KUNZMAN ASSOCIATES, INC.

TENTATIVE PARCEL MAP NO. 30522

TRAFFIC IMPACT ANALYSIS (REVISED)

May 29, 2012

Traffic Engineering | Transportation Planning | Parking | Noise/Vibration | Expert Witness
Air Quality | Global Climate Change | Health Risk Assessment

KUNZMAN ASSOCIATES, INC.

TENTATIVE PARCEL MAP NO. 30522

TRAFFIC IMPACT ANALYSIS (REVISED)

May 29, 2012

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Tentative Parcel Map No. 30522

Traffic Impact Analysis (Revised)

This report contains the traffic impact analysis for the proposed Tentative Parcel Map No. 30522. The project site is located south of Bundy Canyon Road and east of Orange Street in the City of Wildomar. The project site is proposed to be developed with a 3,280 square feet of fast-food restaurant with drive-thru and a 12 fueling position service station with convenience market.

The traffic report contains documentation of existing traffic conditions, traffic generated by the project, distribution of the project traffic to roads outside the project, and an analysis of future traffic conditions. Each of these topics is contained in a separate section of the report. The first section is "Findings", and subsequent sections expand upon the findings. In this way, information on any particular aspect of the study can be easily located by the reader.

Although this is a technical report, every effort has been made to write the report clearly and concisely. To assist the reader with those terms unique to transportation engineering, a glossary of terms is provided within Appendix A.

I. Findings

This section summarizes the existing traffic conditions, project traffic impacts, and the proposed mitigation measures.

A. Transportation and Circulation Thresholds of Significant

Impacts to transportation and circulation are considered to be significant in any of the following would occur:

1. Decrease the Level of Service on a County-maintained road or conventional State highway below Level of Service D within the Community Development Areas designated by the proposed County General Plan and within adjacent jurisdictions, or below Level of Service C within those portions of unincorporated Riverside County outside of a Community Development Area.

2. Decrease the Level of Service on a freeway segment below Level of Service E.

3. Increase traffic on a County-maintained road, conventional State highway, or freeway segment that is currently operating at less than the Level of Service standards identified in thresholds 1 or 2 above.

B. Conclusions

1. The project site is currently undeveloped and is not generating significant traffic.

2. Existing roadways in the vicinity of the project include Orange Street and Bundy Canyon Road.

3. The study area intersections currently operate at acceptable Levels of Service during the peak hours for existing traffic conditions (see Table 1).

4. The project site is proposed to be developed with a 3,280 square feet of fast-food restaurant with drive-thru and a 12 fueling position service station with convenience market.

5. The proposed development is projected to generate a total of approximately 1,672 daily vehicle trips on a weekday, 128 of which will occur during the morning peak hour and 125 of which will occur during the evening peak hour (see Table 2).

6. The study area intersections are projected to operate at acceptable Levels of Service during the peak hours for existing plus ambient growth plus cumulative projects traffic conditions (see Table 4).

7. The study area intersections are projected to operate at acceptable Levels of Service during the peak hours for existing plus ambient growth plus cumulative projects plus project traffic conditions (see Table 5).

II. Project Description

This section discusses the project's location and proposed development. Figure 1 shows the project location map and Figure 2 illustrates the site plan.

A. Location

The project site is located south of Bundy Canyon Road and east of Orange Street in the City of Wildomar.

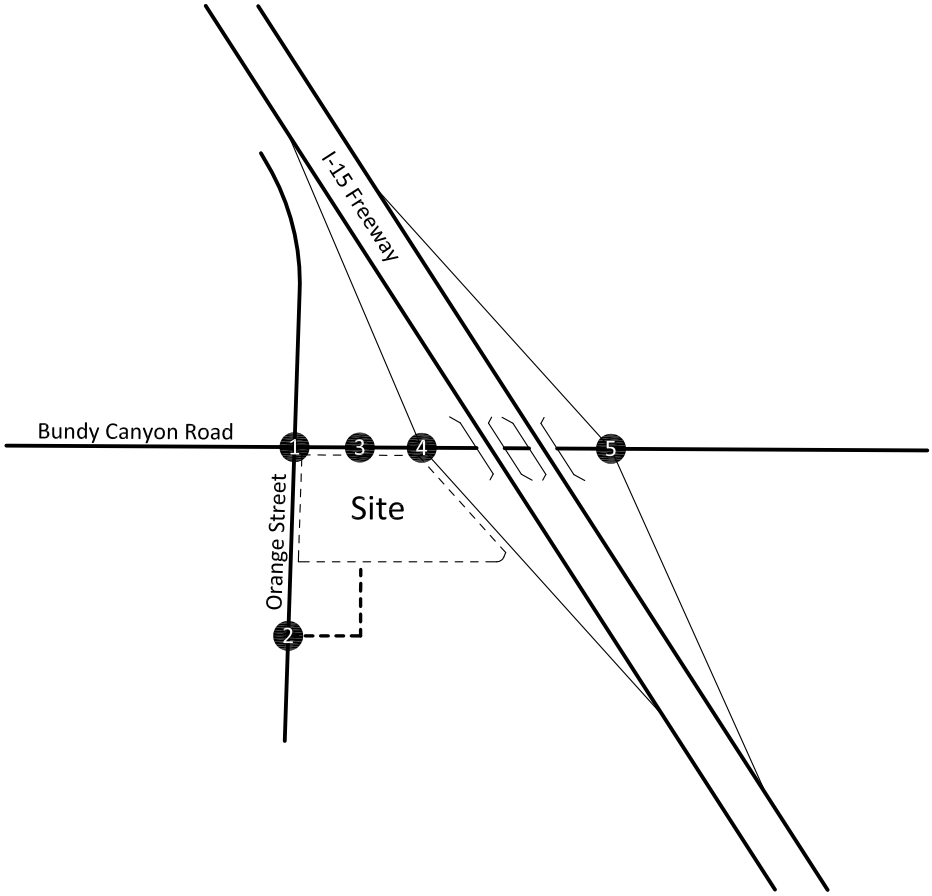
B. Proposed Development

The project site is proposed to be developed with a 3,280 square feet of fast-food restaurant with drive-thru and a 12 fueling position service station with convenience market.

C. Site Access

The proposed project will have full access to Orange Street and right turns in/out only access to Bundy Canyon Road.

Figure 1
Project Location Map



Legend

1 = Intersection Reference Number

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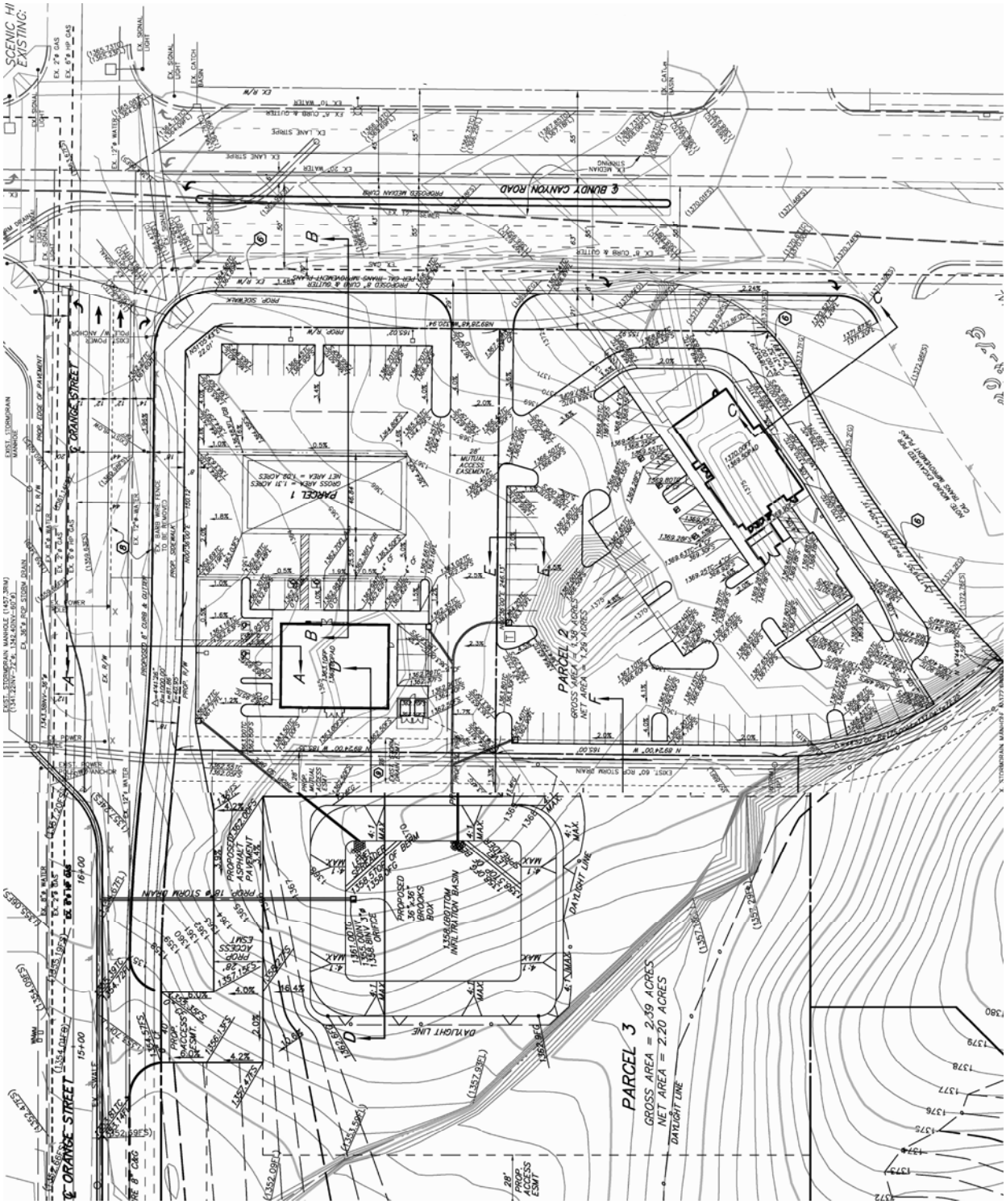
Figure 2
Site Plan



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III. Existing Traffic Conditions

The traffic conditions as they exist today are discussed below and illustrated on Figures 3 to 8.

A. Study Area

The study area includes the following intersections:

Orange Street (NS) at:
- Bundy Canyon Road (EW) - #1
- Project Access (EW) - #2

Project Access (NS) at:
- Bundy Canyon Road (EW) - #3

I-15 Freeway SB Ramps (NS) at:
- Bundy Canyon Road (EW) - #4

I-15 Freeway NB Ramps (NS) at:
- Bundy Canyon Road (EW) - #5

B. Surrounding Street System

Roadways that will be utilized by the development or included in the study area include: Orange Street and Bundy Canyon Road.

Orange Street: This north-south two lane undivided roadway is classified as a Secondary (100 foot right-of-way) on the City of Wildomar General Plan Circulation Element. It currently carries approximately 5,100 to 6,400 vehicles per day in the study area

Bundy Canyon Road: This east-west two lane undivided to four lane divided roadway is classified as an Urban Arterial (152 foot right-of-way) on the City of Wildomar General Plan Circulation Element. It currently carries approximately 10,200 to 20,900 vehicles per day in the study area.

C. Existing Travel Lanes and Intersection Controls

Figure 3 identifies the existing roadway conditions for study area roadways. The number of through lanes for existing roadways and the existing intersection controls are identified.

D. Existing Average Daily Traffic Volumes

Figure 4 depicts the existing average daily traffic volumes. The existing average daily traffic volumes were obtained from the 2010 Traffic Volumes on California State Highways by the California Department of Transportation and by factoring peak hours counts (see Appendix

B) obtained by Kunzman Associates, Inc. using a determined "K" factor for the study area using the following formula for each intersection leg:

PM Peak Hour (Approach + Exit Volume) x 11.6 = Leg Volume.

The "K" factor has been obtained from existing average daily vehicle counts conducted by the Kunzman Associates, Inc. (see Appendix D). Three 24 hour vehicle counts were obtained and the "K" factor has been calculated for each count location. The calculated percentage of daily traffic range is from 8.5 percent to 8.7 percent with an average of 8.6 percent. A "K" factor of 11.6 means that the evening peak hour vehicle count represents 8.6 percent of the daily total vehicles to pass by a specific point on a roadway (8.6% X 11.6 = 1.0).

E. Existing Intersection Delay

The technique used to assess the capacity needs of an intersection is known as the intersection Delay Method (see Appendix C). To calculate delay, the volume of traffic using the intersection is compared with the capacity of the intersection.

The existing delay and Level of Service for intersections in the vicinity of the project are shown in Table 1. Existing delay is based upon manual peak hour intersection turning movement counts obtained by Kunzman Associates, Inc. in February 2011 (see Figures 5 and 6). Traffic count worksheets are provided in Appendix B.

There are two peak hours in a weekday. The morning peak hour is between 7:00 AM and 9:00 AM, and the evening peak hour is between 4:00 PM and 6:00 PM. The actual peak hour within the two hour interval is the four consecutive 15 minute periods with the highest total volume when all movements are added together. Thus, the evening peak hour at one intersection may be 4:45 PM to 5:45 PM if those four consecutive 15 minute periods have the highest combined volume.

The study area intersections currently operate at acceptable Levels of Service during the peak hours for existing traffic conditions. Existing delay worksheets are provided in Appendix C.

F. Existing City of Wildomar Circulation Plan

Figure 7 shows the current City of Wildomar General Plan Circulation Element. Both existing and future roadways are included in the Circulation Element of the General Plan and are graphically depicted on Figure 7. This figure shows the nature and extent of arterial highways that are needed to adequately serve the ultimate development depicted by the land use element of the General Plan. The City of Wildomar General Plan roadway cross-sections are illustrated on Figure 8.

G. Transit Service

The study area is not served by the Riverside Transit Agency.

Table 1

Existing Intersection Delay and Level of Service

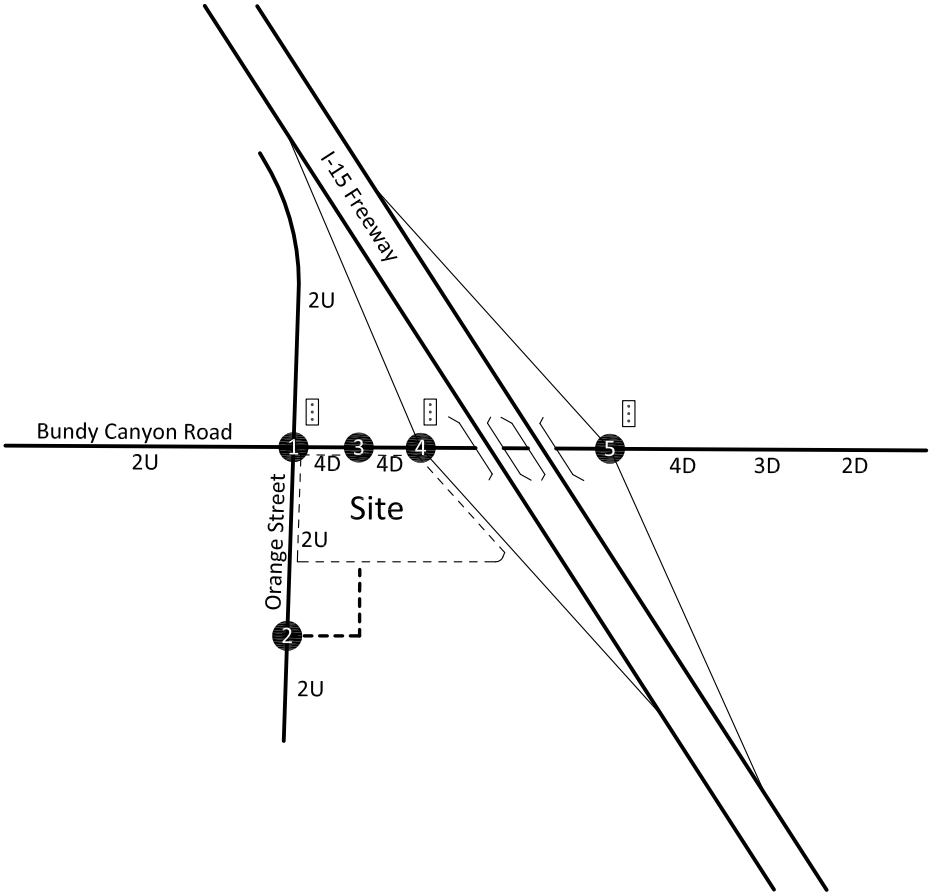
Intersection	Traffic Control [3]	Intersection Approach Lanes [1]												Peak Hour Delay-LOS [2]	
		Northbound			Southbound			Eastbound			Westbound				
		L	T	R	L	T	R	L	T	R	L	T	R	Morning	Evening
Orange Street (NS) at:															
Bundy Canyon Road (EW) - #1	TS	0.5	0.5	1	0.5	0.5	1	1	2	1	1	1	1	24.5-C	18.2-B
I-15 Freeway SB Ramps (NS) at:															
Bundy Canyon Road (EW) - #4	TS	0	0	0	1	0.5	0.5	0	1.5	0.5	1	2	0	21.7-C	18.5-B
I-15 Freeway NB Ramps (NS) at:															
Bundy Canyon Road (EW) - #5	TS	1	0.5	0.5	0	0	0	1	2	0	0	1.5	0.5	23.8-C	21.3-C

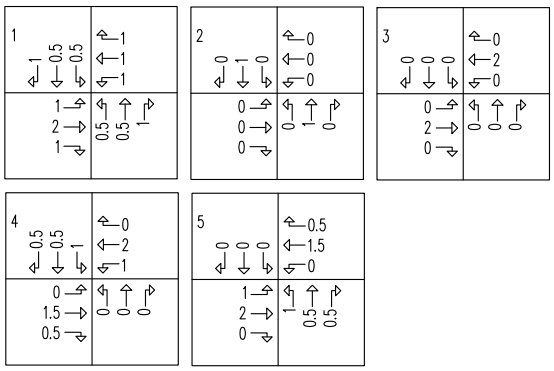
[1] When a right turn lane is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes. L = Left; T = Through; R = Right

[2] Delay and level of service has been calculated using the following analysis software: Traffix, Version 7.9.0215 (2008). Per the 2000 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[3] TS = Traffic Signal

Figure 3
Existing Through Travel Lanes and Intersection Controls





Legend

- = Traffic Signal
- 4 = Through Travel Lanes
- D = Divided
- U = Undivided

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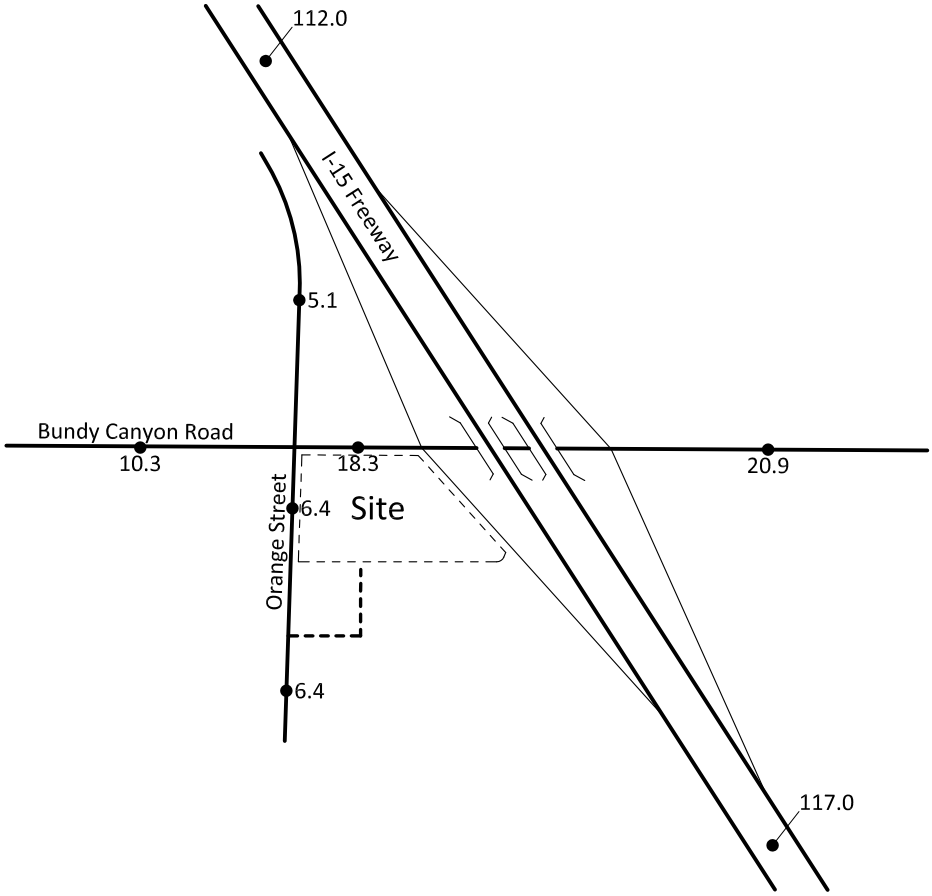
Intersection reference numbers are in upper left corner of turning movement boxes.

Figure 4
Existing Average Daily Traffic Volumes



Legend

6.4 = Vehicles Per Day (1,000's)

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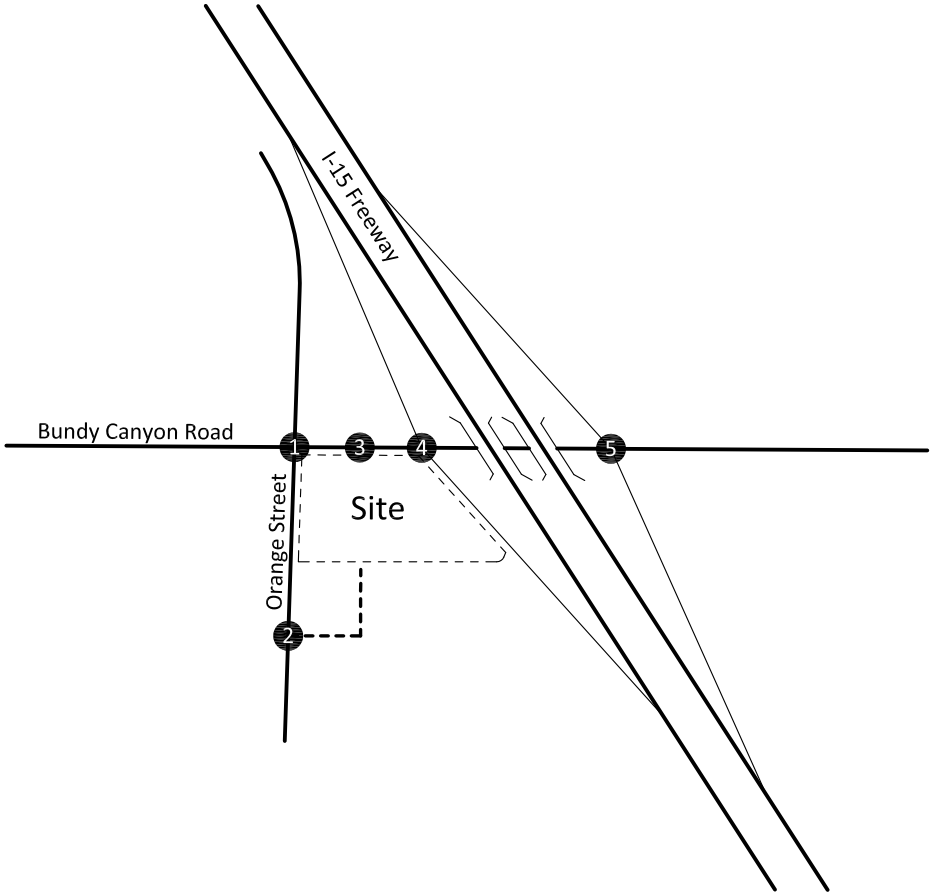
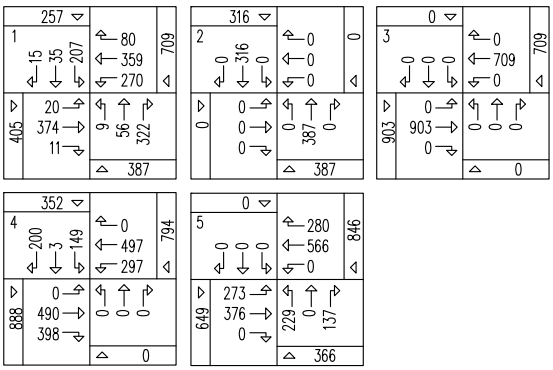
Figure 5
Existing Morning Peak Hour Intersection Turning Movement Volumes





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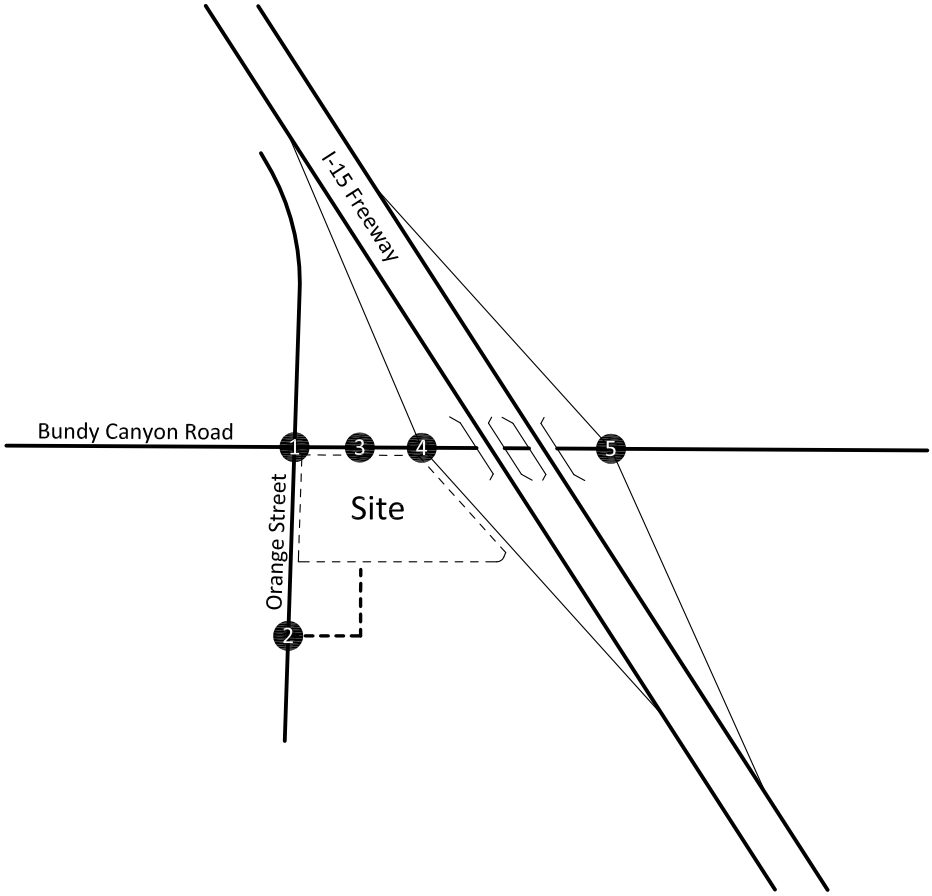
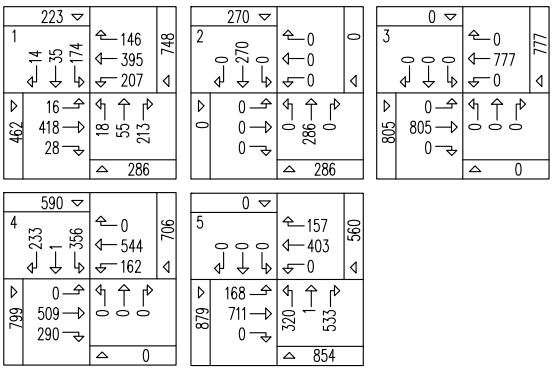
Intersection reference numbers are in upper left corner of turning movement boxes.

Figure 6
Existing Evening Peak Hour Intersection Turning Movement Volumes





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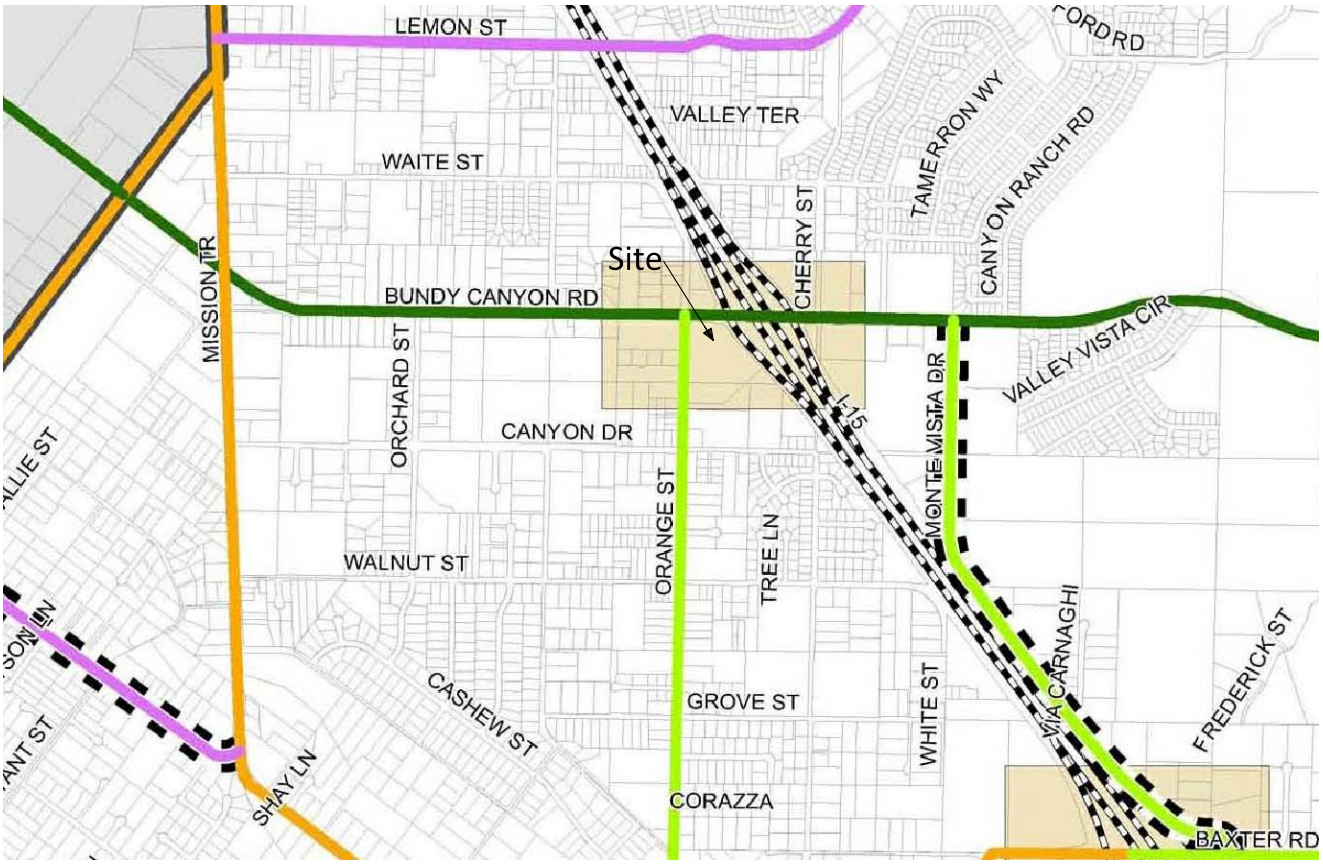
Intersection reference numbers are in upper left corner of turning movement boxes.

Figure 7
City of Wildomar General Plan Circulation Element



Legend

- Proposed Wildomar Circulation Changes
- URBAN ARTERIAL
- ARTERIAL
- MAJOR
- SECONDARY
- COLLECTOR
- Highways
- Parcels
- Proposed Wildomar Incorporation
- Cities
- Existing Interchanges

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Source: City of Wildomar

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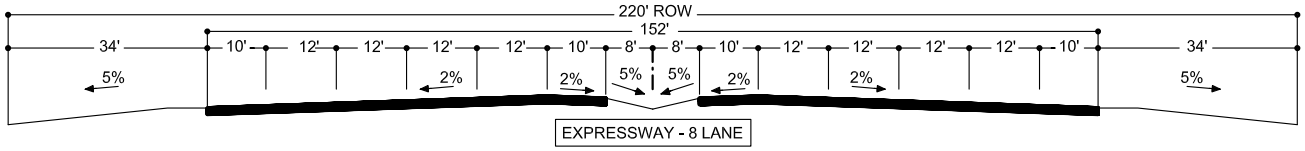
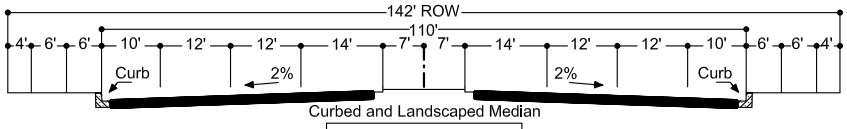
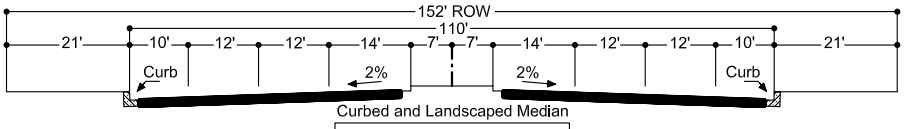
Figure 8
City of Wildomar General Plan Roadway Cross-Sections



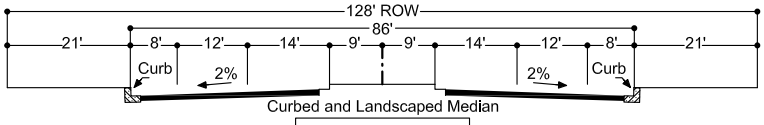
EXPRESSWAY - 8 LANE



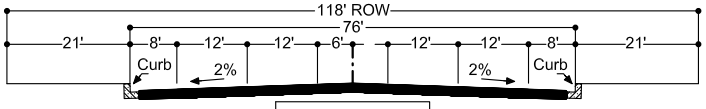
EXPRESSWAY - 6 LANE



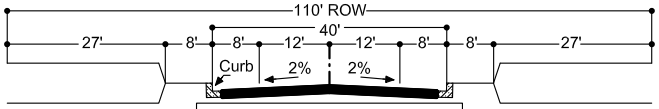
URBAN ARTERIAL HIGHWAY



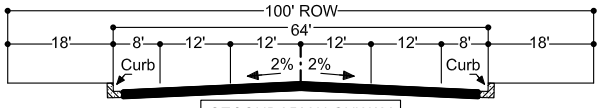
ARTERIAL HIGHWAY



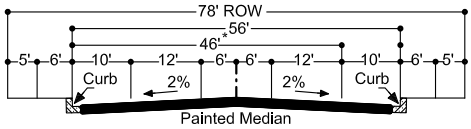
MAJOR HIGHWAY



MOUNTAIN ARTERIAL HIGHWAY

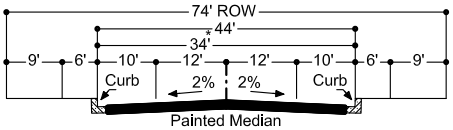


SECONDARY HIGHWAY



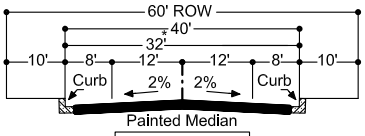
INDUSTRIAL COLLECTOR

*Part-width street section for an interior commercial or industrial street.



COLLECTOR STREET

*Part-width street section for all collector streets-34' improvements on 52' R/W



LOCAL STREET

*Part-width street section for all collector streets-34' improvements on 52' R/W

Source: City of Wildomar

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IV. Project Traffic

The project site is proposed to be developed with a 3,280 square feet of fast-food restaurant with drive-thru and a 12 fueling position service station with convenience market.

A. Trip Generation

The traffic generated by the project is determined by multiplying an appropriate trip generation rates by the quantity of land uses. Trip generation rates are predicated on the assumption that energy costs, the availability of roadway capacity, the availability of vehicles to drive, and our life styles remain similar to what we know today. A major change in these variables may affect trip generation rates.

Traffic generation rates were determined for daily traffic and morning peak hour inbound and outbound traffic, and evening peak hour inbound and outbound traffic for the proposed land uses. Table 2 exhibits the traffic generation rates, project peak hour volumes, and project daily traffic volumes. The traffic generation rates are from the Institute of Transportation Engineers, Trip Generation, 8th Edition, 2008.

The proposed development is projected to generate approximately 1,672 additional daily vehicle trips, 128 of which will occur during the morning peak hour and 125 of which will occur during the evening peak hour.

Pass-by trips are exemplified by vehicles accessing land uses such as a service station or fast food restaurant located along a route they are already traveling along while on route to their destination. Pass-by trips do not contribute additional traffic to the roadway network because no new trips are produced. Land uses such as service stations, fast food, and banks often locate themselves on major roads of travel to attract a significant number of pass-by trips. The reduction for pass-by trips from the project are not used to analyze the project driveways and intersections immediately adjacent to the project site, only to the overall network of the project site. The project driveways and intersections immediately adjacent to the project site are analyzed as operating at the complete number of trips generated by the project site. The pass-by trips methodology and estimation of is outlined in the Institute of Transportation Engineers, Trip Generation Handbook, Chapter 5, 2004 (see Appendix E).

B. Trip Distribution

Figures 9 and 10 contain the directional distributions of the project traffic for the proposed land uses.

To determine the traffic distributions for the proposed project, peak hour traffic counts of the existing directional distribution of traffic for existing areas in the vicinity of the site, and other additional information on future development and traffic impacts in the area were reviewed.

C. Trip Assignment

Based on the identified traffic generation and distributions, project average daily traffic volumes have been calculated and shown on Figure 11. Morning and evening peak hour intersection turning movement volumes expected from the project are shown on Figures 12 and 13, respectively.

D. Modal Split

The traffic reducing potential of public transit has not been considered in this report. Essentially the traffic projections are conservative in that public transit might be able to reduce the traffic volumes.

Table 2

Project Traffic Generation[1]

Land Use	Quantity	Units[2]	Peak Hour						Daily
			Morning			Evening			
			Inbound	Outbound	Total	Inbound	Outbound	Total	
Trip Generation Rates									
Fast-Food Restaurant with Drive-Thru	3.280	TSF	25.17	24.18	49.35	17.60	16.24	33.84	496.12
Service Station with Convenience Market	12	FP	5.08	5.08	10.16	6.69	6.69	13.38	162.78
Trips Generated									
Fast-Food Restaurant with Drive-Thru	3.280	TSF	83	79	162	58	53	111	1,627
Pass-by Trips (49%, 50%, 49%)[3]			-41	-39	-80	-29	-27	-56	-814
Service Station with Convenience Market	12	FP	61	61	122	80	80	160	1,953
Pass-by Trips (62%, 56%, 56%)[4]			-38	-38	-76	-45	-45	-90	-1,094
Total			65	63	128	64	61	125	1,672

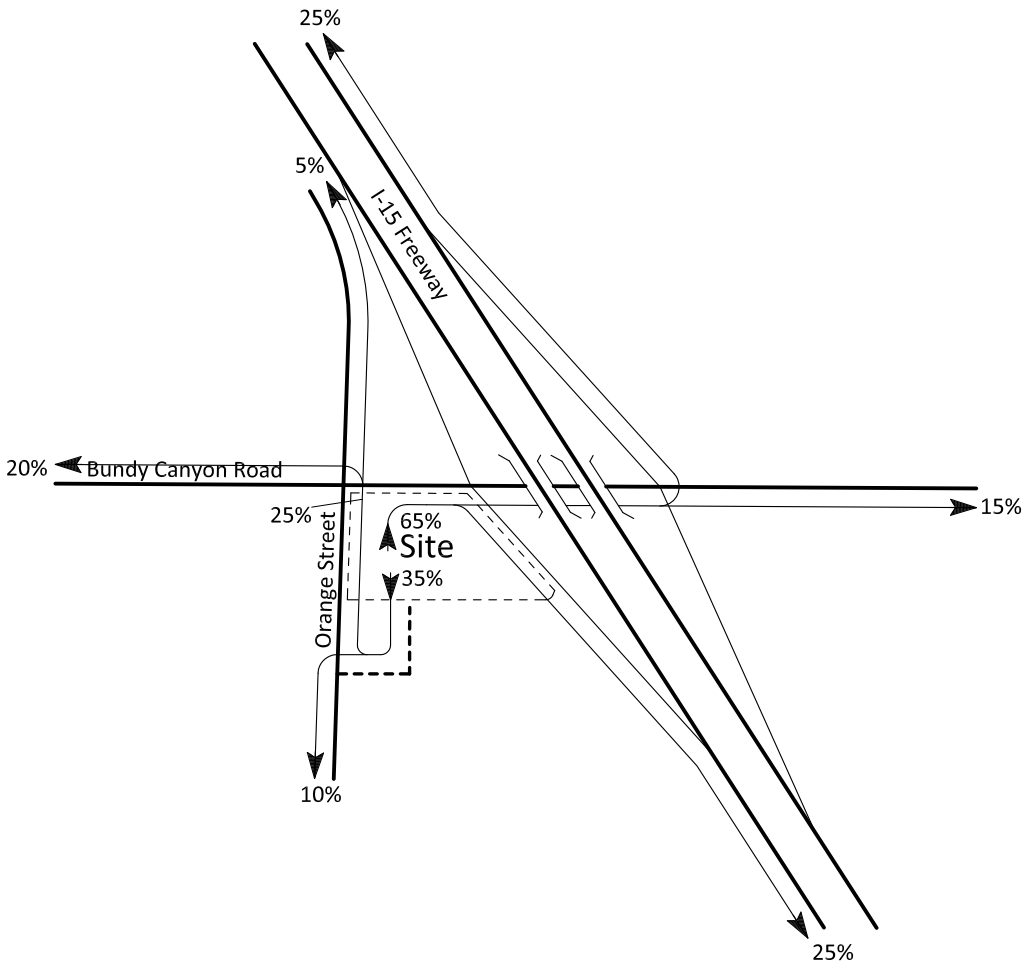
[1] Source: Institute of Transportation Engineers, Trip Generation, 8th Edition, 2008, Land Use Categories 934 and 945.

[2] TSF = Thousand Square Feet; FP = Fueling Positions

[3] Source: Institute of Transportation Engineers, Trip Generation Handbook, 2th Edition, 2004, Land Use Categories 934.

[4] Source: Institute of Transportation Engineers, Trip Generation Handbook, 2th Edition, 2004, Land Use Categories 945.

Figure 9
Project Outbound Traffic Distribution



Legend

10% = Percent From Project

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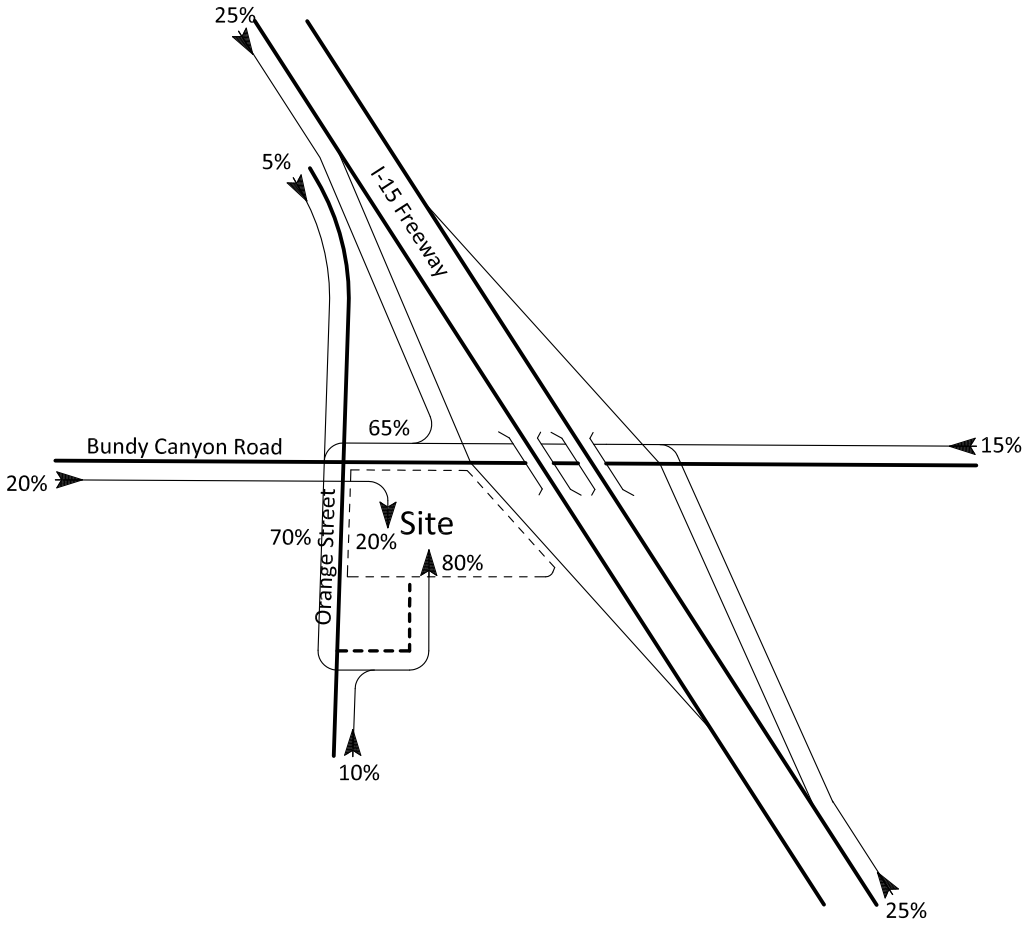
Figure 10
Project Inbound Traffic Distribution



Legend

10% = Percent To Project

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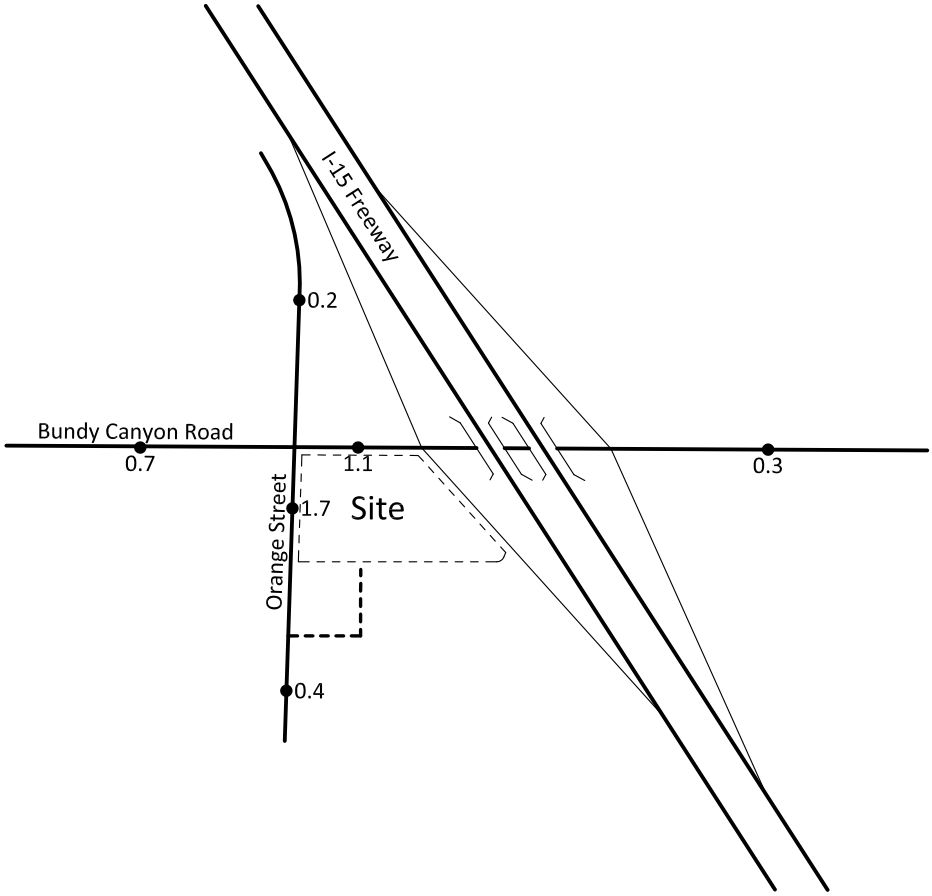
Figure 11
Project Average Daily Traffic Volumes



Legend

0.2 = Vehicles Per Day (1,000's)

N

NTS

3999c/11

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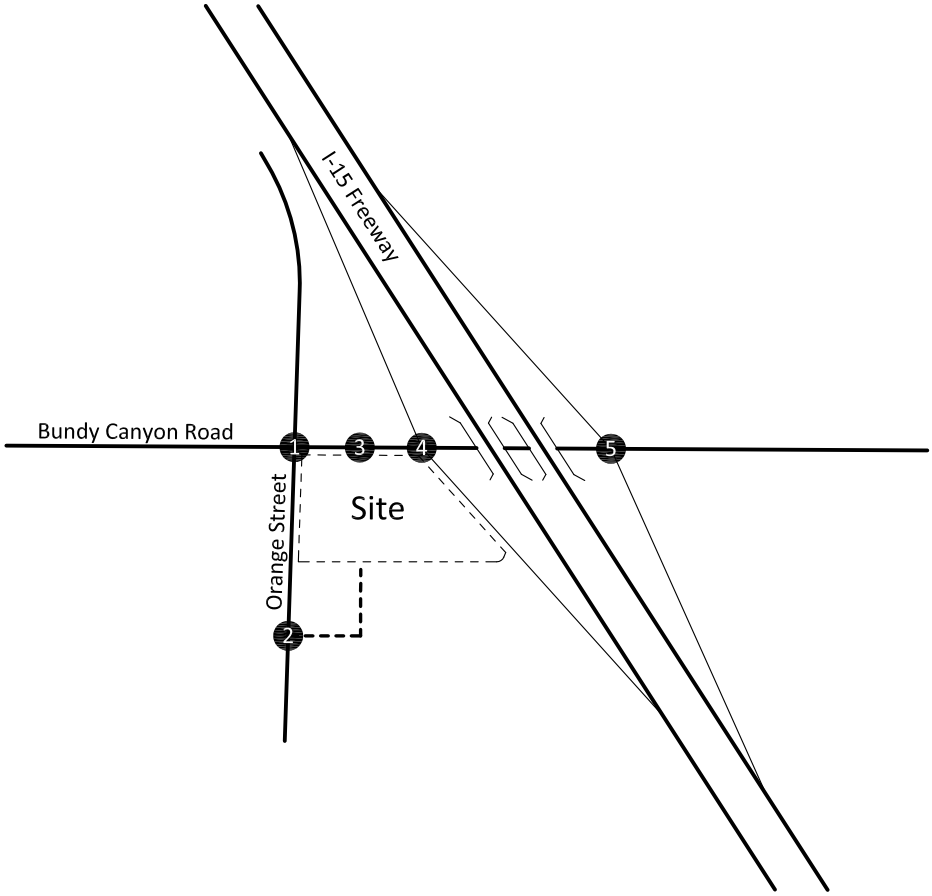
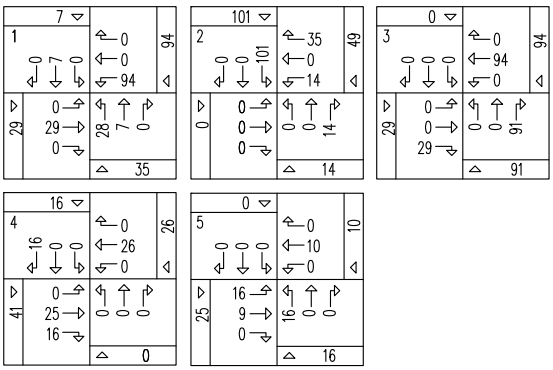
OVER 35 YEARS OF EXCELLENT SERVICE

Figure 12
Project Morning Peak Hour Intersection Turning Movement Volumes





N

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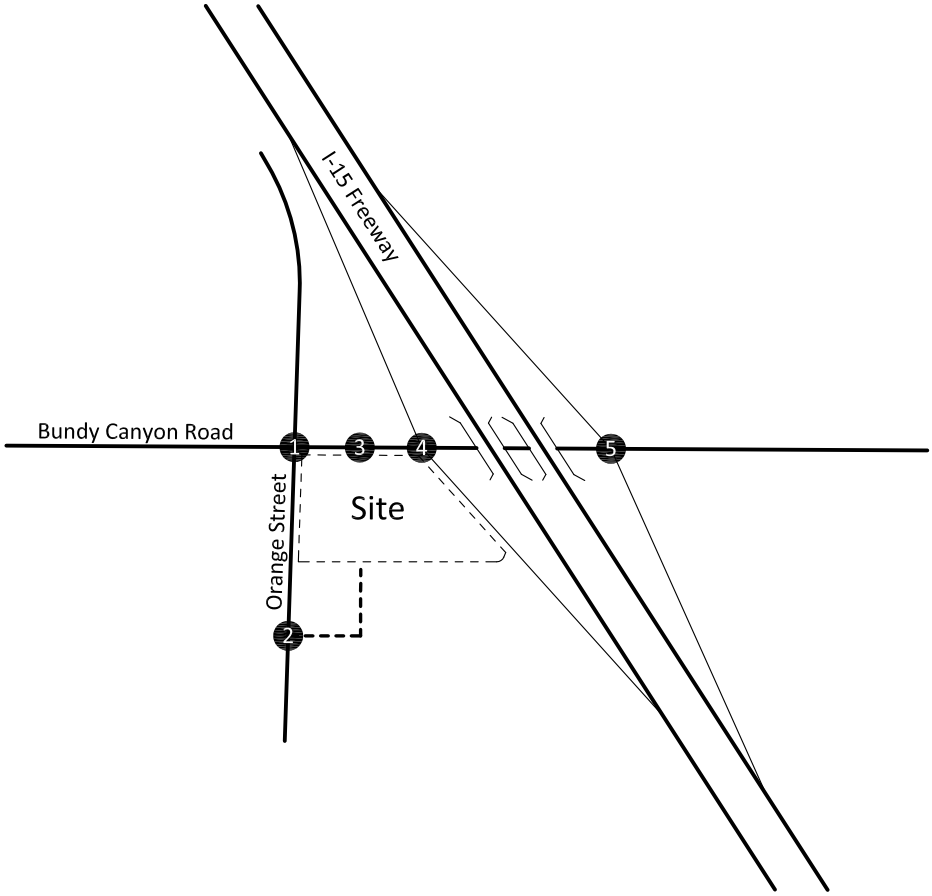
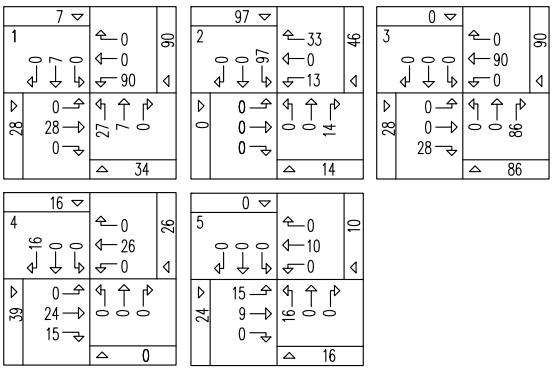
Intersection reference numbers are in upper left corner of turning movement boxes.

Figure 13
Project Evening Peak Hour Intersection Turning Movement Volumes





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3999c/13

Intersection reference numbers are in upper left corner of turning movement boxes.

V. Existing Plus Ambient Growth Plus Cumulative Projects Traffic Conditions

Figures 14 to 25 illustrate the existing plus ambient growth plus cumulative projects traffic conditions.

A. Method of Projection

To assess existing plus ambient growth plus cumulative traffic conditions, existing traffic is combined other development and areawide growth. The Opening Year for analysis purposes in this report is 2013.

To account for areawide growth on roadways, traffic volumes have been calculated based on a "conservative" 2.0 percent annual growth rate of existing traffic volumes over a two (2) year period.

B. Other Development

Table 3 lists the proposed land use for the other development (see Figure 14). Table 3 shows the daily and peak hour vehicle trips generated by the other development in the study area. Figures 15 to 19 contains the directional distribution and assignment of the other development traffic.

Figure 20 shows the average daily traffic volumes that can be expected for the other development traffic conditions. Other development morning and evening peak hour intersection turning movement volumes are shown on Figures 21 and 22, respectively.

C. Existing Plus Ambient Growth Plus Cumulative Projects Average Daily Traffic Volumes

The existing plus ambient growth plus cumulative projects average daily traffic volumes are as illustrated on Figure 23.

D. Existing Plus Ambient Growth Plus Cumulative Projects Intersection Delay

The technique used to assess the capacity needs of an intersection is known as the Intersection Delay Method (see Appendix C). To calculate delay, the volume of traffic using the intersection is compared with the capacity of the intersection.

The delay and Level of Service for existing plus ambient growth plus cumulative projects traffic conditions have been calculated and are shown in Table 4. Existing plus ambient growth plus cumulative projects morning and evening peak hour intersection turning movement volumes are shown on Figures 24 and 25, respectively.

The study area intersections are projected to operate at acceptable Levels of Service during the peak hours for existing plus ambient growth plus cumulative projects traffic conditions.

Existing plus ambient growth plus cumulative projects delay worksheets are provided in Appendix C.

Table 3

Other Development Traffic Generation

Project	Land Use	Quantity	Units[1]	Peak Hour						Daily
				Morning			Evening			
				Inbound	Outbound	Total	Inbound	Outbound	Total	
APN-367-100-019 and	Retail	33.80	TSF	51	33	84	147	160	307	3,394
APN-367-100-020	Pass-by Trip Reduction			-20	-13	-33	-59	-64	-123	-1,358
	Subtotal			31	20	51	88	96	184	2,036
	Fast Food	6.20	TSF	173	167	340	149	138	287	3,076
	Pass-by Trip Reduction			-78	-75	-153	-67	-62	-129	-1,384
	Subtotal			95	92	187	82	76	158	1,692
	Gas Station	12.000	TSF	63	64	127	82	81	163	1,953
	Pass-by Trip Reduction			-38	-38	-76	-49	-49	-98	-1,172
	Subtotal			25	26	51	33	32	65	781
	Total			151	138	289	203	204	407	4,509
Baxter Crossing Development	Apartment	110	DU	11	45	56	44	24	68	732
	Residential Condo/Townhouse	265	DU	19	98	117	93	45	138	1,540
	Shopping Center	130.60	TSF	110	71	181	372	388	760	8,078
	Internal Trips (10% Residential)			-3	-14	-17	-14	-7	-21	-227
	Internal Trips (Shopping Center)			-14	-3	-17	-7	-14	-21	-227
	"Pass-By" (25% Non-Residential Only)			0	0	0	-91	-94	-185	-1,963
	Total			123	197	320	397	342	739	7,933
DL Almond Development	Wholesale Nursery	5.05	TSF	6	6	12	13	13	26	197
Angels Lane Development	Specialty Retail	7.500	TSF	0	0	0	9	11	20	332
	High Turnover Sit-Down Restaurant	3.000	TSF	18	17	35	20	14	34	381
	Subtotal			18	17	35	29	25	54	713
	Pass-by Percentage3			0	0	0	0	0	0	0
	Pass-by Trips			-6	-6	-12	-10	-9	-19	-242
	Total			12	11	23	19	16	35	471
Tract No. 34207	Single Family Detached Housing	71	DU	13	40	53	45	26	71	679
Grand Total				305	392	697	677	601	1,278	13,789

[1] Source: Institute of Transportation Engineers, Trip Generation, 8th Edition, 2008, Land Use Category 220, 230, 710, 814, 820, 834, 845, and 932.

[2] TSF = Thousand Square Feet; DU = Dwelling Units

Table 4

Existing Plus Ambient Growth Plus Cumulative Intersection Delay and Level of Service

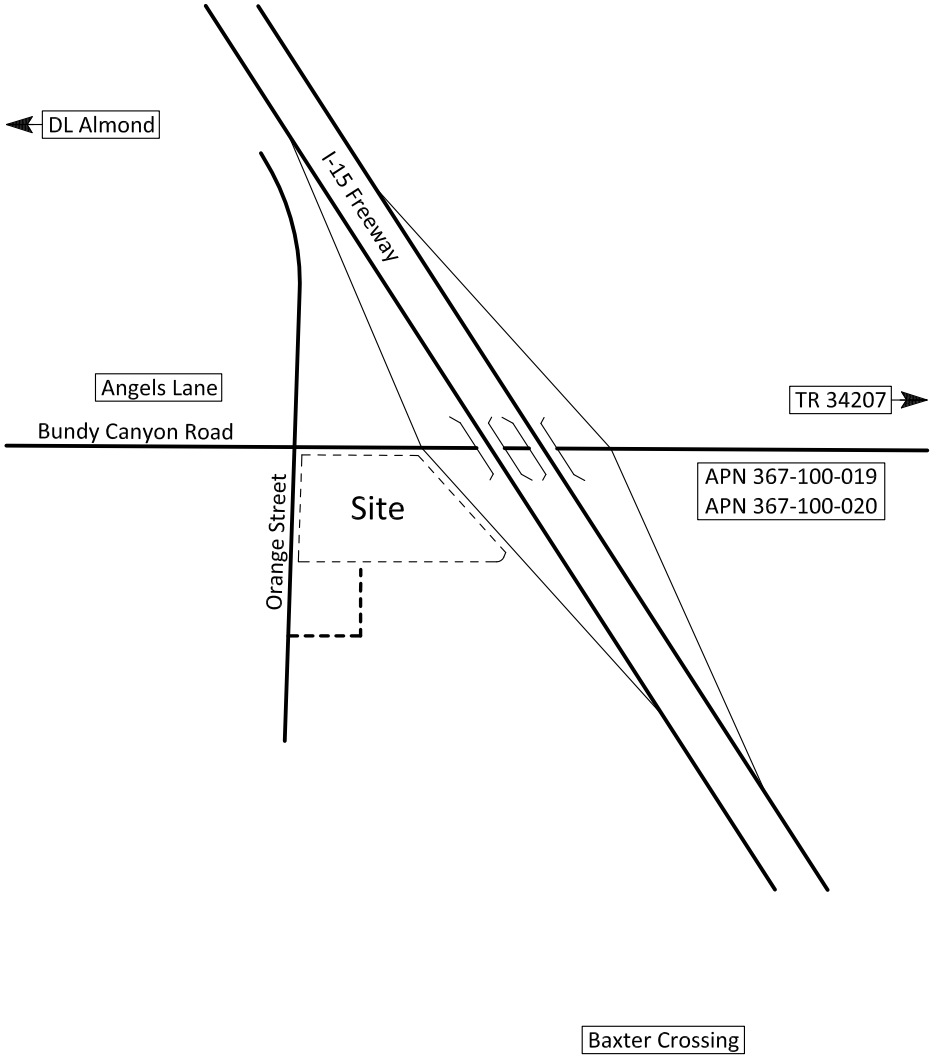
Intersection	Traffic Control [3]	Intersection Approach Lanes [1]												Peak Hour Delay-LOS [2]	
		Northbound			Southbound			Eastbound			Westbound				
		L	T	R	L	T	R	L	T	R	L	T	R	Morning	Evening
Orange Street (NS) at:															
Bundy Canyon Road (EW) - #1	TS	0.5	0.5	1	0.5	0.5	1	1	2	1	1	1	1	27.9-C	19.1-B
I-15 Freeway SB Ramps (NS) at:															
Bundy Canyon Road (EW) - #4	TS	0	0	0	1	0.5	0.5	0	1.5	0.5	1	2	0	32.8-C	28.5-C
I-15 Freeway NB Ramps (NS) at:															
Bundy Canyon Road (EW) - #5	TS	1	0.5	0.5	0	0	0	1	2	0	0	1.5	0.5	30.6-C	34.9-C

[1] When a right turn lane is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes. L = Left; T = Through; R = Right, **1** = Improvements

[2] Delay and level of service has been calculated using the following analysis software: Traffix, Version 7.9.0215 (2008). Per the 2000 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[3] TS = Traffic Signal

Figure 14
Other Development Location Map



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3999c/14

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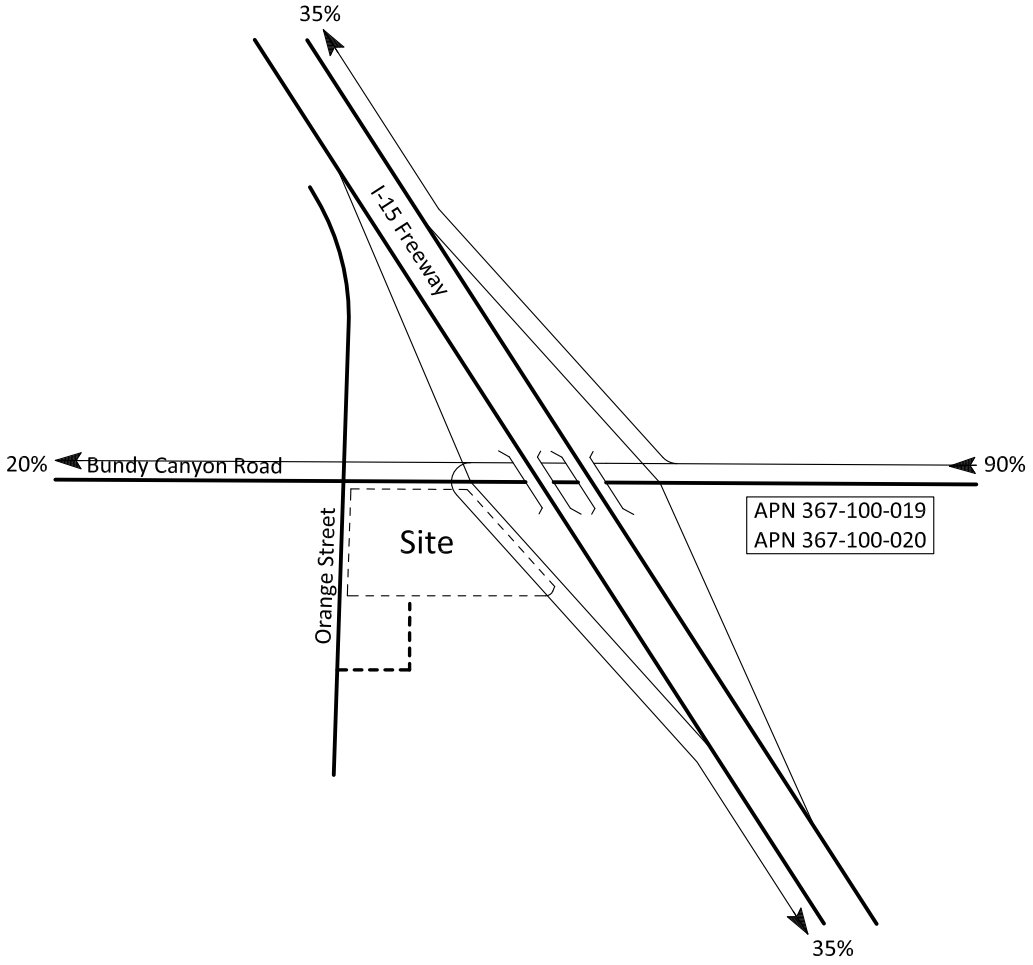
OVER 35 YEARS OF EXCELLENT SERVICE

Figure 15
Other Development (APN 367-100-019 and APN 367-100-020)
Traffic Distribution



Legend

10% = Percent To/From Project

N

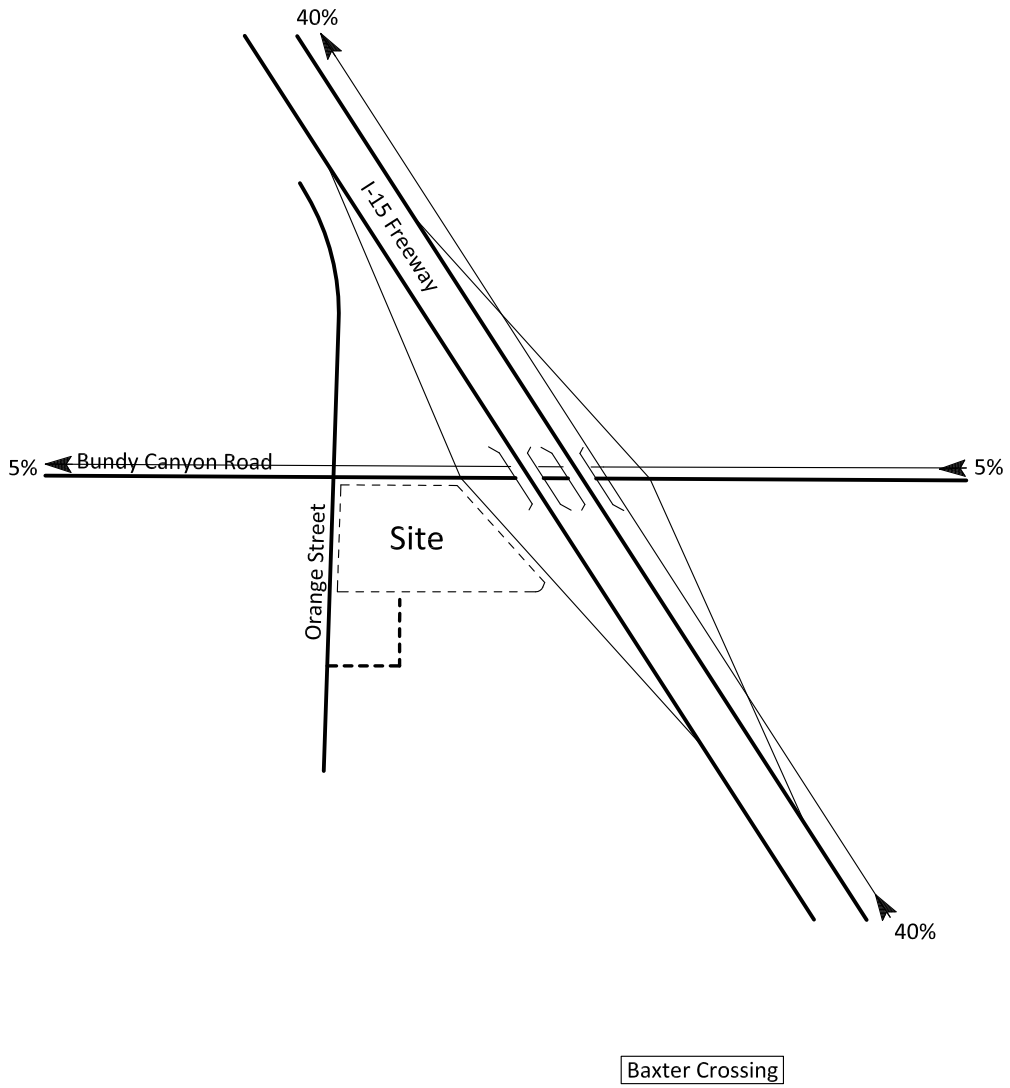
NTS

3999c/15

KUNZMAN ASSOCIATES, INC.

OVER 35 YEARS OF EXCELLENT SERVICE

Figure 16
Other Development (Baxter Crossing) Traffic Distribution



Legend

10% = Percent To/From Project

N

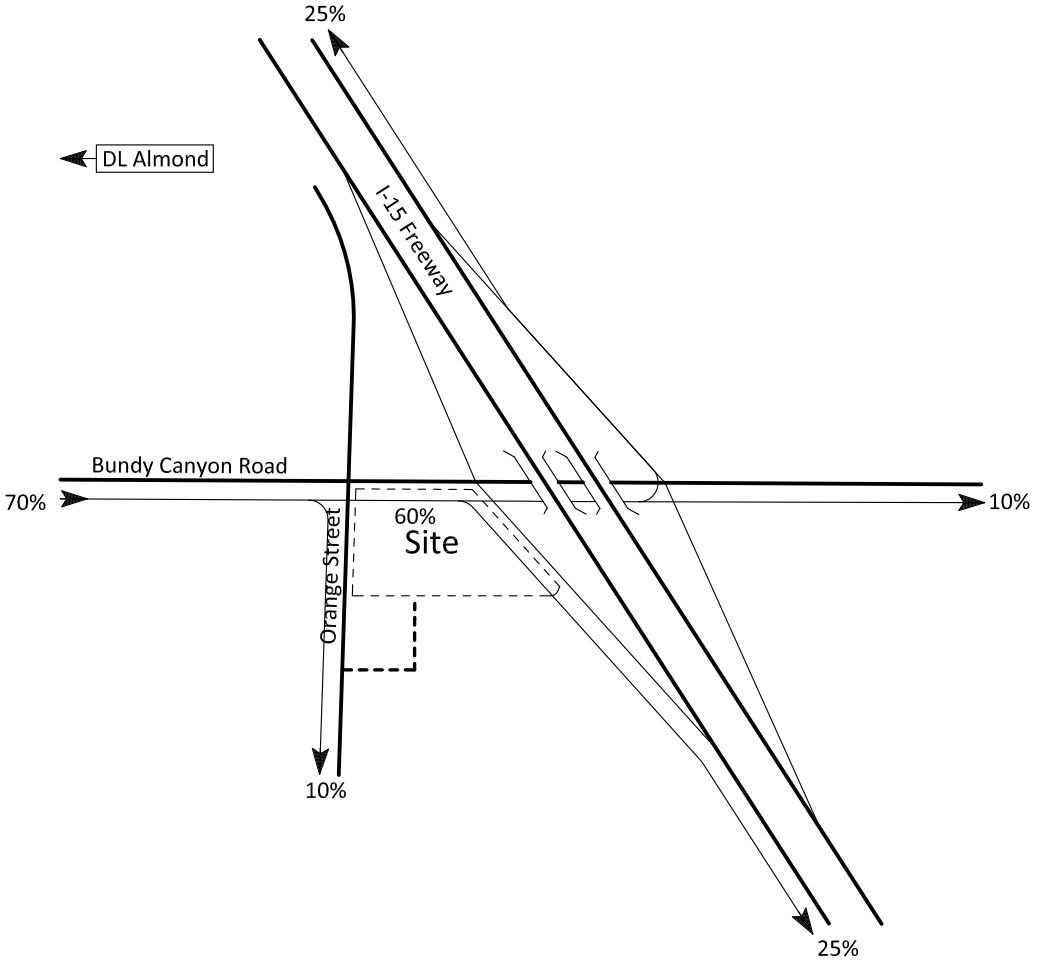
NTS

3999c/16

KUNZMAN ASSOCIATES, INC.

OVER 35 YEARS OF EXCELLENT SERVICE

Figure 17
Other Development (DL Almond) Traffic Distribution



Legend

10% = Percent To/From Project

N

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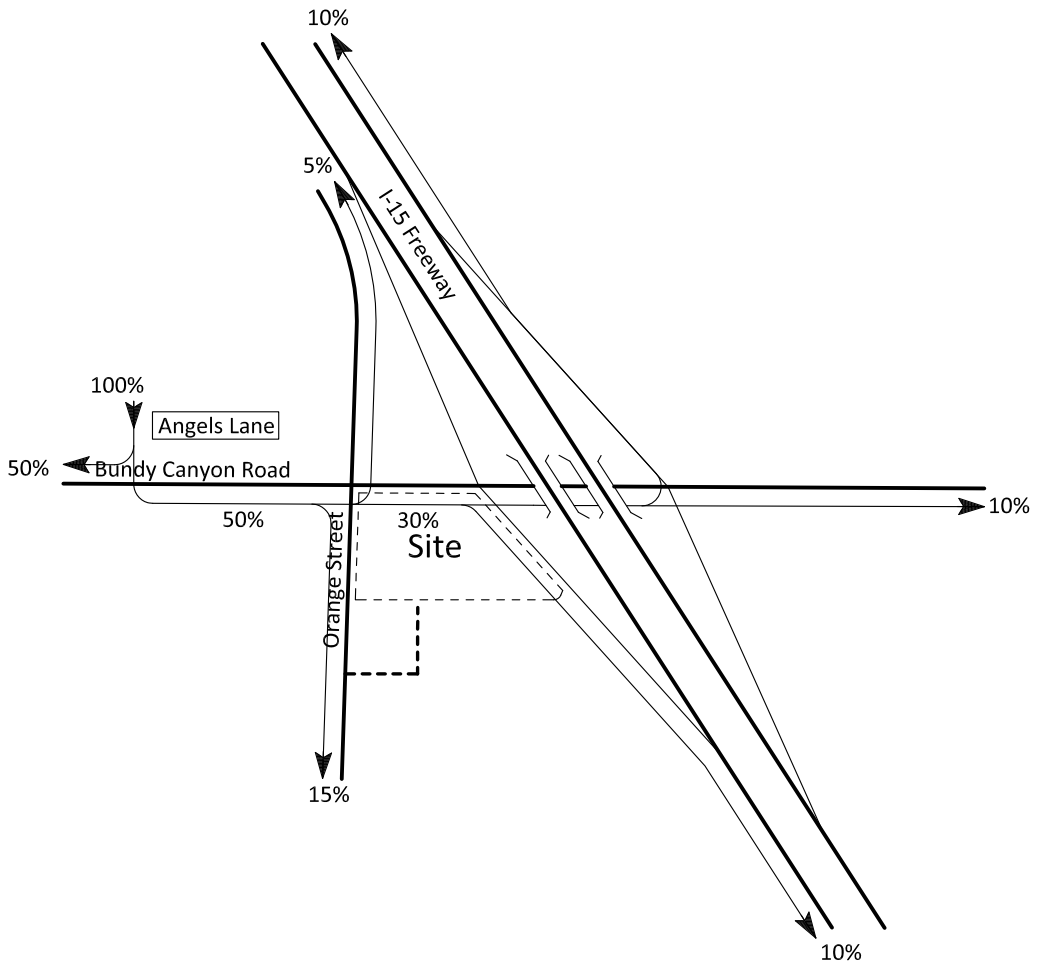
3999c/17

KUNZMAN ASSOCIATES, INC.

OVER 35 YEARS OF EXCELLENT SERVICE

Figure 18
Other Development (Angels Lane Development) Traffic Distribution



Legend

10% = Percent To/From Project

N

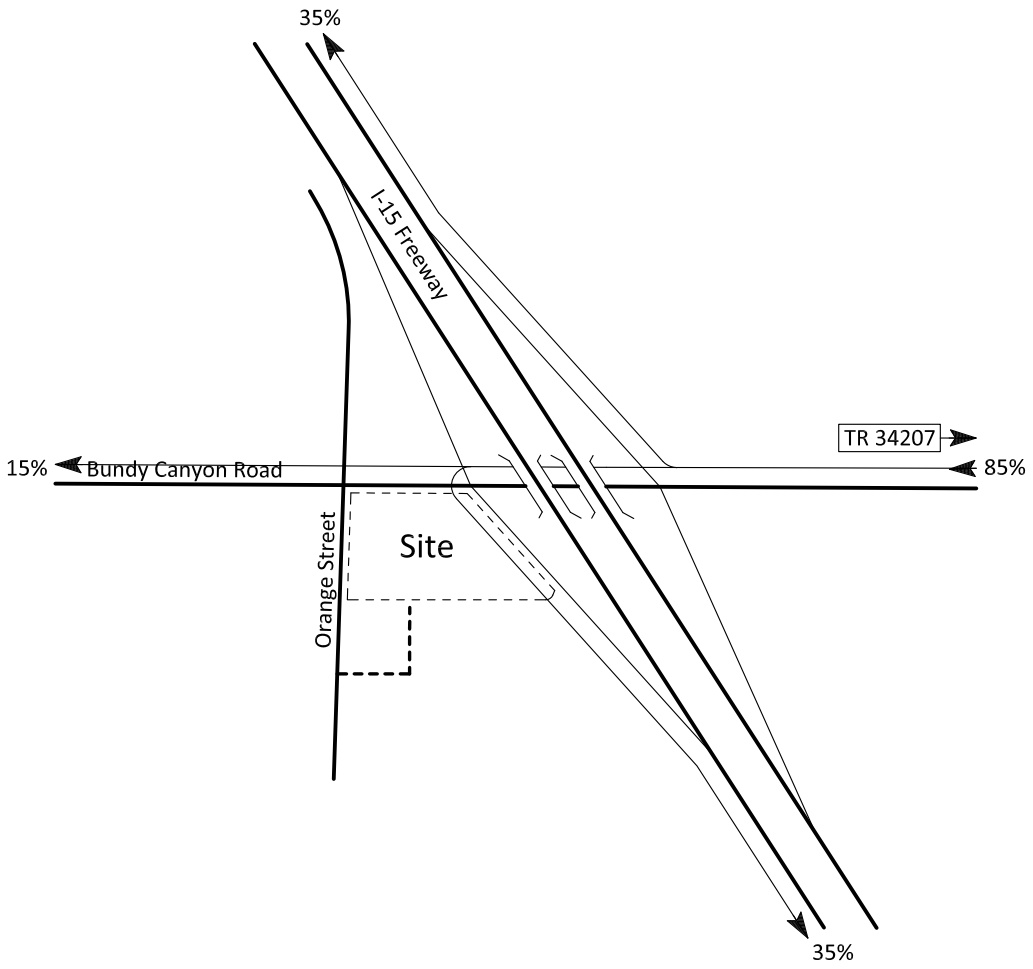
NTS

3999c/18

KUNZMAN ASSOCIATES, INC.

OVER 35 YEARS OF EXCELLENT SERVICE

Figure 19
Other Development (TR 34207) Traffic Distribution



Legend

10% = Percent To/From Project

N

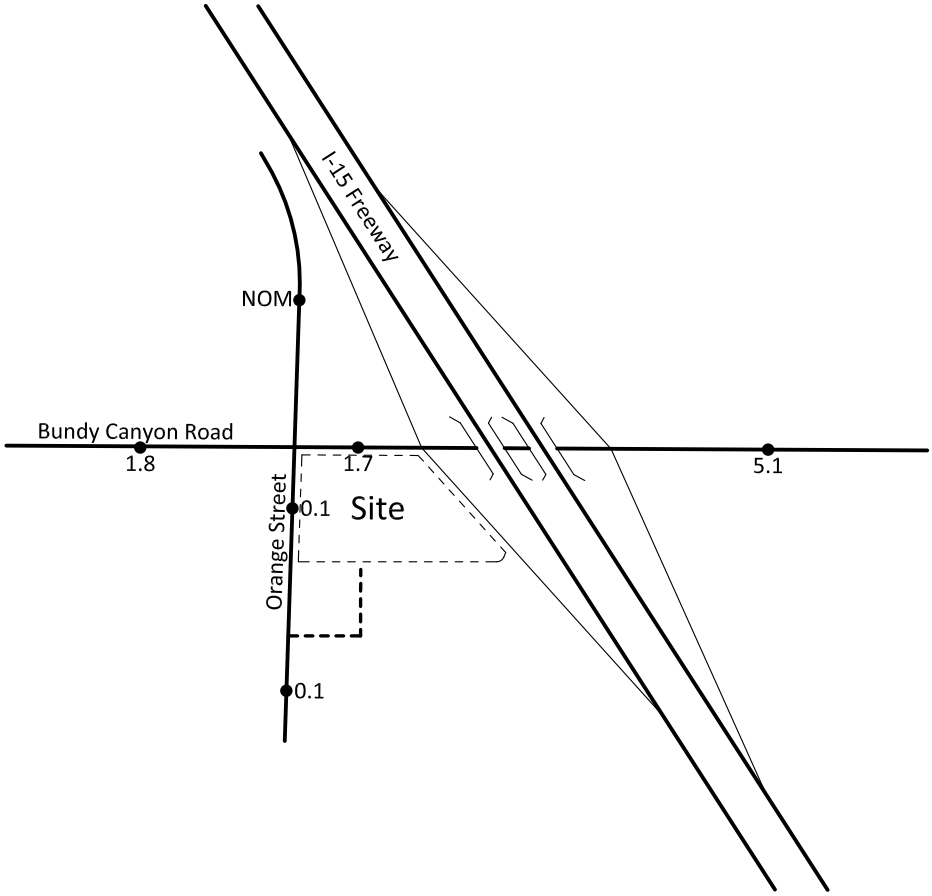
NTS

3999c/19

KUNZMAN ASSOCIATES, INC.

OVER 35 YEARS OF EXCELLENT SERVICE

Figure 20
Other Development Average Daily Traffic Volumes



Legend

0.1 = Vehicles Per Day (1,000's)
NOM = Nominal, Less Than 50 Vehicles Per day

N

NTS

3999c/20

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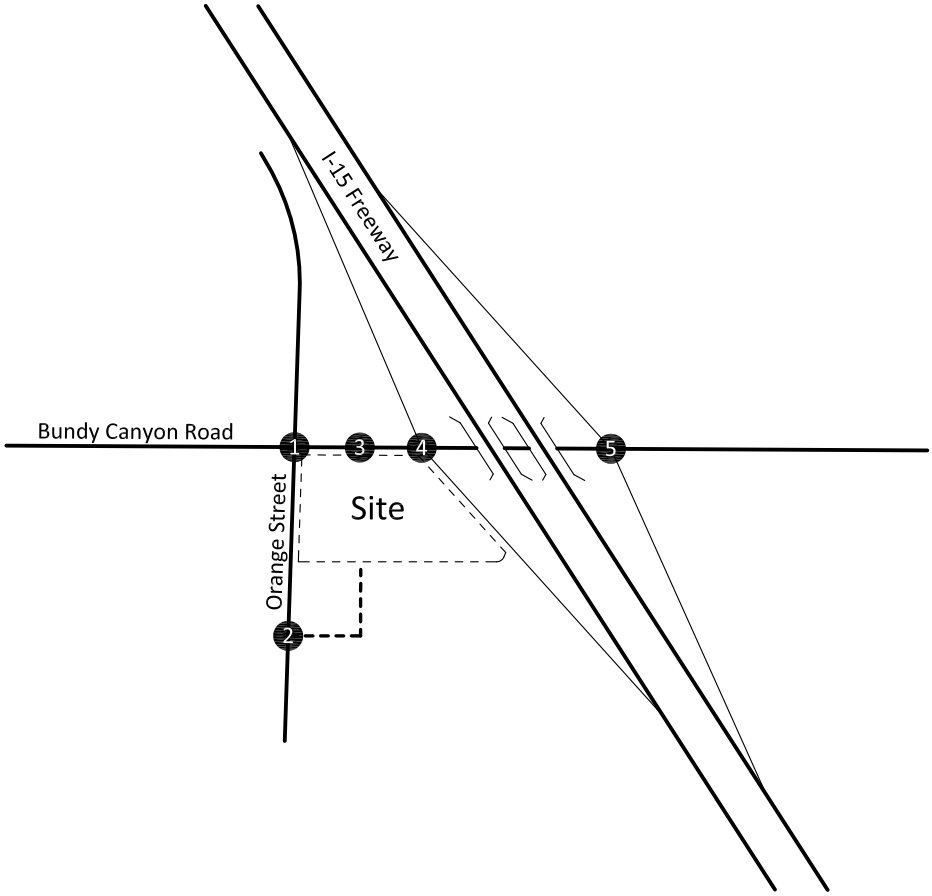
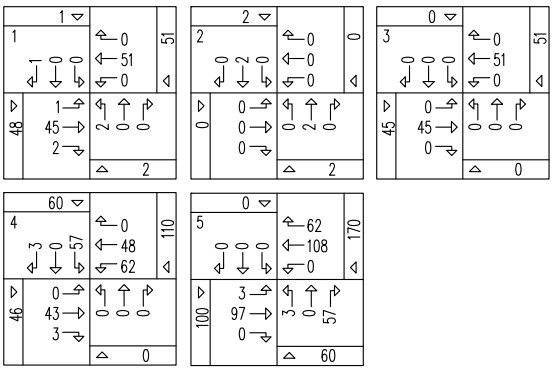
Figure 21
Other Development
Morning Peak Hour Intersection Turning Movement Volumes





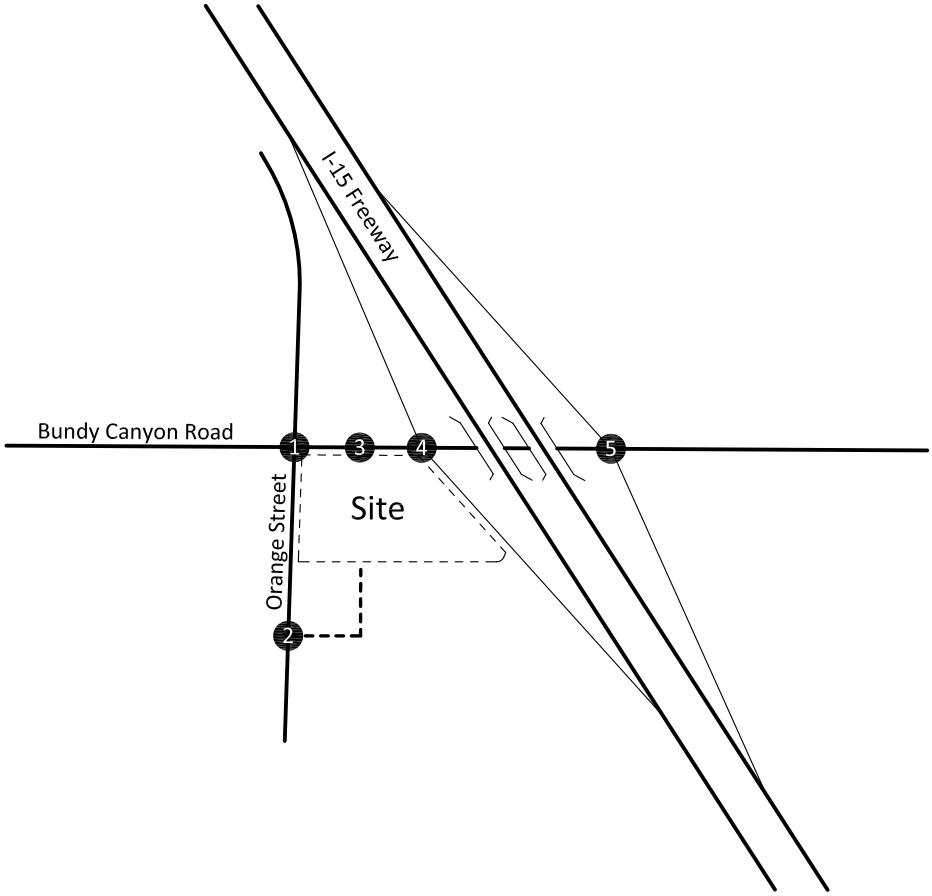
N

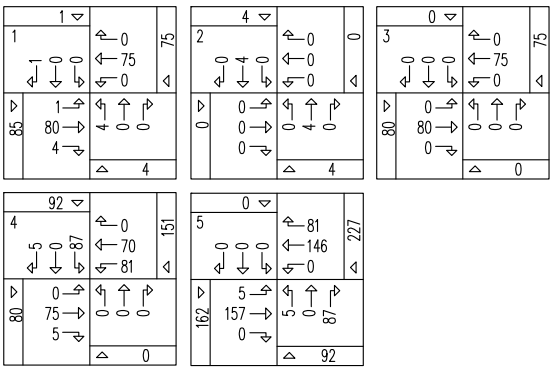
NTS

3999c/21

Intersection reference numbers are in upper left corner of turning movement boxes.

Figure 22
Other Development
Evening Peak Hour Intersection Turning Movement Volumes





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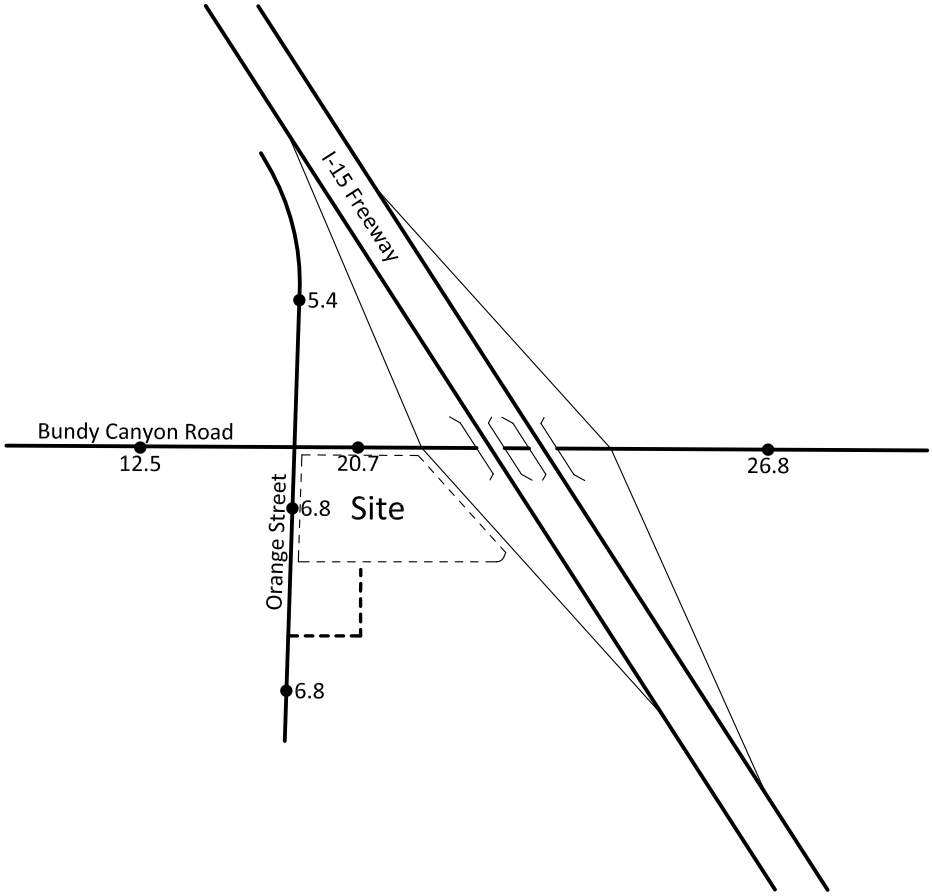
3999c/22

Intersection reference numbers are in upper left corner of turning movement boxes.

Figure 23
Existing Plus Ambient Growth Plus Cumulative Projects
Average Daily Traffic Volumes



Legend

6.8 = Vehicles Per Day (1,000's)

N

NTS

3999c/23

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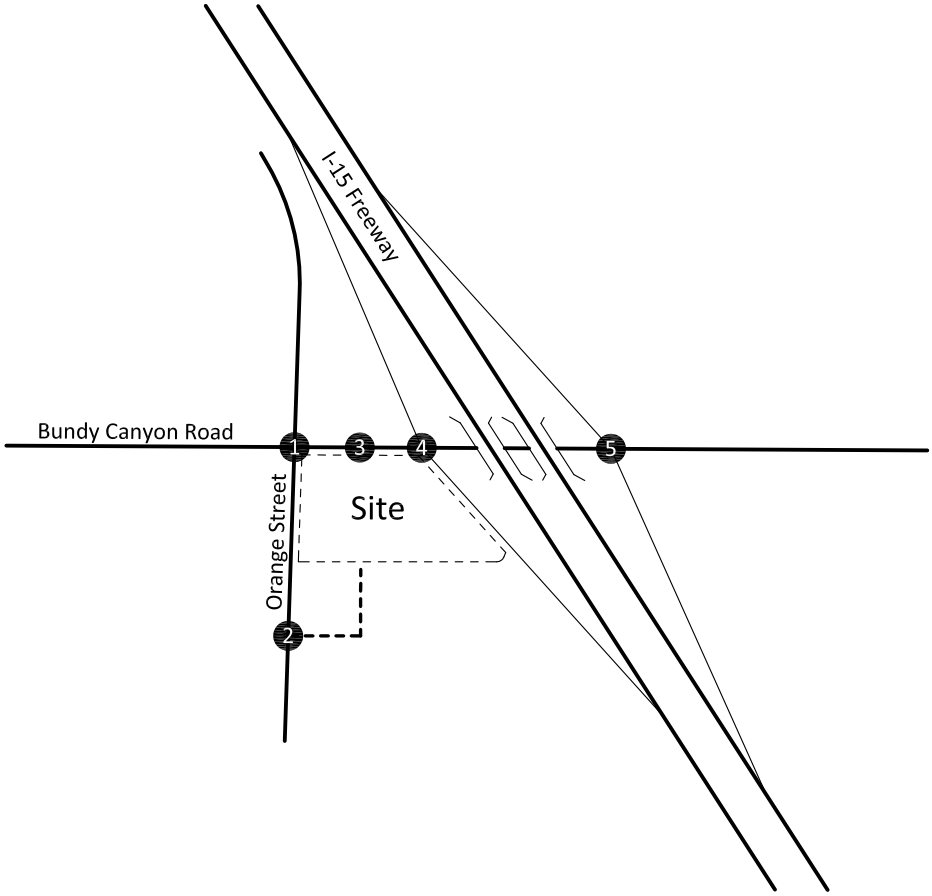
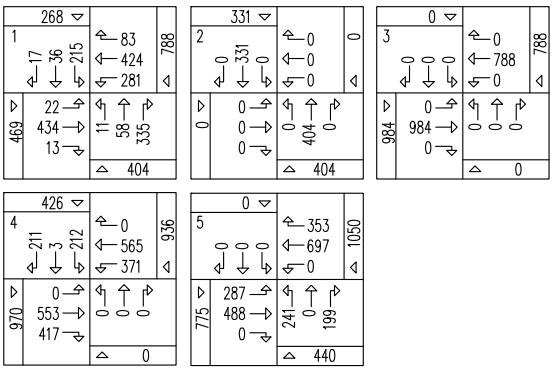
Figure 24
Existing Plus Ambient Growth Plus Cumulative Projects
Morning Peak Hour Intersection Turning Movement Volumes





N

NTS

3999c/24

Kunzman Associates, Inc. Intersection reference numbers are in upper left corner of turning movement boxes.

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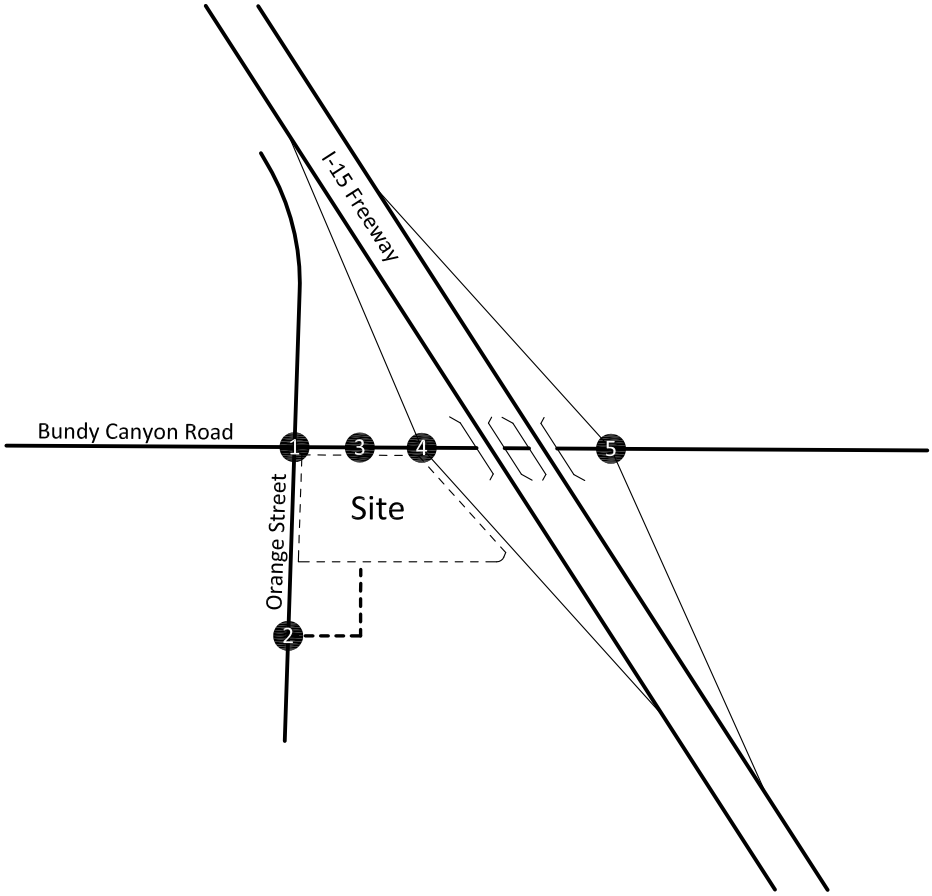
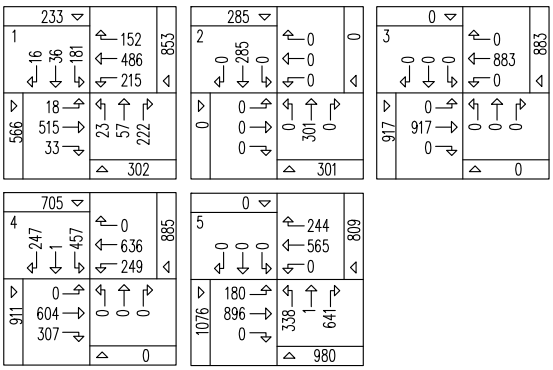
Figure 25
Existing Plus Ambient Growth Plus Cumulative Projects
Evening Peak Hour Intersection Turning Movement Volumes





NTS

3999c/25

Intersection reference numbers are in upper left corner of turning movement boxes.

VI. Existing Plus Ambient Growth Plus Cumulative Plus Project Traffic Conditions

Figures 26 to 28 illustrate the existing plus ambient growth plus cumulative projects plus project traffic conditions.

A. Method of Projection

To assess existing plus ambient growth plus cumulative projects plus project traffic conditions, project traffic is combined with existing traffic, other development, and areawide growth. The Opening Year for analysis purposes in this report is 2013.

To account for areawide growth on roadways, traffic volumes have been calculated based on a "conservative" 2.0 percent annual growth rate of existing traffic volumes over a two (2) year period.

B. Existing Plus Ambient Growth Plus Cumulative Projects Plus Project Average Daily Traffic Volumes

Upon project completion and occupancy, the existing plus ambient growth plus cumulative projects plus project average daily traffic volumes are as illustrated on Figure 26.

C. Existing Plus Ambient Growth Plus Cumulative Projects Plus Project Intersection Delay

The technique used to assess the capacity needs of an intersection is known as the Intersection Delay Method (see Appendix C). To calculate delay, the volume of traffic using the intersection is compared with the capacity of the intersection.

The delay and Level of Service for existing plus ambient growth plus cumulative projects plus project traffic conditions have been calculated and are shown in Table 5. Existing plus ambient growth plus cumulative projects plus project morning and evening peak hour intersection turning movement volumes are shown on Figures 27 and 28, respectively.

The study area intersections are projected to operate at acceptable Levels of Service during the peak hours for existing plus ambient growth plus cumulative projects plus project traffic conditions, with improvements. Existing plus ambient growth plus cumulative projects plus project delay worksheets are provided in Appendix C.

Table 5

Existing Plus Ambient Growth Plus Cumulative Projects Plus Project Intersection Delay and Level of Service

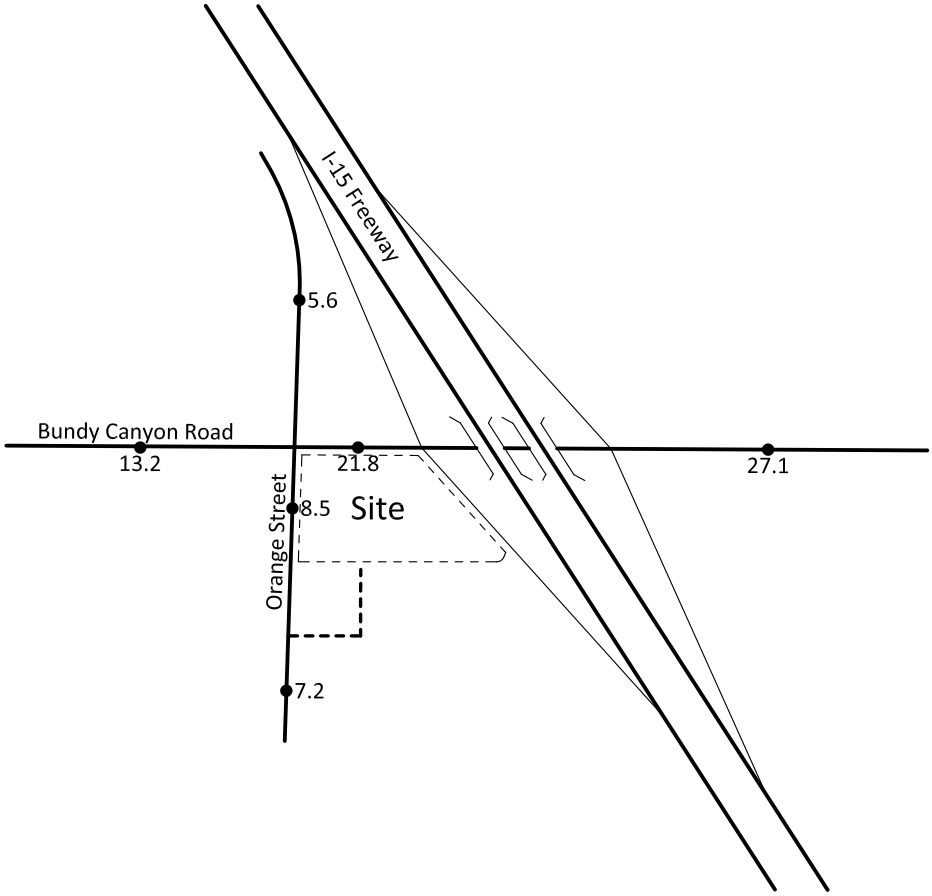
Intersection	Traffic Control [3]	Intersection Approach Lanes [1]												Peak Hour Delay-LOS [2]	
		Northbound			Southbound			Eastbound			Westbound				
		L	T	R	L	T	R	L	T	R	L	T	R	Morning	Evening
Orange Street (NS) at:															
Bundy Canyon Road (EW) - #1	TS	0.5	0.5	1	0.5	0.5	1	1	2	1	1	1	1	35.0-C	20.8-C
Project Access (EW) - #2	**CSS**	0	0.5	0.5	0.5	0.5	0	0	0	0	0	**1**	0	14.2-B	12.4-B
Project Access (NS) at:															
Bundy Canyon Road (EW) - #3	**CSS**	0	0	**1**	0	0	0	0	1.5	0.5	0	2	0	14.0-B	13.3-B
I-15 Freeway SB Ramps (NS) at:															
Bundy Canyon Road (EW) - #4	TS	0	0	0	1	0.5	0.5	0	1.5	0.5	1	2	0	34.5-C	29.6-C
I-15 Freeway NB Ramps (NS) at:															
Bundy Canyon Road (EW) - #5	TS	1	0.5	0.5	0	0	0	1	2	0	0	1.5	0.5	34.0-C	36.5-D

[1] When a right turn lane is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes. L = Left; T = Through; R = Right, **1** = Improvements

[2] Delay and level of service has been calculated using the following analysis software: Traffix, Version 7.9.0215 (2008). Per the 2000 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[3] CSS = Cross Street Stop; TS = Traffic Signal

Figure 26
Existing Plus Ambient Growth Plus Project Plus Cumulative Projects
Average Daily Traffic Volumes



Legend

7.2 = Vehicles Per Day (1,000's)

N

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3999c/26

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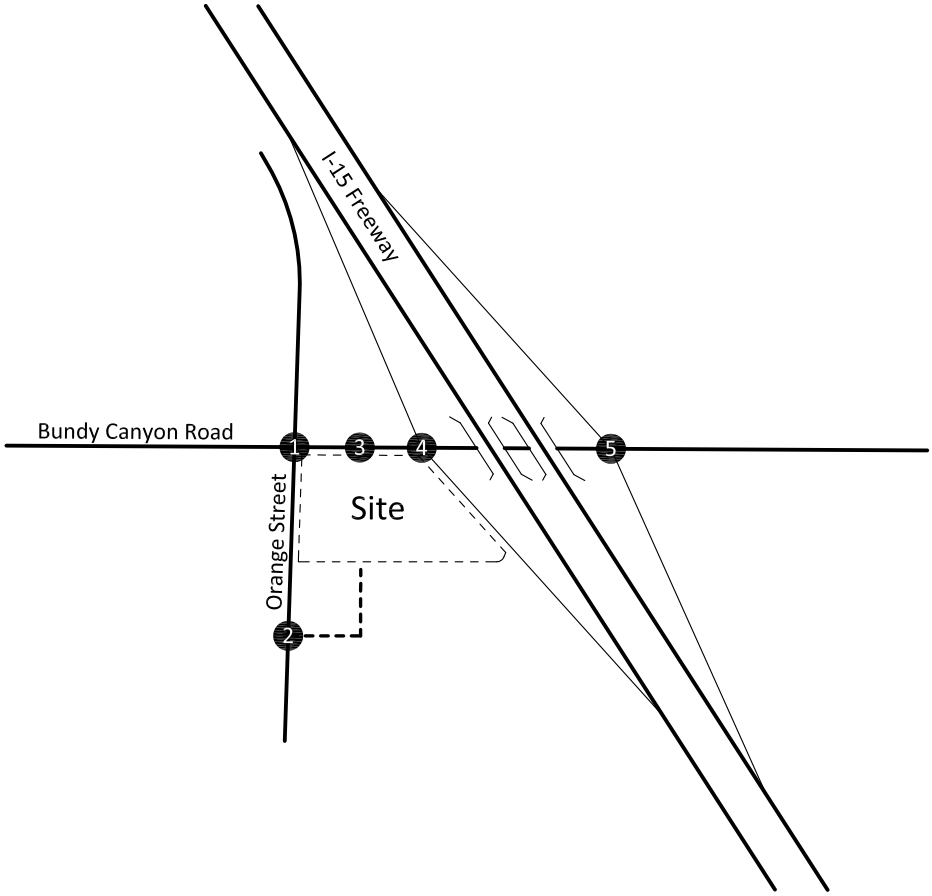
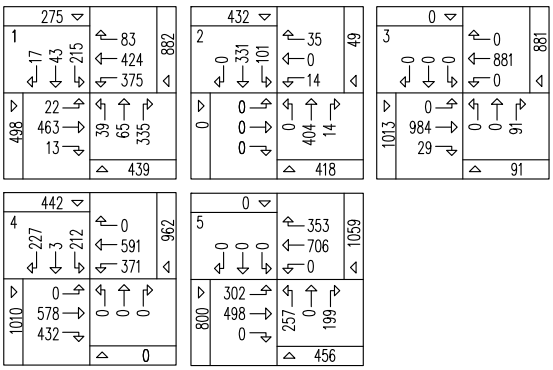
Figure 27
Existing Plus Ambient Growth Plus Project Plus Cumulative Projects Morning Peak Hour Intersection Turning Movement Volumes





N

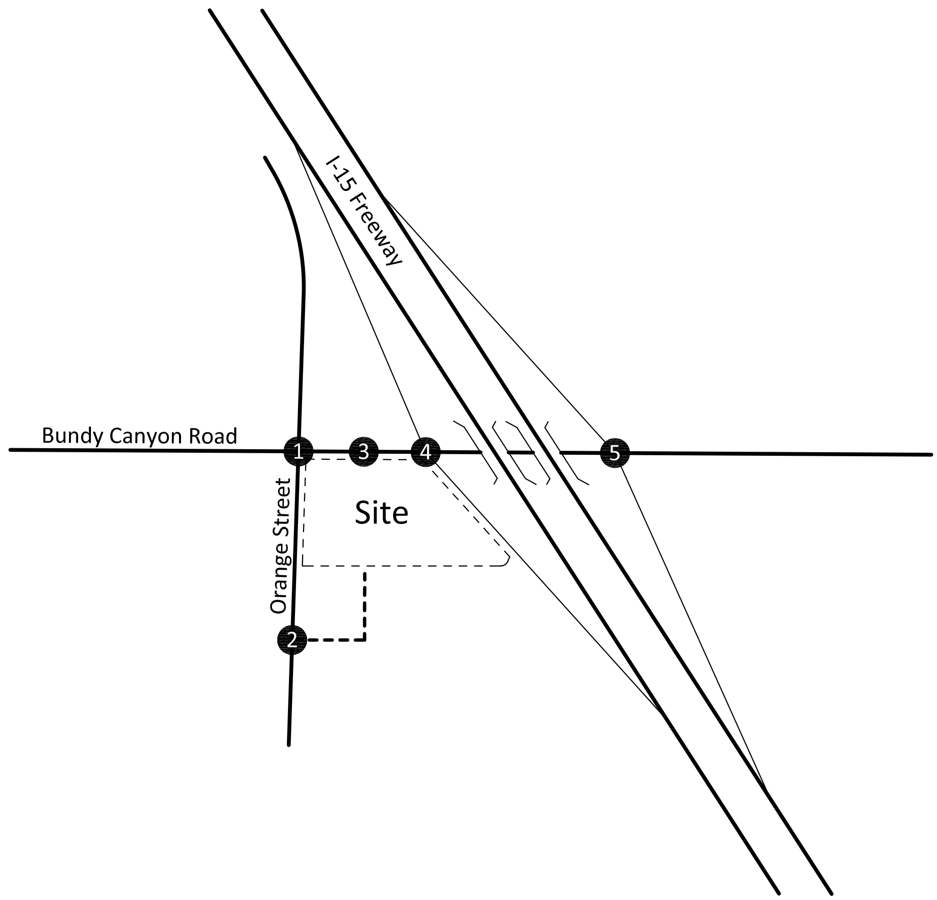
NTS

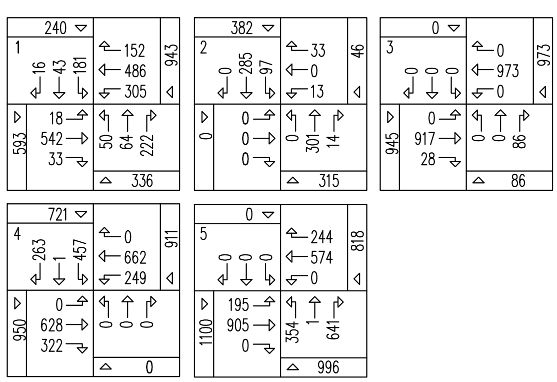
3999c/27

KUNZMAN ASSOCIATES, INC. Intersection reference numbers are in upper left corner of turning movement boxes.

OVER 35 YEARS OF EXCELLENT SERVICE

Figure 28
Existing Plus Ambient Growth Plus Project Plus Cumulative Projects
Evening Peak Hour Intersection Turning Movement Volumes





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3999c/28

KUNZMAN ASSOCIATES, INC. Intersection reference numbers are in upper left corner of turning movement boxes.

OVER 35 YEARS OF EXCELLENT SERVICE

VII. Conclusions

A. Existing Conditions

The study area intersections currently operate at acceptable Levels of Service during the peak hours for existing traffic conditions. Existing delay worksheets are provided in Appendix C.

B. Project Traffic

The project site is proposed to be developed with a 3,280 square feet of fast-food restaurant with drive-thru and a 12 fueling position service station with convenience market.

Traffic generation rates were determined for daily traffic and morning peak hour inbound and outbound traffic, and evening peak hour inbound and outbound traffic for the proposed land uses. Table 2 exhibits the traffic generation rates, project peak hour volumes, and project daily traffic volumes. The traffic generation rates are from the Institute of Transportation Engineers, Trip Generation, 8th Edition, 2008.

The proposed development is projected to generate approximately 1,672 additional daily vehicle trips, 128 of which will occur during the morning peak hour and 125 of which will occur during the evening peak hour.

To determine the traffic distributions for the proposed project, peak hour traffic counts of the existing directional distribution of traffic for existing areas in the vicinity of the site, and other additional information on future development and traffic impacts in the area were reviewed.

C. Future Conditions

The study area intersections are projected to operate at acceptable Levels of Service during the peak hours for existing plus ambient growth plus cumulative projects traffic conditions. Existing plus ambient growth plus cumulative projects delay worksheets are provided in Appendix C.

The study area intersections are projected to operate at acceptable Levels of Service during the peak hours for existing plus ambient growth plus cumulative projects plus project traffic conditions, with improvements. Existing plus ambient growth plus cumulative projects plus project delay worksheets are provided in Appendix C.

D. Site Access

The proposed project will have full access to Orange Street and right turns in/out only access to Bundy Canyon Road.

Appendices

Appendix A – Glossary of Transportation Terms

Appendix B – Traffic Count Worksheets

Appendix C – Explanation and Calculation of Intersection Delay

Appendix D – Average Daily Traffic Volumes "K" Factor Worksheet

Appendix E – Pass-by Trips

APPENDIX A

Glossary of Transportation Terms

GLOSSARY OF TRANSPORTATION TERMS

COMMON ABBREVIATIONS

AC:	Acres
ADT:	Average Daily Traffic
Caltrans:	California Department of Transportation
DU:	Dwelling Unit
ICU:	Intersection Capacity Utilization
LOS:	Level of Service
TSF:	Thousand Square Feet
V/C:	Volume/Capacity
VMT:	Vehicle Miles Traveled

TERMS

AVERAGE DAILY TRAFFIC: The total volume during a year divided by the number of days in a year. Usually only weekdays are included.

BANDWIDTH: The number of seconds of green time available for through traffic in a signal progression.

BOTTLENECK: A constriction along a travelway that limits the amount of traffic that can proceed downstream from its location.

CAPACITY: The maximum number of vehicles that can be reasonably expected to pass over a given section of a lane or a roadway in a given time period.

CHANNELIZATION: The separation or regulation of conflicting traffic movements into definite paths of travel by the use of pavement markings, raised islands, or other suitable means to facilitate the safe and orderly movements of both vehicles and pedestrians.

CLEARANCE INTERVAL: Nearly same as yellow time. If there is an all red interval after the end of a yellow, then that is also added into the clearance interval.

CORDON: An imaginary line around an area across which vehicles, persons, or other items are counted (in and out).

CYCLE LENGTH: The time period in seconds required for one complete signal cycle.

CUL-DE-SAC STREET: A local street open at one end only, and with special provisions for turning around.

DAILY CAPACITY: The daily volume of traffic that will result in a volume during the peak hour equal to the capacity of the roadway.

DELAY: The time consumed while traffic is impeded in its movement by some element over which it has no control, usually expressed in seconds per vehicle.

DEMAND RESPONSIVE SIGNAL: Same as traffic-actuated signal.

DENSITY: The number of vehicles occupying in a unit length of the through traffic lanes of a roadway at any given instant. Usually expressed in vehicles per mile.

DETECTOR: A device that responds to a physical stimulus and transmits a resulting impulse to the signal controller.

DESIGN SPEED: A speed selected for purposes of design. Features of a highway, such as curvature, superelevation, and sight distance (upon which the safe operation of vehicles is dependent) are correlated to design speed.

DIRECTIONAL SPLIT: The percent of traffic in the peak direction at any point in time.

DIVERSION: The rerouting of peak hour traffic to avoid congestion.

FORCED FLOW: Opposite of free flow.

FREE FLOW: Volumes are well below capacity. Vehicles can maneuver freely and travel is unimpeded by other traffic.

GAP: Time or distance between successive vehicles in a traffic stream, rear bumper to front bumper.

HEADWAY: Time or distance spacing between successive vehicles in a traffic stream, front bumper to front bumper.

INTERCONNECTED SIGNAL SYSTEM: A number of intersections that are connected to achieve signal progression.

LEVEL OF SERVICE: A qualitative measure of a number of factors, which include speed and travel time, traffic interruptions, freedom to maneuver, safety, driving comfort and convenience, and operating costs.

LOOP DETECTOR: A vehicle detector consisting of a loop of wire embedded in the roadway, energized by alternating current and producing an output circuit closure when passed over by a vehicle.

MINIMUM ACCEPTABLE GAP: Smallest time headway between successive vehicles in a traffic stream into which another vehicle is willing and able to cross or merge.

MULTI-MODAL: More than one mode; such as automobile, bus transit, rail rapid transit, and bicycle transportation modes.

OFFSET: The time interval in seconds between the beginning of green at one intersection and the beginning of green at an adjacent intersection.

PLATOON: A closely grouped component of traffic that is composed of several vehicles moving, or standing ready to move, with clear spaces ahead and behind.

ORIGIN-DESTINATION SURVEY: A survey to determine the point of origin and the point of destination for a given vehicle trip.

PASSENGER CAR EQUIVALENTS (PCE): One car is one Passenger Car Equivalent. A truck is equal to 2 or 3 Passenger Car Equivalents in that a truck requires longer to start, goes slower, and accelerates slower. Loaded trucks have a higher Passenger Car Equivalent than empty trucks.

PEAK HOUR: The 60 consecutive minutes with the highest number of vehicles.

PRETIMED SIGNAL: A type of traffic signal that directs traffic to stop and go on a predetermined time schedule without regard to traffic conditions. Also, fixed time signal.

PROGRESSION: A term used to describe the progressive movement of traffic through several signalized intersections.

SCREEN-LINE: An imaginary line or physical feature across which all trips are counted, normally to verify the validity of mathematical traffic models.

SIGNAL CYCLE: The time period in seconds required for one complete sequence of signal indications.

SIGNAL PHASE: The part of the signal cycle allocated to one or more traffic movements.

STARTING DELAY: The delay experienced in initiating the movement of queued traffic from a stop to an average running speed through a signalized intersection.

TRAFFIC-ACTUATED SIGNAL: A type of traffic signal that directs traffic to stop and go in accordance with the demands of traffic, as registered by the actuation of detectors.

TRIP: The movement of a person or vehicle from one location (origin) to another (destination). For example, from home to store to home is two trips, not one.

TRIP-END: One end of a trip at either the origin or destination; i.e. each trip has two trip-ends. A trip-end occurs when a person, object, or message is transferred to or from a vehicle.

TRIP GENERATION RATE: The quality of trips produced and/or attracted by a specific land use stated in terms of units such as per dwelling, per acre, and per 1,000 square feet of floor space.

TRUCK: A vehicle having dual tires on one or more axles, or having more than two axles.

UNBALANCED FLOW: Heavier traffic flow in one direction than the other. On a daily basis, most facilities have balanced flow. During the peak hours, flow is seldom balanced in an urban area.

VEHICLE MILES OF TRAVEL: A measure of the amount of usage of a section of highway, obtained by multiplying the average daily traffic by length of facility in miles.

APPENDIX B

Traffic Count Worksheets

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

N-S STREET: Orange St DATE: 02/10/2011 LOCATION: City of Wildomar

E-W STREET: Bundy Canyon Rd DAY: THURSDAY PROJECT# 11-6012-003

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	1	0	1	1	1	2	0	1	1	1	
7:00 AM	0	10	72	35	9	7	4	86	2	109	90	22	446
7:15 AM	2	16	116	60	19	4	10	123	4	96	134	14	598
7:30 AM	5	20	88	68	3	2	3	91	3	37	73	20	413
7:45 AM	2	10	46	44	4	2	3	74	2	28	62	24	301
8:00 AM	1	3	39	48	3	1	2	71	3	14	60	15	260
8:15 AM	1	7	30	21	3	3	1	48	3	20	48	15	200
8:30 AM	1	13	34	43	5	3	4	62	0	18	67	16	266
8:45 AM	4	8	35	43	4	2	5	52	3	13	84	26	279
TOTAL VOLUMES =	NL 16	NT 87	NR 460	SL 362	ST 50	SR 24	EL 32	ET 607	ER 20	WL 335	WT 618	WR 152	TOTAL 2763

AM Peak Hr Begins at: 700 AM

PEAK VOLUMES =	9	56	322	207	35	15	20	374	11	270	359	80	1758
PEAK HR. FACTOR:		0.722			0.774			0.739			0.726		0.735

CONTROL: Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

N-S STREET: Orange St DATE: 02/10/2011 LOCATION: City of Wildomar

E-W STREET: Bundy Canyon Rd DAY: THURSDAY PROJECT# 11-6012-003

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	1	0	1	1	1	2	0	1	1	1	
4:00 PM	2	10	40	36	13	3	7	103	3	57	114	28	416
4:15 PM	4	13	45	37	11	6	2	97	2	47	114	33	411
4:30 PM	8	8	39	50	11	3	6	95	8	46	96	29	399
4:45 PM	3	16	66	36	8	4	4	121	7	54	95	38	452
5:00 PM	1	21	71	44	5	3	0	97	8	69	93	37	449
5:15 PM	6	10	37	44	11	4	6	105	5	38	111	42	419
5:30 PM	3	14	48	46	2	1	5	96	7	51	74	38	385
5:45 PM	4	15	46	29	10	4	8	91	9	67	86	32	401
TOTAL VOLUMES =	NL 31	NT 107	NR 392	SL 322	ST 71	SR 28	EL 38	ET 805	ER 49	WL 429	WT 783	WR 277	TOTAL 3332

PM Peak Hr Begins at: 430 PM

PEAK VOLUMES =	18	55	213	174	35	14	16	418	28	207	395	146	1719
PEAK HR. FACTOR:		0.769			0.871			0.875			0.940		0.951

CONTROL: Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

N-S STREET: I-15 Freeway SB Ramps DATE: 02/10/2011 LOCATION: City of Wildomar

E-W STREET: Bundy Canyon Rd DAY: THURSDAY PROJECT# 11-6012-004

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	0	0	1	0.5	0.5	0	2	0	1	2	0	
7:00 AM				20	1	69		123	73	62	159		507
7:15 AM				40	0	77		171	120	59	161		628
7:30 AM				57	1	27		120	122	95	90		512
7:45 AM				32	1	27		76	83	81	87		387
8:00 AM				38	0	22		75	82	64	66		347
8:15 AM				27	0	18		55	48	80	72		300
8:30 AM				42	0	15		75	69	83	78		362
8:45 AM				35	0	21		83	53	69	95		356
TOTAL VOLUMES =	NL 0	NT 0	NR 0	SL 291	ST 3	SR 276	EL 0	ET 778	ER 650	WL 593	WT 808	WR 0	TOTAL 3399

AM Peak Hr Begins at: 700 AM

PEAK VOLUMES =	0	0	0	149	3	200	0	490	398	297	497	0	2034
PEAK HR. FACTOR:		0.000			0.752			0.763			0.898		0.810

CONTROL: Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

N-S STREET: I-15 Freeway SB Ramps DATE: 02/10/2011 LOCATION: City of Wildomar

E-W STREET: Bundy Canyon Rd DAY: THURSDAY PROJECT# 11-6012-004

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	0	0	1	0.5	0.5	0	2	0	1	2	0	
4:00 PM				81	1	53		106	73	43	145		502
4:15 PM				98	2	58		101	80	39	133		511
4:30 PM				91	0	55		117	71	40	124		498
4:45 PM				85	0	62		134	76	37	133		527
5:00 PM				87	1	56		140	81	30	152		547
5:15 PM				93	0	60		118	62	55	135		523
5:30 PM				85	1	47		128	59	43	128		491
5:45 PM				89	1	50		95	74	31	133		473
TOTAL VOLUMES =	NL 0	NT 0	NR 0	SL 709	ST 6	SR 441	EL 0	ET 939	ER 576	WL 318	WT 1083	WR 0	TOTAL 4072

PM Peak Hr Begins at: 430 PM

PEAK VOLUMES =	0	0	0	356	1	233	0	509	290	162	544	0	2095
PEAK HR. FACTOR:		0.000			0.964			0.904			0.929		0.957

CONTROL: Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

N-S STREET: I-15 Freeway NB Ramps DATE: 02/10/2011 LOCATION: City of Wildomar

E-W STREET: Bundy Canyon Rd DAY: THURSDAY PROJECT# 11-6012-005

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	0.5	0.5	0	0	0	1	2	0	0	2	0	
7:00 AM	77		41				73	74			160	58	483
7:15 AM	64		37				85	128			155	76	545
7:30 AM	50		28				73	109			136	78	474
7:45 AM	38		31				42	65			115	68	359
8:00 AM	36		26				43	71			102	60	338
8:15 AM	37		34				34	64			110	59	338
8:30 AM	47		49				32	70			124	74	396
8:45 AM	58		47				37	70			95	54	361
TOTAL VOLUMES =	NL 407	NT 0	NR 293	SL 0	ST 0	SR 0	EL 419	ET 651	ER 0	WL 0	WT 997	WR 527	TOTAL 3294

AM Peak Hr Begins at: 700 AM

PEAK VOLUMES =	229	0	137	0	0	0	273	376	0	0	566	280	1861
PEAK HR. FACTOR:		0.775			0.000			0.762			0.916		0.854

CONTROL: Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

N-S STREET: I-15 Freeway NB Ramps DATE: 02/10/2011 LOCATION: City of Wildomar

E-W STREET: Bundy Canyon Rd DAY: THURSDAY PROJECT# 11-6012-005

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	0.5	0.5	0	0	0	1	2	0	0	2	0	
4:00 PM	101	0	106				34	155			83	45	524
4:15 PM	96	0	118				32	172			74	35	527
4:30 PM	77	0	131				38	164			90	37	537
4:45 PM	86	0	115				48	179			86	37	551
5:00 PM	92	0	131				38	182			96	34	573
5:15 PM	69	1	136				39	175			124	41	585
5:30 PM	73	0	151				43	175			97	45	584
5:45 PM	86	1	128				29	146			70	20	480
TOTAL VOLUMES =	NL 680	NT 2	NR 1016	SL 0	ST 0	SR 0	EL 301	ET 1348	ER 0	WL 0	WT 720	WR 294	TOTAL 4361

PM Peak Hr Begins at: 445 PM

PEAK VOLUMES =	320	1	533	0	0	0	168	711	0	0	403	157	2293
PEAK HR. FACTOR:		0.953			0.000			0.968			0.848		0.980

CONTROL: Signalized

APPENDIX C

Explanation and Calculation of Intersection Delay

EXPLANATION AND CALCULATION OF INTERSECTION LEVEL OF SERVICE USING DELAY METHODOLOGY

The levels of service at the unsignalized and signalized intersections are calculated using the delay methodology in the 2000 Highway Capacity Manual. This methodology views an intersection as consisting of several lane groups. A lane group is a set of lanes serving a movement. If there are two northbound left turn lanes, then the lane group serving the northbound left turn movement has two lanes. Similarly, there may be three lanes in the lane group serving the northbound through movement, one lane in the lane group serving the northbound right turn movement, and so forth. It is also possible for one lane to serve two lane groups. A shared lane might result in there being 1.5 lanes in the northbound left turn lane group and 2.5 lanes in the northbound through lane group.

For each lane group, there is a capacity. That capacity is calculated by multiplying the number of lanes in the lane group times a theoretical maximum lane capacity per lane times 12 adjustment factors.

Each of the 12 adjustment factors has a value of approximately 1.00. A value less than 1.00 is generally assigned when a less than desirable condition occurs.

The 12 adjustment factors are as follows:

1. Peak hour factor (to account for peaking within the peak hour)
2. Lane utilization factor (to account for not all lanes loading equally)
3. Lane width
4. Percent of heavy trucks
5. Approach grade
6. Parking
7. Bus stops at intersections
8. Area type (CBD or other)
9. Right turns
10. Left turns

11. Pedestrian activity

12. Signal progression

The maximum theoretical lane capacity and the 12 adjustment factors for it are all unknowns for which approximate estimates have been recommended in the 2000 Highway Capacity Manual. For the most part, the recommended values are not based on statistical analysis but rather on educated estimates. However, it is possible to use the delay method and get reasonable results as will be discussed below.

Once the lane group volume is known and the lane group capacity is known, a volume to capacity ratio can be calculated for the lane group.

With a volume to capacity ratio calculated, average delay per vehicle in a lane group can be estimated. The average delay per vehicle in a lane group is calculated using a complex formula provided by the 2000 Highway Capacity Manual, which can be simplified and described as follows:

Delay per vehicle in a lane group is a function of the following:

1. Cycle length

2. Amount of red time faced by a lane group

3. Amount of yellow time for that lane group

4. The volume to capacity ratio of the lane group

The average delay per vehicle for each lane group is calculated, and eventually an overall average delay for all vehicles entering the intersection is calculated. This average delay per vehicle is then used to judge Level of Service. The Level of Services are defined in the table that follows this discussion.

Experience has shown that when a maximum lane capacity of 1,900 vehicles per hour is used (as recommended in the 2000 Highway Capacity Manual), little or no yellow time penalty is used, and none of the 12 penalty factors are applied, calculated delay is realistic. The delay calculation for instance assumes that yellow time is totally unused. Yet experience shows that most of the yellow time is used.

An idiosyncrasy of the delay methodology is that it is possible to add traffic to an intersection and reduce the average total delay per vehicle. If the average total delay is 30 seconds per vehicle for all vehicles traveling through an intersection, and traffic is added to a movement that has an average total delay of 15 seconds per vehicle, then the overall average total delay is reduced.

The delay calculation for a lane group is based on a concept that the delay is a function of the amount of unused capacity available. As the volume approaches capacity and there is no more unused capacity available, then the delay rapidly increases. Delay is not proportional to volume, but rather increases rapidly as the unused capacity approaches zero.

Because delay is not linearly related to volumes, the delay does not reflect how close an intersection is to overloading. If an intersection is operating at Level of Service C and has an average total delay of 18 seconds per vehicle, you know very little as to what percent the traffic can increase before Level of Service is reached.

LEVEL OF SERVICE DESCRIPTION[1]

Level Of Service	Description	Average Total Delay Per Vehicle (Seconds)	
		Signalized	Unsignalized
A	Level of Service A occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.	0 to 10.00	0 to 10.00
B	Level of Service B generally occurs with good progression and/or short cycle lengths. More vehicles stop than for Level of Service A, causing higher levels of average total delay.	10.01 to 20.00	10.01 to 15.00
C	Level of Service C generally results when there is fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear in this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.	20.01 to 35.00	15.01 to 25.00
D	Level of Service D generally results in noticeable congestion. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume to capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	35.01 to 55.00	25.01 to 35.00
E	Level of Service E is considered to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high volume to capacity ratios. Individual cycle failures are frequent occurrences.	55.01 to 80.00	35.01 to 50.00
F	Level of Service F is considered to be unacceptable to most drivers. This condition often occurs with oversaturation, i.e., when arrival flow rates exceed the capacity of the intersection. It may also occur at high volume to capacity ratios below 1.00 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.	80.01 and up	50.01 and up

[1] Source: Highway Capacity Manual Special Report 209, Transportation Research Board, National Research Council, Washington, D.C., 2000.

Existing

Tentative Parcel Map Number 30522
Existing
Morning Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

****

Intersection #1 Orange Street (NS) at Bundy Canyon Road (EW) - #1

****

Cycle (sec): 60 Critical Vol./Cap.(X): 0.689
Loss Time (sec): 12 (Y+R=4.0 sec) Average Delay (sec/veh): 24.5
Optimal Cycle: OPTIMIZED Level Of Service: C

****

Street Name:	Orange Street						Bundy Canyon Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	7	7	7	7	7	7	7	7	7	7	7	7
Lanes:	0 1	0 0	1	0 1	0 0	1	1 0	2 0	1	1 0	1 0	1
Volume Module:												
Base Vol:	9	56	322	207	35	15	20	374	11	270	359	80
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	9	56	322	207	35	15	20	374	11	270	359	80
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.72	0.72	0.72	0.77	0.77	0.77	0.74	0.74	0.74	0.73	0.73	0.73
PHF Volume:	12	78	446	267	45	19	27	506	15	372	494	110
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	12	78	446	267	45	19	27	506	15	372	494	110
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	12	78	446	267	45	19	27	506	15	372	494	110
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.85	0.69	0.69	0.85	0.95	0.95	0.85	0.95	1.00	0.85
Lanes:	0.14	0.86	1.00	0.86	0.14	1.00	1.00	2.00	1.00	1.00	1.00	1.00
Final Sat.:	250	1555	1615	1113	188	1615	1805	3610	1615	1805	1900	1615
Capacity Analysis Module:												
Vol/Sat:	0.05	0.05	0.28	0.24	0.24	0.01	0.01	0.14	0.01	0.21	0.26	0.07
Crit Moves:			****				****				****	
Green/Cycle:	0.35	0.35	0.35	0.35	0.35	0.35	0.12	0.18	0.18	0.27	0.33	0.33
Volume/Cap:	0.14	0.14	0.78	0.68	0.68	0.03	0.13	0.77	0.05	0.77	0.78	0.21
Delay/Veh:	13.4	13.4	24.5	20.8	20.8	12.8	24.0	29.0	20.4	27.9	24.6	14.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	13.4	13.4	24.5	20.8	20.8	12.8	24.0	29.0	20.4	27.9	24.6	14.6
LOS by Move:	B	B	C	C	C	B	C	C	C	C	C	B
HCM2kAvgQ:	1	1	10	6	6	0	1	7	0	9	11	2

****

Note: Queue reported is the number of cars per lane.

****

Tentative Parcel Map Number 30522
Existing
Evening Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

****

Intersection #1 Orange Street (NS) at Bundy Canyon Road (EW) - #1

****

Cycle (sec):	60	Critical Vol./Cap.(X):	0.518
Loss Time (sec):	12 (Y+R=4.0 sec)	Average Delay (sec/veh):	18.2
Optimal Cycle: OPTIMIZED		Level Of Service:	B

****

Street Name:	Orange Street						Bundy Canyon Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	7	7	7	7	7	7	7	7	7	7	7	7
Lanes:	0 1	0 0	1	0 1	0 0	1	1 0	2 0	1	1 0	1 0	1
Volume Module:												
Base Vol:	18	55	213	174	35	14	16	418	28	207	395	146
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	18	55	213	174	35	14	16	418	28	207	395	146
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.77	0.77	0.77	0.87	0.87	0.87	0.88	0.88	0.88	0.94	0.94	0.94
PHF Volume:	23	72	277	200	40	16	18	478	32	220	420	155
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	23	72	277	200	40	16	18	478	32	220	420	155
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	23	72	277	200	40	16	18	478	32	220	420	155
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.91	0.91	0.85	0.69	0.69	0.85	0.95	0.95	0.85	0.95	1.00	0.85
Lanes:	0.25	0.75	1.00	0.83	0.17	1.00	1.00	2.00	1.00	1.00	1.00	1.00
Final Sat.:	424	1297	1615	1091	220	1615	1805	3610	1615	1805	1900	1615
Capacity Analysis Module:												
Vol/Sat:	0.06	0.06	0.17	0.18	0.18	0.01	0.01	0.13	0.02	0.12	0.22	0.10
Crit Moves:					****		****				****	
Green/Cycle:	0.31	0.31	0.31	0.31	0.31	0.31	0.12	0.26	0.26	0.24	0.37	0.37
Volume/Cap:	0.18	0.18	0.55	0.59	0.59	0.03	0.09	0.52	0.08	0.52	0.59	0.26
Delay/Veh:	15.3	15.3	18.6	19.8	19.8	14.5	23.8	19.7	17.1	21.1	16.4	13.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	15.3	15.3	18.6	19.8	19.8	14.5	23.8	19.7	17.1	21.1	16.4	13.2
LOS by Move:	B	B	B	B	B	B	C	B	B	C	B	B
HCM2kAvgQ:	1	1	5	5	5	0	0	5	0	4	7	2

****

Note: Queue reported is the number of cars per lane.

****

Tentative Parcel Map Number 30522
Existing
Morning Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

****

Intersection #4 I-15 Freeway SB Ramps (NS) at Bundy Canyon Road (EW) - #4

****

Cycle (sec): 60 Critical Vol./Cap.(X): 0.818
Loss Time (sec): 12 (Y+R=4.0 sec) Average Delay (sec/veh): 21.7
Optimal Cycle: OPTIMIZED Level Of Service: C

****

Street Name:	I-15 Freeway SB Ramps						Bundy Canyon Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Permitted			Permitted			Permitted			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	7	7	7	0	7	7	7	7	0
Lanes:	0 0 0 0 0			1 0 0 1 0			0 0 1 1 0			1 0 2 0 0		
Volume Module:												
Base Vol:	0	0	0	149	3	200	0	490	398	297	497	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	149	3	200	0	490	398	297	497	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	0.75	0.75	1.00	1.00	0.76	0.76	0.90	0.90	1.00
PHF Volume:	0	0	0	198	4	200	0	642	522	331	553	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	198	4	200	0	642	522	331	553	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	198	4	200	0	642	522	331	553	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.85	0.85	0.85	1.00	0.89	0.89	0.95	0.95	1.00
Lanes:	0.00	0.00	0.00	1.00	0.02	0.98	0.00	1.10	0.90	1.00	2.00	0.00
Final Sat.:	0	0	0	1615	32	1589	0	1859	1510	1805	3610	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.12	0.13	0.13	0.00	0.35	0.35	0.18	0.15	0.00
Crit Moves:					****			****		****		
Green/Cycle:	0.00	0.00	0.00	0.15	0.15	0.15	0.00	0.42	0.42	0.22	0.65	0.00
Volume/Cap:	0.00	0.00	0.00	0.80	0.82	0.82	0.00	0.82	0.82	0.82	0.24	0.00
Delay/Veh:	0.0	0.0	0.0	40.9	43.3	43.3	0.0	19.2	19.2	34.5	4.5	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	40.9	43.3	43.3	0.0	19.2	19.2	34.5	4.5	0.0
LOS by Move:	A	A	A	D	D	D	A	B	B	C	A	A
HCM2kAvgQ:	0	0	0	6	6	6	0	13	13	9	2	0

****

Note: Queue reported is the number of cars per lane.

****

Tentative Parcel Map Number 30522
Existing
Evening Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

****

Intersection #4 I-15 Freeway SB Ramps (NS) at Bundy Canyon Road (EW) - #4

****

Cycle (sec):	60	Critical Vol./Cap.(X):	0.730
Loss Time (sec):	12 (Y+R=4.0 sec)	Average Delay (sec/veh):	18.5
Optimal Cycle: OPTIMIZED		Level Of Service:	B

****

Street Name:	I-15 Freeway SB Ramps						Bundy Canyon Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Permitted			Permitted			Permitted			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	7	7	7	0	7	7	7	7	0
Lanes:	0 0 0 0 0			1 0 0 1 0			0 0 1 1 0			1 0 2 0 0		
Volume Module:												
Base Vol:	0	0	0	356	1	233	0	509	290	162	544	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	356	1	233	0	509	290	162	544	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	0.96	0.96	0.96	1.00	0.90	0.90	0.93	0.93	1.00
PHF Volume:	0	0	0	369	1	242	0	563	321	174	586	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	369	1	242	0	563	321	174	586	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	369	1	242	0	563	321	174	586	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.85	0.85	0.85	1.00	0.90	0.90	0.95	0.95	1.00
Lanes:	0.00	0.00	0.00	1.00	0.01	0.99	0.00	1.27	0.73	1.00	2.00	0.00
Final Sat.:	0	0	0	1615	7	1610	0	2176	1240	1805	3610	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.23	0.15	0.15	0.00	0.26	0.26	0.10	0.16	0.00
Crit Moves:				****				****		****		
Green/Cycle:	0.00	0.00	0.00	0.31	0.31	0.31	0.00	0.35	0.35	0.13	0.49	0.00
Volume/Cap:	0.00	0.00	0.00	0.73	0.48	0.48	0.00	0.73	0.73	0.73	0.33	0.00
Delay/Veh:	0.0	0.0	0.0	23.7	17.4	17.4	0.0	19.2	19.2	35.9	9.5	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	23.7	17.4	17.4	0.0	19.2	19.2	35.9	9.5	0.0
LOS by Move:	A	A	A	C	B	B	A	B	B	D	A	A
HCM2kAvgQ:	0	0	0	8	4	4	0	9	9	5	4	0

****

Note: Queue reported is the number of cars per lane.

****

Tentative Parcel Map Number 30522
Existing
Morning Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

****

Intersection #5 I-15 Freeway NB Ramps (NS) at Bundy Canyon Road (EW) - #5

****

Cycle (sec):	60	Critical Vol./Cap.(X):	0.838
Loss Time (sec):	12 (Y+R=4.0 sec)	Average Delay (sec/veh):	23.8
Optimal Cycle: OPTIMIZED		Level Of Service:	C

****

Street Name:	I-15 Freeway NB Ramps						Bundy Canyon Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Permitted			Permitted			Protected			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	7	7	7	0	0	0	7	7	0	0	7	7
Lanes:	1 0 0	1 0		0 0 0	0 0		1 0 2	0 0		0 0 1	1 0	
Volume Module:												
Base Vol:	229	0	137	0	0	0	273	376	0	0	566	280
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	229	0	137	0	0	0	273	376	0	0	566	280
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.78	0.78	0.78	1.00	1.00	1.00	0.76	0.76	1.00	1.00	0.92	0.92
PHF Volume:	295	0	177	0	0	0	358	493	0	0	618	306
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	295	0	177	0	0	0	358	493	0	0	618	306
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	295	0	177	0	0	0	358	493	0	0	618	306
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.77	1.00	0.85	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.90	0.90
Lanes:	1.00	0.00	1.00	0.00	0.00	0.00	1.00	2.00	0.00	0.00	1.34	0.66
Final Sat.:	1461	0	1615	0	0	0	1805	3610	0	0	2294	1135
Capacity Analysis Module:												
Vol/Sat:	0.20	0.00	0.11	0.00	0.00	0.00	0.20	0.14	0.00	0.00	0.27	0.27
Crit Moves:	****						****				****	
Green/Cycle:	0.24	0.00	0.24	0.00	0.00	0.00	0.24	0.56	0.00	0.00	0.32	0.32
Volume/Cap:	0.84	0.00	0.45	0.00	0.00	0.00	0.84	0.24	0.00	0.00	0.84	0.84
Delay/Veh:	37.6	0.0	20.2	0.0	0.0	0.0	35.3	6.8	0.0	0.0	24.7	24.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	37.6	0.0	20.2	0.0	0.0	0.0	35.3	6.8	0.0	0.0	24.7	24.7
LOS by Move:	D	A	C	A	A	A	D	A	A	A	C	C
HCM2kAvgQ:	8	0	3	0	0	0	9	3	0	0	11	11

****

Note: Queue reported is the number of cars per lane.

****

Tentative Parcel Map Number 30522
Existing
Evening Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

****

Intersection #5 I-15 Freeway NB Ramps (NS) at Bundy Canyon Road (EW) - #5

****

Cycle (sec):	60	Critical Vol./Cap.(X):	0.793
Loss Time (sec):	12 (Y+R=4.0 sec)	Average Delay (sec/veh):	21.3
Optimal Cycle: OPTIMIZED		Level Of Service:	C

****

Street Name:	I-15 Freeway NB Ramps						Bundy Canyon Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Permitted			Permitted			Protected			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	7	7	7	0	0	0	7	7	0	0	7	7
Lanes:	1 0 0	1 0		0 0 0	0 0		1 0 2	0 0		0 0 1	1 0	
Volume Module:												
Base Vol:	320	1	533	0	0	0	168	711	0	0	403	157
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	320	1	533	0	0	0	168	711	0	0	403	157
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	1.00	1.00	1.00	0.97	0.97	1.00	1.00	0.85	0.85
PHF Volume:	336	1	559	0	0	0	174	735	0	0	475	185
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	336	1	559	0	0	0	174	735	0	0	475	185
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	336	1	559	0	0	0	174	735	0	0	475	185
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.85	0.85	0.85	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.91	0.91
Lanes:	1.00	0.01	0.99	0.00	0.00	0.00	1.00	2.00	0.00	0.00	1.44	0.56
Final Sat.:	1615	3	1612	0	0	0	1805	3610	0	0	2489	970
Capacity Analysis Module:												
Vol/Sat:	0.21	0.35	0.35	0.00	0.00	0.00	0.10	0.20	0.00	0.00	0.19	0.19
Crit Moves:		****					****				****	
Green/Cycle:	0.44	0.44	0.44	0.00	0.00	0.00	0.12	0.36	0.00	0.00	0.24	0.24
Volume/Cap:	0.47	0.79	0.79	0.00	0.00	0.00	0.79	0.56	0.00	0.00	0.79	0.79
Delay/Veh:	12.5	20.6	20.6	0.0	0.0	0.0	43.3	15.9	0.0	0.0	26.6	26.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	12.5	20.6	20.6	0.0	0.0	0.0	43.3	15.9	0.0	0.0	26.6	26.6
LOS by Move:	B	C	C	A	A	A	D	B	A	A	C	C
HCM2kAvgQ:	5	11	11	0	0	0	5	6	0	0	8	8

****

Note: Queue reported is the number of cars per lane.

****

Existing Plus Ambient Growth Plus Cumulative Projects

Tentative Parcel Map Number 30522
Existing Plus Ambient Growth Plus Cumulative Projects
Morning Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #1 Orange Street (NS) at Bundy Canyon Road (EW) - #1

Cycle (sec): 65 Critical Vol./Cap.(X): 0.750
Loss Time (sec): 12 (Y+R=4.0 sec) Average Delay (sec/veh): 27.9
Optimal Cycle: OPTIMIZED Level Of Service: C

Street Name:	Orange Street						Bundy Canyon Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	7	7	7	7	7	7	7	7	7	7	7	7
Lanes:	0 1	0 0	1	0 1	0 0	1	1 0	2 0	1	1 0	1 0	1
Volume Module:												
Base Vol:	9	56	322	207	35	15	20	374	11	270	359	80
Growth Adj:	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Initial Bse:	9	58	335	215	36	16	21	389	11	281	373	83
Added Vol:	2	0	0	0	0	1	1	45	2	0	51	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	11	58	335	215	36	17	22	434	13	281	424	83
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.72	0.72	0.72	0.77	0.77	0.77	0.74	0.74	0.74	0.73	0.73	0.73
PHF Volume:	16	81	464	278	47	21	29	587	18	387	585	115
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	16	81	464	278	47	21	29	587	18	387	585	115
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	16	81	464	278	47	21	29	587	18	387	585	115
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.94	0.94	0.85	0.68	0.68	0.85	0.95	0.95	0.85	0.95	1.00	0.85
Lanes:	0.16	0.84	1.00	0.86	0.14	1.00	1.00	2.00	1.00	1.00	1.00	1.00
Final Sat.:	291	1490	1615	1107	187	1615	1805	3610	1615	1805	1900	1615
Capacity Analysis Module:												
Vol/Sat:	0.05	0.05	0.29	0.25	0.25	0.01	0.02	0.16	0.01	0.21	0.31	0.07
Crit Moves:			****				****				****	
Green/Cycle:	0.34	0.34	0.34	0.34	0.34	0.34	0.11	0.20	0.20	0.27	0.37	0.37
Volume/Cap:	0.16	0.16	0.84	0.74	0.74	0.04	0.15	0.80	0.06	0.80	0.84	0.19
Delay/Veh:	15.0	15.0	30.9	25.2	25.2	14.3	26.7	30.6	20.9	31.0	27.9	14.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	15.0	15.0	30.9	25.2	25.2	14.3	26.7	30.6	20.9	31.0	27.9	14.2
LOS by Move:	B	B	C	C	C	B	C	C	C	C	C	B
HCM2kAvgQ:	1	1	12	8	8	0	1	8	0	10	14	2

Note: Queue reported is the number of cars per lane.

Tentative Parcel Map Number 30522
Existing Plus Ambient Growth Plus Cumulative Projects
Evening Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

****

Intersection #1 Orange Street (NS) at Bundy Canyon Road (EW) - #1

****

Cycle (sec):	60	Critical Vol./Cap.(X):	0.594
Loss Time (sec):	12 (Y+R=4.0 sec)	Average Delay (sec/veh):	19.1
Optimal Cycle: OPTIMIZED		Level Of Service:	B

****

Street Name:	Orange Street						Bundy Canyon Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	7	7	7	7	7	7	7	7	7	7	7	7
Lanes:	0 1	0 0	1	0 1	0 0	1	1 0	2 0	1	1 0	1 0	1
Volume Module:												
Base Vol:	18	55	213	174	35	14	16	418	28	207	395	146
Growth Adj:	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Initial Bse:	19	57	222	181	36	15	17	435	29	215	411	152
Added Vol:	4	0	0	0	0	1	1	80	4	0	75	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	23	57	222	181	36	16	18	515	33	215	486	152
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.77	0.77	0.77	0.87	0.87	0.87	0.88	0.88	0.88	0.94	0.94	0.94
PHF Volume:	30	74	288	208	42	18	20	588	38	229	517	162
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	30	74	288	208	42	18	20	588	38	229	517	162
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	30	74	288	208	42	18	20	588	38	229	517	162
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.88	0.88	0.85	0.68	0.68	0.85	0.95	0.95	0.85	0.95	1.00	0.85
Lanes:	0.28	0.72	1.00	0.83	0.17	1.00	1.00	2.00	1.00	1.00	1.00	1.00
Final Sat.:	476	1199	1615	1082	218	1615	1805	3610	1615	1805	1900	1615
Capacity Analysis Module:												
Vol/Sat:	0.06	0.06	0.18	0.19	0.19	0.01	0.01	0.16	0.02	0.13	0.27	0.10
Crit Moves:					****		****				****	
Green/Cycle:	0.28	0.28	0.28	0.28	0.28	0.28	0.12	0.29	0.29	0.23	0.40	0.40
Volume/Cap:	0.22	0.22	0.63	0.68	0.68	0.04	0.10	0.56	0.08	0.56	0.68	0.25
Delay/Veh:	16.7	16.7	21.6	24.2	24.2	15.6	23.9	18.7	15.5	22.3	17.3	12.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	16.7	16.7	21.6	24.2	24.2	15.6	23.9	18.7	15.5	22.3	17.3	12.2
LOS by Move:	B	B	C	C	C	B	C	B	B	C	B	B
HCM2kAvgQ:	2	2	6	6	6	0	0	6	1	5	9	2

****

Note: Queue reported is the number of cars per lane.

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Tentative Parcel Map Number 30522
Existing Plus Ambient Growth Plus Cumulative Projects
Morning Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

****

Intersection #4 I-15 Freeway SB Ramps (NS) at Bundy Canyon Road (EW) - #4

****

Cycle (sec): 75 Critical Vol./Cap.(X): 0.928
Loss Time (sec): 12 (Y+R=4.0 sec) Average Delay (sec/veh): 32.8
Optimal Cycle: OPTIMIZED Level Of Service: C

****

Street Name:	I-15 Freeway SB Ramps						Bundy Canyon Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Permitted			Permitted			Permitted			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	7	7	7	0	7	7	7	7	0
Lanes:	0 0 0 0 0			1 0 0 1 0			0 0 1 1 0			1 0 2 0 0		
Volume Module:												
Base Vol:	0	0	0	149	3	200	0	490	398	297	497	0
Growth Adj:	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Initial Bse:	0	0	0	155	3	208	0	510	414	309	517	0
Added Vol:	0	0	0	57	0	3	0	43	3	62	48	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	212	3	211	0	553	417	371	565	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	0.75	0.75	1.00	1.00	0.76	0.76	0.90	0.90	1.00
PHF Volume:	0	0	0	282	4	211	0	724	546	413	629	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	282	4	211	0	724	546	413	629	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	282	4	211	0	724	546	413	629	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.85	0.85	0.85	1.00	0.89	0.89	0.95	0.95	1.00
Lanes:	0.00	0.00	0.00	1.00	0.02	0.98	0.00	1.14	0.86	1.00	2.00	0.00
Final Sat.:	0	0	0	1615	31	1589	0	1926	1453	1805	3610	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.17	0.13	0.13	0.00	0.38	0.38	0.23	0.17	0.00
Crit Moves:				****				****		****		
Green/Cycle:	0.00	0.00	0.00	0.19	0.19	0.19	0.00	0.41	0.41	0.25	0.65	0.00
Volume/Cap:	0.00	0.00	0.00	0.93	0.71	0.71	0.00	0.93	0.93	0.93	0.27	0.00
Delay/Veh:	0.0	0.0	0.0	63.2	35.9	35.9	0.0	32.4	32.4	53.3	5.6	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	63.2	35.9	35.9	0.0	32.4	32.4	53.3	5.6	0.0
LOS by Move:	A	A	A	E	D	D	A	C	C	D	A	A
HCM2kAvgQ:	0	0	0	10	6	6	0	20	20	14	3	0

****

Note: Queue reported is the number of cars per lane.

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Tentative Parcel Map Number 30522
Existing Plus Ambient Growth Plus Cumulative Projects
Evening Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

****

Intersection #4 I-15 Freeway SB Ramps (NS) at Bundy Canyon Road (EW) - #4

****

Cycle (sec): 70 Critical Vol./Cap.(X): 0.889
Loss Time (sec): 12 (Y+R=4.0 sec) Average Delay (sec/veh): 28.5
Optimal Cycle: OPTIMIZED Level Of Service: C

****

Street Name:	I-15 Freeway SB Ramps						Bundy Canyon Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Permitted			Permitted			Permitted			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	7	7	7	0	7	7	7	7	0
Lanes:	0 0	0 0	0	1 0	0 1	0	0 0	1 1	0	1 0	2 0	0
Volume Module:												
Base Vol:	0	0	0	356	1	233	0	509	290	162	544	0
Growth Adj:	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Initial Bse:	0	0	0	370	1	242	0	529	302	168	566	0
Added Vol:	0	0	0	87	0	5	0	75	5	81	70	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	457	1	247	0	604	307	249	636	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	0.96	0.96	0.96	1.00	0.90	0.90	0.93	0.93	1.00
PHF Volume:	0	0	0	474	1	257	0	669	339	269	684	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	474	1	257	0	669	339	269	684	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	474	1	257	0	669	339	269	684	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.85	0.85	0.85	1.00	0.90	0.90	0.95	0.95	1.00
Lanes:	0.00	0.00	0.00	1.00	0.01	0.99	0.00	1.33	0.67	1.00	2.00	0.00
Final Sat.:	0	0	0	1615	7	1610	0	2273	1153	1805	3610	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.29	0.16	0.16	0.00	0.29	0.29	0.15	0.19	0.00
Crit Moves:				****				****		****		
Green/Cycle:	0.00	0.00	0.00	0.33	0.33	0.33	0.00	0.33	0.33	0.17	0.50	0.00
Volume/Cap:	0.00	0.00	0.00	0.89	0.48	0.48	0.00	0.89	0.89	0.89	0.38	0.00
Delay/Veh:	0.0	0.0	0.0	38.9	19.4	19.4	0.0	31.1	31.1	54.3	11.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	38.9	19.4	19.4	0.0	31.1	31.1	54.3	11.0	0.0
LOS by Move:	A	A	A	D	B	B	A	C	C	D	B	A
HCM2kAvgQ:	0	0	0	14	5	5	0	15	15	9	5	0

****

Note: Queue reported is the number of cars per lane.

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Tentative Parcel Map Number 30522
Existing Plus Ambient Growth Plus Cumulative Projects
Morning Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

****

Intersection #5 I-15 Freeway NB Ramps (NS) at Bundy Canyon Road (EW) - #5

****

Cycle (sec): 70 Critical Vol./Cap.(X): 0.912
Loss Time (sec): 12 (Y+R=4.0 sec) Average Delay (sec/veh): 30.6
Optimal Cycle: OPTIMIZED Level Of Service: C

****

Street Name:	I-15 Freeway NB Ramps						Bundy Canyon Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Permitted			Permitted			Protected			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	7	7	7	0	0	0	7	7	0	0	7	7
Lanes:	1 0	0 1	0	0 0	0 0	0	1 0	2 0	0	0 0	1 1	0
Volume Module:												
Base Vol:	229	0	137	0	0	0	273	376	0	0	566	280
Growth Adj:	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Initial Bse:	238	0	142	0	0	0	284	391	0	0	589	291
Added Vol:	3	0	57	0	0	0	3	97	0	0	108	62
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	241	0	199	0	0	0	287	488	0	0	697	353
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.78	0.78	0.78	1.00	1.00	1.00	0.76	0.76	1.00	1.00	0.92	0.92
PHF Volume:	311	0	257	0	0	0	377	640	0	0	761	386
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	311	0	257	0	0	0	377	640	0	0	761	386
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	311	0	257	0	0	0	377	640	0	0	761	386
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.77	1.00	0.85	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.90	0.90
Lanes:	1.00	0.00	1.00	0.00	0.00	0.00	1.00	2.00	0.00	0.00	1.33	0.67
Final Sat.:	1461	0	1615	0	0	0	1805	3610	0	0	2276	1154
Capacity Analysis Module:												
Vol/Sat:	0.21	0.00	0.16	0.00	0.00	0.00	0.21	0.18	0.00	0.00	0.33	0.33
Crit Moves:	****						****				****	
Green/Cycle:	0.23	0.00	0.23	0.00	0.00	0.00	0.23	0.60	0.00	0.00	0.37	0.37
Volume/Cap:	0.91	0.00	0.68	0.00	0.00	0.00	0.91	0.30	0.00	0.00	0.91	0.91
Delay/Veh:	53.8	0.0	29.5	0.0	0.0	0.0	50.5	7.1	0.0	0.0	31.3	31.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	53.8	0.0	29.5	0.0	0.0	0.0	50.5	7.1	0.0	0.0	31.3	31.3
LOS by Move:	D	A	C	A	A	A	D	A	A	A	C	C
HCM2kAvgQ:	11	0	6	0	0	0	12	4	0	0	17	17

****

Note: Queue reported is the number of cars per lane.

Tentative Parcel Map Number 30522
Existing Plus Ambient Growth Plus Cumulative Projects
Evening Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

****

Intersection #5 I-15 Freeway NB Ramps (NS) at Bundy Canyon Road (EW) - #5

****

Cycle (sec):	80	Critical Vol./Cap.(X):	0.938
Loss Time (sec):	12 (Y+R=4.0 sec)	Average Delay (sec/veh):	34.9
Optimal Cycle: OPTIMIZED		Level Of Service:	C

****

Street Name:	I-15 Freeway NB Ramps						Bundy Canyon Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Permitted			Permitted			Protected			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	7	7	7	0	0	0	7	7	0	0	7	7
Lanes:	1 0 0	1 0		0 0 0	0 0		1 0 2	0 0		0 0 1	1 0	
Volume Module:												
Base Vol:	320	1	533	0	0	0	168	711	0	0	403	157
Growth Adj:	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Initial Bse:	333	1	554	0	0	0	175	739	0	0	419	163
Added Vol:	5	0	87	0	0	0	5	157	0	0	146	81
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	338	1	641	0	0	0	180	896	0	0	565	244
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	1.00	1.00	1.00	0.97	0.97	1.00	1.00	0.85	0.85
PHF Volume:	354	1	673	0	0	0	186	926	0	0	666	288
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	354	1	673	0	0	0	186	926	0	0	666	288
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	354	1	673	0	0	0	186	926	0	0	666	288
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.85	0.85	0.85	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.91	0.91
Lanes:	1.00	0.01	0.99	0.00	0.00	0.00	1.00	2.00	0.00	0.00	1.40	0.60
Final Sat.:	1615	3	1612	0	0	0	1805	3610	0	0	2407	1040
Capacity Analysis Module:												
Vol/Sat:	0.22	0.42	0.42	0.00	0.00	0.00	0.10	0.26	0.00	0.00	0.28	0.28
Crit Moves:		****					****				****	
Green/Cycle:	0.45	0.45	0.45	0.00	0.00	0.00	0.11	0.40	0.00	0.00	0.30	0.30
Volume/Cap:	0.49	0.94	0.94	0.00	0.00	0.00	0.94	0.63	0.00	0.00	0.94	0.94
Delay/Veh:	16.3	41.0	41.0	0.0	0.0	0.0	81.7	20.0	0.0	0.0	43.0	43.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	16.3	41.0	41.0	0.0	0.0	0.0	81.7	20.0	0.0	0.0	43.0	43.0
LOS by Move:	B	D	D	A	A	A	F	B	A	A	D	D
HCM2kAvgQ:	7	21	21	0	0	0	8	10	0	0	17	17

****

Note: Queue reported is the number of cars per lane.

Existing Plus Ambient Growth Plus Cumulative Projects Plus Project

Tentative Parcel Map Number 30522
Existing Plus Ambient Growth Plus Cumulative Projects Plus Project
Morning Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #1 Orange Street (NS) at Bundy Canyon Road (EW) - #1

Cycle (sec):	75	Critical Vol./Cap.(X):	0.889
Loss Time (sec):	12 (Y+R=4.0 sec)	Average Delay (sec/veh):	35.0
Optimal Cycle: OPTIMIZED		Level Of Service:	C

Street Name:	Orange Street						Bundy Canyon Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	7	7	7	7	7	7	7	7	7	7	7	7
Lanes:	0 1	0 0	1	0 1	0 0	1	1 0	2 0	1	1 0	1 0	1
Volume Module:												
Base Vol:	9	56	322	207	35	15	20	374	11	270	359	80
Growth Adj:	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Initial Bse:	9	58	335	215	36	16	21	389	11	281	373	83
Added Vol:	30	7	0	0	7	1	1	74	2	94	51	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	39	65	335	215	43	17	22	463	13	375	424	83
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.72	0.72	0.72	0.77	0.77	0.77	0.74	0.74	0.74	0.73	0.73	0.73
PHF Volume:	55	90	464	278	56	21	29	626	18	516	585	115
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	55	90	464	278	56	21	29	626	18	516	585	115
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	55	90	464	278	56	21	29	626	18	516	585	115
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.72	0.72	0.85	0.65	0.65	0.85	0.95	0.95	0.85	0.95	1.00	0.85
Lanes:	0.38	0.62	1.00	0.83	0.17	1.00	1.00	2.00	1.00	1.00	1.00	1.00
Final Sat.:	513	851	1615	1026	207	1615	1805	3610	1615	1805	1900	1615
Capacity Analysis Module:												
Vol/Sat:	0.11	0.11	0.29	0.27	0.27	0.01	0.02	0.17	0.01	0.29	0.31	0.07
Crit Moves:			****					****		****		
Green/Cycle:	0.32	0.32	0.32	0.32	0.32	0.32	0.12	0.20	0.20	0.32	0.40	0.40
Volume/Cap:	0.33	0.33	0.89	0.84	0.84	0.04	0.14	0.89	0.06	0.89	0.78	0.18
Delay/Veh:	19.7	19.7	41.1	38.1	38.1	17.4	29.8	42.7	24.6	39.7	24.8	14.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	19.7	19.7	41.1	38.1	38.1	17.4	29.8	42.7	24.6	39.7	24.8	14.8
LOS by Move:	B	B	D	D	D	B	C	D	C	D	C	B
HCM2kAvgQ:	3	3	14	10	10	0	1	11	0	15	14	2

Note: Queue reported is the number of cars per lane.

Tentative Parcel Map Number 30522
Existing Plus Ambient Growth Plus Cumulative Projects Plus Project
Evening Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #1 Orange Street (NS) at Bundy Canyon Road (EW) - #1

Cycle (sec): 60 Critical Vol./Cap.(X): 0.609
Loss Time (sec): 12 (Y+R=4.0 sec) Average Delay (sec/veh): 20.8
Optimal Cycle: OPTIMIZED Level Of Service: C

Street Name:	Orange Street						Bundy Canyon Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	7	7	7	7	7	7	7	7	7	7	7	7
Lanes:	0 1	0 0 1		0 1	0 0 1		1 0	2 0 1		1 0	1 0 1	
Volume Module:												
Base Vol:	18	55	213	174	35	14	16	418	28	207	395	146
Growth Adj:	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Initial Bse:	19	57	222	181	36	15	17	435	29	215	411	152
Added Vol:	31	7	0	0	7	1	1	107	4	90	75	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	50	64	222	181	43	16	18	542	33	305	486	152
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.77	0.77	0.77	0.87	0.87	0.87	0.88	0.88	0.88	0.94	0.94	0.94
PHF Volume:	65	83	288	208	50	18	20	619	38	325	517	162
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	65	83	288	208	50	18	20	619	38	325	517	162
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	65	83	288	208	50	18	20	619	38	325	517	162
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.77	0.77	0.85	0.67	0.67	0.85	0.95	0.95	0.85	0.95	1.00	0.85
Lanes:	0.44	0.56	1.00	0.81	0.19	1.00	1.00	2.00	1.00	1.00	1.00	1.00
Final Sat.:	641	828	1615	1019	244	1615	1805	3610	1615	1805	1900	1615
Capacity Analysis Module:												
Vol/Sat:	0.10	0.10	0.18	0.20	0.20	0.01	0.01	0.17	0.02	0.18	0.27	0.10
Crit Moves:					****		****				****	
Green/Cycle:	0.29	0.29	0.29	0.29	0.29	0.29	0.12	0.25	0.25	0.26	0.39	0.39
Volume/Cap:	0.34	0.34	0.61	0.70	0.70	0.04	0.10	0.69	0.09	0.69	0.70	0.26
Delay/Veh:	17.2	17.2	20.6	24.6	24.6	15.2	23.9	22.9	17.5	24.5	18.2	12.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	17.2	17.2	20.6	24.6	24.6	15.2	23.9	22.9	17.5	24.5	18.2	12.6
LOS by Move:	B	B	C	C	C	B	C	C	B	C	B	B
HCM2kAvgQ:	2	2	6	6	6	0	0	7	1	7	9	2

Note: Queue reported is the number of cars per lane.

Tentative Parcel Map Number 30522
Existing Plus Ambient Growth Plus Cumulative Projects Plus Project
Morning Peak Hour - With Improvements

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #2 Orange Street (NS) at Project Access (EW) - #2

Average Delay (sec/veh): 1.7 Worst Case Level Of Service: B[14.2]

Street Name:	Orange Street									Project Access								
Approach:	North Bound					South Bound				East Bound					West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Rights:	Include					Include					Include					Include				
Lanes:	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1!	0	0
Volume Module:																				
Base Vol:	0	387		0		0	316		0		0		0		0	0		0		0
Growth Adj:	1.04	1.04		1.04		1.04	1.04		1.04		1.04		1.04		1.04	1.04		1.04		1.04
Initial Bse:	0	402		0		0	329		0		0		0		0	0		0		0
Added Vol:	0	2		14		101	2		0		0		0		0	14		0		35
PasserByVol:	0	0		0		0	0		0		0		0		0	0		0		0
Initial Fut:	0	404		14		101	331		0		0		0		0	14		0		35
User Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00	1.00		1.00		1.00
PHF Adj:	0.95	0.95		0.95		0.95	0.95		0.95		0.95		0.95		0.95	0.95		0.95		0.95
PHF Volume:	0	426		15		106	348		0		0		0		0	15		0		37
Reduct Vol:	0	0		0		0	0		0		0		0		0	0		0		0
FinalVolume:	0	426		15		106	348		0		0		0		0	15		0		37
Critical Gap Module:																				
Critical Gp:	xxxxx	xxxx		xxxxx		4.1	xxxx		xxxxx		xxxxx		xxxx		xxxxx	6.4		6.5		6.2
FollowUpTim:	xxxxx	xxxx		xxxxx		2.2	xxxx		xxxxx		xxxxx		xxxx		xxxxx	3.5		4.0		3.3
Capacity Module:																				
Cnflict Vol:	xxxx	xxxx		xxxxx		441	xxxx		xxxxx		xxxx		xxxx		xxxxx	994		994		433
Potent Cap.:	xxxx	xxxx		xxxxx		1130	xxxx		xxxxx		xxxx		xxxx		xxxxx	274		247		627
Move Cap.:	xxxx	xxxx		xxxxx		1130	xxxx		xxxxx		xxxx		xxxx		xxxxx	253		222		627
Volume/Cap:	xxxx	xxxx		xxxx		0.09	xxxx		xxxx		xxxx		xxxx		xxxx	0.06		0.00		0.06
Level Of Service Module:																				
2Way95thQ:	xxxx	xxxx		xxxxx		0.3	xxxx		xxxxx		xxxx		xxxx		xxxxx	xxxx		xxxx		xxxxx
Control Del:	xxxxx	xxxx		xxxxx		8.5	xxxx		xxxxx		xxxxx		xxxx		xxxxx	xxxxx		xxxx		xxxxx
LOS by Move:	*	*		*		A	*		*		*		*		*	*		*		*
Movement:	LT	-	LTR	-	RT	LT	-	LTR	-	RT	LT	-	LTR	-	RT	LT	-	LTR	-	RT
Shared Cap.:	xxxx	xxxx		xxxxx		xxxx	xxxx		xxxxx		xxxx		xxxx		xxxxx	xxxx		441		xxxxx
SharedQueue:	xxxxx	xxxx		xxxxx		0.3	xxxx		xxxxx		xxxxx		xxxx		xxxxx	xxxxx		0.4		xxxxx
Shrd ConDel:	xxxxx	xxxx		xxxxx		8.5	xxxx		xxxxx		xxxxx		xxxx		xxxxx	xxxxx		14.2		xxxxx
Shared LOS:	*	*		*		A	*		*		*		*		*	*		B		*
ApproachDel:	xxxxxx					xxxxxx					xxxxxx							14.2		
ApproachLOS:	*					*					*							B		

Note: Queue reported is the number of cars per lane.

Tentative Parcel Map Number 30522
Existing Plus Ambient Growth Plus Cumulative Projects Plus Project
Evening Peak Hour - With Improvements

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

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Intersection #2 Orange Street (NS) at Project Access (EW) - #2

****

Average Delay (sec/veh): 1.8 Worst Case Level Of Service: B[12.4]

****

Street Name:	Orange Street									Project Access								
Approach:	North Bound					South Bound				East Bound					West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Rights:	Include					Include					Include					Include				
Lanes:	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1!	0	0
Volume Module:																				
Base Vol:	0	286		0		0	270		0		0		0		0	0		0		0
Growth Adj:	1.04	1.04		1.04		1.04	1.04		1.04		1.04		1.04		1.04	1.04		1.04		1.04
Initial Bse:	0	297		0		0	281		0		0		0		0	0		0		0
Added Vol:	0	4		14		97	4		0		0		0		0	13		0		33
PasserByVol:	0	0		0		0	0		0		0		0		0	0		0		0
Initial Fut:	0	301		14		97	285		0		0		0		0	13		0		33
User Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00	1.00		1.00		1.00
PHF Adj:	0.95	0.95		0.95		0.95	0.95		0.95		0.95		0.95		0.95	0.95		0.95		0.95
PHF Volume:	0	317		15		102	300		0		0		0		0	14		0		35
Reduct Vol:	0	0		0		0	0		0		0		0		0	0		0		0
FinalVolume:	0	317		15		102	300		0		0		0		0	14		0		35
Critical Gap Module:																				
Critical Gp:	xxxxx	xxxx		xxxxx		4.1	xxxx		xxxxx		xxxxx		xxxx		xxxxx	6.4		6.5		6.2
FollowUpTim:	xxxxx	xxxx		xxxxx		2.2	xxxx		xxxxx		xxxxx		xxxx		xxxxx	3.5		4.0		3.3
Capacity Module:																				
Cnflict Vol:	xxxx	xxxx		xxxxx		332	xxxx		xxxxx		xxxx		xxxx		xxxxx	829		829		325
Potent Cap.:	xxxx	xxxx		xxxxx		1239	xxxx		xxxxx		xxxx		xxxx		xxxxx	343		308		721
Move Cap.:	xxxx	xxxx		xxxxx		1239	xxxx		xxxxx		xxxx		xxxx		xxxxx	320		281		721
Volume/Cap:	xxxx	xxxx		xxxx		0.08	xxxx		xxxx		xxxx		xxxx		xxxx	0.04		0.00		0.05
Level Of Service Module:																				
2Way95thQ:	xxxx	xxxx		xxxxx		0.3	xxxx		xxxxx		xxxx		xxxx		xxxxx	xxxx		xxxx		xxxxx
Control Del:	xxxxx	xxxx		xxxxx		8.2	xxxx		xxxxx		xxxxx		xxxx		xxxxx	xxxxx		xxxx		xxxxx
LOS by Move:	*	*		*		A	*		*		*		*		*	*		*		*
Movement:	LT	-	LTR	-	RT	LT	-	LTR	-	RT	LT	-	LTR	-	RT	LT	-	LTR	-	RT
Shared Cap.:	xxxx	xxxx		xxxxx		xxxx	xxxx		xxxxx		xxxx		xxxx		xxxxx	xxxx		533		xxxxx
SharedQueue:	xxxxx	xxxx		xxxxx		0.3	xxxx		xxxxx		xxxxx		xxxx		xxxxx	xxxxx		0.3		xxxxx
Shrd ConDel:	xxxxx	xxxx		xxxxx		8.2	xxxx		xxxxx		xxxxx		xxxx		xxxxx	xxxxx		12.4		xxxxx
Shared LOS:	*	*		*		A	*		*		*		*		*	*		B		*
ApproachDel:	xxxxxx					xxxxxx					xxxxxx							12.4		
ApproachLOS:	*					*					*							B		

****

Note: Queue reported is the number of cars per lane.

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Tentative Parcel Map Number 30522
Existing Plus Ambient Growth Plus Cumulative Projects Plus Project
Morning Peak Hour - With Improvements

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

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Intersection #3 Project Access (NS) at Bundy Canyon Road (EW) - #3

****

Average Delay (sec/veh): 0.6 Worst Case Level Of Service: B[14.0]

****

Street Name:	Project Access									Bundy Canyon Road				
Approach:	North Bound					South Bound				East Bound					West Bound				
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Stop Sign					Stop Sign					Uncontrolled					Uncontrolled				
Rights:	Include					Include					Include					Include				
Lanes:	0	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	0	2	0	0
Volume Module:																				
Base Vol:	0	0	0	0	0	0	0	0	0	0	903	0	0	709	0					
Growth Adj:	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04					
Initial Bse:	0	0	0	0	0	0	0	939	0	0	737	0								
Added Vol:	0	0	91	0	0	0	0	45	29	0	144	0								
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0								
Initial Fut:	0	0	91	0	0	0	0	984	29	0	881	0								
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00								
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95								
PHF Volume:	0	0	96	0	0	0	0	1036	31	0	928	0								
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0								
FinalVolume:	0	0	96	0	0	0	0	1036	31	0	928	0								
Critical Gap Module:																				
Critical Gp:	xxxxx	xxxx	6.9	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx								
FollowUpTim:	xxxxx	xxxx	3.3	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx								
Capacity Module:																				
Cnflict Vol:	xxxx	xxxx	533	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx								
Potent Cap.:	xxxx	xxxx	496	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx								
Move Cap.:	xxxx	xxxx	496	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx								
Volume/Cap:	xxxx	xxxx	0.19	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx								
Level Of Service Module:																				
2Way95thQ:	xxxx	xxxx	0.7	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx								
Control Del:	xxxxx	xxxx	14.0	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx								
LOS by Move:	*	*	B	*	*	*	*	*	*	*	*	*								
Movement:	LT	-	LTR	-	RT	LT	-	LTR	-	RT	LT	-	LTR	-	RT	LT	-	LTR	-	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx								
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx								
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx								
Shared LOS:	*	*	*	*	*	*	*	*	*	*	*	*								
ApproachDel:	14.0			xxxxxx			xxxxxx			xxxxxx										
ApproachLOS:	B			*			*			*										

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Note: Queue reported is the number of cars per lane.

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Tentative Parcel Map Number 30522
Existing Plus Ambient Growth Plus Cumulative Projects Plus Project
Evening Peak Hour - With Improvements

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

****

Intersection #3 Project Access (NS) at Bundy Canyon Road (EW) - #3

****

Average Delay (sec/veh): 0.6 Worst Case Level Of Service: B[13.3]

****

Street Name:	Project Access									Bundy Canyon Road								
Approach:	North Bound					South Bound				East Bound					West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Stop Sign					Stop Sign					Uncontrolled					Uncontrolled				
Rights:	Include					Include					Include					Include				
Lanes:	0	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	0	2	0	0
Volume Module:																				
Base Vol:	0		0		0	0		0		0	0		805		0	0		777		0
Growth Adj:	1.04		1.04		1.04	1.04		1.04		1.04	1.04		1.04		1.04	1.04		1.04		1.04
Initial Bse:	0		0		0	0		0		0	0		837		0	0		808		0
Added Vol:	0		0		86	0		0		0	0		80		28	0		165		0
PasserByVol:	0		0		0	0		0		0	0		0		0	0		0		0
Initial Fut:	0		0		86	0		0		0	0		917		28	0		973		0
User Adj:	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00
PHF Adj:	0.95		0.95		0.95	0.95		0.95		0.95	0.95		0.95		0.95	0.95		0.95		0.95
PHF Volume:	0		0		91	0		0		0	0		965		29	0		1024		0
Reduct Vol:	0		0		0	0		0		0	0		0		0	0		0		0
FinalVolume:	0		0		91	0		0		0	0		965		29	0		1024		0
Critical Gap Module:																				
Critical Gp:	xxxxx		xxxx		6.9	xxxxx		xxxx		xxxxx	xxxxx		xxxx		xxxxx	xxxxx		xxxx		xxxxx
FollowUpTim:	xxxxx		xxxx		3.3	xxxxx		xxxx		xxxxx	xxxxx		xxxx		xxxxx	xxxxx		xxxx		xxxxx
Capacity Module:																				
Cnflict Vol:	xxxx		xxxx		497	xxxx		xxxx		xxxxx	xxxx		xxxx		xxxxx	xxxx		xxxx		xxxxx
Potent Cap.:	xxxx		xxxx		524	xxxx		xxxx		xxxxx	xxxx		xxxx		xxxxx	xxxx		xxxx		xxxxx
Move Cap.:	xxxx		xxxx		524	xxxx		xxxx		xxxxx	xxxx		xxxx		xxxxx	xxxx		xxxx		xxxxx
Volume/Cap:	xxxx		xxxx		0.17	xxxx		xxxx		xxxx	xxxx		xxxx		xxxx	xxxx		xxxx		xxxx
Level Of Service Module:																				
2Way95thQ:	xxxx		xxxx		0.6	xxxx		xxxx		xxxxx	xxxx		xxxx		xxxxx	xxxx		xxxx		xxxxx
Control Del:	xxxxx		xxxx		13.3	xxxxx		xxxx		xxxxx	xxxxx		xxxx		xxxxx	xxxxx		xxxx		xxxxx
LOS by Move:	*		*		B	*		*		*	*		*		*	*		*		*
Movement:	LT	-	LTR	-	RT	LT	-	LTR	-	RT	LT	-	LTR	-	RT	LT	-	LTR	-	RT
Shared Cap.:	xxxx		xxxx		xxxxx	xxxx		xxxx		xxxxx	xxxx		xxxx		xxxxx	xxxx		xxxx		xxxxx
SharedQueue:	xxxxx		xxxx		xxxxx	xxxxx		xxxx		xxxxx	xxxxx		xxxx		xxxxx	xxxxx		xxxx		xxxxx
Shrd ConDel:	xxxxx		xxxx		xxxxx	xxxxx		xxxx		xxxxx	xxxxx		xxxx		xxxxx	xxxxx		xxxx		xxxxx
Shared LOS:	*		*		*	*		*		*	*		*		*	*		*		*
ApproachDel:			13.3					xxxxxx					xxxxxx					xxxxxx		
ApproachLOS:			B					*					*					*		

****

Note: Queue reported is the number of cars per lane.

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Tentative Parcel Map Number 30522
Existing Plus Ambient Growth Plus Cumulative Projects Plus Project
Morning Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

****

Intersection #4 I-15 Freeway SB Ramps (NS) at Bundy Canyon Road (EW) - #4

****

Cycle (sec): 85 Critical Vol./Cap.(X): 0.926
Loss Time (sec): 12 (Y+R=4.0 sec) Average Delay (sec/veh): 34.5
Optimal Cycle: OPTIMIZED Level Of Service: C

****

Street Name:	I-15 Freeway SB Ramps						Bundy Canyon Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Permitted			Permitted			Permitted			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	7	7	7	0	7	7	7	7	0
Lanes:	0 0 0 0 0			1 0 0 1 0			0 0 1 1 0			1 0 2 0 0		
Volume Module:												
Base Vol:	0	0	0	149	3	200	0	490	398	297	497	0
Growth Adj:	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Initial Bse:	0	0	0	155	3	208	0	510	414	309	517	0
Added Vol:	0	0	0	57	0	19	0	68	18	62	74	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	212	3	227	0	578	432	371	591	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	0.75	0.75	1.00	1.00	0.76	0.76	0.90	0.90	1.00
PHF Volume:	0	0	0	282	4	227	0	757	566	413	658	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	282	4	227	0	757	566	413	658	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	282	4	227	0	757	566	413	658	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.85	0.85	0.85	1.00	0.89	0.89	0.95	0.95	1.00
Lanes:	0.00	0.00	0.00	1.00	0.02	0.98	0.00	1.14	0.86	1.00	2.00	0.00
Final Sat.:	0	0	0	1615	29	1592	0	1933	1446	1805	3610	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.17	0.14	0.14	0.00	0.39	0.39	0.23	0.18	0.00
Crit Moves:				****				****		****		
Green/Cycle:	0.00	0.00	0.00	0.19	0.19	0.19	0.00	0.42	0.42	0.25	0.67	0.00
Volume/Cap:	0.00	0.00	0.00	0.93	0.76	0.76	0.00	0.93	0.93	0.93	0.27	0.00
Delay/Veh:	0.0	0.0	0.0	66.6	43.0	43.0	0.0	33.7	33.7	56.5	5.7	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	66.6	43.0	43.0	0.0	33.7	33.7	56.5	5.7	0.0
LOS by Move:	A	A	A	E	D	D	A	C	C	E	A	A
HCM2kAvgQ:	0	0	0	11	8	8	0	22	22	15	4	0

****

Note: Queue reported is the number of cars per lane.

Tentative Parcel Map Number 30522
Existing Plus Ambient Growth Plus Cumulative Projects Plus Project
Evening Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

****

Intersection #4 I-15 Freeway SB Ramps (NS) at Bundy Canyon Road (EW) - #4

****

Cycle (sec): 70 Critical Vol./Cap.(X): 0.904
Loss Time (sec): 12 (Y+R=4.0 sec) Average Delay (sec/veh): 29.6
Optimal Cycle: OPTIMIZED Level Of Service: C

****

Street Name:	I-15 Freeway SB Ramps						Bundy Canyon Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Permitted			Permitted			Permitted			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	7	7	7	0	7	7	7	7	0
Lanes:	0 0 0 0 0			1 0 0 1 0			0 0 1 1 0			1 0 2 0 0		
Volume Module:												
Base Vol:	0	0	0	356	1	233	0	509	290	162	544	0
Growth Adj:	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Initial Bse:	0	0	0	370	1	242	0	529	302	168	566	0
Added Vol:	0	0	0	87	0	21	0	99	20	81	96	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	457	1	263	0	628	322	249	662	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	0.96	0.96	0.96	1.00	0.90	0.90	0.93	0.93	1.00
PHF Volume:	0	0	0	474	1	273	0	695	356	269	712	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	474	1	273	0	695	356	269	712	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	474	1	273	0	695	356	269	712	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.85	0.85	0.85	1.00	0.90	0.90	0.95	0.95	1.00
Lanes:	0.00	0.00	0.00	1.00	0.01	0.99	0.00	1.32	0.68	1.00	2.00	0.00
Final Sat.:	0	0	0	1615	6	1611	0	2266	1160	1805	3610	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.29	0.17	0.17	0.00	0.31	0.31	0.15	0.20	0.00
Crit Moves:				****				****		****		
Green/Cycle:	0.00	0.00	0.00	0.32	0.32	0.32	0.00	0.34	0.34	0.16	0.50	0.00
Volume/Cap:	0.00	0.00	0.00	0.90	0.52	0.52	0.00	0.90	0.90	0.90	0.39	0.00
Delay/Veh:	0.0	0.0	0.0	41.6	20.2	20.2	0.0	32.1	32.1	57.7	10.9	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	41.6	20.2	20.2	0.0	32.1	32.1	57.7	10.9	0.0
LOS by Move:	A	A	A	D	C	C	A	C	C	E	B	A
HCM2kAvgQ:	0	0	0	14	5	5	0	16	16	9	5	0

****

Note: Queue reported is the number of cars per lane.

Tentative Parcel Map Number 30522
Existing Plus Ambient Growth Plus Cumulative Projects Plus Project
Morning Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

****

Intersection #5 I-15 Freeway NB Ramps (NS) at Bundy Canyon Road (EW) - #5

****

Cycle (sec): 80 Critical Vol./Cap.(X): 0.922
Loss Time (sec): 12 (Y+R=4.0 sec) Average Delay (sec/veh): 34.0
Optimal Cycle: OPTIMIZED Level Of Service: C

****

Street Name:	I-15 Freeway NB Ramps						Bundy Canyon Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Permitted			Permitted			Protected			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	7	7	7	0	0	0	7	7	0	0	7	7
Lanes:	1 0	0 1	0	0 0	0 0	0	1 0	2 0	0	0 0	1 1	0
Volume Module:												
Base Vol:	229	0	137	0	0	0	273	376	0	0	566	280
Growth Adj:	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Initial Bse:	238	0	142	0	0	0	284	391	0	0	589	291
Added Vol:	19	0	57	0	0	0	18	107	0	0	117	62
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	257	0	199	0	0	0	302	498	0	0	706	353
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.78	0.78	0.78	1.00	1.00	1.00	0.76	0.76	1.00	1.00	0.92	0.92
PHF Volume:	332	0	257	0	0	0	396	654	0	0	770	386
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	332	0	257	0	0	0	396	654	0	0	770	386
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	332	0	257	0	0	0	396	654	0	0	770	386
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.77	1.00	0.85	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.90	0.90
Lanes:	1.00	0.00	1.00	0.00	0.00	0.00	1.00	2.00	0.00	0.00	1.33	0.67
Final Sat.:	1461	0	1615	0	0	0	1805	3610	0	0	2286	1144
Capacity Analysis Module:												
Vol/Sat:	0.23	0.00	0.16	0.00	0.00	0.00	0.22	0.18	0.00	0.00	0.34	0.34
Crit Moves:	****						****				****	
Green/Cycle:	0.25	0.00	0.25	0.00	0.00	0.00	0.24	0.60	0.00	0.00	0.37	0.37
Volume/Cap:	0.92	0.00	0.65	0.00	0.00	0.00	0.92	0.30	0.00	0.00	0.92	0.92
Delay/Veh:	57.9	0.0	30.7	0.0	0.0	0.0	55.0	7.7	0.0	0.0	35.5	35.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	57.9	0.0	30.7	0.0	0.0	0.0	55.0	7.7	0.0	0.0	35.5	35.5
LOS by Move:	E	A	C	A	A	A	D	A	A	A	D	D
HCM2kAvgQ:	12	0	7	0	0	0	14	4	0	0	19	19

****

Note: Queue reported is the number of cars per lane.

Tentative Parcel Map Number 30522
Existing Plus Ambient Growth Plus Cumulative Projects Plus Project
Evening Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

****

Intersection #5 I-15 Freeway NB Ramps (NS) at Bundy Canyon Road (EW) - #5

****

Cycle (sec): 85 Critical Vol./Cap.(X): 0.942
Loss Time (sec): 12 (Y+R=4.0 sec) Average Delay (sec/veh): 36.5
Optimal Cycle: OPTIMIZED Level Of Service: D

****

Street Name:	I-15 Freeway NB Ramps						Bundy Canyon Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Permitted			Permitted			Protected			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	7	7	7	0	0	0	7	7	0	0	7	7
Lanes:	1 0 0	1 0		0 0 0	0 0		1 0 2	0 0		0 0 1	1 0	
Volume Module:												
Base Vol:	320	1	533	0	0	0	168	711	0	0	403	157
Growth Adj:	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Initial Bse:	333	1	554	0	0	0	175	739	0	0	419	163
Added Vol:	21	0	87	0	0	0	20	166	0	0	155	81
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	354	1	641	0	0	0	195	905	0	0	574	244
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	1.00	1.00	1.00	0.97	0.97	1.00	1.00	0.85	0.85
PHF Volume:	371	1	673	0	0	0	201	935	0	0	677	288
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	371	1	673	0	0	0	201	935	0	0	677	288
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	371	1	673	0	0	0	201	935	0	0	677	288
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.85	0.85	0.85	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.91	0.91
Lanes:	1.00	0.01	0.99	0.00	0.00	0.00	1.00	2.00	0.00	0.00	1.40	0.60
Final Sat.:	1615	3	1612	0	0	0	1805	3610	0	0	2419	1029
Capacity Analysis Module:												
Vol/Sat:	0.23	0.42	0.42	0.00	0.00	0.00	0.11	0.26	0.00	0.00	0.28	0.28
Crit Moves:		****					****				****	
Green/Cycle:	0.44	0.44	0.44	0.00	0.00	0.00	0.12	0.42	0.00	0.00	0.30	0.30
Volume/Cap:	0.52	0.94	0.94	0.00	0.00	0.00	0.94	0.62	0.00	0.00	0.94	0.94
Delay/Veh:	17.8	43.2	43.2	0.0	0.0	0.0	82.6	20.4	0.0	0.0	45.1	45.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	17.8	43.2	43.2	0.0	0.0	0.0	82.6	20.4	0.0	0.0	45.1	45.1
LOS by Move:	B	D	D	A	A	A	F	C	A	A	D	D
HCM2kAvgQ:	7	22	22	0	0	0	9	11	0	0	18	18

****

Note: Queue reported is the number of cars per lane.

Traffix 7.9.0215 (c) 2008 Dowling Assoc. Licensed to KUNZMAN ASSOC, ORANGE CA

APPENDIX D

Average Daily Traffic Volumes
"K" Factor Worksheet

"K" Factor Average

Count Location	Calculated "K" Factor
Orange Street	
South of Bundy Canyon Road	8.7%
Bundy Canyon Road	
West of Angeles Lane	8.5%
East of Angeles Lane	8.6%
Total	25.8%
Average	8.6%

Average Daily Traffic "K" Factor
11.6

Prepared by NDS/ATD

Volumes for: Thursday, February 10, 2011	City:	Wildomar	Daily Totals NB	SB	EB	WB	Total
Location: Orange St S/o Bundy Canyon Rd	Project:	11-6013-003	3,416	3,052	0	0	6,468

AM Period	NB		SB		EB	WB		PM Period	NB		SB		EB	WB	
00:00	5		11					12:00	44		40				
00:15	5		2					12:15	44		36				
00:30	2		3					12:30	39		43				
00:45	2	14	3	19			33	12:45	42	169	32	151			320
01:00	0		2					13:00	56		40				
01:15	2		0					13:15	38		50				
01:30	1		1					13:30	65		49				
01:45	3	6	2	5			11	13:45	57	216	36	175			391
02:00	3		2					14:00	48		60				
02:15	1		4					14:15	56		97				
02:30	4		0					14:30	123		82				
02:45	3	11	1	7			18	14:45	111	338	88	327			665
03:00	3		2					15:00	55		78				
03:15	4		3					15:15	66		76				
03:30	7		1					15:30	62		79				
03:45	3	17	4	10			27	15:45	50	233	68	301			534
04:00	5		1					16:00	56		74				
04:15	10		2					16:15	59		59				
04:30	17		2					16:30	57		64				
04:45	19	51	9	14			65	16:45	88	260	68	265			525
05:00	15		5					17:00	89		80				
05:15	21		2					17:15	56		56				
05:30	27		5					17:30	64		60				
05:45	26	89	10	22			111	17:45	62	271	89	285			556
06:00	22		17					18:00	52		63				
06:15	48		38					18:15	36		64				
06:30	44		34					18:30	40		58				
06:45	46	160	44	133			293	18:45	56	184	31	216			400
07:00	92		120					19:00	37		38				
07:15	136		123					19:15	41		37				
07:30	106		44					19:30	39		34				
07:45	57	391	30	317			708	19:45	29	146	24	133			279
08:00	40		18					20:00	29		29				
08:15	35		26					20:15	16		21				
08:30	45		21					20:30	45		34				
08:45	50	170	20	85			255	20:45	46	136	26	110			246
09:00	33		22					21:00	24		32				
09:15	28		27					21:15	18		25				
09:30	40		30					21:30	14		16				
09:45	30	131	17	96			227	21:45	15	71	12	85			156
10:00	25		23					22:00	8		12				
10:15	44		27					22:15	13		14				
10:30	54		29					22:30	5		13				
10:45	30	153	25	104			257	22:45	6	32	14	53			85
11:00	35		22					23:00	3		9				
11:15	37		22					23:15	4		7				
11:30	38		33					23:30	5		5				
11:45	42	152	34	111			263	23:45	3	15	7	28			43
Total Vol.		1345		923			**2268**			2071		2129			**4200**

8.7%

	NB	SB	EB	WB	Total
Daily Totals :	3,416	3,052	0	0	6,468

	AM					PM				
Split %	59.3%	40.7%			**35.1%**	49.3%	50.7%			**64.9%**
AM						**PM**				
Peak Hr.	07:00	06:45			**06:45**	**Peak Hr.**	14:30	14:15		**14:15**
Volume	391	331			**711**	**Volume**	355	345		**690**
P.H.F.	0.719	0.673			**0.686**	**P.H.F.**	0.722	0.889		**0.841**
7 - 9 Vol.	561	402	0	0	**963**	**4 - 6 Vol.**	531	550	0	0	**1081**
Peak Hr.	07:00	07:00			**07:00**	**Peak Hr.**	16:45	17:00			**16:15**
Volume	391	317	0	0	**708**	**Volume**	297	285	0	0	**564**
P.H.F.	0.719	0.644	0.000	0.000	**0.683**	**P.H.F.**	0.834	0.801	0.000	0.000	**0.834**

Prepared by NDS/ATD

Volumes for: Thursday, February 10, 2011	City:	Wildomar	Daily Totals NB	SB	EB	WB	Total
Location: Bundy Canyon Rd W/o Angels Lane	Project:	11-6013-001	0	0	5,197	5,152	10,349

AM Period	NB	SB	EB	WB		PM Period	NB	SB	EB	WB	
00:00			7	13		12:00			79	71	
00:15			9	9		12:15			80	78	
00:30			8	8		12:30			77	82	
00:45			11 35	8 38	73	12:45			74 310	63 294	604
01:00			7	8		13:00			86	88	
01:15			7	4		13:15			79	62	
01:30			5	3		13:30			80	88	
01:45			5 24	6 21	45	13:45			73 318	70 308	626
02:00			1	7		14:00			83	88	
02:15			3	3		14:15			75	98	
02:30			2	6		14:30			155	90	
02:45			5 11	4 20	31	14:45			133 446	111 387	833
03:00			6	4		15:00			93	91	
03:15			9	8		15:15			96	112	
03:30			8	5		15:30			80	102	
03:45			12 35	8 25	60	15:45			89 358	103 408	766
04:00			9	5		16:00			111	114	
04:15			12	5		16:15			103	122	
04:30			23	8		16:30			114	97	
04:45			33 77	16 34	111	16:45			123 451	92 425	876
05:00			38	22		17:00			116	107	
05:15			34	34		17:15			108	115	
05:30			46	32		17:30			102	83	
05:45			36 154	53 141	295	17:45			106 432	93 398	830
06:00			46	55		18:00			84	84	
06:15			53	64		18:15			78	98	
06:30			69	52		18:30			62	96	
06:45			75 243	49 220	463	18:45			61 285	67 345	630
07:00			100	90		19:00			75	73	
07:15			136	134		19:15			57	62	
07:30			89	72		19:30			40	43	
07:45			77 402	59 355	757	19:45			44 216	48 226	442
08:00			70	59		20:00			32	35	
08:15			53	50		20:15			28	44	
08:30			70	72		20:30			30	51	
08:45			59 252	86 267	519	20:45			29 119	34 164	283
09:00			74	88		21:00			44	28	
09:15			84	60		21:15			28	44	
09:30			68	73		21:30			19	29	
09:45			68 294	58 279	573	21:45			24 115	35 136	251
10:00			66	68		22:00			18	28	
10:15			57	55		22:15			13	18	
10:30			76	64		22:30			11	29	
10:45			68 267	64 251	518	22:45			15 57	16 91	148
11:00			54	59		23:00			8	11	
11:15			69	79		23:15			8	8	
11:30			70	72		23:30			4	9	
11:45			71 264	68 278	542	23:45			12 32	13 41	73
Total Vol.			2058	1929	**3987**				3139	3223	**6362**

8.5%

	NB	SB	EB	WB	Total
Daily Totals :	0	0	5,197	5,152	10,349

	AM				PM				
Split %			51.6%	48.4%	**38.5%**			49.3%	50.7%	**61.5%**
AM					**PM**					
Peak Hr.			07:00	07:00	**07:00**	**Peak Hr.**		14:30	15:30	**14:30**
Volume			402	355	**757**	**Volume**		477	441	**881**
P.H.F.			0.739	0.662	**0.701**	**P.H.F.**		0.769	0.904	**0.899**
7 - 9 Vol.	0	0	654	622	**1276**	**4 - 6 Vol.**	0	0 883	823	**1706**
Peak Hr.			07:00	07:00	**07:00**	**Peak Hr.**		16:30	16:00	**16:00**
Volume	0	0	402	355	**757**	**Volume**	0	0 461	425	**876**
P.H.F.	0.000	0.000	0.739	0.662	**0.701**	**P.H.F.**	0.000	0.000 0.937	0.871	**0.973**

Prepared by NDS/ATD

Volumes for: Thursday, February 10, 2011	City:	Wildomar	Daily Totals NB	SB	EB	WB	Total
Location: Bundy Canyon Rd E/o Angels Lane	Project:	11-6013-002	0	0	5,207	5,158	10,365

AM Period	NB	SB	EB		WB			PM Period	NB	SB	EB		WB		
00:00			7		13			12:00			81		76		
00:15			8		9			12:15			82		77		
00:30			7		8			12:30			73		83		
00:45			11	33	9	39	72	12:45			77	313	65	301	614
01:00			6		8			13:00			84		84		
01:15			7		5			13:15			79		63		
01:30			5		2			13:30			86		89		
01:45			4	22	6	21	43	13:45			69	318	66	302	620
02:00			2		7			14:00			82		88		
02:15			2		3			14:15			74		98		
02:30			3		6			14:30			150		93		
02:45			5	12	4	20	32	14:45			155	461	111	390	851
03:00			5		4			15:00			90		89		
03:15			10		8			15:15			94		115		
03:30			7		7			15:30			82		103		
03:45			13	35	6	25	60	15:45			83	349	101	408	757
04:00			8		5			16:00			118		117		
04:15			12		6			16:15			101		120		
04:30			24		7			16:30			110		102		
04:45			30	74	17	35	109	16:45			129	458	97	436	894
05:00			35		23			17:00			117		99		
05:15			37		37			17:15			107		120		
05:30			45		32			17:30			101		81		
05:45			32	149	53	145	294	17:45			106	431	90	390	821
06:00			47		58			18:00			85		91		
06:15			57		51			18:15			78		93		
06:30			65		52			18:30			62		93		
06:45			78	247	55	216	463	18:45			58	283	67	344	627
07:00			97		90			19:00			78		74		
07:15			143		135			19:15			56		62		
07:30			88		70			19:30			38		45		
07:45			75	403	56	351	754	19:45			47	219	44	225	444
08:00			73		61			20:00			34		37		
08:15			55		55			20:15			26		42		
08:30			65		67			20:30			33		51		
08:45			61	254	89	272	526	20:45			28	121	33	163	284
09:00			76		85			21:00			39		30		
09:15			83		69			21:15			31		42		
09:30			69		66			21:30			19		32		
09:45			68	296	62	282	578	21:45			24	113	32	136	249
10:00			69		67			22:00			19		30		
10:15			56		55			22:15			13		20		
10:30			72		65			22:30			11		26		
10:45			71	268	63	250	518	22:45			15	58	16	92	150
11:00			53		55			23:00			8		13		
11:15			70		82			23:15			8		7		
11:30			69		72			23:30	8.6%		4		8		
11:45			66	258	65	274	532	23:45			12	32	13	41	73
Total Vol.				2051		1930	**3981**					3156		3228	**6384**

	NB	SB	EB	WB	Total
Daily Totals :	0	0	5,207	5,158	10,365

	AM				PM				
Split %			51.5%	48.5%	**38.4%**			49.4%	50.6%	**61.6%**
AM					**PM**					
Peak Hr.			06:45	07:00	**06:45**	**Peak Hr.**		14:30	15:30	**14:30**
Volume			406	351	**756**	**Volume**		489	441	**897**
P.H.F.			0.710	0.650	**0.680**	**P.H.F.**		0.789	0.919	**0.843**
7 - 9 Vol.	0	0	657	623	**1280**	**4 - 6 Vol.**	0	0	889	826	**1715**
Peak Hr.			07:00	07:00	**07:00**	**Peak Hr.**			16:30	16:00	**16:00**
Volume	0	0	403	351	**754**	**Volume**	0	0	463	436	**894**
P.H.F.	0.000	0.000	0.705	0.650	**0.678**	**P.H.F.**	0.000	0.000	0.897	0.908	**0.951**

APPENDIX E

Pass-by Trips

CHAPTER 5

Pass-by, Primary, and Diverted Linked Trips

5.1 Background

The trip generation rates and equations contained in *Trip Generation* are derived from actual measurements of traffic generated by individual sites. These rates and equations represent vehicles entering and exiting a site at its driveways. Therefore, these volumes are appropriate for determining the total traffic to be accommodated by site driveways.

The pass-by trip-making phenomenon, if estimated to be significant, should be recognized when examining the traffic impact of a development on the adjacent street system.

There are instances, however, when the total number of trips generated by a site is different from the amount of new traffic **added** to the street system by the generator. For example, retail-oriented developments such as shopping centers, discount stores, restaurants, banks, service stations, and convenience markets often locate adjacent to busy streets in order to attract the motorists already on the street. These sites attract a portion of their trips from traffic passing the site on the way from an origin to an ultimate destination. These retail trips **may not add new traffic** to the adjacent street system.

Trip-making can be broken down into two major categories: **pass-by trips** and **non-pass-by trips.** In some traffic impact study applications, it is necessary to further subdivide non-pass-by trips into **primary trips** and **diverted linked** trips. These trip types are illustrated in figure 5.1 and are defined below.

Types of Trips Generated by a Site

- **Pass-By Trips**
- **Non-Pass-By Trips**
  - **Primary Trips**
  - **Diverted Linked Trips**

Pass-by trips are made as intermediate stops *on the way* from an origin to a primary trip destination without a route diversion. Pass-by trips are attracted from traffic passing the site *on an adjacent street* or roadway that offers direct access to the generator. **Pass-by trips are not diverted from another roadway.**

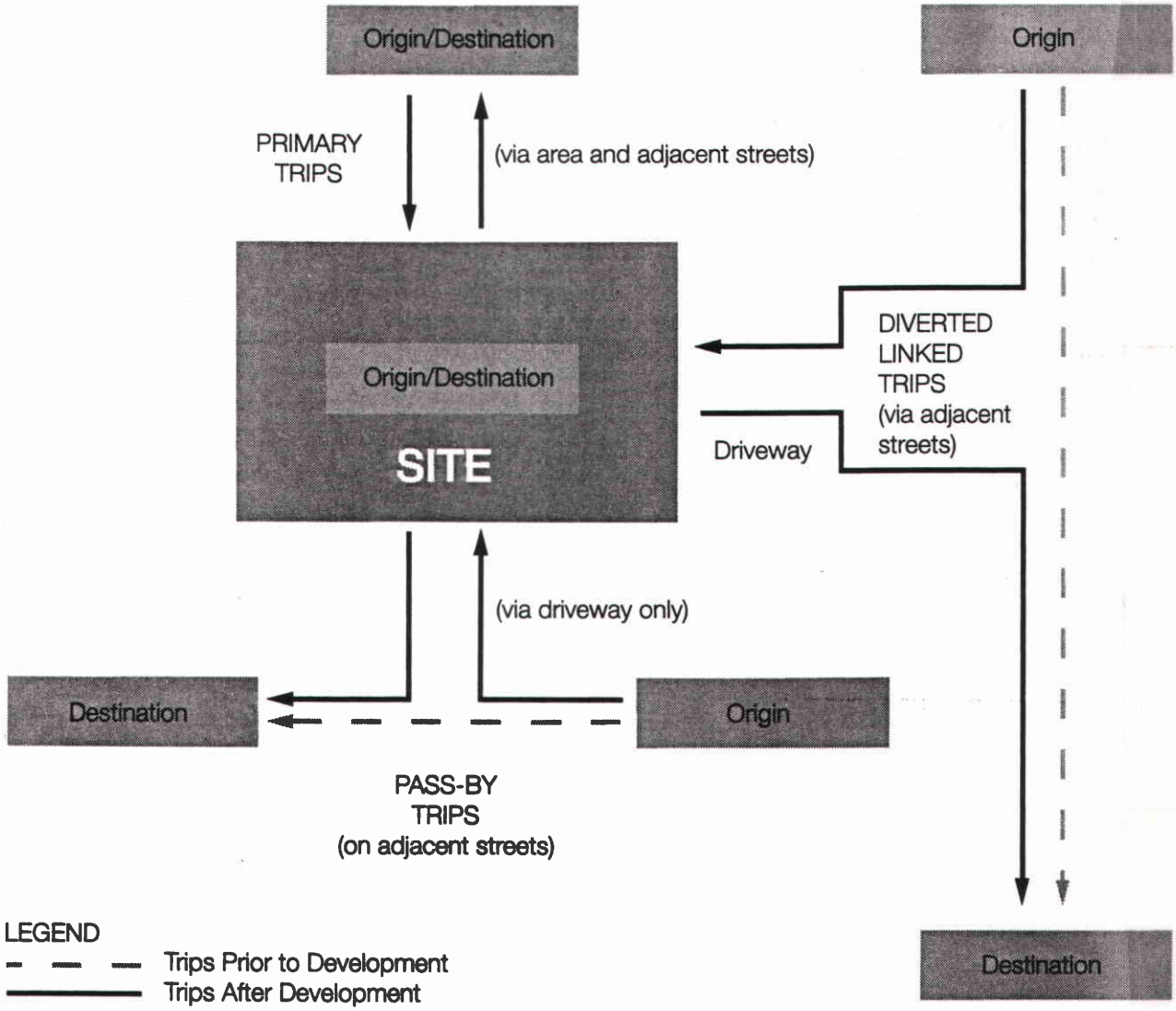
Pass-by trips do not involve a route diversion to enter the site driveway.

Non-pass-by trips are simply all trips generated by a site that are not pass-by trips. This term is sometimes used when diverted linked trips are not tabulated separately from primary trips.

Primary trips are trips made for the specific purpose of visiting the generator. The stop at the generator is the primary reason for the trip. The trip typically goes from origin to generator and then returns to the origin. For example, a home-to-shopping-to-home combination of trips is a primary trip set.

Diverted linked trips are trips that are attracted from the traffic volume on roadways within the vicinity of the generator but that require a diversion from that roadway to another roadway to gain access to the site. These trips could travel on highways or freeways adjacent to a generator, but without access to the generator. **Diverted linked trips add traffic to streets adjacent to a site, but may not add traffic to the area's major travel routes** (see figure 5.1). Both pass-by and diverted linked trips may be part of a multiple-stop chain of trips.

Figure 5.1 Types of Trips



5.2 Sample Application of Pass-By Trip Assignment Process

In this example, the objectives are to (1) estimate the number of new trips added to the adjacent street traffic volume with the development of a shopping center with 580,000 square feet of gross leasable area, and (2) determine the turn movements at the shopping center driveway. The forecasted two-way evening peak hour traffic on a street adjacent to the proposed shopping center is 1,200 vehicles, as shown in figure 5.2(A)—1,000 traveling west and 200 traveling east.

Objective of Assignment Process:

Determine (1) turn movements at a shopping center driveway and (2) trips added to the adjacent street traffic volume.

The shopping center is estimated to generate 2,000 evening peak hour trips (based on the fitted curve equation given for Land Use Code 820 on page 1,339 of *Trip Generation*, Sixth Edition). An assessment of the shopping center parking configuration and access points indicates that an estimated 20 percent of the site-generated traffic will use the driveway being analyzed in this example. Thus, the driveway volume is estimated to be 400 evening peak hour trips (i.e., 20 percent of 2,000 trips). For this example, 50 percent enter and 50 percent exit the shopping center (as shown in figure 5.2(B)).

From data collected at other shopping centers, it is estimated (in this example) that about 15 percent of the driveway volume is pass-by (figure 5.2(B)). Therefore, 30 of the inbound vehicles (i.e., 15 percent of 200 vehicles) and 30 of the outbound vehicles are considered pass-by trips.

The assumed trip distribution for the non-pass-by trips is shown in figure 5.2(C). These values are based on local knowledge of expected trip patterns for primary and diverted linked trips to and from the shopping center (based on existing travel patterns, surrounding land uses, etc.). For example, 80 percent of the non-pass-by trips are expected to arrive from the east and to return to the east after the trip to the shopping center.

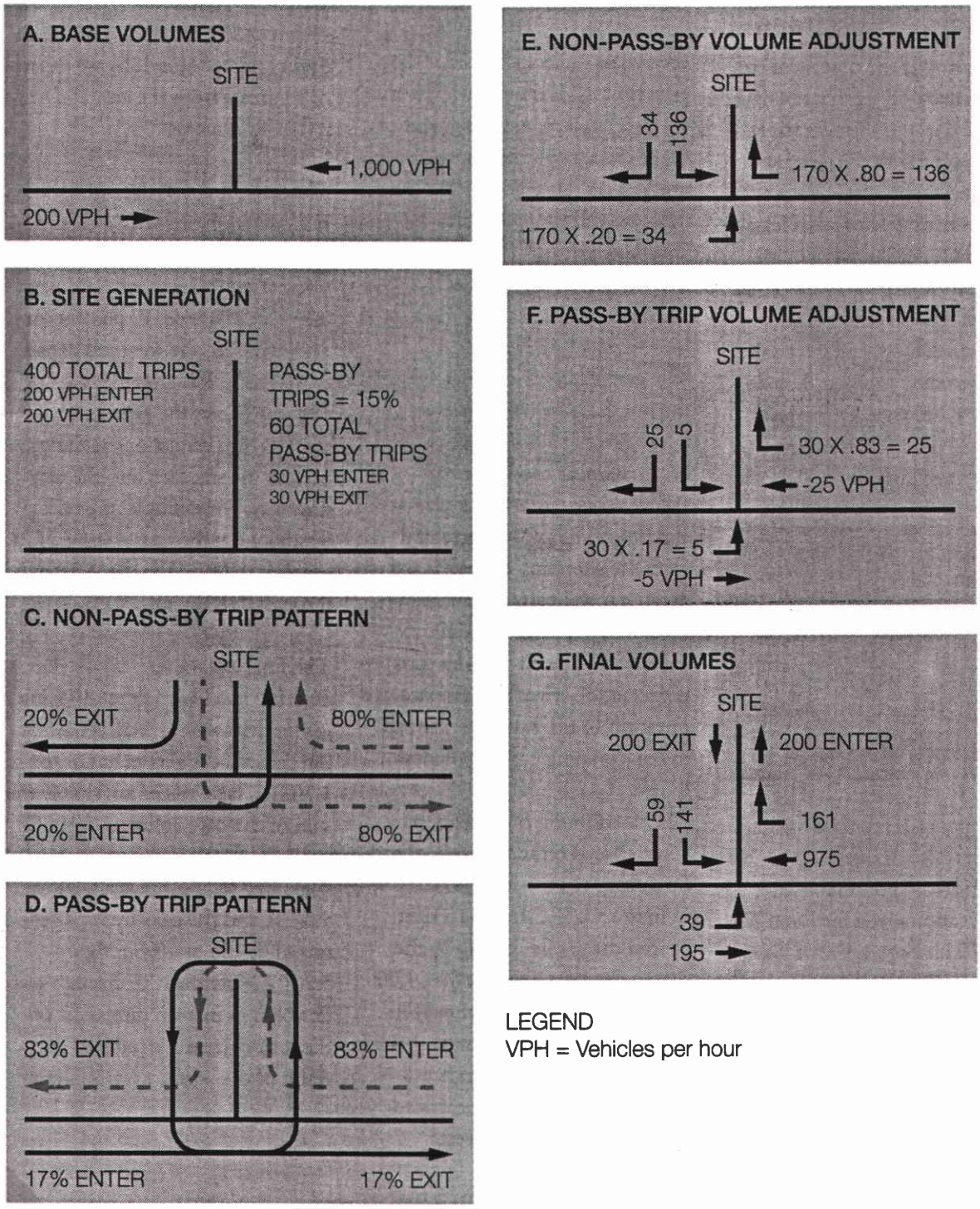
The distribution of the pass-by trips is based on the volume of traffic passing the driveway, as shown in figure 5.2(D). Because 83 percent of the traffic passing by the site comes from the east (i.e., 1,000 of the 1,200 shown previously in figure 5.2 (A)), it is assumed that 83 percent of the pass-by trips will likewise arrive from the east and will depart toward the west.

The assignment of the non-pass-by trips generated by the site is shown in figure 5.2(E). The total number of non-pass-by trips destined to the site is 170 (the 200 total trips minus the 30 inbound pass-by trips shown earlier in figure 5.2(B)). Eighty percent (or 136) are expected to arrive from the east and to return to the east.

The assignment of the pass-by trips is shown in figure 5.2(F). Of the 30 pass-by trips, 83 percent (or 25) arrive from the east and depart to the west. Likewise, 17 percent (or 5) arrive from the west and depart to the east. Note that the calculation also shows the expected through-trip reductions as the trips passing the site turn into the new driveway. For example, the new westbound right-turn volume of 25 causes a reduction in the westbound through movement.

The final assignment of all trips entering and leaving the shopping center driveway, as well as passing the driveway, is shown in figure 5.2(G). These values are simply the sum of the base volumes (from figure 5.2(A)), the non-pass-by trips generated by the site (from figure 5.2(E)), and the pass-by trips generated by the site (from figure 5.2(F)). Note that the through-traffic volumes in both directions on the major street are reduced as a result of the pass-by trip analysis.

Figure 5.2 Application of Pass-By Trips



LEGEND
VPH = Vehicles per hour

5.3 Cautions

Statistical analysis and correlation of the pass-by data collected by the profession continue to evolve. However, due to the limited amount of pass-by data available and the inherent variability in surveyed site characteristics, it has still proven difficult to obtain high correlation indices.

Pass-by trips are closely linked to the size of the development and to the volume of traffic on the adjacent street that can deliver the pass-by trip. However, predictive mathematical relationships have been elusive.

Traditional pass-by trip analyses have attempted to correlate pass-by trip percentages (i.e., percent of the total number of trips generated by a site) with units of occupied site development (such as gross leasable area, gross floor area, seats in a restaurant, or fueling positions at a gas/service station). Limited results for some land uses show that this correlation can be enhanced further by including the magnitude of the traffic passing the site on the adjacent roadways.

The analyst should exercise caution in the use of pass-by and diverted linked data presented in this chapter to ensure that the following aspects of pass-by trip characteristics are handled appropriately in the analysis process.

Diverted linked trips are clearly different from pass-by trips. Diverted linked trips add trips to the adjacent roads at a proposed or expanded site, but may not add trips to nearby major highways or freeways.

Diverted linked trips are often difficult to identify. Therefore, **diverted linked trips should be treated similarly to primary trips,** unless: (1) all three (primary, pass-by, and diverted linked) categories are being analyzed and processed separately, and (2) the travel routes for diverted linked trips can be clearly established.

Pass-by trips are drawn from the passing traffic stream, **but are always included in the site driveway movements.** In traffic analyses, summation of driveway volumes must equal the total external site generation (i.e., the sum of primary, pass-by, and diverted linked trips). Pass-by trips are not included in (and thus, subtracted from) the through-volumes passing a given site access point on an adjacent road. Standard methodologies for assessing the traffic impacts of site development typically require that diverted linked trips be included as additional trips within the confines of local impact assessment studies.

In a multi-use development, it is likely that there will be trips internal to the site (refer to chapter 7 for guidance). Before applying the pass-by reduction, the internal trips should be removed from the total number of trips generated by the multi-use site. **Pass-by trips are only applicable to trips that enter or exit the site, not internal trips.**

Overall, diverted linked trips represent a change in local area travel patterns but constitute no new increase on a *macroscopic* scale. Within the immediate study area, diverted linked trips do represent additional traffic on individual streets and should be analyzed that way.

5.4 Data Base on Pass-By, Primary, and Diverted Linked Trips

Listed in table 5.1 are 19 land uses for which ITE has received and compiled pass-by and diverted linked trip data. The table denotes whether the data are presented in this handbook in a table or a figure (in a data plot similar to those presented in *Trip Generation* for trip end data). Table 5.1 also identifies the time periods for which the data have been reported.

Tables 5.2 through 5.26 present the values for percentage of site generation that is accounted for by pass-by, non-pass-by, primary, and diverted linked trips.

Figures 5.3 through 5.15 plot the average *pass-by* trip percentages associated with the various land uses. No plots are provided for *diverted linked* trips. These figures are provided to enable the user to visualize the data scatter provided in tables 5.2 through 5.26.

Data plots are provided for each land use where nine or more data points are available for a specific independent variable.

For all land uses except shopping centers, data are plotted for only one independent variable. For shopping centers, data are plotted for GLA and peak hour traffic on adjacent streets for the weekday evening peak period; GLA is also used as the independent variable for shopping centers during the midday Saturday time period.

A regression equation is shown on the data plot if there are more than 10 points and the R^2 is greater than 0.25 (which only occurs on two of the Land Use Code 820 data plots). Note that this threshold is less than the 0.5 threshold for R^2 used for data plots in *Trip Generation*.

Recommended guidelines for using the data presented in these figures and tables are provided in section 5.5 of this chapter. In particular, the guidelines recommend when to use the data and how to select a pass-by percentage.

Users of the data are cautioned that the number and geographic distribution of sites are limited. Little or no data on adjacent street traffic volumes have been collected for uses other than shopping centers. The actual pass-by and diverted linked trip percentages may vary by site due to the specific influences of the characteristics of passing traffic, area roadway network patterns, specific businesses in the site being analyzed, other nearby development, and so forth. Surveys of similar developments near the analysis site are encouraged.

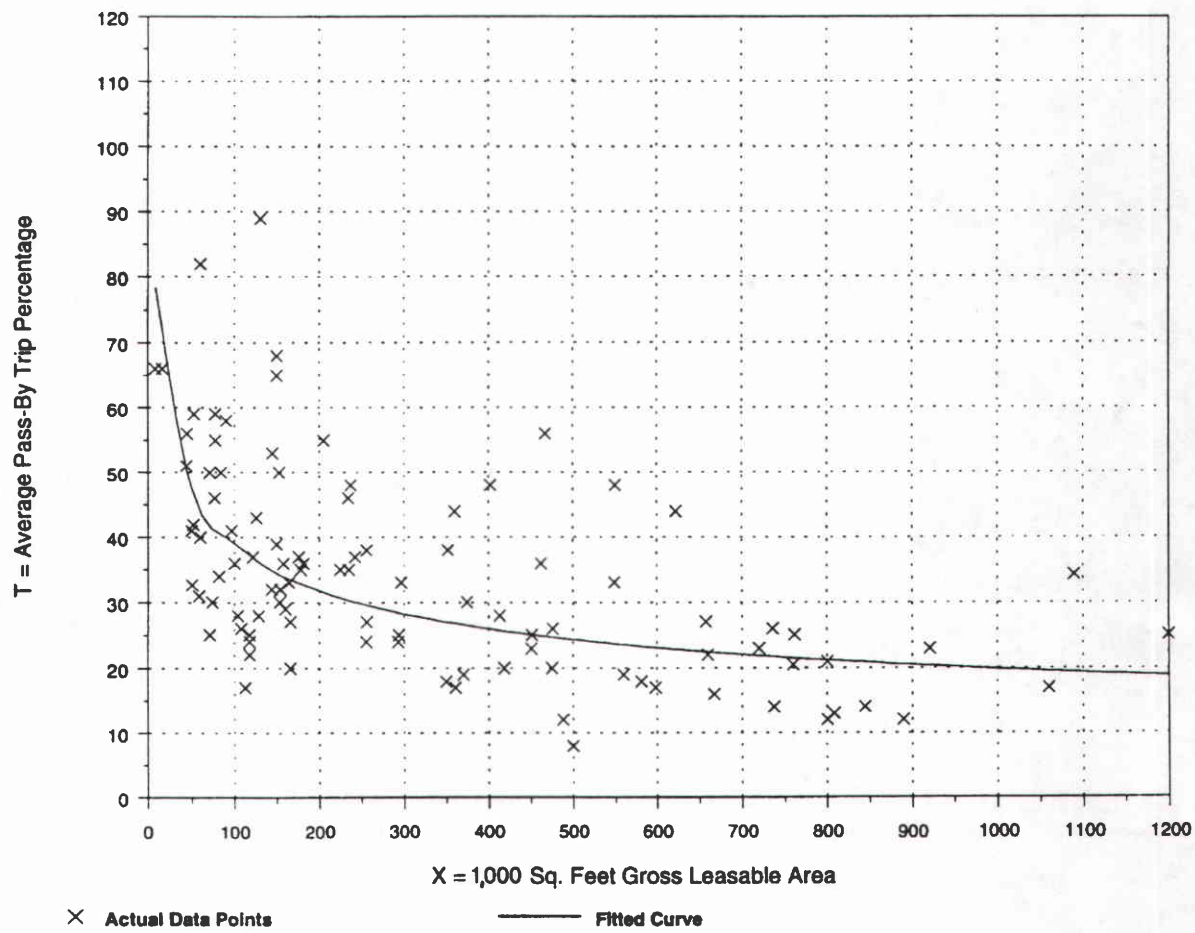
The pass-by data listed in table 5.1 were collected during *peak periods*. These pass-by relationships may differ from those during the *peak hour*.

Because data are limited for many of the land uses, the analyst is encouraged to collect pass-by trip data and transmit the data to ITE. Section 5.6 of this chapter describes how to collect the appropriate data and provides sample forms to use.

Figure 5.5 Shopping Center (820)

Average Pass-By Trip Percentage vs: **1,000 Sq. Feet Gross Leasable Area**
On a: **Weekday, P.M. Peak Period**
Number of Studies: 100
Average 1,000 Sq. Feet GLA: 329

Data Plot



Fitted Curve Equation: Ln(T) = -0.291 Ln(X) + 5.001 $R^2 = 0.37$

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