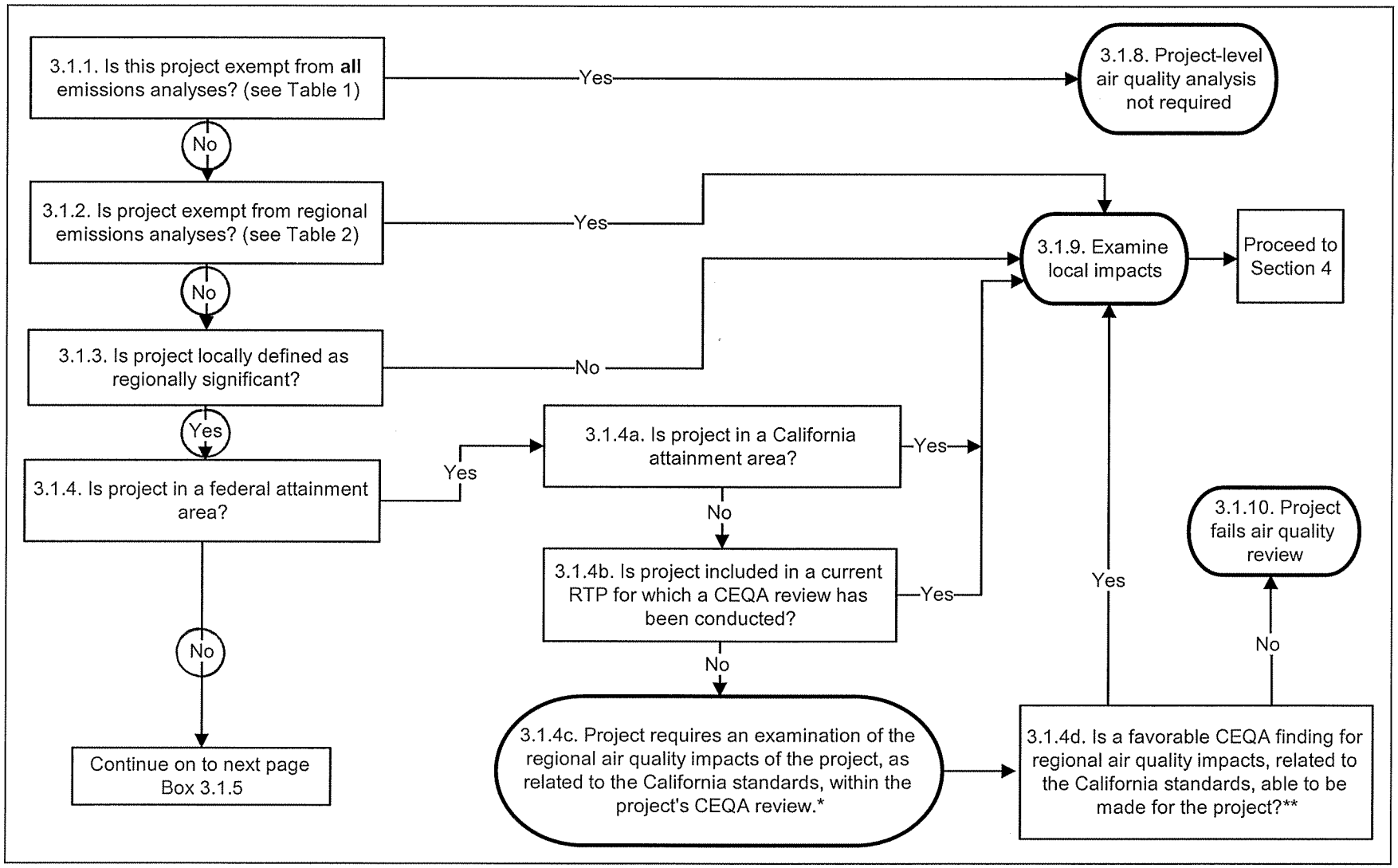

Figure 1. Requirements for New Projects

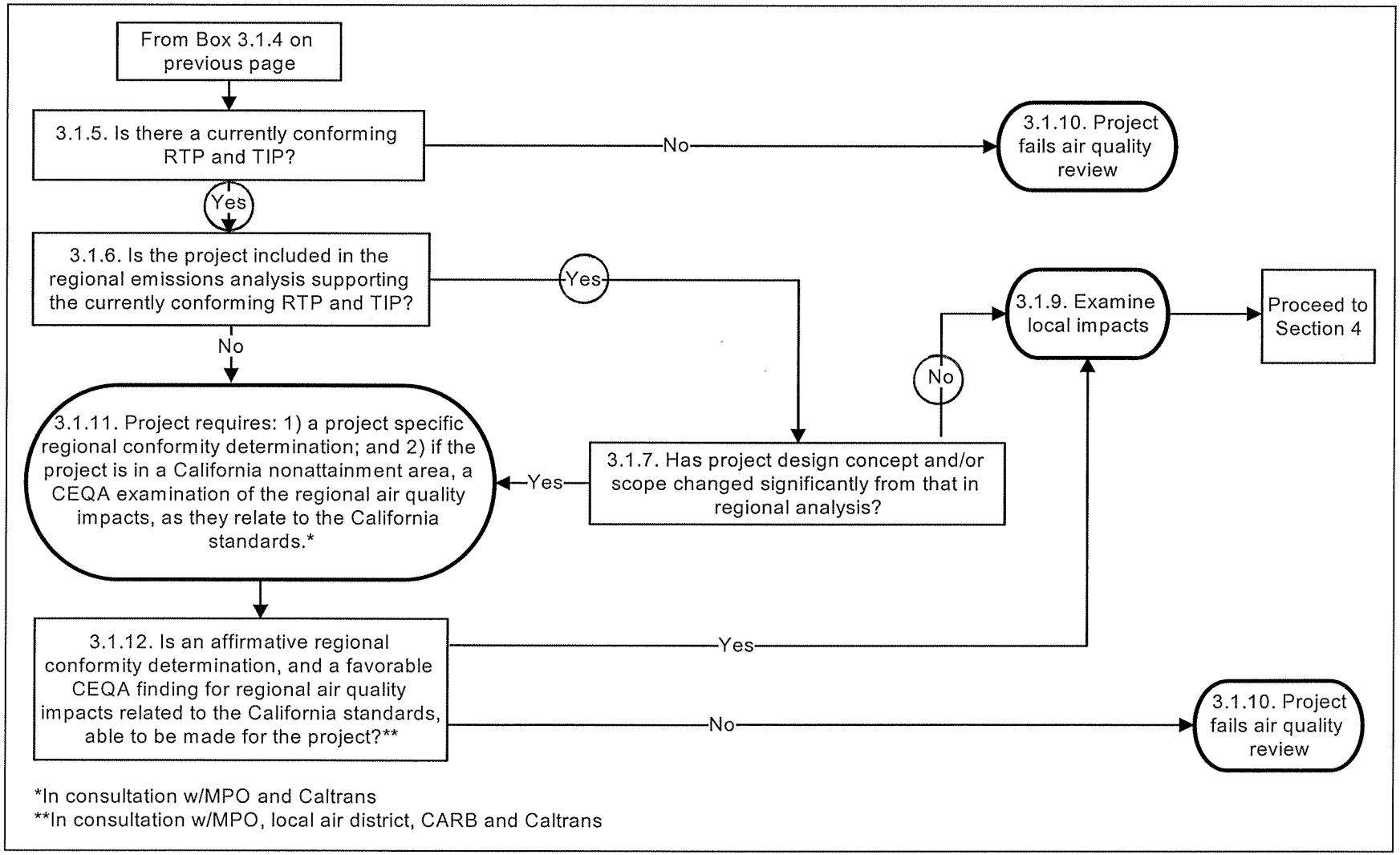

Figure 1 (cont.). Requirements for New Projects

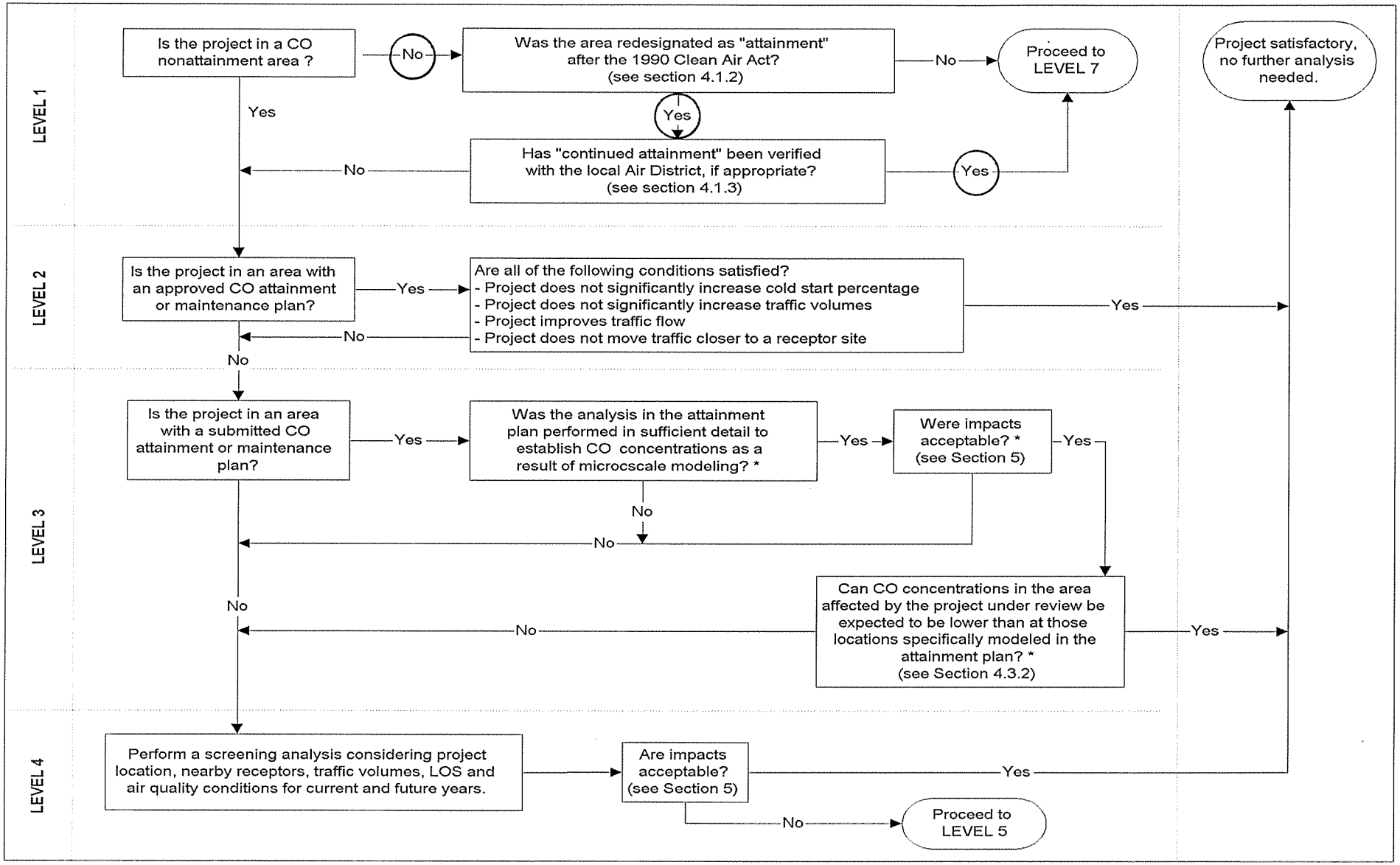

Figure 3. Local CO Analysis

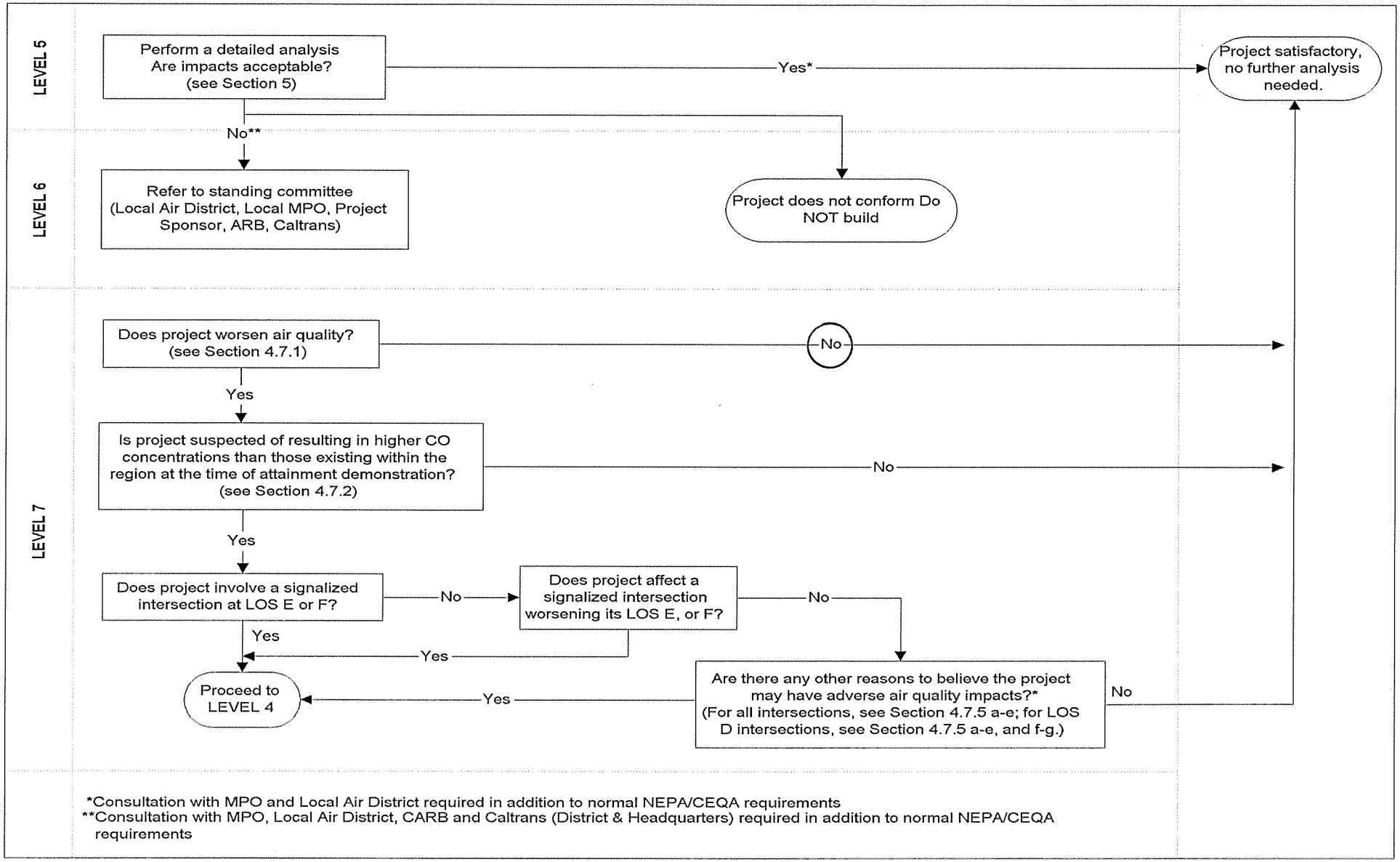

Figure 3 (cont.). Local CO Analysis

Appendix B Experience and Preparers

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TUNG-CHEN CHUNG, PH.D.

PRINCIPAL/
DIRECTOR OF ACOUSTICAL AND AIR QUALITY SERVICES

EXPERTISE

Community and Transportation Noise Studies
Room Acoustics Design and Analysis
Interior Noise and Vibration Isolation Studies
Air Quality Studies
Expert Witness Testimony

EDUCATION

University of California, Los Angeles, Ph.D., Mechanical Engineering, 1991.
University of California, Los Angeles, Engineer Degree in Mechanical Engineering, 1985.
University of Mississippi, Oxford, MS, Mechanical Engineering, 1981.
National Tsing-Hua University, Taiwan, BS, Mechanical Engineering, 1978.
University of California, Irvine, Business Development Techniques for High Value Contracts, 1994.
University of California, Irvine, UAM Regional Air Quality Modeling, 1992.
University of Louisville, Kentucky, FHWA Highway Noise Analysis Certificate, 1990.
BBN/San Francisco, Noise Control for Building and Manufacturing Plants Certificate, 1987.

PROFESSIONAL REGISTRATIONS/AFFILIATIONS

Institute of Noise Control Engineering, Board Certified Member
Certified Acoustical Consultant, County of Orange
Certified Acoustical Consultant, County of San Diego
American Physics Society
Acoustical Society of America
S.C. Chinese-American Environmental Protection Association

PROFESSIONAL EXPERIENCE

Director of Acoustical and Air Quality Services, LSA Associates, Inc., Environmental Planning and Traffic Engineering, Irvine, California, 1997–present.

Director of Technical Services, The Planning Center, Planning and Environmental Impact Report Consultants, Newport Beach, California, 1995–1997.

Section Manager, MBA, Environmental and Planning Consultants, Santa Ana/Irvine, California, 1989–1995. Manager for acoustic and air quality analysis.

Acoustical Specialist, County of Orange Environmental Management Agency, 1989.

Smith, Fause & Associates, Inc., Acoustical Consulting, Project Manager, 1986–1989.

PRINCIPAL PROFESSIONAL RESPONSIBILITIES

Dr. Chung performed more than 750 California Environmental Quality Act/National Environmental Policy Act- (CEQA/NEPA) related and stand-alone noise studies for community and transportation noise analyses, including field measurement, modeling, and data analysis. Typical noise analysis includes construction, vehicular traffic, and long-term stationary-source operations. Others include rail, airport, and shooting range noise impact analysis.

Dr. Chung performed more than 550 air quality studies for projects such as transportation facilities, landfills, office buildings, and ocean bay enhancement/sediment management projects.

Dr. Chung completed the design and analysis of architectural room acoustics (interior configuration and absorption required for proper room use) for more than 20 theaters, studios, workshop places, and convention centers.

Dr. Chung performed more than 60 acoustical analyses on building interior sound and vibration isolation for hospitals, apartment complexes, office buildings, performing arts centers, schools, etc., throughout the United States.

PUBLICATIONS/PRESENTATIONS

Noise Standards, Control, and Market Outlook, Chinese American Professional Society Technical Conference, Environmental Forum, September 7, 1996.

Noise Impacts on People and Wildlife and Governmental Regulations. University of Southern California Environmental Engineering Seminar Guest Speaker, January 31, 1994.

Noise and the Environment—Impacts and Regulations, Chinese American Professional Society Annual Conference, Environmental Forum, June 23, 1993.

Defect of the Kolmogorov Power Laws for Turbulence Using the Wiener-Hermite Expansion, PhD dissertation, December 1991.

Defect of the Five-Thirds Law Using the Wiener-Hermite Expansion, *Journal of Statistical Physics,* Volume 55, June 1989.

PROFESSIONAL EXPERIENCE

Freeway/Highway Project Experience

State Route 91 (SR-91) High-Occupancy Vehicle (HOV) Lane Addition, Caltrans District 12, Orange/Los Angeles County, CA. Dr. Chung conducted a noise impact analysis for this project along SR-91 between Interstate 605 (I-605) and State Route 57 (SR-57). Numerous noise measurements and model calibrations were conducted. Soundwalls were identified for sections of the freeway to mitigate anticipated noise level increases associated with the proposed project.

State Route 18 (SR-18)/Big Bear Bridge Improvements, Caltrans District 8, San Bernardino, CA. Dr. Chung conducted a noise impact analysis for the Big Bear Bridge Relocation project. Noise impacts on the cabins adjacent to SR-18, associated with vehicular traffic on the relocated SR-18, were assessed. Mitigation measures were identified to reduce the long-term impacts to less than significant levels.

State Route 15 (SR-15)/Parks Project, Caltrans District 11, San Diego, CA. Dr. Chung conducted air quality and noise impact analyses for the City of San Diego's proposed parks along SR-15. Air pollutant emissions were calculated, and noise levels were projected. Mitigation measures were identified for both air quality and noise impacts.

Interstate 15 (I-15)/Hook Avenue Interchange, City of Victorville, CA. Dr. Chung conducted a noise impact study, including ambient noise monitoring, and vehicular traffic noise analyses, for both freeway traffic and traffic along Hook Avenue. A soundwall was recommended for certain areas along I-15 to mitigate the noise impacts on existing residences. No significant noise impact was found along Hook Avenue.

I-5/Downey Residence Vibration Impact Assessment, Caltrans, Downey, CA. Dr. Chung conducted a vibration impact analysis at a Downey residence whose property line abutted Caltrans right-of-way along I-5. Vibration due to heavy truck passby on I-5 generated measurable ground vibration within the residence. Mitigation measures were identified for the vibration impacts identified.

Orange County Bus System Improvement Project, Orange County Transportation Authority, (OCTA) Orange County, CA. Dr. Chung conducted noise and air quality impact studies for proposed OCTA service changes. Noise and air quality impacts from the proposed changes were examined and potential impacts were identified. Feasible mitigation measures were identified for the proposed project.

Santa Clara County Congestion Management Program Environmental Impact Report (EIR), Santa Clara County Transportation Commission, Santa Clara County, CA. Dr. Chung conducted a noise and air quality impact analysis for this proposed congestion management program. Potential air quality and noise impacts were examined. Feasible mitigation measures were identified.

Newport Arches Bridge Improvement Project, City of Newport Beach, CA. Dr. Chung prepared a noise impact study for a bridge-widening project on Newport Boulevard over Pacific Coast Highway. Vehicular traffic noise was assessed with the SOUND32 noise program, a Caltrans version of the FHWA Highway Traffic Noise Prediction Model. A soundwall was recommended at several locations along Newport Boulevard to mitigate anticipated traffic noise level increases due to travel lanes being moved closer to the existing residences along Newport Boulevard. Mitigation measures were also recommended during the construction phase to minimize the construction noise impacts.

Beverly Boulevard Widening, County of Los Angeles Department of Public Works, Montebello, CA. Dr. Chung conducted noise monitoring and modeling for this proposed widening project. Impacts and feasible mitigation measures were identified for the proposed project.

Fremont Avenue Widening, County of Los Angeles Department of Public Works, Alhambra, CA. Dr. Chung conducted noise monitoring and modeling for this proposed

widening project. Impacts and feasible mitigation measures were identified for the proposed project.

Almansor Street Widening, County of Los Angeles Department of Public Works, Alhambra, CA. Dr. Chung conducted noise monitoring and modeling for this proposed widening project. Impacts and feasible mitigation measures were identified for the proposed project.

Trask Avenue Widening, City of Garden Grove, CA. Dr. Chung conducted air quality analysis, noise monitoring, and modeling for this proposed widening project. Impacts and feasible mitigation measures, including soundwalls and building facade upgrades, were identified.

Fairview Street Widening, Cities of Santa Ana and Garden Grove, Orange County, CA. Dr. Chung conducted air quality analysis and noise monitoring and modeling for this proposed widening project. Impacts and feasible mitigation measures, including soundwalls and building facade upgrades, were identified for the proposed project.

El Camino Real Widening, City of Tustin, CA. The City of Tustin planned to widen a portion of El Camino Real along I-5. Dr. Chung conducted air quality analysis, noise monitoring, and modeling for the proposed widening. Impacts and feasible mitigation measures, including soundwalls and building facade upgrades, were identified for the proposed project.

Antonio Parkway, County of Orange, CA. The County of Orange planned to extend Antonio Parkway south of Oso Parkway to the Ortega Highway through the proposed new community of Las Flores. Dr. Chung conducted an air quality analysis and noise monitoring and modeling for the proposed new road. Impacts and feasible mitigation measures, including soundwalls and building facade upgrades, were identified for the proposed project.

Tustin Ranch Road and Bridge Improvements, City of Tustin, CA. The City of Tustin planned to widen a portion of Tustin Ranch Road and the bridge over railroad tracks and flood control channel within the City's boundary. Dr. Chung conducted an air quality analysis, noise monitoring, and modeling for the proposed improvements. Impacts and feasible mitigation measures, including soundwalls and building facade upgrades, were identified for the proposed project.

Mid-Valley Parkway, Riverside County Transportation Commission, Riverside County, CA. The Riverside County Transportation Commission planned to construct/widen a major highway, Mid-Valley Parkway, through the cities of Palm Springs, Rancho Mirage, Cathedral City, and Palm Desert. Dr. Chung conducted an air quality analysis as well as noise monitoring and modeling for the proposed widening. Impacts and feasible mitigation measures, including soundwalls and building facade upgrades, were identified for the proposed project.

Carlsbad Boulevard Widening, City of Carlsbad, CA. Dr. Chung conducted an air quality analysis, noise monitoring, and modeling for this proposed widening/extension project. Impacts and feasible mitigation measures, including soundwalls and building facade upgrades, were identified for the proposed project.

KEITH ANDREW LAY

ASSOCIATE

EXPERTISE

Noise and Air Quality Analysis

EDUCATION

University of Manitoba, B.S., Civil Engineering (Transportation and Environmental Engineering emphasis), 1998.

PROFESSIONAL EXPERIENCE

Associate, LSA Associates, Inc., Irvine, California, February 2003–present.

Assistant Engineer, LSA Associates, Inc., May 2000–February 2003.

Technical Officer, National Research Council of Canada, 1999–2000.

Intern, National Research Council of Canada, 1998–1999.

Technical Officer, Manitoba Government Services, 1997.

PRINCIPAL PROFESSIONAL RESPONSIBILITIES

Mr. Lay is an Associate and Air Quality/Noise Specialist, a part of LSA's environmental technical staff. Mr. Lay is primarily responsible for the preparation of air quality and noise studies. Since joining LSA in 2000, Mr. Lay has conducted air quality and noise studies for a variety of transportation projects, in accordance with procedures specified in the California Department of Transportation (Caltrans) protocols and guidelines. He has specific expertise in the use of both the CALINE4 carbon monoxide dispersion model and the SOUND32 noise model.

RECENT PROJECT EXPERIENCE

Interstate 5 (I-5) High-Occupancy Vehicle (HOV)/Truck Lanes Project, Santa Clarita, CA. Mr. Lay prepared an air quality analysis for the I-5 HOV/Truck Lanes Project. The project segment of I-5 crosses the City of Santa Clarita, the unincorporated community of Castaic, and other parts of unincorporated northern Los Angeles County. The analysis consisted of evaluating two build alternatives to extend the HOV lanes on I-5 from the State Route 14 (SR-14) interchange to just south of the Parker Road/I-5 interchange, incorporating truck climbing lanes from the SR-14 interchange to Pico Canyon Road/Lyons Avenue, and constructing and/or extending auxiliary lanes between intersections at six locations.

State Route 60 (SR-60)/Lemon Avenue Interchange Project, Diamond Bar, CA. Mr. Lay prepared air quality analysis for the SR-60/Lemon Avenue Interchange Project in the City of Diamond Bar. The analysis consisted of evaluating three build alternatives to construct a new interchange on SR-60 at Lemon Avenue.

I-5 Widening (State Route [SR-91] to Interstate 605 [I-605]) Environmental Impact Report/Environmental Impact Statement (EIR/EIS), Orange County, CA. Mr. Lay assisted in the preparation of the air quality analysis for the I-5 Corridor Improvement Project (SR-91 to I-605). The purpose of this analysis was to evaluate the potential short-term construction and long-term operation impacts associated with widening I-5 from 6 lanes to 10 or 12 lanes.

SR-91 Eastbound Lane Addition Project, Orange and Riverside Counties, CA. LSA worked with the Orange County Transportation Authority (OCTA) and Caltrans to add an additional lane to eastbound SR-91 between State Route 241 (SR-241) and State Route 71 (SR-71).Mr. Lay assisted in updating the air quality analysis and preparing the air quality section of the environmental document.

Cherry Avenue/Interstate 10 (I-10) Interchange, Fontana, CA. Mr. Lay conducted air quality and noise impact analyses as part of the necessary environmental compliance documents for the improvements to the Cherry Avenue/I-10 interchange project. This project is a cooperative study to evaluate alternatives for widening the Cherry Avenue/I-10 overcrossing and modifying the ramp connections.

Citrus Avenue/I-10 Interchange, Fontana, CA. Mr. Lay conducted air quality and noise impact analyses as part of the environmental services for improvements to the Citrus Avenue/I-10 Interchange project in the City of Fontana. Improvements will consist of widening the Citrus Avenue overcrossing to three through lanes in each direction with two left-turn lanes to the I-10 on-ramps.

I-10 Median Widening, Redlands, CA. Mr. Lay assisted in preparing the air quality and noise impact analyses for the I-10 widening project in the City of Redlands. Improvements will consist of widening the freeway from six to eight lanes by adding one mixed-flow lane in the median in each direction.

Interstate 215 (I-215) Widening/Reconstruction Segment 1, San Bernardino, CA. Mr. Lay conducted a noise impact analysis for the proposed highway widening and reconstruction of I-215 in the City of San Bernardino. The purpose of the project is to improve the existing conditions by upgrading I-215 to current design standards by providing increased weaving distances, eliminating the existing "left-on" and "left-off" ramps, and increasing the capacity of I-215 through the use of HOV lanes in both northbound and southbound directions.

Community and Environmental Transportation Acceptability Process (CETAP) Riverside/Orange County Corridor, Riverside, CA. The technical studies were prepared in support of the overall environmental impact analyses for the comparison of alternative routes to be evaluated with the objective of preserving rights-of-way for two major transportation corridors in western Riverside County, California. Mr. Lay assisted in the preparation of the air quality and noise impact analyses.