APPENDIX M

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FOCUSED TRAFFIC IMPACT ANALYSIS

GREGORY CANYON LANDFILL HAUL ROUTE

South El Monte / San Diego, California

December 9, 2009

LLG Ref. 3-09-1917

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EXECUTIVE SUMMARY

Linscott, Law and Greenspan, Engineers (LLG) has prepared the following focused traffic impact analysis (FTIA) to determine the potential impacts of the proposed recycled water truck haul route for the Gregory Canyon Landfill project. Imported recycled water would be used as a backup water supply for the proposed operations of the landfill. The data in this report is used to determine potential traffic impacts, as well as to provide information used for the noise analysis.

The Revised Final Environmental Impact Report (RFEIR) for the Gregory Canyon Landfill project assumed that recycled water would be imported to the site from a location in San Diego County south of the site. The traffic volumes originally associated with the water trucks in the RFEIR were 178 average daily trips (ADT), or 267 ADT with an applied Passenger Car Equivalence (PCE) factor. The current proposal now calls for water to be imported from a location in the City of South El Monte in Los Angeles County north of the site, using twelve (12) trucks trips from Los Angeles to San Diego. The trip generation associated with the new proposal is 24 ADT (36 ADT with PCE), substantially less than the original recycled water truck trip generation analyzed in the RFEIR.

The proposed haul route would include freeways in Los Angeles, Riverside and San Diego counties. The Gregory Canyon Landfill project has the ability to direct both the route of the trucks from the source, as well as the timing of the truck trips, including the potential for 24-hour operations in Los Angeles. Recycled water haul trucks are thus proposed to run from Los Angeles County to San Diego County on weekdays beginning at about 5:30 AM, with all trucks departing from the Gregory Canyon Landfill site by 2 PM, before the afternoon commuter peak period.

The maximum calculated AM peak hour volumes in San Diego County would be 3 arriving/2 departing trips from the landfill between 8-9 AM. In Los Angeles, the maximum calculated AM peak hour volumes on would be 3 departing/1 arriving trips from the water source in South El Monte.

Based on criteria published for San Diego County and the Los Angeles Department of Transportation (LADOT), a traffic study would not be warranted based on the small amount of daily and peak hour traffic associated with the project. Therefore, local street segments and intersections in the City of South El Monte (Los Angeles) were not analyzed. Also, while not required by the County of San Diego, the analysis does include a review of the State Route (SR) 76 /Interstate 15 interchange AM peak hour operations, since while this interchange was studied in the RFEIR (albeit assuming much higher water haul traffic volumes than currently proposed), the distribution of traffic at this location has changed.

Freeway segments along SR 60 and Interstate 15 (I-15) were studied per Caltrans guidelines for the typical morning commuter peak hours of 7-9 AM. Furthermore, the eastbound (inbound) freeway segments in Los Angeles were also analyzed for the 5-6 AM "pre-peak" hour in order to support the nighttime noise analysis conducted for these corridors. For all analyses, a PCE factor of 1.5 was applied to the forecasted truck volumes to account for their reduced performance characteristics in traffic flow as compared to a passenger car. This is the same PCE factor used in the RFEIR.

The analyses showed that the modest additional peak hour traffic volumes due to the proposed project resulted in no significant impacts on any freeway segments or at the SR-76/I-15 interchange.

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FOCUSED TRAFFIC IMPACT ANALYSIS

GREGORY CANYON LANDFILL HAUL ROUTE

South El Monte / San Diego, California
December 9, 2009

1.0 INTRODUCTION

1.1 Purpose of the Report

The following traffic impact study has been prepared to determine and evaluate the traffic impacts on the local circulation system due to the importation of recycled water to the Gregory Canyon Landfill site in northern San Diego from a location in the City of South El Monte, California. Import recycled water would be used as a backup water supply for the proposed operations of the landfill. A designated haul route to the Gregory Canyon Landfill in San Diego has been identified and is discussed in greater detail in *Section 1.2*.

Included in this traffic analysis are:

- Project Description;
- Existing conditions assessment;
- Project traffic generation/distribution/assignment;
- Intersection and freeway mainline segment analysis;
- Conclusions/Recommendations.

Additional traffic information such as off-peak or "nighttime" traffic generation is provided and discussed in this report to support the noise analysis technical study prepared by another consultant. Nonetheless, appropriate Level of Service calculations are provided as is jurisdictional significance in order to make sufficient findings of significance of potential traffic impacts.

1.2 Project Location and Description

The proposed 1,770-acre Gregory Canyon landfill site is located in northern San Diego County on State Route (SR) 76, approximately three miles east of Interstate 15 (I-15) and two miles southwest of the community of Pala. The site is adjacent to the San Luis Rey River and lies along the western slope of Gregory Mountain. The source of the recycled water is 2701 Loma Avenue, located in the city of South El Monte in the County of Los Angeles.

1.2.1 *Proposed Project*

Landfill operations may utilize recycled water that would be imported via truck. The Revised Final Environmental Impact Report (RFEIR) traffic study assumed that the recycled water would originate in San Diego County. Therefore, all calculations were based on a haul route that was oriented to/from the south of SR 76. Since completion of the RFEIR, consideration has now been given to a water source northwest of the landfill site, approximately 90 miles away in Los Angeles County. The

landfill operator currently proposes to haul water daily from the source (*San Gabriel Valley Water Company*) to the Gregory Canyon Landfill site in San Diego County.

Based on the location of the water source site, the number of one-way truck trips (12), and departure times, it is projected that trucks would depart South El Monte between 5:30 AM and 10 AM, and would depart the Gregory Canyon Landfill site between 7 AM and 2 PM. ***Table 1–1*** shows the hourly breakdown of all water truck activity.

TABLE 1–1
HOURLY DISTRIBUTION OF TRIPS

Water Truck Trips (12 trucks total)		Hourly Trips																	
		5-6 AM		6-7 AM		7-8 AM		8-9 AM [1]		9-10 AM		10-11 AM		11-Noon		Noon-1 PM		1-2 PM	
		In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
Trip Type	A. Departing Trips from South El Monte [2]	—	1	—	3	—	3	—	3	—	2	—	—	—	—	—	—	—	—
	B. Arriving Trips at Gregory Canyon Landfill [3]	–	–	–	–	1	–	3	–	3	–	3	–	2	–	–	–	–	–
	C. Departing Trips from Gregory Canyon Landfill [4]	–	–	–	–	–	1	–	2	–	2	–	2	–	2	–	2	–	1
Total Truck Trips (B + C) [5]		–	–	–	–	*1*	*1*	*3*	*2*	*3*	*2*	*3*	*2*	*2*	*2*	–	*2*	–	*1*

Source: PCR and LLG, 2009.

Footnotes:

1. The peak hour is the highest hour of traffic between 7-9 AM. For the purposes of the signalized intersection analyses at the SR-76/I-15 interchange, the peak hour of 8-9 AM was chosen since project volumes are highest.
2. The first trip from El Monte is assumed to leave at approximately 5:30 so as to arrive at the landfill site no earlier than 7 AM, when "daytime" hours begin. It is estimated that each departing truck will require approximately 20 minutes to fill, resulting in a departure rate of about 3 trips/hour from the South El Monte facility. These trips are not counted since they would be double counted again as "in" trips in line "B". As such, these volumes are informational, and presented in GREY tone. As shown, all twelve truck trips would therefore depart South El Monte by 10 AM.
3. The first trips will arrive at the landfill approximately 1.5 hours after departing South El Monte. Arrivals, like departure, are assumed to occur on 20 minute intervals.
4. It is assumed that the water trucks will require approximately 30 minutes to unload, resulting in a departure rate of a about 2 trips/hour from the Gregory Canyon Landfill. As shown, all twelve trucks trips would therefore depart the Gregory Canyon Landfill by 2PM.
5. The summary of arriving and departing hourly trips at the Gregory Canyon Landfill Site (Rows B + C).
6. Total trips = 12 one-way trips and 24 roundtrips (12 truck trips x 2).

General Notes:

- This table does <u>not</u> show the Passenger Car Equivalence (PCE) factor adjustment of 1.5 See *Table 5–1: Trip Generation* for volumes used in the analysis.

1.2.2 *Need for a Study*

As discussed in *Section 1.2.1*, the potential impacts of recycled water trucks to the study area street system have been evaluated in the RFEIR. The traffic study prepared for this document considered recycled water haul trucks to comprise approximately 178 average daily trips' (ADT's) worth of total Gregory Canyon Landfill project traffic. This traffic was expected to be oriented to/from the south of the Gregory Canyon Landfill site, and the resulting analysis therefore considered trips oriented south of SR 76.

Table 1–1 shows that the revised project description for the recycled water truck component now shows a substantial reduction in water truck trips, down to 24 ADT from 178 ADT originally analyzed in the RFEIR traffic study. When compared to the RFEIR traffic findings, this change in the project description would result in a net *decrease* in recycled water truck traffic volumes to San Diego County roadways south of SR 76. However, it would result in a net *increase* in traffic volumes to San Diego, Riverside and Los Angeles County freeways and roadways north of SR 76. To determine if the project volume of 24 ADT would warrant formal analysis in these jurisdictions, LLG reviewed several local and regional guidelines, including:

- The County of San Diego's *Guidelines for Determining Significance* (June 30, 2009)
- The Los Angeles Department of Transportation's (LADOT's) *Traffic Study Policies and Procedures* (March 2002)
- San Diego Association of Government's (SANDAG's) *Final 2008 Congestion Management Program (CMP) Update* (2008)
- The San Diego Traffic Engineer Council/Institute of Traffic Engineers' (SANTEC/ITE's) *Guidelines for the Preparation of Traffic Impact Studies [TIS] in the San Diego Region* (March 2, 2000)
- The State of California Department of Transportation's (Caltrans') *Guide for the Preparation of Traffic Impact Studies* (June 2001)

Upon review of these documents, the project's 24 ADT would not trigger the need for a full traffic study using any of the above criteria. For example, the minimum traffic volumes required by *County of San Diego* to warrant a traffic study are 200-500 ADT, or 20-50 peak hour trips. *LADOT's* guidelines may require a study if the project is likely to add 500 or more ADT, or 43 or more PM peak hour trips. The project's contribution of 24 ADT to the street system in the City of South El Monte is well under these LADOT thresholds. The *SANDAG 2008 CMP* minimum requirements for a study are 500 ADT or 50 peak hour trips, or 20 or more peak hour trips to an existing on- or off-ramp. The SANTEC/ITE guidelines also consider a minimum of 500 ADT or 50 peak hour trips to warrant a study.

Caltrans guidelines state that a traffic study may be required for projects generating 1 to 49 peak hour trips assigned to a State highway facility that experience "significant delay; unstable or forced traffic flow conditions (LOS "E" or "F")". The guidelines then note that a "traffic study" may be as simple as providing a traffic count. The haul route follows Caltrans facilities in the County of San Diego, and Riverside and Los Angeles Counties. The project is shown to contribute a maximum of

5 peak hour trips during the 8-9 AM peak hour, some of which would presumably affect LOS E/F-operating State facilities in Los Angeles County. While simply stating this fact would appear to suffice, this traffic study does provide near-term peak hour directional freeway analysis of SR 60 and I-15 for the AM commuter peak hour. This level of analysis is described as a "Focused Traffic Impact Analysis".

In addition, this focused traffic impact analysis also provides a detailed, AM peak hour analysis at the SR 76/I-15 signalized intersections at the northbound and southbound ramps. Again, the currently proposed project is resulting in a net decrease in overall recycled water truck traffic from the findings made in the EIR traffic study, including volumes at this interchange. However, it is acknowledged that the distribution of traffic (to/from the north, not south as before) is new, so the analysis is provided.

1.2.3 *Proposed Haul Route*

The source of the water will be from the *San Gabriel Valley Water Company*, located at 2701 Loma Avenue in the city of South El Monte in the County of Los Angeles, approximately 90 miles north of the Gregory Canyon Landfill site in northern San Diego County. Based on discussions with the applicant, the following is a summary of the proposed designated haul route commencing from the San Gabriel Valley Water Company:

- eastbound Loma Avenue/Mabel Avenue to southbound Rosemead Boulevard
- southbound Rosemead Boulevard to eastbound State Route (SR) 60
- eastbound SR 60 to southbound I-15
- southbound I-15 to eastbound Pala Road (SR 76)

Return trip destinations will be at the discretion of the water-haul contractor, although for the purposes of this analysis, trips were assumed to return north towards South El Monte.

Figure 1–1 illustrates the designated haul route.

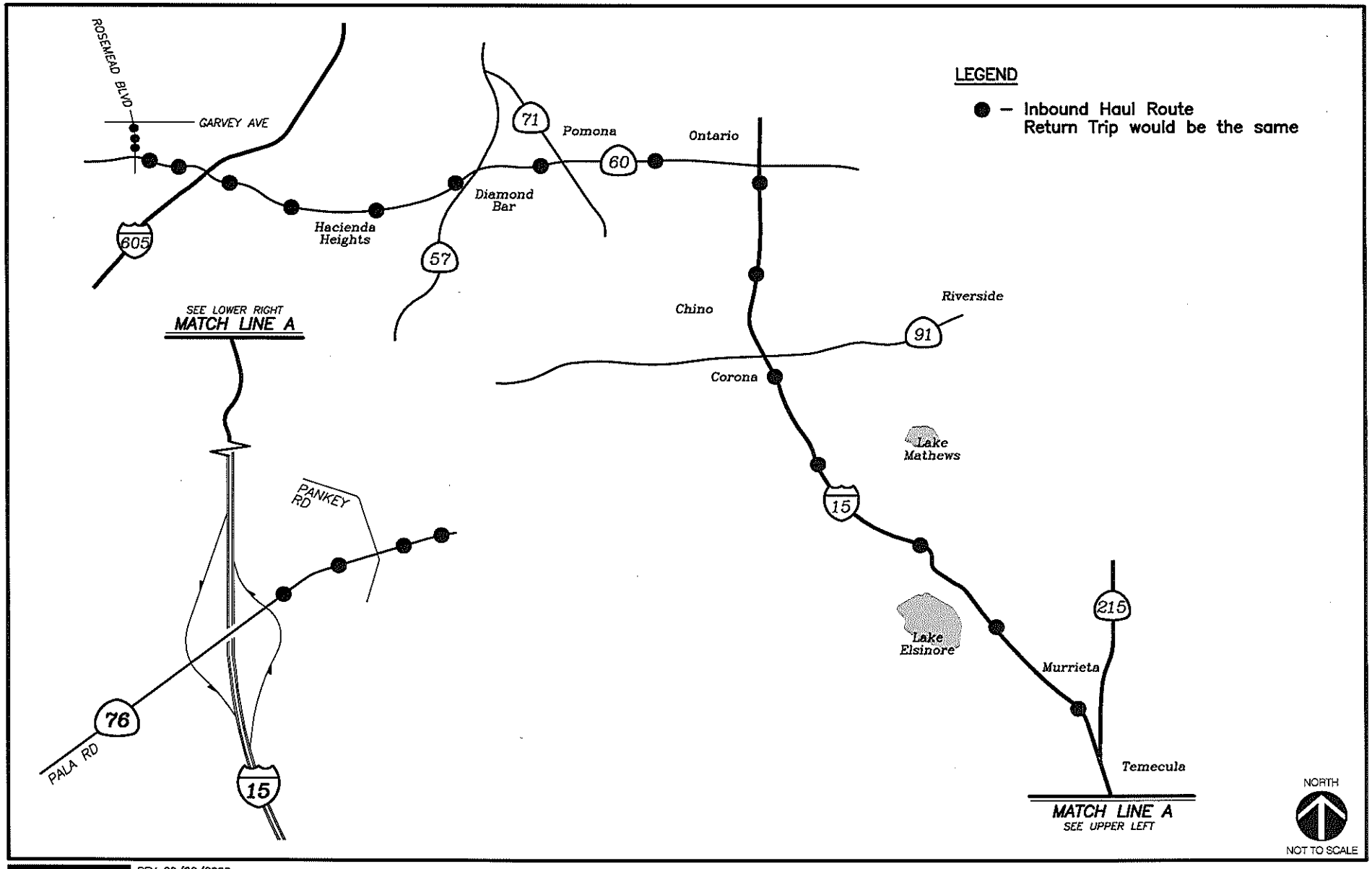

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Figure 1-1

Designated Haul Route

GREGORY CANYON LANDFILL HAUL ROUTE

2.0 EXISTING CONDITIONS

The intersections and freeway mainline segments included in the study area are listed below. These locations were selected based on several factors including: the water source site, the destination site (Gregory Canyon Landfill), and the proposed haul route. ***Figure 2–1*** depicts the existing roadway conditions for the study area intersections and freeway mainline segments.

Intersections

- SR 76 (Pala Road) / I-15 SB Ramps
- SR 76 (Pala Road) / I-15 NB Ramps

Freeway Segments

SR 60

- Between I-605 and SR 57 – (S. Hacienda Boulevard and S. Azusa Avenue)
- Between SR 57 and I-15 – (S. Vineyard Avenue and S. Milliken Avenue)

I-15

- Between SR 60 and SR 91 – (5th Street and 3rd Street)
- Between SR 91 and SR 215 – (Riverside Drive and Main Street)
- Between SR 215 and Pala Road (SR 76)

The following is a brief description of the roadways in the study area.

2.1 Existing Roadway Conditions

State Route 60 (SR 60) is a six-lane east-west state highway facility in the project area with a posted speed limit is 65 mph.

Interstate 15 (I-15) "Temecula Valley Freeway" is an 8-lane north-south interstate freeway facility in the project area. I-15 provides freeway access to the major urban centers of Los Angeles to the north, and San Diego to the south.

State Route 76/Pala Road (SR 76) is a principal east-west route that carries intraregional, interregional, commuter and recreational travel. Currently, SR 76 east of I-15 is constructed as a four-lane between I-15 and the Palomar Aggregates quarry, then two lanes to the landfill access road. In San Diego County, SR-76 traverses the city of Oceanside and the unincorporated communities of Bonsall, Fallbrook, Pala, Pauma Valley, Rincon, and Lake Henshaw serving outlying rural communities and a number of Indian nations. SR 76 is classified on the County of San Diego Circulation Element as a Major Road east of Interstate 15.

Recently, SR 76 has been improved to a 4-lane roadway from I-15 east for approximately 1.4 miles. Further east, SR 76 remains a two-lane roadway in the study area with one lane of travel in each direction between Interstate 15 and State Route 79. Additional turn lanes are provided at key intersections along SR 76 to provide additional capacity at intersections. The posted speed limit in

the study area varies from 40-55 mph, with warning signs at curves recommending speeds as low as 25 mph.

Project traffic trips on SR-76 east of the I-15 interchange were not analyzed in this report because recycled water truck trips on this road segment were already analyzed and determined to, after mitigation, have a less than significant impact in the RFEIR. The truck trips analyzed in this report would replace, and not be in addition to, the recycled water truck trips analyzed in the RFEIR.

Rosemead Boulevard is classified as a Major Road on the City of El Monte's Circulation Element. Rosemead Boulevard is generally a six-lane divided roadway with a posted 50 mph speed limit. Within the project area, curbside parking is generally prohibited along both sides of the road.

Loma Avenue is an unclassified two-lane roadway. Land uses within the project area are generally industrial and no bus stops or bike lanes are provided, and curbside parking is generally permitted along both sides of the road.

Mabel Avenue is an unclassified two-lane roadway. Land uses within the project area are generally industrial and no bus stops or bike lanes are provided, and curbside parking is generally permitted along both sides of the road.

2.2 Existing Traffic Volumes

2.2.1 *Peak Hour Intersection Turning Movement Volumes*

LLG commissioned peak hour intersection turning movement traffic counts at the signalized SR-76/I-15 northbound and southbound ramp intersections in August 2009 during the AM commuter peak hours (between 7-9 AM). While local schools were not in session, LLG did compare the August 2009 counts to historical spring/fall traffic data, which did include school-related trips. This review concluded that the counts varied by approximately 1% (school vs. no school), which would be expected given the rural nature of the surrounding area and subsequent low residential density. However, to be conservative, LLG increased volumes on the critical movements at these two freeway-ramp intersections by 5% to account for potential school related traffic.

A PM peak hour analysis (4-6 PM) was not required nor conducted as part of this study, as the project description described in *Table 1–1* shows that recycled water truck traffic through the interchange is expected to cease before the PM peak hour.

2.2.2 *Freeway Mainline Volumes*

Freeway hourly volumes were obtained directly from the freeway performance measurement system "*PeMS*". This software distributes peak hour volumes by lane and provides a graphical representation the PeMS station location. Peak hour volumes were collected in May 2009, when schools were in session. Based on the proposed haul route and expected hours of operation, freeway hourly volumes were collected for both the off-peak (5-6 AM) and peak hour timeframes for eastbound, westbound, northbound, and southbound trucks on Los Angeles, Riverside county, and San Diego county segments. The off-peak data was collected for analysis used to support the

project's noise study, which is concerned with potential noise impacts associated with inbound traffic volumes occurring during "nighttime" hours, which cease at 7 AM. The latter data was collected for use in determining any Level of Service (LOS) impacts that the project may cause during the AM commuter peak hours. As shown in *Table 1–1*, the project will be contributing a small amount of traffic to the freeways during the AM peak hours.

Appendix A contains the existing manual count sheets and PEMS peak hour data.

2.3 Baseline Traffic Volumes

The original REFEIR traffic study considered recycled water trucks as part of the site's total forecasted 2,085 ADT, including Passenger Car Equivalence (PCE) discussed in *Section 5.1* of this report. In that study, the recycled water truck trips were included in the project traffic oriented south of SR 76 on I-15, to and from San Diego County. The project now proposes recycled water truck trips from South El Monte, located north of SR 76 on I-15. This focused traffic impact study presents the effects of the redistribution of the proposed recycled water truck trips from San Diego County (south of I-15) to Los Angeles County (north of I-15) against a "without project" baseline.

Trip generation estimates for the proposed water truck traffic are shown in *Section 5.0* of this study. It is estimated that the new recycled water truck trips will total 24 ADT (36 ADT with PCE). To establish the "without project" baseline condition, 24 ADT's-worth of traffic was removed from the overall RFEIR landfill project traffic originally oriented to and from the south of SR 76 on I-15. These volumes, plus the updated existing traffic volumes, result in the baseline volume for the landfill operating at 2,049 ADT (2,085 ADT – 36 proposed project ADT), including PCE. The proposed project's traffic associated with 36 ADT was then added back into the system, but oriented to/from the north to reflect the proposed South El Monte recycled water source. This is the "baseline + project" scenario, reflecting 2,085 total trips with PCE.

Using this approach, the analysis considers 1) the updated, existing traffic volumes on the street system; 2) the original 2,085 ADT (with PCE) landfill trip-maximum that was analyzed in the RFEIR; and, 3) the measurable effects of the redistribution of the 24 proposed recycled water truck trips (36 ADT with PCE) from San Diego County to Los Angeles County.

Figure 2–2 depicts the baseline peak hour intersection turning movement and freeway peak hour mainline volumes.

2.4 Baseline Operations

The following analyses of baseline traffic operations were conducted using methodologies described in *Section 4.1*. As stated earlier, a PM peak hour analysis was not conducted since it is anticipated that trucks would not impact the PM peak commuter hour.

2.4.1 *Peak Hour Intersection Levels of Service*

Table 2–2 shows a summary of the signalized SR 76 (Pala Road) interchange operations in the study area. As shown in *Table 2-2*, the SR 76 (Pala Road) interchange is calculated to currently operate at an acceptable LOS C.

2.5 Intersection Lane Vehicle (ILV) Analysis

Table 2–3 shows a summary of the Caltrans-required ILV analysis for the state-controlled, signalized intersections. As shown in *Table 2-3*, SR 76 (Pala Road) interchange is calculated to currently operate at Near capacity for the southbound ramps and Under capacity for the northbound ramps.

2.6 Freeway Mainline Analysis

Table 2–4 shows a summary of the mainline freeway analysis for the key freeway segments. Operations for the off-peak (5-6 AM) hour are shown for the SR 60 freeway for the purposes of supporting the noise study. AM commuter peak hour operations are shown for both the SR 60 and I-15 freeways for the purposes of the traffic analysis.

As shown in *Table 2–4*, the majority of the freeway segments are calculated to currently operate at acceptable LOS C or better. The Riverside area freeway trips continue on the cusp of the AM peak, and the San Diego area freeway trips, while occurring during the peak, affect north county inland freeway segments that are not as congested as urban freeway segments in the mid-city areas.

TABLE 2–2
AM PEAK HOUR
BASELINE INTERSECTION OPERATIONS

Intersection	Control Type	Baseline	
		Delay [a]	LOS [b]
SR 76 (Pala Road) / I-15 SB Ramps	Signal	27.8	C
SR 76 (Pala Road) / I-15 NB Ramps	Signal	22.7	C

Footnotes:
a. Average delay expressed in seconds per vehicle.
b. Level of Service.

General Notes:
1. Baseline = Existing 2009 traffic volumes + Gregory Canyon Landfill RFEIR traffic minus proposed project traffic (24 truck trips).

SIGNALIZED

DELAY/LOS THRESHOLDS

Delay	LOS
0.0 < 10.0	A
10.1 to 20.0	B
20.1 to 35.0	C
35.1 to 55.0	D
55.1 to 80.0	E
> 80.1	F

TABLE 2–3
AM PEAK HOUR
BASELINE ILV OPERATIONS

Intersection	Baseline	
	Total Operating Level (ILV / Hour)	Capacity
SR 76 (Pala Road) / I-15 SB Ramps	1,218	Near
SR 76 (Pala Road) / I-15 NB Ramps	784	Under

Footnotes:

a. See Appendix B for ILV calculation sheets.

General Notes:

1. Baseline = Existing 2009 traffic volumes + Gregory Canyon Landfill RFEIR traffic minus proposed project traffic (24 truck trips).

TABLE 2–4
AM PEAK HOUR
BASELINE MAINLINE OPERATIONS SUMMARY

Freeway and Segment	Baseline					
	ADT	Direction/ Capacity [a]		PHV [b]	V/C [c]	LOS [d]
SR 60 *(Off-peak)*[e]						
I-605 to SR 57	174,300	EB	8,000	2,933	0.367	A
		WB	8,000	N/A	N/A	N/A
SR 57 to I-15	209,700	EB	9,200	2,567	0.279	A
		WB	9,200	N/A	N/A	N/A
SR 60 *(Peak Hour)*[f]						
I-605 to SR 57	174,300	EB	8,000	4,417	0.552	B
		WB	8,000	3,259	0.407	A
SR 57 to I-15	209,700	EB	9,200	4,865	0.529	B
		WB	9,200	4,706	0.512	B
I-15 *(Peak Hour)*						
SR 60 to SR 91	150,000	SB	9,200	3,049	0.331	A
		NB	9,200	4,906	0.533	B
SR 91 to SR 215	109,000	SB	9,200	4,458	0.485	B
		NB	9,200	5,398	0.587	B
SR 215 to SR 76 (Pala Road)	128,000	SB	8,000	5,540	0.693	C
		NB	8,000	2,955	0.369	A

Footnotes:

a. Capacity based on 2,000 vehicles/hour/mainlane and 1,200 per auxiliary lane (HOV).
b. PHV = Peak Hour Volumes
c. V/C = Volume/ Capacity
d. LOS = Level of Service
e. 5-6 AM operations are shown for use in the noise study.
f. AM peak hour operations are shown for use in determining potential project freeway impacts.

General Notes:

1. Baseline = Existing 2009 traffic volumes + Gregory Canyon Landfill RFEIR traffic minus proposed project traffic (24 truck trips).
2. N/A – An off- peak analysis for the WB movements along each segment of SR 60 (return trips) were not applicable since these trips would occur during the peak hour.

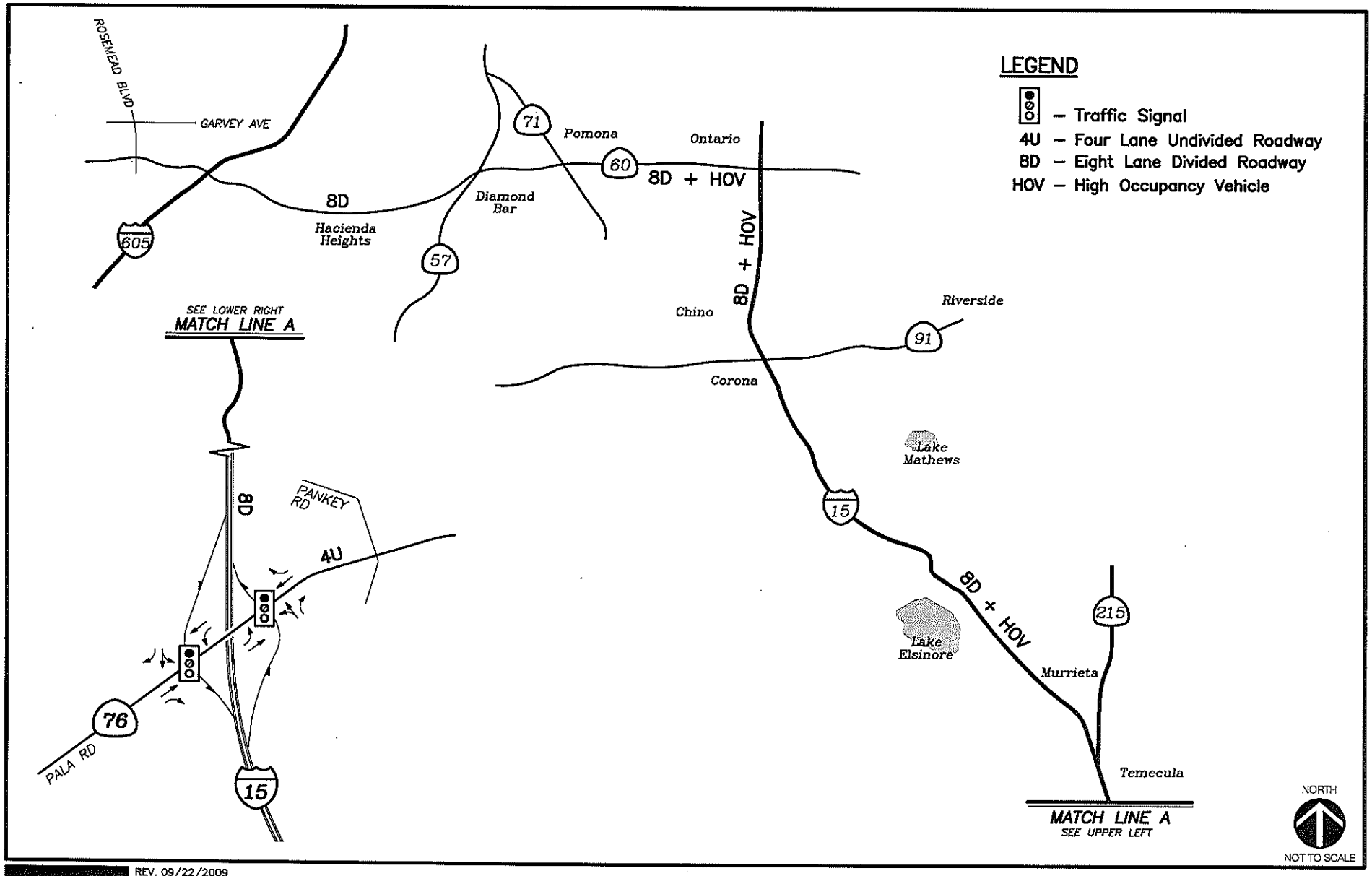

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Figure 2-1

Existing Conditions Diagram

GREGORY CANYON LANDFILL HAUL ROUTE

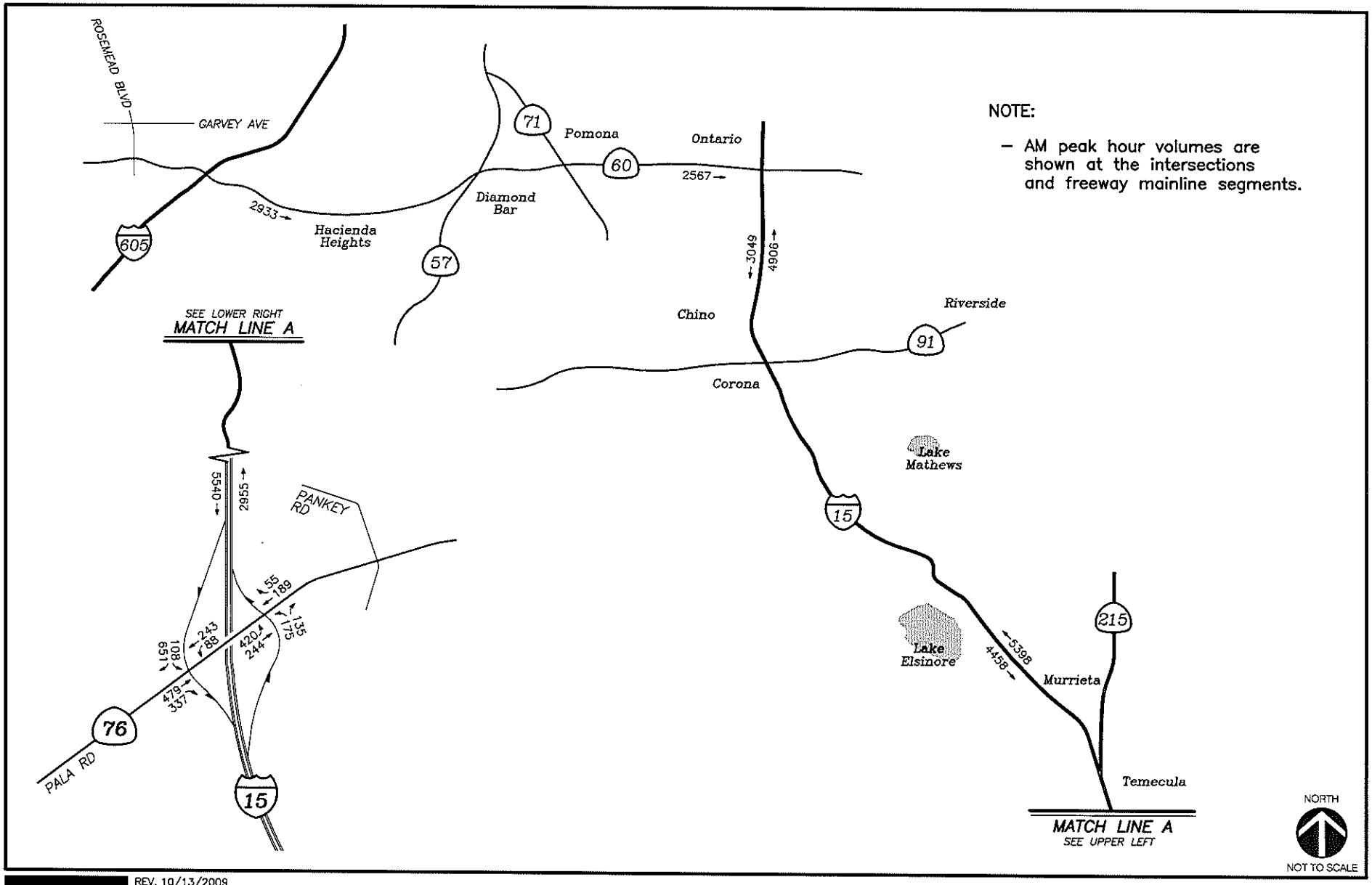

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Figure 2-2

Baseline Traffic Volumes AM Peak Hour

GREGORY CANYON LANDFILL HAUL ROUTE

3.0 LEVEL OF SERVICE AND SIGNIFICANCE THRESHOLDS

As mentioned in *Section 2.0*, the proposed haul route would affect roadways in three county jurisdictions. The haul route commences in Los Angeles County then continues through Riverside County, before reaching the landfill site, situated within the county of San Diego. As discussed in *Section 1.2.2 (Need for a Study)*, the proposed project traffic volumes do not warrant study based on thresholds and guidelines published by these jurisdictions. However, key freeway segments along SR 60 and I-15 were analyzed, along with the signalized intersections at the SR 76/I-15 interchange. No project traffic volumes at intersections or local streets in South El Monte met the criteria for study.

The following is a discussion of the Level of Service concept and the significance thresholds used for these locations.

3.1 Level of Service

Level of Service (LOS) is the term used to denote the different operating conditions which occur on a given roadway facility under various traffic volume loads. It is a qualitative measure used to describe a quantitative analysis taking into account factors such as roadway geometries, signal phasing, speed, travel delay, freedom to maneuver, and safety. Level of Service provides an index to the operational qualities of a roadway facility. Level of Service designations range from A to F, with LOS A representing the best operating conditions and LOS F representing the worst operating conditions. Additional categories of LOS F have been developed to identify varying degrees of congestion on freeway facilities. The "measures of effectiveness" (MOEs) represented by the Level of Service designation are reported differently for signalized and unsignalized intersections, as well as for local roadway segments and freeway segments.

For the analysis, "LOS D or better" operations will be used as the minimum acceptable target against which the project operational impacts have been assessed. Only project contributions to LOS E or LOS F-operating locations are measured against the published thresholds.

3.2 Significance Thresholds

3.2.1 *Signalized Intersections*

This section provides guidance for evaluating potentially adverse environmental effects a project may have on signalized intersections. As noted above, only the signalized intersections at the SR 76/I-15 interchange (County of San Diego) were studied, since analysis of intersections in South El Monte was not warranted. Therefore the following criterion was utilized to evaluate potential significant impacts, based on the County of San Diego's published *Guidelines for Determining Significance* (June 30, 2009).

> *Traffic volume increases from public or private projects that result in one or more of the following criteria will have a significant traffic volume or level of service traffic impact on a signalized intersection:*

- *The additional or redistributed ADT generated by the proposed project will significantly increase congestion on a signalized intersection currently operating at LOS E or LOS F, or will cause a signalized intersection to operate at a LOS E or LOS F as identified in* ***Table 3–1.***

TABLE 3–1
MEASURES OF SIGNIFICANT PROJECT IMPACTS TO CONGESTION ON INTERSECTIONS
ALLOWABLE INCREASES ON CONGESTED INTERSECTIONS

Level of service	Signalized	Unsignalized
LOS E	Delay of 2 seconds	20 peak hour trips on a critical movement
LOS F	Delay of 1 second, or 5 peak hour trips on a critical movement	5 peak hour trips on a critical movement

General Notes:

1. A critical movement is one that is experiencing excessive queues.
2. By adding proposed project trips to all other trips from a list of projects, these same tables are used to determine if total cumulative impacts are significant. If cumulative impacts are found to be significant, each project that contributes any trips must mitigate a share of the cumulative impacts.
3. The County may also determine impacts have occurred on roads even when a project's traffic or cumulative impacts do not trigger an unacceptable level of service, when such traffic uses a significant amount of remaining road capacity.

3.2.2 *Freeway Facilities – (Caltrans)*

As discussed in *Section 1.2.2 (Need for a Study)*, Caltrans' published statewide guidelines indicate that small projects contributing 1 to 49 peak hour trips to LOS E/F-operating freeway sections may need to provide simple analysis of potential impacts. Project contribution to LOS D or better operating freeway segments is not measured against any criteria.

The proposed recycled water haul project studied in this report generates a maximum of 3 directional peak hour trips (e.g., 7-8 AM) on any given freeway segment along the route *(see Table 1–1)*. LLG prepared a peak-hour volume/capacity (V/C) analysis for the various freeway segments in the study area. Based on published criteria, the maximum project V/C contribution allowed during the peak-hour to an LOS F-operating segment is 0.01 in either direction.

4.0 METHODOLOGY

4.1 Intersections

Signalized intersections were analyzed under AM peak hour conditions. Total AM inbound and outbound volumes were analyzed. Average vehicle delay was determined utilizing the methodology found in Chapter 16 of the *2000 Highway Capacity Manual (HCM),* with the assistance of the *Synchro* (version 6) computer software. The delay values (represented in seconds) were qualified with a corresponding intersection Level of Service (LOS). Signalized intersection calculation worksheets and a more detailed explanation of the methodology are attached in ***Appendix B.***

4.2 Caltrans – Intersecting Lane Volume (ILV)

Caltrans requires that State-owned intersections be analyzed using *Intersecting Lane Volume* (ILV) methodology as described in Chapter 400, Topic 406 of the Department Highway Design Manual. The ILV methodology is based on the concept that capacity of intersecting lanes of traffic is 1,500 vehicles per hour. For the typical local street interchange there is usually a critical intersection of a ramp and the crossroads that establishes the capacity of the interchange. An intersection impact is considered significant using the ILV methodology if the project traffic causes the intersection to operate "over capacity" during peak hours. Caltrans ILV calculation worksheets are attached in *Appendix B.*

It should be noted that the ILV methodology is not accepted for use by the County of San Diego in determining significance of impacts. Therefore, this analysis is for informational use by Caltrans as a reviewing agency.

4.3 Freeway Facilities

Mainline Sections

Directional freeway mainline segments were analyzed during the AM peak hour using the volume to capacity (V/C) approved by several regional agencies and approved by Caltrans. Southbound (inbound) and northbound (returning) AM peak project volumes were analyzed, since during the AM peak hour, the distribution of truck traffic is in this direction (from South El Monte south to Gregory Canyon Landfill). Again, the destination of the trucks after departing the Gregory Canyon Landfill will be determined by the contractor. However, for the purposes of the analysis, truck trips were assumed to return to north of the site on the freeway system. While *Table 1–1* shows that a maximum of two northbound truck trips could occur during the AM peak hour (8-9 AM), the resultant change in V/C ratio would be too small to cause a significant impact.

The freeway traffic volumes are obtained from Caltrans count records using the PEMS system. The freeway lane capacities used are 2,000 vehicles/hour for a mainline lane, and 1,200 vehicles/hour for an auxiliary lane, per Caltrans standards of practice.

The LOS thresholds for freeway sections based on calculated V/C ratios are shown in ***Table 3–2.***

TABLE 3–2
FREEWAY SEGMENTS LOS

LOS	V/C
A	<0.41
B	0.62
C	0.8
D	0.92
E	1.00
F(0)	1.25
F(1)	1.35
F(2)	1.45
F(3)	>1.46

LOS = Level of Service
V/C = Volume/Capacity

As stated in *Section 1.2.1*, truck trips would originate in Los Angeles County between 5:30 – 10:00 AM. As a result, SR 60 was studied during the AM commuter peak hour to determine if the project contribution has any potential significant traffic impacts. Three I-15 segments, from SR 60 to SR 76 (Pala Road) were also analyzed during the AM commuter peak hour to determine any potential significant traffic impacts.

5.0 PROJECT TRIP GENERATION/ DISTRIBUTION

5.1 Project Trip Generation

The Gregory Canyon RFEIR traffic study had calculations for the entire landfill site, including water deliveries, but also waste haul trips, employee trips, other deliveries, etc. To calculate the water truck only trips, LLG used key assumptions from the RFEIR traffic study, including the Passenger Car Equivalence (PCE) factor, which accounts for the decreased handling characteristics of heavy vehicles in a traffic stream. The hourly distribution of traffic was determined based on the size of the trucks, the rate at which they could be filled, and the length of the route, as described below.

5.2 Daily Traffic Trip Generation

The applicant has indicated that the highest demand for recycled water is up to 80,000 gallons per day (gpd). Again, this is peak demand, and likely represents a worst-case condition. Based on the applicant's discussions with trucking firms, the haul trucks were calculated to have a capacity of 6,500-7,000 gallons per vehicle (gpv), and when divided into 80,000 gpd results in the need for 12 one-way truck trips, or 24 two-way trips.

As stated earlier, the RFEIR traffic study had defined a PCE factor to account for the effects of trucks in traffic. The PCE factor used was 1.5, which when applied to the newly calculated two-way traffic yields a daily trip generation (average daily traffic, or "ADT") of 36 trips (24 two-way, daily truck trips × 1.5 PCE = 36 ADT). This is substantially less than the 267 ADT (154 ADT X 1.5 PCE) analyzed in the RFEIR.

5.3 Peak Hour Traffic Trip Generation

The project is calculated to generate 36 ADT. To determine how much traffic would occur during the peak hour, LLG utilized specific data (staging operations, fill up duration, departure times) provided by the client to determine the number of trucks that would be on a freeway during any given hour. Based on the hours of business at the landfill (7 AM to 6 PM), LLG used the relationships of the landfill business operations and the staging, fill up times to determine the hourly traffic for the water trucks.

Based on the capacity of the water trucks (6,500-7,000 gpv) it would take approximately 20 minutes for each truck to fill up and depart the water source site. Therefore assuming each truck carries a full load, the maximum number of recycled water trucks that could leave during any given hour would be <u>3 trucks</u> (1 truck = 20 minutes for full load, therefore 3 trucks × 20 minutes = 60 minutes).

As part of this analysis, it was assumed that each truck would depart the source site once fully loaded. It is expected that each trip could require approximately 1.5 hours to arrive at the landfill from the water source. Based on the hours of operation at the landfill stated earlier (7 AM to 6 PM), the first recycled water truck would leave the water source site at 5:30 AM with each subsequent truck leaving every 20 minutes. This would ensure that no truck trips arrive at the SR-76 corridor during nighttime hours (before 7 AM), when noise constraints are high. Once onsite, it was

estimated that each truck would take approximately 30 minutes to unload its contents and depart the landfill site. Thus, it is estimated that 2 trucks per hour would depart the landfill site.

Table 5–1 shows the AM commuter peak hour volumes and daily (24-hour) trips, with a PCE of 1.5 applied. These volumes are the basis of the project analysis conducted at the SR-76/I-15 interchange signalized intersections.

TABLE 5–1
PROJECT TRIP GENERATION
PROPOSED WATER TRUCKS

Vehicle Type	Project Traffic (with PCE)		
	AM Peak Hour		Total ADT
	In	Out	
Water Trucks (Proposed)	**5**	**3**	**36**

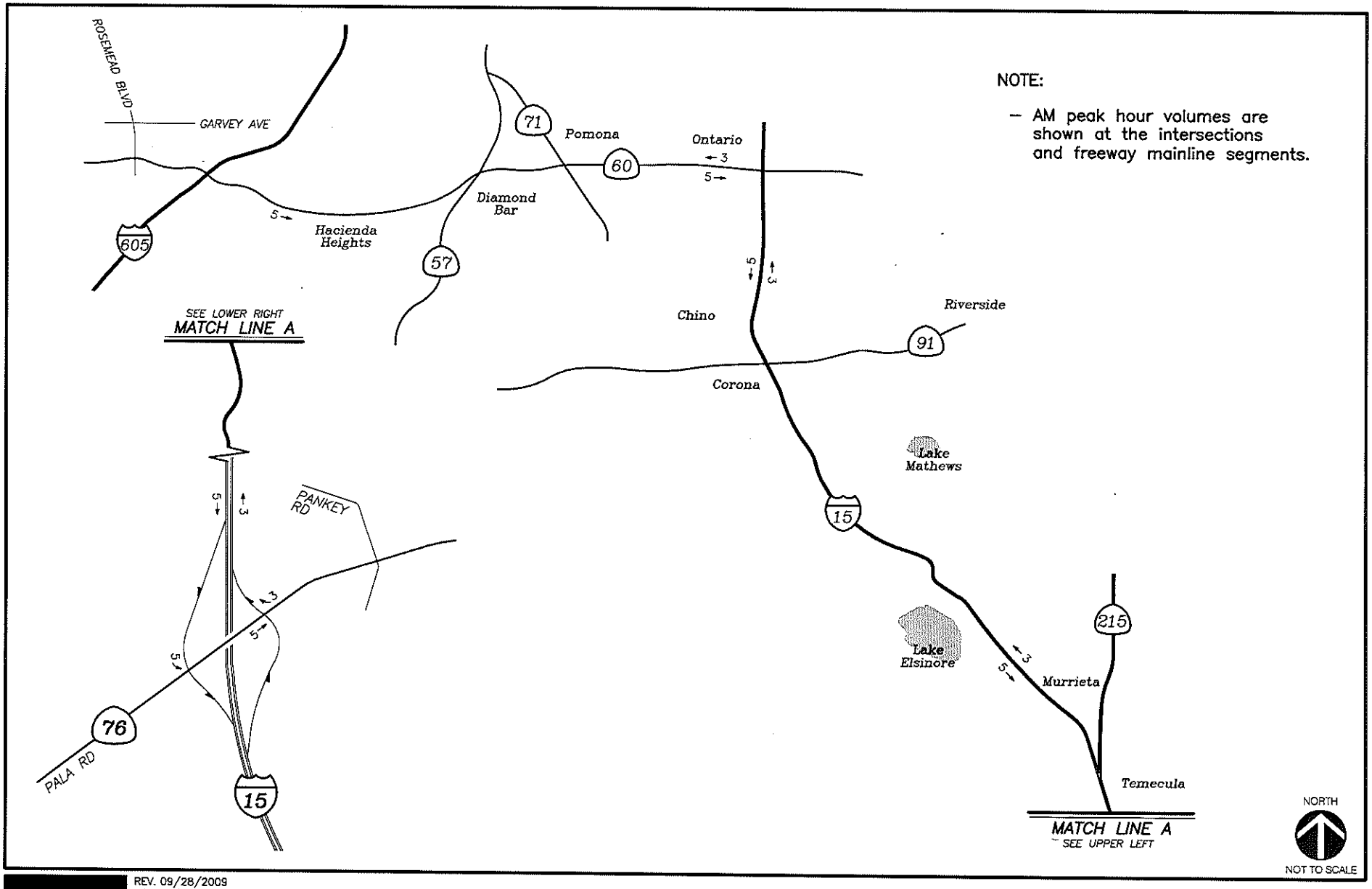
Source: *Table 1–1, Gregory Canyon Landfill Haul Route Focused Traffic Impact Study* (LLG 2009)
General Note: This table shows a PCE factor of 1.5 applied the volumes presented in *Table 1–1*.

5.4 Designated Haul Route

As detailed in Section 1.2, a designated haul route was identified to import water from the *San Gabriel Valley Water Company* and deliver it to the Gregory Canyon Landfill site, in northern San Diego. The haul route would commence from the San Gabriel Valley Water Company:

- eastbound Loma Avenue/Mabel Avenue to southbound Rosemead Boulevard
- southbound Rosemead Boulevard to eastbound State Route (SR) 60
- eastbound SR 60 to southbound I-15
- southbound I-15 to eastbound Pala Road (SR 76)

The return route would be on the same roadways. ***Figure 5–1*** illustrates the project traffic assignment with ***Figure 5–2*** illustrating the baseline + project traffic volumes.



NOTE:

– AM peak hour volumes are shown at the intersections and freeway mainline segments.

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Figure 5-1

Project Traffic Assignment AM Peak Hours

GREGORY CANYON LANDFILL HAUL ROUTE

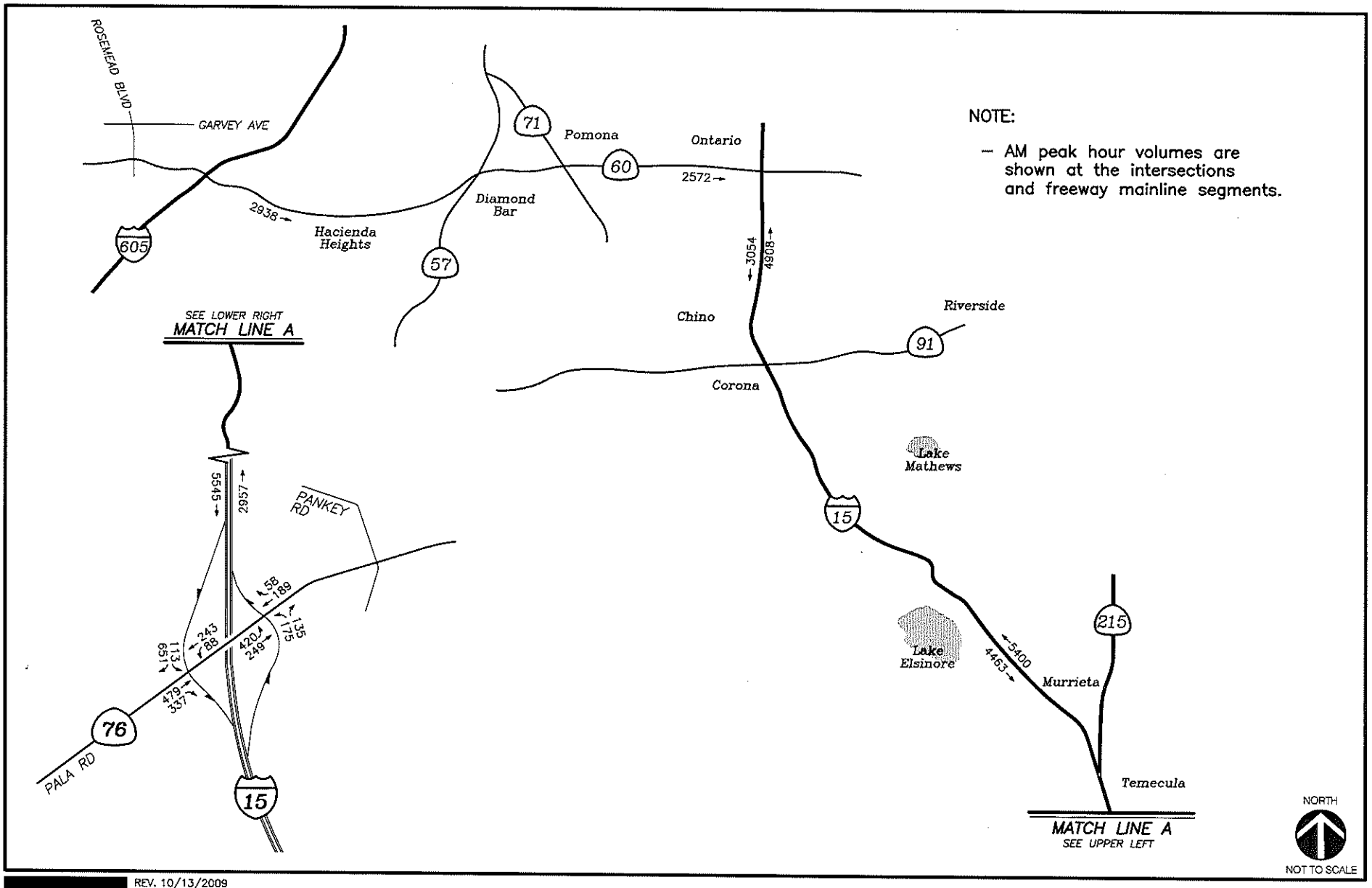

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Figure 5-2

Baseline + Project Traffic Volumes AM Peak Hour

GREGORY CANYON LANDFILL HAUL ROUTE

6.0 NEAR-TERM ANALYSES

The following is a presentation of the project impacts analyzed under near-term conditions, including "Baseline + Project" and "Baseline + Project + Cumulative Growth" scenarios, which are appropriate for this focused traffic impacts analysis.

6.1 Baseline + Project Conditions

6.1.1 *Peak Hour Intersection Levels of Service*

Table 6–1 summarizes the baseline + project intersections Level of Service. As seen in *Table 6–1*, with the addition of project traffic, the *signalized* SR 76/I-15 interchange continues to operate at LOS C with only a nominal increase in delay. ***No significant impacts are calculated.***

Since the SR 76/I-15 interchange continues to operate at acceptable LOS C with the addition of project traffic, this would not be considered to be a significant direct project impact as described in the County Public Facilities Element Criteria discussed in *Section 3.2*.

6.1.2 *Intersection Lane Vehicle (ILV) Analysis*

Table 6–2 shows that with the addition of project traffic to the SR 76/I-15 interchange, the interchange continues to operate at "Near" capacity for the southbound ramps and "Under" capacity for the northbound ramps.

6.1.3 *Freeway Mainline Analysis*

Table 6–3 shows a summary of the mainline freeway analysis along the designated haul route. As seen in *Table 6–3*, within the three jurisdictions of Los Angeles, Riverside, and county of San Diego, the key freeway segments are calculated to continue to operate at acceptable LOS C or better during the AM peak hours. The project is generally adding traffic volumes in the counterflow (westbound and southbound directions) of the SR 60 and I-15 freeways, respectively, although two trucks trips are assumed to return to the north on the freeway system during the AM peak hour. ***No significant impacts are calculated.***

6.2 Baseline + Project + Cumulative Growth Conditions

For the purposes of this focused traffic impact analysis, a growth-factor approach is deemed appropriate to assess near-term cumulative projects, based on the relatively small size of the project traffic volume generation and the project's focused study area. Based on historical growth trends in San Diego County, a two percent (2%) per year increase over existing counts was used for the analysis. ***Figure 6–1*** shows the cumulative growth traffic volumes with ***Figure 6–2*** showing a summary of the baseline + project + cumulative growth traffic volumes.

As the low project trip generation (<30 ADT) requires only a focused traffic impact analysis, no long-term cumulative analysis is required based on regional criteria.

6.2.1 *Peak Hour Intersection Levels of Service*

Table 6–1 summarizes the baseline + project + cumulative growth intersection Level of Service. As seen in *Table 6–1*, with the addition of cumulative growth, the SR 76/I-15 interchange is calculated to continue to operate at acceptable LOS C. ***No significant impacts are calculated.***

6.2.2 *Intersection Lane Vehicle (ILV) Analysis*

Table 6–2 shows that with the addition of cumulative growth to the SR 76/I-15 interchange, the southbound ramps continue to operate at "Near" capacity while the northbound ramps continue to operate at "Under" capacity.

6.2.3 *Freeway Mainline Analysis*

Table 6–3 shows that with the addition of cumulative growth, all freeway segments are calculated to continue to operate at acceptable LOS C or better operations for the AM commuter peak hour direction studied. ***No significant impacts are calculated.***

TABLE 6–1
NEAR-TERM INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Baseline		Baseline + Project		Baseline + Project + Cumulative Growth	
			Delay[a]	LOS[b]	Delay	LOS	Delay	LOS
1. SR 76 (Pala Road) / I-15 SB Ramps	Signal	AM	27.8	C	27.8	C	29.2	C
2. SR 76 (Pala Road) / I-15 NB Ramps	Signal	AM	22.7	C	23.1	C	23.9	C

Footnotes:
a. Average delay expressed in seconds per vehicle.
b. Level of Service.

General Notes:
1. Baseline = "Existing 2009 traffic volumes + Gregory Canyon Landfill RFEIR traffic minus proposed project traffic (24 truck trips)".
2. Baseline + Project = "Existing 2009 traffic volumes + Gregory Canyon Landfill RFEIR traffic = proposed project traffic" for a total Gregory Canyon Landfill traffic contribution of 2,085 ADT (with PCE).
3. Cumulative Growth = 10% (2% / Year) growth factor applied to account for unforeseen development.

SIGNALIZED

DELAY/LOS THRESHOLDS

Delay	LOS
0.0 < 10.0	A
10.1 to 20.0	B
20.1 to 35.0	C
35.1 to 55.0	D
55.1 to 80.0	E
> 80.1	F

TABLE 6–2
NEAR-TERM ILV OPERATIONS

Intersection	Control Type	Peak Hour	Baseline		Baseline + Project		Δ[b]	Baseline + Project + Cumulative Growth		Δ[c]
			Total Operating Level (ILV / Hour)	Capacity	Total Operating Level (ILV / Hour)	Capacity		Total Operating Level (ILV / Hour)	Capacity	
1. SR 76 (Pala Road) / I-15 SB Ramps	Signal	AM	1,218	Near	1,218	Near	0	1,334	Near	116
2. SR 76 (Pala Road) / I-15 NB Ramps	Signal	AM	784	Under	784	Under	0	858	Under	74

Footnotes:

a. See Appendix B for ILV data sheets.

b. "Δ" denotes the project-induced increase.

c. "Δ" denotes increase due to cumulative growth.

General Notes:

1. Baseline = "Existing 2009 traffic volumes + Gregory Canyon Landfill RFEIR traffic minus proposed project traffic (24 truck trips)".
2. Baseline + Project = "Existing 2009 traffic volumes + Gregory Canyon Landfill RFEIR traffic = proposed project traffic" for a total Gregory Canyon Landfill traffic contribution of 2,085 ADT (with PCE).
3. Cumulative Growth = 10% (2% / Year) growth factor applied to account for unforeseen development.

TABLE 6–3
NEAR-TERM AM PEAK HOUR MAINLINE OPERATIONS SUMMARY

Freeway and Segment	Existing ADT	Direction/ Capacity[a]		Baseline			Baseline + Project			Δ[e]	Baseline + Project + Cumulative Growth		
				PHV[b]	V/C[c]	LOS[d]	PHV	V/C	LOS		PHV	V/C	LOS
SR 60 *(Off-peak)*[f]													
I-605 to SR 57	174,300	EB	8,000	2,933	0.367	A	2,935	0.367	A	0.00	3,228	0.404	A
		WB	8,000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SR 57 to I-15	209,700	EB	9,200	2,567	0.279	A	2,569	0.279	A	0.00	2,826	0.307	A
		WB	9,200	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SR 60 *(Peak Hour)*													
I-605 to SR 57	174,300	EB	8,000	4,417	0.552	B	4,422	0.553	B	0.01	4,715	0.589	B
		WB	8,000	3,259	0.407	A	3,261	0.408	A	0.01	3,587	0.448	B
SR 57 to I-15	209,700	EB	9,200	4,865	0.529	B	4,870	0.529	B	0.00	5,127	0.557	B
		WB	9,200	4,706	0.512	B	4,708	0.512	B	0.00	5,179	0.563	B
I-15 *(Peak Hour)*[g]													
SR 60 to SR 91	150,000	SB	9,200	3,049	0.331	A	3,054	0.332	A	0.01	3,359	0.365	A
		NB	9,200	4,906	0.533	B	4,908	0.533	B	0.00	5,399	0.587	B
SR 91 to SR 215	109,000	SB	9,200	4,458	0.485	B	4,463	0.485	B	0.00	4,909	0.534	B
		NB	9,200	5,398	0.587	B	5,400	0.587	B	0.00	5,940	0.646	C
SR 215 to SR 76 (Pala Road)	128,000	SB	8,000	5,540	0.693	C	5,545	0.693	C	0.00	6,095	0.762	C
		NB	8,000	2,955	0.369	A	2,957	0.370	A	0.01	3,253	0.407	A

Footnotes

a. Capacity based on 2,000 vehicles/hour/lane.
b. PHV = Peak Hour Volumes
c. V/C = Volume/ Capacity
d. LOS = Level of Service
e. Δ denotes project-induced increase in the V/C.
f. 5-6 AM operations are shown for use in the noise study.
g. AM peak hour operations are shown for use in determining potential project impacts.

General Notes:

1. Baseline = "Existing 2009 traffic volumes + Gregory Canyon Landfill RFEIR traffic minus proposed project traffic (24 truck trips)".
2. Baseline + Project = "Existing 2009 traffic volumes + Gregory Canyon Landfill RFEIR traffic = proposed project traffic" for a total Gregory Canyon Landfill traffic contribution of 2,085 ADT (with PCE).
3. Cumulative Growth = 10% (2% / Year) growth factor applied to account for unforeseen development.
4. N/A – An off- peak analysis for the WB movements along each segment of SR 60 (return trips) were not applicable since these trips would occur during the peak hour.

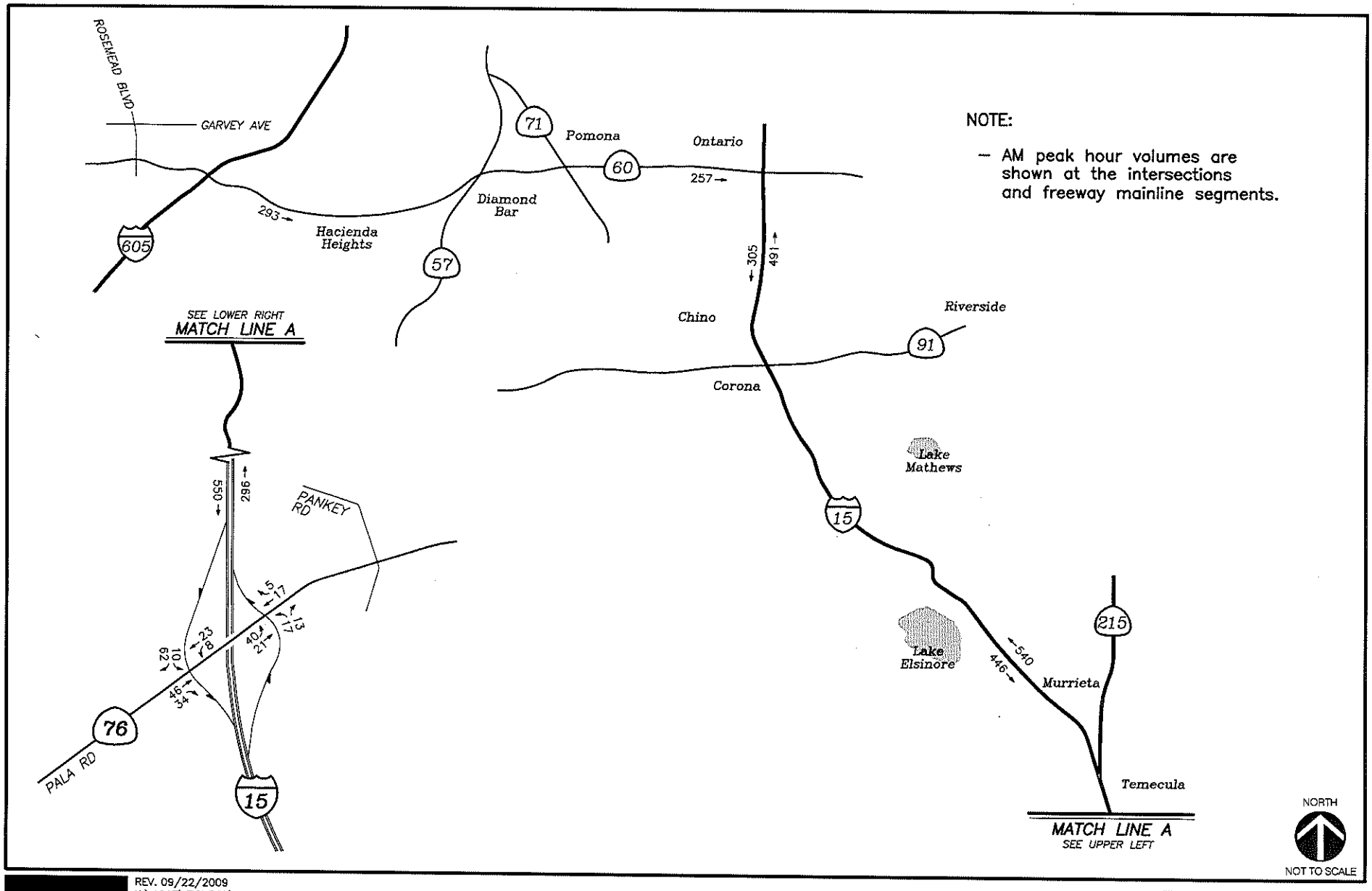

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Figure 6-1

Cumulative Growth Traffic Volumes AM Peak Hour

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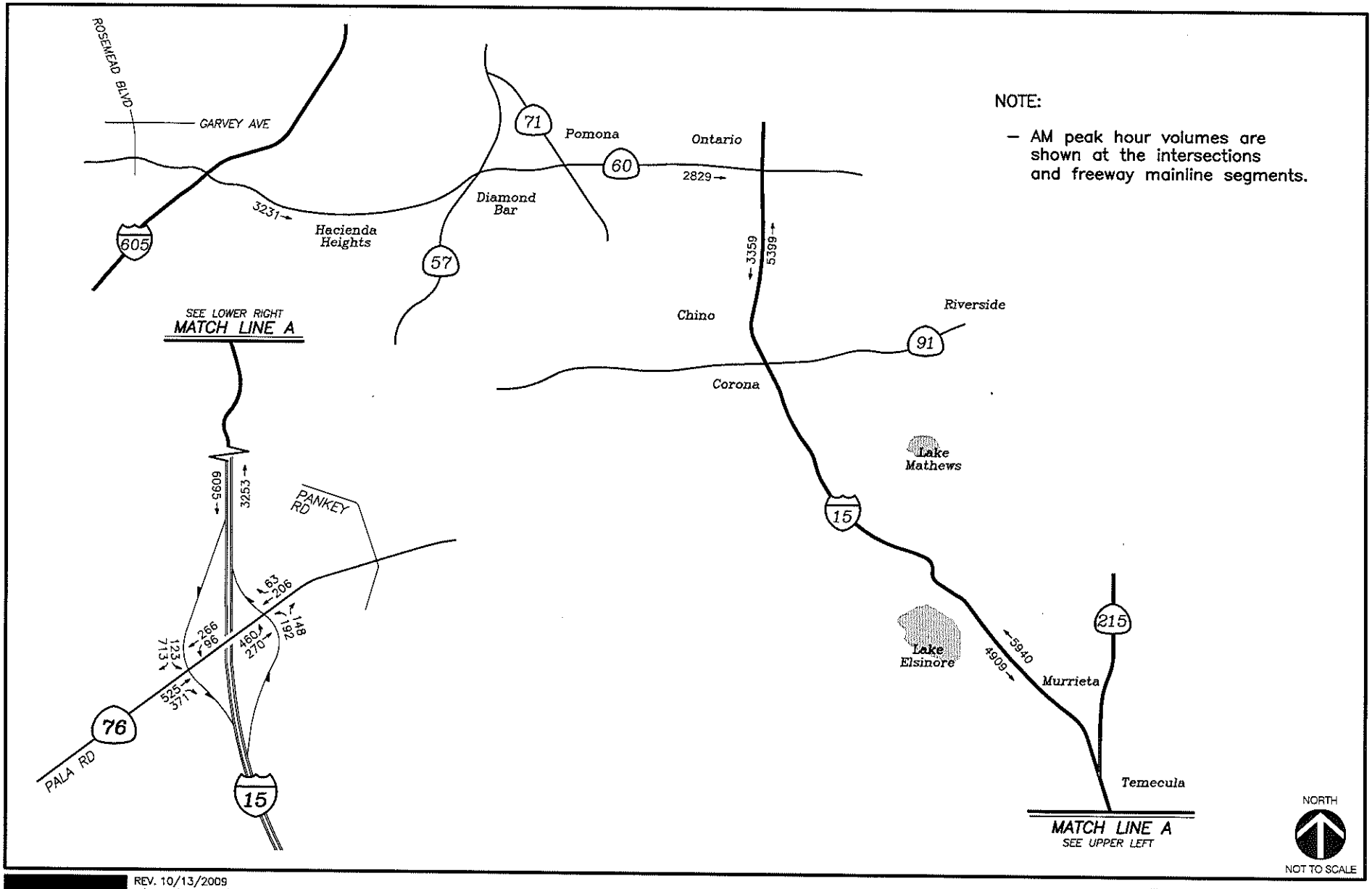

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Figure 6-2

Baseline + Project + Cumulative Growth Traffic Volumes AM Peak Hour

GREGORY CANYON LANDFILL HAUL ROUTE

7.0 CONCLUSIONS/ RECOMMENDATIONS

The RFEIR traffic study considered the potential impacts of recycled water truck trips oriented from San Diego County, south of SR 76. The proposed recycled water truck project would result in fewer water truck trips than the RFEIR, and they would be oriented from Los Angeles County, north of SR 76. This focused traffic impact study assessed the impacts of the redistributed recycled water truck trips. The total RFEIR landfill project trips (including recycled water truck trips) was kept constant at 2,085 ADT with PCE.

The proposed recycled water truck project is calculated to generate thirty-six (36) ADT and eight (8) peak hour trips during the AM commuter peak hour, including a PCE of 1.5. No traffic is forecasted during the PM peak period since daily recycled water truck operations would conclude by 2 PM. These trips would not warrant analysis based on published guidelines for jurisdictions in Los Angeles and San Diego Counties (local streets) and the State of California (freeways in San Diego, Riverside and Los Angeles Counties).

To be conservative, this focused traffic impact analysis does provide an analysis at the SR-76/I-15 interchange signalized intersections and along the SR 60 and I-15 freeway segments. The project's small peak hour contribution of traffic does not exceed the published significance criteria for either the intersections or the freeway segments. Based on these peak hour analyses, no direct or cumulative project impacts are determined.

8.0 REFERENCES

Highway Capacity Manual (HCM) 2000

County of San Diego *Guidelines for Determining Significance* (June 30, 2009)

County of San Diego *General Plan Public Facilities Element (PFE) PFE, Transportation, Policy 1.1*

County of San Diego *Report Format & Content Requirements for Transportation and Traffic* (June 30, 2009)

County of San Diego Circulation Element

County of San Diego *Transportation Impact Fee, TIF Program Update* (January 2008)

Los Angeles Department of Transportation (LADOT) *Traffic Study Policies and Procedures* (March 2002)

San Diego Traffic Engineer's Council/Institute of Traffic Engineers (SANTEC/ITE) *Guidelines for the Preparation of Traffic Impact Studies [TIS] in the San Diego Region* (March 2000)

The State of California Department of Transportation (Caltrans) *Guide for the Preparation of Traffic Impact Studies* (June 2001)

9.0 LIST OF PREPARERS AND ORGANIZATIONS CONTACTED

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Organizations Contacted

County of San Diego, Department of Public Works Transportation Division

True Count (traffic data provider), Mr. Gustavo Garcia

APPENDIX A

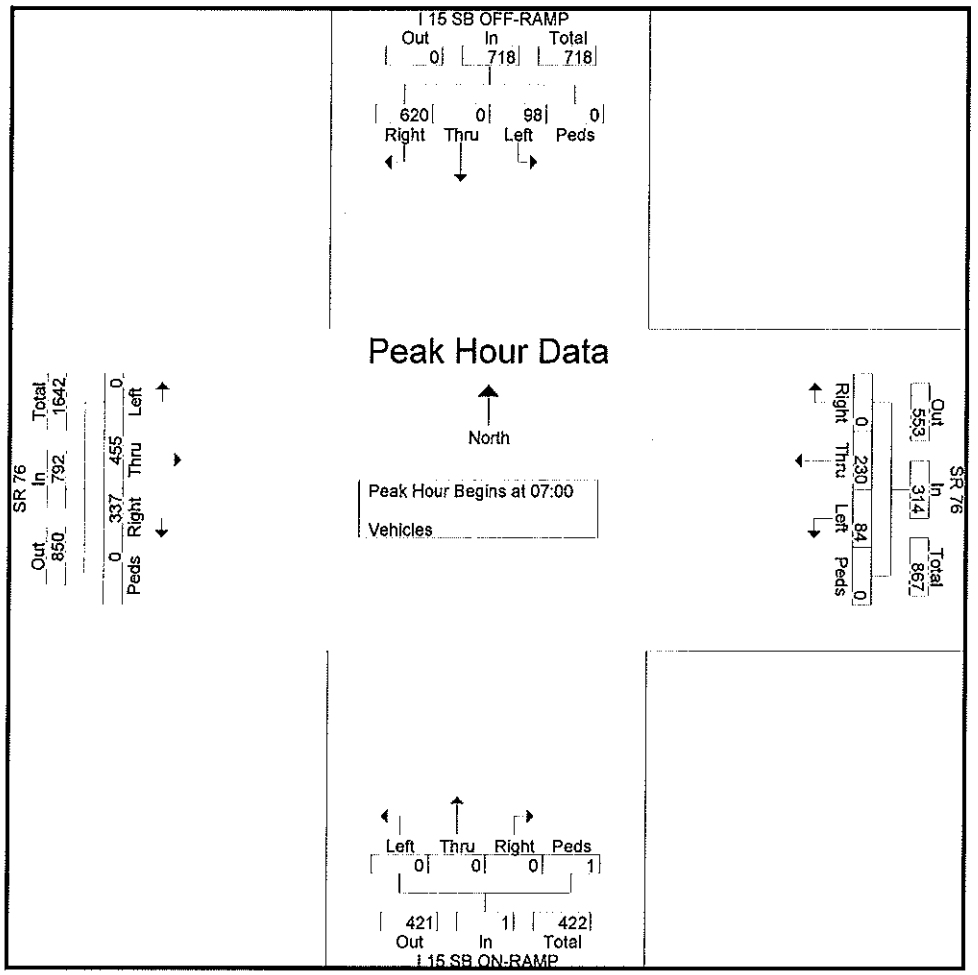
INTERSECTION AND "PEMS" MANUAL COUNT SHEETS

True Count

3401 First Ave #123
San Diego, CA 92103

File Name : 9077.02.I- 15 SB OFF-RAMP.SR 76
Site Code : 00000000
Start Date : 8/26/2009
Page No : 2

	I 15 SB OFF-RAMP Southbound					SR 76 Westbound					I 15 SB ON-RAMP Northbound					SR 76 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 11:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00																					
07:00	17	0	159	0	176	16	50	0	0	66	0	0	0	0	0	0	102	**96**	0	198	440
07:15	16	0	**164**	0	180	**32**	47	0	0	79	0	0	0	0	0	0	109	88	0	197	456
07:30	**33**	0	146	0	179	18	**77**	0	0	**95**	0	0	0	0	0	0	118	94	0	**212**	**486**
07:45	32	0	151	0	**183**	18	56	0	0	74	0	0	0	**1**	**1**	0	**126**	59	0	185	443
Total Volume	98	0	620	0	718	84	230	0	0	314	0	0	0	1	1	0	455	337	0	792	1825
% App. Total	13.6	0	86.4	0		26.8	73.2	0	0		0	0	0	100		0	57.4	42.6	0		
PHF	.742	.000	.945	.000	.981	.656	.747	.000	.000	.826	.000	.000	.000	.250	.250	.000	.903	.878	.000	.934	.939

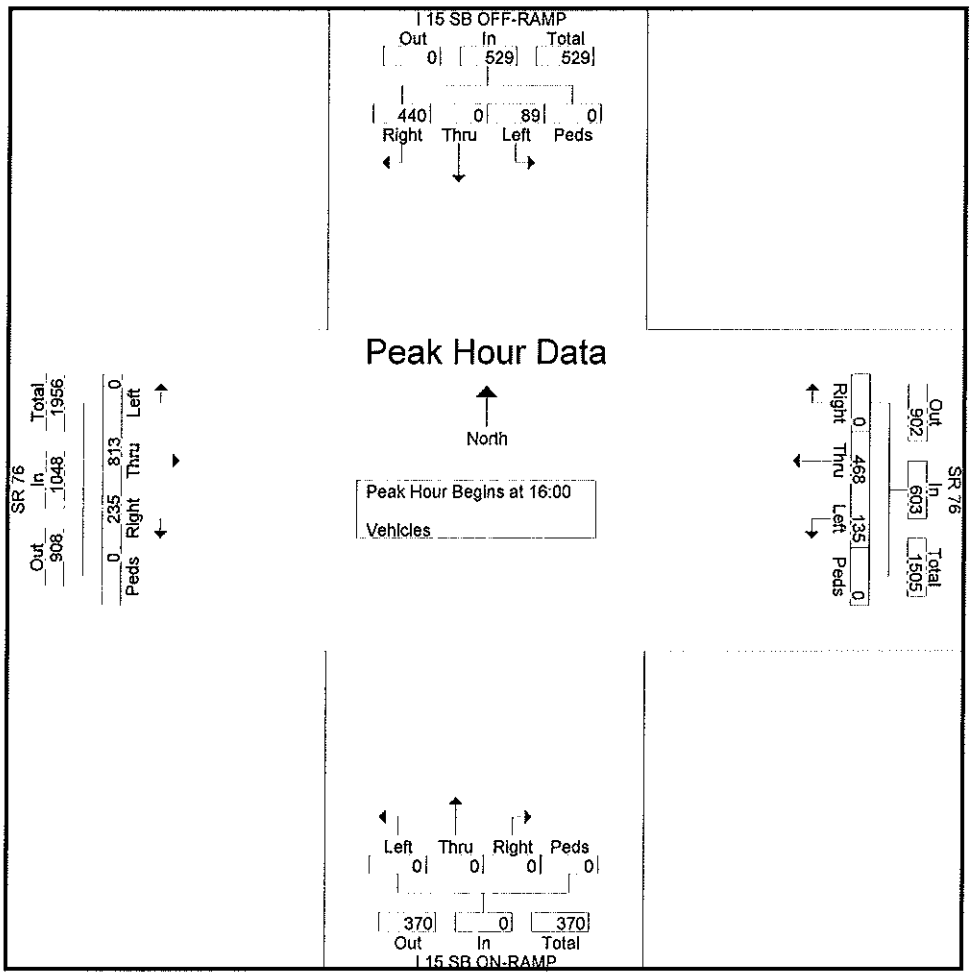


True Count

3401 First Ave #123
San Diego, CA 92103

File Name : 9077.02.I- 15 SB OFF-RAMP.SR 76
Site Code : 00000000
Start Date : 8/26/2009
Page No : 3

	I 15 SB OFF-RAMP Southbound					SR 76 Westbound					I 15 SB ON-RAMP Northbound					SR 76 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 to 17:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 16:00																					
16:00	21	0	**119**	0	**140**	26	130	0	0	156	0	0	0	0	0	0	**214**	54	0	**268**	**564**
16:15	**30**	0	106	0	136	38	115	0	0	153	0	0	0	0	0	0	197	**71**	0	268	557
16:30	25	0	107	0	132	**43**	88	0	0	131	0	0	0	0	0	0	197	56	0	253	516
16:45	13	0	108	0	121	28	**135**	0	0	**163**	0	0	0	0	0	0	205	54	0	259	543
Total Volume	89	0	440	0	529	135	468	0	0	603	0	0	0	0	0	0	813	235	0	1048	2180
% App. Total	16.8	0	83.2	0		22.4	77.6	0	0		0	0	0	0		0	77.6	22.4	0		
PHF	.742	.000	.924	.000	.945	.785	.867	.000	.000	.925	.000	.000	.000	.000	.000	.000	.950	.827	.000	.978	.966

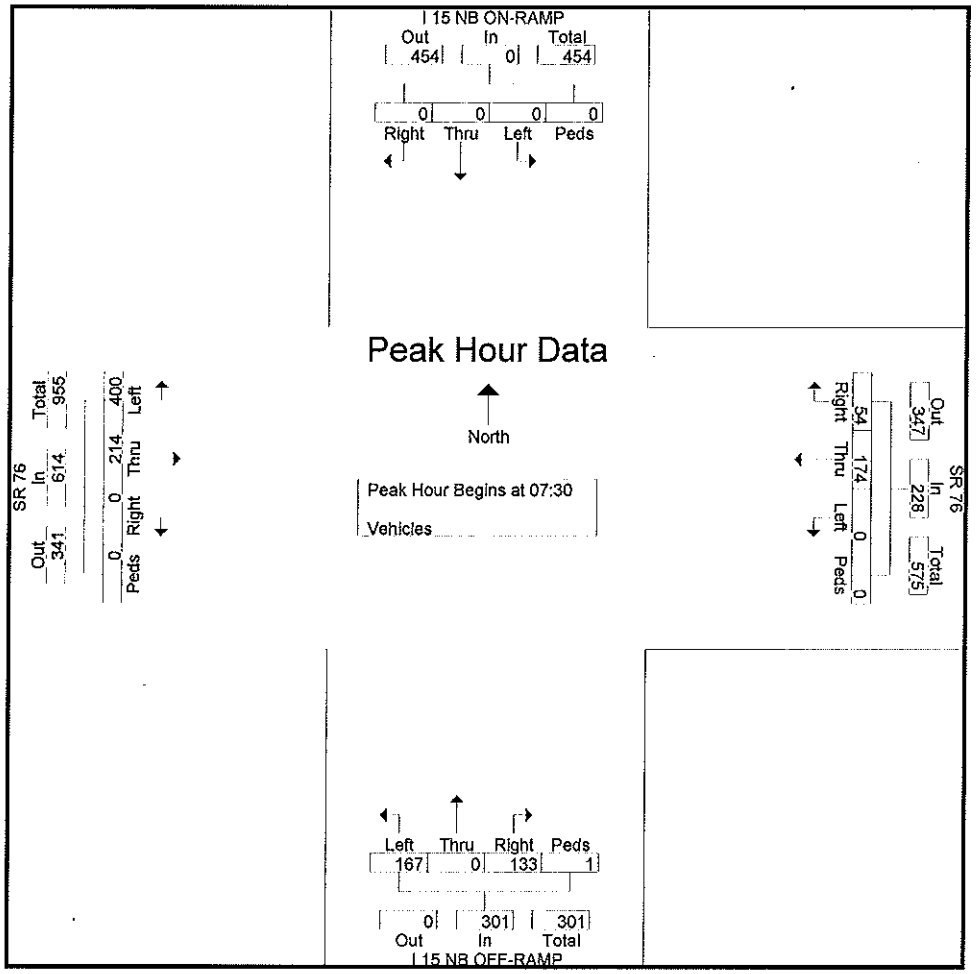


True Count

3401 First Ave #123
San Diego, CA 92103

File Name : 9077.01.I -15 NB OFF-RAMP.SR 76
Site Code : 00000000
Start Date : 8/26/2009
Page No : 2

	I 15 NB ON-RAMP Southbound					SR 76 Westbound					I 15 NB OFF-RAMP Northbound					SR 76 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 11:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30																					
07:30	0	0	0	0	0	0	**54**	**19**	0	**73**	42	0	31	0	73	94	**60**	0	0	154	**300**
07:45	0	0	0	0	0	0	39	14	0	53	38	0	32	0	70	93	52	0	0	145	268
08:00	0	0	0	0	0	0	35	12	0	47	**52**	0	**41**	**1**	**94**	**113**	46	0	0	**159**	300
08:15	0	0	0	0	0	0	46	9	0	55	35	0	29	0	64	100	56	0	0	156	275
Total Volume	0	0	0	0	0	0	174	54	0	228	167	0	133	1	301	400	214	0	0	614	1143
% App. Total	0	0	0	0		0	76.3	23.7	0		55.5	0	44.2	0.3		65.1	34.9	0	0		
PHF	.000	.000	.000	.000	.000	.000	.806	.711	.000	.781	.803	.000	.811	.250	.801	.885	.892	.000	.000	.965	.953

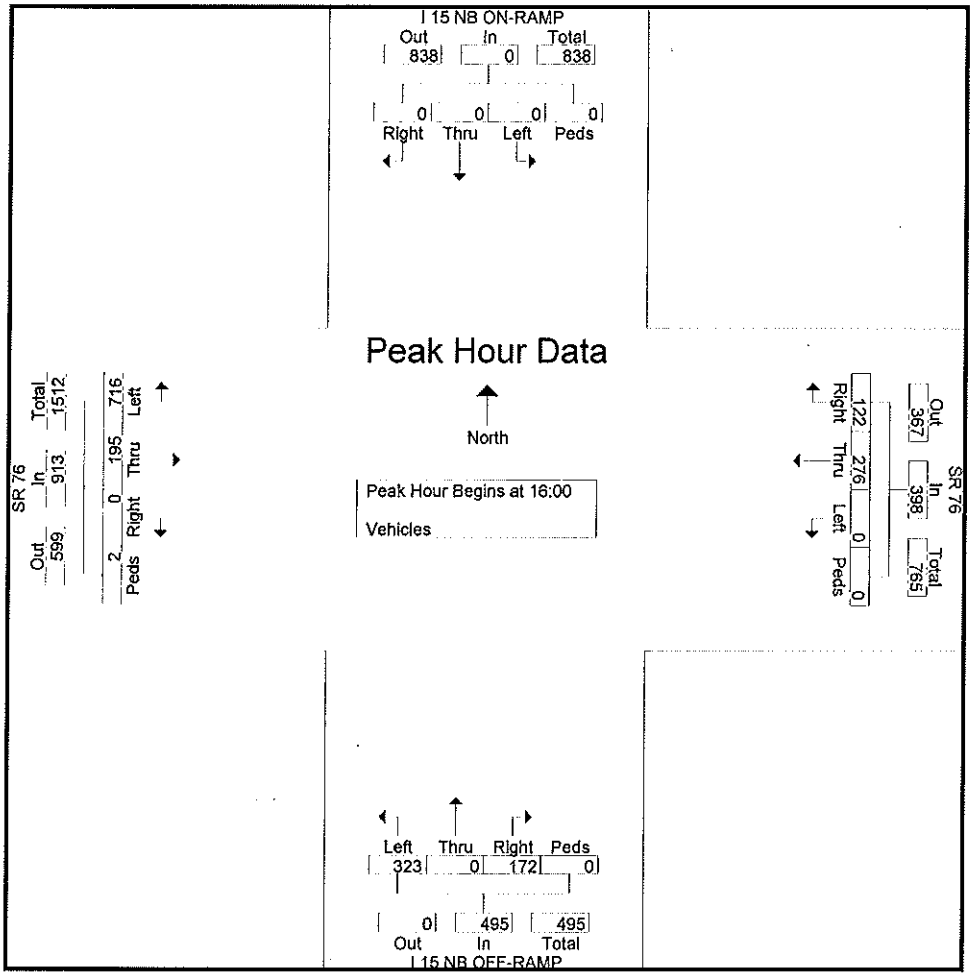


True Count

3401 First Ave #123
San Diego, CA 92103

File Name : 9077.01.I -15 NB OFF-RAMP.SR 76
Site Code : 00000000
Start Date : 8/26/2009
Page No : 3

	I 15 NB ON-RAMP Southbound					SR 76 Westbound					I 15 NB OFF-RAMP Northbound					SR 76 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 to 17:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 16:00																					
16:00	0	0	0	0	0	0	72	**32**	0	104	**94**	0	45	0	**139**	176	49	0	0	225	**468**
16:15	0	0	0	0	0	0	**77**	32	0	**109**	73	0	**51**	0	124	169	**60**	0	**2**	231	464
16:30	0	0	0	0	0	0	55	27	0	82	63	0	32	0	95	**186**	54	0	0	**240**	417
16:45	0	0	0	0	0	0	72	31	0	103	93	0	44	0	137	185	32	0	0	217	457
Total Volume	0	0	0	0	0	0	276	122	0	398	323	0	172	0	495	716	195	0	2	913	1806
% App. Total	0	0	0	0		0	69.3	30.7	0		65.3	0	34.7	0		78.4	21.4	0	0.2		
PHF	.000	.000	.000	.000	.000	.000	.896	.953	.000	.913	.859	.000	.843	.000	.890	.962	.813	.000	.250	.951	.965



MetroCount Traffic Executive
Vehicle Counts

VehicleCount-1699 -- English (ENU)

Datasets:

Site:	**[9077.01] HWY-76 (PANKEY RD-HWY-15) EASTBOUND**
Direction:	6 - West bound A>B, East bound B>A., **Lane:** 0
Survey Duration:	18:07 Monday, August 24, 2009 => 11:17 Wednesday, August 26, 2009
File:	C:\Users\Gus\True Count\Projects\9077 PALA\9077.0126Aug2009.EC0 (Regular)
Identifier:	V231TDVM MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**0:00 Tuesday, August 25, 2009 => 0:00 Wednesday, August 26, 2009**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed range:	5 - 100 mph.
Direction:	East (bound)
Separation:	All - (Headway)
Name:	TC Default Profile
Scheme:	Vehicle classification (Scheme F2)
Units:	Non metric (ft, mi, ft/s, mph, lb, ton)
In profile:	Vehicles = 5448 / 16183 (33.66%)

*** Tuesday, August 25, 2009 - Total=5448, 15 minute drops**

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
38	32	34	23	22	138	260	295	290	271	393	372	354	383	331	338	366	333	302	271	199	170	141	92	
16	11	8	9	4	8	66	59	66	53	91	**84**	106	109	74	71	103	87	72	69	47	49	34	19	-
10	12	6	2	7	41	65	70	90	69	94	**106**	73	93	84	105	82	90	83	71	55	38	44	30	-
5	3	10	6	6	39	68	96	71	77	**108**	90	82	104	100	93	90	81	76	62	52	43	34	26	-
7	6	10	6	5	50	61	70	63	72	**100**	92	93	77	73	69	91	75	71	69	45	40	29	17	-

AM Peak 1030 - 1130 (398), AM PHF=0.92

MetroCount Traffic Executive
Vehicle Counts

VehicleCount-1700 -- English (ENU)

Datasets:

Site:	**[9077.01] HWY-76 (PANKEY RD-HWY-15) WESTBOUND**
Direction:	6 - West bound A>B, East bound B>A., **Lane:** 0
Survey Duration:	18:07 Monday, August 24, 2009 => 11:17 Wednesday, August 26, 2009
File:	C:\Users\Gus\True Count\Projects\9077 PALA\9077.0126Aug2009.EC0 (Regular)
Identifier:	V231TDVM MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**0:00 Tuesday, August 25, 2009 => 0:00 Wednesday, August 26, 2009**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed range:	5 - 100 mph.
Direction:	West (bound)
Separation:	All - (Headway)
Name:	TC Default Profile
Scheme:	Vehicle classification (Scheme F2)
Units:	Non metric (ft, mi, ft/s, mph, lb, ton)
In profile:	Vehicles = 5456 / 16183 (33.71%)

*** Tuesday, August 25, 2009 - Total=5456, 15 minute drops**

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
144	116	99	74	76	114	163	196	211	193	235	275	267	285	379	469	417	370	288	261	252	173	188	211	
28	24	28	21	18	23	29	40	51	56	45	**75**	66	83	91	116	111	102	73	77	71	42	52	52	-
30	28	16	18	26	31	44	51	46	42	61	**61**	69	82	79	102	91	102	75	58	74	53	52	48	-
52	43	26	19	19	32	37	54	59	42	61	**76**	68	58	95	118	104	94	74	66	57	41	37	61	-
34	21	29	16	13	28	53	51	55	53	**68**	63	64	62	114	133	111	72	66	60	50	37	47	50	-

AM Peak 1045 - 1145 (280), AM PHF=0.92

West
Start Date: 9/9/2009
Start Time: 12:00:00 AM
Location 1: Mabel Ave
Location 2: W/O Lee

Date	Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed
9/9/2009	12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	12:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	12:30 AM	0	2	0	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	12:45 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	01:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	01:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	01:30 AM	0	2	0	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	01:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	02:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	02:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	02:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	02:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	03:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	03:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	03:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	03:45 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	04:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	04:15 AM	0	2	0	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	04:30 AM	0	3	1	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	04:45 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	05:00 AM	0	1	1	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	05:15 AM	0	3	0	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	05:30 AM	0	8	1	0	0	0	0	0	0	0	0	0	0	1
9/9/2009	05:45 AM	0	24	4	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	06:00 AM	0	11	1	0	2	0	0	0	0	0	0	0	0	0
9/9/2009	06:15 AM	0	12	7	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	06:30 AM	0	17	3	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	06:45 AM	0	38	1	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	07:00 AM	0	22	5	0	2	0	0	0	0	0	0	0	0	0
9/9/2009	07:15 AM	0	20	4	0	1	0	0	0	0	0	0	0	0	0
9/9/2009	07:30 AM	0	23	7	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	07:45 AM	0	25	6	0	3	0	0	0	0	0	0	0	0	1
9/9/2009	08:00 AM	1	28	4	0	4	0	0	1	0	0	0	0	0	1
9/9/2009	08:15 AM	0	30	4	0	3	0	0	1	0	0	0	0	0	0
9/9/2009	08:30 AM	0	19	1	0	1	0	0	0	0	0	0	0	0	0
9/9/2009	08:45 AM	1	14	1	1	0	0	0	0	1	0	0	0	0	0
9/9/2009	09:00 AM	0	17	1	0	1	0	0	0	0	0	0	0	0	0
9/9/2009	09:15 AM	0	23	4	0	2	0	0	0	1	0	0	0	0	0
9/9/2009	09:30 AM	0	16	1	0	3	0	0	0	0	0	0	0	0	1
9/9/2009	09:45 AM	0	19	2	0	1	0	0	0	0	0	0	0	0	0
9/9/2009	10:00 AM	0	15	1	0	2	0	0	1	2	0	0	0	0	0
9/9/2009	10:15 AM	0	18	1	1	1	0	0	0	1	0	0	0	0	0
9/9/2009	10:30 AM	0	10	2	0	1	0	0	0	0	0	0	0	0	0
9/9/2009	10:45 AM	0	13	1	0	1	0	0	0	0	0	0	0	0	0
9/9/2009	11:00 AM	0	10	1	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	11:15 AM	0	19	3	0	3	0	0	0	0	0	0	0	0	0
9/9/2009	11:30 AM	0	19	4	0	1	0	0	0	0	0	0	0	0	1
9/9/2009	11:45 AM	0	7	2	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	12:00 PM	0	7	2	1	0	0	0	1	0	0	0	0	0	0
9/9/2009	12:15 PM	0	21	4	0	2	0	0	0	0	0	0	0	0	1
9/9/2009	12:30 PM	0	17	1	0	0	0	0	0	1	0	0	0	0	0
9/9/2009	12:45 PM	0	14	2	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	01:00 PM	0	20	4	0	1	0	0	0	0	0	0	0	0	0
9/9/2009	01:15 PM	0	8	1	0	2	0	0	0	0	0	0	0	0	0
9/9/2009	01:30 PM	0	16	3	1	0	0	0	0	0	0	0	0	0	0
9/9/2009	01:45 PM	0	17	4	1	3	0	0	0	0	0	0	0	0	0
9/9/2009	02:00 PM	0	19	5	0	6	0	0	0	0	0	0	0	0	0
9/9/2009	02:15 PM	0	20	3	1	3	0	0	0	0	0	0	0	0	0
9/9/2009	02:30 PM	1	24	0	0	3	0	0	0	1	0	0	0	0	0
9/9/2009	02:45 PM	0	16	6	0	1	0	0	0	0	0	0	0	0	0
9/9/2009	03:00 PM	0	13	1	1	2	0	0	0	0	0	0	0	0	1
9/9/2009	03:15 PM	0	17	7	0	2	0	0	0	0	0	0	0	0	0
9/9/2009	03:30 PM	0	13	2	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	03:45 PM	0	13	2	0	1	0	0	0	0	0	0	0	0	0
9/9/2009	04:00 PM	0	13	4	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	04:15 PM	0	4	1	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	04:30 PM	1	10	0	0	0	0	0	0	0	0	0	0	0	1
9/9/2009	04:45 PM	0	22	4	0	1	1	0	0	0	0	0	0	0	2
9/9/2009	05:00 PM	0	14	0	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	05:15 PM	0	13	1	0	1	0	0	0	0	0	0	0	0	1
9/9/2009	05:30 PM	0	11	1	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	05:45 PM	0	9	1	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	06:00 PM	0	13	3	0	1	0	0	0	0	0	0	0	0	0
9/9/2009	06:15 PM	0	9	2	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	06:30 PM	0	7	1	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	06:45 PM	0	5	1	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	07:00 PM	0	9	1	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	07:15 PM	0	4	3	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	07:30 PM	0	5	0	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	07:45 PM	0	3	0	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	08:00 PM	0	3	1	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	08:15 PM	0	3	1	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	08:30 PM	0	5	1	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	08:45 PM	0	5	0	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	09:00 PM	0	3	0	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	09:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	09:30 PM	0	3	0	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	09:45 PM	0	3	0	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	10:00 PM	1	3	0	0	0	0	0	0	0	0	0	0	0	1
9/9/2009	10:15 PM	0	4	2	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	10:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	10:45 PM	0	2	1	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	11:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	11:15 PM	0	5	0	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	11:30 PM	1	1	0	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	11:45 PM	0	2	0	0	0	0	0	0	0	0	0	0	0	0

North
Start Date: 9/9/2009
Start Time: 12:00:00 AM
Location 1: Rosemead Blvd
Location 2: Bt Fern St & Klingerman St

Date	Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed
9/9/2009	12:00 AM	1	46	4	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	12:15 AM	0	46	5	0	0	0	0	1	0	0	0	0	0	1
9/9/2009	12:30 AM	0	53	6	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	12:45 AM	0	37	6	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	01:00 AM	1	30	2	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	01:15 AM	0	24	2	0	1	0	0	0	1	0	0	0	0	0
9/9/2009	01:30 AM	0	32	4	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	01:45 AM	0	27	2	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	02:00 AM	0	28	3	0	0	0	0	0	0	0	1	0	0	0
9/9/2009	02:15 AM	0	28	0	0	1	0	0	0	0	0	0	0	0	0
9/9/2009	02:30 AM	0	24	0	0	2	0	0	0	0	0	0	0	0	0
9/9/2009	02:45 AM	0	20	4	0	1	0	0	0	1	0	0	0	0	0
9/9/2009	03:00 AM	0	17	3	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	03:15 AM	0	10	1	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	03:30 AM	0	11	4	0	1	0	0	0	1	0	0	0	0	0
9/9/2009	03:45 AM	0	14	1	1	1	0	0	0	0	0	0	0	0	0
9/9/2009	04:00 AM	0	22	3	0	2	0	0	0	0	0	0	0	0	0
9/9/2009	04:15 AM	0	23	4	0	0	0	0	0	0	0	0	0	0	0
9/9/2009	04:30 AM	0	18	3	0	0	1	0	0	0	0	0	0	0	0
9/9/2009	04:45 AM	0	26	5	0	3	0	0	0	0	0	0	0	0	0
9/9/2009	05:00 AM	0	39	7	0	0	0	0	1	0	0	0	0	0	0
9/9/2009	05:15 AM	1	33	7	1	0	0	0	1	0	0	0	0	0	0
9/9/2009	05:30 AM	0	64	14	0	4	0	0	1	1	0	0	0	0	0
9/9/2009	05:45 AM	1	62	17	1	4	2	0	1	0	0	0	0	0	0
9/9/2009	06:00 AM	2	102	21	3	3	2	0	1	0	0	0	0	0	0
9/9/2009	06:15 AM	0	97	11	0	2	0	0	3	2	0	0	0	0	0
9/9/2009	06:30 AM	1	145	24	2	7	1	0	2	0	0	0	0	0	1
9/9/2009	06:45 AM	1	176	22	1	4	1	1	3	3	1	0	0	0	0
9/9/2009	07:00 AM	2	222	34	3	4	3	0	3	0	0	0	0	0	2
9/9/2009	07:15 AM	2	233	32	2	5	3	0	3	0	0	0	0	0	1
9/9/2009	07:30 AM	3	284	44	1	10	1	0	2	1	0	1	0	1	2
9/9/2009	07:45 AM	2	345	41	4	8	3	1	1	0	0	0	0	2	1
9/9/2009	08:00 AM	5	370	32	1	6	6	1	4	1	1	0	0	0	1
9/9/2009	08:15 AM	2	344	49	3	5	10	1	0	4	0	0	1	0	2
9/9/2009	08:30 AM	4	398	35	2	13	5	0	6	1	0	1	0	0	1
9/9/2009	08:45 AM	6	317	45	2	13	6	0	1	4	0	0	0	1	5
9/9/2009	09:00 AM	6	322	33	7	8	6	0	3	2	0	0	1	0	2
9/9/2009	09:15 AM	2	276	47	1	9	2	1	4	1	0	0	0	0	3
9/9/2009	09:30 AM	4	278	45	3	11	4	0	4	1	0	0	0	0	1
9/9/2009	09:45 AM	0	254	35	2	11	6	0	1	1	0	0	0	0	0
9/9/2009	10:00 AM	1	183	47	2	17	5	0	4	2	0	0	0	0	1
9/9/2009	10:15 AM	6	250	43	5	10	2	0	2	1	0	0	0	1	1
9/9/2009	10:30 AM	8	252	40	6	8	5	0	3	1	0	0	0	0	3
9/9/2009	10:45 AM	0	260	43	3	12	3	1	3	1	0	0	0	0	3
9/9/2009	11:00 AM	4	260	51	3	13	2	0	1	3	0	0	0	0	0
9/9/2009	11:15 AM	2	236	46	4	11	5	0	2	1	0	0	0	0	3
9/9/2009	11:30 AM	3	247	38	2	8	3	0	3	2	0	0	0	0	0
9/9/2009	11:45 AM	7	219	34	2	9	5	0	1	1	0	0	0	0	1
9/9/2009	12:00 PM	3	252	33	4	10	3	0	2	0	0	0	0	0	3
9/9/2009	12:15 PM	5	260	53	5	13	3	0	3	1	0	0	0	1	3
9/9/2009	12:30 PM	3	254	56	1	15	1	0	3	2	0	0	0	0	4
9/9/2009	12:45 PM	3	301	40	4	14	3	0	3	2	1	0	0	0	1
9/9/2009	01:00 PM	6	276	59	2	12	8	0	3	1	0	0	0	0	2
9/9/2009	01:15 PM	3	284	43	3	9	11	0	2	0	0	1	0	0	0
9/9/2009	01:30 PM	0	273	48	4	9	3	0	4	1	0	0	0	0	0
9/9/2009	01:45 PM	1	272	41	3	11	3	0	2	1	0	0	0	0	4
9/9/2009	02:00 PM	2	268	54	2	16	1	0	2	1	0	0	0	0	0
9/9/2009	02:15 PM	6	315	48	4	18	7	1	2	0	0	0	0	0	2
9/9/2009	02:30 PM	5	288	46	5	11	2	0	4	1	1	2	0	0	3
9/9/2009	02:45 PM	4	286	60	5	14	6	0	3	0	0	0	0	0	1
9/9/2009	03:00 PM	1	296	48	1	7	5	0	4	4	0	0	0	0	2
9/9/2009	03:15 PM	3	282	58	3	8	4	0	2	1	3	0	0	0	5
9/9/2009	03:30 PM	4	305	45	6	10	6	1	0	2	0	0	0	0	1
9/9/2009	03:45 PM	6	353	43	3	10	7	0	4	1	0	0	0	0	2
9/9/2009	04:00 PM	6	313	48	2	14	2	0	3	2	1	0	0	0	1
9/9/2009	04:15 PM	7	356	48	2	9	6	0	4	0	1	0	0	0	3
9/9/2009	04:30 PM	9	336	45	1	12	7	0	2	1	0	0	0	0	2
9/9/2009	04:45 PM	6	392	39	3	13	2	0	7	2	0	1	0	1	3
9/9/2009	05:00 PM	6	377	44	2	10	3	0	7	1	0	1	0	0	1
9/9/2009	05:15 PM	2	375	41	2	8	5	1	6	1	0	0	1	0	1
9/9/2009	05:30 PM	3	402	47	1	4	7	1	3	1	1	0	0	0	2
9/9/2009	05:45 PM	3	424	40	1	8	2	1	1	0	1	0	0	0	2
9/9/2009	06:00 PM	2	414	33	1	3	4	0	2	1	0	0	0	0	1
9/9/2009	06:15 PM	5	439	36	5	2	5	0	2	0	0	0	1	0	2
9/9/2009	06:30 PM	6	409	33	2	10	8	0	2	2	0	0	0	0	4
9/9/2009	06:45 PM	2	391	27	0	8	5	0	1	0	0	1	0	0	2
9/9/2009	07:00 PM	2	314	21	1	3	3	0	6	0	0	0	0	1	1
9/9/2009	07:15 PM	6	318	24	0	2	3	2	3	0	1	0	0	0	0
9/9/2009	07:30 PM	3	307	30	0	3	4	1	4	0	0	0	0	0	3
9/9/2009	07:45 PM	5	281	27	0	3	6	0	3	0	0	0	0	0	1
9/9/2009	08:00 PM	2	224	33	0	4	2	0	1	0	0	0	0	0	0
9/9/2009	08:15 PM	2	193	19	0	1	4	0	5	0	0	0	0	0	0
9/9/2009	08:30 PM	2	207	11	1	2	2	0	0	0	0	0	0	0	2
9/9/2009	08:45 PM	1	177	17	1	1	1	0	2	0	0	0	0	0	0
9/9/2009	09:00 PM	1	156	17	2	0	1	0	1	2	0	0	0	0	0
9/9/2009	09:15 PM	0	148	12	2	0	1	0	0	1	0	1	0	0	0
9/9/2009	09:30 PM	2	164	13	1	2	2	0	0	1	0	0	0	0	1
9/9/2009	09:45 PM	1	162	16	0	1	4	0	1	2	0	0	0	0	1
9/9/2009	10:00 PM	1	126	10	0	0	0	0	0	0	0	0	0	0	1
9/9/2009	10:15 PM	1	132	7	0	1	0	0	0	0	0	0	0	0	0
9/9/2009	10:30 PM	0	149	8	0	0	0	0	1	0	0	0	0	0	0
9/9/2009	10:45 PM	1	117	11	1	2	0	0	0	1	0	0	0	0	0
9/9/2009	11:00 PM	0	99	9	0	2	0	0	0	0	0	0	0	0	0
9/9/2009	11:15 PM	0	74	5	0	1	2	0	0	0	0	0	0	0	0
9/9/2009	11:30 PM	2	77	9	0	0	0	0	0	1	0	0	0	0	0
9/9/2009	11:45 PM	0	50	8	0	0	0	0	0	0	0	0	0	0	0

SR 60 Eastbound: I-605 to SR 57 (Off Peak)

1 hour	Flow (Veh/1 hour)	# Lane Points	% Observed	
5/5/2009 5:00	2519	48		0
5/6/2009 5:00	2576	48		0
5/7/2009 5:00	2806	48		0
5/12/2009 5:00	3112	48		0
5/13/2009 5:00	2856	48		0
5/14/2009 5:00	2871	48		0
5/19/2009 5:00	3045	48		0
5/20/2009 5:00	3531	48		0
5/21/2009 5:00	2915	48		0
5/26/2009 5:00	2879	48		0
5/27/2009 5:00	3126	48		0
5/28/2009 5:00	2957	48		0
	2933			

Count Station: 717328

SR 60 Eastbound: SR 57 to I-15 (Off Peak)

1 hour	Flow (Veh/1 hour)	# Lane Points	% Observed
5/5/2009 5:00	2561	48	0
5/6/2009 5:00	2625	48	0
5/7/2009 5:00	2608	48	0
5/12/2009 5:00	2597	48	0
5/13/2009 5:00	2594	48	0
5/14/2009 5:00	2604	48	0
5/19/2009 5:00	2535	48	0
5/20/2009 5:00	2616	48	0
5/21/2009 5:00	2340	48	0
5/26/2009 5:00	2558	48	0
5/27/2009 5:00	2571	48	0
5/28/2009 5:00	2591	48	0
	2567		

SR 60 Eastbound: I-605 to SR 57 (Peak Hour)

Day	Flow	# Lane Points	% Observed
5/5/2009	3984	48	0
5/6/2009	3874	48	0
5/7/2009	3966	48	0
5/12/2009	4305	48	0
5/13/2009	4589	48	0
5/14/2009	4347	48	0
5/19/2009	4478	48	0
5/20/2009	4458	48	0
5/21/2009	4647	48	0
5/26/2009	4710	48	0
5/27/2009	4874	48	0
5/28/2009	4775	48	0
	4417		

Count Station: 717328

SR 60 Westbound: I-605 to SR 57 (Peak Hour)

Day	Flow	# Lane Points	% Observed
3/3/2009	3568	48	0
3/4/2009	2250	48	0
3/5/2009	2829	48	0
3/10/2009	3592	48	0
3/11/2009	3320	48	0
3/12/2009	3635	48	0
3/17/2009	3318	48	0
3/18/2009	3512	48	0
3/19/2009	3568	48	0
3/24/2009	3160	48	0
3/25/2009	3558	48	0
3/26/2009	3132	48	0
3/31/2009	2919	48	0
	3259		

SR 60 Eastbound: SR 57 to I-15 (Peak Hour)

Day	Flow	# Lane Points	% Observed
5/5/2009	4999	48	0
5/6/2009	4924	48	0
5/7/2009	4973	48	0
5/12/2009	4771	48	0
5/13/2009	4854	48	0
5/14/2009	4827	48	0
5/19/2009	4509	48	0
5/20/2009	4969	48	0
5/21/2009	4904	48	0
5/26/2009	4874	48	0
5/27/2009	4912	48	0
5/28/2009	4869	48	0
	4865		

SR 60 Westbound: SR 57 to I-15 (Peak Hour)

Day	Flow	# Lane Points	% Observed
3/3/2009	5306	48	100
3/4/2009	4992	48	100
3/5/2009	4853	48	100
3/10/2009	5159	48	100
3/11/2009	4971	48	100
3/12/2009	4947	48	100
3/17/2009	5341	48	100
3/18/2009	4985	48	100
3/19/2009	5235	48	100
3/24/2009	5243	48	100
3/25/2009	5126	48	100
3/26/2009	5026	48	100
	4706		

I-15 Southbound: SR 60 to SR 91 (Peak Hour)

1 hour	Flow (Veh/1 hour)	# Lane Points	% Observed
5/5/2009 5:00	2964	36	100
5/6/2009 5:00	2950	36	100
5/7/2009 5:00	2984	36	100
5/12/2009 5:00	3062	36	100
5/13/2009 5:00	3120	36	100
5/14/2009 5:00	3020	36	100
5/19/2009 5:00	3037	36	100
5/20/2009 5:00	3091	36	100
5/21/2009 5:00	3066	36	100
5/26/2009 5:00	3208	36	100
5/27/2009 5:00	3013	36	100
5/28/2009 5:00	3070	36	100
	3049		

I-15 Northbound: SR 60 to SR 91 (Peak Hour)

1 hour	Flow (Veh/1 hour)	# Lane Points	% Observed
3/4/2009	5125	48	100
3/5/2009	4783	48	100
3/10/2009	4835	48	100
3/11/2009	4839	48	100
3/12/2009	4916	48	100
3/17/2009	4876	48	100
3/18/2009	4923	48	100
3/19/2009	4898	48	100
3/24/2009	5129	48	100
3/25/2009	4910	48	100
3/26/2009	4726	48	100
3/31/2009	4986	48	100
	4906		

I-15 Southbound: SR 215 to SR 76 (Peak Hour)

1 hour	Flow (Veh/1 hour)	# Lane Points	% Observed
5/5/2009 7:00	5615	48	100
5/6/2009 7:00	5415	48	100
5/7/2009 7:00	5492	48	100
5/12/2009 7:00	5471	48	100
5/13/2009 7:00	5575	48	100
5/14/2009 7:00	6041	48	100
5/19/2009 7:00	5459	48	100
5/20/2009 7:00	5545	48	100
5/21/2009 7:00	5475	48	100
5/26/2009 7:00	5406	48	100
5/27/2009 7:00	5409	48	100
5/28/2009 7:00	5467	48	100
	5531		

APPENDIX B

INTERSECTION AND ILV ANALYSIS SHEETS

INTERSECTION ANALYSIS SHEETS

HCM Signalized Intersection Capacity Analysis
1: Pala Rd (SR-76) & I-15 SB Ramps 12/9/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Lane Util. Factor		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		1863	1417	1583	1863						1770	1417
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		1863	1417	1583	1863						1770	1417
Volume (vph)	0	479	337	88	243	0	0	0	0	108	0	651
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	504	355	93	256	0	0	0	0	114	0	685
RTOR Reduction (vph)	0	0	244	0	0	0	0	0	0	0	0	287
Lane Group Flow (vph)	0	504	111	93	256	0	0	0	0	0	114	398
Turn Type			Perm	Prot						Perm		Perm
Protected Phases		4		3	8						6	
Permitted Phases			4							6		6
Actuated Green, G (s)		31.3	31.3	8.8	44.1						47.9	47.9
Effective Green, g (s)		31.3	31.3	8.8	44.1						47.9	47.9
Actuated g/C Ratio		0.31	0.31	0.09	0.44						0.48	0.48
Clearance Time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		583	444	139	822						848	679
v/s Ratio Prot		c0.27		c0.06	0.14							
v/s Ratio Perm			0.08								0.06	c0.28
v/c Ratio		0.86	0.25	0.67	0.31						0.13	0.59
Uniform Delay, d1		32.4	25.6	44.2	18.1						14.5	18.9
Progression Factor		1.00	1.00	0.73	0.62						1.00	1.00
Incremental Delay, d2		12.7	0.3	10.3	0.2						0.3	3.7
Delay (s)		45.0	25.9	42.4	11.4						14.8	22.5
Level of Service		D	C	D	B						B	C
Approach Delay (s)		37.1			19.7			0.0			21.4	
Approach LOS		D			B			A			C	

Intersection Summary			
HCM Average Control Delay	27.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	64.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
2: Pala Rd (SR-76) & I-15 NB Ramps 12/9/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	1583	1863			1863	1417		1770	1417			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	1583	1863			1863	1417		1770	1417			
Volume (vph)	420	244	0	0	189	55	175	0	135	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	442	257	0	0	199	58	184	0	142	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	34	0	0	86	0	0	0
Lane Group Flow (vph)	442	257	0	0	199	24	0	184	56	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	7	4			8			2				
Permitted Phases						8	2		2			
Actuated Green, G (s)	33.0	52.5			15.5	15.5		39.5	39.5			
Effective Green, g (s)	33.0	52.5			15.5	15.5		39.5	39.5			
Actuated g/C Ratio	0.33	0.52			0.16	0.16		0.40	0.40			
Clearance Time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0	3.0			
Lane Grp Cap (vph)	522	978			289	220		699	560			
v/s Ratio Prot	c0.28	0.14			c0.11							
v/s Ratio Perm						0.02		0.10	0.04			
v/c Ratio	0.85	0.26			0.69	0.11		0.26	0.10			
Uniform Delay, d1	31.1	13.1			40.0	36.3		20.4	19.1			
Progression Factor	0.41	0.37			1.00	1.00		1.00	1.00			
Incremental Delay, d2	9.5	0.1			6.7	0.2		0.9	0.4			
Delay (s)	22.2	4.9			46.6	36.5		21.3	19.4			
Level of Service	C	A			D	D		C	B			
Approach Delay (s)		15.8			44.4			20.5			0.0	
Approach LOS		B			D			C			A	

Intersection Summary			
HCM Average Control Delay	22.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	64.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1: Pala Rd (SR-76) & I-15 SB Ramps 12/9/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Lane Util. Factor		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		1863	1417	1583	1863						1770	1417
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		1863	1417	1583	1863						1770	1417
Volume (vph)	0	479	337	88	243	0	0	0	0	113	0	651
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	504	355	93	256	0	0	0	0	119	0	685
RTOR Reduction (vph)	0	0	244	0	0	0	0	0	0	0	0	287
Lane Group Flow (vph)	0	504	111	93	256	0	0	0	0	0	119	398
Turn Type			Perm	Prot						Perm		Perm
Protected Phases		4		3	8						6	
Permitted Phases			4							6		6
Actuated Green, G (s)		31.3	31.3	8.8	44.1						47.9	47.9
Effective Green, g (s)		31.3	31.3	8.8	44.1						47.9	47.9
Actuated g/C Ratio		0.31	0.31	0.09	0.44						0.48	0.48
Clearance Time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		583	444	139	822						848	679
v/s Ratio Prot		c0.27		c0.06	0.14							
v/s Ratio Perm			0.08								0.07	c0.28
v/c Ratio		0.86	0.25	0.67	0.31						0.14	0.59
Uniform Delay, d1		32.4	25.6	44.2	18.1						14.6	18.9
Progression Factor		1.00	1.00	0.73	0.63						1.00	1.00
Incremental Delay, d2		12.7	0.3	10.3	0.2						0.3	3.7
Delay (s)		45.0	25.9	42.4	11.5						14.9	22.5
Level of Service		D	C	D	B						B	C
Approach Delay (s)		37.1			19.8			0.0			21.4	
Approach LOS		D			B			A			C	

Intersection Summary			
HCM Average Control Delay	27.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	64.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
2: Pala Rd (SR-76) & I-15 NB Ramps 12/9/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	1583	1863			1863	1376		1719	1376			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	1583	1863			1863	1376		1719	1376			
Volume (vph)	420	249	0	0	189	58	175	0	135	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	442	262	0	0	199	61	184	0	142	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	35	0	0	86	0	0	0
Lane Group Flow (vph)	442	262	0	0	199	26	0	184	56	0	0	0
Heavy Vehicles (%)	2%	2%	2%	5%	2%	5%	5%	2%	5%	2%	2%	2%
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	7	4			8			2				
Permitted Phases						8	2		2			
Actuated Green, G (s)	32.7	52.3			15.6	15.6		39.7	39.7			
Effective Green, g (s)	32.7	52.3			15.6	15.6		39.7	39.7			
Actuated g/C Ratio	0.33	0.52			0.16	0.16		0.40	0.40			
Clearance Time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0	3.0			
Lane Grp Cap (vph)	518	974			291	215		682	546			
v/s Ratio Prot	c0.28	0.14			c0.11							
v/s Ratio Perm						0.02		0.11	0.04			
v/c Ratio	0.85	0.27			0.68	0.12		0.27	0.10			
Uniform Delay, d1	31.4	13.2			39.9	36.3		20.4	19.0			
Progression Factor	0.42	0.38			1.00	1.00		1.00	1.00			
Incremental Delay, d2	10.2	0.1			6.5	0.2		1.0	0.4			
Delay (s)	23.4	5.1			46.4	36.5		21.3	19.3			
Level of Service	C	A			D	D		C	B			
Approach Delay (s)		16.6			44.1			20.5			0.0	
Approach LOS		B			D			C			A	

Intersection Summary			
HCM Average Control Delay	23.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	64.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: Pala Rd (SR-76) & I-15 SB Ramps 12/9/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Lane Util. Factor		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		1863	1417	1583	1863						1770	1417
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		1863	1417	1583	1863						1770	1417
Volume (vph)	0	525	371	96	266	0	0	0	0	123	0	713
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	553	391	101	280	0	0	0	0	129	0	751
RTOR Reduction (vph)	0	0	260	0	0	0	0	0	0	0	0	284
Lane Group Flow (vph)	0	553	131	101	280	0	0	0	0	0	129	467
Turn Type			Perm	Prot						Perm		Perm
Protected Phases		4		3	8						6	
Permitted Phases			4							6		6
Actuated Green, G (s)		33.4	33.4	9.6	47.0						45.0	45.0
Effective Green, g (s)		33.4	33.4	9.6	47.0						45.0	45.0
Actuated g/C Ratio		0.33	0.33	0.10	0.47						0.45	0.45
Clearance Time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		622	473	152	876						797	638
v/s Ratio Prot		c0.30		c0.06	0.15							
v/s Ratio Perm			0.09								0.07	c0.33
v/c Ratio		0.89	0.28	0.66	0.32						0.16	0.73
Uniform Delay, d1		31.5	24.4	43.6	16.5						16.3	22.6
Progression Factor		1.00	1.00	0.59	0.24						1.00	1.00
Incremental Delay, d2		14.5	0.3	9.5	0.2						0.4	7.3
Delay (s)		46.1	24.7	35.1	4.1						16.7	29.8
Level of Service		D	C	D	A						B	C
Approach Delay (s)		37.2			12.3			0.0			27.9	
Approach LOS		D			B			A			C	

Intersection Summary

HCM Average Control Delay	29.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
2: Pala Rd (SR-76) & I-15 NB Ramps 12/9/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	1495	1863			1863	1376		1671	1376			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	1495	1863			1863	1376		1671	1376			
Volume (vph)	460	270	0	0	206	63	192	0	148	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	484	284	0	0	217	66	202	0	156	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	27	0	0	115	0	0	0
Lane Group Flow (vph)	484	284	0	0	217	39	0	202	41	0	0	0
Heavy Vehicles (%)	8%	2%	2%	5%	2%	5%	8%	2%	5%	2%	2%	2%
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	7	4			8			2				
Permitted Phases						8	2		2			
Actuated Green, G (s)	36.5	65.8			25.3	25.3		26.2	26.2			
Effective Green, g (s)	36.5	65.8			25.3	25.3		26.2	26.2			
Actuated g/C Ratio	0.36	0.66			0.25	0.25		0.26	0.26			
Clearance Time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0	3.0			
Lane Grp Cap (vph)	546	1226			471	348		438	361			
v/s Ratio Prot	c0.32	0.15			c0.12							
v/s Ratio Perm						0.03		0.12	0.03			
v/c Ratio	0.89	0.23			0.46	0.11		0.46	0.11			
Uniform Delay, d1	29.8	6.9			31.6	28.7		31.0	28.1			
Progression Factor	0.46	0.36			1.00	1.00		1.00	1.00			
Incremental Delay, d2	12.3	0.1			0.7	0.1		3.5	0.6			
Delay (s)	26.1	2.6			32.3	28.9		34.4	28.7			
Level of Service	C	A			C	C		C	C			
Approach Delay (s)		17.4			31.5			31.9			0.0	
Approach LOS		B			C			C			A	

Intersection Summary

HCM Average Control Delay	23.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

ILV ANALYSIS SHEETS

Baseline AM INTERSECTION

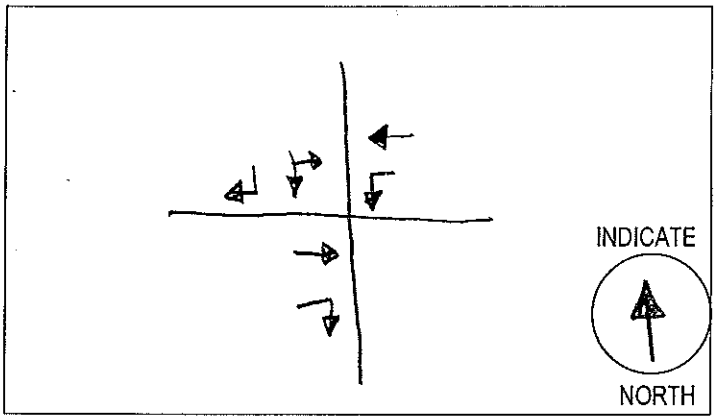
Signalized Intersection

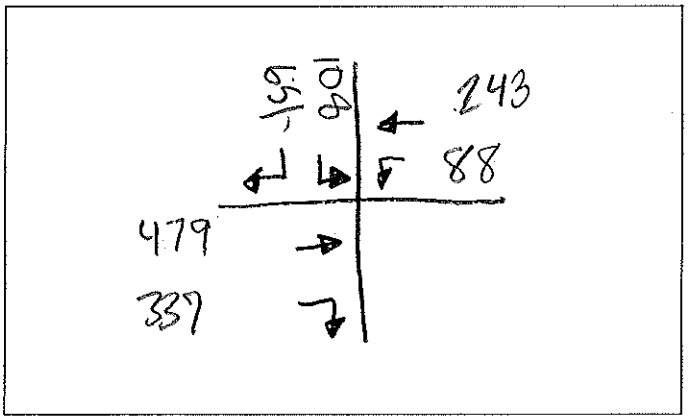
CAPACITY ANALYSIS

INTERSECTION I-15 SB Ramps / SR-76 DIST. CO. RTE. P.M. S.D.

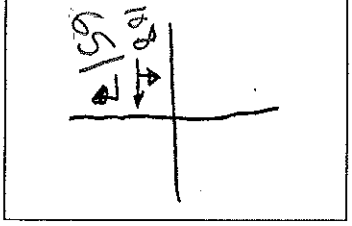
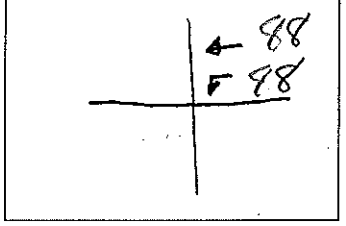
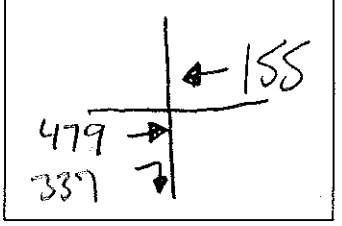
By JN DATE 9/9/09

DIAGRAM AND TRAFFIC FLOWS:





LANE VOLUMES (ILV / HR)

PHASE 1	PHASE 2	PHASE 3	PHASE 4
			

CRITICAL LANE VOLUMES (ILV / HR)

PHASE 1	PHASE 2	PHASE 3	PHASE 4
651	88	479	

TOTAL OPERATING LEVEL (ILV / HR)

Σ
1218

IS . . . .

- [ ] < 1200 ILV / HR
- [x] > 1200 BUT < 1500 ILV / HR
- [ ] > 1500 ILV / HR

near capacity

REMARKS:

Baseline AM INTERSECTION

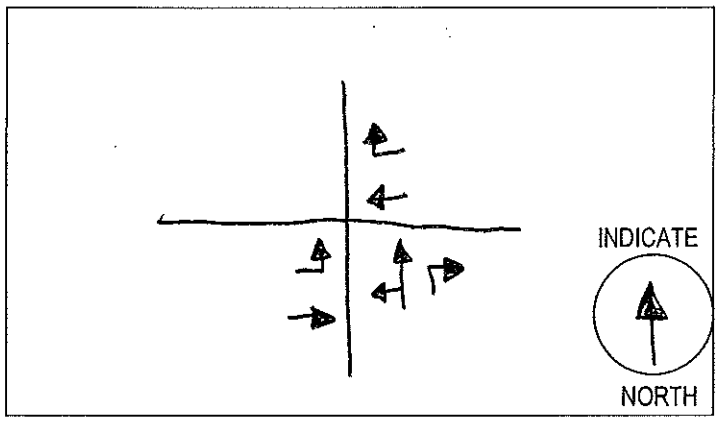
Signalized Intersection

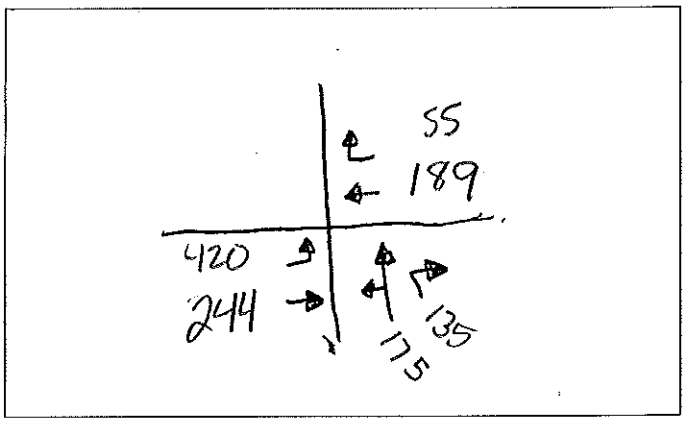
CAPACITY ANALYSIS

INTERSECTION I-15 NB Ramps / SR-76 DIST. CO. RTE. P.M. S.D.

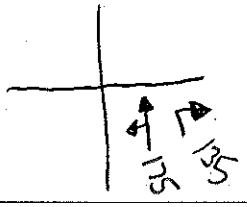
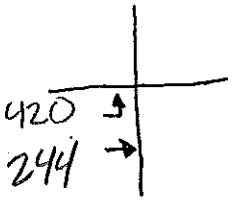
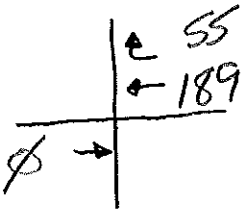
By JN DATE 9/9/09

DIAGRAM AND TRAFFIC FLOWS:





LANE VOLUMES (ILV / HR)

PHASE 1	PHASE 2	PHASE 3	PHASE 4
			

CRITICAL LANE VOLUMES (ILV / HR)

PHASE 1	PHASE 2	PHASE 3	PHASE 4
175	420	189	

TOTAL OPERATING LEVEL (ILV / HR)

Σ
784

under

IS . . . . ☒ < 1200 ILV / HR

☐ > 1200 BUT < 1500 ILV / HR

☐ > 1500 ILV / HR

REMARKS:

Baseline + Proj. AM INTERSECTION

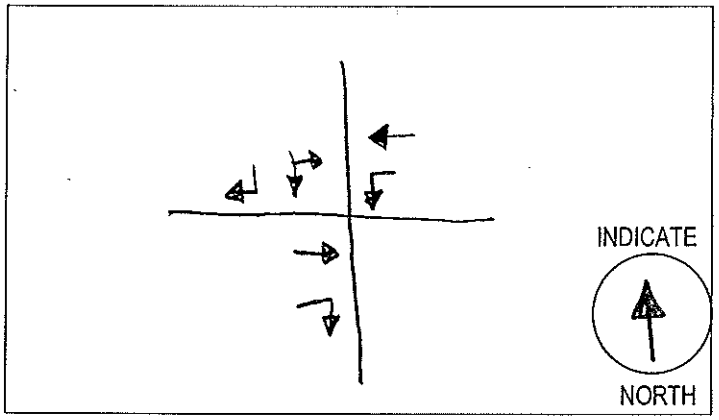
Signalized Intersection

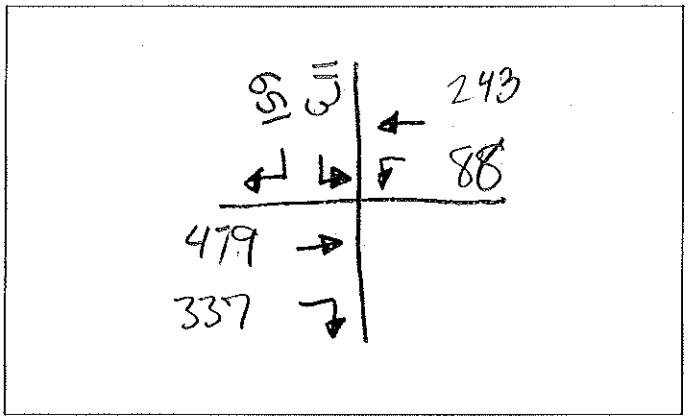
CAPACITY ANALYSIS

INTERSECTION I-15 SB Ramps / SR-76 DIST. CO. RTE. P.M. S.D.

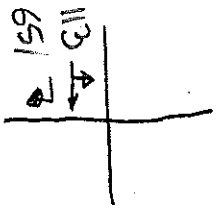
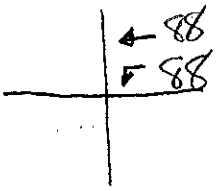
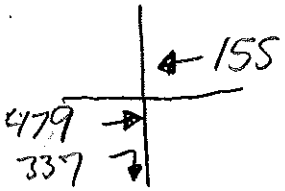
By JN DATE 9/9/09

DIAGRAM AND TRAFFIC FLOWS:





LANE VOLUMES (ILV / HR)

PHASE 1	PHASE 2	PHASE 3	PHASE 4
			

CRITICAL LANE VOLUMES (ILV / HR)

PHASE 1	PHASE 2	PHASE 3	PHASE 4
651	88	479	

TOTAL OPERATING LEVEL (ILV / HR)

Σ
1218

IS . . . .

- [ ] < 1200 ILV / HR
- [x] > 1200 BUT < 1500 ILV / HR
- [ ] > 1500 ILV / HR

near capacity

REMARKS:

Baseline + P AM INTERSECTION

Signalized Intersection

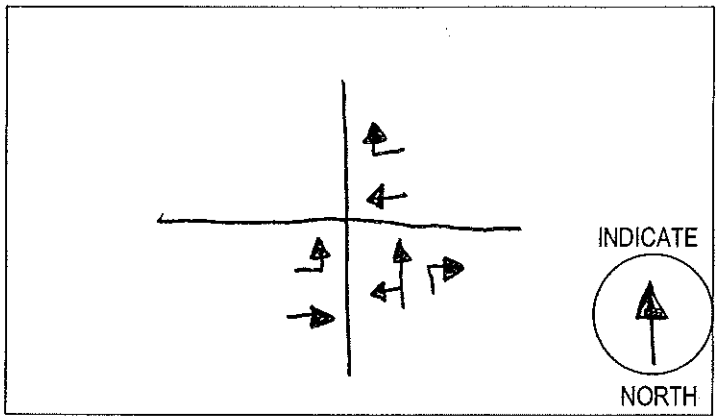
CAPACITY ANALYSIS

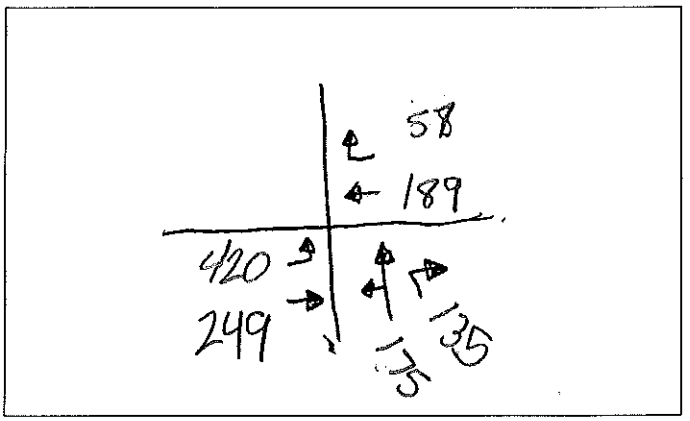
INTERSECTION I-15 NB Ramps / SR-76

DIST. CO. RTE. P.M. S.D.

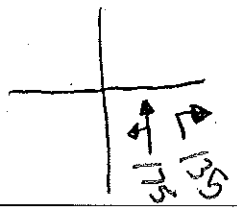
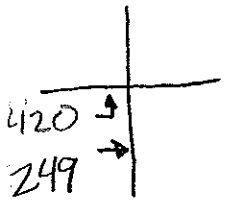
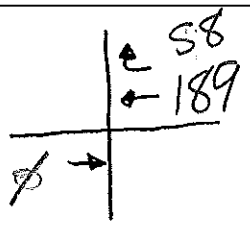
By JN DATE 9/9/09

DIAGRAM AND TRAFFIC FLOWS:





LANE VOLUMES (ILV / HR)

PHASE 1	PHASE 2	PHASE 3	PHASE 4
			

CRITICAL LANE VOLUMES (ILV / HR)

PHASE 1	PHASE 2	PHASE 3	PHASE 4
175	420	189	

TOTAL OPERATING LEVEL (ILV / HR)

Σ
784

under

IS . . . .

- [x] < 1200 ILV / HR
- [ ] > 1200 BUT < 1500 ILV / HR
- [ ] > 1500 ILV / HR

REMARKS:

Baseline + P+C. G. AM

INTERSECTION

Signalized Intersection

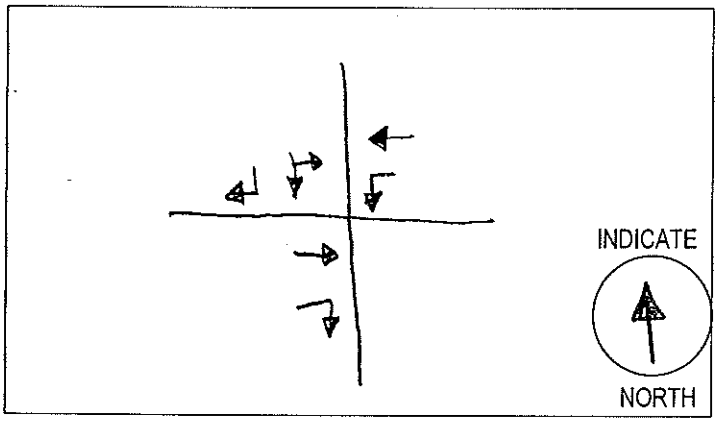
CAPACITY ANALYSIS

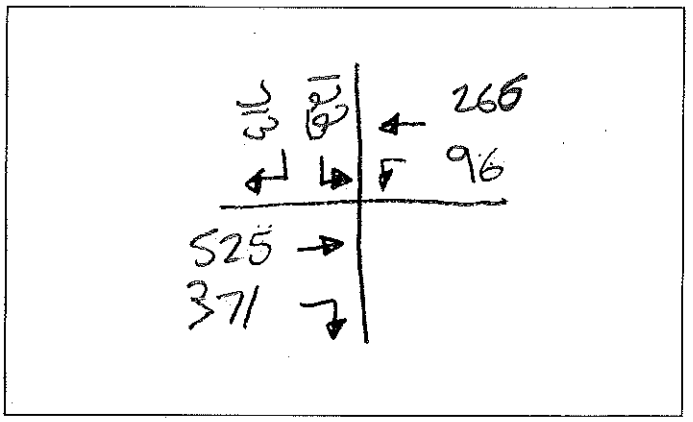
INTERSECTION I-15 SB Ramps / SR-76

DIST. CO. RTE. P.M. S.D.

By JN DATE 9/9/09

DIAGRAM AND TRAFFIC FLOWS:





LANE VOLUMES (ILV / HR)

PHASE 1	PHASE 2	PHASE 3	PHASE 4
713	96 / 96	169 / 525 / 371	

CRITICAL LANE VOLUMES (ILV / HR)

PHASE 1	PHASE 2	PHASE 3	PHASE 4
713	96	525	

TOTAL OPERATING LEVEL (ILV / HR)

Σ
1334

IS . . . .

- [ ] < 1200 ILV / HR
- [x] > 1200 BUT < 1500 ILV / HR
- [ ] > 1500 ILV / HR

Near capacity

REMARKS:

Baseline + P + C. G. AM INTERSECTION

Signalized Intersection

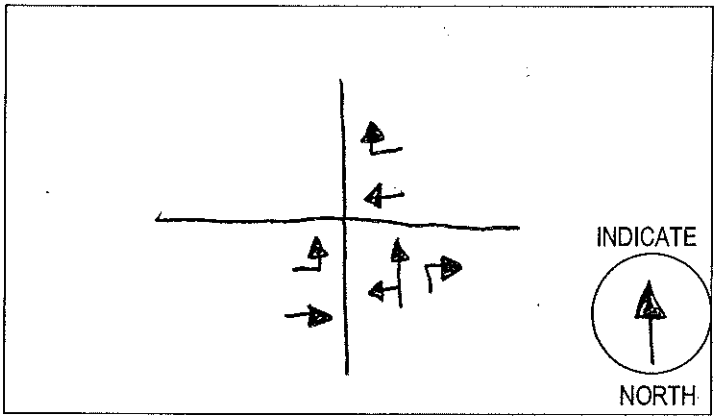
CAPACITY ANALYSIS

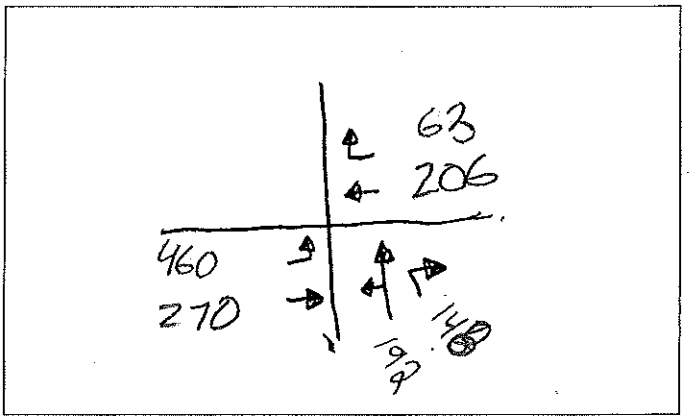
INTERSECTION I-15 NB Ramps / SR-76

DIST. CO. RTE. P.M. S.D.

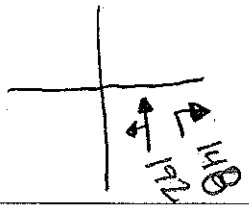
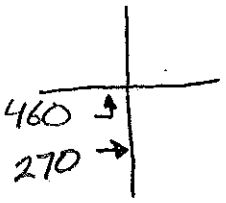
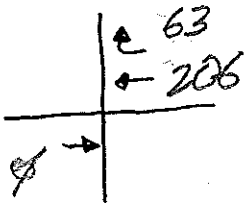
By JN DATE 9/9/09

DIAGRAM AND TRAFFIC FLOWS:





LANE VOLUMES (ILV / HR)

PHASE 1	PHASE 2	PHASE 3	PHASE 4
			

CRITICAL LANE VOLUMES (ILV / HR)

PHASE 1	PHASE 2	PHASE 3	PHASE 4
192	460	206	

TOTAL OPERATING LEVEL (ILV / HR)

Σ
858

IS . . . . [X] < 1200 ILV / HR

[ ] > 1200 BUT < 1500 ILV / HR

[ ] > 1500 ILV / HR

REMARKS: under