

# *Appendices*

---

## *Appendix A*

### *Supplemental Information Regarding The Robertson's Ready Mix Site*



# *Appendices*

---

*This page intentionally left blank*



## Memorandum

**Date:** May 10, 2004

**To:** Jonathan Borrego, Principal Planner  
City of Anaheim

**From:** William Halligan, Esq.

**Subject:** Additional analysis relating to the Robertson's Ready Mix Site

**Project No.:** COA-06.0G

*Governmental Services*  
*Planning & Urban Design*  
*Environmental Studies*  
*Landscape Architecture*

1580 Metro Drive  
Costa Mesa, CA 92626  
Phone: 714.966.9220  
Fax: 714.966.9221  
costamesa@planningcenter.com

Pursuant to your request, The Planning Center has prepared additional analysis relating to the potential revised land use designation for the Robertson's Ready Mix site located adjacent to the Mountain Park Specific Plan area. Since release of the Draft EIR, the City is considering retaining a residential designation on an approximate 15-acre portion of the Cypress Canyon Specific Plan area (hereinafter referred to as the "Robertson's Ready Mix site") instead of redesignating it for Open Space uses. The proposed residential designation would be Low Medium Density Residential with a maximum development of 140 dwelling units, consistent with the previously adopted Cypress Canyon Specific Plan. The proposed zoning designation would be RM-3 which is consistent with the underlying RM-2400 Zone for the property per the Cypress Canyon Specific Plan. The following analysis was prepared to determine if there would be any new significant environmental impacts associated with the proposed change to the General Plan Land Use Map and Zoning designation.

### **Aesthetics**

The site has been subject to ongoing sand and gravel extraction activities for over 25 years. As a result, the site is highly impacted and does not exhibit any substantial aesthetic value. The proposed Low Medium Density Residential designation will allow for the reclamation of the subject site and introduction of landscaping. As a result, no new significant environmental impacts are associated with the proposed land use change and no changes to the analysis contained in the Draft EIR are necessary.

### **Air Quality**

In order to determine if any significant air quality impacts were associated with the change in Land Use designations for the Robertson's Ready Mix site, additional air quality analysis was completed using the URBEMIS 2002 computer model developed by the California Air Resources Board (CARB). The results of the analysis are as follows:

**PROJECTED EMISSIONS ASSOCIATED  
WITH THE REDESIGNATION OF THE  
ROBERTSON'S READY MIX SITE**

<i>Source</i>	<i>Pollutants (lb/day)</i>				
	<i>CO</i>	<i>NO<sub>x</sub></i>	<i>ROG</i>	<i>SO<sub>x</sub></i>	<i>PM<sub>10</sub></i>
<b>Area Sources</b>					
Single-family Residential (140 du's)	2.45	1.78	7.18	0.05	0.01
<b>Mobile Sources</b>					
Single-family Residential (140 du's)	207.13	18.09	16.95	0.16	14.35
<b>Total Daily Emissions</b>	<b>209.59</b>	<b>19.87</b>	<b>24.13</b>	<b>0.21</b>	<b>14.36</b>
<b>SCAQMD Threshold</b>	<b>550</b>	<b>55</b>	<b>55</b>	<b>150</b>	<b>150</b>
<b>Exceed Threshold</b>	<b>No</b>	<b>No</b>	<b>No</b>	<b>No</b>	<b>No</b>

As shown on the previous table, no new significant air quality impacts are associated with the proposed change to the Land Use designation for the Robertson's Ready Mix site. The projected pollutant increases associated with the proposed Land Use change are well below the adopted thresholds of significance used by the South Coast Air Quality Management District (SCAQMD). As a result, no new significant impacts are anticipated and no changes to the analysis contained in the Draft EIR are necessary.

**Cultural Resources**

The site has been subject to ongoing sand and gravel extraction activities for over 25 years. As a result, the site is highly impacted and has been subject to extensive landform modification. As a result, it is unlikely that any archaeological or paleontological resources exist on-site. As a result, no new significant environmental impacts are associated with the proposed land use change and no changes to the analysis contained in the Draft EIR are necessary.

**Geology and Soils**

Section 5.5 of the Draft EIR describes the general geologic constraints present within the City of Anaheim. The geologic conditions on the Robertson's Ready Mix site are similar to other residential areas located within the Hill and Canyon Area of the City and are described in sufficient detail for the proposed General Plan and Zoning Code Update. As a result, no new significant environmental impacts are associated with the proposed land use change and no changes to the analysis contained in the Draft EIR are necessary. However, it should be noted that a project specific geotechnical study would be required prior to any development on the subject site.

**Hazards and Hazardous Materials**

Section 5.6 of the Draft EIR describes the general hazard conditions present within the City of Anaheim. The hazards and hazardous materials conditions on the Robertson's Ready Mix site are similar to other residential areas located within the Hill and Canyon Area of the City and are described in sufficient detail for the proposed General Plan and Zoning Code Update. As a result, no new significant environmental impacts are associated with the proposed land use change and no changes to the analysis contained in the Draft EIR are necessary. However, it should be noted that a project specific Phase 1 Site Assessment would be required prior to any development on the subject site.

## **Hydrology and Water Quality**

Section 5.7 of the Draft EIR describes the general hydrologic conditions present within the City of Anaheim. The hydrologic conditions on the Robertson's Ready Mix site are similar to other residential areas located within the Hill and Canyon Area of the City and are described in sufficient detail for the proposed General Plan and Zoning Code Update. As a result, no new significant environmental impacts are associated with the proposed land use change and no changes to the analysis contained in the Draft EIR are necessary. However, it should be noted that a project specific hydrology study would be required prior to any development on the subject site.

## **Land Use and Relevant Planning**

The proposed Land Use designation and density for the subject site is consistent with the current land use designation and Cypress Canyon Specific Plan density for the site. It would also be consistent with the proposed residential land uses within the Mountain Park Specific Plan area located west of the site. As a result, no new significant environmental impacts are associated with the proposed land use change and no changes to the analysis contained in the Draft EIR are necessary.

## **Mineral Resources**

As described in 5.9 of the Draft EIR and shown on Figure 5.9-1, the subject site is designated as "MRZ-2" Mineral Resource Zone (MRZ) Aggregate Resources Only. However, as described in the Draft EIR, these areas are scheduled for closure in December 2004, therefore, the proposed land use designations would not conflict with the operation of these mines. The minerals are substantially depleted and those that remain can no longer be extracted in an economically feasible manner. As a result, no new significant environmental impacts are associated with the proposed land use change and no changes to the analysis contained in the Draft EIR are necessary.

## **Noise**

Primary access to the site would be Santa Ana Canyon Road. In the vicinity of the Robertson's Ready Mix site, Santa Ana Canyon Road is projected to carry approximately 8,000 cars per day. The 140 additional residential units would generate an additional 1,400 cars per day, thereby increasing traffic on Santa Ana Canyon Road in the project vicinity by a maximum of 17.5 percent. The resulting noise increase would be approximately 0.7 dB. Since noise increases of less than 3 dB are generally not detectable to the human ear, the potential noise increases are not considered significant. In addition, the noise environment in the subject area is dominated by the SR-91 and SR-241 Freeways and would not be altered by the addition of 1,400 vehicle trips. As a result, no new significant environmental impacts are associated with the proposed land use change and no changes to the analysis contained in the Draft EIR are necessary.

## **Police and Fire**

As shown on Table 4.3-1 of the Draft EIR, future development pursuant to the General Plan and Zoning Code Update could result in a maximum of 27,373 additional dwelling units at buildout. The additional 140 units associated with the Robertson's Ready Mix site represents an increase 0.5 percent. This does not represent a significant increase and would not change the conclusions contained in the Draft EIR. As a result, no new significant environmental impacts are associated with the proposed land use change and no changes to the analysis contained in the Draft EIR are necessary.

## **Population and Housing**

As shown on Table 4.3-1 of the Draft EIR, future development pursuant to the General Plan and Zoning Code Update could result in a maximum of 27,373 additional dwelling units at buildout. The additional

140 units associated with the Robertson's Ready Mix site represents an increase 0.5 percent. This does not represent a significant increase and would not change the conclusions contained in the Draft EIR. In addition, this increase in residential units would improve the City's overall jobs/housing balance consistent with regional jobs/housing goals. As a result, no new significant environmental impacts are associated with the proposed land use change and no changes to the analysis contained in the Draft EIR are necessary.

### **Public Services and Facilities**

As shown on Table 4.3-1 of the Draft EIR, future development pursuant to the General Plan and Zoning Code Update could result in a maximum of 27,373 additional dwelling units at buildout. The additional 140 units associated with the Robertson's Ready Mix site represents an increase of 0.5 percent. This does not represent a significant increase and would not change the conclusions contained in the Draft EIR. As a result, no new significant environmental impacts are associated with the proposed land use change and no changes to the analysis contained in the Draft EIR are necessary.

### **Traffic and Circulation**

The City's traffic consultant, Parsons Brinkerhoff Quade & Douglas, Inc., evaluated the traffic impacts associated with the additional 140 units on the Robertson's Ready Mix site. Using the conservative assumption that these would all be single-family dwelling units, such a development would generate 1400 total daily trips, 84 outbound and 21 inbound trips in the AM peak hour, and 43 outbound and 77 inbound trips in the PM peak hour.

The addition of this amount of housing to the General Plan in this area would not create any significant adverse traffic impacts. The intersections which would be most affected by traffic from such a development (the intersections of Gypsum Canyon Road with Santa Ana Canyon Road and SR-91) would remain at peak hour LOS B with the additional traffic. As a result, no new significant environmental impacts are associated with the proposed land use change and no changes to the analysis contained in the Draft EIR are necessary.

### **CONCLUSIONS**

As described above, no new significant environmental impacts are associated with the proposed land use change for the Robertson's Ready Mix site and no changes to the analysis contained in the Draft EIR are necessary.

*Appendices*

---

*Appendix B*

*City of Anaheim Amendments to the MPAH Technical  
Analysis Report*



# *Appendices*

---

*This page intentionally left blank*



**CITY OF ANAHEIM  
AMENDMENTS TO THE ORANGE COUNTY  
MASTER PLAN OF ARTERIAL HIGHWAYS**

**SUPPLEMENTAL REPORT**

**CITY OF ANAHEIM AMENDMENTS TO THE ORANGE  
COUNTY MASTER PLAN OF ARTERIAL HIGHWAYS**

**TECHNICAL ANALYSIS REPORT**

Submitted to:

**Orange County Transportation Authority**

Prepared for:

**City of Anaheim**

Prepared by:

**Parsons Brinckerhoff Quade & Douglas, Inc.**

**March 25, 2004**

## **INTRODUCTION**

As part of its General Plan update, the City of Anaheim has identified several circulation system changes to its long-term roadway master plan. Since some of these changes affect roadways on the current Orange County Master Plan of Arterial Highways (MPAH), the City requested the Orange County Transportation Authority (OCTA) to initiate a cooperative process to evaluate the impact of these changes and amend the MPAH. This report presents the technical evaluation of these changes.

This report first presents the proposed MPAH amendments, then the technical assumptions and methodology, followed by the evaluation of impacts, and recommended mitigation measures.

## **PROPOSED MPAH AMENDMENTS**

The proposed MPAH amendments fall into two categories:

1. administrative changes to eliminate roads which no longer serve an MPAH function due to recent freeway access changes; and
2. substantive changes to the MPAH roadways in terms of classification change or elimination from the MPAH. These changes fall into three categories: (1) changes to individual streets in the portion of Anaheim west of SR-55 to better reflect current circulation needs; (2) changes to Fairmont Boulevard and Santa Ana Canyon Road in the portion of Anaheim between SR-55 and Weir Canyon Road; and (3) changes in the portion of Anaheim east of Weir Canyon Road associated with updated development plans in Coal Canyon and for the Mountain Park development in Gypsum Canyon. The technical evaluation in this study addresses the traffic impacts of these changes.

### **Administrative Changes**

Three MPAH amendments are associated with recent freeway access improvements through the City of Anaheim.

- Remove Loara Street on the north side of I-5 from the MPAH. This segment of Loara Street is on the MPAH because there used to be an offramp from northbound I-5 onto Loara Street. The I-5 improvement project relocated this offramp to Euclid Avenue, so Loara Street no longer serves an MPAH function.
- Remove Crescent Street from the MPAH between Loara Street and I-5, and between I-5 and Brookhurst Street. Plans for a Crescent Street overcrossing were abandoned with the I-5 widening project, so with the removal of Loara Street these segments of Crescent Street no longer serve an MPAH function.
- Remove Commercial Street east of Lemon Street from the MPAH. This segment of Commercial Street is on the MPAH because there used to be an onramp from Commercial Street to eastbound SR-91. The SR-91 improvement project relocated this onramp to Lemon Street, so Commercial Street no longer serves an MPAH function.

### **Changes in Western Anaheim**

Figure 1 shows the locations of proposed MPAH amendments in all three areas of the City, and summarizes the proposed amendments in tabular form. The three proposed amendments in the western portion of Anaheim are highlighted in purple, and are described below:

- Remove Gilbert Street from the MPAH between Crescent Street and Lincoln Avenue. Gilbert Street is a two-lane collector street, and the General Plan update determined that this portion of Gilbert Street should be closed to through traffic to support a planned recreational center, and that this closure would not create significant adverse impacts on Magnolia Avenue and Brookhurst Street.
- Realign Lewis Street south of Katella Avenue to connect with Gene Autry Drive rather than with Anaheim Way and reclassify Lewis Street from Primary to Secondary in this segment. The General Plan update determined that north-south vehicle circulation through this area would be more efficient with the realignment, and a Secondary classification is appropriate to accommodate the forecast traffic volumes.
- Reclassify State College Boulevard between Lincoln Avenue and SR-91 from Primary to Major. The General Plan update determined that this portion of State College will require six lanes to accommodate the forecast traffic volumes.

### **Changes between SR-55 and Weir Canyon Road**

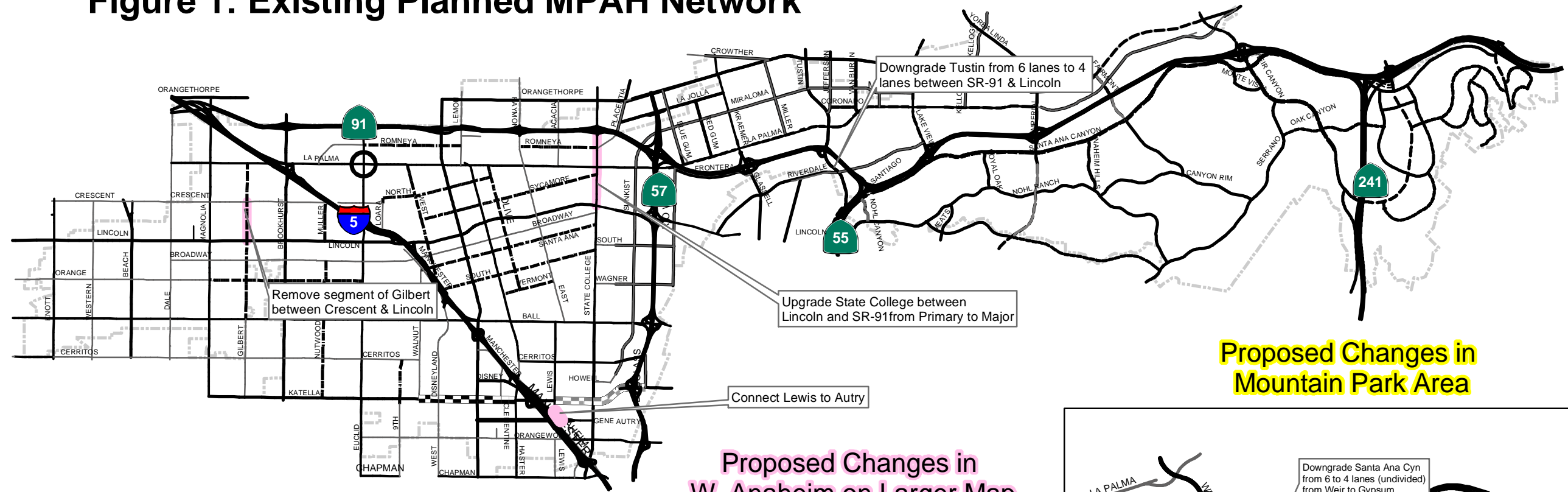
The General Plan update determined that the planned Fairmont Boulevard overcrossing of SR-91 should be removed from the long-term plan, and that Santa Ana Canyon Road would need only four lanes of capacity in certain segments in the future. The proposed MPAH changes are shown in green in Figure 1 and described below:

- Remove the Fairmont Boulevard overcrossing of SR-91 from the MPAH (between La Palma Avenue and Santa Ana Canyon Road) but retain the segment from La Palma Avenue to SR-91 as right-of-way reserve pending further evaluation of needs in the upcoming SR-91 Major Corridor Study. The planned freeway overcrossing is not needed to enhance circulation in this area, but the MCS will study corridor improvement options including a potential interchange at this location connecting with Fairmont Boulevard on the north side of SR-91.
- Reclassify Santa Ana Canyon Road from Major to Primary between Lincoln Avenue and Lakeview Avenue, and between Imperial Highway and Festival Drive.

### **Changes in the Mountain Park area**

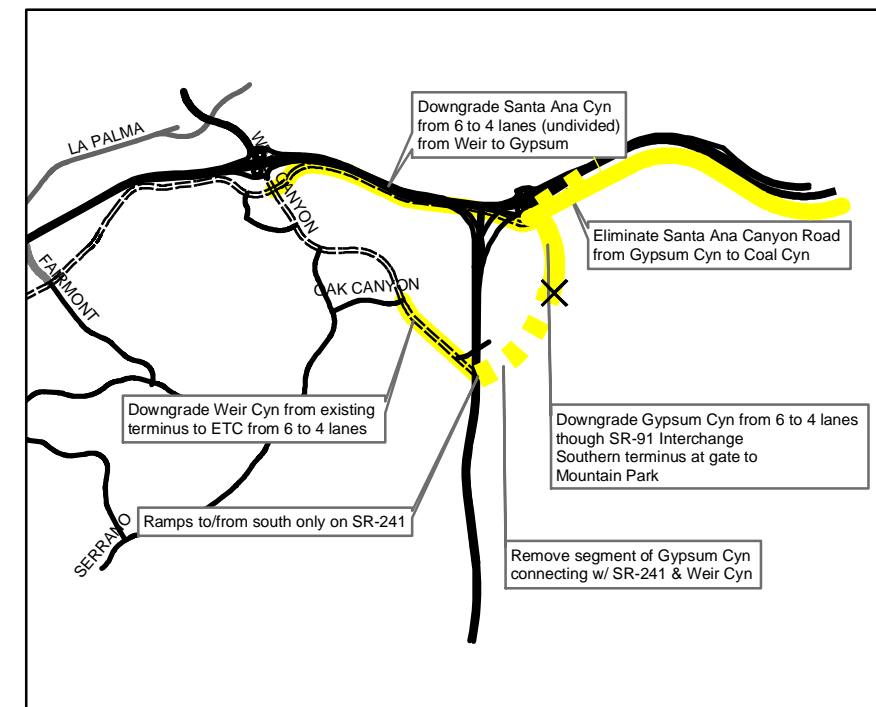
Since the previous General Plan update, development plans for the far eastern areas of Anaheim (Gypsum Canyon and Coal Canyon) have been substantially scaled down. Coal Canyon is now planned to remain as open space, and the Mountain Park development planned for Gypsum Canyon includes much less development than previously envisioned. There are several changes to the planned roadway system which accompany these updated land use plans. The proposed MPAH changes are shown in yellow on Figure 1 and described below:

# Figure 1: Existing Planned MPAH Network

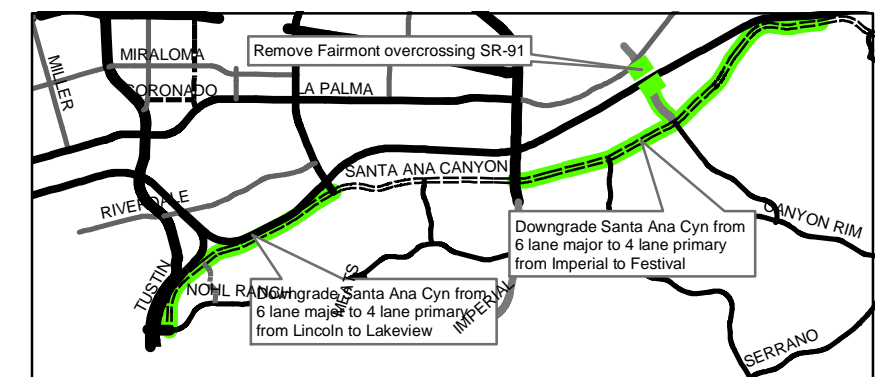


Proposed Changes in W. Anaheim on Larger Map

Proposed Changes in Mountain Park Area



Proposed Changes in Santa Ana Cyn Area



## Description of Proposed MPAH Amendments

Roadway	Current MPAH	Proposed MPAH
Gilbert St: Crescent to Lincoln	yes	no
State College: Lincoln to 91	Primary	major - 6 lanes*
Lewis St: connect to Autry	no	yes
Fairmont overcrossing SR -91	yes	no
Santa Ana Cyn Rd: Imperial to Festival Drive	Major	Primary
Santa Ana Cyn Rd: Lincoln to Lakeview	Major	Primary
Santa Ana Cyn Rd: Weir Cyn to Gypsum Cyn	Major	Primary - 4 lanes (undivided)
Santa Ana Cyn Rd: Gypsum Cyn to Coal Cyn	Secondary	no
Gypsum Cyn: Santa Ana Cyn Rd through SR-91 interchange	Major	Primary
Gypsum Cyn: 241 to Santa Ana Cyn Rd	Major	no
Weir Cyn: from existing terminus to ETC	Major	Primary

- Reclassify Santa Ana Canyon from Major to Primary (undivided) from Weir Canyon Road to Gypsum Canyon Road. With the planned land use changes this segment of Santa Ana Canyon Road no longer requires six lanes, and a four-lane undivided roadway is appropriate because the topography constrains the opportunity for a full Primary right-of-way and left turn lanes will only be needed at selected locations (for access to existing residential streets, the existing church and the planned fire station).
- Remove Santa Ana Canyon Road from the MPAH between Gypsum Canyon Road and Coal Canyon Road. The closure of the Coal Canyon interchange and the designation of Coal Canyon as open space eliminate any need for constructing this segment of Santa Ana Canyon Road.
- Reclassify Gypsum Canyon Road from Major to Primary from Santa Ana Canyon Road through the SR-91 interchange. The downscaling of development planned for Mountain Park will result in less traffic demand through this interchange.
- Remove Gypsum Canyon Road from the MPAH between SR-241 and the entrance to the Mountain Park development south of Santa Ana Canyon Road. The downscaling of development planned for Mountain Park will remove the need for an arterial street through this area. Roads through the Mountain Park area will be private roads.
- Reclassify Weir Canyon road from Major to Primary between Oak Canyon Drive and SR-241. The downscaling of development planned for Mountain Park and the removal of the Jamboree Road extension (from Santiago Canyon Road to Weir Canyon Road) from the MPAH (now being proposed by the City of Orange in cooperation with OCTA) will reduce the future traffic demand on this segment of Weir Canyon Road. With the deletion of planned Gypsum Canyon Road east of SR-241, Weir Canyon Road will terminate at the interchange with SR-241. This interchange is planned to have ramps to/from the south only, due to geometric constraints.

## **METHODOLOGY**

The effects of the proposed MPAH amendments are analyzed under long-term conditions, assuming full buildout of development in accordance with the City of Anaheim’s updated General Plan Land Use Element. Key components and assumptions of the analysis are summarized below.

### **Traffic Model**

- Traffic forecasts were prepared using the Anaheim Traffic Analysis Model (ATAM), which OCTA has determined to be consistent with the Orange County Transportation Analysis Model (OCTAM).

### **Land Use and Roadway Network Scenarios**

- Three scenarios were evaluated:
  - 1 Land use is Existing Anaheim General Plan Buildout in City of Anaheim, OCTAM 2025 elsewhere; existing MPAH network

- 2A Proposed Anaheim General Plan Buildout in City of Anaheim, OCTAM 2025 elsewhere; proposed MPAH network with Jamboree
- 2B Proposed Anaheim General Plan Buildout in City of Anaheim, OCTAM 2025 elsewhere; proposed MPAH network with proposed East Orange network and land use and without Jamboree

### **Intersection Level of Service Calculation Methodology**

- Intersection Capacity Utilization method consistent with OCTA guidelines. Lane capacity of 1700 vehicles per hour, v/c adjustment of 0.05 for clearance interval.

### **Study Area Intersections**

- Peak hour level of service (LOS) forecasts were prepared for all signalized intersections in Anaheim. Those affected by the MPAH changes are included in this report. .

### **Level of Service Standards and Thresholds of Significance**

- LOS standard is peak hour intersection LOS D; LOS E at CMP intersections.
- A significant adverse impact occurs if traffic changes due to the MPAH amendments increase the intersection peak hour volume/capacity ratio by 0.02 or more and the resulting LOS is LOS E or F (v/c = 0.91 or higher).

### **Mitigation**

Mitigation measures are recommended for intersections projected to experience significant adverse impacts as a result of the proposed MPAH amendments.

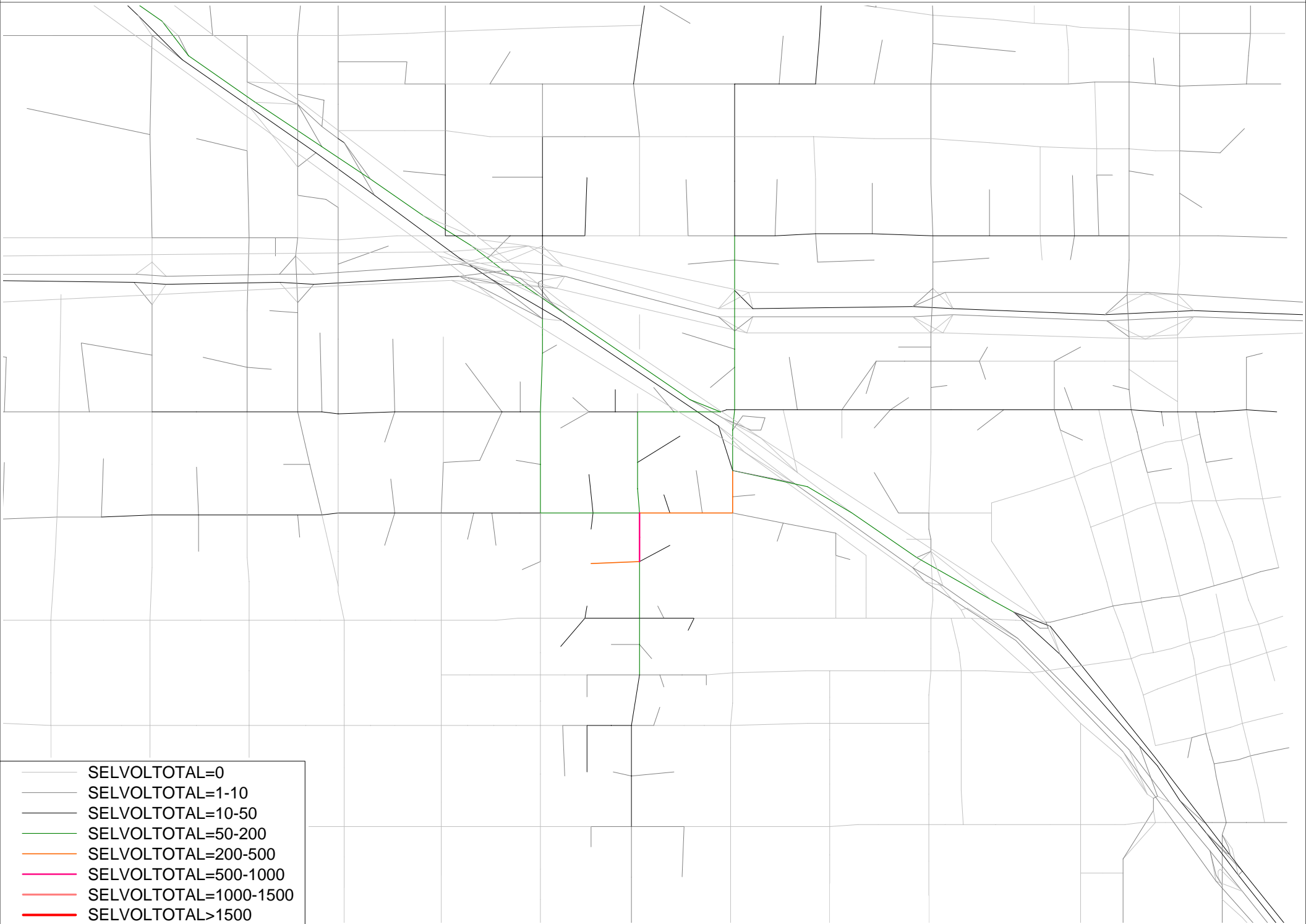
## **EVALUATION OF IMPACTS**

### **Western Anaheim**

The proposed MPAH amendments in western Anaheim include the deletion of Gilbert Street north of Lincoln, the realignment of Lewis Street south of Katella, and the reclassification of State College Boulevard south of SR-91.

Figure 2 presents the results of a select link assignment from ATAM, showing estimated travel paths of existing traffic on the segment of Gilbert Street between Lincoln and Crescent. Most of the trips using Gilbert Street are trips within this portion of Anaheim, though a portion of these trips are using Gilbert Street to travel to/from I-5. Figure 3 presents the ATAM estimate of average daily traffic under Alternative 1 (current General Plan and current MPAH) and Alternative 2B (proposed General Plan with proposed MPAH amendments). Projected volume changes on Magnolia and Brookhurst are minor because Gilbert is not projected to carry a substantial traffic volume. Table 1 summarizes the peak hour v/c and LOS for the six key intersections around this segment. The results show that the peak hour levels of service are within acceptable levels with this change – the worst LOS occurs at Magnolia/Lincoln where the PM peak hour LOS is D.

Figure 2: Gilbert Select Link Volume PM Peak







**Table 1**  
**Peak Hour LOS in Gilbert Street Area**

Intersection	Alternative 1				Alternative 2A				Alternative 2B			
	AM LOS	AM VC	PM LOS	PM VC	AM LOS	AM VC	PM LOS	PM VC	AM LOS	AM VC	PM LOS	PM VC
Magnolia / Crescent	A	0.50	A	0.59	A	0.46	A	0.59	A	0.47	A	0.60
Magnolia / Lincoln	A	0.51	C	0.72	B	0.64	D	0.88	B	0.65	D	0.83
Gilbert / Crescent	A	0.32	A	0.30	A	0.31	A	0.30	A	0.32	A	0.30
Gilbert / Lincoln	A	0.41	A	0.58	A	0.47	B	0.64	A	0.47	B	0.62
Brookhurst / Crescent	C	0.71	C	0.73	C	0.75	B	0.70	B	0.69	C	0.72
Brookhurst / Lincoln	B	0.65	B	0.65	B	0.70	C	0.73	B	0.68	C	0.72

Figure 4 presents ADT for the Lewis Street realignment area. The realignment results in slight decreases along Katella Avenue. Table 2 shows the peak hour LOS at intersections in this area. All intersections are projected to operate at acceptable levels with the change; the worst LOS in this area is at State College/Orangewood with a morning peak hour LOS D.

**Table 2**  
**Peak Hour LOS in the Lewis Street Area**

Intersection	Alternative 1				Alternative 2A				Alternative 2B			
	AM LOS	AM VC	PM LOS	PM VC	AM LOS	AM VC	PM LOS	PM VC	AM LOS	AM VC	PM LOS	PM VC
Anaheim Way / Katella	A	0.56	B	0.69	B	0.63	C	0.73	B	0.61	C	0.73
Lewis / Katella	A	0.49	B	0.66	A	0.48	B	0.70	A	0.48	B	0.70
Anaheim Way/ Orangewood	A	0.43	A	0.60	A	0.36	A	0.49	A	0.36	A	0.48
State College / Katella	D	0.82	D	0.83	C	0.77	C	0.79	C	0.77	C	0.78
State College / Sportstown	A	0.59	A	0.52	A	0.58	A	0.56	A	0.58	A	0.57
State College / Gene Autry	C	0.76	A	0.35	C	0.76	A	0.34	C	0.76	A	0.35
State College / Orangewood	D	0.83	C	0.71	D	0.83	B	0.70	D	0.83	C	0.72

The future ADT for State College Boulevard between Lincoln and SR-91 ranges from about 40,000 to 52,000. This volume exceeds the ADT which can be accommodated by a four-lane primary street, which is approximately 40,000. The six-lane Major classification will be needed in the future to accommodate this traffic volume at acceptable LOS.

**Fairmont Boulevard/Santa Ana Canyon Road**

The proposed MPAH amendments in this portion of Anaheim include the deletion of the planned Fairmont Boulevard overcrossing of SR-91, and classification change on portions of Santa Ana Canyon Road from Major (six lanes) to Primary (four lanes).



Table 3 summarizes the AM and PM peak hour intersection levels of service in this area. With the existing General Plan land use and current MPAH (Alternative 1), three intersections in the area are projected to operate at LOS E or F – Imperial Highway/Nohl Ranch Road, Fairmont Boulevard/Santa Ana Canyon Road, and Imperial Highway/Weir Canyon Road.

**Table 3**  
**Peak Hour LOS in the Fairmont/Santa Ana Canyon Area**

Intersection	Alternative 1				Alternative 2A				Alternative 2B			
	AM LOS	AM VC	PM LOS	PM VC	AM LOS	AM VC	PM LOS	PM VC	AM LOS	AM VC	PM LOS	PM VC
Margarita / Santa Ana Cyn Rd	A	0.45	C	0.78	A	0.39	C	0.74	A	0.40	C	0.72
Imperial Hwy / Orangethorpe	A	0.58	D	0.83	A	0.60	D	0.82	A	0.60	D	0.82
Imperial Hwy / La Palma	C	0.79	D	0.84	D	0.87	C	0.73	D	0.88	C	0.75
Imperial Hwy / SR-91 WB Ramps	B	0.65	B	0.65	B	0.69	C	0.71	B	0.69	B	0.70
Imperial Hwy / SR-91 EB Ramps	C	0.75	D	0.83	B	0.65	C	0.77	B	0.64	C	0.80
Imperial Hwy / Santa Ana Cyn Rd.	C	0.72	D	0.84	D	0.88	F	1.02	E	0.92	E	1.00
Imperial Hwy / Avd. Bernardo	A	0.59	A	0.39	B	0.66	A	0.47	B	0.64	A	0.46
Imperial Hwy / Nohl Ranch Rd.	E	0.91	B	0.69	E	0.94	D	0.81	D	0.85	D	0.84
Imperial Hwy / River Valley Trail	A	0.55	A	0.45	A	0.56	A	0.46	A	0.57	A	0.48
Chrisden / La Palma	A	0.43	A	0.56	A	0.39	A	0.57	A	0.46	A	0.59
Via Cortez / Santa Ana Cyn Rd.	A	0.56	B	0.63	B	0.62	C	0.73	B	0.69	C	0.74
Fairmont / La Palma	A	0.33	A	0.36	A	0.36	A	0.47	A	0.43	A	0.49
Anaheim Hills Rd / Santa Ana Cyn	B	0.61	C	0.78	B	0.69	C	0.76	C	0.78	C	0.78
Anaheim Hills Rd / Nohl Ranch Rd	B	0.61	D	0.85	C	0.74	B	0.67	C	0.76	C	0.77
Canyon Rim / Nohl Ranch Rd	A	0.56	A	0.47	A	0.56	A	0.49	B	0.62	A	0.56
Fairmont / Santa Ana Cyn Rd	D	0.88	F	1.10	A	0.54	A	0.59	A	0.54	B	0.62
Mohler / Santa Ana Cyn	A	0.45	B	0.61	A	0.43	A	0.48	A	0.44	A	0.52
Festival Dr / Santa Ana Cyn	A	0.31	A	0.52	A	0.33	A	0.43	A	0.34	A	0.44
Roosevelt / Santa Ana Cyn	A	0.37	B	0.62	A	0.34	A	0.58	A	0.35	A	0.58
Weir Cyn / La Palma	A	0.58	C	0.75	C	0.77	C	0.73	C	0.78	C	0.73
Weir Cyn / SR-91 WB Ramps	A	0.52	B	0.63	B	0.66	D	0.84	B	0.62	C	0.78
Weir Cyn / SR-91 EB Ramps	A	0.52	C	0.77	C	0.73	E	0.95	C	0.74	E	0.93
Weir Cyn / Santa Ana Cyn Rd	B	0.61	E	0.94	C	0.71	E	0.91	B	0.70	D	0.88
Weir Cyn / Monte Vista	A	0.55	B	0.69	B	0.64	D	0.84	A	0.59	C	0.75
Serrano / Weir Cyn Rd.	B	0.65	A	0.51	C	0.75	B	0.67	C	0.71	A	0.55
Weir Cyn / Oak Cyn Dr	A	0.41	A	0.39	A	0.51	A	0.47	A	0.33	A	0.40
Weir Cyn / SAVI Ranch	C	0.79	C	0.80	C	0.79	D	0.89	C	0.76	D	0.87

The impacts of the MPAH changes are as follows:

- The LOS at Imperial Highway/Nohl Ranch Road is projected to worsen slightly, but the land use and MPAH changes in East Orange will reduce peak traffic through this intersection and bring it to an acceptable level (LOS D).
- The LOS at Fairmont Boulevard/Santa Ana Canyon Road will be reduced to an acceptable level.
- The LOS at Weir Canyon/Santa Ana Canyon Road will be reduced somewhat, and the land use and MPAH changes in East Orange will reduce it to an acceptable level (LOS D).
- The LOS at Imperial Highway/Santa Ana Canyon Road is projected to drop to LOS F; the changes in East Orange reduce the v/c somewhat but this intersection is still projected to operate at LOS E. This intersection would therefore experience a significant adverse traffic impact from the MPAH changes.
- The LOS at Weir Canyon/SR-91 EB ramps is projected to drop to LOS E; the changes in East Orange reduce the v/c somewhat but this intersection is still projected to operate at LOS E. This intersection would therefore experience a significant adverse traffic impact from the MPAH changes.

## Mountain Park area

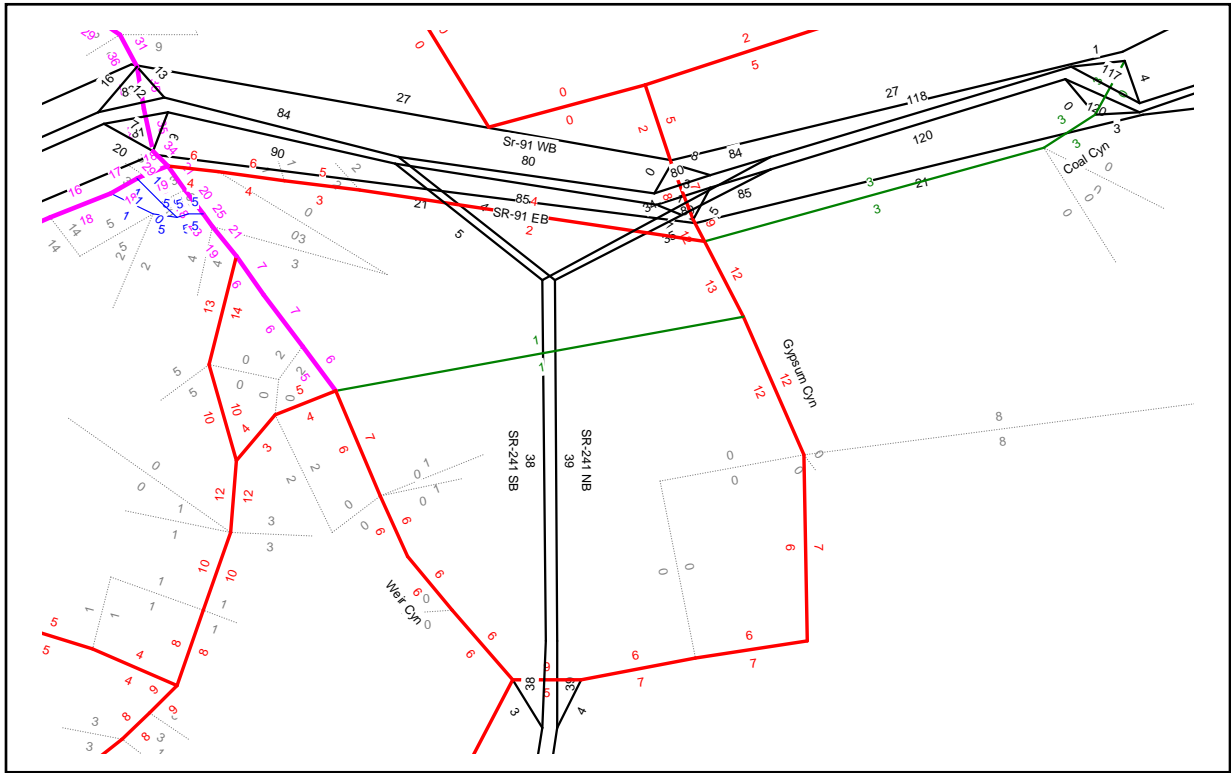
The proposed MPAH changes in this area of Anaheim are associated with the reduction in planned land use intensity in the Gypsum Canyon and Coal Canyon areas. Figure 5 presents the forecast ADT for roads in this area, and Table 4 summarizes the AM and PM peak hour intersection levels of service. The only intersections projected to operate at LOS E or F in any future scenarios are Weir Canyon Road/Santa Ana Canyon Road and Weir Canyon Road/SR-91 Eastbound ramps. These impacts have been identified previously in association with the amendments for Fairmont Boulevard and Santa Ana Canyon Road. All other intersections in the area are projected to operate at acceptable levels without and with the proposed MPAH amendments.

**Table 4**  
**Peak Hour LOS in Mountain Park Area**

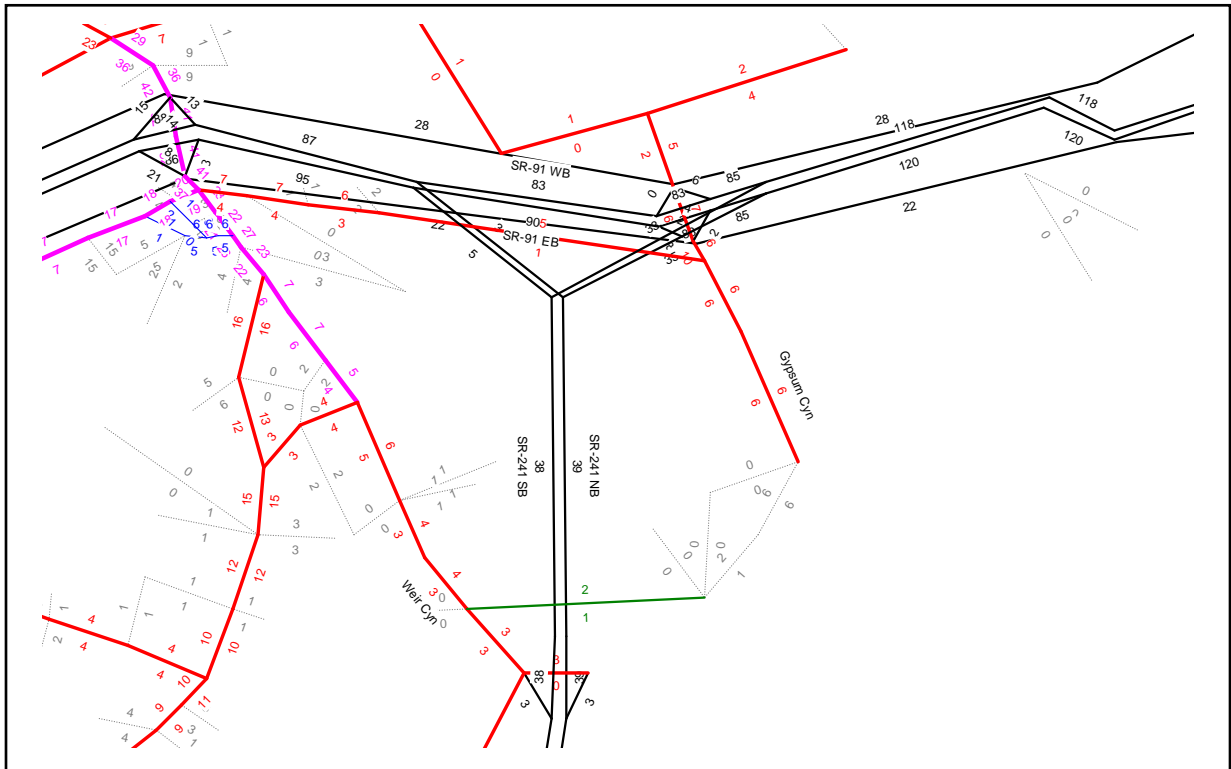
Intersection	Alternative 1				Alternative 2A				Alternative 2B			
	AM LOS	AM VC	PM LOS	PM VC	AM LOS	AM VC	PM LOS	PM VC	AM LOS	AM VC	PM LOS	PM VC
Weir Cyn / La Palma	A	0.58	C	0.75	C	0.77	C	0.73	C	0.78	C	0.73
Weir Cyn / SR-91 WB Ramps	A	0.52	B	0.63	B	0.66	D	0.84	B	0.62	C	0.78
Weir Cyn / SR-91 EB Ramps	A	0.52	C	0.77	C	0.73	E	0.95	C	0.74	E	0.93
Weir Cyn / Santa Ana Cyn Rd	B	0.61	E	0.94	C	0.71	E	0.91	B	0.70	D	0.88
Weir Cyn / Monte Vista	A	0.55	B	0.69	B	0.64	D	0.84	A	0.59	C	0.75
Serrano / Weir Cyn Rd.	B	0.65	A	0.51	C	0.75	B	0.67	C	0.71	A	0.55
Weir Cyn / Oak Cyn Dr	A	0.41	A	0.39	A	0.51	A	0.47	A	0.33	A	0.40
Serrano / Oak Cyn Dr	A	0.45	A	0.57	A	0.49	A	0.60	A	0.55	A	0.57
Serrano / Canyon Rim	A	0.35	A	0.44	A	0.35	A	0.47	A	0.41	A	0.47
Gypsum Cyn / SR-91 WB ramps	A	0.39	B	0.66	A	0.39	A	0.57	A	0.40	A	0.56
Gypsum Cyn / SR-91 EB ramps	A	0.31	A	0.58	A	0.31	A	0.53	A	0.34	B	0.65
Gypsum / Santa Ana Cyn	A	0.29	C	0.77	A	0.29	A	0.59	A	0.26	B	0.63
Weir / 241 On Ramps	C	0.73	A	0.59	C	0.73	D	0.87	A	0.46	A	0.43
Weir / 241 Off Ramps	A	0.15	B	0.65	A	0.26	B	0.67	A	0.15	A	0.35

Figure 5: Future ADT in Mountain Park Area

Alternative 1



Alternative 2B



## **MITIGATION MEASURES**

As discussed in the evaluation section above, the intersections of Imperial Highway/Santa Ana Canyon Road and Weir Canyon Road/SR-91 EB ramps would experience significant adverse impacts from the proposed MPAH changes. This section identifies potential mitigation measures for these locations.

### **Imperial Highway/Santa Ana Canyon Road**

Addition of an exclusive northbound right turn lane will improve the future PM peak hour V/C at this intersection to 0.93; however, this improvement alone will not fully mitigate the impact at this intersection since the V/C in Alternative 1 is 0.84 (LOS D). Implementation of one of these additional two improvements would improve the future LOS to D at this intersection:

- Convert the exclusive northbound right turn lane to a fourth northbound through lane
- Add a third southbound left turn lane

### **Weir Canyon Road/SR-91 EB ramps**

Addition of a fourth southbound through lane (possibly as a shared lane approaching the eastbound loop onramp) will improve the future PM peak hour LOS at this intersection to D.

# *Appendices*

---

## *Appendix C*

### *Updated Analysis of the Southern Resort Area Sewer Collection System*





# *Appendices*

---

*This page intentionally left blank*

# **CITY OF ANAHEIM**

## **ANALYSIS OF SOUTHERN RESORT AREA SEWER COLLECTION SYSTEM**

**Prepared for the  
The Planning Center**



**Prepared by**

**PSOMAS**

**January 2004**  
(Revised April 16, 2004)



## **General**

This study is prepared in conjunction with the 2003 City of Anaheim (City) General Plan Update performed by The Planning Center (TPC). The purpose of this study is to identify potential sewer collection system deficiencies based upon proposed major land use changes (specifically almost 3,000 additional hotel rooms in one area where sewer system capacity is known to be limited) and presents the corresponding recommended improvements and costs. Additionally, this study extends within the adjacent City of Garden Grove (G.G.) to an Orange County Sanitation District (OCSD) trunk sewer to ensure issues associated with these future flows are not overlooked downstream.

## **Study Area**

The study area is located within the City's South Central Area Basin. The boundaries are Orangewood Avenue to the north, the City of Garden Grove to the south and west, and Haster Street to the east. The existing tributary area is nearly 180 acres (0.28 square miles) and consists mostly of residential land uses, but contains both commercial and tourism/entertainment land use areas. Specifically almost 3,000 new hotel rooms are proposed for new tourist/entertainment areas along Harbor Boulevard s/o Orangewood Avenue within City boundaries. The specific location for these proposed hotel rooms came from a Traffic Analysis Zone (TAZ) breakdown provided by The Planning Center.

## **Land Uses**

To analyze the sewer collection system capacity the future land use scenario was examined and evaluated. Sewer Generation Factors (SGF's) were assigned to each land use category per the Combined West Anaheim Area Master Plan of Sanitary Sewers (CH2MHill, November 2001) as shown in **Table 1** below. Residential land use factors were based upon the maximum population densities per this master plan.

**Table 1: Land Use Sewer Generation Factors**

<b>LU Type</b>	<b>DU/ac</b>	<b>SGF</b>	<b>Unit</b>
COM	-	3,500	gpd/ac
R-L	6	252	gpd/du
R-LM	18	272	gpd/du
R-M	36	275	gpd/du
TOUR/ENT	-	150	gpd/room



## **System Modeled**

To further analyze the sewer collection system a computer model was built. With the sewer flow generation data described in the previous section, model scenarios for both existing and future land uses were created. This enabled the current sewer collection system to be evaluated using the current and future flow rates.

Approximately 7,100 linear feet (LF) of 10, 12, and 15-inch sewer pipelines were modeled. The modeled pipeline alignment begins within Wilken Way just west of Madrid Street heading westerly to Harbor Boulevard, and then continues south within Harbor Boulevard to Chapman Avenue where it connects to a G.G. sewer. Flows continue westerly in Chapman in this 12-inch G.G. sewer to an Orange County Sanitation District trunk sewer within Ninth Street approximately 1-mile west of Harbor Boulevard.

There are a few areas within the Harbor Boulevard reach that deserve special attention. First is a single-barrel 15-inch inverted siphon approximately 230 feet north of Chapman Avenue. Next is a reverse fall (sag) approximately 40 feet north of Chapman Avenue. And finally the 15-inch sewer constricts down into a 10-inch sewer for 20 feet immediately prior to discharge into the 12-inch G.G. sewer in Chapman Avenue. According to City staff, this 10-inch section was required by G.G. to limit incoming flows.

Existing pipe and manhole physical information were based upon Record Drawings supplied by the City.

## **Model Loading**

Tributary areas were created and assigned to manholes based upon sewer collection system atlas maps provided by the City as shown in **Figure 1** (in Appendix). Land uses within these tributary areas determined the magnitude and location of flows loaded into the model. These land uses combined with the SGF's in **Table 1** produced an average-day dry weather flow rate-loading scenario as shown in **Table 2** below.

Sewage flows are peaked to critically evaluate the sewer collection system by typically using a peaking equation. A peaking equation creates a factor (peaking factor) used to multiply the average sewer flow rate by to create a peaked sewer flow rate. For the sake of this evaluation a global peaking factor of 2.0 was used from the Combined West Anaheim Area Master Plan of Sanitary Sewers (CH2MHill, November 2001).

Utilizing this peaking factor to develop the peak dry weather flow rates, both existing and proposed scenarios were modeled.

Computer modeling runs and a node and pipe diagram for the existing and proposed sewer collection systems, assuming build-out of the future land use and recommended improvement projects, are included in the appendix.



**Table 2: Average-Day Dry Weather Flow Rate Loading Scenario**

Trib.	Area/MH	LU Type	Area (ac)	DU/ac	DU/room	SGF	Unit	Qavg (gpd)	Qavg (cfs)
	10	R-M	30.7	36	1,106	275	gpd/du	304,227	0.471
	10	R-L	58.3	6	350	252	gpd/du	88,089	0.136
	10	R-M	5.5	36	199	275	gpd/du	54,747	0.085
	12	R-M	11.7	36	419	275	gpd/du	115,335	0.178
	12	R-L	3.4	6	20	252	gpd/du	5,065	0.008
	14	R-M	2.6	36	93	275	gpd/du	25,443	0.039
	14	TOUR/ENT	0.9		50	150	gpd/room	7,500	0.012
	16	TOUR/ENT	8.8		1,898	150	gpd/room	284,700	0.440
	16	R-M	4.9	36	177	275	gpd/du	48,609	0.075
	18	TOUR/ENT	0.8		6	150	gpd/ac	900	0.001
	20	TOUR/ENT	5.8		550	150	gpd/room	82,500	0.128
	22	TOUR/ENT	1.3		125	150	gpd/room	18,750	0.029
	24	TOUR/ENT	1.3		125	150	gpd/room	18,750	0.029
	28	TOUR/ENT	0.6		50	150	gpd/room	7,500	0.012
	42	TOUR/ENT	5.6		150	150	gpd/room	22,500	0.035
	42	R-LM	27.3	18	491	272	gpd/du	133,661	0.207
			<b>169.4</b>					<b>1,218,276</b>	<b>1.88</b>

**Deficiencies**

Based upon guidelines set by the City, a deficiency criterion was set for the analysis of the sewer collection system. There were two major criteria used in the evaluation of the sewer collection system: (1) flow velocity and; (2) the ratio of depth of flow to pipe diameter (d/D). The flow velocity criteria are 2 feet per second (fps) minimum and 10 fps maximum. The d/D ratio criteria for pipes less than 12-inches in diameter are not to exceed 67% and 75% for pipelines 12-inches or greater.

Using the future peak dry weather loading scenario and adhering to the City’s deficiency criteria, all 7,100 linear feet of existing sewer collection system pipeline modeled require improvements as shown in **Table A-1** in the Appendix. In **Table A-2** the future peak dry weather-loading scenario in a proposed sewer collection system with recommended parallel improvements is shown.



**Recommended Capital Improvements**

To satisfy the requirements for the future land use as specified in the City’s General Plan, the existing sewer collection system requires approximately \$3.6 million (January 2004 dollars, ENR: 6825) in recommended capital improvements as itemized in **Table 3** below.

For purposes of this study, it has been assumed that the proposed sewer in Chapman Avenue would have to extend to the OCSD trunk sewer in Euclid Street, one and a half miles to the west. However, based on availability of capacity in the OCSD trunk in Ninth Street, it could connect there, which would be one-half mile shorter in length. Additionally, a short 12-inch inter-tie/overflow is proposed between the existing City sewer in Harbor Boulevard just upstream of its connection to the G.G. sewer and the proposed 15-inch parallel in Chapman Avenue as shown in **Figure 2** (in the Appendix).

**Table 3: Recommended Capital Improvements**

Pipe ID	Size (in.)	Length (LF)	Location	Cost
41	18	7,920	Chapman Ave: Harbor Blvd. to Euclid St.	\$ 2,154,240
43	18	227	Harbor Blvd.: N/O Chapman Ave.	\$ 61,744
45	18	112	Harbor Blvd.: between Wilken Way and Chapman Ave.	\$ 30,591
47	15	365	Harbor Blvd.: between Wilken Way and Chapman Ave.	\$ 95,289
49	18	368	Harbor Blvd.: between Wilken Way and Chapman Ave.	\$ 100,170
51	15	373	Harbor Blvd.: between Wilken Way and Chapman Ave.	\$ 97,421
53	12	362	Wilken Way: E/O Harbor Blvd.	\$ 86,791
57	12	20	Add a 20 LF intertie between the existing and proposed manholes in the intersection of Harbor Boulevard and Chapman Avenue.	\$ 4,800
-	8	340	Potential extension northerly in Harbor Blvd. to 185' s/o Orangewood (may not be necessary depending on future parcelization).	\$ 54,400
		10,088	<b>SUBTOTAL OF CONSTRUCTION</b>	<b>\$ 2,685,446</b>
				Contingency (20%) \$ 537,089
				Engineering & Administration (15%) \$ 402,817
				<b>PROBABLE PROJECT COSTS \$ 3,625,000</b>

- All improvements are parallel pipeline installations unless otherwise specified.
- Costs are total construction costs in January 2004 dollars (ENR CCI: 6825). These include materials, labor, equipment, excavation, and backfill. The costs are average estimates for the Southern California area. Local and/or environmental conditions can impact costs and vary from location to location.



# APPENDIX

CITY OF ANAHEIM  
ANALYSIS OF SOUTHERN RESORT AREA SEWER COLLECTION SYSTEM  
EXISTING SEWER COLLECTION SYSTEM W/PEAKED FUTURE FLOWS  
TABLE A-1

ID	From		Pipe	Length (ft)	Slope	Total Flow (cfs)	Velocity (ft/s)	d/D	Water		Full Flow (cfs)	Analysis Flow (cfs)	Analysis		Design		
	ID	To ID	Dia. (in)						Depth (ft)	Critical Depth (ft)			Excess (cfs)	Analysis d/D Ratio	Design Flow (cfs)	Excess (cfs)	Design d/D Ratio
15	14	16	12	362	0.002	1.858	2.4	1.00	1.0	0.5	1.596	1.456	-0.402	0.75	1.456	-0.402	0.75
17	16	18	15	373	0.001	2.890	2.4	1.00	1.3	0.6	2.289	2.087	-0.803	0.75	2.087	-0.803	0.75
19	18	20	15	365	0.001	2.892	2.4	1.00	1.3	0.6	2.249	2.050	-0.842	0.75	2.050	-0.842	0.75
21	20	22	15	368	0.001	3.148	2.6	1.00	1.3	0.6	2.244	2.046	-1.102	0.75	2.046	-1.102	0.75
23	22	24	15	112	0.002	3.206	2.6	1.00	1.3	0.6	2.518	2.296	-0.910	0.75	2.296	-0.910	0.75
*25	24	32	15	6	0.206	3.264	15.8	0.23	0.3	0.7	29.368	26.780	23.516	n/a	26.780	23.516	n/a
27	26	38	15	133	0.002	3.264	2.7	1.00	1.3	0.6	2.603	2.373	-0.891	0.75	2.373	-0.891	0.75
29	28	42	10	16	0.001	3.288	6.0	1.00	0.8	0.4	0.785	0.619	-2.669	0.67	0.619	-2.669	0.67
*31	32	34	15	17	-0.020	3.264	2.7	1.00	1.3	0.7	3.264	3.264	n/a	n/a	3.264	n/a	n/a
*33	34	26	15	6	-0.143	3.264	2.7	1.00	1.3	0.7	3.264	3.264	n/a	n/a	3.264	n/a	n/a
^35	36	28	15	15	-0.021	3.264	2.7	1.00	1.3	0.7	3.264	3.264	n/a	n/a	3.264	n/a	n/a
^37	38	36	15	42	0.010	3.264	5.3	0.50	0.6	0.7	6.472	5.901	2.637	0.75	5.901	2.637	0.75
39	42	40	12	5280	0.002	3.772	4.8	1.00	1.0	0.5	1.598	1.457	-2.315	0.75	1.457	-2.315	0.75

7,095 feet

**Notes**

- \* Denotes inverted siphon sewer
- ^ Denotes reverse fall sewer



CITY OF ANAHEIM  
ANALYSIS OF SOUTHERN RESORT AREA SEWER COLLECTION SYSTEM  
PROPOSED SEWER COLLECTION SYSTEM W/PEAKED FUTURE FLOWS  
TABLE A-2

From ID	To ID	Pipe Dia. (in)	Length (ft)	Slope	Total Flow (cfs)	Velocity (ft/s)	Water Depth (ft)	Critical Depth (ft)	Full Flow (cfs)	Analysis Flow (cfs)	Analysis Excess (cfs)	Analysis d/D Ratio	Design Flow (cfs)	Design Excess (cfs)	Design d/D Ratio		
15	14	16	12	362	0.002	0.929	2.1	0.55	0.5	0.4	1.596	1.456	0.527	0.75	1.456	0.527	0.75
17	16	18	15	373	0.001	0.929	1.8	0.44	0.6	0.4	2.289	2.087	1.158	0.75	2.087	1.158	0.75
19	18	20	15	365	0.001	0.929	1.7	0.45	0.6	0.4	2.249	2.050	1.121	0.75	2.050	1.121	0.75
21	20	22	15	368	0.001	0.929	1.7	0.45	0.6	0.4	2.244	2.046	1.117	0.75	2.046	1.117	0.75
23	22	24	15	112	0.002	0.929	1.9	0.42	0.5	0.4	2.518	2.296	1.367	0.75	2.296	1.367	0.75
*25	24	32	15	6	0.206	0.929	10.9	0.12	0.2	0.4	29.368	26.780	25.851	0.75	26.780	25.851	0.75
27	26	38	15	133	0.002	0.929	1.9	0.41	0.5	0.4	2.603	2.373	1.444	0.75	2.373	1.444	0.75
29	28	42	10	16	0.001	0.511	1.5	0.59	0.5	0.3	0.785	0.619	0.108	0.67	0.619	0.108	0.67
*31	32	34	15	17	-0.020	0.929	0.8	1.00	1.3	0.4	0.929	0.929	0	0.75	0.929	0	0.75
*33	34	26	15	6	-0.143	0.929	0.8	1.00	1.3	0.4	0.929	0.929	0	0.75	0.929	0	0.75
^35	36	28	15	15	-0.021	0.929	0.8	1.00	1.3	0.4	0.929	0.929	0	0.75	0.929	0	0.75
^37	38	36	15	42	0.010	0.929	3.7	0.26	0.3	0.4	6.472	5.901	4.972	0.75	5.901	4.972	0.75
39	42	40	12	5280	0.002	0.995	2.1	0.57	0.6	0.4	1.598	1.457	0.461	0.75	1.457	0.461	0.75
41	44	58	18	7920	0.002	2.777	2.8	0.55	0.8	0.6	4.710	4.295	1.519	0.75	4.295	1.519	0.75
43	46	44	18	227	0.001	2.335	2.3	0.56	0.8	0.6	3.842	3.503	1.168	0.75	3.503	1.168	0.75
45	48	46	18	112	0.002	2.277	2.4	0.53	0.8	0.6	4.095	3.734	1.457	0.75	3.734	1.457	0.75
47	52	50	15	365	0.001	1.963	2.1	0.72	0.9	0.6	2.249	2.050	0.087	0.75	2.050	0.087	0.75
49	50	48	18	368	0.001	2.219	2.2	0.56	0.8	0.6	3.649	3.327	1.108	0.75	3.327	1.108	0.75
51	54	52	15	373	0.001	1.961	2.1	0.71	0.9	0.6	2.289	2.087	0.126	0.75	2.087	0.126	0.75
53	14	54	12	362	0.002	0.929	2.1	0.55	0.5	0.4	1.596	1.456	0.527	0.75	1.456	0.527	0.75
57	28	44	12	20	0.002	0.418	1.8	0.34	0.3	0.3	1.656	1.510	1.093	0.75	1.510	1.093	0.75
60	Potential Ext'n <sup>1</sup>		8	340													

17,182 feet

**Notes**

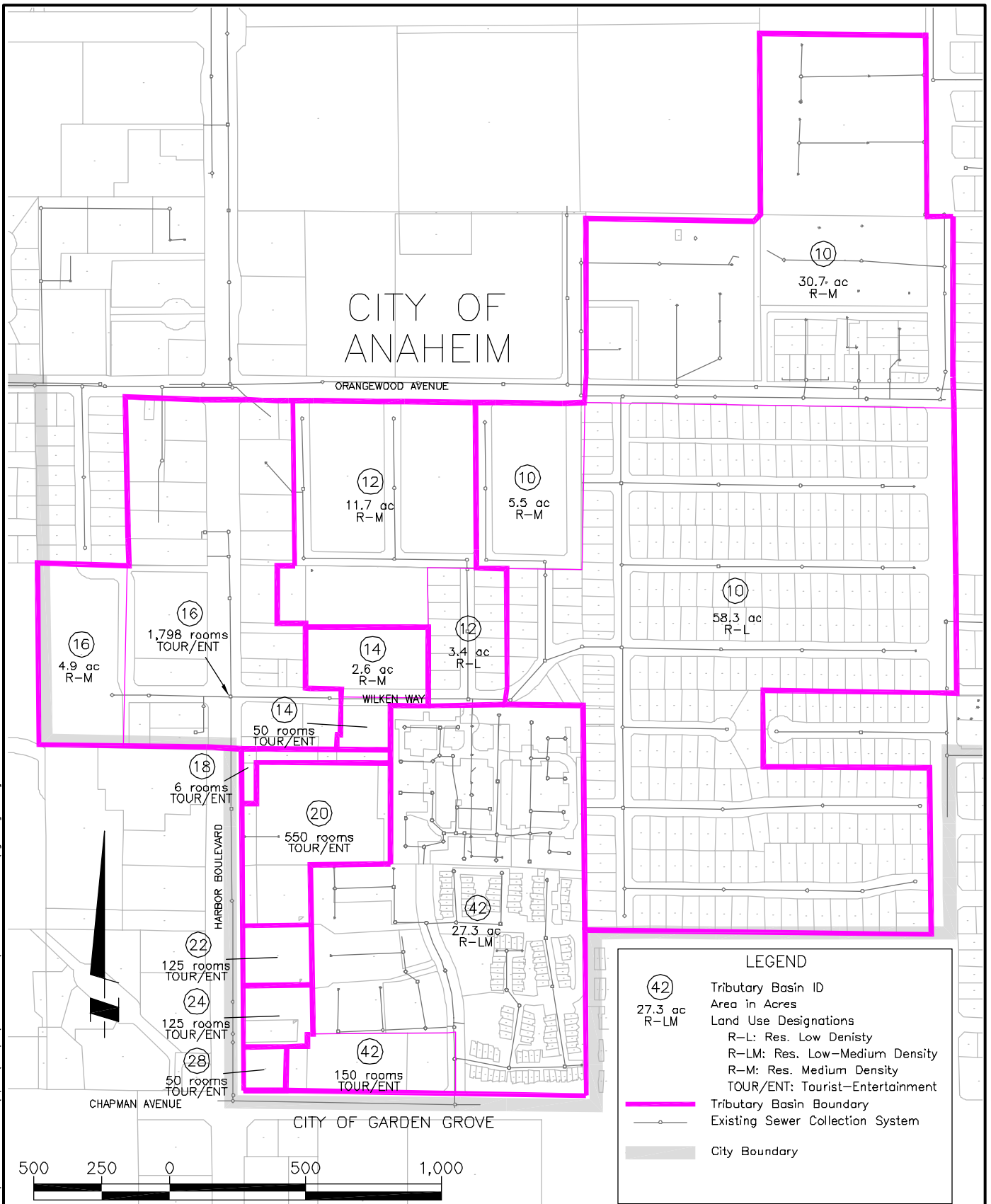
\* Denotes inverted siphon sewer

^ Denotes reverse fall sewer

Denotes proposed sewer improvement

1) Pipe 60 - Per City of Anaheim, 8-inch existing sewer to be extended to the south property line of the parcel fronting Orangewood Avenue (see p. 5, Table 3 for cost, etc.)

Plot#: 04/15/04-14-1626 W:\TPO\0800\Admin\Work\plan\_and\_deliverables\Reports\Final\South Central Sub Area\Fig\_1.dwg TDang

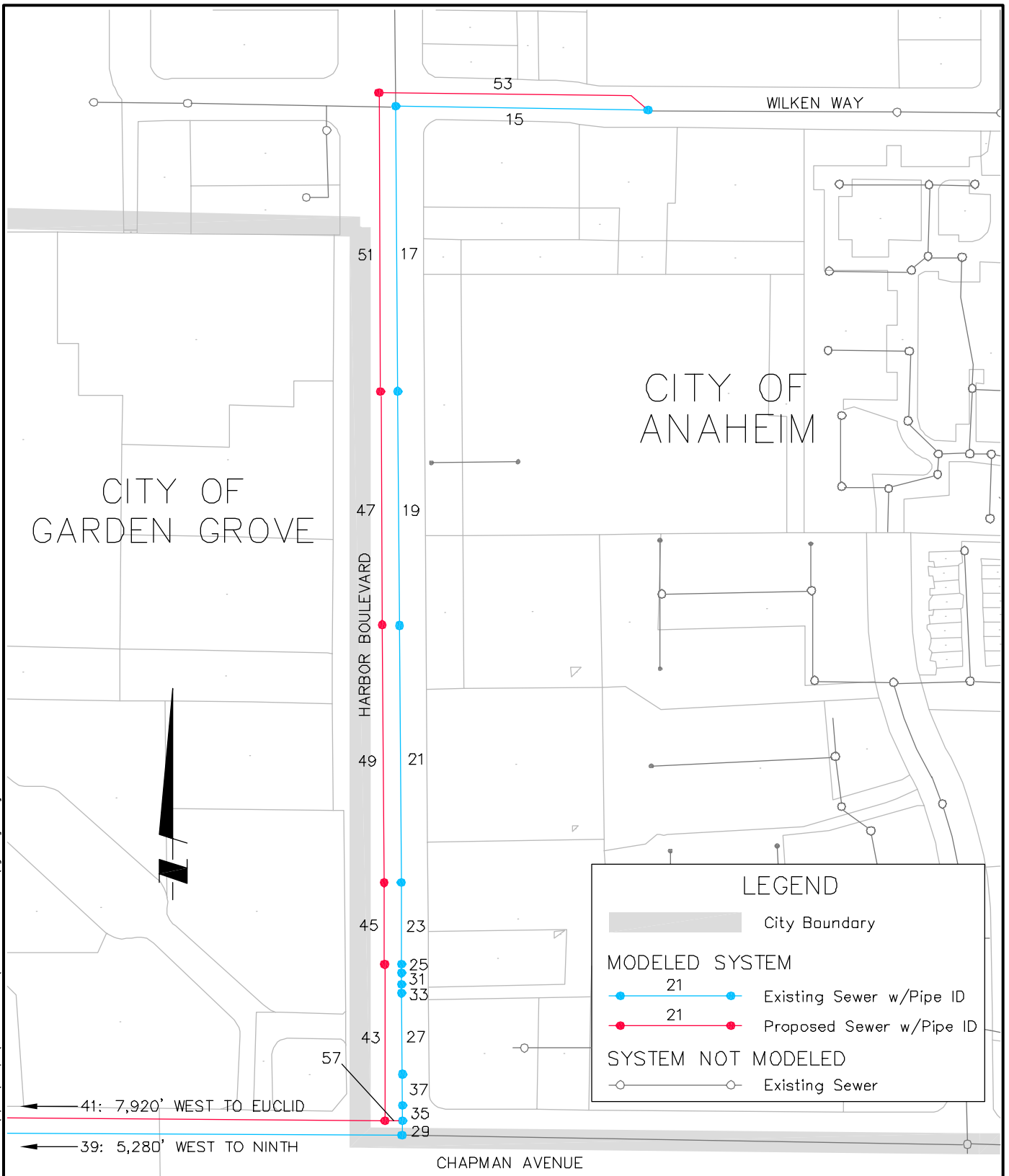


**CITY OF ANAHEIM  
ANALYSIS OF SOUTHERN RESORT  
AREA SEWER COLLECTION SYSTEM**

**PSOMAS**

**FIGURE 1  
TRIBUTARY BASINS**

Plotfile: 04/15/04 17:37:25 W:\TPO\0800\Admin\Work\plan\_and\_schedules\Anaheim\Final\Anaheim Sewer Phase 11\South Central Sub Area\Fig\_2.dwg TDang



**LEGEND**

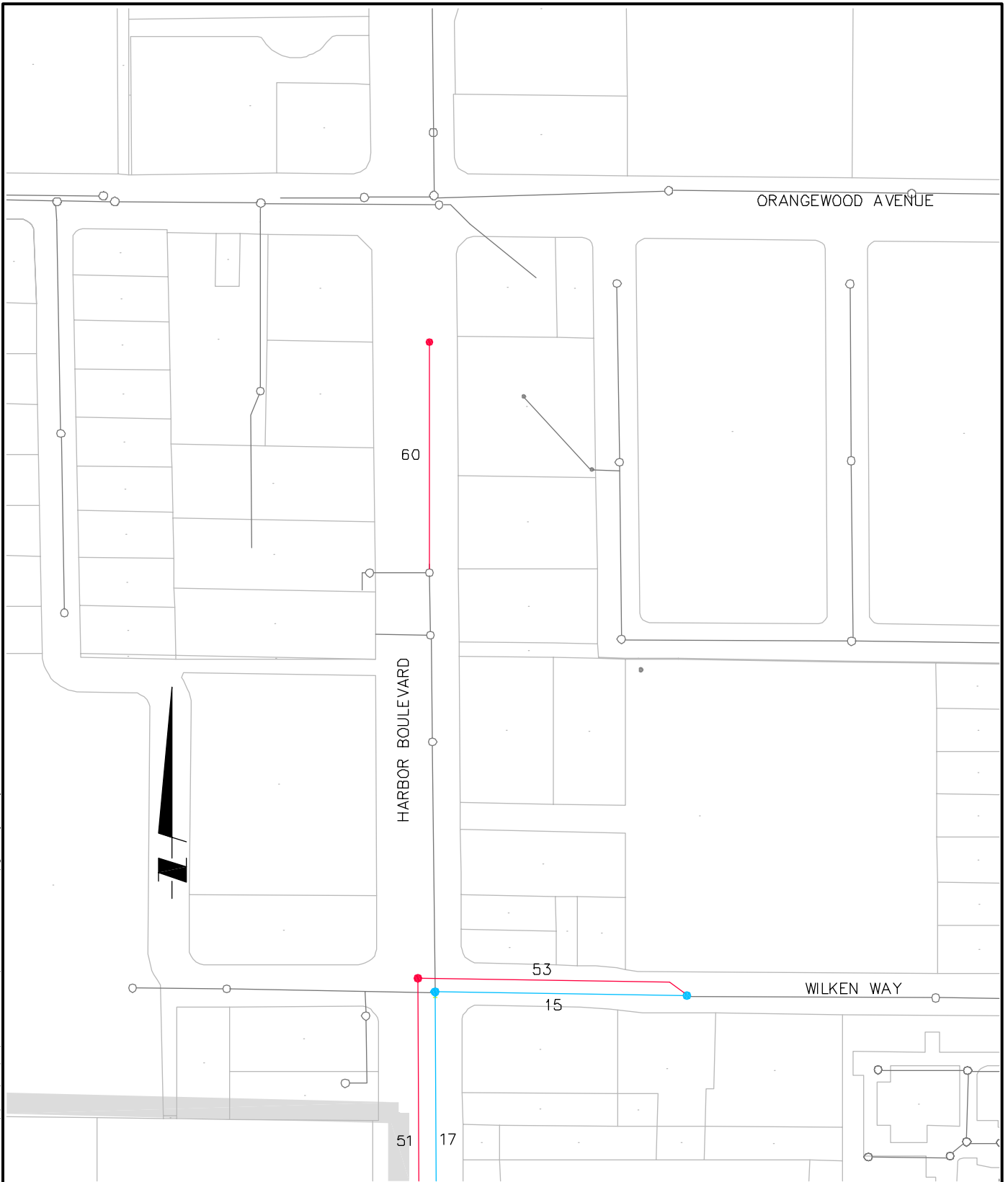
- City Boundary
- MODELED SYSTEM**
  - Existing Sewer w/Pipe ID
  - Proposed Sewer w/Pipe ID
- SYSTEM NOT MODELED**
  - Existing Sewer



**PSOMAS**



Plotfile: 04/15/04 15:01:05 M:\2\TPO\0800\Admin\Work\plan\_and\_silverboxes\Reports\Final\Report\Sewer Process 11\South Central Sub Area\Fig\_2b.dwg - T.Dong



**CITY OF ANAHEIM  
ANALYSIS OF SOUTHERN RESORT  
AREA SEWER COLLECTION SYSTEM**

**PSOMAS**

**FIGURE 2  
PAGE 2 OF 2  
MODEL PIPE DIAGRAM**