KUNZMAN ASSOCIATES, INC.

TENTATIVE TRACT MAP NO. 18255

TRAFFIC IMPACT ANALYSIS (REVISED)

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I. Introduction

The purpose of this report is to provide an assessment of the traffic impacts resulting from the proposed development of the Tentative Tract Map No. 18255 project, and to identify the traffic mitigation measures necessary to maintain the established Level of Service standard for the elements of the impacted roadway system. The traffic issues related to the proposed land uses and development have been evaluated in the context of the California Environmental Quality Act.

The County of San Bernardino is the lead agency responsible for preparation of the traffic impact analysis, in accordance with the California Environmental Quality Act authorizing legislation. This report analyzes traffic impacts for the anticipated opening date with full occupancy of the development in Year 2014, at which time it will be generating traffic at its full potential, and for the Year 2035.

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 in Appendix A.

A. Project Description

The proposed development is located north of Alta Loma Drive and west of Sunny Vista Road in the County of San Bernardino. A vicinity map showing the project location is provided on Figure 1.

The project site is proposed to be developed with 252 single-family detached residential dwelling units. Figure 2 illustrates the project site plan.

B. Study Area

Regional access to the project site is provided by the Twenty-Nine Palms Highway SR-62. Local access is provided by various roadways in the vicinity of the site. The east-west roadways which will be most affected by the project include Twenty-Nine Palms Highway SR-62 and Yucca Trail/Alta Loma Drive. North-south roadways expected to provide local access include Pioneertown Road, Sage Avenue, Old Woman Springs Road, Avalon Avenue, Yucca Mesa Road/La Contenta Road, Sherwood Avenue, Torres Avenue, and Sunny Vista Road.

A series of scoping discussions were conducted with the following agencies to define the desired analysis locations for each future analysis year:

- County of San Bernardino
- San Bernardino Associated Governments
- California Department of Transportation

In addition, staff from the County of San Bernardino has also been contacted to discuss the project and its associated travel patterns.

No analysis is required further than 5 miles from the project site. The roadway elements that must be analyzed are dependent on both the analysis year (project Opening Year or Year 2035) and project generated traffic volumes. The identification of the study area, and the intersections and highway segments requiring analysis, was based on an estimate of the two-way traffic volumes on the roadway segments near the project site. All arterial segments have been included in the analysis when the anticipated project volume equals or exceeds 50 two-way trips in the peak hours. The requirement is 100 two-way peak hour trips for freeways.

The project does not contribute traffic greater than the freeway threshold volume of 100 two-way peak hour trips. The project contributes traffic greater than the arterial link threshold volume of 50 two-way trips in the morning and evening peak hours in the Town of Yucca Valley. This means that the County of San Bernardino must notify the California Department of Transportation and Town of Yucca Valley. Each of these agencies have been provided with a copy of the traffic impact analysis, once the document was accepted by the County of San Bernardino. (Note: The purpose of this notification is to allow the identification of opportunities to make improvements to intersections concurrent with adjacent development, at considerably less cost and disruption than would occur if it were done after-the-fact).

C. Analysis Methodology

The analysis of the traffic impacts from the proposed development and the assessment of the required mitigation measures were based on an evaluation of the existing and forecast traffic conditions in the vicinity of the site with and without the project. The following analysis years are considered in this report:

- Existing Conditions (2011)
- Project Opening Year Conditions (2014)
- Horizon Year Conditions (2035)

Existing intersection traffic conditions were established through morning and evening peak hour traffic counts obtained by Kunzman Associates, Inc. (see Appendix B) and factored up to Year 2011. Supplemental traffic data was available from the 2009 Traffic Volumes on California State Highways by the California Department of Transportation.

In addition, truck classification counts were conducted at the study area intersections. The existing percent of trucks were used in the conversion of trucks to Passenger Car Equivalent's (see Appendix C).

Project traffic volumes for all future projections were estimated using the manual approach. Trip generation has been estimated based on the Institute of Transportation Engineers, Trip Generation, 8th Edition, 2008.

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.

To assess the Opening Year (2014) and Year 2035 traffic conditions, project traffic is combined with existing traffic and areawide growth. An areawide growth rate has been utilized to account for areawide growth on study area roadways. Opening Year (2014) traffic volumes have been calculated based on a 1.5 percent annual growth rate of existing traffic volumes over a three year period. Year 2035 traffic volumes have been calculated based on a 1.5 percent annual growth rate of existing traffic volumes over a twenty-four year period. The areawide growth rate has been obtained from the Town of Yucca Valley based upon a historical growth rate of 1.5 percent over the last 20 years.

The technique used to assess the capacity needs of an intersection is known as the Intersection Delay Method (see Appendix D) based on the 2000 Highway Capacity Manual – Transportation Research Board Special Report 209. To calculate delay, the volume of traffic using the intersection is compared with the capacity of the intersection. The signalized intersections are considered deficient (Level of Service F) if the overall intersection critical volume to capacity ratio equals or exceeds 1.0, even if the level of service defined by the delay value is below the defined Level of Service standard. The volume to capacity ratio is defined as the critical volumes divided by the intersection capacity. A volume to capacity ratio greater than 1.0 implies an infinite queue.

The Level of Service analysis for signalized intersections has been performed using optimized signal timing. This analysis has included an assumed lost time of two seconds per phase. Signal timing optimization has considered pedestrian safety and signal coordination requirements. Appropriate time for pedestrian crossings has also been considered in the signalized intersection analysis. The following formula has been used to calculate the pedestrian minimum times for all Highway Capacity Manual runs:

[(Curb to curb distance) / (4 feet/second)] + 7 seconds.

For existing and Opening Year traffic conditions, saturation flow rates of 1,800 vehicles per hour of green for through and right turn lanes and 1,700 vehicles per lane for single left turn lanes, 1,600 vehicles per lane for dual left turn lanes and 1,500 vehicles per lane for triple left turn lanes have been assumed for the capacity analysis.

For Year 2035 traffic conditions, saturation flow rates of 1,900 vehicles per hour of green for through and right turn lanes and 1,800 vehicles per lane for single left turn lanes, 1,700 vehicles per lane for dual left turn lanes and 1,800 vehicles per lane for double right turn lanes have been assumed for the capacity analysis.

The peak hour traffic volumes have been adjusted to peak 15 minute volumes for analysis purposes using the existing observed peak 15 minute to peak hour factors for all scenarios analyzed. Where feasible improvements in accordance with the local jurisdiction's General Plan and which result in acceptable operations cannot be identified, the Year 2035 peak hour factor has been adjusted upwards to 0.95. This is to account for the effects of congestion on peak spreading. Peak spreading refers to the tendency of traffic to spread more evenly across time as congestion increases.

The traffic mitigation needs anticipated at the time of the project opening with full occupancy and for the Year 2035 were combined into a summary of mitigation

requirements and costs. The mitigation cost responsibility for the proposed development was estimated based on the percent of the increase in traffic from the existing condition to the Year 2035 that was attributed to the project-generated traffic.

D. Definition of Deficiency and Significant Impact

The following definitions of deficiencies and significant impacts have been developed in accordance with the County of San Bernardino requirements.

1. Definition of Deficiency

The definition of an intersection deficiency has been obtained from the County of San Bernardino General Plan. The General Plan states that peak hour intersection operations of Level of Service C or better are generally acceptable. Therefore, any intersection operating at Level of Service D to F will be considered deficient. The California Department of Transportation states that Level of Service D or better (45 seconds) is acceptable along Twenty-Nine Palms Highway SR-62.

For freeway facilities, the Congestion Management Program controls the definition of deficiency for purposes of this study. The Congestion Management Program definition of deficiency is based on maintaining a Level of Service standard of Level of Service E or better, except where an existing Level of Service F condition is identified in the Congestion Management Program document (San Bernardino County Congestion Management Program Table 2-1). A Congestion Management Program deficiency is, therefore, defined as any freeway segment operating or projected to operate at Level of Service F, unless the segment is identified explicitly in the Congestion Management Program document.

The identification of a Congestion Management Program deficiency requires further analysis in satisfaction of Congestion Management Program requirements, including:

- Evaluation of the mitigation measures required to restore traffic operations to an acceptable level with respect to Congestion Management Program Level of Service standards.
- Calculation of the project share of new traffic on the impacted Congestion Management Program facility during peak hours of traffic.
- Estimation of the cost required to implement the improvements required to restore traffic operations to an acceptable Level of Service as described above.

This study incorporates each of these aspects for all locations where a Congestion Management Program deficiency is identified.

2. Definition of Significant Impact

The identification of significant impacts is a requirement of the California Environmental Quality Act. The County of San Bernardino General Plan and Circulation Element have been adopted in accordance with California Environmental Quality Act requirements, and any roadway improvements within the County of San Bernardino that are consistent with these documents are not considered a significant impact, so long as the project contributes its "fair share" funding for improvements.

A traffic impact is considered significant if the project both: i) contributes measurable traffic to and ii) substantially and adversely changes the Level of Service at any off-site location projected to experience deficient operations under foreseeable cumulative conditions, where feasible improvements consistent with the County of San Bernardino General Plan cannot be constructed.

Figure 1
Project Location Map

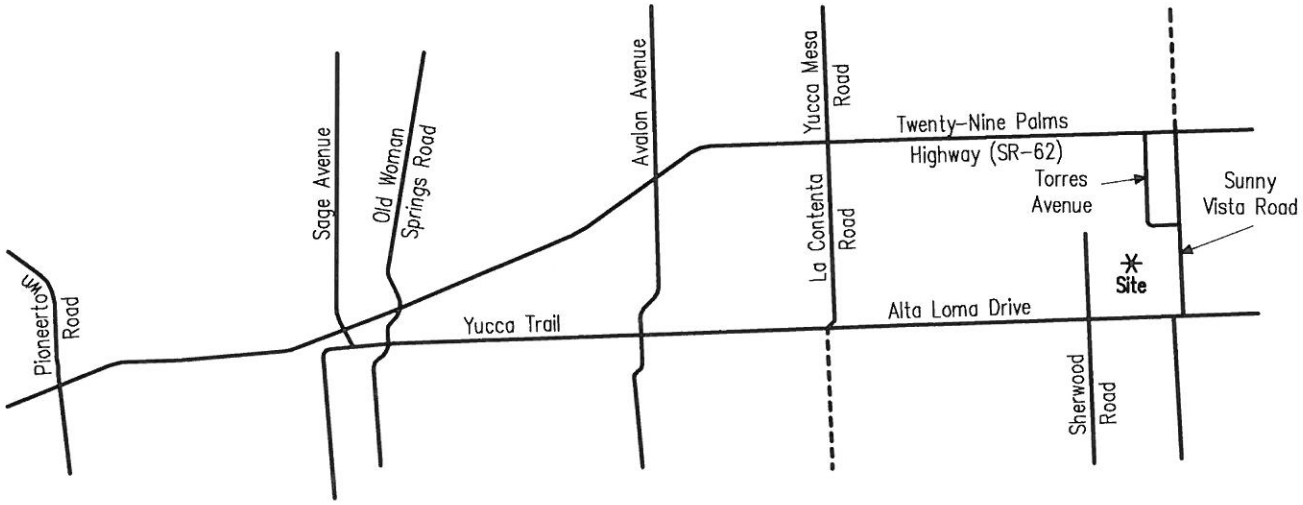

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Figure 2
Site Plan

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II. Existing (Year 2011) Conditions

A. Existing (Year 2011) Roadway System

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

Regional access to the project site is provided by the Twenty-Nine Palms Highway SR-62. Local access is provided by various roadways in the vicinity of the site. The east-west roadways which will be most affected by the project include Twenty-Nine Palms Highway SR-62 and Yucca Trail/Alta Loma Drive. North-south roadways expected to provide local access include Pioneertown Road, Sage Avenue, Old Woman Springs Road, Avalon Avenue, Yucca Mesa Road/La Contenta Road, Sherwood Avenue, Torres Avenue, and Sunny Vista Road.

B. Existing (Year 2011) Volumes

Figure 4 depicts the existing average daily traffic volumes. The existing average daily traffic volumes were obtained from the 2009 Traffic Volumes on California State Highways by the California Department of Transportation and factored from peak hour counts obtained by Kunzman Associates, Inc. using the following formula for each intersection leg:

PM Peak Hour (Approach + Exit Volume) x 11.5 = Daily Leg Volume.

This is a conservative estimate and may over estimate the average daily traffic volumes.

Existing intersection traffic conditions were established through morning and evening peak hour traffic counts obtained by Kunzman Associates, Inc. (see Appendix B) and factored up to Year 2011 and shown on Figures 5 and 6, respectively. Explicit peak hour factors have been calculated using the data collected for this effort as well. The morning and evening peak hour traffic volumes were identified by counting the two-hour periods from 7:00 AM – 9:00 AM and 4:00 PM – 6:00 PM.

C. Existing (Year 2011) Level of Service

The existing delay and Level of Service for intersections in the vicinity of the project are shown in Table 1. The study area intersections currently operate within acceptable Levels of Service during the peak hours for existing traffic conditions, except for the following study area intersections that currently operate at unacceptable Levels of Service during the peak hours:

Torres Avenue (NS) at:
Twenty-Nine Palms Highway SR-62 (EW)

Sunny Vista Road (NS) at:
Twenty-Nine Palms Highway SR-62 (EW)

Existing delay worksheets are provided in Appendix D.

D. Existing (Year 2011) Traffic Signal Warrant Analysis

A traffic signal appears to currently be warranted at the following study area intersection for existing traffic conditions (see Appendix E):

Sunny Vista Road (NS) at:
Twenty-Nine Palms Highway SR-62 (EW)

The unsignalized intersections have been evaluated for traffic signals using the California Department of Transportation Warrant 3 Peak Hour traffic signal warrant analysis, as specified in the Manual of Uniform Traffic Control Devices 2003 California Supplement, dated May 20, 2004.

E. Planned Transportation Improvements and Relationship to General Plan

The County of San Bernardino General Plan Circulation Element is shown on Figure 7. 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.

Table 1

Existing (Year 2011) Intersection Delay and Level of Service

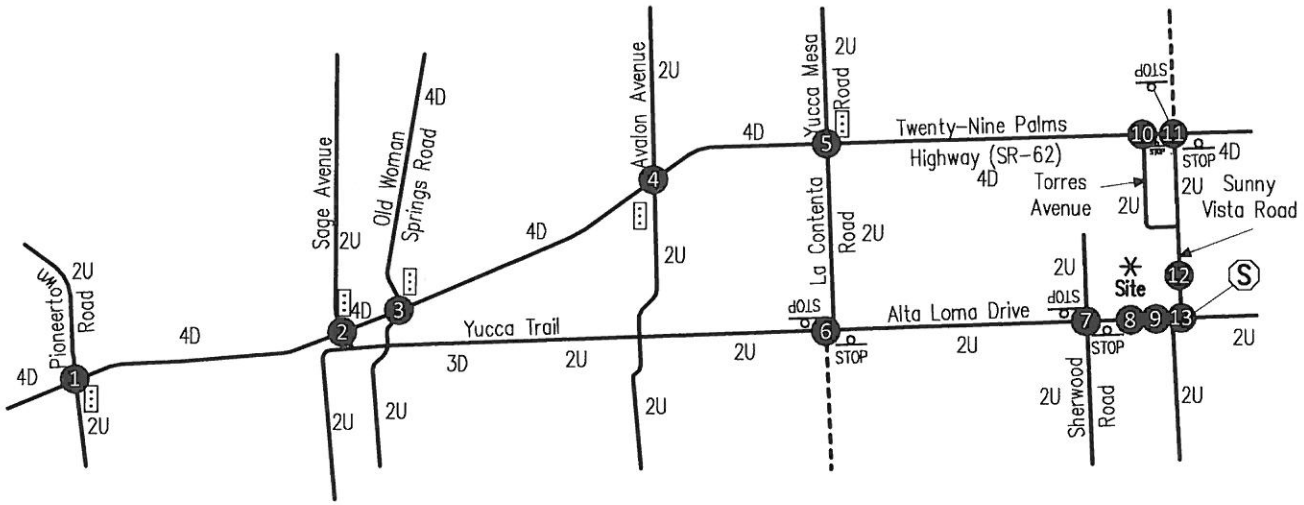
Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Peak Hour Delay-LOS[2]	
		Northbound			Southbound			Eastbound			Westbound				
		L	T	R	L	T	R	L	T	R	L	T	R	Morning	Evening
Pioneertown Road (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	TS	1	1	1	1	0.5	0.5	1	2	1	1	2	1	16.7-B	17.4-B
Sage Avenue (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	TS	1	0.5	0.5	1	0.5	0.5	1	2	1	1	2	1	19.0-B	19.0-B
Old Woman Springs Road (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	TS	1	2	1	1	2	1	1	2	1	1	2	1	19.9-B	28.0-C
Avalon Avenue (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	TS	2	1	1	1	1	1	1	2	1	1	2	1	23.4-C	23.9-C
Yucca Mesa Road / La Contenta Road (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	TS	1	0.5	0.5	1	0.5	0.5	1	2	1	1	2	1	18.7-B	20.7-C
Yucca Trail/Alta Loma Drive (EW)	CSS	0	1	0	1	0.5	0.5	0	1	0	0	1	0	15.5-C	13.2-B
Sherwood Road (NS) at:															
Alta Loma Drive (EW)	CSS	0	1	0	0	1	0	0	1	0	0	1	0	10.7-B	12.1-B
Torres Avenue (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	CSS	0	1	0	0	0	0	0	2	1	1	2	0	20.9-C	50.6-F
Sunny Vista Road (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	CSS	0	1	0	0	1	0	1	2	1	1	2	1	42.4-E	99.7-F
Alta Loma Drive (EW)	AWS	0	1	0	1	0.5	0.5	0	1	0	0	1	0	15.5-C	8.0-A

[1] When a right turn 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 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; CSS = Cross Street Stop; AWS = All Way Stop

Figure 3
Existing (Year 2011) Through Travel Lanes and Intersection Controls



Legend

- = Traffic Signal
- (S) = All Way Stop
- STOP = Stop Sign
- 4 = Through Travel Lanes
- D = Divided
- U = Undivided

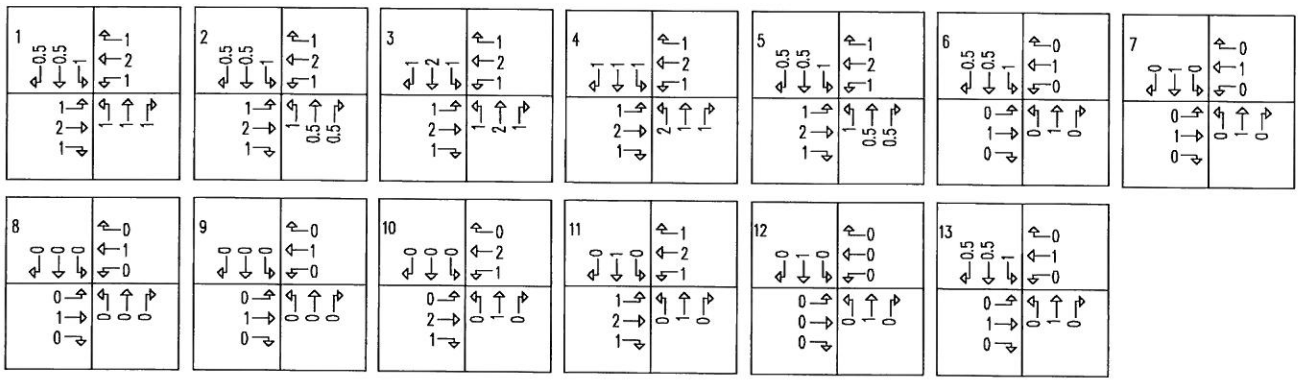


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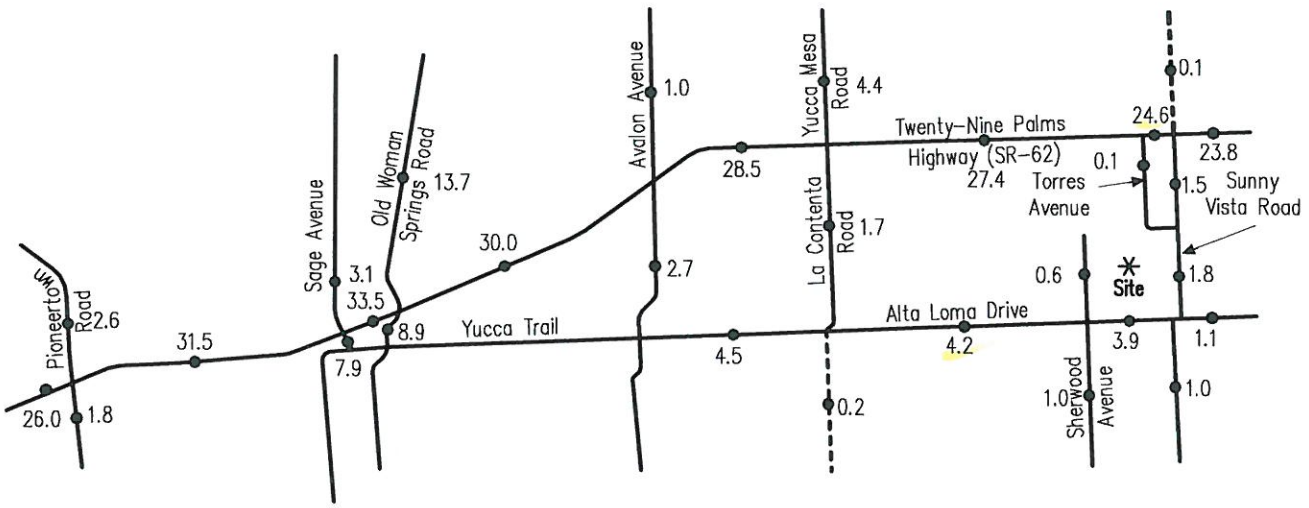
Figure 4
Existing (Year 2011) Average Daily Traffic Volumes



Legend

1.0 = Vehicles Per Day (1000's)

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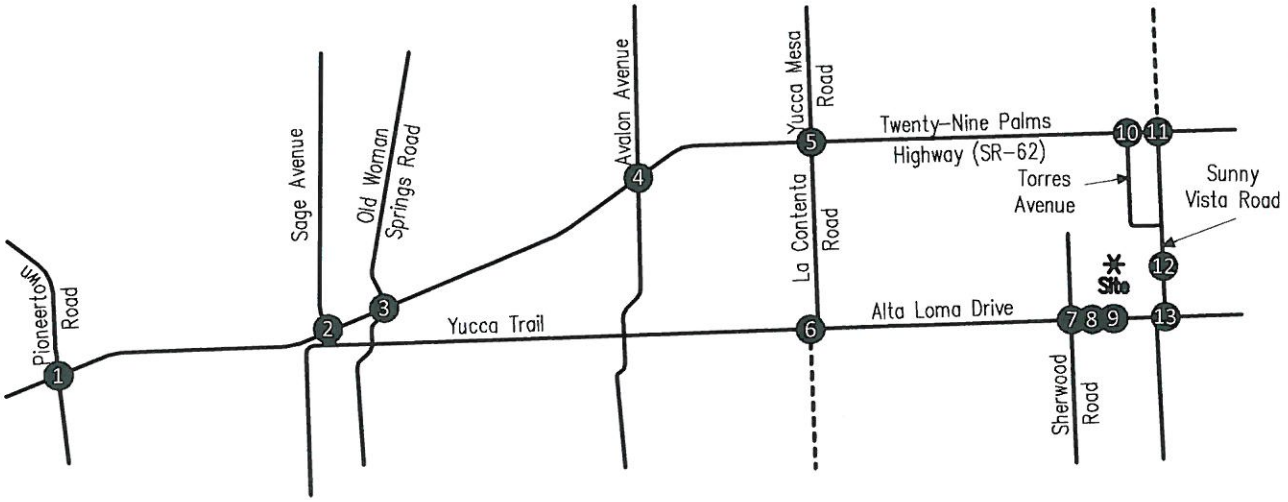
Figure 5
Existing (Year 2011)
Morning Peak Hour Intersection Turning Movement Volumes



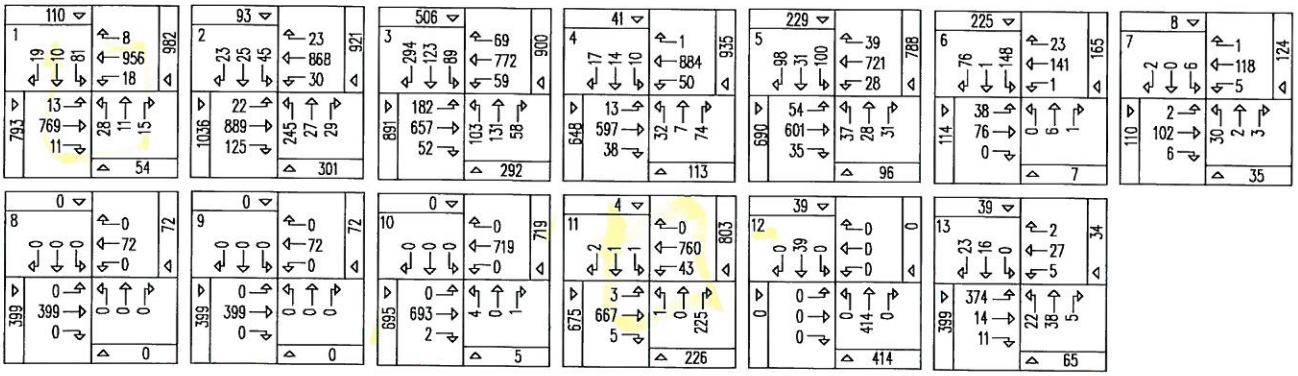


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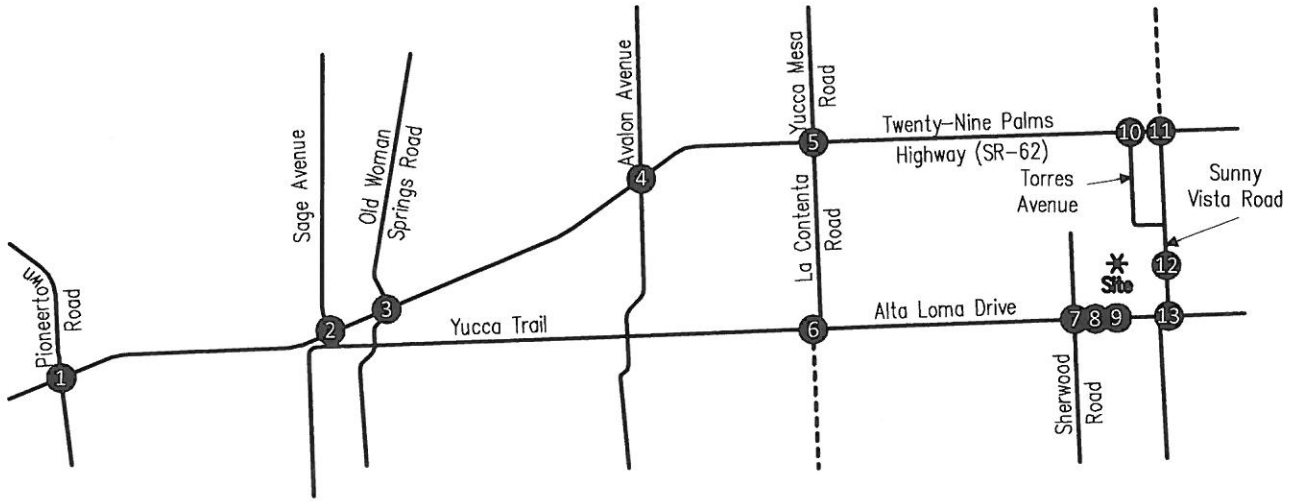
Figure 6
Existing (Year 2011)
Evening Peak Hour Intersection Turning Movement Volumes



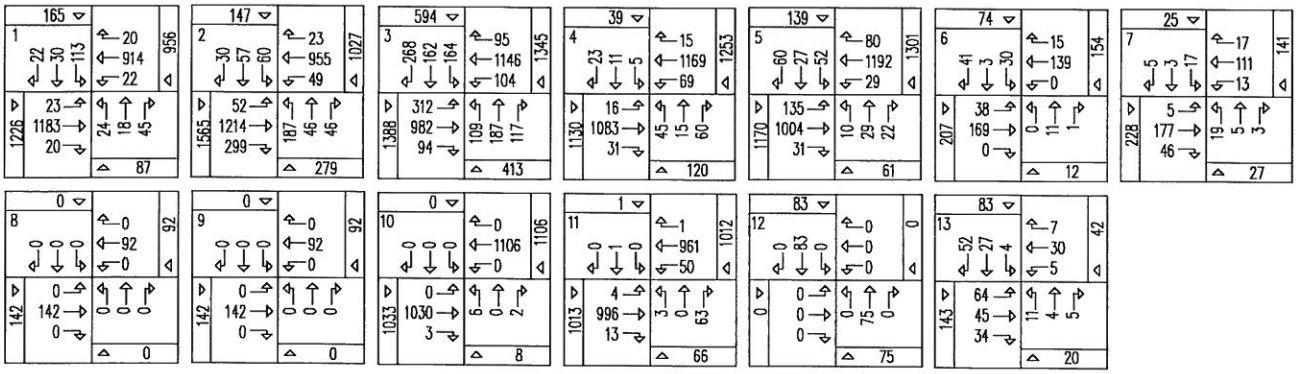


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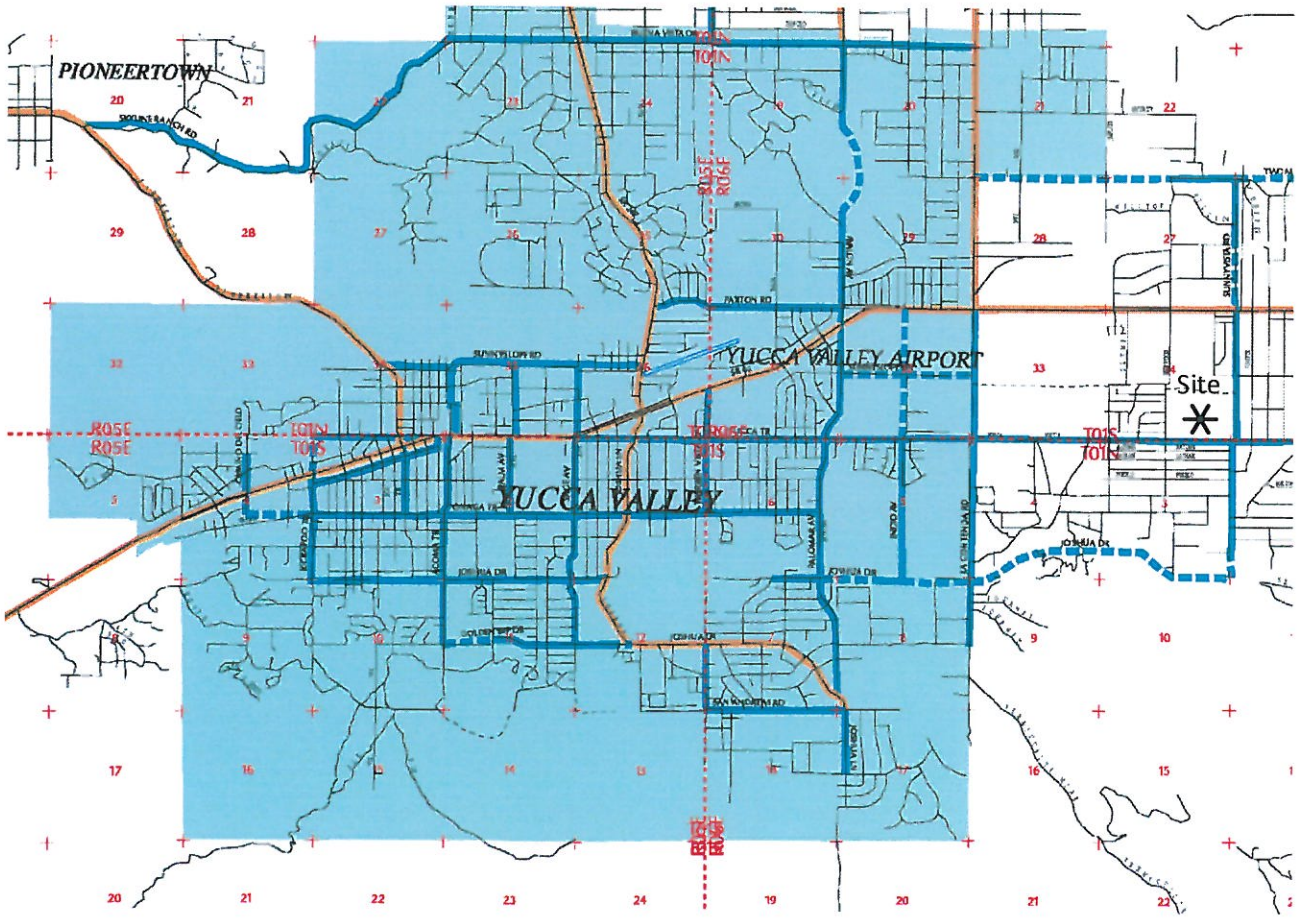
Figure 7
County of San Bernardino General Plan Circulation Element



Legend

EXISTING	PROPOSED	
		Freeway
		Major Divided Highway
		Major Arterial Highway
		Major Highway
		Secondary Highway
		Controlled/Limited Access Collector
		Mountain Major Highway
		Mountain Secondary Highway
		State Highway (Special Standards or Conditions)
		Railroads

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Source: County of San Bernardino

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III. Project Traffic

A. Project Description

The project site is proposed to be developed with 252 single-family detached residential dwelling units. The project will have access to Sunny Vista Road and Alta Loma Drive.

B. Trip Generation

The traffic generated by the project is determined by multiplying an appropriate trip generation rate by the quantity of land use. 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.

Trip generation rates were determined for daily traffic, morning peak hour inbound and outbound traffic, and evening peak hour inbound and outbound traffic for the proposed land use. By multiplying the traffic generation rates by the land use quantity, the traffic volumes are determined. Table 2 shows the project trip generation based upon rates obtained from the Institute of Transportation Engineers, Trip Generation, 8th Edition, 2008.

As shown in Table 2, the proposed development is projected to generate approximately 2,412 daily vehicle trips, 189 of which will occur during the morning peak hour and 254 of which will occur during the evening peak hour.

C. Trip Distribution

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. Figures 8 and 9 contain the directional distributions of the project traffic for the proposed land use.

D. Trip Assignment

Based on the identified traffic generation and distributions, project average daily traffic volumes have been calculated and shown on Figure 10. Morning and evening peak hour intersection turning movement volumes expected from the project are shown on Figures 11 and 12, respectively.

E. Traffic Contribution Test

No analysis is required further than 5 miles from the project site. The roadway elements that must be analyzed are dependent on both the analysis year (project Opening Year or Year 2035) and project generated traffic volumes. The identification of the study area, and the intersections and highway segments requiring analysis, was based on an estimate of the

two-way traffic volumes on the roadway segments near the project site. All arterial segments have been included in the analysis when the anticipated project volume equals or exceeds 50 two-way trips in the peak hours. The requirement is 100 two-way peak hour trips for freeways. Figure 13 graphically depicts the project traffic contribution test volumes on all of the roadway segments adjacent to the potential intersection analysis locations until the project volume contribution has clearly dropped below the 50 trip threshold.

The project does not contribute traffic greater than the freeway threshold volume of 100 two-way peak hour trips. The project contributes traffic greater than the arterial link threshold volume of 50 two-way trips in the morning and evening peak hours in the Town of Yucca Valley. This means that the County of San Bernardino must notify the California Department of Transportation and Town of Yucca Valley. Each of these agencies have been provided with a copy of the traffic impact analysis, once the document was accepted by the County of San Bernardino. (Note: The purpose of this notification is to allow the identification of opportunities to make improvements to intersections concurrent with adjacent development, at considerably less cost and disruption than would occur if it were done after-the-fact).

Table 2

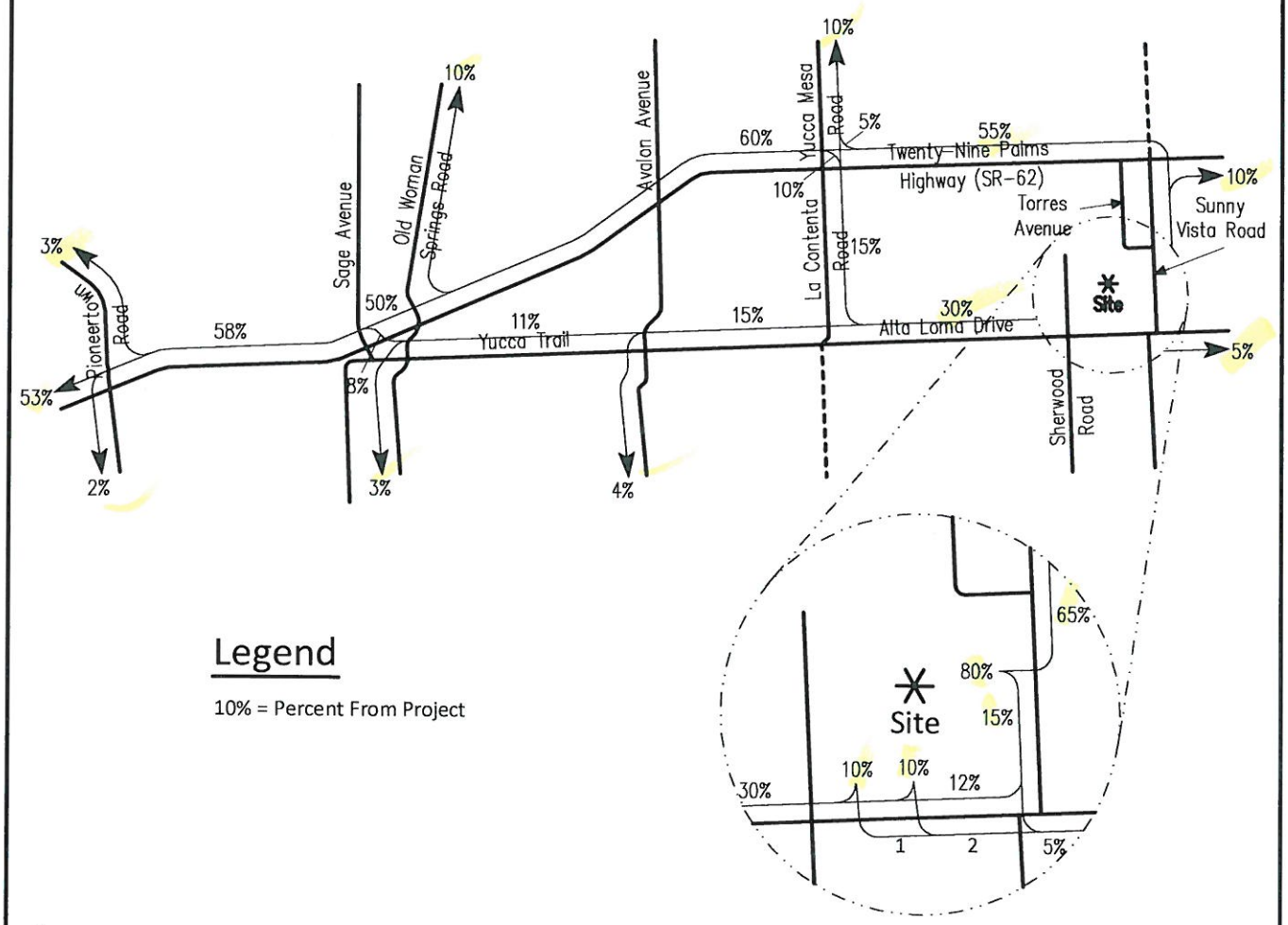
Project Traffic Generation[1]

Land Use	Quantity	Units[2]	Peak Hour						Daily
			Morning			Evening			
			Inbound	Outbound	Total	Inbound	Outbound	Total	
Trip Generation Rates									
Single-Family Detached Residential	252	DU	0.19	0.56	0.75	0.64	0.37	1.01	9.57
Trips Generated									
Single-Family Detached Residential	252	DU	48	141	189	161	93	254	2,412

[1] Source: Institute of Transportation Engineers, Trip Generation, 8th Edition, 2008, Land Use Category 210.

[2] DU = Dwelling Units

Figure 8
Project Outbound Traffic Distribution



Legend

10% = Percent From Project

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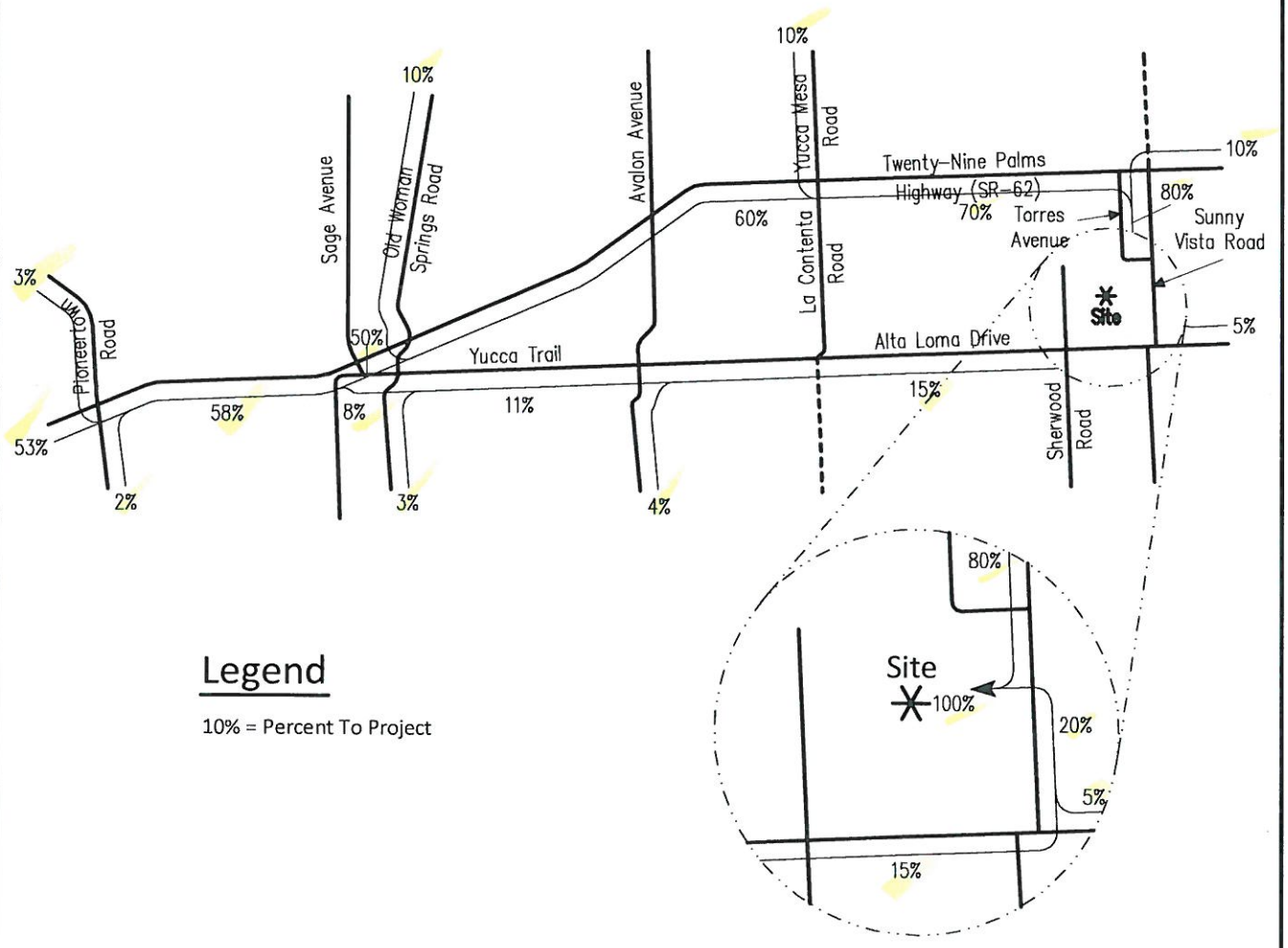
Figure 9
Project Inbound Traffic Distribution



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10% = Percent To Project

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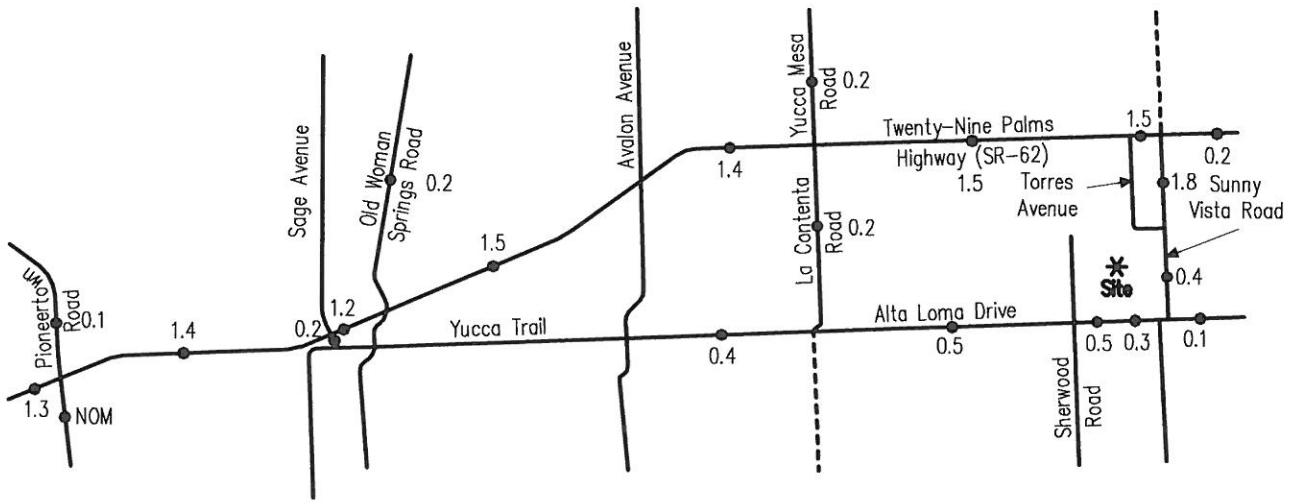
Figure 10
Project Average Daily Traffic Volumes



Legend

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

NOM = Nominal, Less Than 50 Vehicles Per Day

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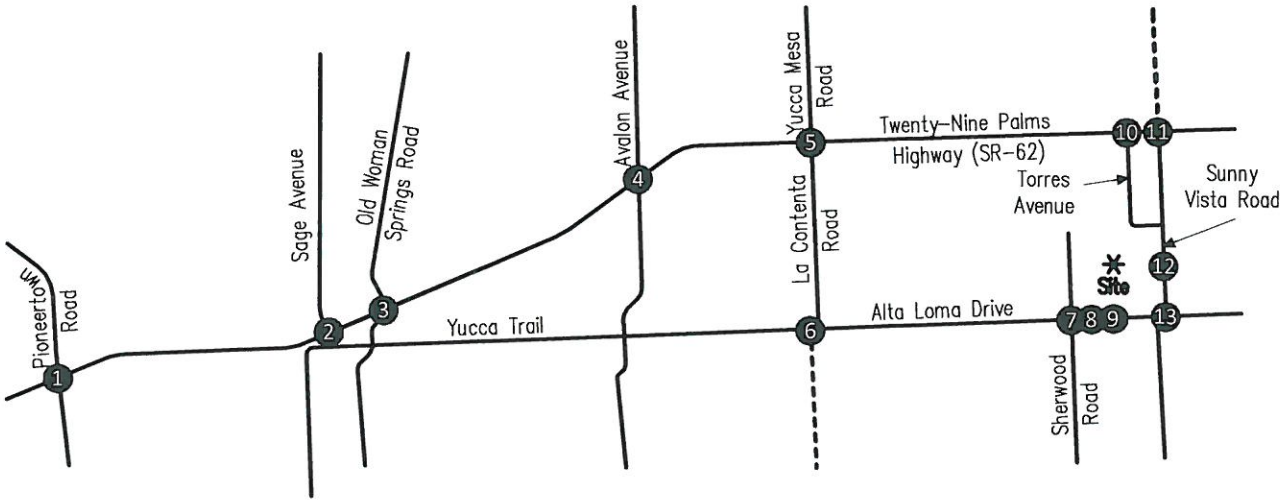
Figure 11
Project Morning Peak Hour Intersection Turning Movement Volumes



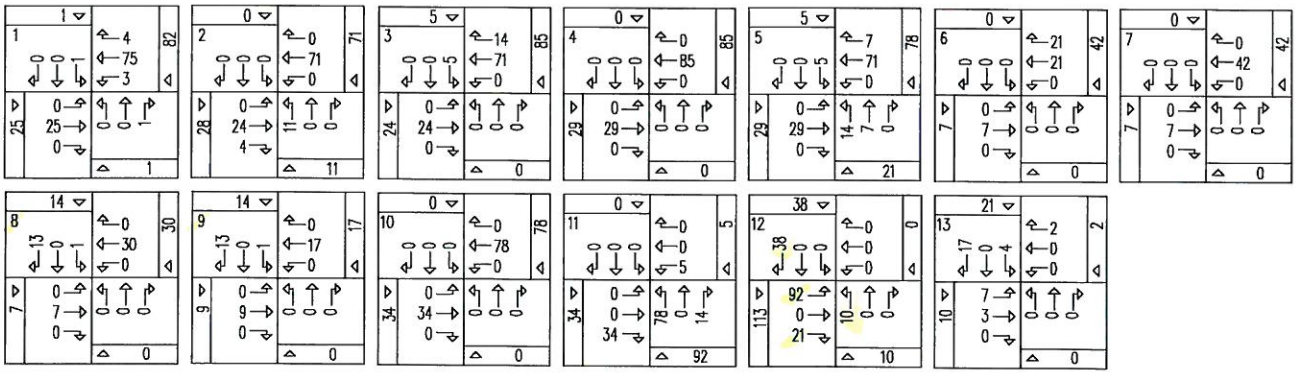


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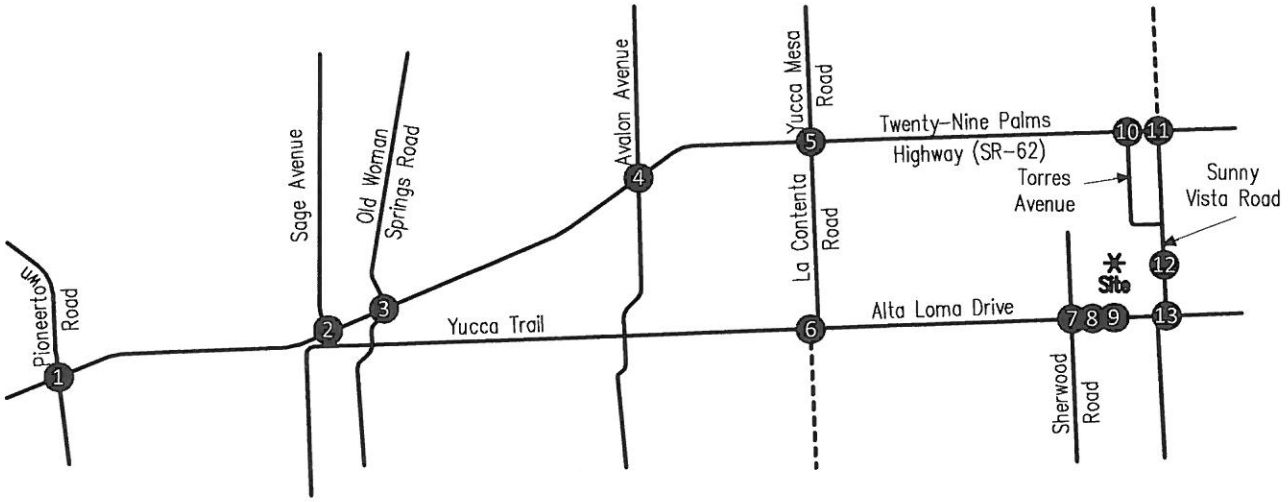
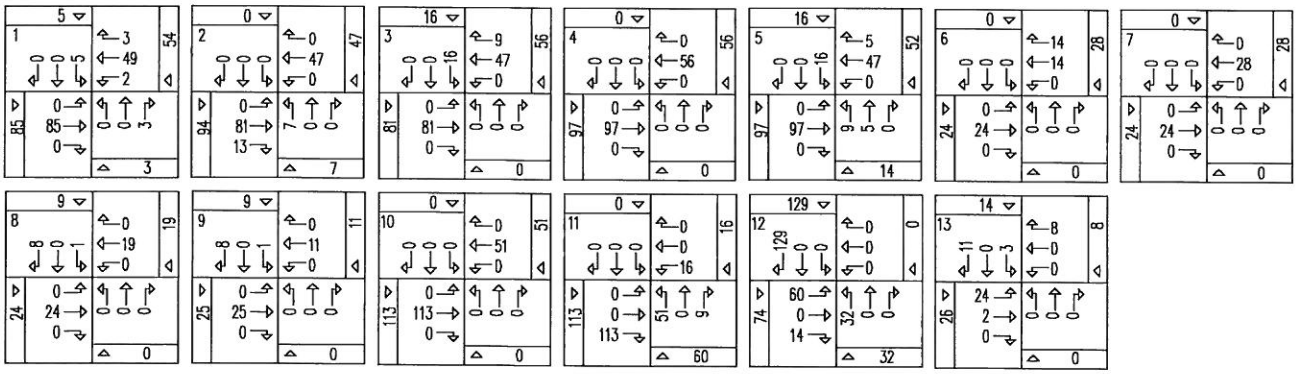
Figure 12
Project Evening Peak Hour Intersection Turning Movement Volumes





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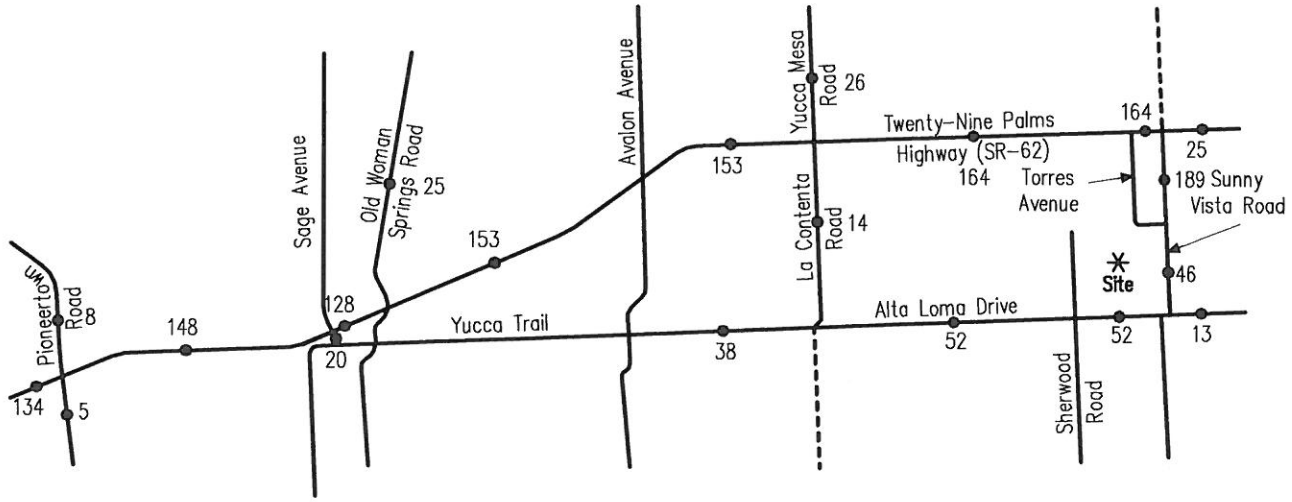
OVER 35 YEARS OF EXCELLENT SERVICE

Figure 13
Project Traffic Contribution Test Volumes



Legend

13 = Project Evening Peak Hour Volumes

NTS

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OVER 35 YEARS OF EXCELLENT SERVICE

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IV. Future Conditions

A. Future Volumes

To assess the Opening Year (2014) and Year 2035 traffic conditions, project traffic is combined with existing traffic and areawide growth. An areawide growth rate has been utilized to account for areawide growth on study area roadways. Opening Year (2014) traffic volumes have been calculated based on a 1.5 percent annual growth rate of existing traffic volumes over a three year period. Year 2035 traffic volumes have been calculated based on a 1.5 percent annual growth rate of existing traffic volumes over a twenty-four year period. The areawide growth rate has been obtained from the Town of Yucca Valley based upon a historical growth rate of 1.5 percent over the last 20 years.

1. Opening Year (2014) Without Project

   The average daily traffic volumes for Opening Year (2014) Without Project traffic conditions have been determined as described above using the areawide growth process. Opening Year (2014) Without Project average daily traffic volumes are shown on Figure 14.

2. Opening Year (2014) With Project

   The average daily traffic volumes for Opening Year (2014) With Project traffic conditions have been determined using the volume addition process. Opening Year (2014) With Project average daily traffic volumes are shown on Figure 15.

3. Year 2035 Without Project

   The average daily traffic volumes for Year 2035 Without Project traffic conditions have been determined as described above using the areawide growth process. Year 2035 Without Project average daily traffic volumes are shown on Figure 16.

4. Year 2035 With Project

   The average daily traffic volumes for Year 2035 With Project traffic conditions have been determined using the volume addition process. Year 2035 With Project average daily traffic volumes are shown on Figure 17.

B. Future Level of Service

1. Opening Year (2014) Without Project

   The Opening Year (2014) Without Project delay and Level of Service for the study area roadway network without the proposed project are shown in Table 3. Table 3 shows delay values based on the geometrics at the study area intersections, without improvements. Opening Year (2014) Without Project delay calculation worksheets are

provided in Appendix D. Opening Year (2014) Without Project morning and evening peak hour intersection turning movement volumes are shown on Figures 18 and 19, respectively.

For Opening Year (2014) Without Project traffic conditions, the study area intersections are projected to operate within acceptable Levels of Service during the peak hours without improvements, except for the following study area intersections that are projected to operate at unacceptable Levels of Service during the peak hours:

Torres Avenue (NS) at:
Twenty-Nine Palms Highway SR-62 (EW)

Sunny Vista Road (NS) at:
Twenty-Nine Palms Highway SR-62 (EW)

2. Opening Year (2014) With Project

The Opening Year (2014) With Project delay and Level of Service for the study area roadway network with the proposed project are shown in Table 4. Table 4 shows delay values based on the geometrics at the study area intersections, without improvements. Opening Year (2014) With Project delay calculation worksheets are provided in Appendix D. Opening Year (2014) With Project morning and evening peak hour intersection turning movement volumes are shown on Figures 20 and 21, respectively.

For Opening Year (2014) With Project traffic conditions, the study area intersections are projected to operate within acceptable Levels of Service during the peak hours without improvements, except for the following study area intersections that are projected to operate at unacceptable Levels of Service during the peak hours:

Torres Avenue (NS) at:
Twenty-Nine Palms Highway SR-62 (EW)

Sunny Vista Road (NS) at:
Twenty-Nine Palms Highway SR-62 (EW)

The Opening Year (2014) delay and Level of Service for the study area roadway network with the proposed project and with improvements are shown in Table 5. Improvements presented in Table 5 include both funded improvements (see Section II.D) and any additional improvements needed to achieve acceptable Levels of Service during the peak hours. Opening Year (2014) With Project (with improvements) delay calculation worksheets are provided in Appendix D. As shown in Table 5, the study area intersections are projected to operate within acceptable Levels of Service during the peak hours for Opening Year (2014) With Project traffic conditions, with improvements.

3. Year 2035 Without Project

The Year 2035 delay and Level of Service for the study area roadway network without the proposed project are shown in Table 6. Table 6 shows delay values based on the geometrics at the study area intersections, without improvements. Year 2035 Without Project delay calculation worksheets are provided in Appendix D. Year 2035 Without Project morning and evening peak hour intersection turning movement volumes are shown on Figures 22 and 23, respectively.

For Year 2035 Without Project traffic conditions, the study area intersections are projected to operate within acceptable Levels of Service during the peak hours without improvements, except for the following study area intersections that are projected to operate at unacceptable Levels of Service during the peak hours:

Torres Avenue (NS) at:
Twenty-Nine Palms Highway SR-62 (EW)

Sunny Vista Road (NS) at:
Twenty-Nine Palms Highway SR-62 (EW)

4. Year 2035 With Project

The Year 2035 With Project delay and Level of Service for the study area roadway network with the proposed project are shown in Table 7. Table 7 shows delay values based on the geometrics at the study area intersections, without improvements. Year 2035 With Project delay calculation worksheets are provided in Appendix D. Year 2035 With Project morning and evening peak hour intersection turning movement volumes are shown on Figures 24 and 25, respectively.

For Year 2035 With Project traffic conditions, the study area intersections are projected to operate within acceptable Levels of Service during the peak hours without improvements, except for the following study area intersections that are projected to operate at unacceptable Levels of Service during the peak hours:

Torres Avenue (NS) at:
Twenty-Nine Palms Highway SR-62 (EW)

Sunny Vista Road (NS) at:
Twenty-Nine Palms Highway SR-62 (EW)

The Year 2035 delay and Level of Service for the study area roadway network with the proposed project and with improvements are shown in Table 8. Improvements presented in Table 8 include both funded improvements (see Section II.D) and any additional improvements needed to achieve acceptable Levels of Service during the peak hours. Year 2035 With Project (with improvements) delay calculation worksheets are provided in Appendix D. As shown in Table 8, the study area intersections are projected to operate within acceptable Levels of Service during the peak hours for Year 2035 With Project traffic conditions, with improvements.

Table 3

Opening Year (2014) Without 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
Pioneertown Road (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	TS	1	1	1	1	0.5	0.5	1	2	1	1	2	1	16.8-B	17.6-B
Sage Avenue (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	TS	1	0.5	0.5	1	0.5	0.5	1	2	1	1	2	1	19.2-B	19.3-B
Old Woman Springs Road (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	TS	1	2	1	1	2	1	1	2	1	1	2	1	20.2-C	29.5-C
Avalon Avenue (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	TS	2	1	1	1	1	1	1	2	1	1	2	1	23.5-C	24.3-C
Yucca Mesa Road / La Contenta Road (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	TS	1	0.5	0.5	1	0.5	0.5	1	2	1	1	2	1	18.8-B	21.1-C
Yucca Trail/Alta Loma Drive (EW)	CSS	0	1	0	1	0.5	0.5	0	1	0	0	1	0	16.6-C	13.5-B
Sherwood Road (NS) at:															
Alta Loma Drive (EW)	CSS	0	1	0	0	1	0	0	1	0	0	1	0	10.8-B	12.4-B
Torres Avenue (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	CSS	0	1	0	0	0	0	0	2	1	1	2	0	22.3-C	59.3-F
Sunny Vista Road (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	CSS	0	1	0	0	1	0	1	2	1	1	2	1	50.4-F	99.9-F[4]
Alta Loma Drive (EW)	AWS	0	1	0	1	0.5	0.5	0	1	0	0	1	0	17.0-C	8.1-A

[1] When a right turn 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 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; CSS = Cross Street Stop; AWS = All Way Stop

[4] 99.9 = Delay High, Intersection Unstable, Level of Service F.

Table 4

Opening Year (2014) With 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
Pioneertown Road (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	TS	1	1	1	1	0.5	0.5	1	2	1	1	2	1	16.8-B	17.7-B
Sage Avenue (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	TS	1	0.5	0.5	1	0.5	0.5	1	2	1	1	2	1	19.3-B	19.5-B
Old Woman Springs Road (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	TS	1	2	1	1	2	1	1	2	1	1	2	1	20.4-C	30.2-C
Avalon Avenue (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	TS	2	1	1	1	1	1	1	2	1	1	2	1	23.5-C	24.9-C
Yucca Mesa Road / La Contenta Road (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	TS	1	0.5	0.5	1	0.5	0.5	1	2	1	1	2	1	19.0-B	21.4-C
Yucca Trail/Alta Loma Drive (EW)	CSS	0	1	0	1	0.5	0.5	0	1	0	0	1	0	18.6-C	14.4-B
Sherwood Road (NS) at:															
Alta Loma Drive (EW)	CSS	0	1	0	0	1	0	0	1	0	0	1	0	11.4-B	13.1-B
Project West Access (NS) at:															
Alta Loma Drive (EW)	CSS	0	0	0	0	1	0	0.5	0.5	0	0	5	0.5	9.1-A	9.0-A
Project East Access (NS) at:															
Alta Loma Drive (EW)	CSS	0	0	0	0	1	0	0.5	0.5	0	0	5	0.5	9.0-A	9.0-A
Torres Avenue (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	CSS	0	1	0	0	0	0	0	2	1	1	2	0	24.4-C	79.4-F
Sunny Vista Road (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	CSS	0	1	0	0	1	0	1	2	1	1	2	1	99.9-F[4]	99.9-F
Project Access (EW)	CSS	0.5	0.5	0	0	0.5	0.5	0	1	0	0	0	0	13.3-B	10.7-B
Alta Loma Drive (EW)	AWS	0	1	0	1	0.5	0.5	0	1	0	0	1	0	18.3-C	8.4-A

[1] When a right turn 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 = Improvement

[2] Delay and level of service calculated using the following analysis software: Traffix, Version 7.8.0115 (2006). 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; CSS = Cross Street Stop; AWS = All Way Stop

[4] 99.9 = Delay High, Intersection Unstable, Level of Service F.

Table 5

Opening Year (2014) With Project Intersection Delay and Level of Service With Improvements

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
Pioneertown Road (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	TS	1	1	1	1	0.5	0.5	1	2	1	1	2	1	16.8-B	17.7-B
Sage Avenue (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	TS	1	0.5	0.5	1	0.5	0.5	1	2	1	1	2	1	19.3-B	19.5-B
Old Woman Springs Road (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	TS	1	2	1	1	2	1	1	2	1	1	2	1	20.4-C	30.2-C
Avalon Avenue (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	TS	2	1	1	1	1	1	1	2	1	1	2	1	23.5-C	24.9-C
Yucca Mesa Road / La Contenta Road (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	TS	1	0.5	0.5	1	0.5	0.5	1	2	1	1	2	1	19.0-B	21.4-C
Yucca Trail/Alta Loma Drive (EW)	CSS	0	1	0	1	0.5	0.5	0	1	0	0	1	0	18.6-C	14.4-B
Sherwood Road (NS) at:															
Alta Loma Drive (EW)	CSS	0	1	0	0	1	0	0	1	0	0	1	0	11.4-B	13.1-B
Project West Access (NS) at:															
Alta Loma Drive (EW)	**CSS**	0	0	0	0	**1**	0	0.5	0.5	0	0	5	0.5	9.1-A	9.0-A
Project East Access (NS) at:															
Alta Loma Drive (EW)	**CSS**	0	0	0	0	**1**	0	0.5	0.5	0	0	5	0.5	9.0-A	9.0-A
Torres Avenue (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	**CSS**[4]	0	0	**1**	0	0	0	0	2	1	**0**	2	0	11.0-B	13.6-B
Sunny Vista Road (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	**TS**	0	1	0	0	1	0	1	2	1	1	2	1	23.1-C	12.3-B
Project Access (EW)	**CSS**	0.5	0.5	0	0	0.5	0.5	0	**1**	0	0	0	0	13.3-B	10.7-B
Alta Loma Drive (EW)	AWS	0	1	0	1	0.5	0.5	0	1	0	0	1	0	18.3-C	8.4-A

[1] When a right turn 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** = Improvement

[2] Delay and level of service calculated using the following analysis software: Traffix, Version 7.8.0115 (2006). 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; CSS = Cross Street Stop; AWS = All Way Stop

[4] Restricted to right turns in/out only.

Table 6

Year 2035 Without 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
Pioneertown Road (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	TS	1	1	1	1	0.5	0.5	1	2	1	1	2	1	11.4-B	13.0-B
Sage Avenue (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	TS	1	0.5	0.5	1	0.5	0.5	1	2	1	1	2	1	18.4-B	16.0-B
Old Woman Springs Road (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	TS	1	2	1	1	2	1	1	2	1	1	2	1	23.0-C	40.7-D
Avalon Avenue (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	TS	2	1	1	1	1	1	1	2	1	1	2	1	19.4-B	21.8-C
Yucca Mesa Road / La Contenta Road (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	TS	1	0.5	0.5	1	0.5	0.5	1	2	1	1	2	1	17.6-B	18.1-B
Yucca Trail/Alta Loma Drive (EW)	CSS	0	1	0	1	0.5	0.5	0	1	0	0	1	0	15.9-C	14.0-B
Sherwood Road (NS) at:															
Alta Loma Drive (EW)	CSS	0	1	0	0	1	0	0	1	0	0	1	0	11.5-B	13.6-B
Torres Avenue (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	CSS	0	1	0	0	0	0	0	2	1	1	2	0	37.2-E	99.9-F[4]
Sunny Vista Road (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	CSS	0	1	0	0	1	0	1	2	1	1	2	1	99.9-F	99.9-F
Alta Loma Drive (EW)	AWS	0	1	0	1	0.5	0.5	0	1	0	0	1	0	17.9-C	8.4-A

[1] When a right turn 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 calculated using the following analysis software: Traffix, Version 7.8.0115 (2006). 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; CSS = Cross Street Stop; AWS = All Way Stop

[4] 99.9 = Delay High, Intersection Unstable, Level of Service F.

Table 7

Year 2035 With 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
Pioneertown Road (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	TS	1	1	1	1	0.5	0.5	1	2	1	1	2	1	11.4-B	13.2-B
Sage Avenue (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	TS	1	0.5	0.5	1	0.5	0.5	1	2	1	1	2	1	18.7-B	16.1-B
Old Woman Springs Road (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	TS	1	2	1	1	2	1	1	2	1	1	2	1	26.3-C	42.0-D
Avalon Avenue (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	TS	2	1	1	1	1	1	1	2	1	1	2	1	19.5-B	22.7-C
Yucca Mesa Road / La Contenta Road (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	TS	1	0.5	0.5	1	0.5	0.5	1	2	1	1	2	1	17.7-B	18.3-B
Yucca Trail/Alta Loma Drive (EW)	CSS	0	1	0	1	0.5	0.5	0	1	0	0	1	0	17.1-C	14.7-B
Sherwood Road (NS) at:															
Alta Loma Drive (EW)	CSS	0	1	0	0	1	0	0	1	0	0	1	0	12.0-B	14.4-B
Project West Access (NS) at:															
Alta Loma Drive (EW)	CSS	0	0	0	0	1	0	0.5	0.5	0	0	5	0.5	9.4-A	9.3-A
Project East Access (NS) at:															
Alta Loma Drive (EW)	CSS	0	0	0	0	1	0	0.5	0.5	0	0	5	0.5	9.3-A	9.2-A
Torres Avenue (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	CSS	0	1	0	0	0	0	0	2	1	1	2	0	41.4-E	99.9-F[4]
Sunny Vista Road (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	CSS	0	1	0	0	1	0	1	2	1	1	2	1	99.9-F	99.9-F
Project Access (EW)	CSS	0.5	0.5	0	0	0.5	0.5	0	1	0	0	0	0	16.1-C	11.3-B
Alta Loma Drive (EW)	AWS	0	1	0	1	0.5	0.5	0	1	0	0	1	0	19.1-C	8.7-A

[1] When a right turn 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; >> = Free Right Turn; 1 = Improvement

[2] Delay and level of service calculated using the following analysis software: Traffix, Version 7.8.0115 (2006). 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; CSS = Cross Street Stop; AWS = All Way Stop

[4] 99.9 = Delay High, Intersection Unstable, Level of Service F.

Table 8

Year 2035 With Project Intersection Delay and Level of Service With Improvements

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
Pioneertown Road (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	TS	1	1	1	1	0.5	0.5	1	2	1	1	2	1	11.4-B	13.2-B
Sage Avenue (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	TS	1	0.5	0.5	1	0.5	0.5	1	2	1	1	2	1	18.7-B	16.1-B
Old Woman Springs Road (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	TS	1	2	1	1	2	1	1	2	1	1	2	1	26.3-C	42.0-D
Avalon Avenue (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	TS	2	1	1	1	1	1	1	2	1	1	2	1	19.5-B	22.7-C
Yucca Mesa Road / La Contenta Road (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	TS	1	0.5	0.5	1	0.5	0.5	1	2	1	1	2	1	17.7-B	18.3-B
Yucca Trail/Alta Loma Drive (EW)	CSS	0	1	0	1	0.5	0.5	0	1	0	0	1	0	17.1-C	14.7-B
Sherwood Road (NS) at:															
Alta Loma Drive (EW)	CSS	0	1	0	0	1	0	0	1	0	0	1	0	12.0-B	14.4-B
Project West Access (NS) at:															
Alta Loma Drive (EW)	**CSS**	0	0	0	0	**1**	0	0.5	0.5	0	0	5	0.5	9.4-A	9.3-A
Project East Access (NS) at:															
Alta Loma Drive (EW)	**CSS**	0	0	0	0	**1**	0	0.5	0.5	0	0	5	0.5	9.3-A	9.2-A
Torres Avenue (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	**CSS**[4]	0	0	**1**	0	0	0	0	2	1	**0**	2	0	12.4-B	16.6-C
Sunny Vista Road (NS) at:															
Twenty-Nine Palms Highway SR-62 (EW)	**TS**	0	1	0	0	1	0	1	2	1	1	2	1	20.1-C	11.8-B
Project Access (EW)	**CSS**	0.5	0.5	0	0	0.5	0.5	0	**1**	0	0	0	0	16.1-C	11.3-B
Alta Loma Drive (EW)	AWS	0	1	0	1	0.5	0.5	0	1	0	0	1	0	19.1-C	8.7-A

[1] When a right turn 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.

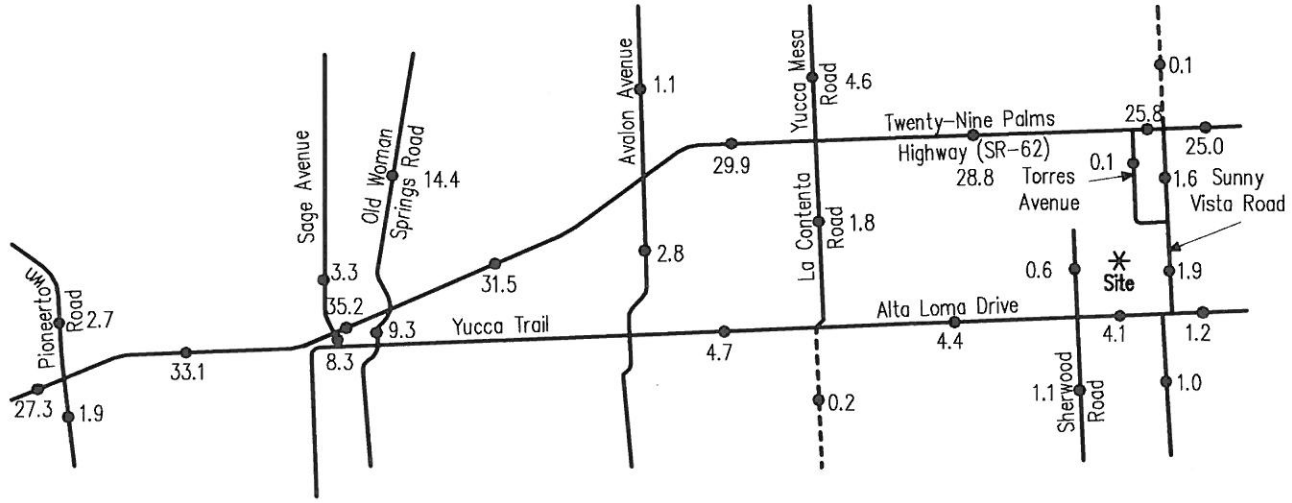
L = Left; T = Through; R = Right; **1** = Improvement

[2] Delay and level of service calculated using the following analysis software: Traffix, Version 7.8.0115 (2006). 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; CSS = Cross Street Stop; AWS = All Way Stop

[4] Restricted to right turns in/out only.

Figure 14
Opening Year (2014) Without Project Average Daily Traffic Volumes



Legend

1.0 = Vehicles Per Day (1000's)

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OVER 35 YEARS OF EXCELLENT SERVICE

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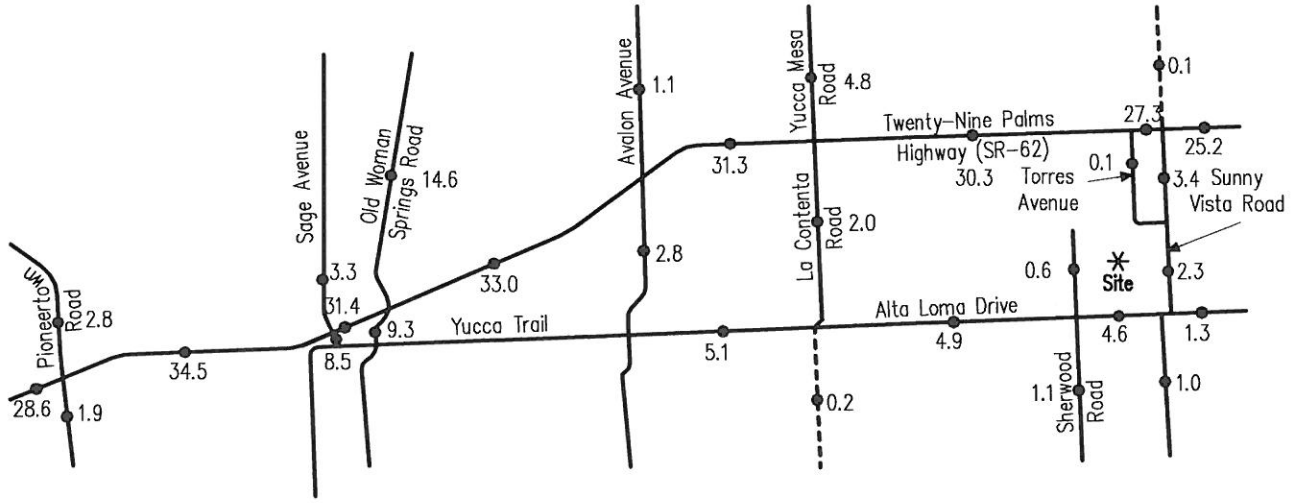
Figure 15
Opening Year (2014) With Project Average Daily Traffic Volumes



Legend

1.0 = Vehicles Per Day (1000's)

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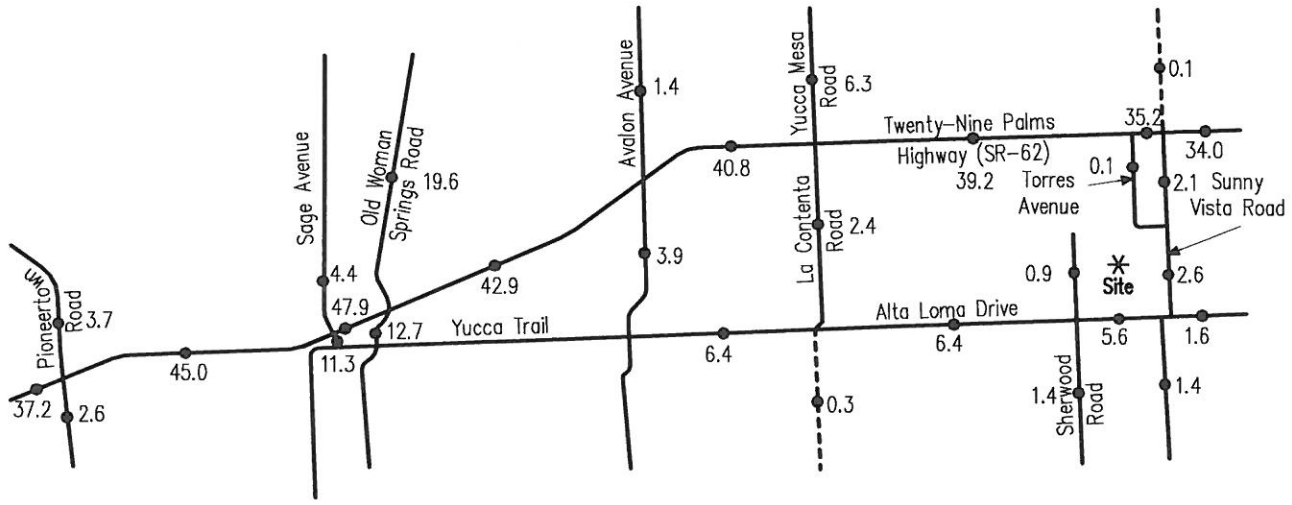
Figure 16
Year 2035 Without Project Average Daily Traffic Volumes



Legend

1.4 = Vehicles Per Day (1000's)

N

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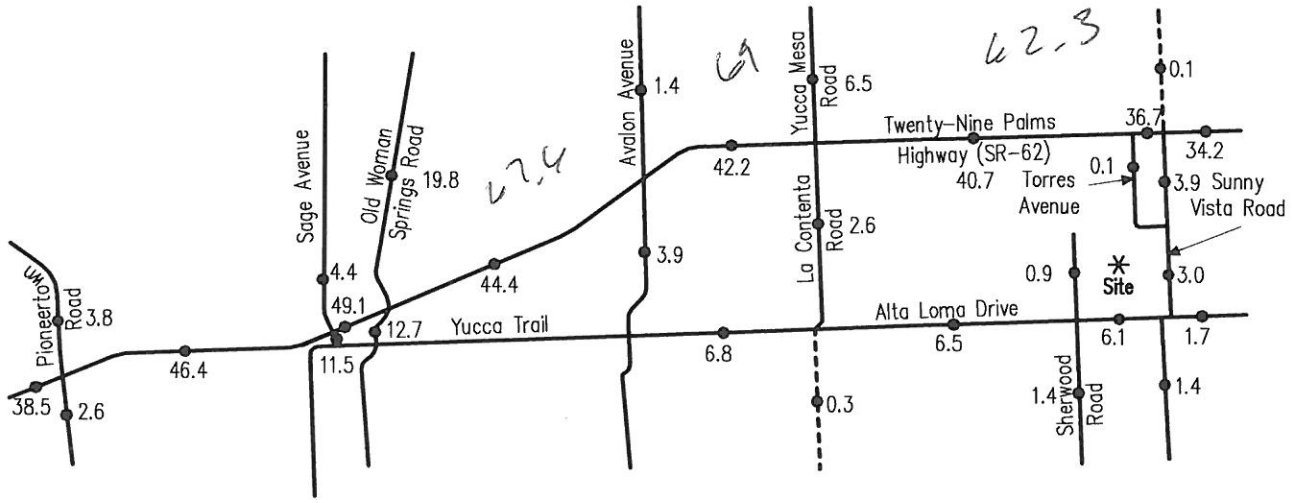
3744f/16

Figure 17
Year 2035 With Project Average Daily Traffic Volumes



Legend

1.4 = Vehicles Per Day (1000's)

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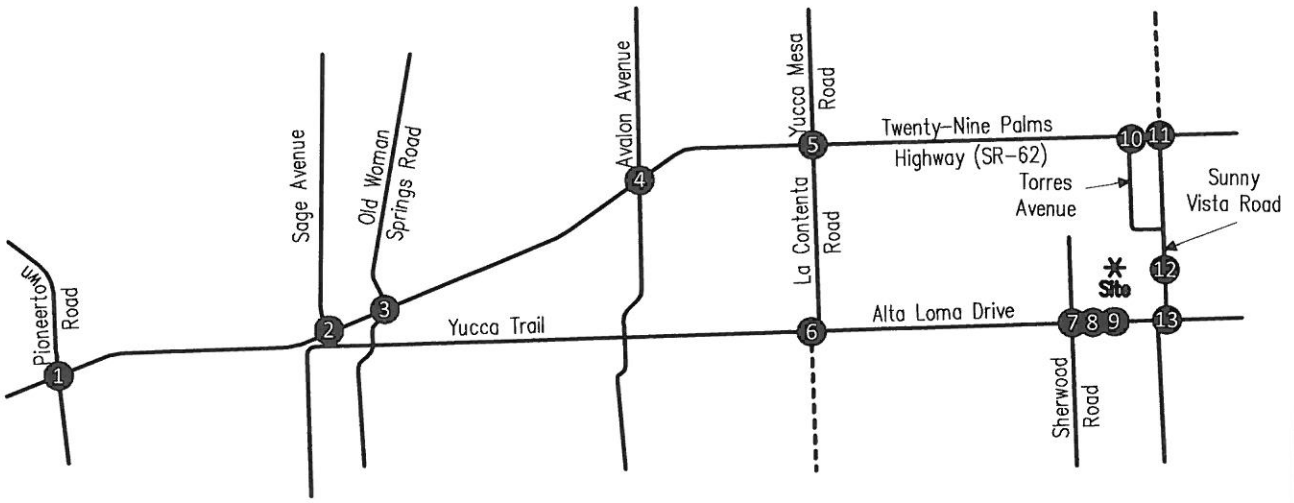
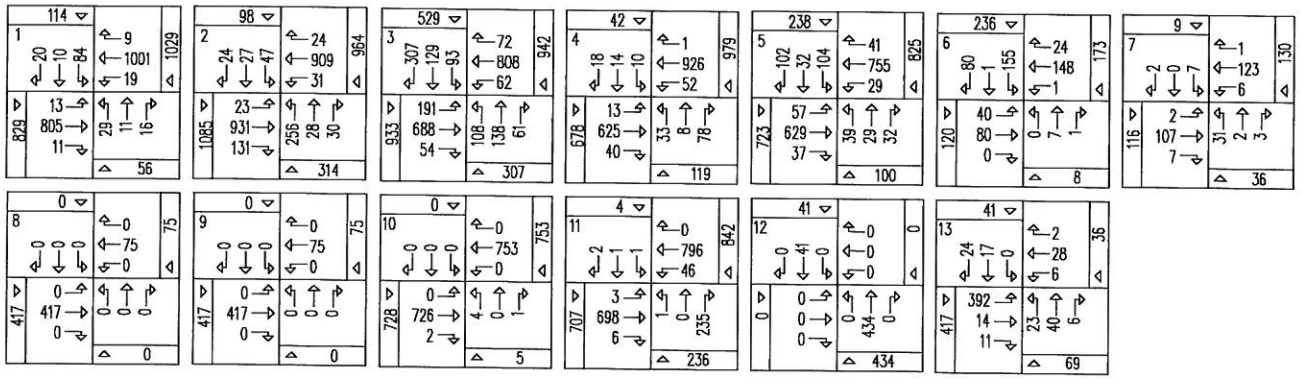
OVER 35 YEARS OF EXCELLENT SERVICE

3744f/17

Figure 18
Opening (Year 2014) Without Project
Morning Peak Hour Intersection Turning Movement Volumes





NTS

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

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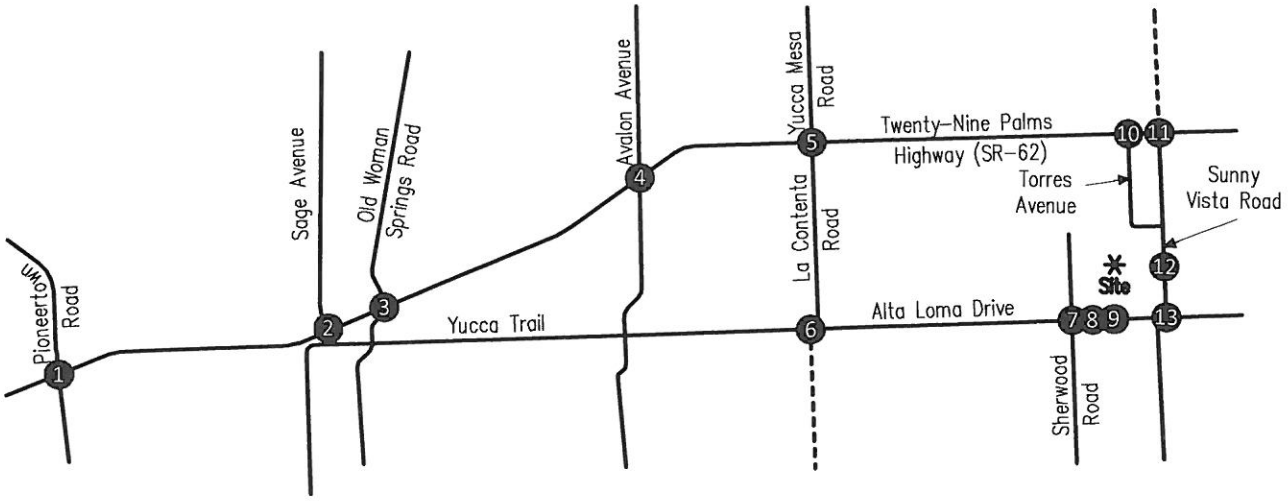
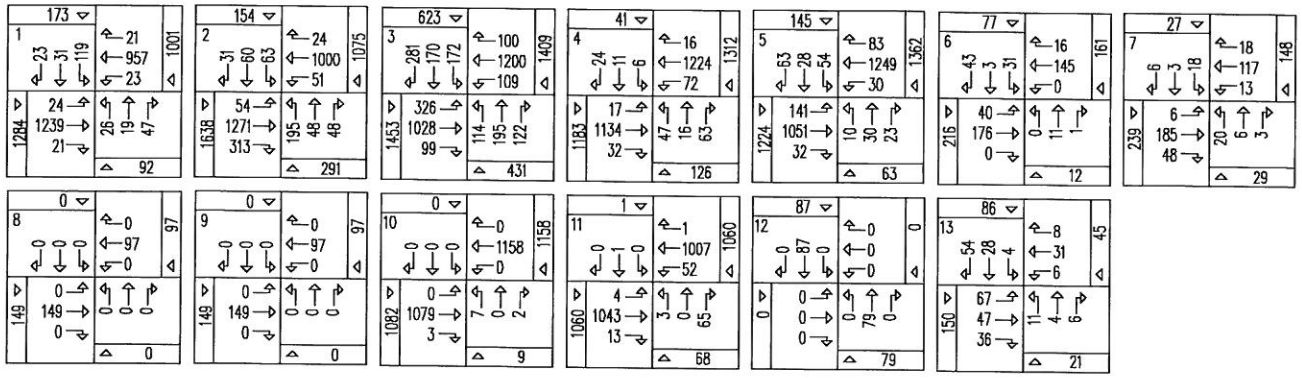
OVER 35 YEARS OF EXCELLENT SERVICE

Figure 19
Opening (Year 2014) Without Project
Evening Peak Hour Intersection Turning Movement Volumes





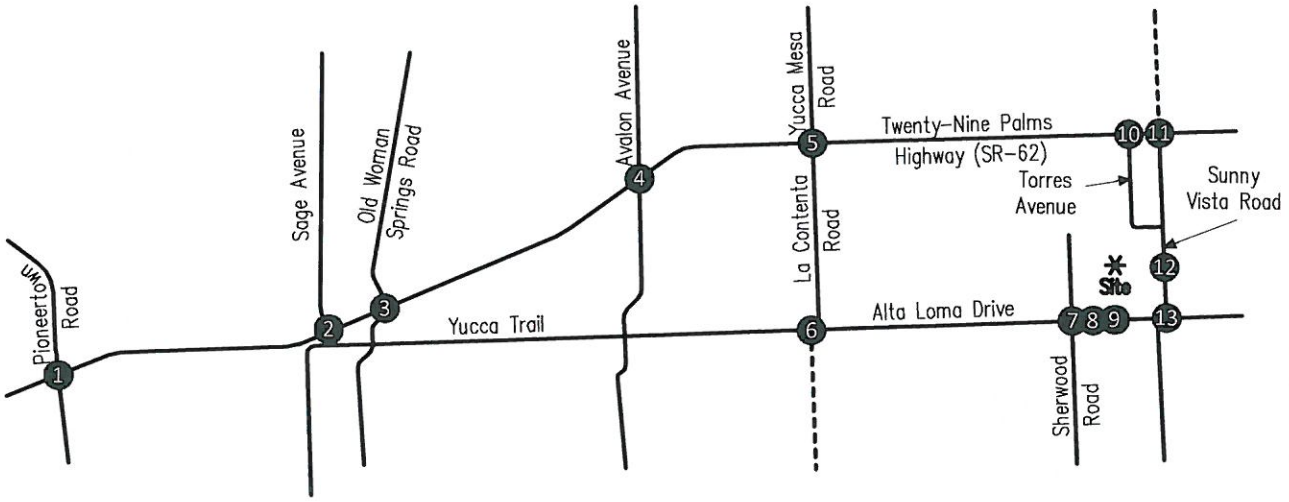
NTS

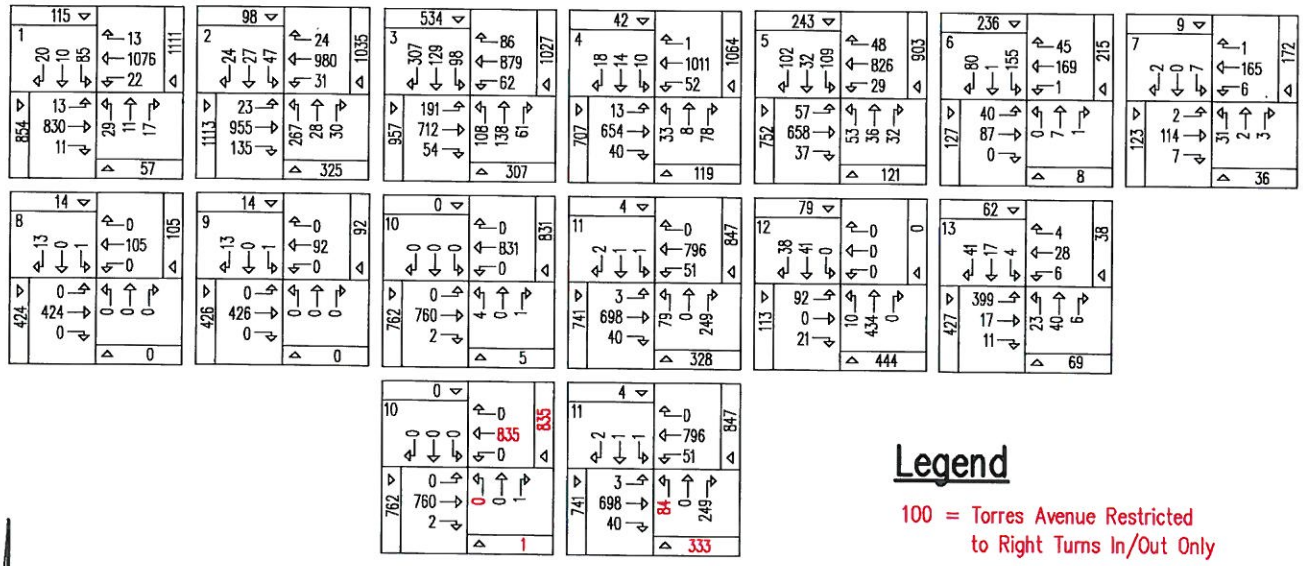
KUNZMAN ASSOCIATES, INC. Intersection reference numbers are in upper left corner of turning movement boxes.

3744f/19

OVER 35 YEARS OF EXCELLENT SERVICE

Figure 20
Opening (Year 2014) With Project
Morning Peak Hour Intersection Turning Movement Volumes





Legend

100 = Torres Avenue Restricted to Right Turns In/Out Only

NTS

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

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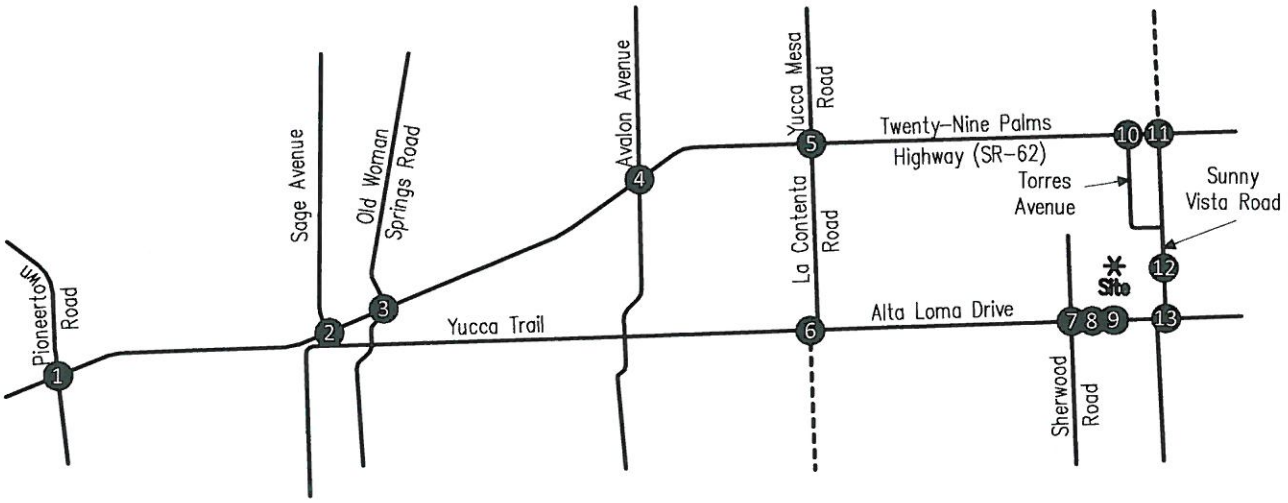
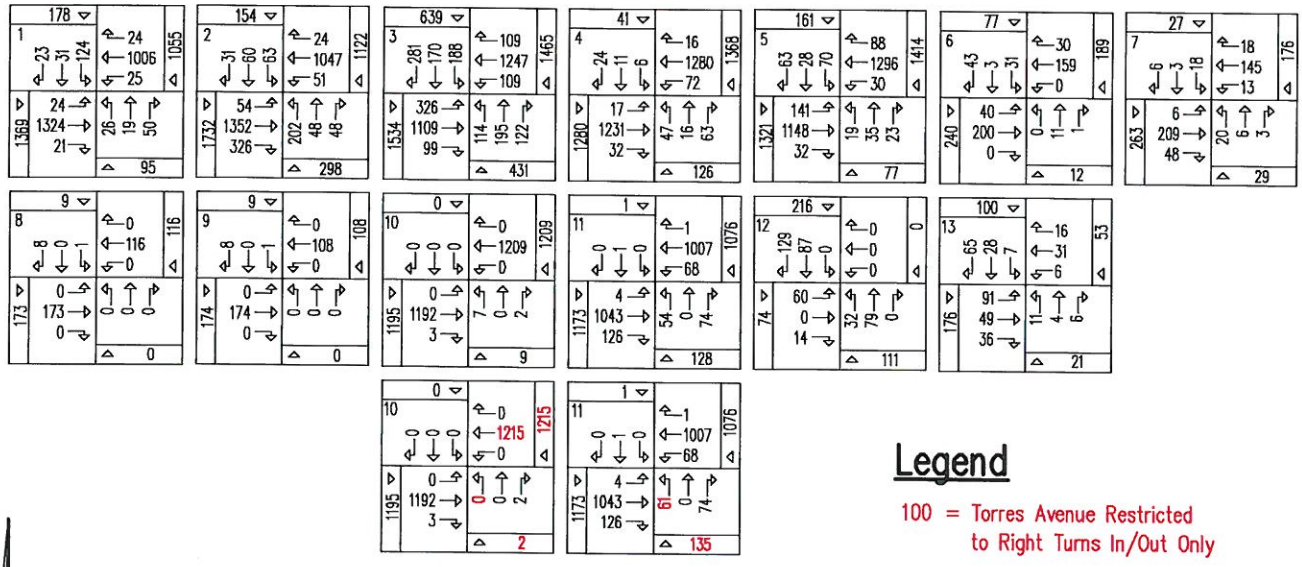
OVER 35 YEARS OF EXCELLENT SERVICE

Figure 21
Opening (Year 2014) With Project
Evening Peak Hour Intersection Turning Movement Volumes





Legend

100 = Torres Avenue Restricted to Right Turns In/Out Only

NTS

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

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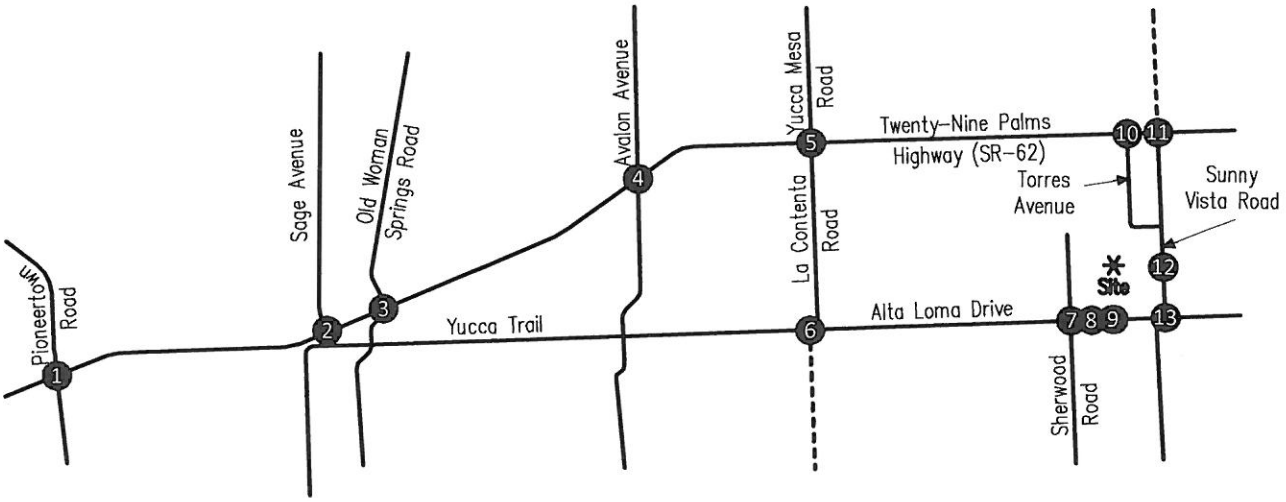
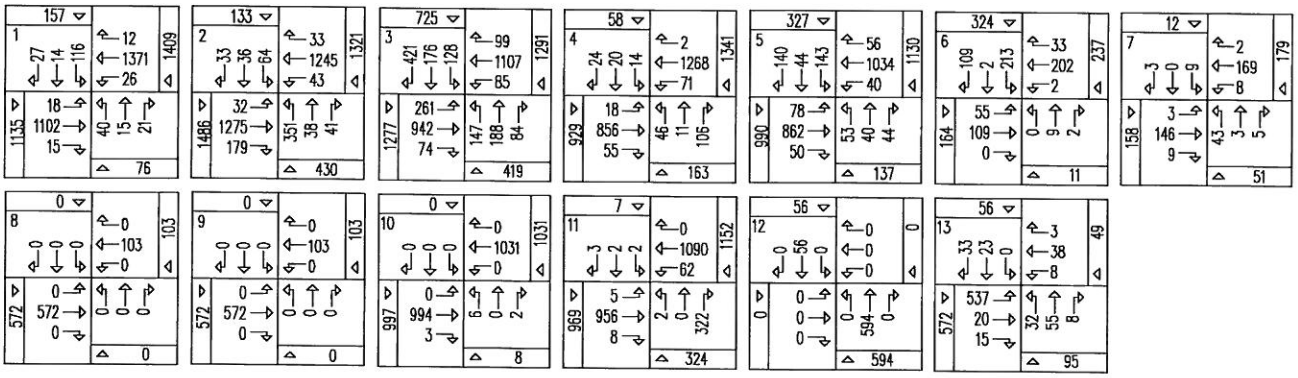
OVER 35 YEARS OF EXCELLENT SERVICE

Figure 22
Year 2035 Without Project
Morning Peak Hour Intersection Turning Movement Volumes





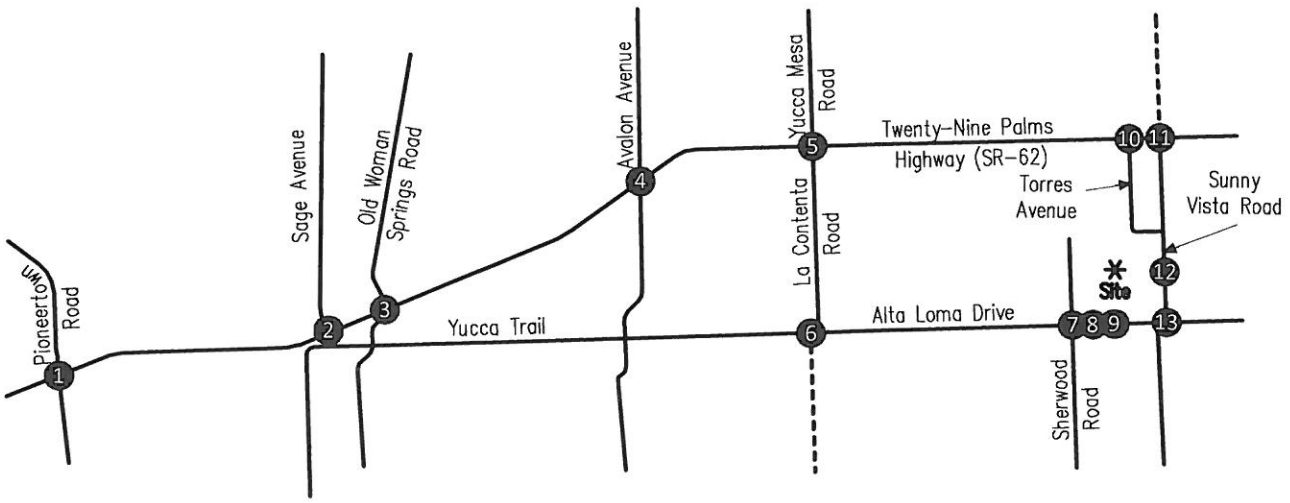
NTS

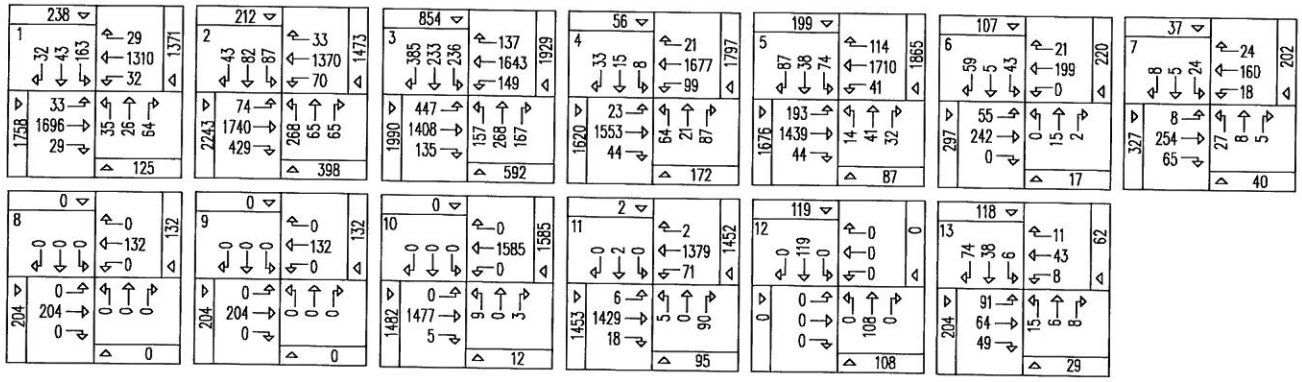
KUNZMAN ASSOCIATES, INC. Intersection reference numbers are in upper left corner of turning movement boxes.

3744f/22

OVER 35 YEARS OF EXCELLENT SERVICE

Figure 23
Year 2035 Without Project
Evening Peak Hour Intersection Turning Movement Volumes





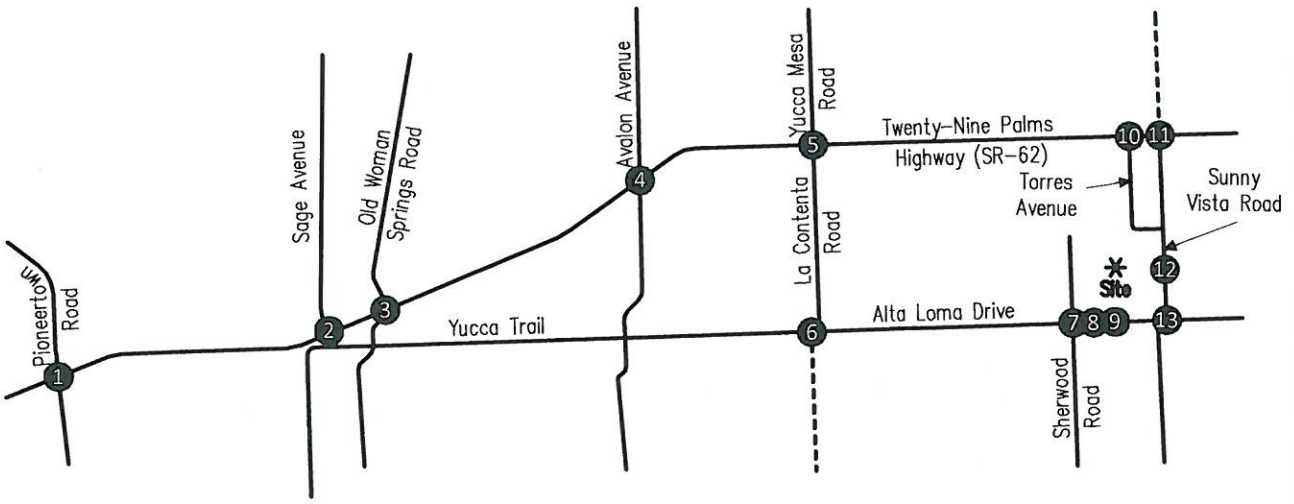
NTS

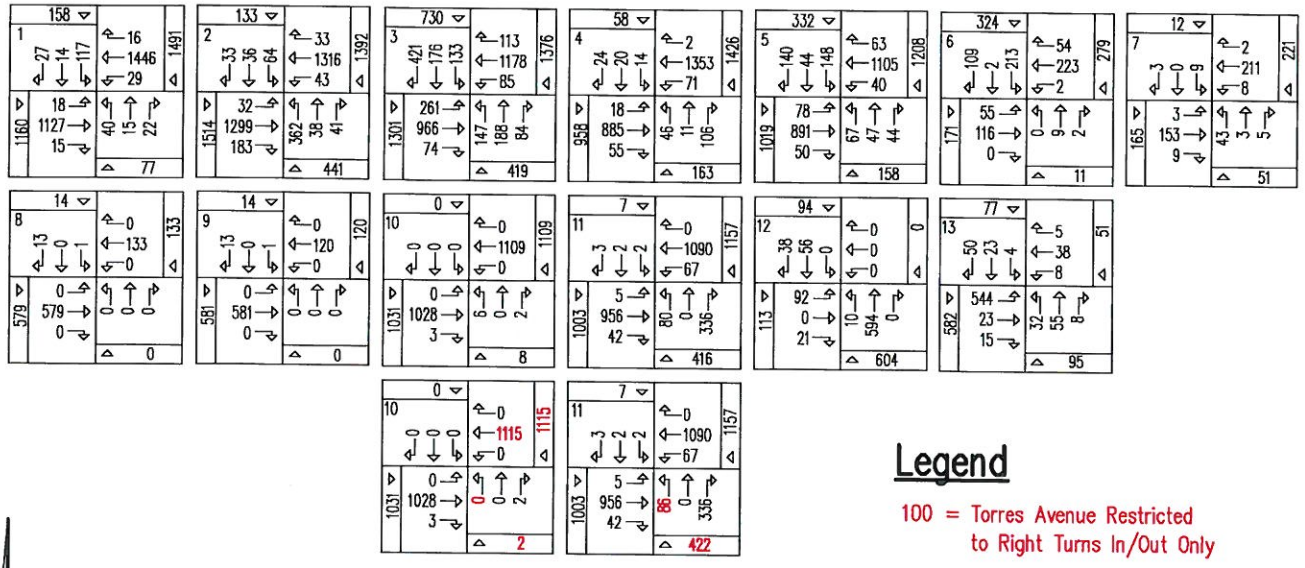
KUNZMAN ASSOCIATES, INC. Intersection reference numbers are in upper left corner of turning movement boxes.

3744f/23

OVER 35 YEARS OF EXCELLENT SERVICE

Figure 24
Year 2035 With Project
Morning Peak Hour Intersection Turning Movement Volumes





Legend

100 = Torres Avenue Restricted to Right Turns In/Out Only

NTS

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

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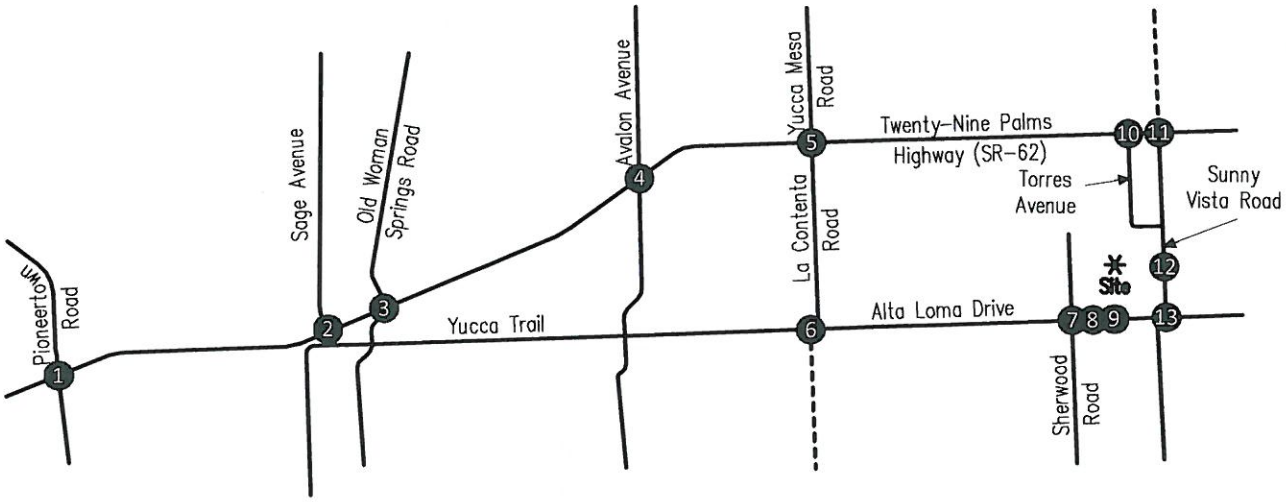
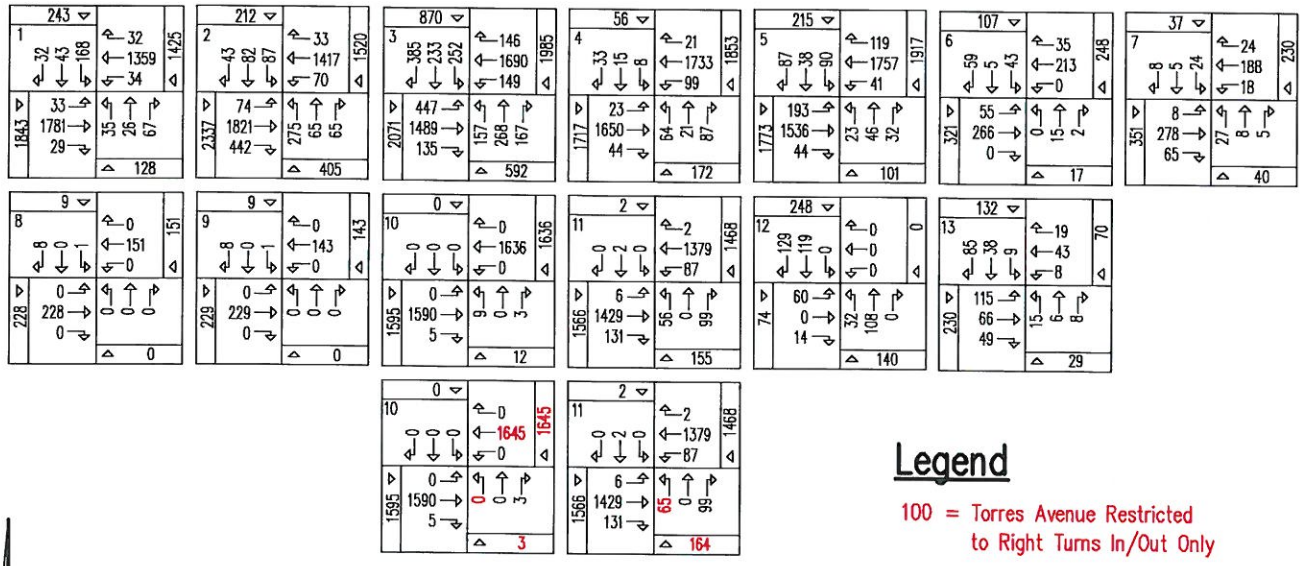
OVER 35 YEARS OF EXCELLENT SERVICE

Figure 25
Year 2035 With Project
Evening Peak Hour Intersection Turning Movement Volumes





Legend

100 = Torres Avenue Restricted to Right Turns In/Out Only

NTS

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

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V. Project Mitigation and Cost Summary

A. Required Improvements and Costs

Improvements that will eliminate all anticipated roadway operational deficiencies throughout the study area have been identified for Opening Year (2014) and Year 2035 traffic conditions. The improvements were determined through the operations analysis of Section IV.

The approximate costs for the Year 2035 improvements have generally been estimated using cost guidelines in the Congestion Management Program Handbook (see Appendix F). For adding a through lane, a unit cost of $289,720 has been assumed and a unit cost of $400,000 for installation of a traffic signal has been substituted for the lower value cited in the Congestion Management Plan materials.

The needed improvements and resulting costs are summarized in Table 9 for intersections and roadway links. The total cost of needed and unfunded roadway improvements is $400,000.

B. Project Contribution and Fair Share Costs

The project fair share contributions have also been calculated for Year 2035 improvement locations. The project share of cost has been based on the proportion of project peak hour traffic contributed to the improvement location relative to the total new peak hour Year 2035 traffic volume.

Table 10 presents a summary of improvement cost and project cost shares at each of the Year 2035 intersection improvement locations. The intersection fair share cost calculations are based on the higher of the morning and evening peak hour traffic volumes. As shown in Table 10, the project's fair share of identified intersection and roadway link costs is $68,400.

The dollar figures are rough order of magnitude estimates only. They are intended only for the discussion purposes of this traffic impact analysis, and do not imply any legal responsibility or formula for contributions or mitigation.

As mitigation for the potential traffic impacts, the proposed project shall contribute on a fair share basis in the implementation of the recommended intersection lane improvements or freeway improvements, or in dollar equivalent in lieu mitigation contributions, or in the implementation of additional capacity on parallel routes to offset potential impacts to intersections and freeway segments.

Table 9

Summary of Intersection Improvements and Costs

Intersection	Improvement	Total Cost
Sunny Vista Road (NS) at: Twenty-Nine Palms Highway SR-62 (EW)	Install Traffic Signal[1]	$ 400,000

[1] Improvement needed for Opening Year (2014).

Table 10

Project Fair Share Intersection Traffic Contribution

Intersection	Total Cost	Peak Hour Traffic Volumes										Project Cost Share	
		Existing (Year 2011)		Year 2035 With Project		Project		Total New		Project % of New			
		Morning	Evening	Morning	Evening	Morning	Evening	Morning	Evening	Morning	Evening	Morning	Evening
Sunny Vista Road (NS) at:													
Twenty-Nine Palms Highway SR-62 (EW)	$ 400,000	1,708	2,092	2,589	3,200	131	189	881	1,108	14.9%	17.1%	$ 59,600	$ 68,400 [1]

[1] Higher project cost share.

VI. Conclusions and Recommendations

A. Summary

The traffic issues related to the proposed land use and development have been evaluated in the context of the California Environmental Quality Act.

The County of San Bernardino is the lead agency responsible for preparation of the traffic impact analysis, in accordance with the California Environmental Quality Act authorizing legislation. This report analyzes traffic impacts for the anticipated opening date with full occupancy of the development in Year 2014, at which time it will be generating traffic at its full potential, and for the Year 2035.

A series of scoping discussions were conducted with the following agencies to define the desired analysis locations for each future analysis year:

- County of San Bernardino
- San Bernardino Associated Governments
- California Department of Transportation

In addition, staff from the County of San Bernardino has also been contacted to discuss the project and its associated travel patterns.

No analysis is required further than 5 miles from the project site. The roadway elements that must be analyzed are dependent on both the analysis year (project Opening Year or Year 2035) and project generated traffic volumes. The identification of the study area, and the intersections and highway segments requiring analysis, was based on an estimate of the two-way traffic volumes on the roadway segments near the project site. All arterial segments have been included in the analysis when the anticipated project volume equals or exceeds 50 two-way trips in the peak hours. The requirement is 100 two-way peak hour trips for freeways.

The project does not contribute traffic greater than the freeway threshold volume of 100 two-way peak hour trips. The project contributes traffic greater than the arterial link threshold volume of 50 two-way trips in the morning and evening peak hours in the Town of Yucca Valley. This means that the County of San Bernardino must notify the California Department of Transportation and Town of Yucca Valley. Each of these agencies have been provided with a copy of the traffic impact analysis, once the document was accepted by the County of San Bernardino. (Note: The purpose of this notification is to allow the identification of opportunities to make improvements to intersections concurrent with adjacent development, at considerably less cost and disruption than would occur if it were done after-the-fact).

B. Existing (Year 2011) Conditions

Regional access to the project site is provided by the Twenty-Nine Palms Highway SR-62. Local access is provided by various roadways in the vicinity of the site. The east-west roadways which will be most affected by the project include Twenty-Nine Palms Highway SR-62, and Alta Loma Drive. North-south roadways expected to provide local access include Pioneertown Road, Sage Avenue, Old Woman Springs Road, Avalon Avenue, Yucca Mesa Road/La Contenta Road, Sherwood Avenue, Torres Avenue, and Sunny Vista Road.

The study area intersections currently operate within acceptable Levels of Service during the peak hours for Existing traffic conditions, except for the following study area intersections that currently operate at unacceptable Levels of Service during the peak hours:

Torres Avenue (NS) at:
Twenty-Nine Palms Highway SR-62 (EW)

Sunny Vista Road (NS) at:
Twenty-Nine Palms Highway SR-62 (EW)

C. Existing (Year 2011) Traffic Signal Warrant Analysis

A traffic signal appears to currently be warranted at the following study area intersection for existing traffic conditions (see Appendix E):

Sunny Vista Road (NS) at:
Twenty-Nine Palms Highway SR-62 (EW)

The unsignalized intersections have been evaluated for traffic signals using the California Department of Transportation Warrant 3 Peak Hour traffic signal warrant analysis, as specified in the Manual of Uniform Traffic Control Devices 2003 California Supplement, dated May 20, 2004.

D. Project Traffic

Trip 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 use. By multiplying the traffic generation rates by the land use quantity, the traffic volumes are determined based upon rates obtained from the Institute of Transportation Engineers, Trip Generation, 8th Edition, 2008.

As shown in Table 2, the proposed development is projected to generate approximately 2,412 daily vehicle trips, 189 of which will occur during the morning peak hour and 254 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.

E. Future Conditions

An Opening Year (2014) analysis and Year 2035 analysis are included in this report. Opening Year (2014) traffic operations analysis has been completed for the morning and evening peak hours and are shown in Tables 3 through 5. Morning and evening peak hour traffic operations analysis are summarized in Tables 6 through 8 for the Year 2035.

1. Opening Year (2014) Without Project

For Opening Year (2014) Without Project traffic conditions, the study area intersections are projected to operate within acceptable Levels of Service during the peak hours without improvements, except for the following study area intersections that are projected to operate at unacceptable Levels of Service during the peak hours:

Torres Avenue (NS) at:
Twenty-Nine Palms Highway SR-62 (EW)

Sunny Vista Road (NS) at:
Twenty-Nine Palms Highway SR-62 (EW)

2. Opening Year (2014) With Project

For Opening Year (2014) With Project traffic conditions, the following study area intersections are projected to operate within acceptable Levels of Service during the peak hours without improvements, except for the following study area intersections that are projected to operate at unacceptable Levels of Service during the peak hours:

Torres Avenue (NS) at:
Twenty-Nine Palms Highway SR-62 (EW)

Sunny Vista Road (NS) at:
Twenty-Nine Palms Highway SR-62 (EW)

The study area intersections are projected to operate within acceptable Levels of Service during the peak hours for Opening Year (2014) With Project traffic conditions, with improvements.

3. Year 2035 Without Project

For Year 2035 Without Project traffic conditions, the study area intersections are projected to operate within acceptable Levels of Service during the peak hours without improvements, except for the following study area intersections that are projected to operate at unacceptable Levels of Service during the peak hours:

Torres Avenue (NS) at:
Twenty-Nine Palms Highway SR-62 (EW)

Sunny Vista Road (NS) at:
Twenty-Nine Palms Highway SR-62 (EW)

4. Year 2035 With Project

For Year 2035 With Project traffic conditions, the following study area intersections are projected to operate within acceptable Levels of Service during the peak hours without improvements, except for the following study area intersections that are projected to operate at unacceptable Levels of Service during the peak hours:

Torres Avenue (NS) at:
Twenty-Nine Palms Highway SR-62 (EW)

Sunny Vista Road (NS) at:
Twenty-Nine Palms Highway SR-62 (EW)

The study area intersections are projected to operate within acceptable Levels of Service during the peak hours for Year 2035 With Project traffic conditions, with improvements.

G. Cost Summary

Improvements that will eliminate all anticipated roadway operational deficiencies throughout the study area have been identified for Opening Year (2014) and Year 2035 traffic conditions. The improvements were determined through the operations analysis of Section IV.

The total cost of needed and unfunded arterial roadway improvements is $400,000. Table 10 presents a summary of improvement cost and project cost shares at each of Year 2035 intersection improvement locations. The intersection fair share cost calculations are based on the evening peak hour traffic volumes. As shown in Table 10, the project's fair share of identified intersection and roadway link costs is $68,400.

The dollar figures are rough order of magnitude estimates only. They are intended only for the discussion purposes of this Traffic Impact Analysis, and do not imply any legal responsibility or formula for contributions or mitigation.

As mitigation for the potential traffic impacts, the proposed project shall contribute on a fair share basis in the implementation of the recommended intersection lane improvements or freeway improvements, or in dollar equivalent in lieu mitigation contributions, or in the implementation of additional capacity on parallel routes to offset potential impacts to intersections and freeway segments.

H. Recommendations

The recommendations in this section address on-site improvements, off-site improvements and the phasing of all necessary study area transportation improvements.

1. On-Site Improvements

On-site improvements and improvements adjacent to the site will be required in conjunction with the proposed development to ensure adequate circulation within the project itself (see Figure 26).

Construct Alta Loma Drive from the west project boundary to the east project boundary at its ultimate half-section width including landscaping and parkway improvements in conjunction with development.

Construct Sunny Vista Road from the north project boundary to the south project boundary at its ultimate half-section width including landscaping and parkway improvements in conjunction with development.

Sight distance at each project access should be reviewed with respect to California Department of Transportation/County of San Bernardino standards in conjunction with the preparation of final grading, landscaping, and street improvement plans.

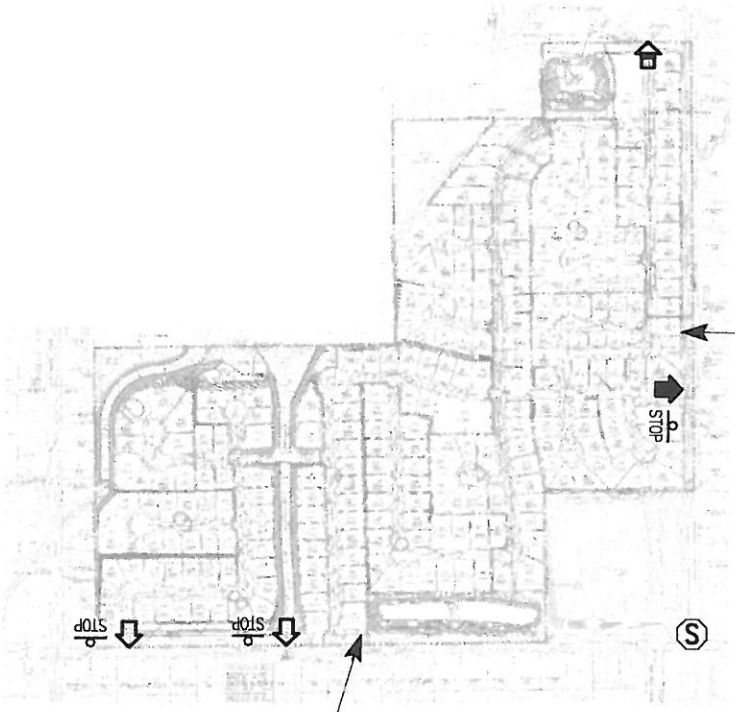
On-site traffic signing and striping should be implemented in conjunction with detailed construction plans for the project.

2. Off-Site Improvements

The necessary off-site improvement recommendations were described in previous sections of this report. The project should contribute towards the cost of necessary study area improvements on a fair share or "pro-rata" basis.

As is the case for any roadway design, the County of San Bernardino should periodically review traffic operations in the vicinity of the project once the project is constructed to assure that the traffic operations are satisfactory.

Figure 26
Circulation Recommendations



Construct Sunny Vista Road from the north project boundary to the south project boundary at its ultimate half-section width including landscaping and parkway improvements in conjunction with development.

Construct Alta Loma Drive from the west project boundary to the east project boundary at its ultimate half-section width including landscaping and parkway improvements in conjunction with development.

Sight distance at each project access should be reviewed with respect to California Department of Transportation/County of San Bernardino standard in conjunction with the preparation of final grading, landscaping, and street improvement plans.

On-site traffic signing and striping should be implemented in conjunction with detailed construction plans for the project.

The project should contribute towards the cost of necessary study area improvements on a fair share or "pro-rata" basis.

As is the case for any roadway design, the County of San Bernardino should periodically review traffic operations in the vicinity of the project once the project is constructed to assure that the traffic operations are satisfactory.

Legend

- (S) = All Way Stop
- STOP = Stop Sign
- = Full Access Gated Driveway
- = Outbound Only Gated Access Driveway
- = Emergency Only Gated Access Driveway

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Appendices

Appendix A – Glossary of Transportation Terms

Appendix B – Traffic Count Worksheets

Appendix C – Passenger Car Equivalency Calculation Worksheets

Appendix D – Explanation and Calculation of Intersection Delay

Appendix E – Traffic Signal Warrant Worksheet

Appendix F – Preliminary Construction Cost Estimates for Congestion Management Program

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.

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

15 45 Start Time -15 MINUTES

SOUTHLAND CAR COUNTERS

Axle Count

Project # 06-3383-001Axl

Location: Pioneertown Rd. & Twenty-nine Pa City: Yucca Valley Date: 09/20/2006 Day: Wednesday

	LANES:	1	1	0	1	1	0	1	2	1	1	2	0
		NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
16:00	CARS	5	4	7	26	10	5	8	258	8	10	197	3
	2-axle				4	1			7			8	
	3-axle				2							1	
	4-axle											1	
	5-axle +							1	2			2	
16:15	CARS	0	2	2	27	8	7	0	261	0	6	200	4
	2-axle								7			1	
	3-axle												
	4-axle												
	5-axle +								3			5	
16:30	CARS	3	10	5	24	3	10	5	256	5	9	187	5
	2-axle								9			7	
	3-axle								1			2	
	4-axle											1	
	5-axle +								3				
16:45	CARS	5	3	8	33	5	2	9	226	5	8	173	8
	2-axle			2					5			8	
	3-axle											3	
	4-axle												
	5-axle +								4			9	
17:00	CARS	2	6	10	32	7	2	6	255	7	5	200	7
	2-axle			1	1				11			7	
	3-axle											1	
	4-axle												
	5-axle +								2			5	
17:15	CARS	4	2	10	22	9	5	6	270	6	4	215	3
	2-axle			1	1				4			6	
	3-axle												
	4-axle												
	5-axle +						1		4			2	
17:30	CARS	9	4	9	19	4	8	6	271	1	5	191	2
	2-axle	1		1					7			5	
	3-axle												
	4-axle												
	5-axle +								1			1	
17:45	CARS	6	5	8	31	8	3	4	255	5	7	185	7
	2-axle								7			4	
	3-axle												
	4-axle												
	5-axle +											4	

MOVEMENT TOTALS

CARS	34	36	59	214	54	42	44	2052	37	54	1548	39
2-axle	1	0	5	6	1	0	0	57	0	0	46	0
3-axle	0	0	0	2	0	0	0	1	0	0	7	0
4-axle	0	0	0	0	0	0	0	0	0	0	2	0
5-axle +	0	0	0	0	0	1	1	19	0	0	28	0
TOTALS	35	36	64	222	55	43	45	2129	37	54	1631	39
	NL	*NT*	*NR*	*SL*	*ST*	*SR*	*EL*	*ET*	*ER*	*WL*	*WT*	*WR*

PM Peak Hr Begins at: 1700 PM

PEAK VOLUMES =	22	17	40	106	28	19	22	1087	19	21	826	19
PEAK HR. FACTOR:		0.823			0.911			0.972			0.941	

CONTROL: Signalized

SOUTHLAND CAR COUNTERS

Axle Count

Project # 06-3383-002Axl

Location: Sage Ave. & Twenty-nine Palms Hy City: Yucca Valley Date: 09/21/2006 Day: THURSDAY

	LANES:	1	0.5	0.5	1	1	0	1	2	0	1	2	0
		NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
7:00	CARS	39	4	4	2	0	1	0	99	14	0	184	3
	2-axle	3			1			1	6				
	3-axle								1				
	4-axle												
	5-axle +								8			4	
7:15	CARS	46	3	6	6	3	4	5	117	28	6	216	3
	2-axle	3			1				5	2		5	
	3-axle								3				
	4-axle								2			1	
	5-axle +								11	1		4	
7:30	CARS	49	3	6	10	5	2	3	129	27	3	175	6
	2-axle	4					1		13	3	1	7	
	3-axle								2				
	4-axle												
	5-axle +								9	1			
7:45	CARS	64	8	3	6	9	9	11	151	22	7	212	6
	2-axle	2		1					5	1		3	
	3-axle											2	
	4-axle												
	5-axle +								7			8	
8:00	CARS	50	8	2	12	9	6	8	167	19	9	188	8
	2-axle	1		1					10	3		7	1
	3-axle	1							1			3	
	4-axle												
	5-axle +								8			6	
8:15	CARS	61	4	9	10	2	4	3	155	34	8	165	5
	2-axle	1							8	2		8	
	3-axle								1				
	4-axle												
	5-axle +								6			1	
8:30	CARS	47	3	6	3	7	5	5	189	27	6	163	5
	2-axle	3						1	8	1		10	
	3-axle								1			2	
	4-axle								1	1			
	5-axle +								4			8	
8:45	CARS	56	10	8	15	6	7	2	190	22	5	182	2
	2-axle	3			1			1	12	1		9	
	3-axle								3	1			
	4-axle								1				
	5-axle +	1							3			5	

MOVEMENT TOTALS

CARS	412	43	44	64	41	38	37	1197	193	44	1485	38
2-axle	20	0	2	3	0	1	3	67	13	1	49	1
3-axle	1	0	0	0	0	0	0	12	1	0	7	0
4-axle	0	0	0	0	0	0	0	4	1	0	1	0
5-axle +	1	0	0	0	0	0	0	56	2	0	36	0
TOTALS	434	43	46	67	41	39	40	1336	210	45	1578	39
	NL	*NT*	*NR*	*SL*	*ST*	*SR*	*EL*	*ET*	*ER*	*WL*	*WT*	*WR*

PM Peak Hr Begins at: 800 AM

PEAK VOLUMES =	224	25	26	41	24	22	20	768	111	28	757	21
PEAK HR. FACTOR:		0.881			0.750			0.944			0.908	

CONTROL: Signalized

15 45 Start Time -15 MINUTES

SOUTHLAND CAR COUNTERS

Axle Count

Project # 06-3383-002Axl

Location: Sage Ave. & Twenty-nine Palms H City: Yucca Valley Date: 09/21/2006 Day: THURSDAY

		LANES:	1	0.5	0.5	1	1	0	1	2	0	1	2	0
			NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
16:00	CARS		64	8	9	19	13	3	7	269	66	14	209	4
	2-axle		2			1	1	1	1	5	2	1	9	
	3-axle									1			1	
	4-axle												1	
	5-axle +									1			4	
16:15	CARS		55	8	10	17	13	8	8	245	59	10	200	11
	2-axle		2							7	2		9	
	3-axle													
	4-axle													
	5-axle +									2			5	
16:30	CARS		52	8	11	9	18	8	12	262	61	13	202	7
	2-axle		3					1	1	7			4	
	3-axle													
	4-axle													
	5-axle +									3				
16:45	CARS		46	17	15	15	10	5	12	251	59	10	193	7
	2-axle		1							13	1		4	
	3-axle		1			1			1			1	1	
	4-axle													
	5-axle +									3			8	
17:00	CARS		5	12	10	13	14	6	6	281	78	13	230	5
	2-axle		2	1			1			6	1		6	
	3-axle													
	4-axle													
	5-axle +					1			1				5	
17:15	CARS		62	4	7	15	10	6	12	274	78	8	205	3
	2-axle							1		5	2		4	
	3-axle													
	4-axle													
	5-axle +									4			1	
17:30	CARS		45	13	4	13	17	8	13	266	71	11	188	5
	2-axle									5	3		9	
	3-axle													
	4-axle													
	5-axle +													
17:45	CARS		39	19	13	7	15	2	15	266	66	14	193	3
	2-axle		1			1	1			5	1		3	
	3-axle													
	4-axle													
	5-axle +									1			2	

MOVEMENT TOTALS

CARS	368	89	79	108	110	46	85	2114	538	93	1620	45
2-axle	11	1	0	2	3	3	2	53	12	1	48	0
3-axle	1	0	0	1	0	0	1	1	0	1	2	0
4-axle	0	0	0	0	0	0	0	0	0	0	1	0
5-axle +	0	0	0	1	0	0	1	14	0	0	25	0
TOTALS	380	90	79	112	113	49	89	2182	550	95	1696	45
	NL	*NT*	*NR*	*SL*	*ST*	*SR*	*EL*	*ET*	*ER*	*WL*	*WT*	*WR*

PM Peak Hr Begins at: 1630 PM

PEAK VOLUMES =	172	42	43	54	53	27	45	1109	280	45	863	22
PEAK HR. FACTOR:		0.803			0.931			0.956			0.898	

CONTROL: Signalized

SOUTHLAND CAR COUNTERS

Axle Count

Project # 06-3383-003Axl

Location: Old Women Springs Rd. & Twenty- City: Yucca Valley Date: 09/20/2006 Day: WEDNESDAY

	LANES:	1	2	0	1	2	0	1	2	0	1	2	0
		NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
7:00	CARS	21	39	18	9	22	83	26	130	6	8	146	12
	2-axle	2	3	1	3	2	5	2	4		2	2	
	3-axle								1			1	
	4-axle												
	5-axle +						2	1	6			3	1
7:15	CARS	20	22	10	11	23	65	25	104	7	9	175	12
	2-axle	5	1		2	1	2	5	7		1	4	
	3-axle						2						
	4-axle												1
	5-axle +						1	3	1			3	
7:30	CARS	12	15	12	13	31	46	24	106	12	25	139	9
	2-axle	1	4		2	1	1	2	7	1		4	1
	3-axle							1					
	4-axle						1	1					
	5-axle +						2	2	5			3	1
7:45	CARS	24	33	15	16	35	83	28	103	5	18	163	14
	2-axle				1	1	3	1	12			3	
	3-axle				1				2			1	
	4-axle								1				
	5-axle +				1		1	2	2	1			
8:00	CARS	19	26	8	18	18	62	29	134	5	9	177	9
	2-axle	2	2	6		1	4		6	1		5	1
	3-axle		1			1	2		5			1	
	4-axle								1				
	5-axle +						2	3		1		5	
8:15	CARS	16	27	9	21	34	67	34	110	14	17	165	15
	2-axle	1			2			2	7	2		6	2
	3-axle		1						2				
	4-axle												
	5-axle +						2	4	1	1		2	
8:30	CARS	19	27	17	20	22	40	31	133	11	13	137	17
	2-axle	1	1	1	1	1			10	1		4	1
	3-axle					1	2		2	1		2	1
	4-axle							1	1				
	5-axle +				1		1	3	5			3	1
8:45	CARS	29	28	10	14	32	73	36	131	5	15	178	11
	2-axle	4	2		2	2	2	2	12		1	5	1
	3-axle	1	2						1			1	
	4-axle								1				
	5-axle +						1	1	4			1	

MOVEMENT TOTALS

CARS	160	217	99	122	217	519	233	951	65	114	1280	99
2-axle	16	13	8	13	9	17	14	65	5	4	33	6
3-axle	1	4	0	1	2	6	1	13	1	0	6	1
4-axle	0	0	0	0	0	1	2	4	0	0	0	1
5-axle +	0	0	0	2	0	12	19	24	3	0	20	3
TOTALS	177	234	107	138	228	555	269	1057	74	118	1339	110
	NL	*NT*	*NR*	*SL*	*ST*	*SR*	*EL*	*ET*	*ER*	*WL*	*WT*	*WR*

PM Peak Hr Begins at: 800 AM

PEAK VOLUMES =	92	117	51	79	112	258	146	566	42	55	692	59
PEAK HR. FACTOR:		0.855			0.891			0.947			0.946	

CONTROL: Signalized

15 45 Start Time -15 MINUTES

SOUTHLAND CAR COUNTERS

Axle Count

Project # 06-3383-003Axl

Location: Old Women Springs Rd. & Twenty- City: Yucca Valley Date: 09/20/2006 Day: WEDNESDAY

	LANES:	1	2	0	1	2	0	1	2	0	1	2	0
		NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
16:00	CARS	28	50	22	28	46	58	59	165	16	22	230	17
	2-axle				4	1	1	2	5			8	1
	3-axle		1		6		1					1	
	4-axle												
	5-axle +						1	1					
16:15	CARS	29	36	21	31	45	64	60	190	22	24	233	14
	2-axle	1	1		1	1	1	2	2			8	
	3-axle				1								
	4-axle												
	5-axle +				2		1	5	1				
16:30	CARS	26	45	24	39	37	43	59	218	20	18	256	18
	2-axle					2	1	2	7		2	5	
	3-axle		1										
	4-axle												
	5-axle +						3	3	2			2	2
16:45	CARS	27	38	26	38	32	72	66	207	23	26	240	23
	2-axle		1		1		2	2	5	1		6	
	3-axle					1						2	1
	4-axle						1						
	5-axle +							1	1				
17:00	CARS	25	41	33	35	36	61	57	227	25	22	298	17
	2-axle	1	1		3	1	4	2	2	1		7	2
	3-axle											1	
	4-axle												
	5-axle +		1				2					1	
17:15	CARS	22	44	27	35	40	48	80	233	18	29	233	21
	2-axle	1			1	1			5			3	
	3-axle							1				2	
	4-axle												
	5-axle +							3	1			1	
17:30	CARS	26	38	24	34	33	50	69	213	13	20	235	25
	2-axle		1		2	3	2	4	4	1		3	
	3-axle							1				1	
	4-axle				1								
	5-axle +				3		2	6					
17:45	CARS	25	40	20	20	37	64	55	181	16	13	232	20
	2-axle						1		1			5	1
	3-axle										1	2	
	4-axle												
	5-axle +										1	2	2

MOVEMENT TOTALS

CARS	208	332	197	260	306	460	505	1634	153	174	1957	155
2-axle	3	4	0	12	9	12	14	31	3	2	45	4
3-axle	0	2	0	7	1	1	2	0	0	1	9	1
4-axle	0	0	0	1	0	1	0	0	0	0	0	0
5-axle +	0	1	0	5	0	9	19	5	0	1	6	4
TOTALS	211	339	197	285	316	483	540	1670	156	178	2017	164
	NL	*NT*	*NR*	*SL*	*ST*	*SR*	*EL*	*ET*	*ER*	*WL*	*WT*	*WR*

PM Peak Hr Begins at: 1630 PM

PEAK VOLUMES =	102	172	110	152	150	237	276	908	88	97	1057	84
PEAK HR. FACTOR:		0.941			0.917			0.933			0.889	

CONTROL: Signalized

SOUTHLAND CAR COUNTERS

Axle Count

Project # 06-3383-005Axl

Location: Avalon Ave. & Twenty-nine Palms I City: Yucca Valley Date: 09/21/2006 Day: THURSDAY

	LANES:	1	1	1	1	1	1	1	2	0	1	2	0
		NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
7:00	CARS	3	3	37	5	4	5	1	133	3	5	145	2
	2-axle					1			9	2	1	7	1
	3-axle								1			2	
	4-axle											1	
	5-axle +								6			2	
7:15	CARS	5	0	28	3	3	4	2	123	6	10	157	1
	2-axle								10			4	
	3-axle												
	4-axle												
	5-axle +								2			2	
7:30	CARS	3	3	22	2	2	8	3	105	5	11	164	1
	2-axle								9			5	
	3-axle								2				
	4-axle												
	5-axle +								5			4	
7:45	CARS	2	3	21	4	5	6	2	116	7	6	191	3
	2-axle								19	1		11	
	3-axle								1				
	4-axle								1				
	5-axle +								3	1		2	
8:00	CARS	5	1	16	0	3	1	3	96	10	10	177	1
	2-axle								8	1	1	5	
	3-axle								4			1	
	4-axle								1				
	5-axle +			1					1			2	
8:15	CARS	5	1	12	2	2	5	4	103	7	7	186	0
	2-axle			1			1		8		1	11	
	3-axle												
	4-axle												
	5-axle +								3			4	
8:30	CARS	6	1	19	4	1	7	1	120	9	15	172	0
	2-axle								7			5	
	3-axle				1				3			2	
	4-axle								2			1	
	5-axle +								6			3	
8:45	CARS	14	4	15	1	5	1	4	120	8	9	206	0
	2-axle			2		1			10		2	11	
	3-axle								3				
	4-axle								1			1	
	5-axle +								4			2	

MOVEMENT TOTALS

CARS	43	16	170	21	25	37	20	916	55	73	1398	8
2-axle	0	0	3	0	2	1	0	80	4	5	59	1
3-axle	0	0	0	1	0	0	0	14	0	0	5	0
4-axle	0	0	0	0	0	0	0	5	0	0	3	0
5-axle +	0	0	1	0	0	0	0	30	1	0	21	0
TOTALS	43	16	174	22	27	38	20	1045	60	78	1486	9
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR

PM Peak Hr Begins at: 800 AM

PEAK VOLUMES =	30	7	66	8	12	15	12	500	35	45	789	1
PEAK HR. FACTOR:		0.736			0.673			0.912			0.904	

CONTROL: Signalized

15 45 Start Time -15 MINUTES

SOUTHLAND CAR COUNTERS

Axle Count

Project # 06-3383-005Axl

Location: Avalon Ave. & Twenty-nine Palms I City: Yucca Valley Date: 09/21/2006 Day: THURSDAY

	LANES:	1	1	1	1	1	1	1	2	0	1	2	0
		NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
16:00	CARS	9	4	7	2	1	5	10	196	9	9	245	4
	2-axle			1		1	1	1	13	2	1	12	
	3-axle												
	4-axle												
	5-axle +												
16:15	CARS	8	4	10	3	3	8	5	237	10	12	261	1
	2-axle								3			9	
	3-axle												
	4-axle												
	5-axle +								2			2	
16:30	CARS	9	3	19	2	3	5	1	242	5	17	244	1
	2-axle	2							5		1	8	1
	3-axle											3	
	4-axle												
	5-axle +								3			2	
16:45	CARS	10	2	7	0	1	5	5	209	6	19	254	2
	2-axle								5	1		9	
	3-axle												
	4-axle												
	5-axle +			1					1			2	
17:00	CARS	12	5	18	0	3	4	4	284	5	15	258	8
	2-axle								8	1		10	
	3-axle											1	
	4-axle												
	5-axle +											2	
17:15	CARS	5	1	7	1	5	4	5	246	3	13	259	3
	2-axle								7			1	
	3-axle											1	
	4-axle											1	
	5-axle +											1	
17:30	CARS	8	2	15	6	3	9	6	221	5	12	218	3
	2-axle	1			1				5		1	8	
	3-axle											1	
	4-axle								1				
	5-axle +								4			3	
17:45	CARS	7	2	25	2	2	6	1	223	6	13	222	4
	2-axle			1					5	1		10	1
	3-axle											3	
	4-axle												
	5-axle +											2	

MOVEMENT TOTALS

CARS	68	23	108	16	21	46	37	1858	49	110	1961	26
2-axle	3	0	2	1	1	1	1	51	5	3	67	2
3-axle	0	0	0	0	0	0	0	0	0	0	9	0
4-axle	0	0	0	0	0	0	0	1	0	0	1	0
5-axle +	0	0	1	0	0	0	0	10	0	0	14	0
TOTALS	71	23	111	17	22	47	38	1920	54	113	2052	28
	NL	*NT*	*NR*	*SL*	*ST*	*SR*	*EL*	*ET*	*ER*	*WL*	*WT*	*WR*

PM Peak Hr Begins at: 1615 PM

PEAK VOLUMES =	41	14	55	5	10	22	15	999	28	64	1065	13
PEAK HR. FACTOR:		0.786			0.661			0.863			0.971	

CONTROL: Signalized

SOUTHLAND CAR COUNTERS

Axle Count

Project # 06-3383-008Axl

Location: Yucca Mesa Rd. & Twenty-nine Pa City: Yucca Valley Date: 09/20/2006 Day: WEDNESDAY

	LANES:	1	1	0	1	1	0	1	2	0	1	2	0
		NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
7:00	CARS	12	9	7	22	9	17	19	112	17	9	130	6
	2-axle	1			1			1	1				
	3-axle								1			1	
	4-axle												
	5-axle +								2			1	
7:15	CARS	14	6	10	25	10	21	6	125	20	4	138	6
	2-axle	1			1		1		9			3	
	3-axle				1							1	
	4-axle												
	5-axle +								3			2	
7:30	CARS	2	2	4	21	6	20	11	106	3	8	145	7
	2-axle	1			2		2	4	5		1	4	
	3-axle								1				
	4-axle											1	
	5-axle +								5			4	
7:45	CARS	5	4	5	25	7	24	11	116	6	8	171	4
	2-axle	2	2	3	1	1		1	14			4	
	3-axle								3			1	
	4-axle							2	2				
	5-axle +								1			2	
8:00	CARS	6	6	4	13	3	21	9	112	1	3	161	8
	2-axle	1	3	1		1	1		7		1	6	2
	3-axle				1				4			1	
	4-axle								1				
	5-axle +								1	1		2	3
8:15	CARS	0	10	3	10	7	19	3	107	3	6	171	11
	2-axle	3	1	1		1		2	4		2	5	1
	3-axle												
	4-axle								1				
	5-axle +				1				2			4	1
8:30	CARS	5	2	1	17	5	23	10	124	2	7	149	12
	2-axle		1		1				9	2	1	4	
	3-axle								3			2	
	4-axle								1				
	5-axle +							1	4			2	
8:45	CARS	4	4	3	12	8	30	13	114	3	3	175	8
	2-axle					5	1	3	10			6	2
	3-axle								2			1	
	4-axle								1				
	5-axle +							1	4	1		2	

MOVEMENT TOTALS

CARS	48	43	37	145	55	175	82	916	55	48	1240	62
2-axle	9	7	5	6	8	5	11	59	2	5	32	5
3-axle	0	0	0	2	0	0	0	14	0	0	7	0
4-axle	0	0	0	0	0	0	2	6	0	0	1	0
5-axle +	0	0	0	1	0	0	2	22	2	0	19	4
TOTALS	57	50	42	154	63	180	97	1017	59	53	1299	71
	NL	*NT*	*NR*	*SL*	*ST*	*SR*	*EL*	*ET*	*ER*	*WL*	*WT*	*WR*

PM Peak Hr Begins at: 715 AM

PEAK VOLUMES =	32	23	27	90	28	90	44	515	31	25	646	30
PEAK HR. FACTOR:		0.661			0.881			0.905			0.922	

CONTROL: Signalized

15 45 Start Time -15 MINUTES

SOUTHLAND CAR COUNTERS

Axle Count

Project # 06-3383-008Axl

Location: Yucca Mesa Rd. & Twenty-nine Pa City: Yucca Valley Date: 09/20/2006 Day: WEDNESDAY

	LANES:	1	1	0	1	1	0	1	2	0	1	2	0
		NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
16:00	CARS	18	7	15	8	8	15	23	202	13	11	222	18
	2-axle		1			3	3	2	5	2	1	10	1
	3-axle												
	4-axle												
	5-axle +												1
16:15	CARS	8	7	5	14	5	19	34	176	1	6	224	10
	2-axle						2	1	8		2	5	1
	3-axle												
	4-axle												
	5-axle +											2	1
16:30	CARS	1	5	6	10	6	18	33	175	5	5	208	9
	2-axle		1			1	1	1	3			5	1
	3-axle												
	4-axle												
	5-axle +							1	2	1		2	
16:45	CARS	4	7	7	11	7	10	30	193	7	6	284	11
	2-axle		1				1	3	3		2	10	1
	3-axle												
	4-axle												
	5-axle +								2				1
17:00	CARS	3	7	7	14	4	13	36	249	3	5	260	18
	2-axle					1		1	6	1		6	
	3-axle											1	
	4-axle												
	5-axle +											1	
17:15	CARS	1	2	1	12	5	11	29	240	7	8	307	22
	2-axle					2		1	6	1	1	6	
	3-axle												
	4-axle												
	5-axle +				1							1	
17:30	CARS	1	9	4	9	3	21	24	226	6	3	215	16
	2-axle			1		1			3	2		6	
	3-axle												
	4-axle												
	5-axle +								2			3	1
17:45	CARS	3	8	4	17	5	17	30	228	3	7	203	9
	2-axle								5		1	10	
	3-axle								1			1	
	4-axle												
	5-axle +								2			2	

MOVEMENT TOTALS

CARS	39	52	49	95	43	124	239	1689	45	51	1923	113
2-axle	0	3	1	0	8	7	9	39	6	7	58	4
3-axle	0	0	0	0	0	0	0	1	0	0	2	0
4-axle	0	0	0	0	0	0	0	0	0	0	0	0
5-axle +	0	0	0	1	0	0	1	8	1	0	11	4
TOTALS	39	55	50	96	51	131	249	1737	52	58	1994	121
	NL	*NT*	*NR*	*SL*	*ST*	*SR*	*EL*	*ET*	*ER*	*WL*	*WT*	*WR*

PM Peak Hr Begins at: 1645 PM

PEAK VOLUMES =	9	26	20	47	23	56	124	930	27	25	1100	70
PEAK HR. FACTOR:		0.724			0.926			0.913			0.866	

CONTROL: Signalized

SOUTHLAND CAR COUNTERS

Axle Count

Project # 06-3383-010Axl

Location: Yucca Mesa Rd. & Yucca Trail City: Yucca Valley Date: 09/21/2006 Day: THURSDAY

	LANES:	0	1	0	1	1	0	0	1	0	0	1	0
		NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
7:00	CARS		2	0	22	0	16	7	13		0	25	7
	2-axle				2		1		1				1
	3-axle												
	4-axle												
	5-axle +												
7:15	CARS		4	0	74	1	20	9	16		0	27	2
	2-axle				1		1	3	1			1	1
	3-axle												
	4-axle												
	5-axle +												
7:30	CARS		0	0	27	0	22	3	17		0	31	4
	2-axle				2		2		3			3	
	3-axle												
	4-axle												
	5-axle +				2								
7:45	CARS		0	1	2	0	5	7	17		1	42	3
	2-axle				1		2	2	1			1	2
	3-axle							1					
	4-axle												
	5-axle +												
8:00	CARS		0	0	2	0	13	4	24		0	23	1
	2-axle											1	1
	3-axle					1							
	4-axle												
	5-axle +												
8:15	CARS		0	0	1	1	8	10	22		0	31	3
	2-axle				1			2				1	
	3-axle												
	4-axle												
	5-axle +												
8:30	CARS		1	0	2	0	12	15	25		0	36	2
	2-axle							2	1				
	3-axle												
	4-axle												
	5-axle +												
8:45	CARS		1	0	1	0	6	7	31		0	45	0
	2-axle				1			2				2	
	3-axle												
	4-axle												
	5-axle +												

MOVEMENT TOTALS

CARS	0	8	1	131	2	102	62	165	0	1	260	22
2-axle	0	0	0	8	0	6	11	7	0	0	9	5
3-axle	0	0	0	0	1	0	1	0	0	0	0	0
4-axle	0	0	0	0	0	0	0	0	0	0	0	0
5-axle +	0	0	0	2	0	0	0	0	0	0	0	0
TOTALS	0	8	1	141	3	108	74	172	0	1	269	27
	NL	*NT*	*NR*	*SL*	*ST*	*SR*	*EL*	*ET*	*ER*	*WL*	*WT*	*WR*

PM Peak Hr Begins at: 700 AM

PEAK VOLUMES =	0	6	1	133	1	69	32	69	0	1	130	20
PEAK HR. FACTOR:		0.438			0.523			0.871			0.770	

CONTROL: 2-Way Stop N & S

SOUTHLAND CAR COUNTERS

Axle Count

Project # 06-3383-010Axl

Location: Yucca Mesa Rd. & Yucca Trail City: Yucca Valley Date: 09/21/2006 Day: THURSDAY

	LANES:	0	1	0	1	1	0	0	1	0	0	1	0
		NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
16:00	CARS		1	0	4	0	11	7	45	0		56	3
	2-axle		2				1	2				1	
	3-axle												
	4-axle												
	5-axle +												
16:15	CARS		0	0	4	1	6	8	43	0		28	4
	2-axle		1		1			2				1	1
	3-axle												
	4-axle												
	5-axle +												
16:30	CARS		0	1	9	1	7	6	38	0		27	0
	2-axle		1				2	2					
	3-axle												
	4-axle												
	5-axle +												
16:45	CARS		0	0	8	1	10	2	33	0		15	5
	2-axle		2		1			1				1	
	3-axle							1					
	4-axle												
	5-axle +												
17:00	CARS		0	0	4	0	5	2	40	0		27	1
	2-axle		1		1			2				2	
	3-axle		1					1					
	4-axle												
	5-axle +												
17:15	CARS		0	0	3	1	11	5	45	0		31	6
	2-axle						1	1				1	
	3-axle							1					
	4-axle												
	5-axle +												
17:30	CARS		0	0	5	0	9	7	39	0		27	3
	2-axle		1		1		1	1				1	
	3-axle							1					
	4-axle												
	5-axle +												
17:45	CARS		0	0	6	1	7	4	41	0		21	2
	2-axle		2					2				2	
	3-axle							2					
	4-axle												
	5-axle +												

MOVEMENT TOTALS

CARS	0	1	1	43	5	66	41	324	0	0	232	24
2-axle	0	10	0	4	0	5	13	0	0	0	9	1
3-axle	0	1	0	0	0	0	6	0	0	0	0	0
4-axle	0	0	0	0	0	0	0	0	0	0	0	0
5-axle +	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS	0	12	1	47	5	71	60	324	0	0	241	25
	NL	*NT*	*NR*	*SL*	*ST*	*SR*	*EL*	*ET*	*ER*	*WL*	*WT*	*WR*

PM Peak Hr Begins at: 1600 PM

PEAK VOLUMES =	0	7	1	27	3	37	31	159	0	0	129	13
PEAK HR. FACTOR:		0.667			0.838			0.880			0.592	

CONTROL: 2-Way Stop N & S

NATIONAL DATA & SURVEYING SERVICES

Axle Count

Project # 07-3208-002Axles

Location: Sherwood Ave. & Alta Loma Dr. City: Yucca Valley Date: 6/14/2007 Day: THURSDAY

	LANES:	0 NL	1 NT	0 NR	0 SL	1 ST	0 SR	0 EL	1 ET	0 ER	0 WL	1 WT	0 WR
7:00	CARS	4	1	2	3	0	1	1	24	2	2	30	1
	2-axle				1				2		1		
	3-axle												
	4-axle												
	5-axle +												
7:15	CARS	6	1	0	0	0	0	0	24	1	1	25	0
	2-axle												
	3-axle												
	4-axle												
	5-axle +												
7:30	CARS	11	0	1	0	0	0	0	18	1	0	25	0
	2-axle												
	3-axle												
	4-axle												
	5-axle +											1	
7:45	CARS	7	0	0	1	0	1	1	24	2	0	26	0
	2-axle								2			1	
	3-axle												
	4-axle												
	5-axle +												
8:00	CARS	5	0	0	0	0	0	0	23	0	2	18	3
	2-axle												
	3-axle												
	4-axle												
	5-axle +												
8:15	CARS	3	0	1	0	0	2	0	22	2	1	20	0
	2-axle								3			1	
	3-axle								1				
	4-axle												
	5-axle +												
8:30	CARS	1	0	1	2	0	3	2	25	3	0	36	1
	2-axle												
	3-axle												
	4-axle												
	5-axle +									1			
8:45	CARS	1	0	1	1	0	3	0	24	2	1	34	4
	2-axle								1				
	3-axle											1	
	4-axle												
	5-axle +												

MOVEMENT TOTALS

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
CARS	38	2	6	7	0	10	4	184	13	7	214	9
2-axle	0	0	0	1	0	0	0	8	0	1	2	0
3-axle	0	0	0	0	0	0	0	1	0	0	1	0
4-axle	0	0	0	0	0	0	0	0	0	0	0	0
5-axle +	0	0	0	0	0	0	0	0	1	0	1	0
TOTALS	38	2	6	8	0	10	4	193	14	8	218	9

PM Peak Hr Begins at: 800 AM

PEAK VOLUMES =	28	2	3	5	0	8	2	99	8	4	110	8
PEAK HR. FACTOR:		0.688			0.550			0.879			0.831	

CONTROL: 2-Way Stop N & S

15 45 Start Time -15 MINUTES

NATIONAL DATA & SURVEYING SERVICES

Axle Count

Project # 07-3208-002Axles

Location: Sherwood Ave. & Alta Loma Dr. City: Yucca Valley Date: 6/14/2007 Day: THURSDAY

	LANES:	0	1	0	0	1	0	0	1	0	0	1	0
		NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
16:00	CARS	5	0	0	1	0	1	3	20	9	1	26	2
	2-axle											1	
	3-axle												
	4-axle												
	5-axle +												
16:15	CARS	6	0	0	1	0	2	0	31	5	0	21	3
	2-axle												
	3-axle												
	4-axle												
	5-axle +												
16:30	CARS	4	0	3	0	1	0	0	35	7	0	26	2
	2-axle												
	3-axle												
	4-axle												
	5-axle +												
16:45	CARS	7	2	1	5	3	2	3	46	13	9	20	7
	2-axle								1				
	3-axle												
	4-axle												
	5-axle +												
17:00	CARS	5	1	0	3	0	2	1	39	9	1	20	4
	2-axle												
	3-axle												
	4-axle												
	5-axle +												
17:15	CARS	4	2	2	5	0	1	1	44	11	1	33	2
	2-axle											2	
	3-axle												
	4-axle												
	5-axle +												
17:30	CARS	2	0	0	3	0	0	0	36	10	1	29	3
	2-axle												
	3-axle												
	4-axle												
	5-axle +												
17:45	CARS	7	1	2	2	0	1	0	26	7	0	27	4
	2-axle												
	3-axle												
	4-axle												
	5-axle +												

MOVEMENT TOTALS

CARS	40	6	8	20	4	9	8	277	71	13	202	27
2-axle	0	0	0	0	0	0	0	1	0	0	3	0
3-axle	0	0	0	0	0	0	0	0	0	0	0	0
4-axle	0	0	0	0	0	0	0	0	0	0	0	0
5-axle +	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS	40	6	8	20	4	9	8	278	71	13	205	27
	NL	*NT*	*NR*	*SL*	*ST*	*SR*	*EL*	*ET*	*ER*	*WL*	*WT*	*WR*

PM Peak Hr Begins at: 1645 PM

PEAK VOLUMES =	18	5	3	16	3	5	5	166	43	12	104	16
PEAK HR. FACTOR:		0.650			0.600			0.849			0.868	

CONTROL: 2-Way Stop N & S

NATIONAL DATA & SURVEYING SERVICES

Axle Count

Project # 07-3208-001Axles

Location: Torres Ave. & Twenty-nine Palms I City: Yucca Valley Date: 6/14/2007 Day: THURSDAY

		LANES:	0	1	0	0	0	0	0	2	0	0	2	0
			NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
7:00	CARS		1	0	0	0	0	0	0	117	1	0	96	0
	2-axle									7			1	
	3-axle									1				
	4-axle												2	
	5-axle +									2				
7:15	CARS		0	0	0	0	0	0	0	122	0	0	118	0
	2-axle									4			4	
	3-axle													
	4-axle													
	5-axle +									7			3	
7:30	CARS		0	0	0	0	0	0	0	114	0	0	151	0
	2-axle									6			2	
	3-axle									1				
	4-axle												2	
	5-axle +									2			6	
7:45	CARS		0	0	0	0	0	0	0	139	1	0	144	0
	2-axle									11			5	
	3-axle									1			1	
	4-axle													
	5-axle +									4			8	
8:00	CARS		3	0	0	0	0	0	0	126	1	0	155	0
	2-axle									10			5	
	3-axle									1			3	
	4-axle									1			2	
	5-axle +									7				
8:15	CARS		1	0	0	0	0	0	0	128	0	0	133	0
	2-axle									13			5	
	3-axle									3				
	4-axle												1	
	5-axle +									2			5	
8:30	CARS		0	0	1	0	0	0	0	129	0	0	143	0
	2-axle									11			12	
	3-axle									3				
	4-axle													
	5-axle +									2			2	
8:45	CARS		0	0	0	0	0	0	0	81	0	0	120	0
	2-axle									5			5	
	3-axle									2			1	
	4-axle													
	5-axle +									4			2	

MOVEMENT TOTALS

CARS	5	0	1	0	0	0	0	956	3	0	1060	0
2-axle	0	0	0	0	0	0	0	67	0	0	39	0
3-axle	0	0	0	0	0	0	0	12	0	0	5	0
4-axle	0	0	0	0	0	0	0	1	0	0	7	0
5-axle +	0	0	0	0	0	0	0	30	0	0	26	0
TOTALS	5	0	1	0	0	0	0	1066	3	0	1137	0
	NL	*NT*	*NR*	*SL*	*ST*	*SR*	*EL*	*ET*	*ER*	*WL*	*WT*	*WR*

PM Peak Hr Begins at: 745 AM

PEAK VOLUMES =	4	0	1	0	0	0	0	591	2	0	624	0
PEAK HR. FACTOR:		0.417			0.000			0.950			0.945	

CONTROL: 1-Way Stop N

15 45 Start Time -15 MINUTES

NATIONAL DATA & SURVEYING SERVICES

Axle Count

Project # 07-3208-001Axles

Location: Torres Ave. & Twenty-nine Palms I City: Yucca Valley Date: 6/14/2007 Day: THURSDAY

	LANES:	0	1	0	0	0	0	0	2	0	0	2	0
		NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
16:00	CARS	2	0	0	0	0	0	0	190	2	0	237	0
	2-axle								9			10	
	3-axle											4	
	4-axle												
	5-axle +								1			3	
16:15	CARS	1	0	0	0	0	0	0	194	2	0	241	0
	2-axle								5			13	
	3-axle								1			4	
	4-axle											1	
	5-axle +								1			2	
16:30	CARS	0	0	0	0	0	0	0	229	0	0	279	0
	2-axle								5			3	
	3-axle											1	
	4-axle												
	5-axle +								2			2	
16:45	CARS	1	0	0	0	0	0	0	248	2	0	251	0
	2-axle								5			6	
	3-axle											1	
	4-axle												
	5-axle +								1			3	
17:00	CARS	1	0	0	0	0	0	0	236	1	0	229	0
	2-axle								1			2	
	3-axle											1	
	4-axle												
	5-axle +								1			1	
17:15	CARS	4	0	2	0	0	0	0	221	0	0	234	0
	2-axle								5			6	
	3-axle								1				
	4-axle												
	5-axle +												
17:30	CARS	0	0	0	0	0	0	0	189	2	0	225	0
	2-axle								7			10	
	3-axle								1				
	4-axle								1				
	5-axle +											3	
17:45	CARS	0	0	0	0	0	0	0	190	2	0	208	0
	2-axle								1			2	
	3-axle											1	
	4-axle												
	5-axle +											1	

MOVEMENT TOTALS

CARS	9	0	2	0	0	0	0	1697	11	0	1904	0
2-axle	0	0	0	0	0	0	0	38	0	0	52	0
3-axle	0	0	0	0	0	0	0	3	0	0	12	0
4-axle	0	0	0	0	0	0	0	1	0	0	1	0
5-axle +	0	0	0	0	0	0	0	6	0	0	15	0
TOTALS	9	0	2	0	0	0	0	1745	11	0	1984	0
	NL	*NT*	*NR*	*SL*	*ST*	*SR*	*EL*	*ET*	*ER*	*WL*	*WT*	*WR*

PM Peak Hr Begins at: 1630 PM

PEAK VOLUMES =	6	0	2	0	0	0	0	955	3	0	1019	0
PEAK HR. FACTOR:		0.333			0.000			0.936			0.894	

CONTROL: 1-Way Stop N

SOUTHLAND CAR COUNTERS

Axle Count

Project # 06-3383-013Axl

Location: Sunny Vista Rd. & Twenty-nine Pal City: Yucca Valley Date: 09/21/2006 Day: THURSDAY

		LANES:	0	1	0	0	1	0	1	2	0	1	2	0
			NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
7:00	CARS		2		79	0	0	2	0	83	1	10	146	1
	2-axle									2		2	4	
	3-axle												1	
	4-axle													
	5-axle +				2								5	
7:15	CARS		0		63	0	0	0	0	79	2	14	167	0
	2-axle				1					4		2	4	
	3-axle												1	
	4-axle												1	
	5-axle +				1					2			2	
7:30	CARS		0		70	0	1	1	0	174	1	9	148	0
	2-axle				2				1	6			6	
	3-axle													
	4-axle													
	5-axle +				2					6			1	
7:45	CARS		1		45	0	0	0	1	153	1	7	182	0
	2-axle				1					5		1	5	
	3-axle				1					1				
	4-axle													
	5-axle +									4			3	
8:00	CARS		0		15	1	0	1	0	142	1	5	153	0
	2-axle				1					7		1	6	
	3-axle									2				
	4-axle													
	5-axle +									2			4	
8:15	CARS		0		24	0	0	0	0	107	4	8	170	1
	2-axle				2					4		2	6	
	3-axle									2			2	
	4-axle													
	5-axle +									2			4	
8:30	CARS		3		11	0	0	0	2	124	2	7	154	0
	2-axle				1					5		3	5	
	3-axle									1				
	4-axle												1	
	5-axle +									2			1	
8:45	CARS		0		4	0	0	0	0	99	1	4	131	0
	2-axle									3		1	3	
	3-axle									1				
	4-axle													
	5-axle +									1			1	

MOVEMENT TOTALS

CARS	6	0	311	1	1	4	3	961	13	64	1251	2
2-axle	0	0	8	0	0	0	1	36	0	12	39	0
3-axle	0	0	1	0	0	0	0	7	0	0	4	0
4-axle	0	0	0	0	0	0	0	0	0	0	2	0
5-axle +	0	0	5	0	0	0	0	19	0	0	21	0
TOTALS	6	0	325	1	1	4	4	1023	13	76	1317	2
	NL	*NT*	*NR*	*SL*	*ST*	*SR*	*EL*	*ET*	*ER*	*WL*	*WT*	*WR*

PM Peak Hr Begins at: 715 AM 211 1625

PEAK VOLUMES =	1	0	202	1	1	2	2	587	5	39	683	0
PEAK HR. FACTOR:		0.686			0.500			0.790			0.912	

CONTROL: 2-Way Stop N & S

SOUTHLAND CAR COUNTERS

Axle Count

Project # 06-3383-013Axl

Location: Sunny Vista Rd. & Twenty-nine Pal City: Yucca Valley Date: 09/21/2006 Day: THURSDAY

		LANES:	0	1	0	0	1	0	1	2	0	1	2	0
			NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
16:00	CARS		0		15		0		0	174	1	3	194	0
	2-axle				1					2			2	
	3-axle												1	
	4-axle													
	5-axle +													
16:15	CARS		0		20		0		0	199	2	5	208	1
	2-axle									1	1		4	
	3-axle									1				
	4-axle									1				
	5-axle +									1			2	
16:30	CARS		1		18		1		1	208	4	7	221	0
	2-axle									2			3	
	3-axle													
	4-axle									1				
	5-axle +												1	
16:45	CARS		0		12		0		0	221	2	13	228	0
	2-axle				1					4		1	3	
	3-axle													
	4-axle													
	5-axle +									1			1	
17:00	CARS		1		14		0		0	243	3	15	220	0
	2-axle									2			2	
	3-axle									1				
	4-axle													
	5-axle +									1				
17:15	CARS		1		13		0		3	237	3	10	212	1
	2-axle									3			5	
	3-axle													
	4-axle													
	5-axle +									1				
17:30	CARS		0		9		0		0	187	2	9	184	0
	2-axle									1			2	
	3-axle									1				
	4-axle													
	5-axle +													
17:45	CARS		0		7		0		2	167	3	12	198	0
	2-axle									2			3	
	3-axle													
	4-axle													
	5-axle +												1	

MOVEMENT TOTALS

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
CARS	3	0	108	0	1	0	6	1636	20	74	1665	2
2-axle	0	0	2	0	0	0	0	17	1	1	24	0
3-axle	0	0	0	0	0	0	0	3	0	0	1	0
4-axle	0	0	0	0	0	0	0	2	0	0	0	0
5-axle +	0	0	0	0	0	0	0	4	0	0	5	0
TOTALS	3	0	110	0	1	0	6	1662	21	75	1695	2

PM Peak Hr Begins at: 1630 PM

PEAK VOLUMES =	3	0	58	0	1	0	4	925	12	46	896	1
PEAK HR. FACTOR:		0.803			0.250			0.941			0.958	

CONTROL: 2-Way Stop N & S

SOUTHLAND CAR COUNTERS

Axle Count

Project # 06-3383-014Axl

Location: Sunny Vista Rd. & Alta Loma Dr. City: Yucca Valley Date: 09/21/2006 Day: THURSDAY

	LANES:	0	1	0	0	1	1	0	1	0	0	1	0
		NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
7:00	CARS	3	11	0	0	5	4	89	4	1	0	5	0
	2-axle							2					
	3-axle							1					
	4-axle												
	5-axle +												
7:15	CARS	4	9	1	0	3	3	122	5	3	2	7	0
	2-axle					1	2	3					
	3-axle												
	4-axle												
	5-axle +												
7:30	CARS	5	8	2	0	3	4	114	3	1	2	4	1
	2-axle			1			1	2		2			
	3-axle												
	4-axle												
	5-axle +												
7:45	CARS	9	6	0	0	2	6	11	1	2	1	9	1
	2-axle		1					3					
	3-axle												
	4-axle												
	5-axle +												
8:00	CARS	7	7	1	0	4	7	19	7	3	1	3	2
	2-axle					1	2						
	3-axle												
	4-axle												
	5-axle +												
8:15	CARS	1	4	2	0	5	10	17	6	4	0	4	1
	2-axle			1			1			1			
	3-axle												
	4-axle												
	5-axle +												
8:30	CARS	3	12	1	0	7	6	22	2	2	0	3	4
	2-axle		1				1	1					
	3-axle												
	4-axle												
	5-axle +												
8:45	CARS	2	9	0	1	4	9	26	3	4	1	9	1
	2-axle						2						
	3-axle												
	4-axle												
	5-axle +												

MOVEMENT TOTALS

CARS	34	66	7	1	33	49	420	31	20	7	44	10
2-axle	0	2	2	0	2	9	11	0	3	0	0	0
3-axle	0	0	0	0	0	0	1	0	0	0	0	0
4-axle	0	0	0	0	0	0	0	0	0	0	0	0
5-axle +	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS	34	68	9	1	35	58	432	31	23	7	44	10
	NL	*NT*	*NR*	*SL*	*ST*	*SR*	*EL*	*ET*	*ER*	*WL*	*WT*	*WR*

PM Peak Hr Begins at: 700 AM

PEAK VOLUMES =	21	35	4	0	14	20	347	13	9	5	25	2
PEAK HR. FACTOR:		0.938			0.944			0.694			0.727	

CONTROL: 4-Way Stop

SOUTHLAND CAR COUNTERS

Axle Count

Project # 06-3383-014Axl

Location: Sunny Vista Rd. & Alta Loma Dr. City: Yucca Valley Date: 09/21/2006 Day: THURSDAY

		LANES:	0	1	0	0	1	1	0	1	0	0	1	0
			NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
16:00	CARS		0	0	0	0	16	14	12	3	16	0	0	0
	2-axle								1					
	3-axle													
	4-axle													
	5-axle +													
16:15	CARS		4	0	2	1	18	12	17	5	12	0	0	5
	2-axle							1						
	3-axle													
	4-axle													
	5-axle +													
16:30	CARS		3	0	0	0	5	9	15	8	7	1	4	0
	2-axle													
	3-axle													
	4-axle													
	5-axle +													
16:45	CARS		1	1	3	0	7	16	18	14	7	2	2	0
	2-axle							1						
	3-axle													
	4-axle													
	5-axle +													
17:00	CARS		4	0	0	3	3	13	16	10	8	0	10	0
	2-axle													
	3-axle													
	4-axle													
	5-axle +													
17:15	CARS		3	2	1	0	9	11	12	11	9	3	9	7
	2-axle													
	3-axle													
	4-axle													
	5-axle +													
17:30	CARS		2	1	1	1	6	7	14	7	8	0	5	0
	2-axle												1	
	3-axle													
	4-axle													
	5-axle +													
17:45	CARS		3	2	0	0	4	9	9	9	5	0	4	0
	2-axle													
	3-axle													
	4-axle													
	5-axle +													

MOVEMENT TOTALS

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
CARS	20	6	7	5	68	91	113	67	72	6	34	12
2-axle	0	0	0	0	0	2	1	0	0	0	1	0
3-axle	0	0	0	0	0	0	0	0	0	0	0	0
4-axle	0	0	0	0	0	0	0	0	0	0	0	0
5-axle +	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS	20	6	7	5	68	93	114	67	72	6	35	12

PM Peak Hr Begins at: 1645 PM

PEAK VOLUMES =	10	4	5	4	25	48	60	42	32	5	27	7
PEAK HR. FACTOR:		0.792			0.802			0.859			0.513	

CONTROL: 4-Way Stop

APPENDIX C

Passenger Car Equivalency Calculation Worksheets

PIONEERTOWN ROAD (NS) / TWENTY-NINE PALMS (EW)

MORNING PEAK HOUR

EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (AUTOS):

2006

			15	9	57			
			<	v	>			
		10	^			^		8
		572	>			<		781
		5	v			v		17
			<	^	>			
			24	8	12			

EXISTING PEAK HOUR COUNT YEAR (AUTOS):

2006

				81	26			
				v	^			
		820	<	IN =	1518	<		806
		587	>	OUT =	1518	>		641
				v	^			
				31	44			

EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (TRUCKS IN PCE'S):

			3	0	19			
			<	v	>			
		2	^			^		0
		153	>			<		121
		5	v			v		0
			<	^	>			
			2	2	2			

PCE FACTORS BY AXLE:

2: 1.5 3: 2.0 4+: 3.0

TOTAL EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (PCES):

2006

			18	9	76			
			<	v	>			
		12	^			^		8
		725	>			<		902
		10	v			v		17
			<	^	>			
			26	10	14			

EVENING PEAK HOUR

EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (AUTOS):

2006

			18	28	104			
			<	v	>			
		22	^			^		19
		1051	>			<		791
		19	v			v		21
			<	^	>			
			21	17	37			

EXISTING PEAK HOUR COUNT YEAR (AUTOS):

2006

				150	58			
				v	^			
		830	<	IN =	2148	<		831
		1092	>	OUT =	2148	>		1192
				v	^			
				68	75			

EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (TRUCKS IN PCE'S):

			3	0	3			
			<	v	>			
		0	^			^		0
		65	>			<		71
		0	v			v		0
			<	^	>			
			2	0	5			

PCE FACTORS BY AXLE:

2: 1.5 3: 2 4+: 3.0

TOTAL EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (PCES):

2006

			21	28	107			
			<	v	>			
		22	^			^		19
		1116	>			<		862
		19	v			v		21
			<	^	>			
			23	17	42			

SAGE AVENUE (NS) / TWENTY-NINE PALMS (EW)

MORNING PEAK HOUR

EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (AUTOS):

2006

			22	24	40	
			<	v	>	
	18	^			^	20
	701	>			<	698
	102	v			v	28
			<	^	>	
			214	25	25	

EXISTING PEAK HOUR COUNT YEAR (AUTOS):

2006

				86	63	
				v	^	
	934	<	IN =	1917	<	746
	821	>	OUT =	1917	>	766
				v	^	
				154	264	

EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (TRUCKS IN PCE'S):

			0	0	2	
			<	v	>	
	3	^			^	2
	138	>			<	121
	16	v			v	0
			<	^	>	
			17	0	2	

PCE FACTORS BY AXLE:

2: 1.5 3: 2.0 4+: 3.0

TOTAL EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (PCES):

2006

			22	24	42	
			<	v	>	
	21	^			^	22
	839	>			<	819
	118	v			v	28
			<	^	>	
			231	25	27	

EVENING PEAK HOUR

EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (AUTOS):

2006

			25	52	52	
			<	v	>	
	42	^			^	22
	1068	>			<	830
	276	v			v	44
			<	^	>	
			165	41	43	

EXISTING PEAK HOUR COUNT YEAR (AUTOS):

2006

				129	105	
				v	^	
	1020	<	IN =	2660	<	896
	1386	>	OUT =	2660	>	1163
				v	^	
				372	249	

EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (TRUCKS IN PCE'S):

			3	2	5	
			<	v	>	
	7	^			^	0
	77	>			<	71
	6	v			v	2
			<	^	>	
			11	2	0	

PCE FACTORS BY AXLE:

2: 1.5 3: 2 4+: 3.0

TOTAL EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (PCES):

2006

			28	54	57	
			<	v	>	
	49	^			^	22
	1145	>			<	901
	282	v			v	46
			<	^	>	
			176	43	43	

OLD WOMAN SPRINGS ROAD (NS) / TWENTY-NINE PALMS (EW)

MORNING PEAK HOUR

EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (AUTOS):

2006

			242	106	73			
			<	v	>			
		130	^			^		52
		508	>			<		657
		35	v			v		54
			<	^	>			
			83	108	44			

EXISTING PEAK HOUR COUNT YEAR (AUTOS):

2006

				421	290			
				v	^			
		982	<	IN	=	2092	<	763
		673	>	OUT	=	2092	>	625
				v	^			
				195	235			

EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (TRUCKS IN PCE'S):

			35	10	11			
			<	v	>			
		42	^			^		13
		112	>			<		71
		14	v			v		2
			<	^	>			
			14	16	11			

PCE FACTORS BY AXLE:

2: 1.5 3: 2.0 4+: 3.0

TOTAL EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (PCES):

2006

			277	116	84			
			<	v	>			
		172	^			^		65
		620	>			<		728
		49	v			v		56
			<	^	>			
			97	124	55			

EVENING PEAK HOUR

EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (AUTOS):

2006

			224	145	147			
			<	v	>			
		262	^			^		79
		885	>			<		1027
		86	v			v		95
			<	^	>			
			100	168	110			

EXISTING PEAK HOUR COUNT YEAR (AUTOS):

2006

				516	509			
				v	^			
		1351	<	IN	=	3328	<	1201
		1233	>	OUT	=	3328	>	1142
				v	^			
				326	378			

EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (TRUCKS IN PCE'S):

			29	8	8			
			<	v	>			
		32	^			^		11
		41	>			<		54
		3	v			v		3
			<	^	>			
			3	8	0			

PCE FACTORS BY AXLE:

2: 1.5 3: 2 4+: 3.0

TOTAL EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (PCES):

2006

			253	153	155			
			<	v	>			
		294	^			^		90
		926	>			<		1081
		89	v			v		98
			<	^	>			
			103	176	110			

AVALON AVENUE (NS) / TWENTY-NINE PALMS (EW)

MORNING PEAK HOUR

EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (AUTOS):

2006

			14	11	7	
			<	v	>	
12	^				^	1
439	>				<	741
34	v				v	41
			<	^	>	
			30	7	62	

EXISTING PEAK HOUR COUNT YEAR (AUTOS):

2006

				32	20	
				v	^	
785	<		IN =	1399	<	783
485	>		OUT =	1399	>	508
				v	^	
				86	99	

EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (TRUCKS IN PCE'S):

			2	2	2	
			<	v	>	
0	^				^	0
124	>				<	93
2	v				v	6
			<	^	>	
			0	0	8	

PCE FACTORS BY AXLE:

2: 1.5 3: 2.0 4+: 3.0

TOTAL EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (PCES):

2006

			16	13	9	
			<	v	>	
12	^				^	1
563	>				<	834
36	v				v	47
			<	^	>	
			30	7	70	

EVENING PEAK HOUR

EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (AUTOS):

2006

			22	10	5	
			<	v	>	
15	^				^	12
972	>				<	1017
26	v				v	63
			<	^	>	
			39	14	54	

EXISTING PEAK HOUR COUNT YEAR (AUTOS):

2006

				37	41	
				v	^	
1078	<		IN =	2249	<	1092
1013	>		OUT =	2249	>	1031
				v	^	
				99	107	

EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (TRUCKS IN PCE'S):

			0	0	0	
			<	v	>	
0	^				^	2
50	>				<	86
3	v				v	2
			<	^	>	
			3	0	3	

PCE FACTORS BY AXLE:

2: 1.5 3: 2 4+: 3.0

TOTAL EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (PCES):

2006

			22	10	5	
			<	v	>	
15	^				^	14
1022	>				<	1103
29	v				v	65
			<	^	>	
			42	14	57	

YUCCA MESA ROAD (NS) / TWENTY-NINE PALMS (EW)

MORNING PEAK HOUR

EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (AUTOS):

2006

				86	26	84		
				<	v	>		
		37	^				^	25
		459	>				<	615
		30	v				v	23
				<	^	>		
				27	18	23		

EXISTING PEAK HOUR COUNT YEAR (AUTOS):

2006

					196	80		
					v	^		
		728	<	IN	=	1453	<	663
		526	>	OUT	=	1453	>	566
					v	^		
					79	68		

EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (TRUCKS IN PCE'S):

				6	3	10		
				<	v	>		
		14	^				^	12
		108	>				<	65
		3	v				v	3
				<	^	>		
				8	8	6		

PCE FACTORS BY AXLE:

2: 1.5 3: 2.0 4+: 3.0

TOTAL EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (PCES):

2006

				92	29	94		
				<	v	>		
		51	^				^	37
		567	>				<	680
		33	v				v	26
				<	^	>		
				35	26	29		

EVENING PEAK HOUR

EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (AUTOS):

2006

				55	19	46		
				<	v	>		
		119	^				^	67
		908	>				<	1066
		23	v				v	22
				<	^	>		
				9	25	19		

EXISTING PEAK HOUR COUNT YEAR (AUTOS):

2006

					120	211		
					v	^		
		1130	<	IN	=	2378	<	1155
		1050	>	OUT	=	2378	>	973
					v	^		
					64	53		

EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (TRUCKS IN PCE'S):

				2	6	3		
				<	v	>		
		8	^				^	8
		39	>				<	59
		6	v				v	5
				<	^	>		
				0	2	2		

PCE FACTORS BY AXLE:

2: 1.5 3: 2 4+: 3.0

TOTAL EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (PCES):

2006

				57	25	49		
				<	v	>		
		127	^				^	75
		947	>				<	1125
		29	v				v	27
				<	^	>		
				9	27	21		

YUCCA MESA ROAD (NS) / YUCCA TRAIL (EW)

MORNING PEAK HOUR

EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (AUTOS):

2006

			63		1		125	
			<		v		>	
26	^						^	16
63	>						<	125
0	v						v	1
			<		^		>	
			0		6		1	

EXISTING PEAK HOUR COUNT YEAR (AUTOS):

2006

					189		48	
					v		^	
188	<		IN	=		427	<	142
89	>		OUT	=		427	>	189
					v		^	
					2		7	

EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (TRUCKS IN PCE'S):

			9		0		15	
			<		v		>	
10	^						^	6
9	>						<	8
0	v						v	0
			<		^		>	
			0		0		0	

PCE FACTORS BY AXLE:

2: 1.5 3: 2.0 4+: 3.0

TOTAL EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (PCES):

2006

			72		1		140	
			<		v		>	
36	^						^	22
72	>						<	133
0	v						v	1
			<		^		>	
			0		6		1	

EVENING PEAK HOUR

EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (AUTOS):

2006

			34		3		25	
			<		v		>	
23	^						^	12
159	>						<	126
0	v						v	0
			<		^		>	
			0		1		1	

EXISTING PEAK HOUR COUNT YEAR (AUTOS):

2006

					62		36	
					v		^	
160	<		IN	=		384	<	138
182	>		OUT	=		384	>	185
					v		^	
					3		2	

EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (TRUCKS IN PCE'S):

			5		0		3	
			<		v		>	
13	^						^	2
0	>						<	5
0	v						v	0
			<		^		>	
			0		9		0	

PCE FACTORS BY AXLE:

2: 1.5 3: 2 4+: 3.0

TOTAL EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (PCES):

2006

			39		3		28	
			<		v		>	
36	^						^	14
159	>						<	131
0	v						v	0
			<		^		>	
			0		10		1	

SHERWOOD AVENUE (NS) / YUCCA TRAIL (EW)

MORNING PEAK HOUR

EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (AUTOS):

2007

			2	0	4			
			<	v	>			
	2	^				^	1	
	90	>				<	106	
	6	v				v	3	
			<	^	>			
			28	2	3			

EXISTING PEAK HOUR COUNT YEAR (AUTOS):

2007

				6	5			
				v	^			
	136	<	IN	=	247	<	110	
	98	>	OUT	=	247	>	97	
				v	^			
				9	33			

EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (TRUCKS IN PCE'S):

			0	0	2			
			<	v	>			
	0	^				^	0	
	6	>				<	5	
	0	v				v	2	
PCE FACTORS BY AXLE:			<	^	>			
2: 1.5 3: 2.0 4+: 3.0			0	0	0			

TOTAL EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (PCES):

2007

			2	0	6			
			<	v	>			
	2	^				^	1	
	96	>				<	111	
	6	v				v	5	
			<	^	>			
			28	2	3			

EVENING PEAK HOUR

EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (AUTOS):

2007

			5	3	16			
			<	v	>			
	5	^				^	16	
	165	>				<	102	
	43	v				v	12	
			<	^	>			
			18	5	3			

EXISTING PEAK HOUR COUNT YEAR (AUTOS):

2007

				24	26			
				v	^			
	125	<	IN	=	393	<	130	
	213	>	OUT	=	393	>	184	
				v	^			
				58	26			

EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (TRUCKS IN PCE'S):

			0	0	0			
			<	v	>			
	0	^				^	0	
	2	>				<	3	
	0	v				v	0	
PCE FACTORS BY AXLE:			<	^	>			
2: 1.5 3: 2 4+: 3.0			0	0	0			

TOTAL EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (PCES):

2007

			5	3	16			
			<	v	>			
	5	^				^	16	
	167	>				<	105	
	43	v				v	12	
			<	^	>			
			18	5	3			

TORRES AVENUE (NS) / TWENTY-NINE PALMS (EW)

MORNING PEAK HOUR

EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (AUTOS):

2007

			0	0	0	
			<	v	>	
	0	^			^	0
	522	>			<	575
	2	v			v	0
			<	^	>	
			4	0	1	

EXISTING PEAK HOUR COUNT YEAR (AUTOS):

2007

				0	0	
				v	^	
	579	<	IN	=	1104	< 575
	524	>	OUT	=	1104	> 523
				v	^	
				2	5	

EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (TRUCKS IN PCE'S):

			0	0	0	
			<	v	>	
	0	^			^	0
	132	>			<	103
	0	v			v	0
PCE FACTORS BY AXLE:			<	^	>	
2: 1.5 3: 2.0 4+: 3.0			0	0	0	

TOTAL EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (PCES):

2007

		0	0	0	
		<	v	>	
0	^			^	0
654	>			<	678
2	v			v	0
		<	^	>	
		4	0	1	

EVENING PEAK HOUR

EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (AUTOS):

2007

			0	0	0	
			<	v	>	
	0	^			^	0
	934	>			<	993
	3	v			v	0
			<	^	>	
			6	0	2	

EXISTING PEAK HOUR COUNT YEAR (AUTOS):

2007

				0	0	
				v	^	
	999	<	IN	=	1938	< 993
	937	>	OUT	=	1938	> 936
				v	^	
				3	8	

EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (TRUCKS IN PCE'S):

			0	0	0	
			<	v	>	
	0	^			^	0
	38	>			<	50
	0	v			v	0
PCE FACTORS BY AXLE:			<	^	>	
2: 1.5 3: 2 4+: 3.0			0	0	0	

TOTAL EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (PCES):

2007

		0	0	0	
		<	v	>	
0	^			^	0
972	>			<	1043
3	v			v	0
		<	^	>	
		6	0	2	

SUNNY VISTA ROAD (NS) / TWENTY-NINE PALMS (EW)

MORNING PEAK HOUR

EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (AUTOS):

2006

			2	1	1			
			<	v	>			
		1	^			^		0
		548	>			<		650
		5	v			v		35
			<	^	>			
			1	0	193			

EXISTING PEAK HOUR COUNT YEAR (AUTOS):

2006

				4	1			
				v	^			
		653	<	IN =	1437	<		685
		554	>	OUT =	1437	>		742
				v	^			
				41	194			

EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (TRUCKS IN PCE'S):

			0	0	0			
			<	v	>			
		2	^			^		0
		81	>			<		67
		0	v			v		6
			<	^	>			
			0	0	19			

PCE FACTORS BY AXLE:

2: 1.5 3: 2.0 4+: 3.0

TOTAL EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (PCES):

2006

			2	1	1			
			<	v	>			
		3	^			^		0
		629	>			<		717
		5	v			v		41
			<	^	>			
			1	0	212			

EVENING PEAK HOUR

EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (AUTOS):

2006

			0	1	0			
			<	v	>			
		4	^			^		1
		909	>			<		881
		12	v			v		45
			<	^	>			
			3	0	57			

EXISTING PEAK HOUR COUNT YEAR (AUTOS):

2006

				1	5			
				v	^			
		884	<	IN =	1913	<		927
		925	>	OUT =	1913	>		966
				v	^			
				58	60			

EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (TRUCKS IN PCE'S):

			0	0	0			
			<	v	>			
		0	^			^		0
		31	>			<		26
		0	v			v		2
			<	^	>			
			0	0	2			

PCE FACTORS BY AXLE:

2: 1.5 3: 2 4+: 3.0

TOTAL EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (PCES):

2006

			0	1	0			
			<	v	>			
		4	^			^		1
		940	>			<		907
		12	v			v		47
			<	^	>			
			3	0	59			

SUNNY VISTA ROAD (NS) / ALTA LOMA DRIVE (EW)

MORNING PEAK HOUR

EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (AUTOS):

2006

				17	13	0		
				<	v	>		
		336	^				^	2
		13	>				<	25
		7	v				v	5
				<	^	>		
				21	34	3		

EXISTING PEAK HOUR COUNT YEAR (AUTOS):

2006

					30	372		
					v	^		
		63	<	IN	=	476	<	32
		356	>	OUT	=	476	>	16
					v	^		
					25	58		

EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (TRUCKS IN PCE'S):

				5	2	0		
				<	v	>		
		17	^				^	0
		0	>				<	0
		3	v				v	0
				<	^	>		
				0	2	2		

PCE FACTORS BY AXLE:

2: **1.5** 3: **2.0** 4+: **3.0**

TOTAL EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (PCES):

2006

				22	15	0		
				<	v			
		353	^				^	2
		13	>				<	25
		10	v				v	5
				<	^	>		
				21	36	5		

EVENING PEAK HOUR

EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (AUTOS):

2006

				47	25	4		
				<	v	>		
		60	^				^	7
		42	>				<	26
		32	v				v	5
				<	^	>		
				10	4	5		

EXISTING PEAK HOUR COUNT YEAR (AUTOS):

2006

					76	71		
					v	^		
		83	<	IN	=	267	<	38
		134	>	OUT	=	267	>	51
					v	^		
					62	19		

EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (TRUCKS IN PCE'S):

				2	0	0		
				<	v	>		
		0	^				^	0
		0	>				<	2
		0	v				v	0
				<	^	>		
				0	0	0		

PCE FACTORS BY AXLE:

2: 1.5 3: 2 4+: 3.0

TOTAL EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES (PCES):

2006

				49	25	4		
				<	v	>		
		60	^				^	7
		42	>				<	28
		32	v				v	5
				<	^	>		
				10	4	5		

APPENDIX D

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 time's 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 HCM. 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 HCM, 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 E 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 (Year 2011)

Tentative Tract Map No. 18255
Existing (Year 2011)
Morning Peak Hour

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

****

Intersection #1 Pioneertown Road (NS) at Twentynine Palms Highway SR-62 (EW)

****

Cycle (sec): 130 Critical Vol./Cap.(X): 0.385
Loss Time (sec): 6 (Y+R=3.0 sec) Average Delay (sec/veh): 16.7
Optimal Cycle: OPTIMIZED Level Of Service: B

****

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:	28	28	28				28	28	28				10	18	18				10	18	18			
Lanes:	1	0	1	0	1		1	0	0	1	0		1	0	2	0	1		1	0	2	0	1	
Volume Module:																								
Base Vol:	26	10	14				76	9	18				12	725	10				17	902	8			
Growth Adj:	1.06	1.06	1.06				1.06	1.06	1.06				1.06	1.06	1.06				1.06	1.06	1.06			
Initial Bse:	28	11	15				81	10	19				13	769	11				18	956	8			
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				0.78	0.78	0.78				0.93	0.93	0.93				0.89	0.89	0.89			
PHF Volume:	35	14	19				103	12	24				14	823	11				20	1076	10			
Reduct Vol:	0	0	0				0	0	0				0	0	0				0	0	0			
Reduced Vol:	35	14	19				103	12	24				14	823	11				20	1076	10			
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:	35	14	19				103	12	24				14	823	11				20	1076	10			
Saturation Flow Module:																								
Sat/Lane:	1800	1800	1800				1800	1800	1800				1800	1800	1800				1800	1800	1800			
Adjustment:	0.94	1.00	1.00				0.94	1.00	1.00				0.94	1.00	1.00				0.94	1.00	1.00			
Lanes:	1.00	1.00	1.00				1.00	0.33	0.67				1.00	2.00	1.00				1.00	2.00	1.00			
Final Sat.:	1700	1800	1800				1700	600	1200				1700	3600	1800				1700	3600	1800			
Capacity Analysis Module:																								
Vol/Sat:	0.02	0.01	0.01				0.06	0.02	0.02				0.01	0.23	0.01				0.01	0.30	0.01			
Crit Moves:							****						****							****				
Green/Cycle:	0.22	0.22	0.22				0.22	0.22	0.22				0.08	0.55	0.55				0.19	0.66	0.66			
Volume/Cap:	0.10	0.03	0.05				0.28	0.09	0.09				0.10	0.41	0.01				0.06	0.45	0.01			
Delay/Veh:	41.0	40.4	40.5				43.0	41.0	41.0				56.2	17.0	13.1				43.7	10.8	7.5			
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:	41.0	40.4	40.5				43.0	41.0	41.0				56.2	17.0	13.1				43.7	10.8	7.5			
LOS by Move:	D	D	D				D	D	D				E	B	B				D	B	A			
HCM2kAvgQ:	1	0	1				4	1	1				1	9	0				1	10	0			

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

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