Griffin Ranch S.P. 2004-074 Amendment No. 1 and Tentative Tract Map No. 34642 Traffic Impact Study

Prepared By: Endo Engineering

November 2006

Endo Engineering *Traffic Engineering* *Air Quality Studies* *Noise Assessments*

November 17, 2006

Mr. Jerry Herman
TransWest Housing
47-120 Dune Palms Road, Suite C
La Quinta, CA 92253-2051

SUBJECT: Griffin Ranch Specific Plan 2004-074 Amendment No. 1 and Tentative Tract Map 34642 Traffic Impact Study

Dear Mr. Herman;

Endo Engineering is pleased to submit this evaluation of the traffic impacts associated with an Amendment No. 1 to the recently approved Griffin Ranch Specific Plan (2004-074) that is located south of Avenue 54 and east of Madison Street, in the City of La Quinta. The amendment addresses an expansion area (Tentative Tract Map 34642) which occupies 45.04 acres located adjacent to the eastern boundary of the Griffin Ranch Specific Plan on the southwest corner of the intersection of Monroe Street and Avenue 54. The gated development proposed would include 90 equestrian-oriented single-family residential lots with private streets, consistent with the General Plan land use designation (VLDR - Very Low Density Residential) and the zoning designation (RVL-Residential Very Low Density with Equestrian Overlay) of the site. Project build-out is expected to occur in the year 2008.

The analysis herein represents an update and modification of the previously approved *Griffin Ranch Specific Plan and Vesting Tentative Map 32879 Traffic Impact Study* (dated September 7, 2004) prepared by Endo Engineering. The pages which follow include the following modifications to the previous traffic study:

- The 45.04-acre residential expansion area is addressed with a total of 90 single-family residential dwellings in the gated development;
- Madison Street is assumed to be extended from Avenue 52 to Avenue 54 in 2008;
- The intersections of Madison Street at Avenue 52 and Madison Street at Avenue 54 are evaluated as four-way intersections, rather than "tee" intersections;
- New peak season traffic counts are addressed, which reflect a two-hour interval in the morning (7:00 a.m. to 9:00 a.m.) and an extended four-hour interval in the afternoon and evening (2:00 p.m. to 6:00 p.m.);
- Two off-site key intersections are eliminated from the analysis (Jefferson Street at Highway 111 and Madison Street at Avenue 50); and
- Additional cumulative developments have been included.

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The format of this report and scope of the analysis herein have been approved by the City of La Quinta Contract Engineer. The pages which follow briefly summarize in graphic and narrative form: (1) existing circulation conditions in the project vicinity; (2) year 2008 circulation conditions with and without the proposed project; and (3) specific mitigation measures designed to reduce any significant impacts identified to acceptable levels.

We trust that the information provided herein will be of value in your review of the impacts and conditions of approval associated with the project. Should questions or comments arise regarding the findings and recommendations herein, please do not hesitate to contact our offices by telephone, facsimile or electronic mail at endoengr@cox.net. We look forward to discussing our findings with you.

Sincerely,

ENDO ENGINEERING

Vicki Lee Endo

Vicki Lee Endo, P.E.
Registered Professional
Traffic Engineer TR 1161

GRIFFIN RANCH SPECIFIC PLAN 2004-074 AMENDMENT NO. 1 AND T.T.M. 34642 TRAFFIC IMPACT STUDY

SOUTHWEST CORNER OF AVENUE 54 AND MONROE STREET

CITY OF LA QUINTA

November 17, 2006

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1.0 EXECUTIVE SUMMARY

1.1 EXISTING CONDITIONS

1. All midblock roadway segments adjacent to the key intersections evaluated in the study area are currently operating below their daily capacity (i.e., handling daily traffic volumes which comprise less than 80 percent of the current daily roadway capacity). Current traffic volumes utilize between 6 and 57 percent of the existing daily capacity of the roadway segments within the study area.

2. Current levels of delay at the intersection of Madison Street and Avenue 52 appear to be acceptable in the morning peak hour during the peak season but do not appear to meet the City of La Quinta minimum intersection performance standard in the evening peak hour, when the delay for motorists using the northbound approach corresponds to LOS F. The peak hour traffic volumes at this intersection currently meet rural traffic signal warrants and will increase dramatically when Madison Street is opened between Avenue 52 and Avenue 54. Therefore, this intersection should be signalized when Madison Street is opened between Avenue 52 and Avenue 54.

3. With one exception, the current overall intersection average control delay in the peak season at the key intersections with all-way stop control corresponds to operation at LOS C or better during the morning and evening peak hours (which is considered acceptable). The intersection of Jefferson Street and Avenue 54 is currently operating at LOS E during the morning peak hour and LOS F during the evening peak hour, which does not meet the City of La Quinta minimum performance standard.

4. Although the current peak hour traffic volumes at the intersection of Jefferson Street and Avenue 54 exceed rural traffic signal volume warrants, once Madison Street is opened between Avenue 52 and Avenue 54, the number of vehicles passing through the intersection of Jefferson Street and Avenue 54 should decrease dramatically, as motorists utilize both Madison Street and Jefferson Street to travel north of Avenue 54. At that point, the levels of service should improve and traffic signal warrants may no longer be met at the intersection of Jefferson Street and Avenue 54.

5. Based upon current peak season peak hour traffic volumes, two key intersections that are operating at acceptable levels of service (Madison Street at Avenue 54, and Monroe Street at Avenue 54) currently meet rural traffic signal warrants.

6. The intersection of Madison Street and Avenue 58 provides LOS A operation in the peak hours and does not accommodate peak hour traffic volumes that are sufficient to currently meet the rural peak hour traffic signal volume warrants.

1.2 CIRCULATION IMPACTS

1. Buildout of the proposed project would generate approximately 940 daily trip-ends, with 72 trip-ends during the morning peak hour (18 inbound and 54 outbound) and 97 trip-ends during the evening peak hour (61 inbound and 36 outbound).

2. With three cumulative developments (i.e., the Country Club of the Desert, the Griffin Ranch Specific Plan, and the Saddle Club at Griffin Ranch), the projected growth in background traffic by the year 2008, and the opening of Madison Street between

Avenue 52 and Avenue 54, all of the roadway segments evaluated except one are projected to be carrying daily traffic volumes which are below their capacity (i.e., which comprise less than 80 percent of their daily capacity). Avenue 52, west of Madison Street, is projected to have a daily volume-to-capacity ratio of 0.89 and be classified as "near capacity."

3. Following the addition of project-related traffic to the year 2008 ambient daily traffic projections, all of the roadway segments evaluated except one are projected to be carrying daily traffic volumes that are "below capacity" (i.e., that comprise less than 80 percent of their daily capacity). With 2008+project traffic volumes, Avenue 52, west of Madison Street, is projected to have a daily volume-to-capacity ratio of 0.89 and be classified as "near capacity."

4. With the proposed site access improvements, the two unsignalized site access intersections are projected to provide LOS B operation on the approaches with the most delay upon project completion in the year 2008.

5. With the expected traffic growth in the area and the extension of Madison Street north to Avenue 52, the following key intersections with all-way stop control are projected to continue to operate at acceptable levels of service upon project completion in the year 2008: (1) Jefferson Street at Avenue 54, (2) Monroe Street at Avenue 54, and (3) Madison Street at Avenue 58.

6. With the northerly extension of Madison Street and the anticipated growth in the area, two key intersections (Madison Street at Avenue 52, and Madison Street at Avenue 54) are projected to operate at F in the year 2008 and require signalization to maintain acceptable levels of service with or without site traffic. With signalization, these intersections are projected to operate at LOS B in the peak hours.

7. Although project-related traffic will incrementally increase the control delay at all of the key intersections, it is not expected to change the peak hour level of service at any of the key intersections evaluated.

8. Project-related traffic will contribute incrementally (60 vehicles per day) to the need to improve Avenue 52, between Madison Street and Jefferson Street, to provide a consistent four-lane cross-section.

1.3 Recommended Mitigation

The following mitigation measures should be incorporated in the project to minimize the potential for significant adverse circulation impacts associated with the proposed development.

1. The project proponent shall dedicate appropriate right-of-way for Monroe Street and Avenue 54 along the site frontage, and construct improvements consistent with their ultimate half-street sections, as required by the City of La Quinta.

2. A right-turn deceleration lane with adequate taper and deceleration length shall be constructed on Avenue 54 to permit eastbound motorists to decelerate out of travel lanes, prior to turning right into the eastern Griffin Ranch access on Avenue 54. Based on the 50 mph speed limit on Avenue 54, this deceleration lane should be 12 feet wide and 248 feet long, with a 150-foot transition length.

3. A left-turn bay/deceleration lane with adequate taper and queue storage length shall be constructed on Avenue 54 to permit westbound motorists to decelerate out of travel lanes prior to turning left into the eastern Griffin Ranch access on Avenue 54. Based on the 50 mph speed limit on Avenue 54, this lane should be 12 feet wide and 248 feet long, with a 150-foot transition length. The 95th percentile queue in the peak hour of the peak season is projected to be 0.12 car length; therefore, the required left-turn queue storage length will be minimal.

4. Although not warranted by the criteria in Engineering Bulletin #03-08, a deceleration/right turn only lane with adequate taper and deceleration length has been incorporated in the Site Development Plan and shall be constructed on Monroe Street, at the site entry south of Avenue 54, to permit southbound motorists to decelerate out of travel lanes, prior to turning right into the site access. Based on the 50 mph speed limit on Monroe Street, this deceleration lane should be 12 feet wide and 248 feet long, with a 150-foot transitional taper length.

5. Improvements along Monroe Street shall include an 18-foot wide raised landscaped median opposite the entire site boundary with a conventional median opening at the site entry that incorporates a deceleration/left-turn lane at least 12 feet wide and 248 feet long, with a 150-foot transitional taper length.

6. An on-street shared Class II bikeway and golf cart path (a minimum of 8 feet wide) shall be appropriately striped along Monroe Street and Avenue 54 adjacent to the site.

7. A 10-foot wide Multi-Purpose Trail shall be constructed within the landscaped setback along the site frontage on Monroe Street, per La Quinta Standard 260. Although the location and design shall be subject to City approval, improvements will include a split rail fence along the roadway side of the trail and a 4-inch wide concrete or similar inflexible border between the trail and the landscaping.

8. The final layout and site access design shall be subject to the review and approval of the City Traffic Engineer during the development review process, to ensure compliance with City of La Quinta roadway and access design standards.

9. Clear unobstructed sight distances shall be provided at both site access points and at all internal intersections.

10. Stop signs shall be installed at the proposed access on Monroe Street and on Avenue 54 to control exiting site traffic.

11. Since the total entering volume at the intersection of Merv Griffin Way and Haflinger Way during the peak hour, would be approximately 182 vehicles, it is recommended that a STOP sign be installed on Haflinger Way at the intersection of Merv Griffin Way, as a means of minimizing traffic conflicts.

12. The project proponent shall provide (at a minimum) the lane geometrics shown in Figure 5-1 at the site access points in conjunction with on-site development.[1]

13. To achieve and maintain the City of La Quinta minimum intersection performance standard of LOS "D" in the year 2008 (with or without project traffic), the project proponent may be required to contribute on a "fair-share" basis to the cost of

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1. The developer of the Country Club of the Desert shall widen the westbound side of Avenue 54, between Jefferson Street and Monroe Street.

installing traffic signals at the following key intersections: (1) Madison Street at Avenue 52, (2) Madison Street at Avenue 54. These signals will be warranted and should be installed when Madison Street is first opened between Avenue 54 and Avenue 52.

14. The project proponent may be required to participate in a traffic mitigation fee program which would ensure that a "fair-share" contribution is made to the cost of future traffic signals and other future roadway infrastructure improvements of area-wide benefit.

2.0 PROJECT LOCATION AND DESCRIPTION

2.1 PROJECT LOCATION

The project site is comprised of approximately 45.04 acres, generally located in the southeastern portion of the City of La Quinta. The site is currently vacant and used for agriculture. Figure 2-1 depicts the project site in its regional context.

Figure 2-2, the Vicinity Map, depicts the study area, the key intersections, and the proposed site access locations. As shown therein, the project site is located on the southwest corner of the intersection of Monroe Street and Avenue 54. It abuts the eastern boundary of the approved Griffin Ranch Specific Plan and is located immediately north of the proposed Saddle Club at Griffin Ranch.

2.2 PROJECT DESCRIPTION

The proposed project is the Griffin Ranch Specific Plan Amendment No. 1 and Tentative Tract 34642 addressing a proposed 45.04-acre expansion area. The project includes the development of 90 single-family residential lots with an internal connection to the gated eastern Griffin Ranch Specific Plan full-turn access on Avenue 54 (located 3,075 feet east of Madison Street) as shown in Figure 2-3. In addition, a new conventional (full-turn) gated site access is proposed on Monroe Street, approximately 1,120 feet south of Avenue 54 and 550 feet north of the Saddle Club access.

Figure 2-4 illustrates the Site Development Plan for the Griffin Ranch expansion area, including the proposed site access and internal circulation system. The proposed private internal circulation system would connect to the Griffin Ranch Specific Plan private street system at three locations along the boundary between the two development areas. The southernmost internal street connection proposed (see Figure 2-5) would provide access to the Saddle Club at Griffin Ranch, permitting future residents to walk or drive golf carts from their homes to the adjacent Saddle Club without using the external street system.

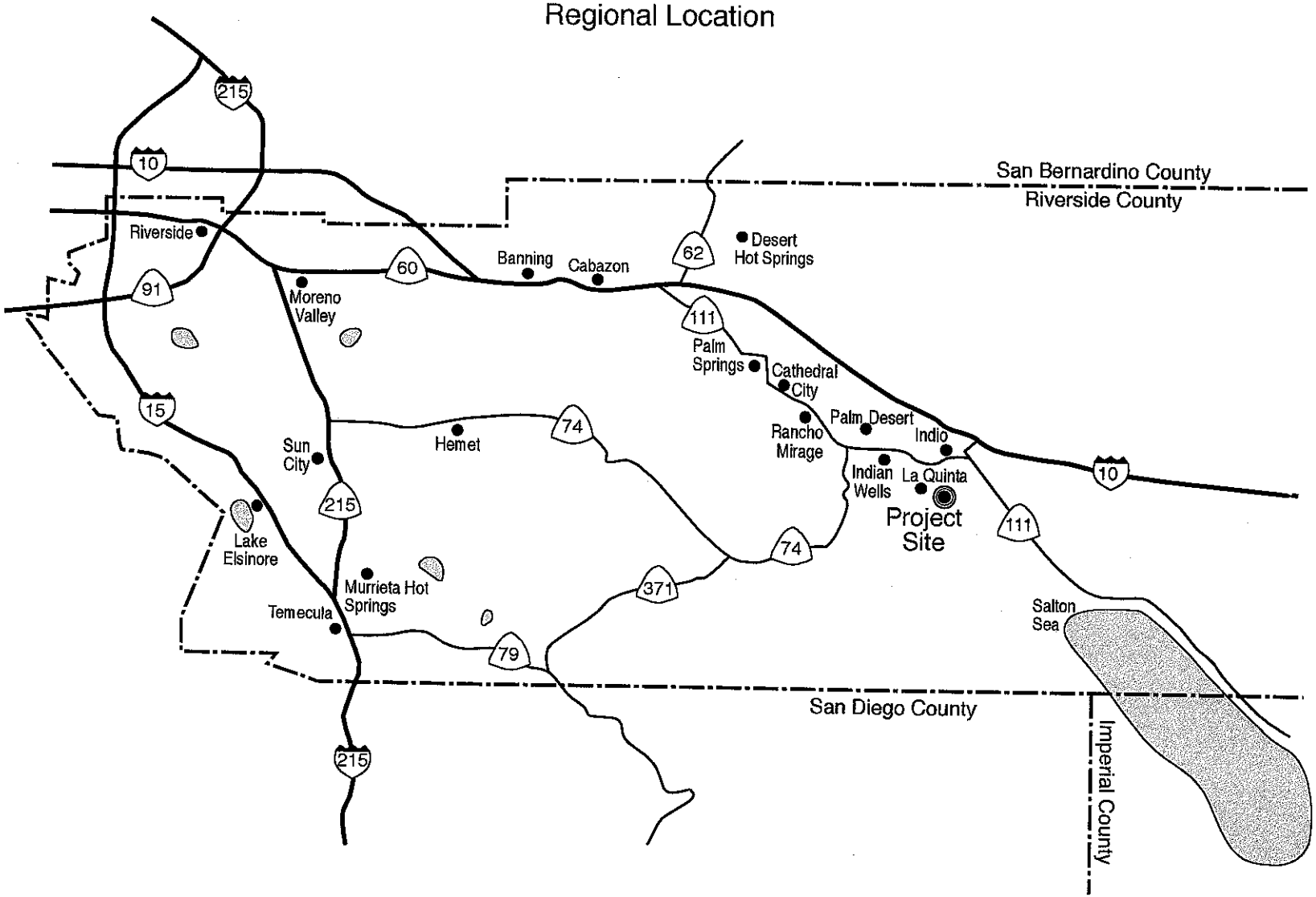
Site Access and Internal Circulation

The proposed Griffin Ranch expansion project will be served by two access points. A new full-turn site access is proposed on Monroe Street. Since Monroe Street is designated in the La Quinta General Plan Circulation Element as a Primary Arterial – A, the City-recommended minimum intersection spacing for design purposes is 1,060 feet. The access for the Saddle Club at Griffin Ranch would be on the same side of Monroe Street, within 1,060 feet. As a result, the Saddle Club access on Monroe Street has been designed to restrict movements to right-in/right-out and left-turn in (with left-turn egress not permitted). The access to the proposed project on Monroe Street will be a full-turn access.

Additional site access will be through the approved Griffin Ranch Specific Plan gated eastern access on Avenue 54. The Avenue 54 eastern site access is a full-turn access located approximately 2,200 feet west of Monroe Street.

The proposed site access on Monroe Street will include queue storage in excess of 100 feet in front of a card activated gate. The access will include a turn around area to allow visitors who enter inadvertently to turn around and exit without first passing through the gate.

Figure 2-1
Regional Location



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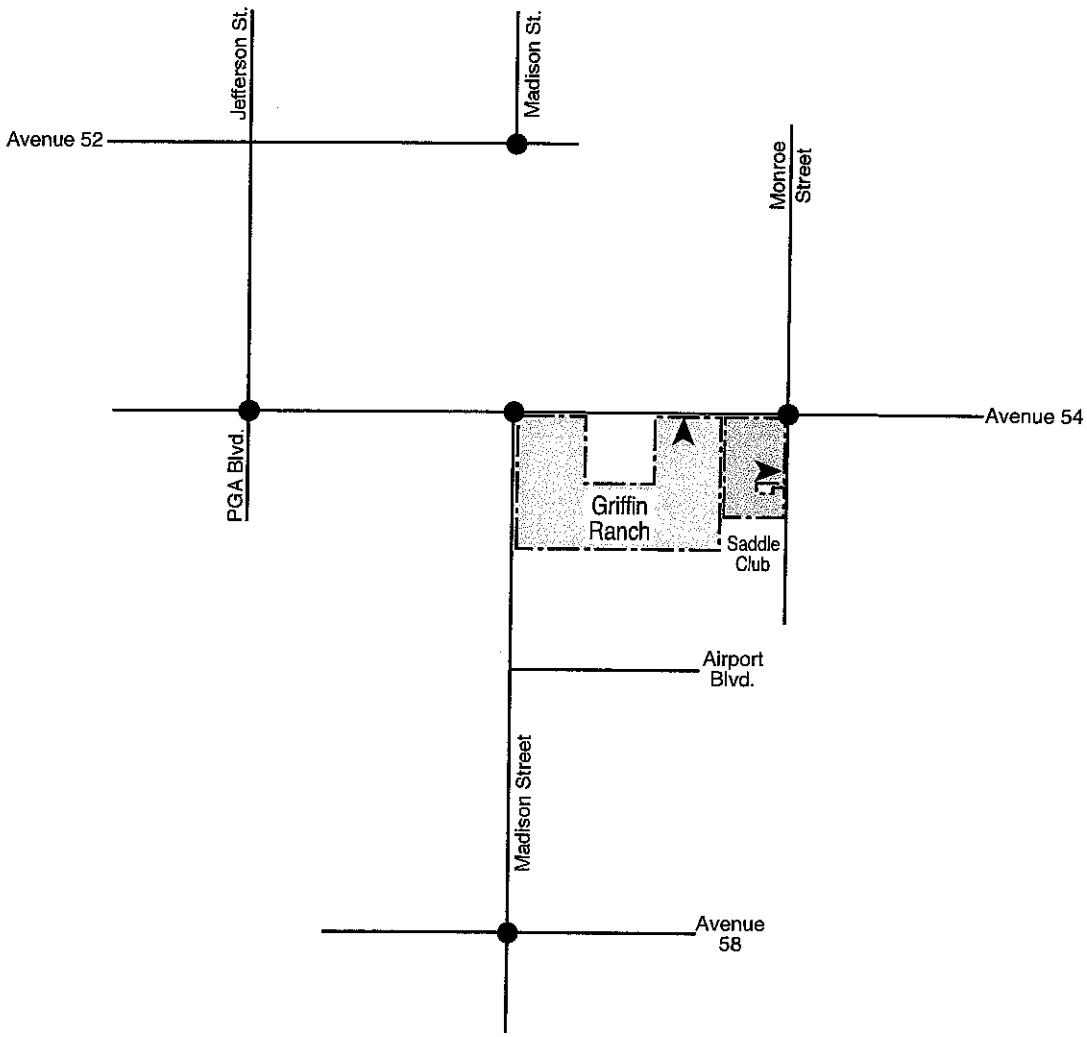
Scale: 1" = 13.3 Miles

Figure 2-2
Vicinity Map



Legend

- Project Site
- Key Intersection
- Site Access

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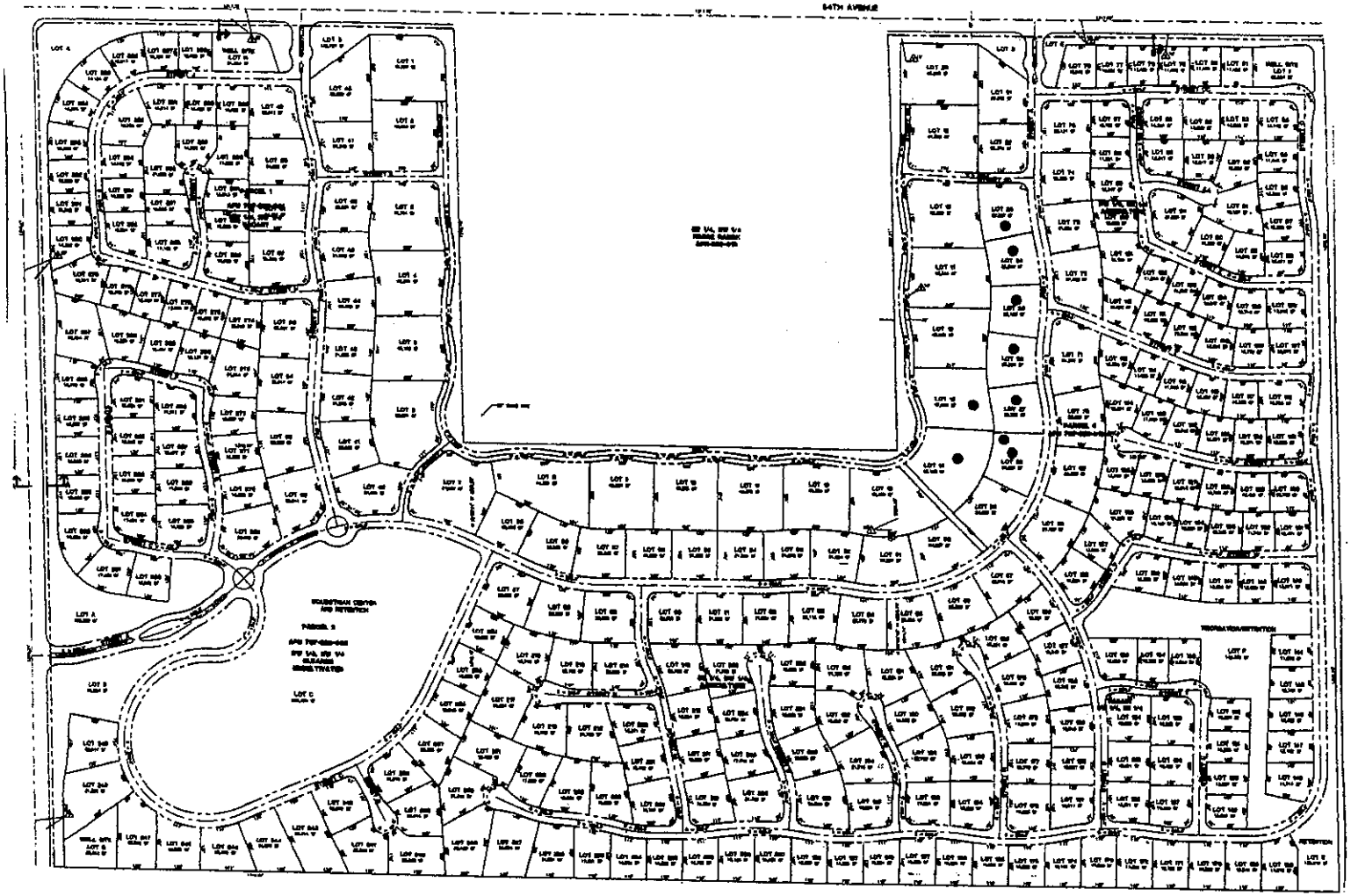
Scale: 1" = 3770'

Figure 2-3

Griffin Ranch Specific Plan
Development Plan

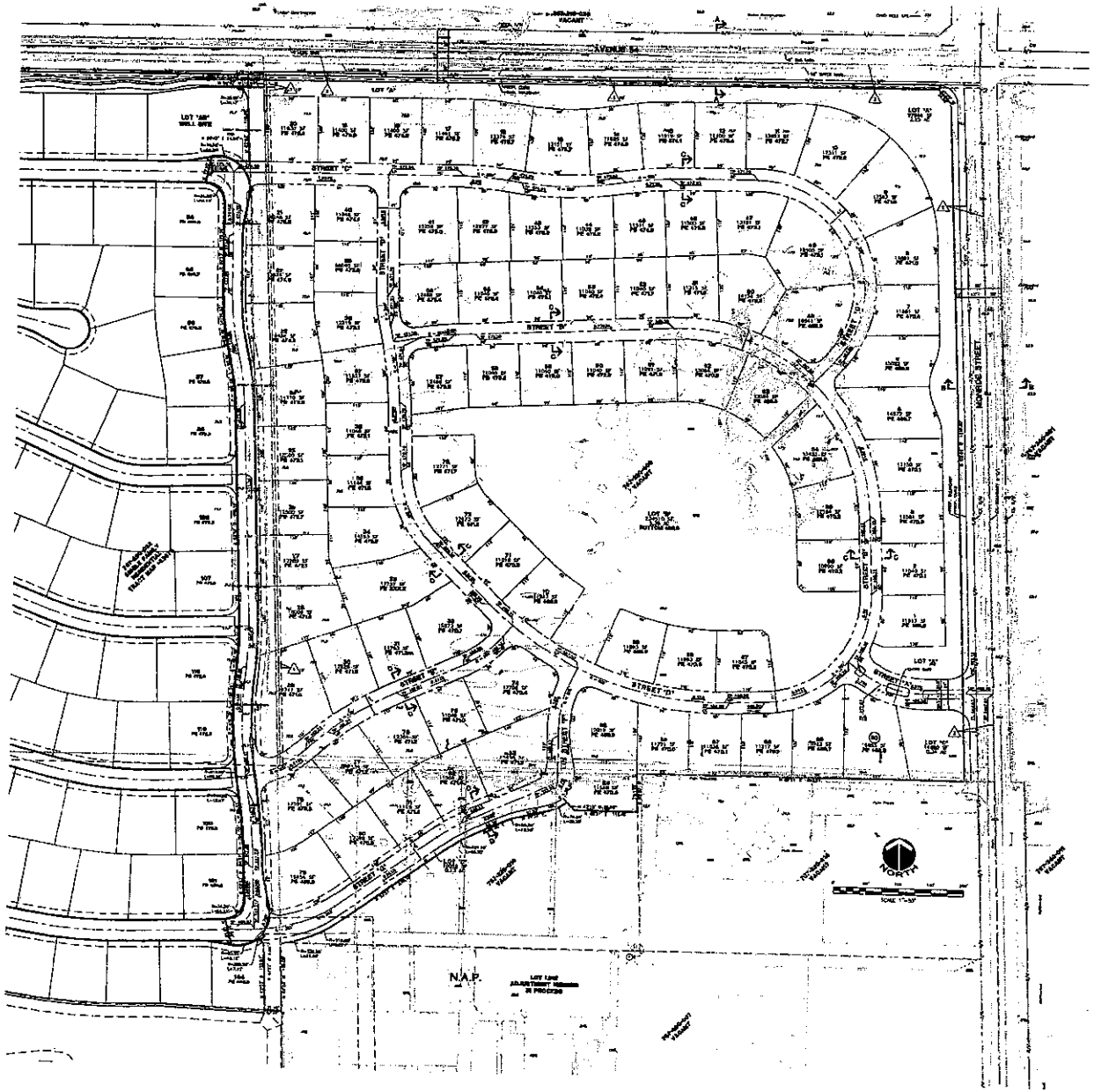


Source: MSA Inc.

Scale: 1" = 500'

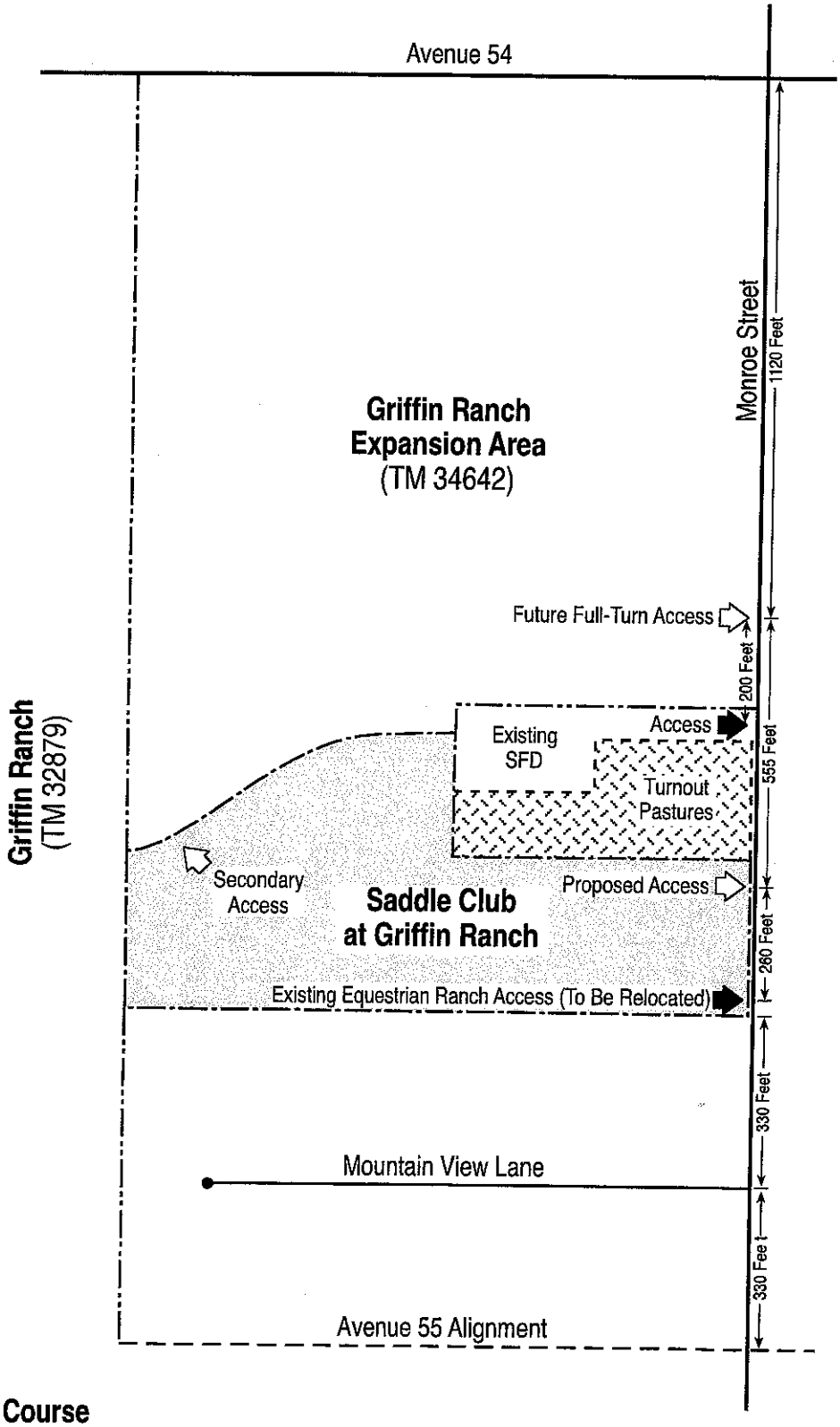
Figure 2-4

Griffin Ranch Expansion Area Site Development Plan (T.T.M. 34642)



Scale: 1" = 300'

Figure 2-5
Access Spacing Along Monroe Street



The expansion area will connect to the approved Griffin Ranch Specific Plan internal circulation system at three streets (Haflinger Way, Man-O-War Court, and MacBeth Street) as shown in Figure 2-4. Although the proposed internal access connections could increase the traffic volumes on the private residential streets serving some of the proposed Griffin Ranch residential lots, the internal traffic volumes will remain quite low.

The City of La Quinta Engineering Bulletin #03-08 includes the established policy regarding when auxiliary lanes will be required on primary arterial streets and higher order street classifications for proposed development projects.[1] The Public Works Department has indicated that in applying this policy, City staff does not differentiate between primary and secondary arterials. As a result, the easterly Griffin Ranch Specific Plan entrance on Avenue 54 will be required to provide an eastbound right-turn deceleration lane and a westbound left-turn bay (with deceleration lane). The addition of the proposed expansion area traffic to this access will contribute to the need for these auxiliary lanes on Avenue 54. The appropriate length of the required auxiliary lanes at the site access intersections is addressed at the end of Section 4, under the heading "Other Considerations."

Based on the criteria set forth in the City of La Quinta Engineering Bulletin #03-08, the future traffic volumes at the site entry on Monroe Street do not appear to be sufficient to warrant the provision of a deceleration/right-turn only lane. A southbound deceleration/ right-turn only lane has been incorporated in the Site Development Plan on Monroe Street, as specified by the City of La Quinta

Existing and Proposed General Plan and Zoning Designations

The proposed Griffin Ranch Specific Plan Amendment No. 1 is consistent with the existing General Plan Land Use and zoning designations of the site. The project site is currently designated VLDR (Very Low Density Residential) in the *City of La Quinta Comprehensive General Plan*, with a permitted residential density of up to 2 dwelling units per acre. The 90 dwellings proposed on the 45.04-acre site reflect a density of 2 dwellings per acre. The existing zoning on-site is RVL (Residential Very Low) with an Equestrian Overlay.

2.3 Project Phasing Plan

The grading phase is expected to begin in the year 2007 and require approximately 3 months to complete. For the purposes of the traffic analysis, it was assumed that the project would be completed and occupied in the year 2008.

2.4 Study Area and Key Intersections

Based upon coordination with the City of La Quinta, a study area has been identified with five key intersections, as shown in Figure 2-2. Morning (7:00 a.m. to 9:00 a.m.) and evening (2:00 p.m. to 6:00 p.m.) peak hour levels of service were analyzed at the following key intersections:

- Madison Street @ Avenue 52;
- Madison Street @ Avenue 54;
- Monroe Street @ Avenue 54.
- Jefferson Street @ Avenue 54;
- Madison Street @ Avenue 58; and

1. *Auxiliary Lanes and Traffic Impact Studies Required For Proposed Development Projects*, Timothy R. Jonasson, City of La Quinta Public Works Director/City Engineer, December 16, 2003.

2.5 CUMULATIVE DEVELOPMENT

Development is currently underway at a variety of locations throughout the City of La Quinta and throughout the Coachella Valley at a rapid pace. From January 2002 to January 2003, the Cities of Coachella, La Quinta, and Indio were the fastest growing cities in the Coachella Valley. The City of Coachella grew by 10.1 percent, the population of La Quinta grew by 5.9 percent, and the population of Indio grew by 4.4 percent during that 12-month interval. During the same period, Riverside County as a whole experienced a population growth of 3.7 percent.

Cumulative development was addressed herein by reflecting the anticipated traffic growth on the circulation network in the study area through the application of an annual traffic growth rate (based on historical 24-hour traffic counts) and the addition of traffic generated by three projects in the immediate vicinity. A 9 percent annual traffic growth rate was assumed herein for the key intersections (on Monroe Street, Madison Street, and Avenue 54 at the eastern site access). In addition, traffic associated with: (1) The Country Club of the Desert, (2) the Griffin Ranch Specific Plan, and (3) the Saddle Club at Griffin Ranch was added to the future traffic volumes at the key intersections to reflect traffic increases generated by regional development.

The Country Club of the Desert

The Country Club of the Desert is a 988-acre development located north of Avenue 54, between Monroe Street and Jefferson Street. Bounded on the north by the All American Canal, Avenue 52, and Avenue 53, the Country Club of the Desert development was originally scheduled to be completed in the year 2005 and include 798 single-family detached residential dwelling units, 21 casitas (timeshare dwelling units) and three 18-hole golf courses.

The traffic that will be generated by the Country Club of the Desert was estimated to be 9,690 average daily trips, with 731 trips (250 inbound and 481 outbound) in the morning peak hour and 965 trips (591 inbound plus 374 outbound) in the evening peak hour. This cumulative traffic has been explicitly included herein in the peak hour traffic projections at the key intersections and the daily traffic projections for roadways in the study area (in addition to the application of an ambient traffic growth rate). The assignment of the traffic was derived from the *Country Club of the Desert Traffic Impact Analysis* (Revised) by RKJK & Associates, Inc., dated August 23, 2000.

This area has since been divided into smaller projects, two of which are currently under construction north of the Griffin Ranch Specific Plan area: The Hideaway Golf Club and The Madison Club. The Hideaway Golf Club includes a private equity 36-hole golf course and residential development with 450 single-family homes and custom home construction sites. The Madison Club is located east of The Hideaway Golf Club, between Avenue 54 and Avenue 52. The Madison Club will include a private real-estate driven 18-hole golf course with 193 estate-sized home sites, 20 villa homes, and 5 clubhouse luxury suites.

The *Country Club of the Desert Traffic Impact Analysis* recommended several improvements in the study area in conjunction with the development including the following.

- Construct the southern side of Avenue 52 east of the All American Canal to its ultimate half-section width as a Primary Arterial (110-foot right-of-way).

- Construct the northern side of Avenue 54, from Jefferson Street to Monroe Street, to its ultimate half-section width as a Primary Arterial (100-foot right-of-way).
- Construct the east side of Jefferson Street, from Avenue 54 to the All American Canal, to its ultimate half-section as a Major Arterial (120-foot right-of-way).
- Construct Madison Street, from Avenue 52 to Avenue 54, to its ultimate cross-section width as a Primary Arterial (110-foot right-of-way).
- Construct the west side of Monroe Street, from Avenue 53 to Avenue 54, to its ultimate half-section as a Primary Arterial (110-foot right-of-way).
- The installation of new traffic signals when warranted on Jefferson Street at the site entry (opposite Avenue 53).
- Contribute to a Citywide traffic signal improvement program to fund new traffic signals at the following intersections, when warranted: (1) Jefferson Street at Avenue 54, (2) Madison Street at Avenue 54, (3) Madison Street at Avenue 52, (4) Monroe Street at Avenue 54, (5) Monroe Street at Avenue 53, and (6) Monroe Street at Avenue 52.

The Griffin Ranch Specific Plan

The approved Griffin Ranch Specific Plan 2004-074 is under construction and will include 305 single-family dwelling units on 199 acres located south of Avenue 54 and east of Madison Street. The traffic generated by the Griffin Ranch Specific Plan would include approximately 2,900 daily trips with 223 trips (56 inbound and 167 outbound) in the morning peak hour and 292 trips (184 inbound and 108 outbound) in the evening peak hour. This traffic was included in the year 2008 cumulative volumes evaluated herein.

The Saddle Club at Griffin Ranch (SDP 2006-866)

The Saddle Club at Griffin Ranch is a private equestrian riding and boarding center to be developed on 12.18 acres in conjunction with the Griffin Ranch Specific Plan. The Saddle Club project would involve upgrading the existing equestrian facility where, depending upon the season, between twenty and eighty horses are currently boarded. Older facilities at the existing equestrian facility will be improved and new facilities will be constructed. Equestrian facilities are planned for the Saddle club that could accommodate up to 90 horses with a card-activated access to Monroe Street, north of Mountain View Lane (see Figure 2-5). There will be no outdoor public address system or organized non-resident events or shows at the Saddle Club.

Located south of the southern boundary of the gated residential portion of the Griffin Ranch expansion area, the Saddle Club at Griffin Ranch would provide private equestrian facilities for the existing tenants and lot owners of the Griffin Ranch. To insure that existing boarders who are not Griffin Ranch homeowners will be allowed to continue to stable their horses on-site, twenty-five percent of the horse stalls in the renovated Saddle Club will be allocated for their use. While not a part of the proposed project, the Saddle Club is addressed herein as a cumulative development.

The Saddle Club Development Plan includes two controlled site access points with card-activated gates. The main access point is on the west side of Monroe Street, between Avenue 54 and Mountain View Lane. The second 24-foot wide access point will be via a future road along the northern edge of the Saddle Club, connecting the existing Griffin Ranch with the future residential development in the Griffin Ranch expansion area. This secondary access will be for residents of the Griffin Ranch Specific Plan who opt to use golf carts to travel to/from the adjacent Saddle Club.

A focused traffic impact analysis of the Saddle Club at Griffin Ranch (dated May 15, 2006) was prepared by Endo Engineering that included future traffic projections. It documented the proposed Saddle Club activities and addressed the proposed Saddle Club site access, including recommendations regarding the lane configuration and traffic control at the Saddle Club access on Monroe Street and stacking distance at the Saddle Club entry gate. Final Condition of Approval 44 (dated September 26, 2006) for the Saddle Club at Griffin Ranch specifies that the entry on Monroe Street shall be permitted right-in/right-out and left-turn in movements but not left-turn egress.

3.0 EXISTING CIRCULATION CONDITIONS

Regional access to the City of La Quinta is available from State Highway 111 and Interstate 10. Local access is available from Avenue 52, Airport Boulevard, Madison Street and Jefferson Street. Direct site access will be taken from Monroe Street and Avenue 54.

Figure 3-1 depicts the existing circulation system in the vicinity of the project site. The number of mid-block through lanes are shown as well as whether or not each roadway is a divided or undivided facility. Divided facilities typically provide sufficient pavement width for left-turn pockets at intersections or mid-block at median openings. Undivided facilities require left-turning motorists to queue in the through lane, thereby reducing the carrying capacity of the roadway. The existing traffic control devices and posted speed limits are shown in Figure 3-1, based upon field reconnaissance in the project vicinity. The intersection approach lanes and traffic control at the existing key intersections are shown in Figure 3-2.

3.1 SURROUNDING STREET SYSTEM

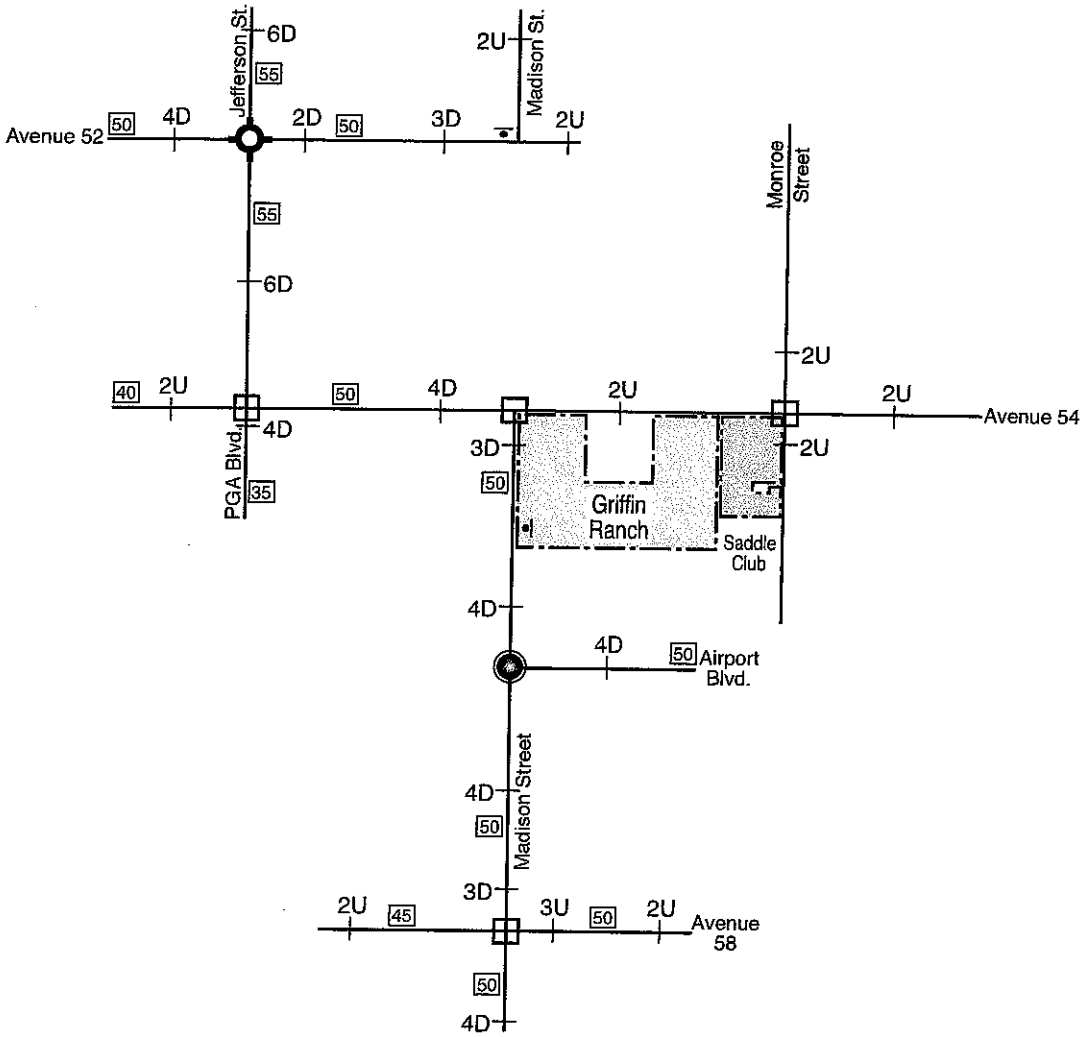
Airport Boulevard is an east/west 4-lane divided roadway with a posted speed limit of 50 mph between Madison Street and Monroe Street. East of Monroe Street, Airport Boulevard has a two-lane undivided cross-section. The intersection of Madison Street and Airport Boulevard is signalized.

Avenue 52 is an east/west roadway with a posted speed limit of 50 mph on either side of Jefferson Street. Avenue 52 is a two-lane undivided roadway, east of Jefferson Street (where it crosses the All American Canal). It is a four-lane divided roadway (west of Jefferson Street). West of the All American Canal, Avenue 52 provides two through lanes with a painted median. Between Madison Street and the All American Canal, Avenue 52 provides two eastbound travel lanes and one westbound travel lane. East of Madison Street, Avenue 52 transitions to a two-lane undivided cross-section, with construction underway along the south side of the roadway. Between Madison Street and Monroe Street, the southern half of Avenue 52 will be fully improved in conjunction with adjacent development that is currently under construction.

Avenue 54 is an east/west two-lane undivided roadway with 26± feet of pavement, east of Madison Street. This section of Avenue 54 does not have curbs, gutters, sidewalks or street lights. West of Madison Street, Avenue 54 has a raised, landscaped median and has been fully improved to provide a four-lane divided cross-section. The eastbound portion of the roadway has improvements that were completed in conjunction with the development of the PGA West Specific Plan including curbs, gutters, sidewalks, streetlights and landscaping. The westbound side has recently been improved during development of the Hideaway project. West of Jefferson Street, Avenue 54 narrows to a 2-lane undivided roadway with a prima facie speed of 40 mph. The intersections of Avenue 54 with Jefferson Street, Madison Street, and Monroe Street are all-way stop-controlled intersections.

Avenue 58 is an east/west roadway with a prima facie speed of 45 mph (west of Madison Street) and a 50 mph posted speed limit, east of Madison Street. Avenue 58 is a two-lane undivided roadway west of Madison Street, and a three-lane undivided roadway east of Madison Street (with two westbound and one eastbound travel lane). East of Madison

Figure 3-1
Existing Transportation System



Legend

2U	Number of Through Lanes D = Divided U = Undivided
	STOP Sign
	Signalized Intersection
	All-Way STOP Control
	Roundabout
45	Posted Speed Limit

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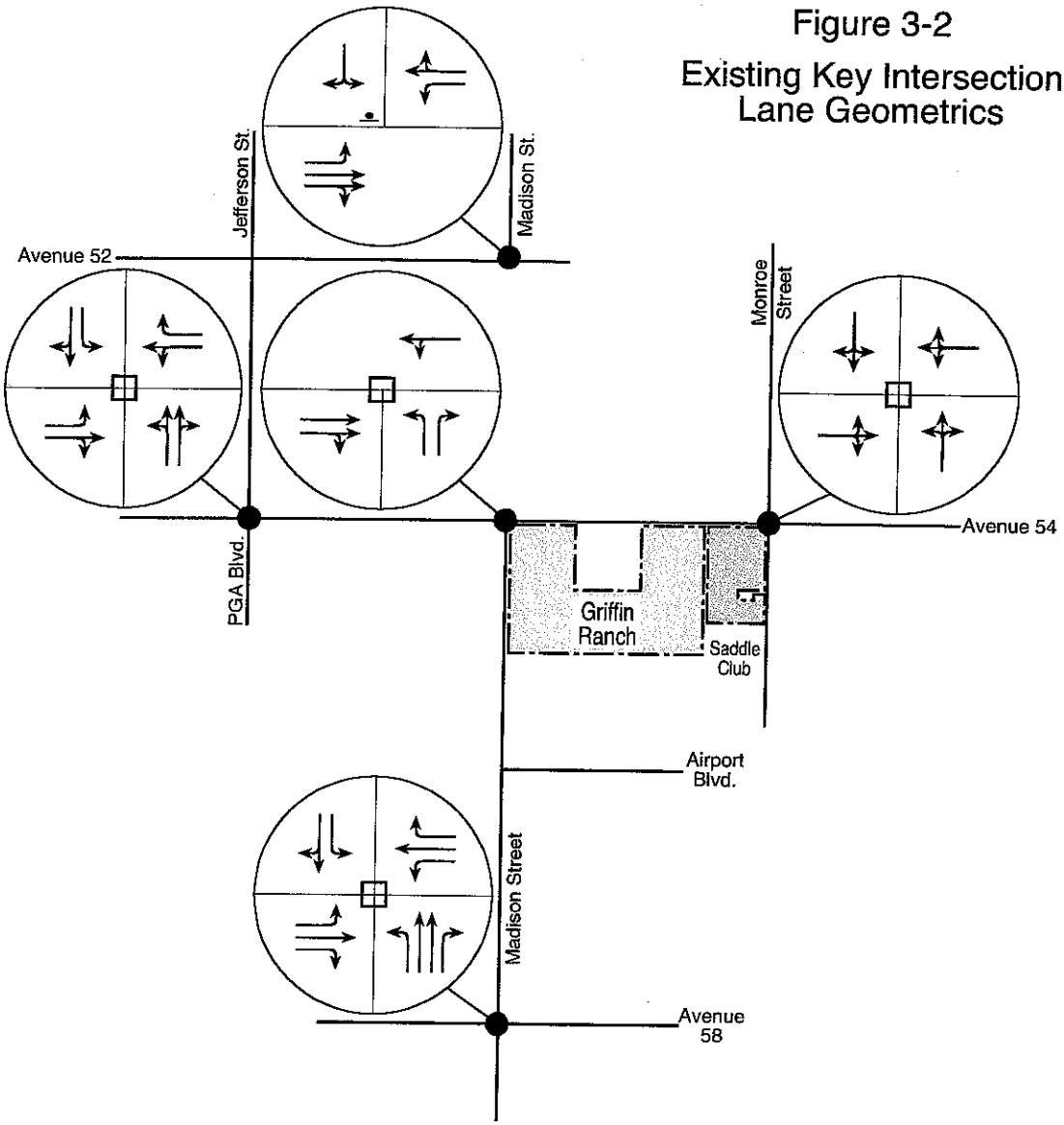
Scale: 1" = 3770'

Figure 3-2
Existing Key Intersection Lane Geometrics



Legend

- Exclusive Right-Turn Lane
- Through Lane
- Exclusive Left-Turn Lane
- Shared Through/Right Lane
- Shared Through/Left Lane
- Shared Through/Right/Left Lane
- All-Way STOP Control
- STOP Sign

Endo Engineering

Scale: 1" = 3770'

Street, Avenue 58 will soon be fully improved in conjunction with adjacent development that is currently under construction.

Jefferson Street runs north/south and is a six-lane divided major arterial with a posted speed limit of 55 mph north of Avenue 54. South of Avenue 54, Jefferson Street becomes PGA Boulevard, a four-lane divided facility with a 35 mph posted speed limit. Jefferson Street is currently controlled by an all-way stop at Avenue 54 and by traffic signals at Avenue 50. The intersections of Jefferson Street and Avenue 52 is a roundabout.

Madison Street is a north/south arterial with a 50 mph posted speed limit. Four-lane roadway segments and accompanying improvements exist on Madison Street where adjacent development has occurred. From Avenue 58 to the Griffin Ranch site, Madison Street provides a four-lane divided cross-section (where the adjacent land on both sides of the roadbed has been developed in conjunction with the PGA West Specific Plan). North of Avenue 58, Madison Street has one southbound lane and two northbound lanes. South of Avenue 54, Madison Street includes two southbound lanes, with one northbound lane.

Madison Street does not currently extend between Avenue 50 and Highway 111. The section of Madison Street between Avenue 54 and Avenue 52 is currently under construction, and should be completed within the next year. Madison Street, south of Avenue 52, is currently providing access primarily to construction traffic associated with the Country Club of the Desert. South of Avenue 58, Madison Street is a four-lane divided roadway. Madison Street is currently controlled by an all-way stop at the intersection of Avenue 54 and at Avenue 58. A traffic signal controls the intersection of Madison Street and Airport Boulevard.

Monroe Street is a north/south 2-lane undivided roadway with a prima facie speed limit of 55 mph near Avenue 54. The intersection of Monroe Street and Avenue 54 is controlled by an all-way stop.

3.2 Current Traffic Volumes

The selection of an appropriate hour for planning, design, and operational purposes is critical in providing an adequate level of service for every (or nearly every) hour of the year. For urban roadways, a design hour for the repetitive weekday peak periods is common. However, to avoid substantial congestion during the highest-volume hours, local data is required on which to base informed judgments. The *Highway Capacity Manual* (HCM 2000) states that as a general guide, the most repetitive peak volumes may be used for the design of new or upgraded facilities.

Typically, morning and evening peak hours are evident on urban commuter routes on weekdays, with the evening peak being generally more intense than the morning peak. However, commuter travel patterns can vary in response to local travel habits and environments. Traffic analyses focus on the peak hour traffic volume because it has the highest capacity requirements and represents the most critical period for operations.

Commuter and business-oriented travel typically exhibit more uniform travel patterns than recreational travel (which can create substantial variations in traffic volumes). Typically, evening counts are made between 4:00 p.m. and 6:00 p.m. However, previous counts in the study area have indicated there is an additional peak between 2:00 p.m. and 3:00 p.m. As a result, a four-hour traffic count will be made in order to ensure that the highest evening peak hour is counted.

To document the current traffic volumes in the study area, weekday morning and evening peak hour traffic counts were made by Counts Unlimited, Inc. at the key intersections on March 15 and 16 of 2006. Manual turning movement counts were made continuously between 7:00 a.m. and 9:00 a.m. and again between 2:00 p.m. and 6:00 p.m. to quantify the highest volume over a consecutive 60-minute interval. The evening counts were made over a four-hour time period to correctly determine the peak 60-minute interval and corresponding traffic volumes. Figure 3-3 shows the morning and evening peak hour turning volumes at the key intersections during the peak season of the year 2006.

Peak season (winter) weekday traffic volumes have historically been determined with 24-hour machine counters placed at various locations throughout the Coachella Valley. The Coachella Valley Association of Governments (CVAG) compiles the 24-hour traffic count data and publishes traffic census reports annually. The most recent CVAG traffic count data was collected in the peak season (winter) of 2005. This data includes counts for several roadway segments, as shown in Figure 3-4. In addition, Figure 3-4 shows the daily traffic volume estimates derived from the year 2006 peak season peak hour traffic count data.

3.3 Roadway Capacity Considerations

Roadway capacity is the maximum number of vehicles that can pass over a given roadway during a given time period under prevailing roadway, traffic and control conditions, assuming no interference from downstream traffic operations. A roadway's ability to handle different traffic demands can be described in terms of levels of service (LOS). Levels of service are a relative measure of traffic operating conditions and driver satisfaction, based upon prevailing traffic volumes in relation to roadway capacity. LOS values range from A (free flow) to F (forced flow). Levels of service reflect a number of factors such as speed and travel time, traffic interruptions, vehicle delay, freedom to maneuver, driver comfort and convenience, and vehicle operating costs.

An important distinction exists between the concepts of capacity and levels of service. A given lane or roadway may provide a wide range of service levels depending upon traffic volumes and speeds, but it has only one maximum capacity. The maximum capacity is determined from roadway factors (such as lane widths, lateral clearance, shoulders, surface conditions, alignment and grades) as well as traffic factors such as vehicle composition (truck and bus mix), distribution by lane, peaking characteristics, traffic control devices, intersections, etc. It is usually given as the hourly service volume at the upper limit of LOS E because the volume of traffic that can be served under the stop-and-go conditions associated with LOS F is lower than that possible at LOS E; therefore, the upper limit of LOS E corresponds to the maximum flow rate or "physical" capacity of the facility.

The upper limit of LOS E represents the absolute maximum capacity under ideal conditions on typical master planned roadways. Ideal conditions assume good weather, good pavement conditions, users familiar with the facility, level terrain, only passenger cars in the traffic stream, no pedestrians or curb parking, and no incidents impeding traffic flow. The LOS E maximum capacity values reflect the absolute maximum volume under ideal conditions (assuming improvement to full standards under optimum operating conditions). This level of service is characterized by unstable flows, extremely high volumes, limited operating speeds, and intermittent vehicle queuing.

The maximum capacity values shown in Table 3-1 have been applied at the General Plan level as guidelines relating the daily traffic volume to the number of lanes needed mid-block to serve that volume. The roadway capacity estimates in Table 3-1 are "rule-of-thumb" estimates affected by site specific factors such as the number and configuration of

intersections, the degree of access control, roadway grades, substandard design geometrics (horizontal and vertical alignment), sight distance, the level of truck and bus traffic, the percentage of turning movements, and the level of pedestrian and bicycle traffic.

Table 3-1
City of La Quinta
Maximum Daily Capacity By Roadway Classification

Classification	Typical Lane Configuration[a]	Daily Capacity[b]
Major Arterial	6-Lane Divided Roadway	57,000 Vehicles/Day
Primary Arterial	4-Lane Divided Roadway	38,000 Vehicles/Day
Secondary Arterial	4-Lane Undivided Roadway	28,000 Vehicles/Day
Collector Street	2-Lane Undivided Roadway	14,000 Vehicles/Day
Local Street	2-Lane Undivided Roadway	9,000 Vehicles/Day

a. Format is: number of mid-block through lanes-undivided or divided roadway.
b. The daily capacity values shown have been applied by the City of La Quinta at the General Plan level as guidelines relating the daily traffic volume to the number of lanes needed mid-block to serve that volume. Where it is not feasible to add additional mid-block through lanes, localized mitigation may be needed (e.g. additional turn lanes at intersections, access restrictions, signal synchronization, etc.) to ensure that acceptable peak hour levels of service are maintained.

For planning purposes, "design" capacities at the upper limit of LOS D are often used because they ensure a more acceptable quality of service to facility users than the "physical" carrying capacity of the roadway and because of the expense required to achieve a better level of service. The City of La Quinta has established LOS D as a peak hour system performance standard or design guideline for traffic volumes on the roadway system.

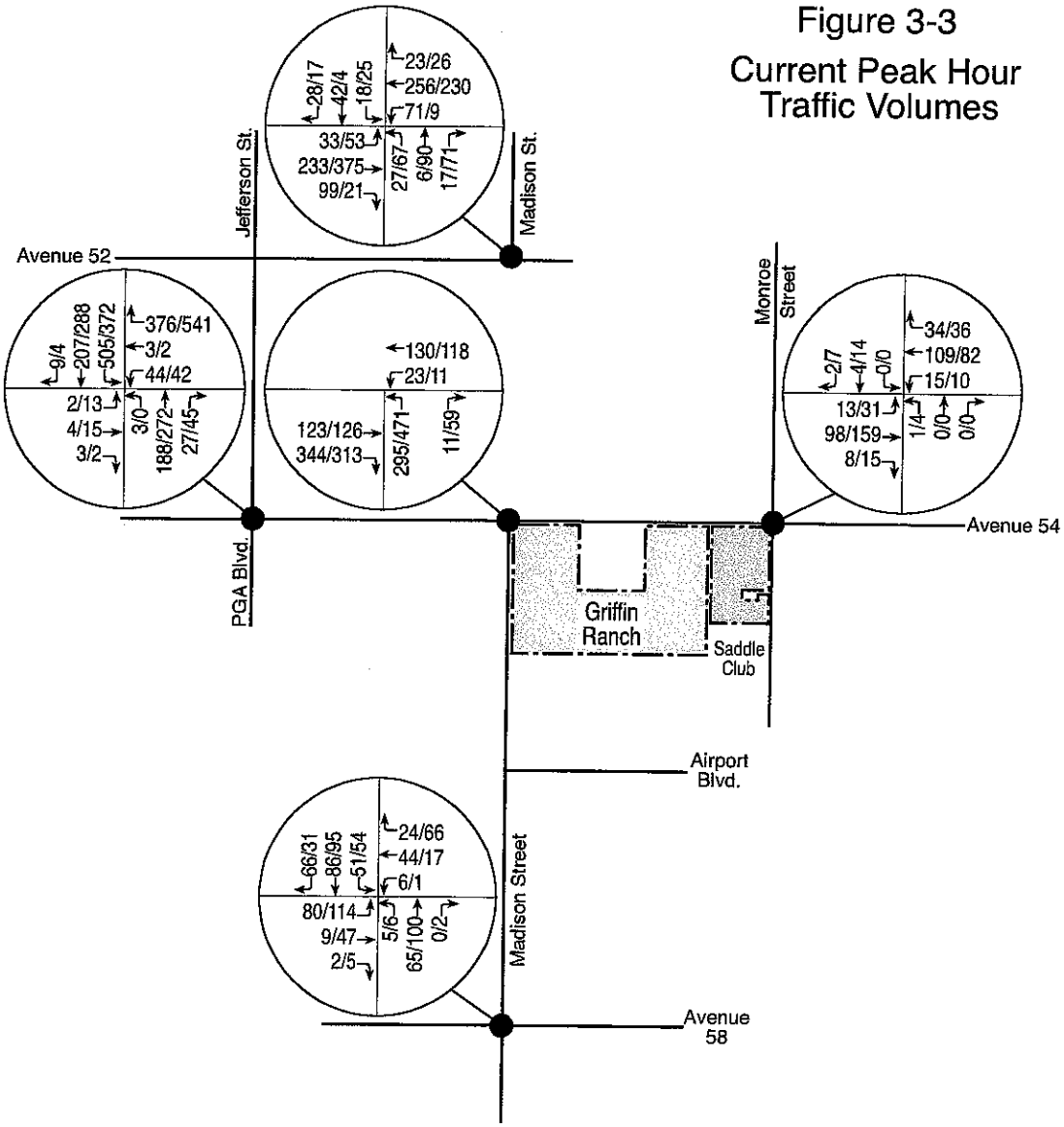
LOS D represents high density but stable flow, with tolerable operating speeds being maintained albeit significantly affected by changes in operating conditions. With LOS D, fluctuations in volume and temporary restrictions to flow may cause substantial drops in operating speeds.

3.4 APPLICABLE LOS STANDARDS

Minimum level of service performance standards have been established by the City of La Quinta that apply to the roadways and intersections located within the study area. Since peak hour traffic creates the heaviest demand upon the circulation system and the lane configuration at intersections is the limiting factor in roadway capacity, peak hour intersection capacity analyses are indicators of "worst-case" conditions and used to determine required mitigation. The City of La Quinta requires the HCM 2000 methodology to be used to determine mitigation and has adopted a circulation policy that level of service "D" or better operation shall be maintained in the peak hours of the peak season at intersections throughout the City. Any project which does not meet the performance standard is considered to have a significant impact that warrants mitigation.

The analysis herein addresses whether or not the required level of service will be achieved after the proposed project is constructed. Intersections not meeting the required LOS standard have been evaluated both with and without mitigation to demonstrate that the

Figure 3-3
Current Peak Hour Traffic Volumes

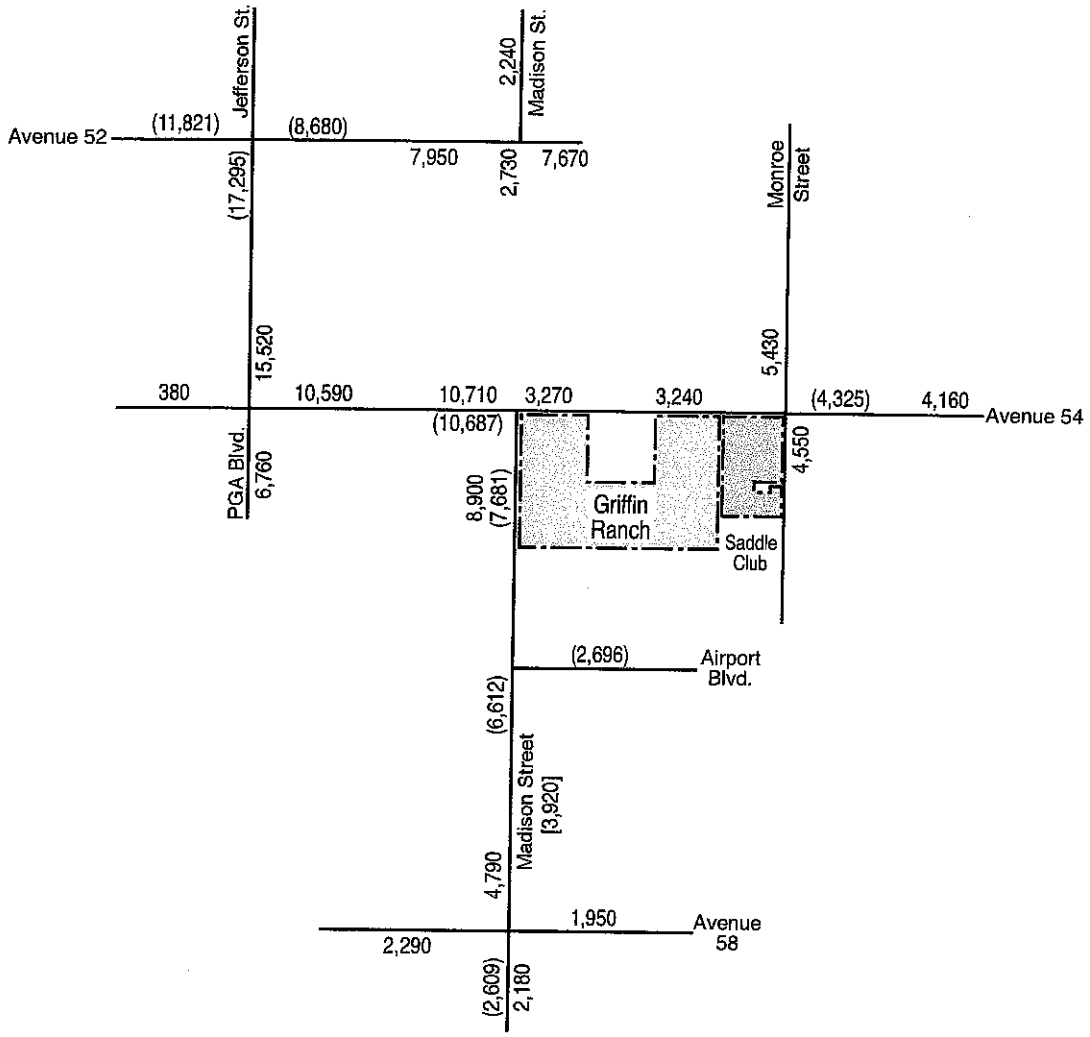


Legend
5/8 AM/PM Peak Hour Turning Volume

Endo Engineering

Scale: 1" = 3770'

Figure 3-4
Current Daily Traffic Volumes
(2006 Peak Season)



Legend	
(1,000)	CVAG "2005 Traffic Census Report"
2,000	Estimate from 2006 Peak Hour Count

Endo Engineering

Scale: 1" = 3770'

required level of service will be achieved. Roadway segments have been evaluated with a daily link analysis to facilitate an understanding of which segments may need widening to provide additional master planned through lanes and how soon widening may be needed.

No single overall intersection level of service is defined for intersections with two-way stop control (TWSC). The operation of TWSC intersections is reviewed on a cases-by-case basis by the City of La Quinta, based upon evaluation with the HCM 2000 methodology. When unacceptable operation is projected on the minor leg approach at a TWSC intersection, mitigation is typically required in the form of geometric improvements or signalization of the intersection (if traffic signal warrants are met).

3.5 Daily Volume-To-Capacity Analysis

A comparison of daily traffic volumes to the daily capacity gives the proportion of the roadway capacity being utilized by the traffic volumes present. Daily volume-to-capacity ratios reflect mid-block operations based upon daily traffic volumes and capacities derived from the number of through lanes available on each roadway. Therefore, a volume-to-capacity (V/C) ratio of 1.0 indicates that the facility is handling the maximum traffic volume that it can accommodate at the maximum capacity of the facility. Smaller volume-to-capacity ratios imply better operational characteristics. Ratios which exceed 1.0 imply less favorable operating conditions (forced flow).

Daily traffic volumes on roadway segments adjacent to the key intersections in the project vicinity were evaluated to determine if existing and projected future traffic volumes would approach or exceed the daily capacity of the roadway segments. Table 3-2 provides the current daily traffic volumes, roadway capacity, and volume-to-capacity ratios for roadway segments adjacent to the existing key intersections in the study area. As shown therein, all midblock roadway segments in the study area are currently handling daily traffic volumes which comprise less than 80 percent of their current daily capacity. Current daily traffic volumes utilize between 6 and 57 percent of the existing daily capacity of the roadway segments within the study area.

3.6 Peak Hour Intersection Analysis

The latest update of the *Highway Capacity Manual* (HCM 2000) presents the best available techniques for determining capacity, delay and LOS for transportation facilities.[1] The peak hour delay and levels of service were determined at the existing key intersections with the methodologies outlined in the HCM 2000. The Highway Capacity Software (HCS 2000) package is a direct computerized implementation of the HCM 2000 procedures, prepared under FHWA sponsorship and maintained by the McTrans Center at the University of Florida Transportation Research Center. HCS 2000 Version 4.1d was employed to evaluate the operation of the unsignalized key intersections in the project vicinity. HCS 2000 Version 4.1e was employed to evaluate the operation of the signalized key intersections.

A brief discussion of the HCM 2000 operational analysis is provided in Appendix B, in conjunction with the corresponding LOS criteria and intersection evaluation worksheets. The relationship between peak hour intersection control delay and levels of service is provided in Appendix B (Table B-1 for unsignalized and Table B-2 for signalized intersections). The City of La Quinta has defined Level of Service "D" as the minimum adequate intersection service level during peak hours for planning and design purposes.

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1. *Highway Capacity Manual;* Fourth Edition; TRB Report 209; Transportation Research Board, National Research Council; Washington, D.C.; 2000.

Table 3-2
Current Daily Volume-To-Capacity Ratios
For Roadways in the Study Area

Roadway Segment	Daily Volume[a] (Vehicles/Day)	Daily Capacity (Vehicles/Day)	V/C Ratio	Conclusion
Jefferson Street				
- North of Avenue 54	15,520	57,000	0.27	Below
- South of Avenue 54	6,760	38,000	0.18	Below
Madison Street				
- North of Avenue 52	2,240	14,000	0.16	Below
- South of Avenue 52	2,730	14,000	0.20	Below
- South of Avenue 54	8,900	38,000	0.23	Below
- North of Avenue 58	4,790	38,000	0.13	Below
- South of Avenue 58	2,180	38,000	0.06	Below
Monroe Street				
- North of Avenue 54	5,430	14,000	0.39	Below
- South of Avenue 54	4,550	14,000	0.33	Below
Avenue 52				
- West of Madison Street	7,950	14,000	0.57	Below
- East of Madison Street	7,670	14,000	0.55	Below
Avenue 54				
- West of Jefferson Street	380	14,000	0.03	Below
- East of Jefferson Street	10,590	38,000	0.28	Below
- West of Madison Street	10,710	38,000	0.28	Below
- East of Madison Street	3,270	14,000	0.23	Below
- West of East Site Access	3,240	14,000	0.23	Below
- East of East Site Access	3,240	14,000	0.23	Below
- West of Monroe Street	3,240	14,000	0.23	Below
- East of Monroe Street	4,160	14,000	0.30	Below
Avenue 58				
- West of Madison Street	2,290	14,000	0.16	Below
- East of Madison Street	1,950	14,000	0.14	Below

a. These peak season weekday volumes were estimated from year 2006 evening peak hour traffic counts.
b. "Below" indicates that the volume is less than 80 percent of the capacity.

Unsignalized Intersection Analysis

All of the key intersections are currently unsignalized. Unsignalized intersections are typically categorized as either two-way stop-controlled (TWSC) or all-way stop-controlled (AWSC) intersections. The intersection of Madison Street and Avenue 52 is currently two-way stop-controlled. The other four unsignalized key intersections are all-way stop-controlled.

Two-Way STOP-Control Intersections

At TWSC intersections, the approaches controlled by the STOP sign are referred to as the minor street approaches. Minor street approaches can be either public streets or private driveways. The intersection approaches that are not controlled by STOP signs are called

the major street approaches. Because it faces the most complex set of conflicting moves, the left-turn movement from the minor street is normally the most difficult to execute at a TWSC intersection.

The performance measures for TWSC and AWSC intersections are: control delay, delay to major street through vehicles, queue length, and volume-to-capacity ratio. However, the level of service is primarily related to the average control delay, which is given in terms of seconds of delay per vehicle by minor movement and intersection approach. The average control delay for any particular minor movement is a function of the capacity of the approach and the degree of saturation. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay.

Existing approach control delay values and the corresponding level of service values for the unsignalized key intersections are provided in Table 3-3. These results assume existing lane geometrics at the intersections (as shown in Figure 3-2) and an 8 percent heavy vehicle mix. As directed by the City of La Quinta, the analysis assumed a peak hour factor of 1.0 to determine the impact of traffic volumes occurring over the entire peak hour, rather than the peak 15 minutes.

As shown in Table 3-3, the two-way stop-controlled key intersection of Madison Street at the Avenue 52 currently has an average approach control delay for the northbound approach (which is currently under construction and has the most delay) that corresponds to level of service D (LOS D) operation during the morning peak hour and LOS F during the evening peak hours. The average approach control delay experienced by residents and construction workers using the northbound approach in the evening peak hours is currently 60.1 seconds per vehicle. The control delay associated with the left-turn movement from Madison Street at this intersection (which represents the "best case" movement) corresponds to LOS A operation during the morning and evening peak hours.

Although a single overall intersection delay and LOS are not defined for TWSC intersections in the HCM 2000, it may be concluded from the evaluation summarized in Table 3-3 that current levels of delay at the intersection of Madison Street and Avenue 52 are not within the range considered acceptable by the City of La Quinta (LOS D or better).

All-Way STOP-Control Intersections

The HCM 2000 procedures for all-way stop-controlled (AWSC) intersections provide the overall intersection delay and LOS as well as the delay and LOS for the intersection approach with the most delay. Since AWSC intersections do not have minor street approaches, the delay and LOS determinations for the approach with the most delay are included in Table 3-3 under the heading "Minor Street Approach With The Most Delay."

The current peak season intersection control delay values were found to correspond to overall intersection operation at LOS C or better during the morning peak hours and evening peak hours at three of the four key intersections with all-way stop-control. Motorists using the approach with the most delay at these three AWSC intersections currently experience LOS C or better operation during the morning and evening peak hours.

The intersection of Jefferson Street and Avenue 54 is currently operating at LOS E during the morning peak hour and LOS F during the evening peak hour in the peak season. During the morning peak hours at this intersection, southbound motorists experience LOS F operation and an average control delay of 67.6 seconds per vehicle.

Table 3-3
Current Peak Hour Delay and Levels of Service
At The Unsignalized Key Intersections

Unsignalized Intersection	Existing Condition (Year 2006 Peak Season)				
	Major Street Left		Minor Street Approach With The Most Delay		
	Control Delay[a]	Level of Service[b]	Approach	Control Delay[c]	Level of Service[b]
TWO-WAY STOP CONTROL					
Madison St. @ Avenue 52					
- Morning Peak Hour	8.2	LOS A	Northbound	28.2	LOS D
- Evening Peak Hour	8.2	LOS A	Northbound	60.1	LOS F
ALL-WAY STOP CONTROL					
Jefferson St. @ Avenue 54					
- Morning Peak Hour	43.85[d]	LOS E[d]	Southbound	67.60	LOS F
- Evening Peak Hour	57.34[d]	LOS F[d]	Westbound	112.66	LOS F
Madison St. @ Avenue 54					
- Morning Peak Hour	12.28[d]	LOS B[d]	Northbound	13.56	LOS B
- Evening Peak Hour	18.01[d]	LOS C[d]	Northbound	23.56	LOS C
Monroe St. @ Avenue 54					
- Morning Peak Hour	9.60[d]	LOS A[d]	Southbound	10.13	LOS B
- Evening Peak Hour	11.36[d]	LOS B[d]	Northbound	11.86	LOS B
Madison St. @ Avenue 58					
- Morning Peak Hour	8.74[d]	LOS A[d]	Eastbound	9.30	LOS A
- Evening Peak Hour	9.04[d]	LOS A[d]	Eastbound	9.59	LOS A

a. Average control delay (seconds/vehicle) for the left-turn move from the major street onto the minor street. Assumes intersection geometrics shown in Figure 3-2, an 8 percent heavy vehicle mix, and a peak hour factor of 1.0 Appendix B includes the HCS unsignalized intersection worksheets.
b. LOS was determined from the delay (0-10 sec./veh.=LOS A; 10-15 sec./veh.=LOS B; 15-25 sec./veh.=LOS C; 25-35 sec./veh.=LOS D; 35-50 sec./veh.=LOS E; 50+ sec./veh. = LOS F) per HCM 2000 page 17-2 and 17-32. LOS is not defined for the overall intersection but rather for individual movements and approaches at TWSC intersections.
c. Delay=average approach control delay (seconds/vehicle) for the minor street approach that exhibits the most delay at TWSC intersections. Since AWSC intersections do not have minor approaches, the delay and LOS for the approach with the most delay are shown.
d. The overall intersection control delay and intersection LOS are shown for this all-way stop-controlled intersection.

Westbound motorists on Avenue 54 experience levels of delay which correspond to LOS F during the evening peak hour at the intersection of Jefferson Street. The average westbound approach control delay is currently 112.66 seconds per vehicle during the evening peak hour. As discussed in Section 3.8, the current peak hour traffic volumes at this intersection exceed rural traffic signal volume warrants. However, once Madison Street is opened between Avenue 52 and Avenue 54, the number of vehicles passing through the intersection of Jefferson Street and Avenue 54 should decrease dramatically, as motorists re-route from Jefferson Street to Madison Street, north of Avenue 54. At that point, the peak hour traffic volumes may no longer meet signal warrants.

3.7 Relevant Circulation Plans

City of La Quinta Circulation Element

The *City of La Quinta General Plan* Circulation Element details the location and extent of the circulation system required to serve future traffic demands upon buildout of the General Plan Land Use Element. The roadway classifications adopted by the City of La Quinta in the Circulation Element are depicted in Figure 3-5. The right-of-way requirements and typical cross-sections associated with the roadway classifications are shown in Figure 3-6.

Major arterials are six-lane divided roadways with restricted access and a 120-foot right-of-way. Major arterials provide parkways a minimum of 12-feet wide and an 18-foot landscape median. Jefferson Street is classified as a major arterial in the study area.

Avenue 52, Airport Boulevard, and Madison Street (north of Avenue 58), and Monroe Street (between Avenue 52 and Avenue 60) are classified Primary Arterial - A in the study area. These primary arterials have 110-foot rights-of-way. They provide a four-lane divided cross-section with an 18-foot median and an 86-foot roadbed. Avenue 54 (between Jefferson Street and Madison Street) is classified Primary Arterial - B. These primary arterials have 100-foot rights-of-way. They provide a four-lane divided cross-section with a 12-foot median and a 76-foot roadbed.

Avenue 54 (east of Madison Street) and Madison Street (south of Avenue 58) are master planned as secondary arterials. Secondary arterials typically include a four-lane undivided cross-section in an 88-foot right-of-way with 12-foot parkways.

City Access Spacing and Design Standards

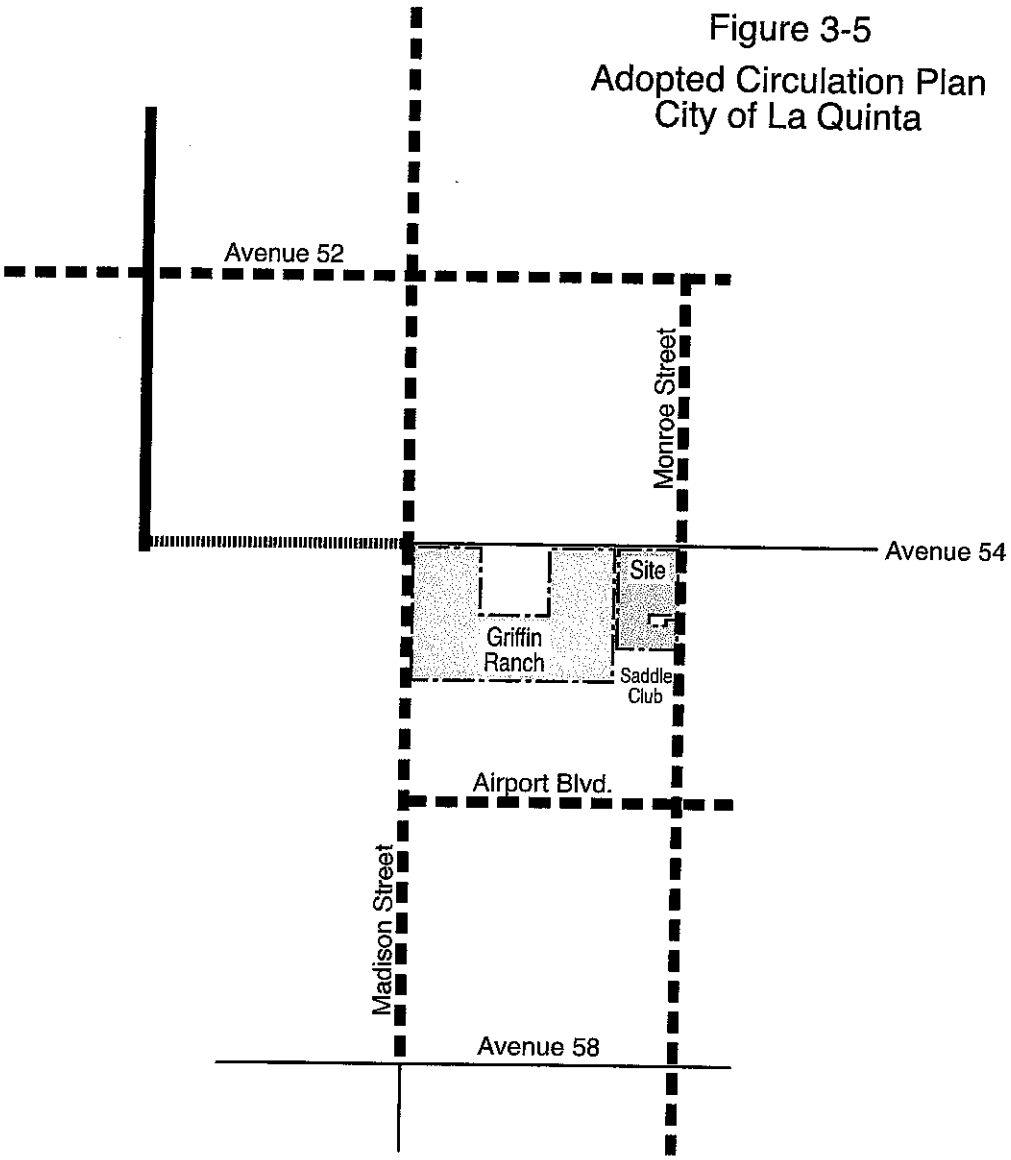
The City of La Quinta has adopted policies and standards for each roadway classification regarding design criteria related to access to adjoining property and minimum intersection spacing and driveway separation. All access configurations require City Engineer review and approval. The minimum landscape setbacks required are 20 feet (along major arterials and primary arterials) and 10 feet (along secondary arterials and collector streets).

Left-turn median cuts may be authorized if they do not interfere with other existing or planned left-turn pockets. Right-in/right-out access driveways shall be located such that they exceed the following driveway spacing criteria (measured from the curb returns): (1) 250 feet on the approach leg to a full-turn intersection; (2) 150 feet on the exit leg from a full-turn intersection; and (3) 250 feet from other driveways.

On major arterials, design speed is 60 mph and the minimum intersection spacing is 2,600 feet in residential areas. It may be reduced to 1,060 feet for commercial frontage. On primary arterials, the design speed is 50 mph and the minimum intersection spacing is 1,060 feet. On collectors the minimum intersection spacing is 300 feet and the design

Figure 3-5

Adopted Circulation Plan
City of La Quinta



Legend

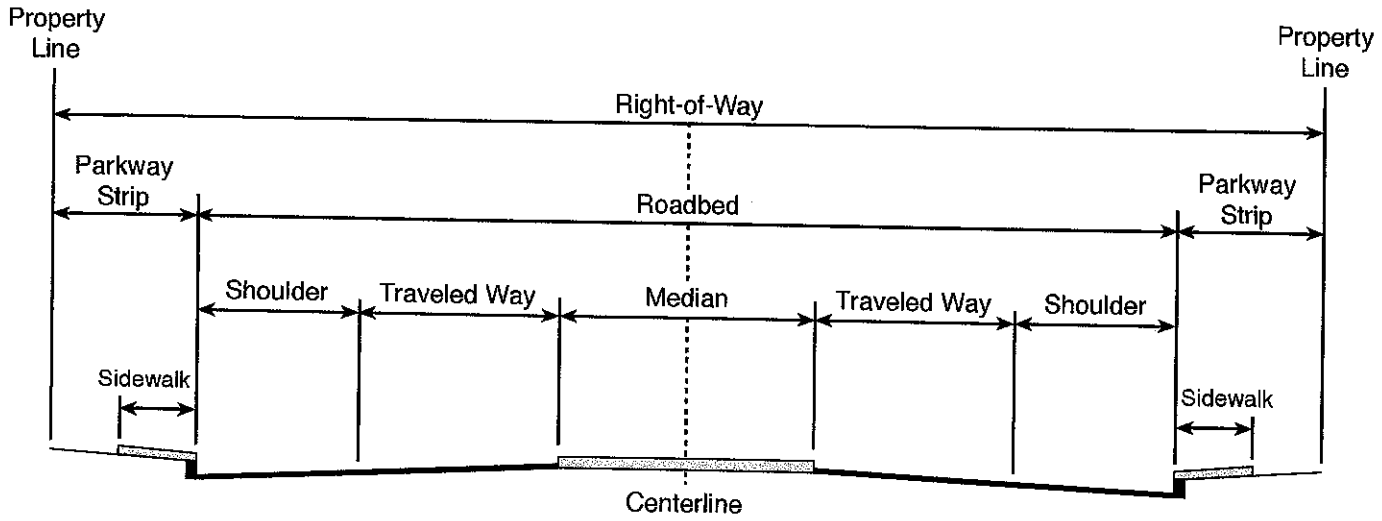
- Major Arterial
- Primary Arterial A
- Primary Arterial B
- Secondary Arterial

Endo Engineering

Source: "City of La Quinta Comprehensive General Plan"

Scale: 1" = 3770'

Figure 3-6
City of La Quinta Typical Street Sections



Corridor Classification	Lanes	Median (Feet)	Traveled Way (Ft.)	Shoulder (Feet)	Parkway Strip (Ft.)	Sidewalk (Feet)	Roadbed (Feet)	Right-of-Way (Ft.)
Augmented Major*	8	14	47	—	12	8	108	132
Major Arterial*	6	14	36	8	9	6-8	102	120
Primary Arterial A	4	18	26	8	12	6	86	110
Primary Arterial B	4	12	25	7	12	6	76	100
Secondary Arterial	4	12	26	0	12	6	64	88
Modified Secondary	2	18	15	8	12	6	64	88
Collector	2	—	18	8	11	6	52	74
Local Street	2	—	10	8	12	5	36	60

*Does not include State Highways, which require additional right of way.

speed is 30 mph. On local streets, the minimum intersection spacing is 250 feet and the design speed is 25 mph.

On secondary arterials, the design speed is 40 mph and the minimum intersection spacing is 600 feet. Full access to adjoining properties shall be avoided where feasible and when necessary shall exceed the minimum separation distances outlined above.

Standards for all City streets are provided in the Development Code. Streets within planned residential areas shall be installed and maintained as private streets. Private streets should be designed to meet the City's public street standards at the point where they connect. Within subdivisions, private streets may be designed to a width of 28 feet with restricted parking, subject to City Engineer and Fire Department approval.

City of La Quinta Policies Regarding Auxiliary Lanes

Engineering Bulletin #03-08 details adopted City of La Quinta policies regarding auxiliary lanes.[2] As outlined therein, auxiliary lanes shall be installed on all primary arterial and higher classification streets when specific criteria are met including:

- A left-turn deceleration lane with taper and storage length is required for any driveway with a projected peak hour left ingress turning volume greater than 25 vehicles per hour. The taper length will be included within the required deceleration lane length.
- A right-turn deceleration lane with taper and storage length is required for any driveway with a projected peak hour right ingress turning volume greater than 50 vehicles per hour. The taper length will be included within the required deceleration lane length.
- A right-turn deceleration lane will not generally be required on streets with more than three travel lanes in the direction of the right-turn lane.

The minimum lane length for auxiliary lanes shall be 100 feet plus taper length. The right-of-way must be widened 12 feet to accommodate the 12-foot wide auxiliary lane. No reductions in the width of the landscape buffer will be permitted to construct the auxiliary lane. All auxiliary lanes must be contained within the development project limits.

Non-Motorized Circulation

Non-motorized circulation is encouraged in La Quinta. The provision of sidewalks, bike lanes, and multi-purpose trails is especially important along major roadways in the community. On primary arterials, sidewalks a minimum of 6 feet wide are typically provided within 12-foot wide landscaped parkway strips on both sides of the roadbed. City policy requires that sidewalks be provided on both sides of all arterial and collector streets, except where there is a multi-use trail on one side.

The General Plan includes a two-phase golf cart route implementation plan. The initial phase benefits existing developments and has a five-year time horizon. Phase II provides a long-term comprehensive route plan and includes Class II golf cart paths along Monroe Street and Avenue 54, adjacent to the project site. These on-street Class II golf cart paths should be a minimum of 8 feet wide and appropriately striped adjacent to the site. The striped lane accommodates one-way golf cart travel shared with bicyclists.

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2. Jonasson, Timothy R. "Auxiliary Lanes and Traffic Impact Studies Required for Proposed Development Projects," December 16, 2003.

The City of La Quinta Multi-Purpose Trails are depicted in Exhibit 3.10 of the *City of La Quinta General Plan* Circulation Element. A Class II Bike Path is shown therein extending along Monroe Street from a point one-quarter mile south of the Saddle Club at Griffin Ranch to the southern La Quinta City Limit at Avenue 52. New bikeways should conform to Caltrans specifications and design criteria, with all bikeways a minimum of six feet in width.

A Multi-Purpose Trail is depicted adjacent to the Griffin Ranch Expansion Area along Monroe Street (extending from Avenue 62 to Avenue 52). In addition, a Pedestrian/Hiking Trail is shown extending east from Madison Street, midway between Avenue 54 and Airport Boulevard (along the southern boundary of the Griffin Ranch site) to a point approximately one-quarter mile west of the western boundary of the Saddle Club at Griffin Ranch.

The *La Quinta Comprehensive General Plan* states that in future development, pedestrian and other non-motorized transportation safety and accommodation should be given emphasis equal to that currently given to automobile access. Private equestrian trails will be developed as part of the Griffin Ranch Specific Plan development that will connect to the public multi-purpose trail system established by the City of La Quinta. The secondary access proposed between the Saddle Club and the Griffin Ranch Specific Plan should facilitate access to pedestrian and equestrian trails within the Griffin Ranch Specific Plan area as well as the public multi-purpose trail system planned in the project vicinity.

3.8 TRAFFIC SIGNAL WARRANTS

Justification for the installation of a traffic signal at an intersection is based on the warrants adopted by the Federal Highway Administration in the *Manual on Uniform Traffic Control Devices* (2003 Edition) and Caltrans in the *MUTCD 2003 California Supplement* (May 20, 2004). There are several different types of traffic signal warrants including warrants based on eight-hour vehicular volumes, four-hour vehicle volumes, peak hour vehicle volumes and delay, pedestrian volumes, school crossings, coordinated signal system warrant, accident experience, and a roadway network warrant. Caltrans also has adopted future average daily traffic warrants (including minimum vehicular traffic, interruption of continuous traffic and a combination warrant) to be used for new intersections or other locations where it is not reasonable to count actual traffic volumes.

The installation of a traffic signal should be considered if one or more of the warrants is met; however, the satisfaction of a warrant is not necessarily sufficient justification for the installation of signals. Delay, congestion, approach conditions, driver confusion, future land use or other evidence of the need for right-of-way assignment beyond that which could be provided by stop signs must be demonstrated. Improper or unwarranted signal installations may cause: (1) excessive delay; (2) disobedience of the signal indications; (3) circuitous travel on alternate routes; and (4) increased accident frequency.[3]

Rural volume warrants (70 percent of the urban warrants) apply when the 85th percentile speed of traffic on the major street exceeds 40 mph in either an urban or a rural area, or when the intersection lies within the built-up area of an isolated community with a population under 10,000. All other areas are considered urban.

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3. Caltrans, *Traffic Manual,* Revised 3/1/95, pg. 9-1 and 9-2.

Peak hour signal warrants (see Appendix C) are used herein as a preliminary indication of the need for traffic signals. These signal warrants should be considered in conjunction with the unsignalized peak hour intersection analysis to provide a more complete understanding of the need for signalization. The actual design and installation of signals should be based upon detailed studies which include extensive traffic counts.

Peak hour signal warrants were checked for the unsignalized key intersections in the study area. Rural warrants were applied, based upon the posted speed limits. Refer to Appendix C for the peak hour signal warrant worksheets. Based upon the most recent peak hour traffic count data, the intersection of Madison Street and Avenue 58 does not appear to currently meet the rural peak hour traffic signal volume warrants. However, the following unsignalized key intersections currently meet the peak hour traffic signal volume warrants:

- Madison Street at Avenue 52 (with LOS F on the northbound approach in the evening peak hour);
- Jefferson Street at Avenue 54 (with LOS E in the morning peak hour and LOS F in the evening peak hour on the approach with the most delay),
- Madison Street at Avenue 54 (with LOS C or better operation in the peak hours), and
- Monroe Street at Avenue 54 (with LOS B or better operation in the peak hours).

Once Madison Street is extended from Avenue 54 to Avenue 52, traffic volumes at the intersection of Madison Street and Avenue 52 will increase dramatically. Therefore, a traffic signal should be installed at the intersection of Madison Street at Avenue 52 in conjunction with the construction of Madison Street between Avenue 54 and Avenue 52.

Once Madison Street is connected from Avenue 54 to Avenue 52, the traffic volumes passing through the intersection of Jefferson Street and Avenue 54 should drop dramatically. This will occur as motorists divert to the new Madison Street connection to avoid delay at the intersection of Jefferson Street and Avenue 54. Once this diversion occurs, the peak hour levels of service should improve at the intersection of Jefferson Street and Avenue 54 and traffic signal warrants should be re-evaluated. Future peak hour traffic volumes and levels of service should be monitored at this intersection to ensure that it provides LOS D or better levels of service without signalization, following the northerly extension of Madison Street.

3.9 ALTERNATIVE TRANSPORTATION MODES

Public Transportation

The SunLine Transit Agency was created in 1977 through a Joint Powers Authority of five cities and Riverside County. SunLine Transit now provides public transit service to 2.8 million passengers per year throughout the entire Coachella Valley and has a service area of approximately 366 square miles. SunLine Transit has bicycle racks on every bus in its fleet. These bike racks can carry up to two bicycles per bus.

Twelve SunBus transit lines provide public bus service with a fleet of 27 buses throughout the Coachella Valley seven days a week (excluding Thanksgiving and Christmas). Line 111 is the major trunk line, which is interconnected with eleven smaller community feeder routes that provide access to every community in the Valley.

Line 111 travels along Highway 111 from Palms Springs to Indio. Although there is currently no transit service available directly adjacent to the project site, the closest transit route (Line 70) passes through the intersection of Washington Street and Calle Tampico. Line 80 passes through the intersection of Arabia Street and Avenue 48.

The SunLine Transit Agency contracts with a private provider for SunDial, a door-to-door dial-a-ride service. SunDial is a demand response service designed to serve seniors and those with disabilities on an appointment basis between 8:30 A.M. and 9:00 P.M. on weekdays, and between 8:30 A.M. and 4:00 P.M. on weekends. In addition to SunDial, a subscription-based transit service is available through agencies serving people with disabilities who need regular repetitive trips. No transit stations or park-and-ride facilities currently exist or are planned in the City of La Quinta.

Bicycle Facilities

The use of bicycles instead of automobiles as a means of transportation improves health and fitness, provides enjoyment, reduces air pollution, traffic congestion, energy consumption and transportation costs. These benefits justify local and regional government recognition of bicycles as a viable transportation mode for local trips as well as the development and improvement of facilities to accommodate safe and efficient bicycle use.

Bikeways and pathways are used by a wide variety of people including children on their way to school, commuters riding to work, and people exercising, racing or touring. While recreational riders seek routes leading to parks, through areas of interest, or racing circuits, commuters want the shortest, fastest, and safest route between two points.

CALTRANS standards are used to design bikeways by most jurisdictions throughout California. The City of La Quinta adheres to Caltrans bikeway standards. Bike lanes on existing roadways should conform to Caltrans standards or be upgraded to meet Caltrans standards. These standards apply to three different classifications of bicycle facilities: Class I, Class II, and Class III bikeways, as described below.

Class I Bikeway A bike path that provides for bicycle travel on a right-of-way completely separated from any street or highway. The paths may be located along alignments parallel to streets or unrelated alignments as long as there is no encroachment from motor vehicle or pedestrian traffic except at grade intersections.

Class II Bikeway A bike lane that provides a striped lane for one-way bike travel within the paved area of a street or highway. These bike lanes are within an exclusive right-of-way designated for use by bicyclists. However, cross traffic is permitted for driveway access.

Class III Bikeway A bike route in which both bicycle and motor vehicle traffic share the same roadway surface area. The route is marked with signs or stenciled lettering on the pavement identifying the roadway as part of a bikeway system.

Existing and Planned Non-Motorized Facilities

The Coachella Valley Association of Governments *Non-Motorized Transportation Plan* (October, 2001) identifies existing and proposed non-motorized facilities within the project vicinity. The bicycle element of the CVAG *Non-Motorized Transportation Plan* (October, 2001) is called the Regional Bikeway Plan. The Regional Bikeway Plan identifies regionally significant routes that link important destinations in neighboring cities and are candidates for joint funding applications among cities and/or the County of Riverside. The Regional Bikeway Plan routes include Class I (bike paths), Class II (bike lanes), and Class III (signed bike routes) facilities.

Class I bikeways are typically called bike paths as they provide a paved right-of-way separated from streets and highways. Class I bikeways are estimated to cost $500,000 per mile. Class II bikeways are often called bike lanes because they provide a striped or stenciled lane for one-way travel on a street or highway. Costs for Class II projects are estimated at $50,000 per mile. Class III bikeways are often referred to as bike routes. They provide for shared use with pedestrian or motor vehicle traffic and are identified only by signing. Class III projects are estimated to cost $10,000 per mile.

The City of La Quinta has several existing bikeways including 2.5 miles of Class I and 10.5 miles of Class II facilities. Class II bikeways currently exist at the following locations within the study area:

- along Avenue 54 from Jefferson Street to Madison Street (1 mile);
- along Madison Street from Avenue 54 to Avenue 58 (2 miles);
- along Airport Boulevard from Madison Street to the City limit (1 mile).

The City of La Quinta proposed eighteen proposed bikeway projects for inclusion in the CVAG Regional Bikeway Plan including: two Class I projects, fifteen Class II projects, and one Class III project. The highest priority bikeway project in the study area is a Class II facility proposed along Jefferson Street from the northern city limit south to Avenue 54. Third priority bikeway projects proposed by the City of La Quinta in the study area include Class II bikeways along:

- Avenue 52 (from Washington Street to the eastern city limit);
- Avenue 54 (from Jefferson Street to the eastern city limit);
- Avenue 58 (from Jefferson Street to the eastern city limit);
- Madison Street (from Avenue 50 to Avenue 54); and
- All American Canal (from Avenue 50 to Avenue 54).

Western Coachella Valley Area Plan Trails and Bikeways

A Regional Trail is shown through the study area along Jefferson Street, from Highway 111 to Avenue 54. The trail extends along Avenue 54 to Madison Street, and along Madison Street from Avenue 54 to Avenue 60. In addition, a regional trail extends from Madison Street to Lake Cahuilla.

A Class I bike path/regional trail is shown through the study area along the general alignment of the All American Canal from north of Highway 111 to Cahuilla Lake. The All American Canal is located parallel and east of the alignment of Madison Street, from Highway 111 to north of Avenue 50. The All American Canal is crossed by Avenue 50, at the future alignment of Madison Street. South of Avenue 50, the All American Canal extends southwest and crosses Avenue 52 and Jefferson Street, adjacent to the Hideaway Resort. West of Jefferson Street, the All American Canal turns south to Lake Cahuilla.

3.10 CONGESTION MANAGEMENT PROGRAM (CMP)

The Congestion Management Program (CMP) is intended to link land use, transportation, and air quality with reasonable growth management methods, strategies and programs that effectively utilize new transportation funds to alleviate traffic congestion and related impacts. The Riverside County Transportation Commission (RCTC) is the designated Congestion Management Agency (CMA) that prepares the Riverside County Congestion Management Program updates in consultation with local agencies, the County of Riverside, transit agencies and sub regional agencies like the Coachella Valley Association of Governments (CVAG).

The RCTC must designate a system of highways and roadways to include (at a minimum) all State Highway facilities within Riverside County and a system of "principal arterials" as the Congestion Management System (CMS). State Highway 111 is a CMP facility in the study area. It is the responsibility of local agencies, when reviewing and approving development proposals to consider the traffic impacts on the CMS.

To include additional arterials on the CMP System, consideration will be given to: (1) routes identified by Caltrans as "principal arterials" on their "Functional Classification System" maps; (2) designated expressways; and (3) facilities linking cities/communities (inter-regional facilities) and major activity centers (shopping malls, major industrial/ business parks, stadiums). Local agencies may nominate arterials for inclusion on the CMP System.[4] Jefferson Street, Madison Street, Monroe Street, Avenue 50, Avenue 52, Avenue 54, and Airport Boulevard are regionally significant arterials in the study area that have been nominated and included in the CMP System.

Per the adopted Level of Service standard of "E", when a Congestion Management System (CMS) segment falls to LOS F, a deficiency plan must be prepared by the local agency where the deficiency is located, following coordination with other agencies identified as contributors to the deficiency. The deficiency plan must contain mitigation measures (including TDM strategies and transit alternatives) and a schedule for mitigating the deficiency. RCTC will prepare deficiency plans on the State Highway System when deficiencies are identified by local jurisdictions. In preparation of the *2001 Riverside County CMP,* there were no deficiencies found on the CMP System, based upon the year 2001 monitoring effort.

The CMA provides a uniform database of traffic impacts for use in a countywide transportation computer model. The RCTC has recognized use of the Coachella Valley Area Transportation System (CVATS) sub-regional transportation model to analyze traffic impacts associated with development proposals or land use plans. The methodology for measuring LOS must be that contained in the most recent version of the Highway Capacity Manual (HCM 2000). Traffic standards must be set no lower than LOS E for any segment or intersection on the CMP system unless the current LOS is lower (i.e., LOS F).

The Coachella Valley Association of Governments has developed a Transportation Uniform Mitigation Fee (TUMF) that compliments the objectives of the Congestion Management Program (CMP). To comply with the Riverside County CMP, all developments must participate in the TUMF program.

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4. *2001 Riverside County Congestion Management Program;* RCTC; December 12, 2001.

3.11 Regional Transportation Improvement Plans

The Capital Improvement Program (CIP) is a 7-year program including all regional and local capital improvement projects that maintain or improve the LOS for traffic and transit and conform to transportation-related emission air quality mitigation measures. Currently, regional projects are programmed in the Riverside County Transportation Improvement Plan (TIP), while locally funded projects (off the State Highway System) are identified in local agency CIPs. To comply with CMP Statutes, CIP requirements shall be the same as and accomplished through the RCTC TIP development process. Projects in the CIP may be incorporated into the Regional Transportation Improvement Program (RTIP) for the programming of Flexible Congestion Relief (FCR) and Urban and Commuter Rail funds.

The Coachella Valley Association of Governments Regional Arterial Program - Financial Plan and Expenditure Program Contract Status Report dated December 31, 2002 includes five I-10 Interchange improvement projects in the Coachella Valley that were authorized and funded with twenty-one million dollars. The interchange projects were located at: (1) Washington Street, (2) Jefferson Street, (3) Date Palm, (4) Palm Drive/Gene Autry Trail, and (5) Indian Avenue.

As growth occurs in the area, commuter traffic is expected to increase significantly. Without improvements to the I-10 interchanges in the vicinity, conditions at these interchanges are expected to deteriorate at the ramp intersections, inducing longer traffic queues and longer control delays until interchange improvements are made.

Although improvements at the I-10 Interchanges in the Coachella Valley were planned and funding appeared to be available, the State budget shortfall crisis caused the funding to be revoked so alternative funding mechanisms had to be pursued. Until the planned improvements are implemented, conditions will deteriorate, as demand for I-10 access grows with development throughout the Coachella Valley including the study area.

The City of Indio is the Lead Agency on the planned Interstate 10 interchange redesign project at Jefferson Street. The improvements are scheduled to begin in April, 2007 and be completed by July of 2008. The City of Indio is also the Lead Agency for arterial improvements planned on Monroe Street, between Miles Avenue and Avenue 52. The project is currently in the process of finalizing design details.

Riverside County is the Lead Agency for scheduled improvements to Jefferson Street from the intersection of Highway 111 north to Indio Boulevard. Construction is slated to begin in November, 2004 and continue for 12 months.

4.0 CIRCULATION IMPACT ANALYSIS

Methodology and Scope

The study area, roadway network configuration, key intersections, future development scenarios, annual traffic growth rates, cumulative developments, trip generation forecast, existing and future traffic reassignment to Madison Street (between Avenue 52 and Avenue 54), and methodology employed to assess the potential impacts of the proposed development were determined through coordination with the City of La Quinta. The traffic study format was also approved by the City of La Quinta.

The average weekday and peak hour traffic volumes that will be generated by the proposed development were determined from the land uses proposed on-site and appropriate ITE trip generation rates. Project-related traffic was manually distributed to current and future major trip origins and destinations, assuming that Madison Street will be open between Avenue 54 and Avenue 52 in the year 2008. Project-related peak hour and daily traffic volumes were determined and added to the future year 2008 background traffic projections at key intersections and the roadway segments adjacent to the key intersections. The background traffic projections include the traffic associated with: (1) The Country Club of the Desert, (2) the Griffin Ranch Specific Plan, and (3) the Saddle Club at Griffin Ranch.

The potential impacts associated with project-related traffic in the year 2008 were determined by evaluating the peak hour intersection control delay and LOS values with and without project-related traffic. Both morning and evening peak hour control delay and LOS evaluations were completed for the off-site key intersections and both full-turn site access intersections (on Avenue 54 and on Monroe Street) to determine the adequacy of the intersection approach lanes and traffic control. The City of La Quinta requires the HCM 2000 intersection operation methodology to be used to assess intersection control delay and levels of service and has established a minimum peak hour intersection performance standard for the peak season at the upper limit of LOS D.

Since the proposed project is expected to be completed by the year 2008, daily mid-block volume-to-capacity ratios were evaluated on the roadway segments adjacent to the key intersections for future year 2008 conditions with and without the proposed project. Although any exceedances of daily capacity may not result in an immediate recommendation for mid-block roadway widening, daily volume-to-capacity ratios are useful in that they provide important information with respect to the overall traffic loading on the circulation system and the timing of future mid-block widening.

4.1 TRIP GENERATION FORECAST

The Institute of Transportation Engineers (ITE) report *Trip Generation* is the principal source of trip-generation rates used in site traffic analyses. Detailed data are provided therein for vehicular trips with "average" vehicle occupancy. The ITE *Trip Generation* database is updated periodically, with the latest revision utilized herein to project the trip generation associated with the proposed development. All of the trip-generation rates provided by the ITE reflect isolated single-use stand-alone developments. The trip generation data compiled by the ITE identifies traffic peaking characteristics by land use type in terms of the trip generation during the peak hour of the generator as well as during the peak hours of the traffic on the adjacent street system.

The proposed project includes 90 single-family detached dwelling units. Single-family detached residences exhibit higher trip generation rates per dwelling unit than attached residences because they tend to have more residents and more vehicles per dwelling unit. They are generally located farther from shopping centers, employment centers, and other trip attractions, and generally have fewer modes of transportation available.

The trip generation potential of the Griffin Ranch expansion area development was determined from average trip generation rates published by the ITE in the *Trip Generation* manual (Seventh Edition; December, 2003). Table 4-1 provides the peak hour and daily trip generation associated with the proposed project. As shown therein, the proposed development of 90 residential dwelling units would generate an estimated 940 daily trip-ends. During the morning peak hour, approximately 72 trip-ends would be generated (18 inbound and 54 outbound). During the evening peak hour, approximately 97 trip-ends would be generated (61 inbound and 36 outbound).

Table 4-1
Estimated Trip Generation

Land Use Category (ITE Code)	Quantity	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Daily 2-Way
Proposed Project								
Residential - SFD (210)[a]	90 DU	18	54	72	61	36	97	940
Cumulative Projects								
Griffin Ranch Specific Plan[b]	305 DU	56	167	223	184	108	292	2,900
Saddle Club @ Griffin Ranch[c]	15 Acres	7	6	13	6	7	13	130
Country Club of the Desert[d]	819 DU	250	481	731	591	374	965	9,690
Cumulative Total		313	654	967	781	489	1,270	12,720

a. Based upon the regression equations for ITE Land Use Code 210 (Single-Family Detached Housing) published by the ITE *Trip Generation* (7th Edition December, 2003). SFD=Single Family Detached. DU=Dwelling Units.

b. From Table 4-1, *Griffin Ranch Specific Plan and Vesting Tentative Tract Map 32879 Traffic Impact Study*, September 7, 2005.

c. Based upon the trip generation rate data from ITE Land Use Code 411 (City Park) assuming 10 percent of the daily traffic occurs during the peak hours with a 60/40 in/out directional split in the morning and a 40/60 in/out directional split in the evening peak hours. Includes traffic from the caretaker residence on-site.

d. Taken from Table 4-2 of the *Country Club of the Desert Traffic Impact Analysis (Revised) La Quinta, California*, RKJK & Associates Inc.; August 23, 2000. Assumes 798 single-family detached dwelling units, 21 casitas (timeshare) units, and three 18-hole golf courses.

Table 4-1 also provides the trip generation assumed for the three cumulative development projects that were addressed herein. These trip generation forecasts were taken from the approved traffic studies addressing these three developments. The three cumulative developments are expected to generate substantially more traffic than the proposed Griffin Ranch Expansion. A combined total of 12,720 daily trips would be generated by the three cumulative developments, with 967 trips occurring in the morning peak hour and 1,270 trips generated in the evening peak hour.

4.2 TRAFFIC DISTRIBUTION AND ASSIGNMENT

Traffic distribution is the determination of the directional orientation of traffic. It is based upon the geographical location of the site and land uses that will serve as trip origins and destinations. Traffic assignment is the determination of which specific routes project-related traffic will use, once the generalized traffic distribution is determined. The basic factors affecting route selection are minimizing time and distance. Other considerations might be the aesthetic quality of alternate routes, number of turning maneuvers, and avoidance of congestion. Site access locations, signalized access points, and turn restrictions at driveways directly affect the project traffic assignment.

The Griffin Ranch expansion area traffic distribution and the daily two-way traffic volumes associated with the proposed development are shown in Figure 4-1. There are two project access intersections proposed including: (1) the full-turn eastern Griffin Ranch Specific Plan access on Avenue 54, west of Monroe Street; and (2) a full-turn site access on Monroe Street approximately 1,120 feet south of Avenue 54. The site access on Monroe Street is expected to serve 45 percent of the site traffic (420 vehicles per day). The remaining 520 vehicles per day (55 percent of the site traffic) are projected to utilize the full-turn gated eastern access to the Griffin Ranch Specific Plan (Tract Map No. 32879) located on Avenue 54. The project-related peak hour traffic volumes at the key intersections and site access intersections are shown in Figure 4-2.

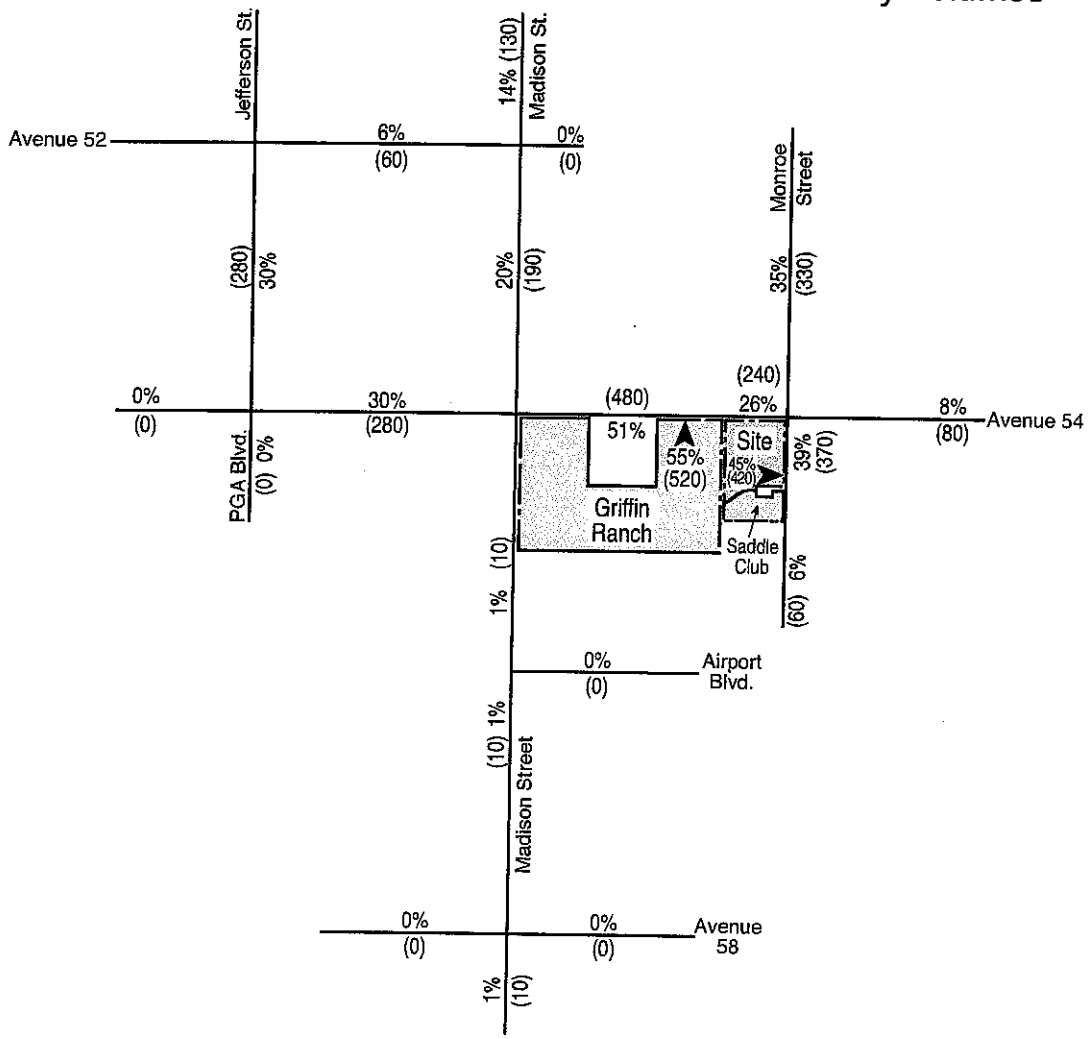
The proposed Griffin Ranch expansion area is an extension of the Griffin Ranch project and will share its internal circulation system. It will be possible, therefore, for any of the residents of the Griffin Ranch (including the residents in the Griffin Ranch expansion area) to utilize any of the four site access gates. Generally, the traffic from the Griffin Ranch development was assigned to the closest access gate to minimize travel time and distance. In some cases, the traffic was assigned to the access gate in the direction of the off-site destination.

It is possible that some residents of the previously approved Griffin Ranch development (Tract Map No. 32879) will pass through the expansion area to use the proposed access on Monroe Street to travel to and from destinations to the east. However, the residential dwelling within Tract Map No. 32879 which is located closest to the new Griffin Ranch expansion area access on Monroe Street is essentially equidistant (approximately 1,500 feet) from the eastern access gate within Tract Map No. 32879 on Avenue 54. Consequently, the number of trips expected to divert to the new access on Monroe Street would be very small, given that the potential savings in travel time and distance would be marginal. Therefore, the traffic generated by the Griffin Ranch Specific Plan development was assumed to utilize the eastern gate on Avenue 54 (consistent with the approved Griffin Ranch Specific Plan Traffic Impact Study) rather than being reassigned across the expansion area to the proposed Monroe Street access. This assumption permits the applicant's fair share contribution to the cost of mitigation to be more clear cut.

Traffic Assigned to Madison Street North of Avenue 54

Since Madison Street will be extended between Avenue 52 and Avenue 54 before the year 2008, the traffic volumes associated with the proposed project and the three cumulative developments were assigned to the street system in the study area assuming this extension of Madison Street. However, the opening of Madison Street between Avenue 54 and Avenue 52 will also cause a substantial number of motorists who are currently using Avenue 54, west of Madison Street, to divert onto Madison Street, north of Avenue 54.

Figure 4-1
Site Traffic Distribution and Daily Volumes

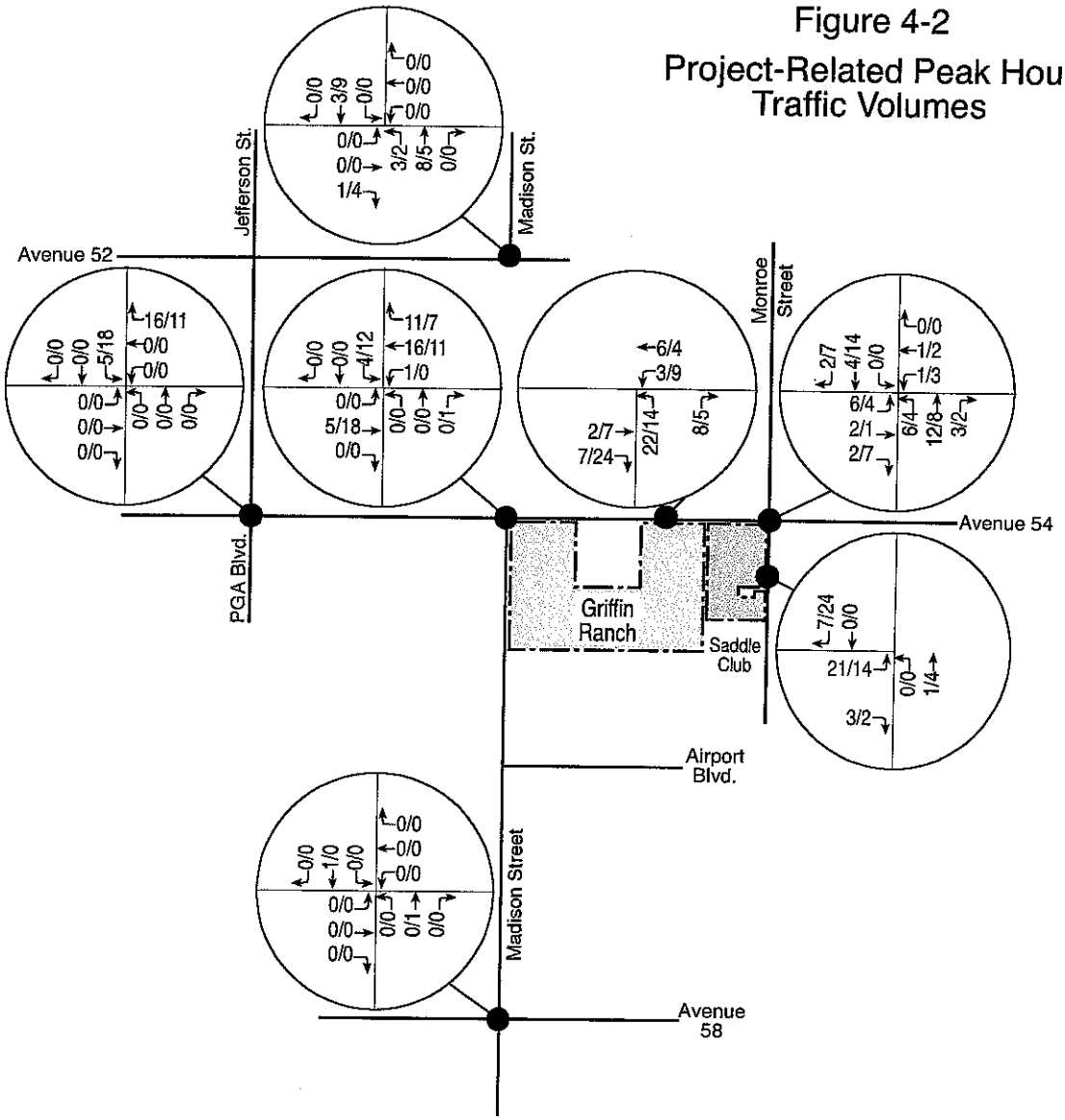


Legend	
100%	Percent Project-Related Traffic
(80)	Daily Two-Way Site Traffic Volume

Endo Engineering

Scale: 1" = 3770'

Figure 4-2
Project-Related Peak Hour Traffic Volumes



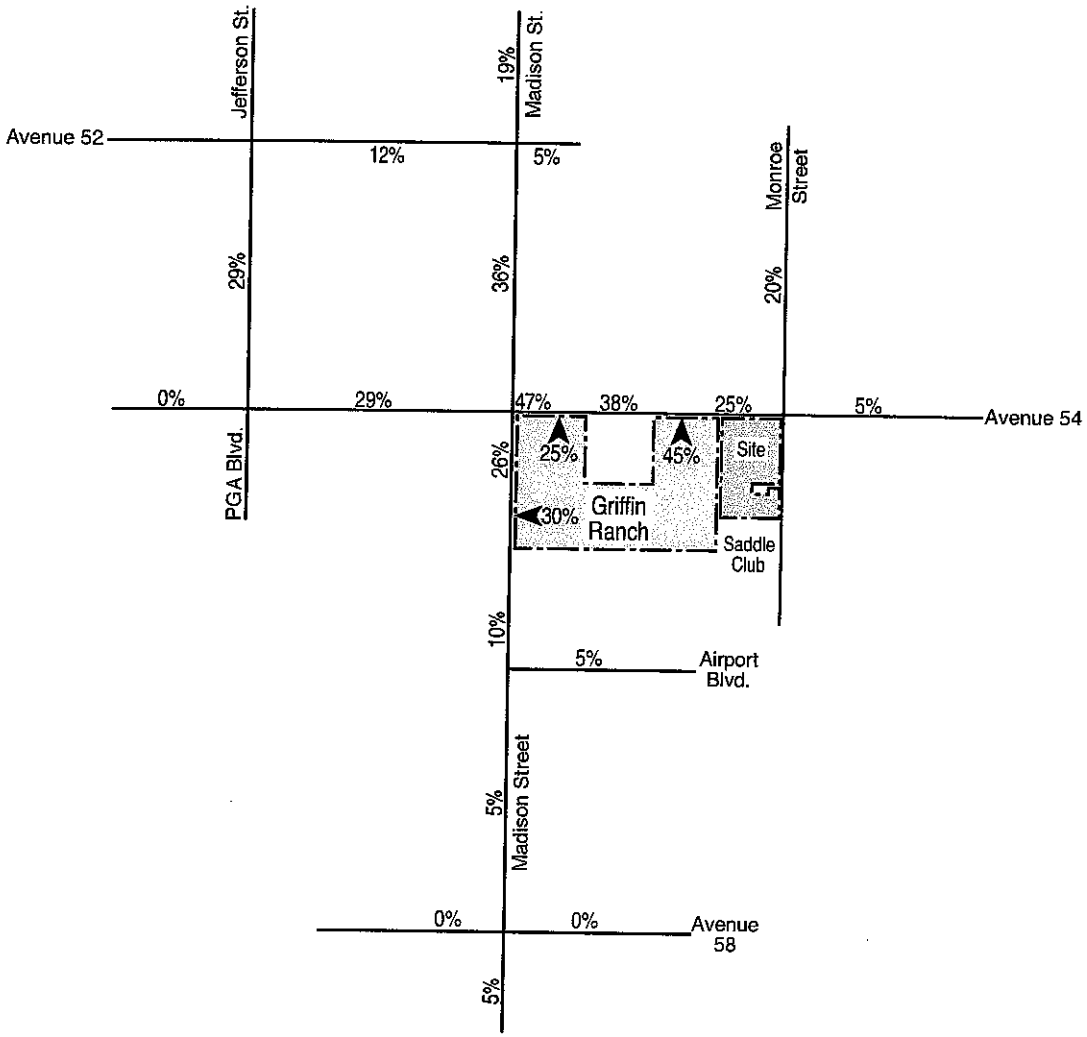
Legend

5/8 AM/PM Peak Hour Turning Volume

Endo Engineering

Scale: 1" = 3770'

Figure 4-3
Griffin Ranch Specific Plan Reassignment



Legend	
100%	Percent of Griffin Ranch Specific Plan Traffic

Endo Engineering

Scale: 1" = 3770'

Initially, 7,300 vehicles per day (VPH) were reassigned to Madison Street, north of Avenue 54 from Avenue 54 (west of Madison Street). This volume reflected approximately 55 percent of the existing traffic on Avenue 54 (west of Madison Street) following the application of a nine percent annual traffic growth rate for two years to reflect year 2008 conditions. Based upon the approved *Country Club of the Desert Traffic Study* (RKJK, August 23, 2000) which assumed the extension of Madison Street, the traffic assignment associated with buildout of the Country Club of the Desert project added 2,420 VPD to Madison Street, north of Avenue 54. The traffic assignment from the approved *Griffin Ranch Specific Plan Traffic Impact Study* (Endo Engineering; September 30, 2004) was modified, as shown in Figure 4-3, to add 1,040 VPD to Madison Street, north of Avenue 54. The Saddle Club at Griffin Ranch added 20 VPD to Madison Street, north of Avenue 54. The Griffin Ranch expansion area added 190 VPD to this roadway segment.

Traffic Assigned to Avenue 52 West of Madison Street

Avenue 52, west of Madison Street, will experience a substantial increase in traffic volume following the opening of Madison Street (between Avenue 52 and Avenue 54). Avenue 52 is being widened to add a second eastbound through lane from the All American Canal to a point east of Madison Street in conjunction with the development of the Country Club of the Desert site, which is currently under construction as "The Hideaway Golf Club" (west of Madison Street) and "The Madison Club" (east of Madison Street).

If adjacent parcels along the north side of Avenue 52, between Madison Street and Jefferson Street, are not developed by the year 2008, the westbound side of Avenue 52 will not be fully improved to provide two through lanes and the bridge over the All American Canal will provide only one lane in each direction. The developments contributing traffic to Avenue 52 (west of Madison Street) may be required to contribute to the cost of widening the bridge across the canal and/or providing a second westbound through lane.

The Griffin Ranch Specific Plan was estimated to contribute 340 VPD to Avenue 52, west of Madison Street upon buildout in the year 2008. The *Country Club of the Desert Traffic Study* assigned a total of 480 VPD to Avenue 52, west of Madison Street. It was assumed that the Saddle Club at Griffin Ranch would not contribute traffic to this segment of Avenue 52. The traffic increase on Avenue 52 expected to occur as a result of the diversion of existing traffic from Avenue 54 (west of Madison Street) upon the opening of Madison Street (between Avenue 52 and Avenue 54) was 2,190 VPD. A nine percent annual traffic growth rate for two years was applied to the 2,190 diverted traffic volume as well as the existing traffic volume (7,950 ADT) to reflect year 2008 conditions. Following these adjustments, the year 2008 ambient traffic volume on Avenue 52, west of Madison Street, was projected to be 12,460 ADT.

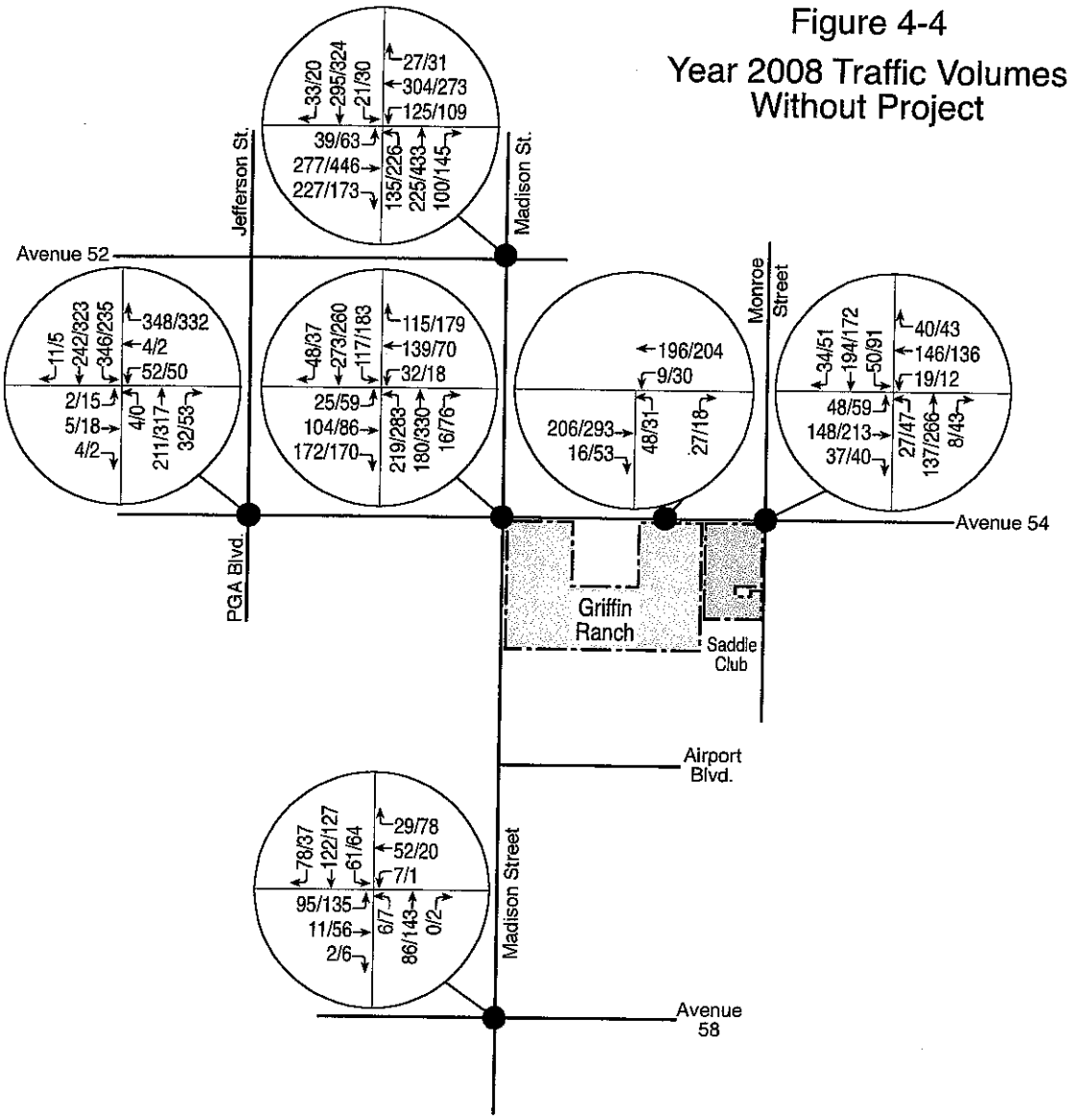
4.3 Future Year 2008 Ambient Conditions

The future background traffic volumes in the year 2008 were projected by applying an appropriate annual traffic growth rate to existing traffic volumes in the study area and adding the traffic associated with the three cumulative developments to estimate future ambient volumes. The annual traffic growth rate applied was determined from available current and historical traffic count data in the study area and approved by La Quinta staff as part of the traffic study scoping process.

Traffic Growth Rates

Growth rates for the key intersections were established with 24-hour traffic counts made at two locations where historical 24-hour counts were available from CVAG. For the

Figure 4-4
Year 2008 Traffic Volumes Without Project



Legend

5/8 AM/PM Peak Hour Turning Volume

Endo Engineering

Scale: 1" = 3770'

intersections near the project site, Madison Street, south of Avenue 54, has exhibited an annual traffic growth rate of approximately 9 percent from the year 1998 through the year 2003. This growth rate was applied to the volumes at the intersections of Madison Street and Avenue 54, Monroe Street and Avenue 54, Madison Street and Avenue 58, and the site access intersections.

Two different growth rates were applied to the traffic volumes at the intersection of Jefferson Street and Avenue 54. Since the PGA West development is nearly fully constructed, a lower growth rate of 2.7 percent was applied to the north/south movements along Jefferson Street. A higher growth rate of 9 percent was applied to all other turning movement volumes at the intersection of Jefferson Street and Avenue 54. It was assumed that the traffic from cumulative developments, other than the three projects addressed explicitly herein, was included in the background traffic growth.

Year 2008 ambient daily traffic volumes are provided in Table 4-2. The year 2008 ambient peak hour turning movement traffic volumes at the key intersections and at the full-turn site access point on Avenue 54 are shown in Figure 4-4. The traffic volumes shown in Figure 4-4 for the site access on Avenue 54 reflect buildout of the Griffin Ranch Specific Plan, the Country Club of the Desert, and the Saddle Club at Griffin Ranch (with no development in the Griffin Ranch expansion area). No traffic volumes are shown for the site access on Monroe Street, as this intersection would not exist without the proposed project.

Daily Volume-To-Capacity Ratio Analysis

Daily volume-to-capacity (V/C) ratios are useful planning tools at the General Plan level of analysis that provide an indication of whether or not additional mid-block through lanes will be needed to accommodate future traffic volumes. Daily V/C ratios focus attention on mid-block and network operation. They provide a more regional perspective of unsatisfied demand for north/south or east/west travel corridors in an area and can be particularly useful when many developments are occurring that are under the jurisdiction of more than one governmental agency. Daily analyses also permit decisions to be made regarding when a particular roadway requires widening to its master planned cross-section or upgrading to a higher capacity classification in the Circulation Element.

Site specific mitigation is generally not developed from daily mid-block volume-to-capacity ratio analyses. Most projects are not large enough to fund major roadway widening that extends a significant distance beyond the development site. By providing a mechanism to identify locations where a project proponent's fair-share contribution to the cost of transportation improvements of regional benefit could be significant, daily V/C ratio analyses can be useful in developing conditions of approval.

The year 2008 daily traffic volume projections shown in Table 4-2 (without the project) were divided by the current daily midblock roadway design capacities (from Table 3-3) to determine the ambient daily mid-block volume-to-capacity ratios on the roadway segments adjacent to the key intersections. As shown in Table 4-2, year 2008 ambient daily traffic volumes are projected to utilize between 3 and 89 percent of the current daily design capacity of the roadway segments evaluated within the study area.

In the year 2008, all of the roadway segments evaluated, except one, are projected to be handling ambient daily traffic volumes comprising less than 80 percent of their daily roadway capacity. These segments will be operating "below capacity". Avenue 52, west of Madison Street, is projected to carry daily traffic volumes that correspond to 89 percent of the daily capacity of a two-lane undivided roadway segment. This condition is

categorized as operating "near capacity" on a daily basis and approaching the point where widening may be necessary to provide an additional mid-block travel lane in each direction.

Table 4-2
Year 2008 Daily Volumes and V/C Ratios[a]

Roadway Segment	Without Project		With Project		Project-Related Change	
	ADT	V/C Ratio	ADT	V/C Ratio	ADT	V/C Ratio
Jefferson Street						
- North of Avenue 54	13,460	0.24	13,740	0.24	280	0.00
- South of Avenue 54	8,510	0.22	8,510	0.22	0	0.00
Madison Street						
- North of Avenue 52	9,310	0.67	9,440	0.67	130	0.00
- South of Avenue 52	14,500	0.38	14,690	0.39	190	0.01
- North of Avenue 54	10,760	0.28	10,950	0.29	190	0.01
- South of Avenue 54	11,770	0.31	11,780	0.31	10	0.00
- North of Avenue 58	6,070	0.16	6,080	0.16	10	0.00
- South of Avenue 58	2,970	0.08	2,980	0.08	10	0.00
Monroe Street						
- North of Avenue 54	7,070	0.51	7,400	0.53	330	0.02
- South of Avenue 54	6,020	0.43	6,390	0.46	370	0.03
Avenue 52						
- West of Madison Street	12,460	0.89	12,520	0.89	60	0.00
- East of Madison Street	10,710	0.77	10,710	0.77	0	0.00
Avenue 54						
- West of Jefferson Street	450	0.03	450	0.03	0	0.00
- East of Jefferson Street	7,120	0.19	7,400	0.19	280	0.00
- West of Madison Street	7,260	0.19	7,540	0.20	280	0.01
- East of Madison Street	6,270	0.45	6,750	0.48	480	0.03
- West of East Site Access	5,950	0.43	6,430	0.46	480	0.03
- East of East Site Access	5,610	0.40	5,850	0.42	240	0.02
- West of Monroe Street	5,590	0.40	5,830	0.42	240	0.02
- East of Monroe Street	5,580	0.40	5,660	0.40	80	0.00
Avenue 58						
- West of Madison Street	2,720	0.19	2,720	0.19	0	0.00
- East of Madison Street	2,320	0.17	2,320	0.17	0	0.00

a. Assumes the existing capacity of all streets except Madison Street, between Avenue 54 and Avenue 52. This roadway segment is under construction as a four-lane divided primary arterial with a 110-foot right-of-way, but is not fully constructed at present. The daily volume projections shown reflect the redistribution of 55 percent of the existing traffic volume on Avenue 54, west of Madison Street (and therefore the same volume of traffic from Jefferson Street, north of Avenue 54) to the newly constructed Madison Street segment (between Avenue 54 and Avenue 52) and Avenue 52 (west of Madison Street).

The opening of Madison Street, between Avenue 54 and Avenue 52, is expected to increase the daily traffic volume on Avenue 52, west of Madison Street, by 4,510 VPD in the year 2008. As noted previously, this increase in traffic demand would include: (1) the redistribution of existing traffic on Avenue 54, west of Madison Street, (2) the growth in that volume by nine percent per annum for two years, as well as (3) new traffic generated by the development of the Griffin Ranch Specific Plan and the Country Club of the Desert.

It should be noted that the eastbound side of Avenue 52 will be improved to provide two through lanes by the year 2008, in conjunction with the development of the Country Club of the Desert. Localized widening has also occurred on the westbound side of Avenue 52, between Madison Street and Jefferson Street, as some adjacent parcels on the north side of Avenue 52 have developed. Although the three-lane portions of Avenue 52 are capable of carrying higher traffic volumes than a two-lane undivided roadway, the narrow sections of Avenue 52 (including the two-lane crossing of the All American Canal) may limit the carrying capacity of the roadway until a consistent fully improved four-lane primary arterial is constructed between Madison Street and Jefferson Street. In the interim, the northbound side of Jefferson Street will be constructed to its ultimate half-section width as a major arterial adjacent to the Country Club of the Desert development and the City of La Quinta has initiated improvements along a 6.2-mile segment of Jefferson Street, between Avenue 54 and Indio Boulevard.

Peak Hour Intersection Analysis

With the expected increases in the background traffic volumes and cumulative development in the study area (as well as the redistribution of traffic caused by the extension of Madison Street from Avenue 54 to Avenue 52) two of the key intersections are projected to require signalization to maintain acceptable levels of service in the year 2008, prior to the addition of site traffic. These two intersections (Madison Street with Avenue 54 and Madison Street with Avenue 52) were assumed to be signalized by the year 2008 both with and without project-related traffic, to determine whether or not additional approach lanes would be required to achieve LOS D operation in the peak hours.

Two additional key intersections (Jefferson Street at Avenue 54 and Monroe Street at Avenue 54) are projected to meet the rural peak hour traffic signal volume warrants with year 2008 ambient traffic volumes. However, these two intersections will provide acceptable levels of service in the peak hours without signalization, as shown in Table 4-3.

Unsignalized Intersection Analysis

Table 4-3 provides the year 2008 peak hour average control delay values and levels of service for the unsignalized key intersections, assuming an 8 percent truck mix and the unsignalized intersection approach lane geometrics depicted in Figure 5-1. These geometrics include existing lanes plus those improvements at the site access on Avenue 54 required in conjunction with the development of the Griffin Ranch Specific Plan and the Country Club of the Desert project. To facilitate direct comparisons and allow project-related impacts to be more readily identified, identical approach lane geometrics were assumed for conditions both with and without site traffic in Table 4-3.

The Griffin Ranch Specific Plan eastern site access intersection on Avenue 54 will provide acceptable levels of service (LOS B or better) prior to the addition of traffic from the Griffin Ranch expansion area. Motorists turning left into the Griffin Ranch Specific Plan site from Avenue 54 will experience very little delay (8.2 seconds per vehicle or less) and LOS A operation in the peak hours. Residents departing from the Griffin Ranch Specific Plan site onto Avenue 54 will experience LOS B and an average control delay of 11.0 seconds per vehicle or less in the peak hours prior to the addition of traffic associated with the development of the Griffin Ranch expansion area.

Table 4-3
Year 2008 Unsignalized Key Intersection
Peak Hour Delay and LOS Summary[a]

Unsignalized Intersection[b]	No-Project			With Project			Change In	
	Major Left[c] Delay/LOS	Minor Approach[d] Move	Delay/LOS	Major Left[c] Delay/LOS	Minor Approach[d] Move	Delay/LOS	Minor Approach[e] Delay	LOS
TWO-WAY STOP CONTROL								
East Site Access @ Avenue 54								
- Morning Peak Hour	7.8/A	NB	10.5/B	7.8/A	NB	10.8/B	0.3	No
- Evening Peak Hour	8.2/A	NB	11.0/B	8.3/A	NB	11.4/B	0.4	No
Monroe Street @ Site Access								
- Morning Peak Hour	NA	NA	NA	7.9/A	EB	10.8/B	NA	NA
- Evening Peak Hour	NA	NA	NA	7.8/A	EB	11.6/B	NA	NA
ALL-WAY STOP CONTROL								
Jefferson St. @ Avenue 54								
- Morning Peak Hour	16.46/C	SB	18.48/C	17.18/C	SB	19.18/C	0.72	No
- Evening Peak Hour	15.95/C	SB	17.41/C	16.55/C	WB	18.11/C	0.60	No
Monroe St. @ Avenue 54								
- Morning Peak Hour	11.89/B	SB	12.91/B	12.34/B	SB	13.46/B	0.55	No
- Evening Peak Hour	18.00/C	NB	20.99/C	20.30/C	NB	24.33/C	4.34	No
Madison St. @ Avenue 58								
- Morning Peak Hour	9.28/A	EB	9.79/A	9.29/A	EB	9.80/A	0.01	No
- Evening Peak Hour	9.67/A	EB	10.29/B	9.67/A	EB	10.29/B	0.00	No

a. Appendix B includes all of the HCS 2000 unsignalized intersection peak hour worksheets. The values shown assume the lane geometrics shown in Figure 5-1 and an 8 percent heavy vehicle mix. Delay=Average Control Delay (seconds/vehicle). NB=Northbound. SB=Southbound. EB=Eastbound. WB=Westbound. LOS was determined from the delay (0-10 sec./veh.=LOS A; 10-15 sec./veh.=LOS B; 15-25 sec./veh.=LOS C; 25-35 sec./veh.=LOS D; 35-50 sec./veh.=LOS E; 50+ sec./veh. = LOS F) per HCM 2000 page 17-2.

b. The two key intersections not included herein are projected to meet rural peak hour and daily planning level signal warrants with year 2008 ambient traffic volumes and operate at LOS F in the peak hours with two-way stop control or all-way stop control.

c. The delay and LOS for the left-turn movement from the major street is shown for intersections with two-way stop control. The overall intersection delay and intersection LOS are shown for the all-way stop-controlled intersections.

d. The average approach control delay was shown for the minor street approach that exhibits the most delay at TWSC intersections. Since AWSC intersections do not have minor approaches, the delay and LOS for the approach with the most delay were included under the heading "Minor Approach Delay/LOS".

e. The change in delay on the minor street approach is shown for intersections with two-way stop control. The change in overall intersection delay and LOS are shown for the all-way stop-controlled intersections.

Prior to the addition of site traffic, all three of the unsignalized key intersections with all-way STOP control are expected to provide LOS C or better (acceptable levels of service) operation during the peak hours in the year 2008. At these three intersections, the approaches with the most delay will provide LOS C or better operation in the peak hours, prior to the addition of traffic generated by the Griffin Ranch expansion area.

Following the opening of Madison Street, between Avenue 54 and Avenue 52, the intersection of Jefferson Street and Avenue 54 is projected to operate at LOS C in the peak hours, prior to the addition of site traffic. The intersection of Madison Street and Avenue 58 is projected to operate at LOS A in the peak hours, prior to the addition of site traffic. The intersection of Monroe Street and Avenue 54 is projected to operate at LOS B in the morning peak hour and LOS C in the evening peak hour, prior to the addition of site traffic.

Before site traffic is added to the street network in the year 2008, the overall average intersection control delay at the three unsignalized all-way stop-controlled intersections will range from 9.28 seconds per vehicle (LOS A) to 18.00 seconds per vehicle (LOS C). During the peak hours, the motorists using the approaches with the most delay at these three intersections will experience control delays ranging from 9.79 seconds per vehicle (LOS A) to 20.99 seconds per vehicle (LOS C).

Signalized Intersection Analysis

The HCM 2000 procedures were utilized via the HCS 2000 software to evaluate the three signalized key intersections. The HCM 2000 methodology addresses the capacity, V/C ratio, and level of service of intersection approaches as well as the level of service of each intersection as a whole.

The HCM 2000 analysis is undertaken in terms of the ratio of demand flow rate to capacity (V/C ratio) for individual movements or approach lane groups during the peak hour and the composite V/C ratio for the sum of the critical movements or lane groups within the intersection. The critical V/C ratio is an indicator of whether or not the physical geometry and signal design provide sufficient capacity for the movements.

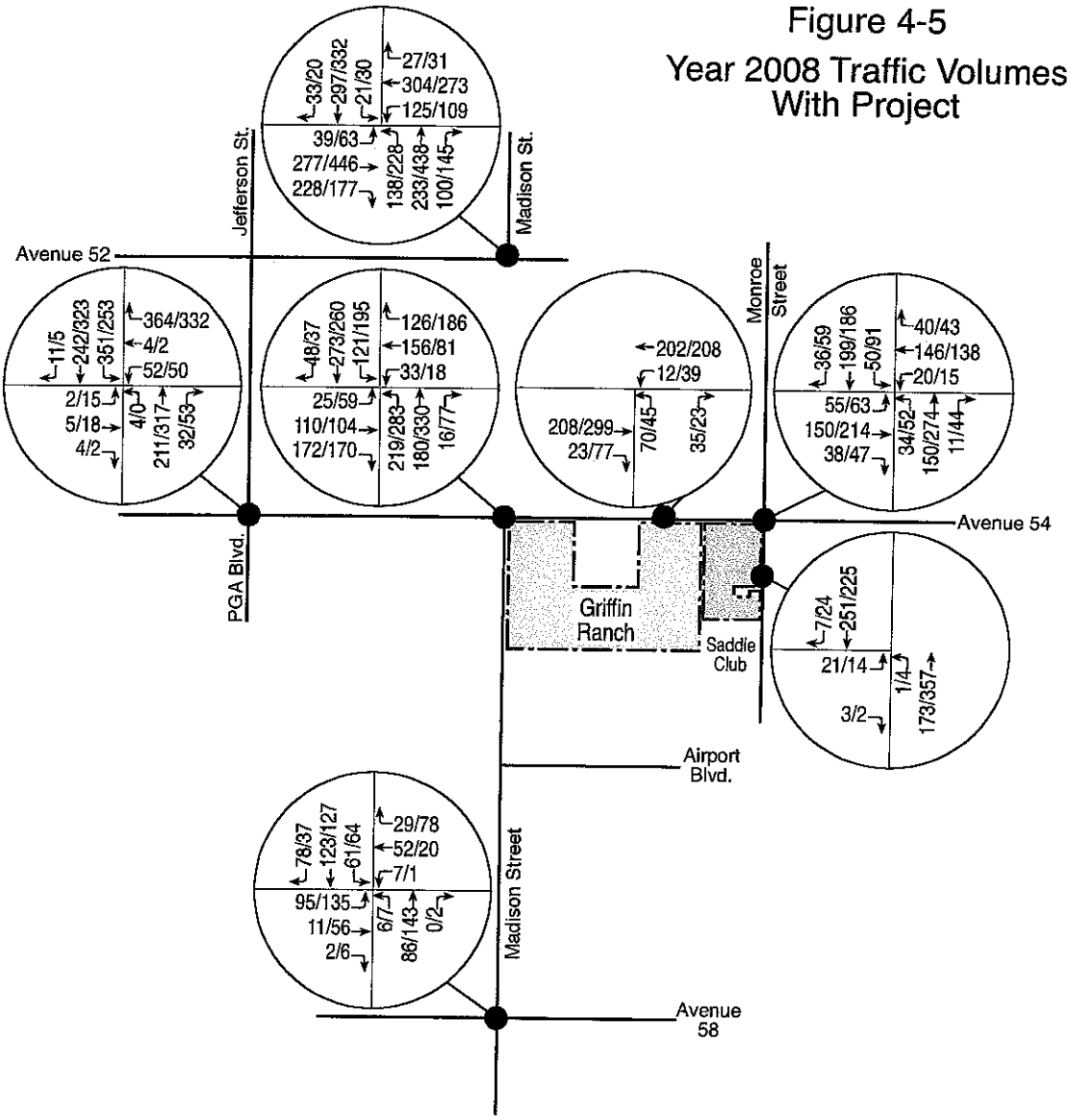
The measures of effectiveness for signalized intersections are: average control delay per vehicle, critical V/C ratios, and levels of service. The level of service is based on the average control delay for various intersection movements. The following parameters affect levels of service: (1) V/C ratio; (2) quality of progression; (3) length of green phases; (4) cycle lengths; and (5) average control delay.

Average control delay is the total time vehicles are stopped at an intersection approach during a specified time interval divided by the volume departing from the approach during the same time period. It does not include queue follow-up time (i.e. the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position).

A critical V/C ratio less than 1.00 indicates that all movements at the intersection can be accommodated within the defined cycle length and phase sequence by proportionally allocating green time. In other words, the total available green time in the phase sequence is adequate to handle all movements, if properly allocated.

It is possible to have unacceptable delays (LOS F) while the V/C ratio is below 1.00 (when the cycle length is long, the lane group has a long red time because of signal timing and/or the signal progression for the subject movements is poor). Conversely, a saturated approach (with V/C ratio $\geq$ 1.00) may have low delays if the cycle length is short and/or the signal progression is favorable. Therefore, an LOS F designation may not necessarily

Figure 4-5
Year 2008 Traffic Volumes With Project



Legend

5/8 AM/PM Peak Hour Turning Volume

Endo Engineering

Scale: 1" = 3770'

mean that the intersection, approach or lane group is overloaded and LOS A to LOS E does not automatically imply available unused capacity.

The peak hour intersection control delay values, critical volume-to-capacity ratios, and levels of service at the two signalized key intersections, with year 2008 ambient traffic volumes, are provided in Table 4-4. Prior to the addition of project-related traffic in the year 2008, both of the signalized key intersections are projected to operate at LOS B during the peak hours. The intersection average control delay is projected to range from 11.0 to 17.4 seconds per vehicle at the intersection of Madison Street with Avenue 52 and Madison Street with Avenue 54.

4.4 FUTURE YEAR 2008+PROJECT CONDITIONS

Figure 4-5 illustrates year 2008+project morning and evening peak hour traffic volumes at the key intersections. These volumes were developed by adding the project-related traffic volumes shown in Figure 4-2 to the year 2008 ambient traffic volumes shown in Figure 4-3. The year 2008+project daily traffic volumes are provided in Table 4-2.

Daily Volume-To-Capacity Analysis

Projected year 2008+project daily traffic volumes were divided by the current daily roadway capacities to determine daily volume-to-capacity ratios for year 2008+project conditions. A comparison of the daily V/C ratios from Table 4-2 for conditions before and after project-related traffic is added to the street network reveals the impact of the proposed project.

Upon completion of the proposed project in the year 2008, project-related traffic will utilize up to three percent of the current daily capacity of Avenue 54 within the study area. Site traffic will require up to two percent of the daily capacity of Monroe Street and up to one percent of the daily capacity of Madison Street. Following the addition of project-related traffic, all of the roadway segments analyzed, except one, are expected to carry daily traffic volumes that comprise less than 80 percent of their daily capacity in the year 2008. These roadway segments will operate "below capacity".

With or without site traffic, Avenue 52 (west of Madison Street) is projected to carry daily traffic volumes that represent 89 percent of the daily capacity of this roadway segment. This constitutes a "near capacity" condition, which indicates that the widening of Avenue 52 to provide two through lanes in each direction between Jefferson Street and Madison Street may be necessary before long. Upon completion the proposed project would add approximately 60 vehicles per day to Avenue 52, west of Madison Street.

Peak Hour Intersection Analysis

Unsignalized Intersection Analysis

As shown in Table 4-3, traffic generated by the Griffin Ranch expansion area will increase the peak hour control delay at the site access on Avenue 54, but not sufficiently to change the level of service. Griffin Ranch residents leaving the site by turning onto Avenue 54 via the eastern site access will experience, on average, 0.4 seconds per vehicle of additional delay in the evening peak hour, once the traffic from the Griffin Ranch expansion area is added to this intersection. However, the peak hour level of service for a single-lane northbound approach to Avenue 54 is projected to remain LOS B upon project completion in the year 2008.

Table 4-4
Year 2008 Signalized Key Intersection
Peak Hour Delay and LOS Summary[a]

Signalized Intersection[b]	No-Project			With Project			Change In	
	Delay (Sec./Veh.)	Critical V/C	LOS	Delay (Sec./Veh.)	Critical V/C	LOS	Delay (Sec./Veh.)	LOS
Madison Street @ Avenue 52								
- Morning Peak Hour	11.0	0.42	B	11.0	0.42	B	0.0	No
- Evening Peak Hour	11.8	0.52	B	11.9	0.54	B	0.1	No
Madison Street @ Avenue 54								
- Morning Peak Hour	16.9	0.31	B	16.9	0.31	B	0.0	No
- Evening Peak Hour	17.4	0.35	B	17.3	0.36	B	- 0.1	No

a. Delay = Overall Intersection Control Delay (seconds per vehicle). Assumes intersection geometrics shown in Figure 5-1 and an eight percent heavy vehicle mix. Based upon the HCM 2000 Signalized Operation Methodology implemented by Version 4.1e of the HCS 2000. See Appendix B for the signalized intersection HCS worksheets.

b. Both of these intersections are projected to exceed the rural peak hour traffic signal warrants as well as the rural daily planning level signal warrants for minimum vehicular traffic and interruption of continuous traffic with year 2008 ambient traffic volumes. Furthermore, both of these intersections will fail (operate at LOS F) in the peak hours with year 2008 ambient traffic volumes and two-way STOP control or with all-way STOP control.

Motorists making left turns into the Griffin Ranch from Avenue 54 will experience LOS A during the peak hours in the year 2008 after the expansion area is developed. The additional traffic associated with the expansion area will increase the average control delay for this movement by 0.1 second per vehicle during the evening peak hour. The delay in the morning peak hour will not change following the development of the expansion area.

Motorists making northbound left-turns from Monroe Street into the project site via the unsignalized site access are expected to experience an average of 7.8 to 7.9 seconds per vehicle of delay (LOS A) in the morning and evening peak hours of the year 2008. The motorists exiting the project site by turning onto Monroe Street will experience LOS B operation in the morning and evening peak hour with an average control delay of 10.8 seconds per vehicle in the morning peak hour and 11.6 seconds per vehicle of delay in the evening peak hour.

In the year 2008, the intersection of Jefferson Street and Avenue 54 will provide LOS C operation during the peak hours, with or without site traffic. The approach with the most delay at this intersection will also provide LOS C operation in the peak hours with and without site traffic. Project-related traffic will increase the overall intersection control delay by up to 0.72 seconds per vehicle during the peak hours. This increase will not be sufficient to change the peak hour LOS at this intersection

The unsignalized intersection of Monroe Street and Avenue 54 is expected to operate at LOS B in the morning peak hour and LOS C in the evening peak hour, following the addition of project-related traffic in the year 2008. The approach with the most delay at this intersection will also operate at LOS B in the morning peak hour and LOS C in the evening peak hour.

As shown in Table 4-3, once project-related traffic volumes are added to year 2008 ambient volumes, the AWSC intersection of Madison Street and Avenue 58 will continue to provide LOS A operation, with intersection delays that range from 9.29 to 9.67 seconds per vehicle during the peak hours. Site traffic will increase the overall intersection control delay at this intersection by up to 0.01 second per vehicle but will not change the level of service during the peak hours.

Although project-related traffic will increase the peak hour control delay at the unsignalized key intersections, the levels of service are projected to remain at LOS C or better levels of service in the year 2008. Since the City of La Quinta minimum intersection performance standard will be met at these unsignalized key intersections upon project completion without mitigation (other than that proposed to facilitate site access) the project-related impact at these intersections is not considered significant.

Signalized Intersection Analysis

Table 4-4 provides the peak hour intersection average control delay and LOS at the two signalized key intersections with year 2008+project traffic volumes. Following the addition of project-related traffic, both of these signalized intersections (Madison Street at Avenue 52 and Madison Street at Avenue 54) will provide level of service B operation in the peak hours. Project-related traffic will change the intersection control delay values at the two signalized key intersections by up to 0.1 second per vehicle. Changes in average control delay of this magnitude will not be sufficient to change the peak hour levels of service at either of the signalized key intersections.

Based upon the City of La Quinta minimum intersection performance standard, no mitigation (other than the installation of the traffic signals at both intersections) will be required at either of the signalized key intersections to maintain acceptable levels of service with year 2008+project traffic volumes. Although project-related traffic will contribute incrementally to the need for signalization at these two intersections, the project-related impact on the signalized key intersections in the year 2008 is not expected to be significant.

4.5 Traffic Signal Warrants

The evaluation of peak hour levels of service at unsignalized key intersections provides a preliminary indication of when and where traffic signals might be needed in the study area to improve levels of service. Future peak hour traffic projections at the unsignalized key intersections were compared to rural peak hour traffic signal volume warrants to determine whether or not the installation of new traffic signals would be warranted.

The installation of a traffic signal should be considered if one or more of the warrants is met; however, the satisfaction of a warrant is not necessarily sufficient justification for the installation of signals. Delay, congestion, approach conditions, driver confusion, future land use or other evidence of the need for right-of-way assignment beyond that which could be provided by stop signs must be demonstrated.

The type of traffic control chosen for an intersection has a strong influence on the frequency and severity of crashes that occur at the intersection. The type of traffic control must be appropriate for the intersection configuration and the traffic volumes to be served. Signals associated with new developments can introduce congestion on through roadways that previously operated relatively safely and smoothly. Two-way stop control and all-way stop control are alternatives to signalization that should be considered.

Appendix C includes the peak hour traffic signal warrants as well as spreadsheets with the peak hour traffic volume projections at each unsignalized key intersection with and without project-related traffic. Table 4-5 provides a summary of the development scenarios under which traffic signal warrants are expected to be met at the unsignalized key intersections in the study area.

As shown in Table 4-5, four of the key intersections are expected to serve traffic volumes that will be sufficient to meet the rural peak hour traffic signal volume warrants in the year 2008 with and without site traffic including: (1) Jefferson Street at Avenue 54, (2) Madison Street at Avenue 52, (3) Madison Street at Avenue 54, and (4) Monroe Street at Avenue 54. Of those four intersections, two (Jefferson Street at Avenue 54 and Monroe Street at Avenue 54) will provide acceptable peak hour levels of service in the year 2008, following the addition of project-related traffic.

Madison Street at Avenue 52 and at Avenue 54

Two intersections are expected to provide unacceptable levels of service on one or more of the intersection approaches in the year 2008. These two intersections (Madison Street at Avenue 52 and Madison Street at Avenue 54) are also projected to carry traffic volumes that are sufficient to warrant signalization under the rural daily planning level traffic signal warrants for minimum vehicle volume and interruption of continuous flow. Consequently, when Madison Street is first opened between Avenue 54 and Avenue 52, the intersection of Madison Street with Avenue 52 and the intersection of Madison Street with Avenue 54 are recommended for signalization.

Table 4-5
Traffic Signal Warrants Summary[a]

Intersection	Scenario When Rural Traffic Signal Volume Warrants Are Met		
	Year 2006 Peak Season	Year 2008 Ambient Condition	Year 2008 With Project
Jefferson Street @			
• Avenue 54[b]	●	○	○
Madison Street @			
• Avenue 52[c]	●	●	●
• Avenue 54	○	●	●
• Avenue 58	--	--	--
Monroe Street @			
• Avenue 54	○	○	○
• Site Access	--	--	--
Eastern Site Access @			
• Avenue 54	--	--	--

a. Based upon daily planning level volume warrants for use at new intersections or other locations where actual traffic volumes cannot be counted.
○ = Peak hour warrants or Daily Planning Signal Warrants appear to be met, but the intersection operates adequately without signalization during peak hours.
● = Meets signal warrants and has one or more approaches operating at LOS F in the peak hour.
-- = Does not meet signal warrants.

b. Once Madison Street is opened between Avenue 52 and Avenue 54, traffic volumes will decrease substantially at the intersection of Jefferson Street and Avenue 54. Although acceptable levels of service are expected in the peak hours, signal warrants are still expected to be met. Therefore, future traffic volumes and levels of service should be monitored closely at this intersection, following the northerly extension of Madison Street, to ensure that a signal is installed if/when warranted.

c. Once Madison Street is opened between Avenue 52 and Avenue 54, traffic volumes will increase substantially at the intersection of Madison Street and Avenue 52. Therefore, traffic signals should be installed and operational upon the opening of Madison Street, between Avenue 52 and Avenue 54.

Site Access Intersections

None of the site access intersections are projected to meet traffic signal warrants with year 2008+project traffic volumes. The northbound approach volume at the western Griffin Ranch access on Avenue 54 will remain below the minimum volume threshold for the minor street approach warrant. Consequently, the western Griffin Ranch access on Avenue 54 is not expected to ever meet traffic signal volume warrants.

The eastern Griffin Ranch access on Avenue 54 is projected to serve 1,300 vehicles per day (VPD) associated with the Griffin Ranch Specific Plan development as well as 520 VPD associated with the Griffin Ranch expansion area, for a total two-way traffic volume 1,820 VPD. The minor street approach volume required to warrant a signal is 850 VPD for a single-lane approach or 1,120 VPD for an access configuration with two northbound lanes. Therefore, the 910 northbound vehicles per day leaving the Griffin Ranch through the eastern access would be sufficient to exceed the rural minor street approach warrant for a single exit lane. However, future daily traffic volumes on Avenue 54 are expected to remain relatively low. The projected year 2008+project daily traffic volume on Avenue 54 at this location (approximately 6,430 ADT) will be less than the 10,080 VPD necessary to warrant signalization. Consequently, a traffic signal is not warranted or recommended at the eastern Griffin Ranch access on Avenue 54.

The eastbound approach volume at the site access on Monroe Street will remain below the minimum volume threshold for the minor street approach warrant. Consequently, the site access on Monroe Street is not expected to ever meet traffic signal volume warrants.

4.6 OTHER CONSIDERATIONS

Consistency with the Circulation Element

The proposed project appears to be consistent with the Circulation Element of the *La Quinta Comprehensive General Plan*. As shown in Figure 2-4, Tentative Tract Map No. 34642 incorporates Avenue 54 as a Secondary Arterial and Monroe Street as a Primary Arterial - A adjacent to the project site. Multi-purpose trails, bikeways, meandering sidewalks, and landscape buffers have been incorporated in the proposed cross-sections, as required by the City of La Quinta. The site access points on Avenue 54 and Monroe Street have been located far enough from the intersection of Monroe Street and Avenue 54 to comply with the City of La Quinta minimum intersection spacing criteria for Secondary and Primary Arterials, respectively.

The project developer/applicant shall dedicate public rights-of-way in accordance with the *City of La Quinta Comprehensive General Plan* for both abutting General Plan roadways. Dedications shall include additional widths, as necessary, for dedicated right-turn and left-turn lanes, bicycle or equestrian paths and trails. Perimeter landscaping setbacks shall be created along the Avenue 54 and Monroe Street frontages with a minimum depth of ten feet from the right-of-way to the property line. Direct vehicular access to Avenue 54 and Monroe Street from lots with frontage shall be restricted to the two private streets shown on Tentative Tract 34642 and Tract Map 32879.

All required public and private streets on-site shall be designed and constructed in accordance with City of La Quinta design standards, as required by the City Engineer. The project developer/applicant shall submit street improvement plans for construction of required streets to the La Quinta City Engineer for review and approval. Improvements along Avenue 54 and Monroe Street shall include half-width right-of-way improvements and appurtenances such as curbs, gutters, traffic control signs, channelization

markings/devices, medians (if required), street name signs and sidewalks. The applicant shall extend improvements beyond the site boundaries, if deemed necessary to ensure that they safely integrate with existing improvements (such as street width transitions, pavement elevation transitions, alignment, elevation or dimensions of sidewalks). Transit facilities shall be provided, as required, on Avenue 54 and Monroe Street adjacent to the site.

Monroe Street

Monroe Street is classified as a four-lane divided "Primary Arterial-A" in the *City of La Quinta Comprehensive General Plan*. Primary arterials typically have a 110-foot right-of-way and an 86-foot wide roadbed. They generally provide four 13-foot travel lanes with an 18-foot median and 8-foot shoulders. Non-motorized circulation is encouraged in La Quinta and the provision of sidewalks, bike lanes, and multi-purpose trails is especially important along major roadways. On primary arterials, sidewalks a minimum of 6 feet wide are typically provided within 12-foot wide landscaped parkway strips on both sides of the roadbed. City policy requires that sidewalks be provided on both sides of all arterial and collector streets, except where there is a multi-use trail on one side.

Tentative Tract Map 34642 provides the existing and proposed cross-sections for the abutting General Plan streets. As shown in Figure 2-4, adjacent to the project site, the existing Monroe Street right-of-way is 30 feet wide on each side of the centerline. The existing pavement is approximately ten feet wide on the west side of the centerline and 14 feet wide on the east side of the centerline of Monroe Street.

The proposed right-of-way and Primary Arterial-A improvements for Monroe Street appear to be consistent with the requirements of the *City of La Quinta Comprehensive General Plan*. The project developer/applicant shall dedicate public right-of-way in accordance with the Primary Arterial - A classification (including 25 additional feet, for a 55-foot half-width right-of-way adjacent to the Griffin Ranch expansion area). Full half-width improvements are proposed along the west side of Monroe Street, including a 43-foot wide roadbed (9-feet in the median, a 26-foot traveled way, and an 8-foot shoulder). A 12-foot parkway will be improved with a 6-foot meandering sidewalk. In addition, a 30-foot landscape buffer will be provided with a 10-foot wide meandering multi-use trail. On-site multi-purpose trail improvements, including multi-purpose trail street intersections, shall include appurtenances such as traffic control signs, markings and other devices, and raised medians if required.

The La Quinta General Plan Traffic Model projected a post 2020 traffic volume on Monroe Street (south of Avenue 54) of 21,800 vehicles per day, which should include the project-related traffic. Based upon its Primary Arterial-A roadway classification and ultimate capacity of 38,000 vehicles per day, Monroe Street is projected to operate at 57 percent of its master planned capacity (LOS A) on a daily basis upon General Plan buildout.

The *City of La Quinta Comprehensive General Plan* includes a two-phase golf cart route implementation plan. Phase II provides a long-term comprehensive route plan and includes a Class II golf cart path along Monroe Street, adjacent to the project site. An on-street Class II golf cart path shall be provided that is a minimum of 8 feet wide and appropriately striped adjacent to the site. The striped lane shall accommodate one-way golf cart travel shared with bicyclists.

The City of La Quinta has adopted policies and standards for each roadway classification regarding design criteria related to access to adjoining property and minimum intersection spacing and driveway separation. All access configurations require City Engineer review and approval. Minimum landscape setbacks are 20 feet along Primary Arterials like

Monroe Street. The construction of bikeways should conform to Caltrans specifications and design criteria, with all bikeways a minimum of six feet in width.

On Primary Arterials like Monroe Street, the design speed is 50 miles per hour. To maintain the capacity of the roadway and facilitate through traffic movement, the City of La Quinta requires a minimum intersection spacing for full-turn access intersections of 1,060 feet for Primary Arterials (Program 2.4). As shown in Figure 2-5, the proposed site access on Monroe Street appears to be located approximately 1,120 feet south of Avenue 54 (centerline-to-centerline). This is consistent with the City minimum intersection spacing requirement.

The General Plan states that right-in/right-out access driveways shall be located such that they exceed the following driveway spacing criteria (measured from the curb returns): (1) 250 feet on the approach leg to a full-turn intersection; (2) 150 feet on the exit leg from a full-turn intersection; and (3) 250 feet from other driveways. The proposed site access driveway on Monroe Street appears to be located on the approach leg and 200± feet (centerline-to-centerline) north of an existing driveway to a single-family home. This residence is located between but is not a part of the Griffin Ranch expansion area and the Saddle Club at Griffin Ranch. The proposed driveway spacing appears to be less than the 250-foot minimum driveway spacing criteria adopted by the City of La Quinta. However, the traffic volume generated by a single residence is not considered significant.

The City of La Quinta multi-purpose trails are depicted in Exhibit 3.10 of the *City of La Quinta General Plan* Circulation Element. A Class II Bike Path is shown therein extending along Monroe Street from a point one-quarter mile south of the Saddle Club to the southern La Quinta City Limit at Avenue 52. A multi-purpose trail is depicted adjacent to the Griffin Ranch expansion area and the Saddle Club, along Monroe Street (extending from Avenue 62 to Avenue 52). A pedestrian/hiking trail is shown extending east from Madison Street, midway between Avenue 54 and Airport Boulevard (along the southern boundary of the Griffin Ranch site) to a point approximately one-quarter mile west of the western boundary of the Saddle Club.

The *La Quinta Comprehensive General Plan* states that in future development, pedestrian and other non-motorized transportation safety and accommodation should be given emphasis equal to that currently given to automobile access. Private equestrian trails will be developed as part of the Griffin Ranch Specific Plan development that will connect to the public multi-purpose trail system established by the City of La Quinta. The internal access proposed between the expansion area, the Saddle Club and the Griffin Ranch Specific Plan should facilitate access to pedestrian and equestrian trails within the Griffin Ranch Specific Plan area as well as the public multi-purpose trail system planned in the project vicinity.

Avenue 54

Avenue 54 is currently shown in the Circulation Element of the *La Quinta Comprehensive General Plan* as a Secondary Arterial, adjacent to the northern boundary of the project site. Secondary Arterials typically require an 88-foot right-of-way and provide four-lane undivided roadways. Prior to the *City of La Quinta Comprehensive General Plan* update of March 20, 2002, Avenue 54 was master planned as a Primary Arterial that would have required a 100-foot right-of-way and provided a four-lane divided cross-section with a raised landscape median. Consequently, the existing right-of-way is 30 feet wide (on the south side of the centerline) and 55 feet wide (north of the Avenue 54 centerline). The existing pavement is approximately 15 feet wide on the south side of Avenue 54 and 10 feet wide on the north side of Avenue 54.

Tentative Tract Map 34642 shows Avenue 54 adjacent to the site as a Secondary Arterial with a 98-foot right-of-way and a 30-foot landscape buffer with a 20-foot meandering multi-use trail. The additional right-of-way proposed would accommodate a median of sufficient width to provide a left-turn bay as well as a right-turn deceleration lane at the eastern Griffin Ranch Specific Plan access intersection.[1] Each of these auxiliary lanes would be 12 feet wide.

The 72-foot wide roadbed proposed would be wider than the typical 64-foot roadbed of secondary arterials, but appears to be consistent with the classification of Avenue 54 currently shown in the "La Quinta Circulation Element." A six-foot wide meandering sidewalk is proposed in the 12-foot parkway along the south side of Avenue 54. The parkway on the north side of Avenue 54 would be 14 feet wide and include a sidewalk to be improved in conjunction with the widening of the north side of Avenue 54 by the developer of the Country Club of the Desert Specific Plan site).

The proposed project shall incorporate the Class II bikeway facility and golf cart path a minimum of 8 feet wide and appropriately striped adjacent to the site along Avenue 54. The striped lane will accommodate one-way golf cart travel and be shared with bicyclists.

The proposed full-turn eastern Griffin Ranch access on Avenue 54 complies with the City of La Quinta minimum intersection spacing requirements for secondary arterials. It appears to be spaced an adequate distance from adjacent intersections and more than the requisite 250 feet from the nearest driveway.

Internal Circulation

Those residents of the Griffin Ranch expansion area who opt to utilize the eastern Griffin Ranch Specific Plan access on Avenue 54 will need to travel east/west on Haflinger Way and north/south on Merv Griffin Way to do so. The eastern access is expected to serve a traffic volume of 1,300 vehicles per day, upon development of the Griffin Ranch Specific Plan, and 1,820 vehicles per day following the development of the expansion area. The proposed Griffin Ranch expansion development would add an estimated 520 vehicles per day to Merv Griffin Way (south of Avenue 54) and to Haflinger Way (east of Merv Griffin Drive).

As the internal street just south of and parallel to Avenue 54, Haflinger Way will serve approximately 48 percent of the traffic that passes through the eastern Griffin Ranch access. Merv Griffin Way (south of Haflinger Way) is projected to carry 950 vehicles per day and Haflinger Way (east of Merv Griffin Way) is projected to carry approximately 870 vehicles per day.

Although the City of La Quinta has not established a daily capacity for local streets, a daily volume of less than 1,000 vehicles per day is within the typical range of volumes for local residential streets. In *Recommended Guidelines for Subdivision Streets* (1984), the ITE states that the daily volume on a local street typically ranges from 100 ADT to 1,500 ADT.

An HCS analysis of the projected traffic volumes at the intersection of Merv Griffin Way and Haflinger Way in the evening peak hour was undertaken. It revealed that LOS A operation would be experienced by the 52 southbound motorists on Merv Griffin Way who

1. Although the future peak hour traffic volume would be 77 VPH turning right into the eastern Griffin Ranch access on Avenue 54 and 39 VPH turning left into this access, the City of La Quinta Engineering Bulletin #03-08 specifically states that the warrants therein for auxiliary right-turn deceleration lanes and left-turn bays shall be applied to "primary arterial and higher classification streets."

would be turning left onto Haflinger Way in the peak hour. Similarly, the delay on the minor street approach (westbound Haflinger Way) was found to correspond to LOS A operation. The 95th percentile back-of-queue length in the peak hour was found to be a fraction of one vehicle on both the southbound and westbound intersection approaches. Consequently, it is highly unlikely that a back up will form at the easterly entry gate on Avenue 54 of Tract Map No. 32879 as a result of the additional left-turn movements from southbound Merv Griffin Way onto eastbound Haflinger Way associated with the expansion area.

Standards for all City streets are provided in the Development Code. All internal street sections shall be subject to review and acceptance by the City Engineer. Streets within planned residential areas shall be installed and maintained as private streets. Private streets should be designed to meet the City's public street standards at the point where they connect with a public street in order to safely integrate into it. Within subdivisions, private streets may be designed to a width of 28 feet of AC pavement with restricted parking, subject to City Engineer and Fire Department approval.

The proposed interior streets exceed the minimum width outlined above. For the most part, the internal streets, including the internal loop road that will allow residents to reach the Griffin Ranch eastern access on Avenue 54, are proposed as private streets with a 41-foot right-of-way and a roadbed 41 feet wide, with wedge curbs and a 10-foot public utility easement along both sides of the right-of-way. Street "G" will be the southernmost connection to the Griffin Ranch internal street network and the Saddle Club at Griffin Ranch. Street "G" is proposed as a private street with a 36-foot right-of-way and a 35-foot roadbed with wedge curbs as well as a 10-foot wide public utility easement on both sides of the roadbed. These 10-foot easements will accommodate a landscape buffer on one side of Street "G" and a multi-use trail on the opposite side of Street "G" for residents traveling between their homes and the Saddle Club, the riding ring in the Griffin Ranch, or trail rides on the community multi-purpose trail network.

Any gates between the project site and the Saddle Club at Griffin Ranch or between the site and the Griffin Ranch Specific Plan area intended to permit riders/owners and their mounts to exit as well as enter the Griffin Ranch expansion area should be equipped with keypads or card readers on both sides of the gate, to ensure that riders and their mounts are not forced to summon people on the other side of the gate to activate the key pad in order to open the gate and allow them to pass through.

Internal Street Intersection Control

The layout and design of the internal circulation system should minimize the need for traffic regulation and enforcement in neighborhoods. The *Neighborhood Street Design Guidelines* (ITE; 2003) indicate that intersections of two neighborhood local streets should be designed to operate without any control device when: (1) the total entering volume at the intersection during a peak hour is less than 100 vehicles, and (2) adequate clear sight distance is provided. Where these conditions are not met, intersection traffic controls (most likely stop signs) should be provided as a means of minimizing traffic conflicts.

At the intersection of Merv Griffin Way and Haflinger Way, the north leg is expected to serve approximately 1,820 vehicles per day. The south leg of Merv Griffin Way is projected to carry 950 vehicles per day. The east leg (Haflinger Way) is projected to carry approximately 870 vehicles per day. During the peak hour, the total entering volume at the intersection of Merv Griffin Way and Haflinger Way would be approximately 182 vehicles. Consequently, it is recommended that a STOP sign be installed on Haflinger Way at the intersection of Merv Griffin Way, as a means of minimizing traffic conflicts.

Site Access

The project site has adequate access for the land uses proposed. As shown on Figure 2-4, the project proposes to take access from the unsignalized Griffin Ranch Specific Plan eastern full-turn gated access point on Avenue 54 (3,075 feet east of Madison Street and west of the Griffin Ranch expansion area) as well as at a full-turn gated access on Monroe Street, south of Avenue 54. The adjacent street system has sufficient capacity to accommodate project-related traffic with the site access improvements proposed and depicted in Figure 5-1.

Both of the access intersections require only one exit lane that should be controlled by a STOP sign facing motorists leaving the site. With two full-turn access points serving the 90 single-family dwelling units proposed, these intersections are expected to provide excellent levels of service (LOS B or better) for all movements in the year 2008 peak hours.

Improvements at the site access intersection on Monroe Street shall include appurtenances such as traffic control signs, markings and other devices, raised medians if required, street name signs and sidewalks. Site access improvements shall be designed and constructed in accordance with City adopted standards, or as approved by the City Engineer. Improvement plans for the streets and access gates shall be submitted for City review and approval. The minimum dimension for access roads and gates is 20 feet clear and unobstructed width and a minimum vertical clearance of 13 feet, 6 inches in height. Gates shall be automatic and equipped with a rapid-entry system.

Adequacy of Stacking Space at Access Gates

The gated access points for the development should provide sufficient storage space in advance of the gates to have a very high probability of storing all arriving vehicles. A 95 percent probability is suggested by the ITE, based on the number of entering vehicles in a peak 15-minute interval. The ITE recommends a minimum gate storage length of 50 feet for gates serving fewer than 50 dwelling units and 75 feet for gates serving 50 to 100 dwellings. Gates serving more than 100 dwellings should provide a minimum storage of 100 feet.[2] A turn-around in advance of the gate is also necessary for motorists who inadvertently turn into the access and wish to leave without passing through the gate into the development.

The stacking distance at the gated entry on Avenue 54 was reviewed by the City of La Quinta in conjunction with the approval of the Griffin Ranch Specific Plan and found to be adequate. The use of this access gate by the residents of some of the 90 homes proposed in the expansion area should not change the stacking space required at this access, since gates serving more than 100 dwellings should provide a minimum storage of 100 feet.

Monroe Street Access

The entering and exiting queue stacking distance at the gated access on Monroe Street appears to exceed 100 feet and be adequate to meet the needs of future residents as well as prevent vehicles queued for the gate from extending onto Monroe Street or Street "D", where they could disrupt or interfere with the movements of other motorists. A turn-around area has been incorporated in the entry design that will permit motorists who enter

2. Stover, Vergil G., Frank J. Koepke, *Transportation and Land Development*. Institute of Transportation Engineers, 2002 (pg. 13-14).

inadvertently to turn around and exit without first passing through the gate into the development.

Avenue 54 Access

The conditions of approval attached to the Griffin Ranch Specific Plan specify that auxiliary lanes (a right-turn deceleration lane and a left-turn deceleration lane) be provided at the eastern Griffin Ranch entry on Avenue 54, if required pursuant to Engineering Bulletin #03-08. Year 2008 ambient traffic volumes are projected to include 30 VPH turning left and 53 VPH turning right into the site. The proposed project would increase the peak hour traffic volume entering the Griffin Ranch from Avenue 54 by 13 VPH turning left and 24 VPH turning right into the site. The peak hour traffic volumes on Avenue 54 expected to turn into the Griffin Ranch with or without the development of the expansion area will exceed the volume criteria identified in Engineering Bulletin #03-08 as warranting dedicated left-turn and right-turn auxiliary lanes.

Auxiliary Left-Turn and Right-Turn Deceleration Lanes

Turn lanes may also be used on high volume or high speed roadways to decelerate vehicles leaving the major street. The separation of turning vehicles from through traffic can be an important condition for the safe and effective operation of an intersection. Auxiliary turn bays and deceleration lanes are the only method of limiting the speed differential between turning vehicles and through traffic. This allows through traffic to avoid being delayed by vehicles waiting to turn, thereby improving traffic flow and safety.

Engineering Bulletin #03-08 details adopted City of La Quinta policy regarding auxiliary lanes.[3] As outlined therein, auxiliary lanes shall be installed on all primary arterial and higher classification streets when specific criteria are met including:[4]

- A left-turn deceleration lane with taper and storage length is required for any driveway with a projected peak hour left ingress turning volume greater than 25 vehicles per hour. The taper length will be included within the required deceleration lane length.
- A right-turn deceleration lane with taper and storage length is required for any driveway with a projected peak hour right ingress turning volume greater than 50 vehicles per hour. The taper length will be included within the required deceleration lane length.
- A right-turn deceleration lane will not generally be required on streets with more than three travel lanes in the direction of the right-turn lane.

The minimum lane length for auxiliary lanes shall be 100 feet plus taper length. The right-of-way must be widened 12 feet to accommodate the 12-foot wide auxiliary lane. No reductions in the width of the landscape buffer will be permitted to construct the auxiliary lane. All auxiliary lanes must be contained within the development project limits.

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3. Jonasson, Timothy R. "Auxiliary Lanes and Traffic Impact Studies Required for Proposed Development Projects," December 16, 2003.
4. The City of La Quinta Contract Engineer, Mr. Nazir Lalani, has indicated that the City Council has clearly directed that where the turning volume warrants in Engineering Bulletin #03-08 are met, auxiliary right-turn deceleration lanes and left-turn bays shall be required. He also stated that City staff does not differentiate between secondary arterials and "primary arterial and higher classification streets" in applying the criteria warranting auxiliary lanes.

Deceleration Lane Length

The length of required deceleration lanes in La Quinta is based on the posted speed limit of the roadway. For roadways with a 50 mph posted speed limit, the City of La Quinta has identified a deceleration length of 248 feet with a transition length of 150 feet. These deceleration lengths apply unless there is insufficient property frontage to accommodate the required length.

Western Griffin Ranch Access on Avenue 54

A total of 32 VPH are projected to enter the Griffin Ranch by turning right from the eastbound side of Avenue 54 into the site. Therefore, no right-turn deceleration lane is warranted on Avenue 54 at the western Griffin Ranch access.

A total of 14 VPH are projected to enter the Griffin Ranch by turning left from the westbound side of Avenue 54 into the site. Therefore, no left-turn bay or deceleration lane is warranted on Avenue 54 at the western Griffin Ranch access.

Eastern Griffin Ranch Access on Avenue 54

A total of 77 VPH are projected to enter the Griffin Ranch by turning right from the eastbound side of Avenue 54 into the site. Therefore, if the City of La Quinta auxiliary lane warrants apply to Secondary Arterials, a right-turn deceleration lane would be warranted on Avenue 54 at the eastern Griffin Ranch access.

The threshold at which the City of La Quinta would require a left-turn lane is 25 vehicles per hour turning left from Avenue 54 into the site in the peak hour. A total of 39 vehicles per hour are projected to enter the Griffin Ranch by turning left from the westbound side of Avenue 54 into the site. Therefore, if the City of La Quinta auxiliary lane warrants apply to Secondary Arterials, a left-turn bay/deceleration lane will be warranted on Avenue 54 at the eastern Griffin Ranch access.

The total length required for an auxiliary turn bay includes adequate queue storage length as well as deceleration length and taper. The 95th percentile westbound left-turn back of queue in the peak hour is projected to be less than one vehicle (0.12 vehicle) based upon the low opposing volume upon project completion. A left-turn bay at the eastern Griffin Ranch access on Avenue 54 would require minimal queue storage length. The ITE recommends a minimum left-turn queue storage length of 50 feet for rural areas and a standard taper length of 100 feet for single left-turn and right-turn lanes.[5]

Appendix A to Engineering Bulletin #03-08 (see Appendix E) specifies deceleration lane lengths and transition lengths as a function of the posted speed limit for arterials in the City of La Quinta. As shown therein, with a 50 mph posted speed limit, the left-turn pocket and the right-turn deceleration lane on Avenue 54 at the eastern Griffin Ranch Specific Plan access would require 248 feet for deceleration with a 150-foot transition length. These auxiliary turn lane lengths should permit drivers to clear the through lane at a speed differential of 10 mph or less and decelerate to 10 mph before turning into the site entry drive. Engineering Bulletin #03-08 states that the taper length will be included within the required deceleration lane length. It also states that the minimum auxiliary lane length shall be 100 feet plus taper length.

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5. In rural (high speed) areas, the minimum queue storage length (50 feet) is one-half that of urban areas (100 feet).

Site Access on Monroe Street

An auxiliary lane for right turns would remove right-turning vehicles from the through-traffic lane with an acceptable speed differential, improve traffic safety by reducing the potential for rear-end collisions, and increase the capacity of the roadway. It can reduce the disruption of platooned traffic flow that is caused by vehicles decelerating to turn right.

A total of 24 vehicles per hour are projected to enter the Griffin Ranch Expansion Area by turning right from the southbound side of Monroe Street into the site. There is the potential for a small number of vehicles from the previously approved Griffin Ranch development to use the proposed Monroe Street site access. However, none of the dwelling units in the previously approved Griffin Ranch development are located closer to the proposed site access on Monroe Street than they are to the eastern Griffin Ranch access on Avenue 54. Therefore, even with this traffic, the total volume turning right into the proposed site access should remain well below the City of La Quinta's 50 peak hour warrant for a right-turn/deceleration lane.

Since fewer than 50 vehicles per hour are projected to turn right from Monroe Street into the site upon project completion, a right-turn deceleration lane would not be required by the City of La Quinta on Monroe Street at the site access intersection. The Site Plan includes a right-turn deceleration lane on Monroe Street, even though the projected traffic volume on Monroe Street will not be sufficient to meet the threshold requiring a right-turn deceleration lane.

Traffic movements most frequently conflict with one another at intersections. Many collisions at unsignalized intersections are related to left-turn maneuvers, as they increase vehicular conflicts as well as conflicts with bicyclists and pedestrians. More than two-thirds of all access-related collisions involve left-turning vehicles. The installation of a single left-turn lane on one major-road approach at an unsignalized T-intersection has been found to reduce total crashes by 44 percent in rural areas and 33 percent in urban areas.[6]

A key strategy for minimizing collisions involving left-turning vehicles is to provide exclusive left-turn lanes, particularly on high-volume and high-speed major-road approaches. Left-turn lanes remove vehicles waiting to turn left from the through-traffic stream, reducing the potential for rear-end collisions. By providing a sheltered location for drivers to wait for a gap in opposing traffic, left-turn lanes encourage drivers to be more selective in choosing a gap in which to complete their left-turn maneuver. This may reduce the potential for collisions between left-turn and opposing through vehicles.

A maximum of four vehicles per hour are projected to enter the project site by turning left from the northbound side of Monroe Street into the proposed site access. Since this is less than the 25 VPH threshold for a left-turn deceleration lane, no left-turn bay or deceleration lane is required by the City on Monroe Street at the proposed site access. However, the proposed development is an equestrian-oriented residential community and horse owners may opt to show their horses, hunt, race, play polo, or participate in rodeos. Owners often do their own hauling with two- or four-horse trailers towed behind their vehicle. Horse trailers may allow a horse to be thrown off balance and on his side while negotiating a curve during transit.

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6. Based on an extensive before-after evaluation conducted for the FHWA by Midwest Research Institute. Harwood, D.W., et al. *Safety Effectiveness of Intersection Left- and Right-Turn Lanes,* FHWA-RD-02-089, July 2002.

Horses change position in trailers. Their weight shifts, throwing more weight on the front or back of the trailer. Acceleration or deceleration can set up a rocking motion which can be exacerbated by the horse trying to regain his balance. Two-axle trailers are better balanced so that sudden stops and starts are less likely to make the rig pitch and toss. Even with two-axle horse trailers, owners accelerate and decelerate gradually and take turns relatively slowly to avoid throwing their horse off balance or against the side of the trailer or the chain and doors at the rear of the trailer.

Turn bays are the only method of limiting the speed differential between turning vehicles and through traffic. Channelization can be used to provide a refuge for vehicles turning left into the proposed development, permitting motorists to pause in the median while selecting an acceptable gap in the traffic stream in which to complete their left-turn maneuver (i.e., two-stage gap acceptance).

Left-turn lanes have been found to be effective in improving safety at signalized and unsignalized intersections in both rural and urban areas. One of the most critical design factors affecting an intersection's operation is the treatment of left-turning vehicles, since both safety and the level of service are greatly influenced. Various guidelines, standards and warrants have been developed for left-turn bays at signalized and unsignalized intersections including those developed by M.D. Harmelink, by the American Association of State Highway and Transportation Officials (AASHTO), and by the Institute of Transportation Engineers (ITE). No single standard is universally accepted and research continues today with computerized simulation models to refine the warrants and make them more universally applicable.

The ITE modified the warrants for isolated left-turn bays based on studies indicating that both the perception-reaction time and the time to complete a left-turn maneuver were longer than assumed to develop the previous warrants.[7] Consequently, left-turn bays would be warranted at lower volumes than previously indicated and the queue storage lengths would be longer than previously estimated. The modified warrants suggested by the ITE indicate that with ten or fewer vehicles turning left into the site access from Monroe Street during the peak hour (assuming a 55 mph speed) a left-turn bay would be warranted when the average of the peak hour opposing volume and advancing volume reaches 325 vehicles per lane. While this volume warrant is only 67 percent met today, future projections for Monroe Street indicate that the 6,800 ADT needed to meet the warrant could be reached as soon as the year 2008.

Once the Griffin Ranch Specific Plan development increases the daily volume on Monroe Street to 6,380 ADT in the year 2008, the ITE suggested warrant for isolated left-turn bays (325 VPH) will be approximately 94 percent met at the site access. When the daily volume on Monroe Street reaches 6,800 ADT, the ITE suggested warrant will be met. Therefore, consideration should be given to the provision of a left-turn bay in the median on Monroe Street at the site access. Since the ITE suggested warrant will likely be met within two years, it should be constructed on Monroe Street in conjunction with the ultimate half-width and site access improvements along the site frontage, provided the City of La Quinta concurs that a left-turn pocket is desirable to facilitate safer left-turn access.

The ITE recommends that the existence of a median opening on divided roadways should be the warrant for a left-turn bay. Therefore, a left-turn deceleration bay should be

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7. Hawley, P.E. and V.G. Stover. *Guidelines for Left-Turn Bays at Unsignalized Access Locations on Arterial Roadways*, Second National Conference on Access Management, Vail, Colorado, August 1996.

provided at all median openings on divided roadways.[8] The master planned cross-section on Monroe Street includes an 18-foot median that could easily accommodate a single left-turn bay. There does not appear to be a conflict with the left-turn bay to the south.

U-Turn maneuvers on Monroe Street at Avenue 54 would be inconvenient for vehicles towing loaded horse trailers. Loaded truck and horse trailer combination rigs require more time to complete left-turn maneuvers than passenger cars because of their increased length, additional weight, and the driver's reluctance to spook the horse(s) in the trailer by making sudden stops, starts, or turn maneuvers. Therefore, serious consideration should be given to the provision of a median break with a channelized left-turn deceleration bay on Monroe Street at the project access, even though the peak hour turning volume would be low. It is recommended that the improvements along Monroe Street include an 18-foot wide raised landscaped median opposite the entire site boundary with a conventional median opening at the site entry that incorporates a deceleration/left-turn lane at least 12 feet wide and 248 feet long, with a 150-foot transitional taper length.

8. Stover, Vergil G., and Frank J. Koepke. *Transportation and Land Development* (2nd Edition), 2002, pg. 5-53.

5.0 CIRCULATION MITIGATION MEASURES

When the *Griffin Ranch Specific Plan Traffic Impact Study* was prepared, it was assumed that the circulation network in the project vicinity might need to fully accommodate the project-related traffic and background traffic growth, prior to the extension of Madison Street. Therefore, that traffic study addressed a worst-case scenario wherein Madison Street terminates at Avenue 54 through the year 2008. As a result, a near-term need for signalization was identified therein at the intersections of Jefferson Street and Avenue 54 as well as Monroe Street at Avenue 54.

Development is currently under construction north of Avenue 54, on both sides of the future alignment of Madison Street. Consequently, the extension of Madison Street northerly, from Avenue 54 to Avenue 52, is expected to be completed by the year 2008. The traffic impact analysis summarized herein assumes a circulation network after the extension of Madison Street, between Avenue 52 and Avenue 54. In addition, the City of Indio has recently decided to extend Madison Street from Avenue 50 to Highway 111.

Jefferson Street at Avenue 54

Once Madison Street is constructed between Avenue 54 and Avenue 52, a substantial portion of the existing traffic on Madison Street, south of Avenue 54, will no longer pass through the intersection of Jefferson Street and Avenue 54. Instead of diverting to the west to use Jefferson Street, north-south travel will be accomplished on Madison Street, north of Avenue 54. The anticipated reduction in traffic through the intersection of Jefferson Street and Avenue 54 may mean that the traffic signal required at that intersection in the near-term to maintain acceptable levels of service, may no longer be necessary after the extension of Madison Street.

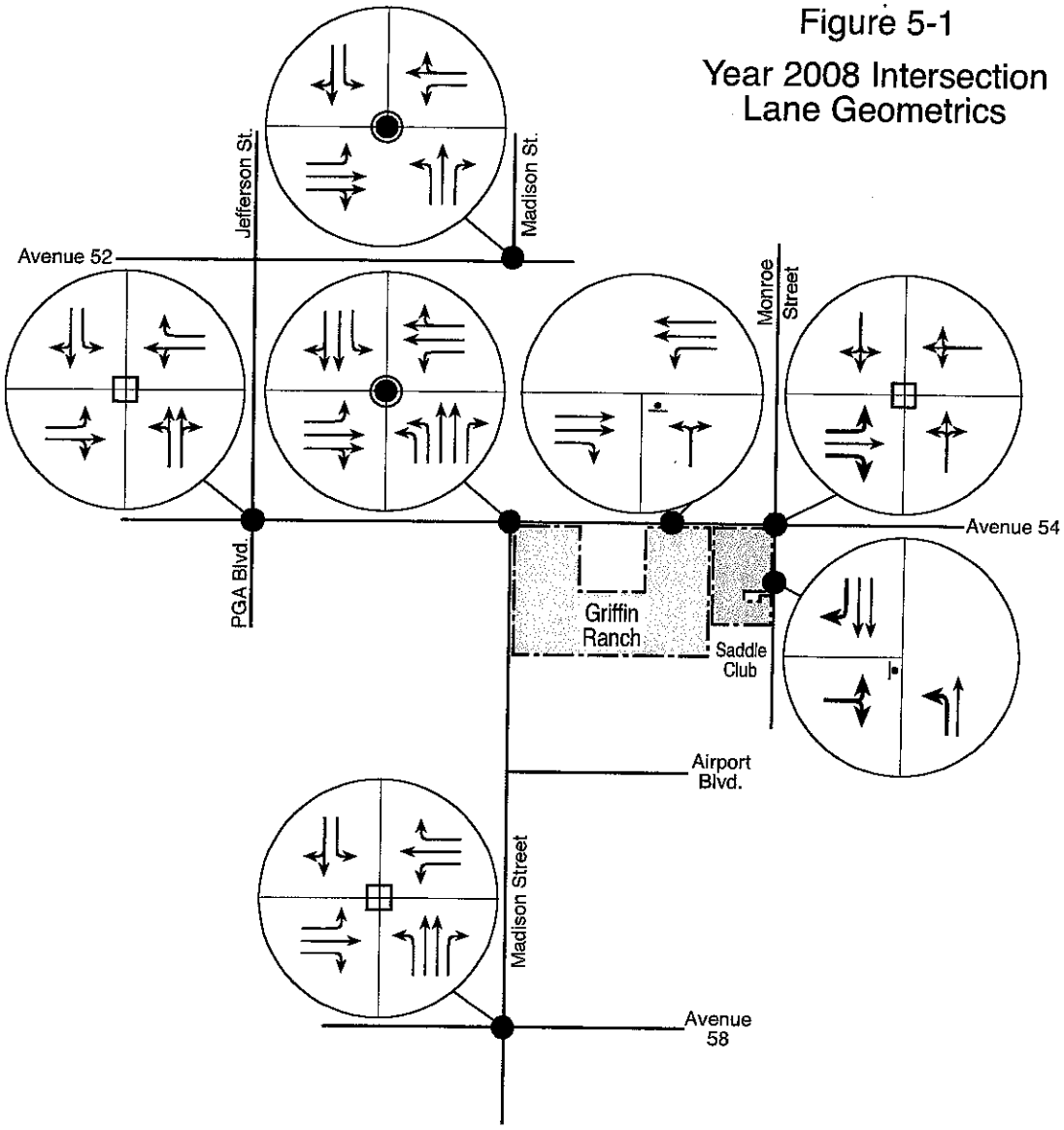
Monroe Street at Avenue 54

Without the extension of Madison Street, the intersection of Monroe Street and Avenue 54 was previously projected to require signalization to accommodate year 2008 traffic volumes at acceptable levels of service. Extending Madison Street northerly from Avenue 54 may divert sufficient traffic from the intersection of Monroe Street and Avenue 54 to maintain acceptable levels of service and eliminate the need for a traffic signal at this intersection in the near term. This intersection meets signal warrants today and even though acceptable levels of service are projected through the year 2008, with an additional thirteen percent increase in peak hour traffic volumes (which is expected to occur by the year 2010), the level of service may drop below the City of La Quinta minimum performance standard and justify the signalization of this intersection. Based on the General Plan buildout traffic volumes, a traffic signal will ultimately be required at this intersection.

Recommended Mitigation Measures

Figure 5-1 illustrates the key intersection approach lane geometrics required to maintain acceptable levels of service upon project completion in the year 2008. With the exception of the new traffic signals required at the two unsignalized key intersections (Madison Street at Avenue 54 and Madison Street at Avenue 52) the improvements depicted in Figure 5-1 are required in conjunction with the development of Griffin Ranch Specific Plan and the Country Club of the Desert site.

Figure 5-1
Year 2008 Intersection Lane Geometrics



Legend

- Exclusive Right-Turn Lane
- Through Lane
- Exclusive Left-Turn Lane
- Optional Through/Right Lane
- Optional Through/Left Lane
- Optional Through/Right/Left Lane
- New Traffic Signal Required
- All Way Stop Control
- Stop Sign

Note: Bold arrows represent new or modified traffic lanes.

Endo Engineering

Scale: 1" = 3770'

The following mitigation measures should be incorporated in the project to minimize the potential for significant adverse circulation impacts associated with the proposed development. The measures recommended are separated into two groups: those required on the project site, and those required for potential off-site impacts.

5.1 Measures Required On-Site

1. The project proponent shall dedicate appropriate right-of-way for Monroe Street and Avenue 54 along the site frontage, and construct improvements consistent with their ultimate half-street sections, as required by the City of La Quinta.

2. A right-turn deceleration lane with adequate taper and deceleration length shall be constructed on Avenue 54 to permit eastbound motorists to decelerate out of travel lanes prior to turning right into the eastern Griffin Ranch access on Avenue 54. Based on the 50 mph speed limit on Avenue 54, this deceleration lane should be 12 feet wide and 248 feet long, with a 150-foot transition length.

3. A left-turn bay/deceleration lane with adequate taper and queue storage length shall be constructed on Avenue 54 to permit westbound motorists to decelerate out of travel lanes prior to turning left into the eastern Griffin Ranch access on Avenue 54. Based on the 50 mph speed limit on Avenue 54, this lane should be 12 feet wide and 248 feet long, with a 150-foot transition length. The 95th percentile queue in the peak hour of the peak season is projected to be 0.12 car length; therefore, the required left-turn queue storage length will be minimal.

4. Although not warranted by the criteria in Engineering Bulletin #03-08, a deceleration/right turn only lane with adequate taper and deceleration length has been incorporated in the Site Development Plan and shall be constructed on Monroe Street, at the site entry south of Avenue 54, to permit southbound motorists to decelerate out of travel lanes, prior to turning right into the site access. Based on the 50 mph speed limit on Monroe Street, this deceleration lane should be 12 feet wide and 248 feet long, with a 150-foot transitional taper length.

5. Improvements along Monroe Street shall include an 18-foot wide raised landscaped median opposite the entire site boundary with a conventional median opening at the site entry that incorporates a deceleration/left-turn lane at least 12 feet wide and 248 feet long, with a 150-foot transitional taper length.

6. An on-street shared Class II bikeway and golf cart path (a minimum of 8 feet wide) shall be appropriately striped along Monroe Street and Avenue 54 adjacent to the site.

7. A 10-foot wide Multi-Purpose Trail shall be constructed within the landscaped setback along the site frontage on Monroe Street, per La Quinta Standard 260. Although the location and design shall be subject to City approval, improvements will include a split rail fence along the roadway side of the trail and a 4-inch wide concrete or similar inflexible border between the trail and the landscaping.

8. The final layout and site access design shall be subject to the review and approval of the City Traffic Engineer during the development review process, to ensure compliance with City of La Quinta roadway and access design standards.

9. Clear unobstructed sight distances shall be provided at both site access points and at all internal intersections.

10. Stop signs shall be installed at the proposed access points on Monroe Street and Avenue 54 to control exiting site traffic.

11. Since the total entering volume at the intersection of Merv Griffin Way and Haflinger Way during the peak hour, would be approximately 182 vehicles, it is recommended that a STOP sign be installed on Haflinger Way at the intersection of Merv Griffin Way, as a means of minimizing traffic conflicts.

12. The project proponent shall provide (at a minimum) the lane geometrics shown in Figure 5-1 at the site access points in conjunction with on-site development.[1]

5.2 MEASURES REQUIRED OFF-SITE

All of the off-site key intersections are projected to operate at acceptable levels of service with existing intersection approach lanes, provided two new traffic signals are installed at the unsignalized key intersections.

1. To achieve and maintain the City of La Quinta minimum intersection performance standard of LOS "D" in the year 2008 (with or without project traffic), the project proponent may be required to contribute on a "fair-share" basis to the cost of installing traffic signals at the following key intersections: (1) Madison Street at Avenue 52, (2) Madison Street at Avenue 54. These signals will be warranted and should be installed when Madison Street is first opened between Avenue 54 and Avenue 52.

2. The project proponent may be required to participate in a traffic mitigation fee program which would ensure that a "fair-share" contribution is made to the cost of future traffic signals and other future roadway infrastructure improvements of area-wide benefit.

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1. The developer of the Country Club of the Desert shall widen the westbound side of Avenue 54 between Jefferson Street and Monroe Street.

Appendices

A. Peak Hour Traffic Count Data
B. HCM Methodology and Worksheets
C. Traffic Signal Warrants
D. Traffic Glossary
E. Engineering Bulletin #03-08

Appendix A

TRAFFIC COUNT DATA

COUNTS UNLIMITED INC.
25424 JACLYN AVENUE
MORENO VALLEY CA. 92557
951-247-6716

CITY OF LA QUINTA
N/S: MADISON STREET
E/W: AVENUE 52
WEATHER: SUNNY

File Name : LQMA52AM
Site Code : 0092047
Start Date : 3/16/2006
Page No : 1

Groups Printed- TOTAL VOLUME

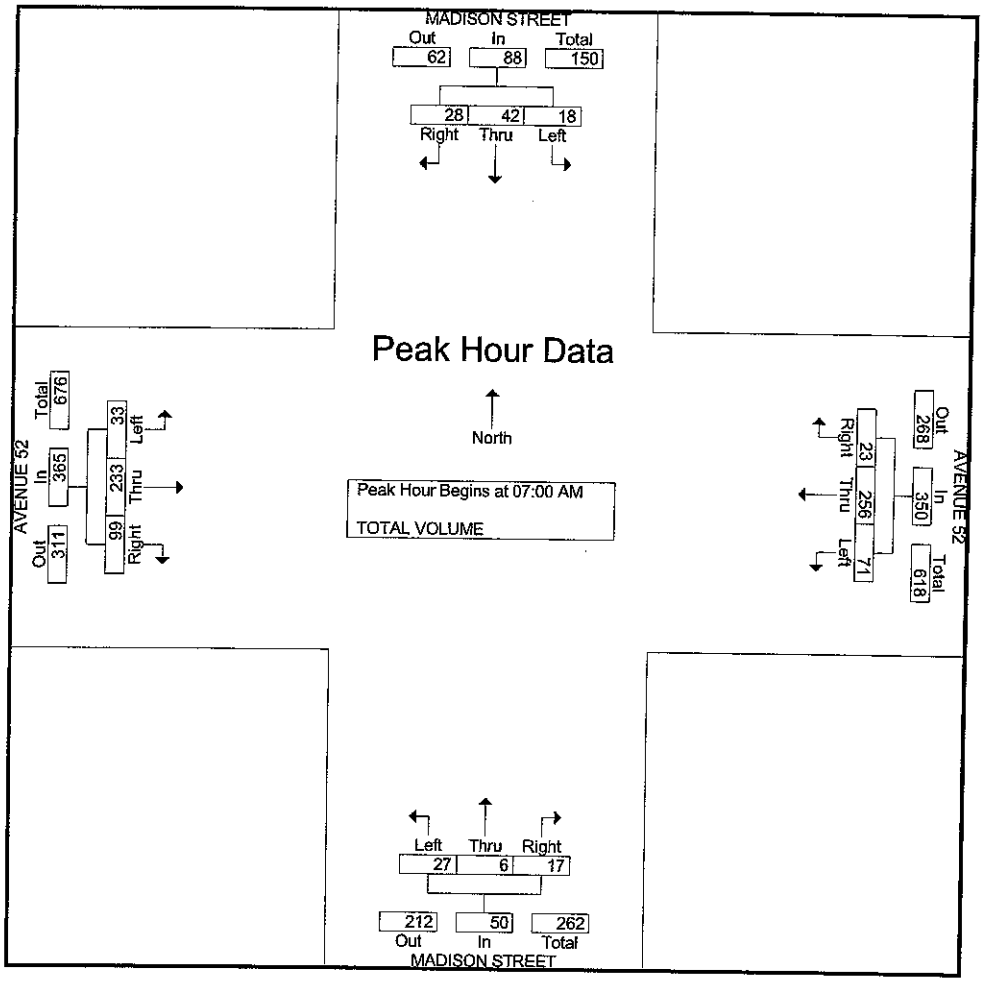
	MADISON STREET Southbound				AVENUE 52 Westbound				MADISON STREET Northbound				AVENUE 52 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	5	23	14	42	40	64	3	107	2	0	4	6	11	57	33	101	256
07:15 AM	6	7	6	19	15	54	7	76	1	1	6	8	4	51	24	79	182
07:30 AM	1	8	5	14	9	77	6	92	7	4	4	15	9	68	20	97	218
07:45 AM	6	4	3	13	7	61	7	75	17	1	3	21	9	57	22	88	197
Total	18	42	28	88	71	256	23	350	27	6	17	50	33	233	99	365	853
08:00 AM	3	8	8	19	5	47	0	52	6	3	5	14	10	51	22	83	168
08:15 AM	4	4	3	11	7	56	6	69	7	4	3	14	13	40	16	69	163
08:30 AM	1	5	2	8	4	35	3	42	11	4	5	20	1	35	8	44	114
08:45 AM	3	4	5	12	9	48	1	58	6	4	6	16	3	36	22	61	147
Total	11	21	18	50	25	186	10	221	30	15	19	64	27	162	68	257	592
Grand Total	29	63	46	138	96	442	33	571	57	21	36	114	60	395	167	622	1445
Apprch %	21	45.7	33.3		16.8	77.4	5.8		50	18.4	31.6		9.6	63.5	26.8		
Total %	2	4.4	3.2	9.6	6.6	30.6	2.3	39.5	3.9	1.5	2.5	7.9	4.2	27.3	11.6	43	

	MADISON STREET Southbound				AVENUE 52 Westbound				MADISON STREET Northbound				AVENUE 52 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	5	**23**	**14**	**42**	**40**	64	3	**107**	2	0	4	6	**11**	57	**33**	**101**	**256**
07:15 AM	**6**	7	6	19	15	54	**7**	76	1	1	**6**	8	4	51	24	79	182
07:30 AM	1	8	5	14	9	**77**	6	92	7	**4**	4	15	9	**68**	20	97	218
07:45 AM	6	4	3	13	7	61	7	75	**17**	1	3	**21**	9	57	22	88	197
Total Volume	18	42	28	88	71	256	23	350	27	6	17	50	33	233	99	365	853
% App. Total	20.5	47.7	31.8		20.3	73.1	6.6		54	12	34		9	63.8	27.1		
PHF	.750	.457	.500	.524	.444	.831	.821	.818	.397	.375	.708	.595	.750	.857	.750	.903	.833

COUNTS UNLIMITED INC.
25424 JACLYN AVENUE
MORENO VALLEY CA. 92557
951-247-6716

CITY OF LA QUINTA
N/S: MADISON STREET
E/W: AVENUE 52
WEATHER: SUNNY

File Name : LQMA52AM
Site Code : 0092047
Start Date : 3/16/2006
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:45 AM				07:00 AM			
+0 mins.	5	**23**	**14**	**42**	**40**	64	3	**107**	**17**	1	3	**21**	**11**	57	**33**	**101**
+15 mins.	**6**	7	6	19	15	54	**7**	76	6	3	**5**	14	4	51	24	79
+30 mins.	1	8	5	14	9	**77**	6	92	7	**4**	3	14	9	**68**	20	97
+45 mins.	6	4	3	13	7	61	7	75	11	4	5	20	9	57	22	88
Total Volume	18	42	28	88	71	256	23	350	41	12	16	69	33	233	99	365
% App. Total	20.5	47.7	31.8		20.3	73.1	6.6		59.4	17.4	23.2		9	63.8	27.1	
PHF	.750	.457	.500	.524	.444	.831	.821	.818	.603	.750	.800	.821	.750	.857	.750	.903

COUNTS UNLIMITED INC.
25424 JACLYN AVENUE
MORENO VALLEY CA. 92557
951-247-6716

CITY OF LA QUINTA
N/S: MADISON STREET
E/W: AVENUE 52
WEATHER: SUNNY

File Name : LQMA52PM
Site Code : 0092047
Start Date : 3/16/2006
Page No : 1

Groups Printed- TOTAL VOLUME

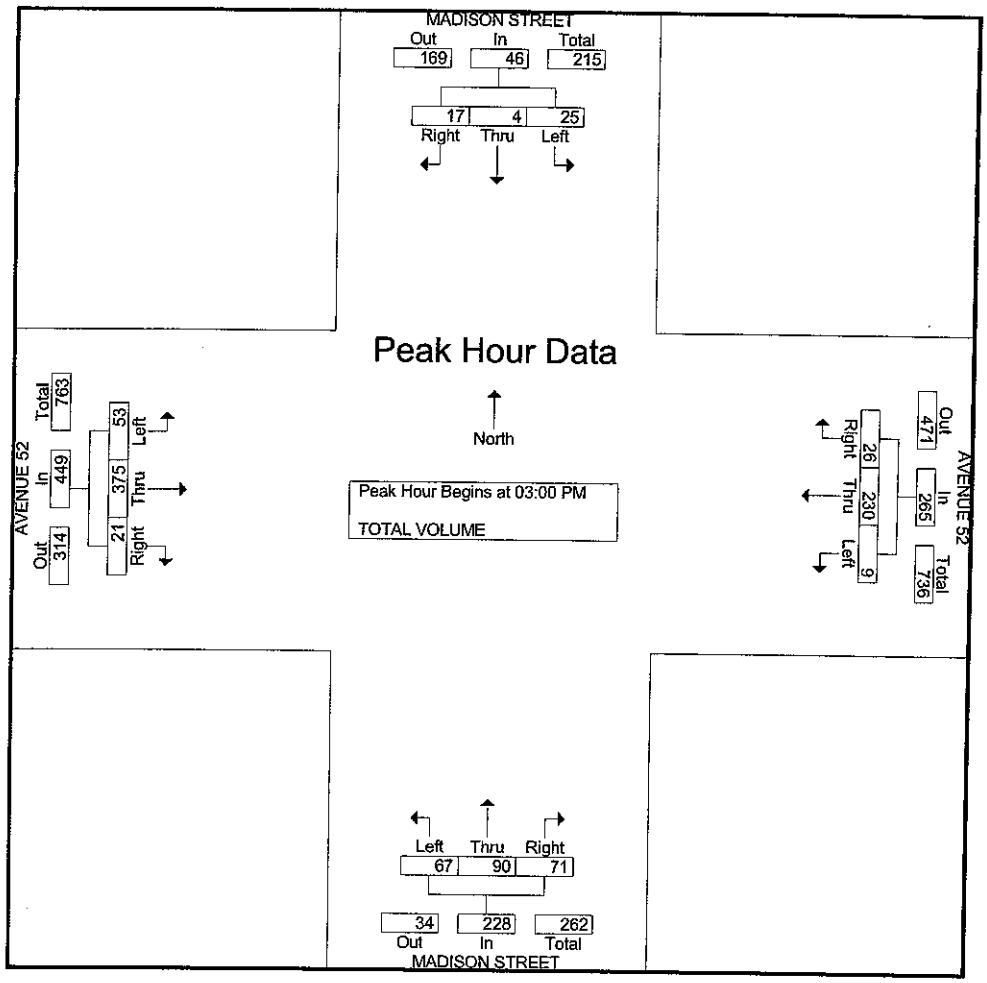
	MADISON STREET Southbound				AVENUE 52 Westbound				MADISON STREET Northbound				AVENUE 52 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
02:00 PM	8	6	7	21	2	69	7	78	14	7	5	26	12	92	7	111	236
02:15 PM	4	0	2	6	4	44	5	53	10	10	16	36	17	89	11	117	212
02:30 PM	3	2	2	7	9	46	11	66	21	9	27	57	8	79	7	94	224
02:45 PM	11	3	1	15	2	68	11	81	5	5	7	17	7	68	9	84	197
Total	26	11	12	49	17	227	34	278	50	31	55	136	44	328	34	406	869
03:00 PM	5	2	5	12	4	61	6	71	20	21	22	63	12	107	6	125	271
03:15 PM	6	2	3	11	2	53	5	60	22	23	14	59	15	79	5	99	229
03:30 PM	6	0	5	11	2	57	9	68	16	20	25	61	17	112	6	135	275
03:45 PM	8	0	4	12	1	59	6	66	9	26	10	45	9	77	4	90	213
Total	25	4	17	46	9	230	26	265	67	90	71	228	53	375	21	449	988
04:00 PM	4	0	6	10	0	53	5	58	12	8	8	28	9	67	5	81	177
04:15 PM	2	1	7	10	0	66	2	68	11	13	8	32	1	49	1	51	161
04:30 PM	1	1	2	4	0	60	4	64	8	4	4	16	4	60	1	65	149
04:45 PM	7	0	3	10	1	55	6	62	4	9	3	16	5	67	0	72	160
Total	14	2	18	34	1	234	17	252	35	34	23	92	19	243	7	269	647
05:00 PM	4	1	3	8	1	67	3	71	9	2	1	12	3	51	0	54	145
05:15 PM	4	0	3	7	0	61	1	62	1	3	2	6	8	80	2	90	165
05:30 PM	6	0	1	7	0	47	2	49	1	1	3	5	6	69	0	75	136
05:45 PM	5	0	6	11	0	47	2	49	0	0	0	0	3	59	0	62	122
Total	19	1	13	33	1	222	8	231	11	6	6	23	20	259	2	281	568
Grand Total	84	18	60	162	28	913	85	1026	163	161	155	479	136	1205	64	1405	3072
Apprch %	51.9	11.1	37		2.7	89	8.3		34	33.6	32.4		9.7	85.8	4.6		
Total %	2.7	0.6	2	5.3	0.9	29.7	2.8	33.4	5.3	5.2	5	15.6	4.4	39.2	2.1	45.7	

	MADISON STREET Southbound				AVENUE 52 Westbound				MADISON STREET Northbound				AVENUE 52 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 03:00 PM																	
03:00 PM	5	**2**	**5**	**12**	**4**	**61**	6	**71**	20	21	22	**63**	12	107	**6**	125	271
03:15 PM	6	2	3	11	2	53	5	60	**22**	23	14	59	15	79	5	99	229
03:30 PM	6	0	5	11	2	57	**9**	68	16	20	**25**	61	**17**	**112**	6	**135**	**275**
03:45 PM	**8**	0	4	12	1	59	6	66	9	**26**	10	45	9	77	4	90	213
Total Volume	25	4	17	46	9	230	26	265	67	90	71	228	53	375	21	449	988
% App. Total	54.3	8.7	37		3.4	86.8	9.8		29.4	39.5	31.1		11.8	83.5	4.7		
PHF	.781	.500	.850	.958	.563	.943	.722	.933	.761	.865	.710	.905	.779	.837	.875	.831	.898

COUNTS UNLIMITED INC.
25424 JACLYN AVENUE
MORENO VALLEY CA. 92557
951-247-6716

CITY OF LA QUINTA
N/S: MADISON STREET
E/W: AVENUE 52
WEATHER: SUNNY

File Name : LQMA52PM
Site Code : 0092047
Start Date : 3/16/2006
Page No : 2



Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	02:00 PM				02:45 PM				03:00 PM				03:00 PM			
+0 mins.	8	**6**	**7**	**21**	2	**68**	**11**	**81**	20	21	22	**63**	12	107	**6**	125
+15 mins.	4	0	2	6	**4**	61	6	71	**22**	23	14	59	15	79	5	99
+30 mins.	3	2	2	7	2	53	5	60	16	20	**25**	61	**17**	**112**	6	**135**
+45 mins.	**11**	3	1	15	2	57	9	68	9	**26**	10	45	9	77	4	90
Total Volume	26	11	12	49	10	239	31	280	67	90	71	228	53	375	21	449
% App. Total	53.1	22.4	24.5		3.6	85.4	11.1		29.4	39.5	31.1		11.8	83.5	4.7	
PHF	.591	.458	.429	.583	.625	.879	.705	.864	.761	.865	.710	.905	.779	.837	.875	.831

COUNTS UNLIMITED INC.
25424 JACLYN AVENUE
MORENO VALLEY CA. 92557
951-247-6716

CITY OF LA QUINTA
N/S: JEFFERSON STREET
E/W: AVENUE 54
WEATHER: SUNNY

File Name : LQJE54AM
Site Code : 0092051
Start Date : 3/16/2006
Page No : 1

Groups Printed- TOTAL VOLUME

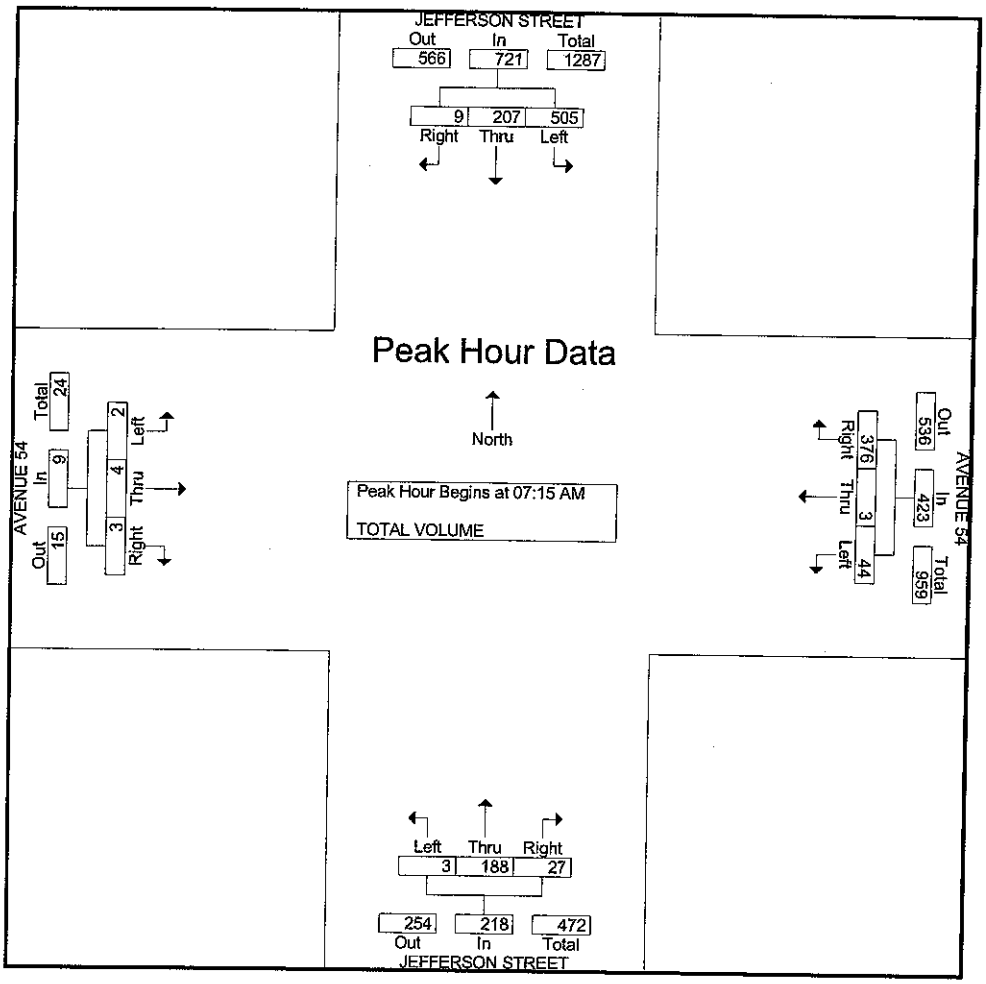
	JEFFERSON STREET Southbound				AVENUE 54 Westbound				JEFFERSON STREET Northbound				AVENUE 54 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	96	37	3	136	7	1	76	84	0	26	3	29	1	1	0	2	251
07:15 AM	140	39	3	182	10	0	96	106	1	52	5	58	0	2	0	2	348
07:30 AM	106	33	3	142	9	1	97	107	1	52	5	58	0	1	2	3	310
07:45 AM	157	68	2	227	14	1	89	104	0	40	8	48	0	1	0	1	380
Total	499	177	11	687	40	3	358	401	2	170	21	193	1	5	2	8	1289
08:00 AM	102	67	1	170	11	1	94	106	1	44	9	54	2	0	1	3	333
08:15 AM	90	54	5	149	7	3	82	92	1	60	4	65	5	2	1	8	314
08:30 AM	67	58	2	127	16	1	118	135	1	65	2	68	1	1	0	2	332
08:45 AM	70	53	2	125	10	3	91	104	1	71	6	78	1	5	0	6	313
Total	329	232	10	571	44	8	385	437	4	240	21	265	9	8	2	19	1292
Grand Total	828	409	21	1258	84	11	743	838	6	410	42	458	10	13	4	27	2581
Apprch %	65.8	32.5	1.7		10	1.3	88.7		1.3	89.5	9.2		37	48.1	14.8		
Total %	32.1	15.8	0.8	48.7	3.3	0.4	28.8	32.5	0.2	15.9	1.6	17.7	0.4	0.5	0.2	1	

	JEFFERSON STREET Southbound				AVENUE 54 Westbound				JEFFERSON STREET Northbound				AVENUE 54 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	140	39	**3**	182	10	0	96	106	**1**	**52**	5	**58**	0	**2**	0	2	348
07:30 AM	106	33	3	142	9	**1**	**97**	**107**	1	52	5	58	0	1	**2**	**3**	310
07:45 AM	**157**	**68**	2	**227**	**14**	1	89	104	0	40	8	48	0	1	0	1	**380**
08:00 AM	102	67	1	170	11	1	94	106	1	44	**9**	54	**2**	0	1	3	333
Total Volume	505	207	9	721	44	3	376	423	3	188	27	218	2	4	3	9	1371
% App. Total	70	28.7	1.2		10.4	0.7	88.9		1.4	86.2	12.4		22.2	44.4	33.3		
PHF	.804	.761	.750	.794	.786	.750	.969	.988	.750	.904	.750	.940	.250	.500	.375	.750	.902

COUNTS UNLIMITED INC.
25424 JACLYN AVENUE
MORENO VALLEY CA. 92557
951-247-6716

CITY OF LA QUINTA
N/S: JEFFERSON STREET
E/W: AVENUE 54
WEATHER: SUNNY

File Name : LQJE54AM
Site Code : 0092051
Start Date : 3/16/2006
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM				07:45 AM				08:00 AM				08:00 AM			
+0 mins.	140	39	**3**	182	14	1	89	104	**1**	44	**9**	54	2	0	**1**	3
+15 mins.	106	33	3	142	11	1	94	106	1	60	4	65	**5**	2	1	**8**
+30 mins.	**157**	**68**	2	**227**	7	**3**	82	92	1	65	2	68	1	1	0	2
+45 mins.	102	67	1	170	**16**	1	**118**	**135**	1	**71**	6	**78**	1	**5**	0	6
Total Volume	505	207	9	721	48	6	383	437	4	240	21	265	9	8	2	19
% App. Total	70	28.7	1.2		11	1.4	87.6		1.5	90.6	7.9		47.4	42.1	10.5	
PHF	.804	.761	.750	.794	.750	.500	.811	.809	1.000	.845	.583	.849	.450	.400	.500	.594

COUNTS UNLIMITED INC.
25424 JACLYN AVENUE
MORENO VALLEY CA. 92557
951-247-6716

CITY OF LA QUINTA
N/S: JEFFERSON STREET
E/W: AVENUE 54
WEATHER: SUNNY

File Name : LQJE54PM
Site Code : 0092050
Start Date : 3/15/2006
Page No : 1

Groups Printed- TOTAL VOLUME

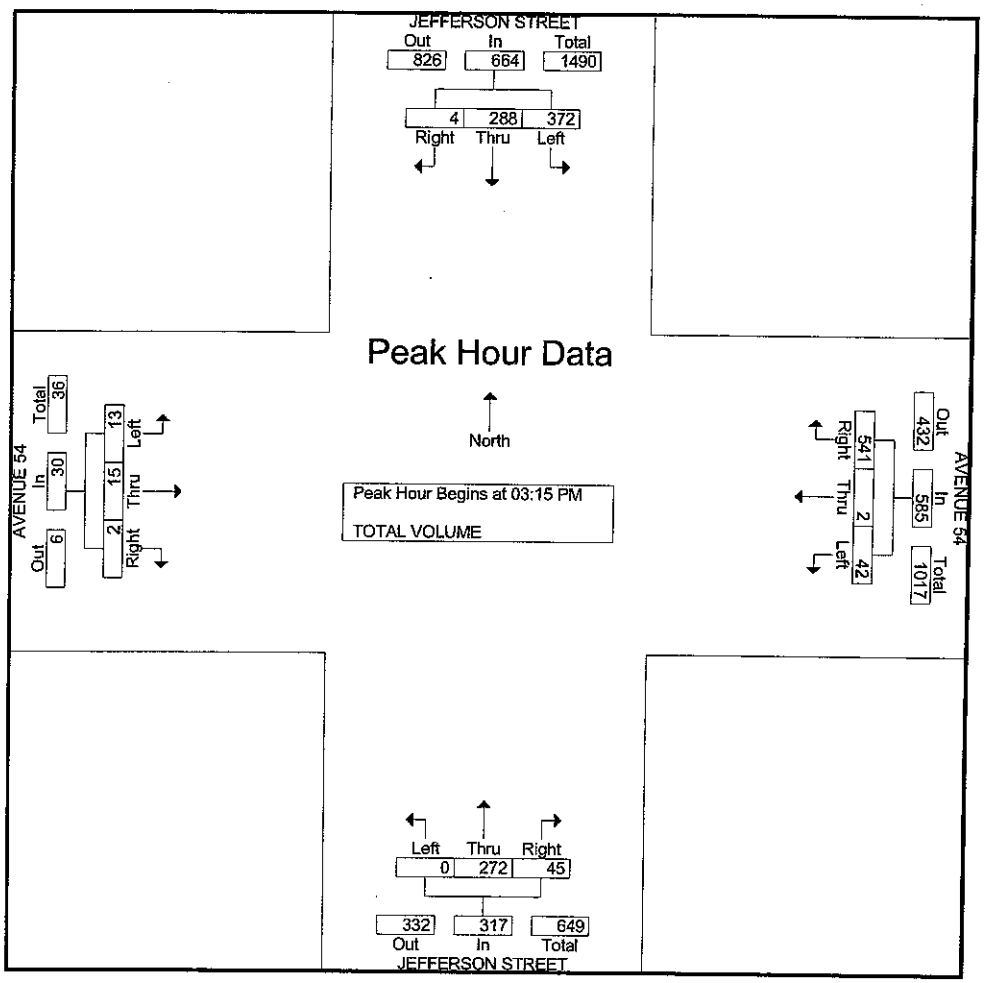
	JEFFERSON STREET Southbound				AVENUE 54 Westbound				JEFFERSON STREET Northbound				AVENUE 54 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
02:00 PM	88	64	2	154	8	4	111	123	1	80	3	84	9	3	2	14	375
02:15 PM	101	54	1	156	10	1	95	106	1	63	3	67	2	2	1	5	334
02:30 PM	85	54	0	139	4	1	102	107	0	62	10	72	3	3	0	6	324
02:45 PM	99	79	0	178	10	0	108	118	0	51	6	57	1	1	1	3	356
Total	373	251	3	627	32	6	416	454	2	256	22	280	15	9	4	28	1389
03:00 PM	97	61	4	162	9	0	123	132	0	55	7	62	1	2	1	4	360
03:15 PM	84	64	1	149	5	0	144	149	0	70	12	82	2	4	0	6	386
03:30 PM	107	61	1	169	13	2	148	163	0	85	11	96	8	9	1	18	446
03:45 PM	98	77	1	176	10	0	130	140	0	59	6	65	2	0	1	3	384
Total	386	263	7	656	37	2	545	584	0	269	36	305	13	15	3	31	1576
04:00 PM	83	86	1	170	14	0	119	133	0	58	16	74	1	2	0	3	380
04:15 PM	102	67	0	169	4	1	101	106	0	89	4	93	0	1	0	1	369
04:30 PM	75	79	0	154	6	1	109	116	1	64	4	69	0	0	0	0	339
04:45 PM	83	66	2	151	7	0	106	113	1	51	9	61	2	0	2	4	329
Total	343	298	3	644	31	2	435	468	2	262	33	297	3	3	2	8	1417
05:00 PM	78	82	3	163	6	1	107	114	0	60	8	68	0	1	1	2	347
05:15 PM	86	57	1	144	7	0	109	116	0	67	5	72	0	0	1	1	333
05:30 PM	82	76	0	158	4	0	94	98	0	76	4	80	1	0	0	1	337
05:45 PM	79	59	1	139	9	0	79	88	0	62	4	66	0	0	0	0	293
Total	325	274	5	604	26	1	389	416	0	265	21	286	1	1	2	4	1310
Grand Total	1427	1086	18	2531	126	11	1785	1922	4	1052	112	1168	32	28	11	71	5692
Apprch %	56.4	42.9	0.7		6.6	0.6	92.9		0.3	90.1	9.6		45.1	39.4	15.5		
Total %	25.1	19.1	0.3	44.5	2.2	0.2	31.4	33.8	0.1	18.5	2	20.5	0.6	0.5	0.2	1.2	

	JEFFERSON STREET Southbound				AVENUE 54 Westbound				JEFFERSON STREET Northbound				AVENUE 54 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 03:15 PM																	
03:15 PM	84	64	1	149	5	0	144	149	0	70	12	82	2	4	0	6	386
03:30 PM	**107**	61	1	169	13	**2**	**148**	**163**	0	**85**	11	**96**	**8**	**9**	**1**	**18**	**446**
03:45 PM	98	77	1	**176**	10	0	130	140	0	59	6	65	2	0	1	3	384
04:00 PM	83	**86**	1	170	**14**	0	119	133	0	58	**16**	74	1	2	0	3	380
Total Volume	372	288	4	664	42	2	541	585	0	272	45	317	13	15	2	30	1596
% App. Total	56	43.4	0.6		7.2	0.3	92.5		0	85.8	14.2		43.3	50	6.7		
PHF	.869	.837	1.000	.943	.750	.250	.914	.897	.000	.800	.703	.826	.406	.417	.500	.417	.895

COUNTS UNLIMITED INC.
25424 JACLYN AVENUE
MORENO VALLEY CA. 92557
951-247-6716

CITY OF LA QUINTA
N/S: JEFFERSON STREET
E/W: AVENUE 54
WEATHER: SUNNY

File Name : LQJE54PM
Site Code : 0092050
Start Date : 3/15/2006
Page No : 2



Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	03:30 PM				03:15 PM				03:30 PM				02:45 PM			
+0 mins.	**107**	61	**1**	169	5	0	144	149	0	85	11	**96**	1	1	**1**	3
+15 mins.	98	77	1	**176**	13	**2**	**148**	**163**	0	59	6	65	1	2	1	4
+30 mins.	83	**86**	1	170	10	0	130	140	0	58	**16**	74	2	4	0	6
+45 mins.	102	67	0	169	**14**	0	119	133	0	**89**	4	93	**8**	**9**	1	**18**
Total Volume	390	291	3	684	42	2	541	585	0	291	37	328	12	16	3	31
% App. Total	57	42.5	0.4		7.2	0.3	92.5		0	88.7	11.3		38.7	51.6	9.7	
PHF	.911	.846	.750	.972	.750	.250	.914	.897	.000	.817	.578	.854	.375	.444	.750	.431

COUNTS UNLIMITED INC.
25424 JACLYN AVENUE
MORENO VALLEY CA. 92557
951-247-6716

CITY OF LA QUINTA
N/S: MADISON STREET
E/W: AVENUE 54
WEATHER: SUNNY

File Name : LQMA54AM
Site Code : 0092047
Start Date : 3/15/2006
Page No : 1

Groups Printed- TOTAL VOLUME

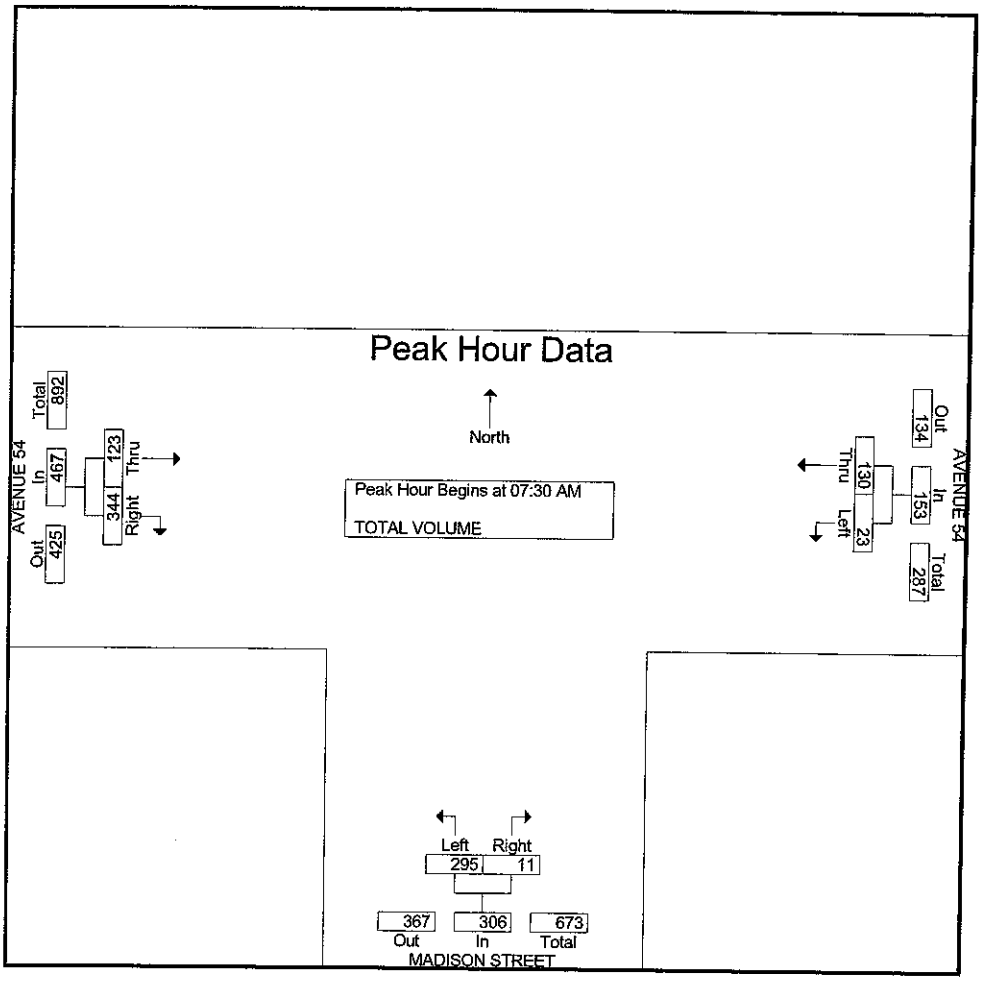
	AVENUE 54 Westbound			MADISON STREET Northbound			AVENUE 54 Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
07:00 AM	2	36	38	41	2	43	26	78	104	185
07:15 AM	3	44	47	45	2	47	29	81	110	204
07:30 AM	4	35	39	86	2	88	25	83	108	235
07:45 AM	4	33	37	79	1	80	44	88	132	249
Total	13	148	161	251	7	258	124	330	454	873
08:00 AM	7	27	34	63	3	66	32	88	120	220
08:15 AM	8	35	43	67	5	72	22	85	107	222
08:30 AM	4	28	32	69	2	71	15	64	79	182
08:45 AM	4	23	27	91	4	95	16	79	95	217
Total	23	113	136	290	14	304	85	316	401	841
Grand Total	36	261	297	541	21	562	209	646	855	1714
Apprch %	12.1	87.9		96.3	3.7		24.4	75.6		
Total %	2.1	15.2	17.3	31.6	1.2	32.8	12.2	37.7	49.9	

	AVENUE 54 Westbound			MADISON STREET Northbound			AVENUE 54 Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:30 AM										
07:30 AM	4	**35**	39	**86**	2	**88**	25	83	108	235
07:45 AM	4	33	37	79	1	80	**44**	**88**	**132**	**249**
08:00 AM	7	27	34	63	3	66	32	88	120	220
08:15 AM	**8**	35	**43**	67	**5**	72	22	85	107	222
Total Volume	23	130	153	295	11	306	123	344	467	926
% App. Total	15	85		96.4	3.6		26.3	73.7		
PHF	.719	.929	.890	.858	.550	.869	.699	.977	.884	.930

COUNTS UNLIMITED INC.
25424 JACLYN AVENUE
MORENO VALLEY CA. 92557
951-247-6716

CITY OF LA QUINTA
N/S: MADISON STREET
E/W: AVENUE 54
WEATHER: SUNNY

File Name : LQMA54AM
Site Code : 0092047
Start Date : 3/15/2006
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM			07:30 AM			07:15 AM		
+0 mins.	2	36	38	**86**	2	**88**	29	81	110
+15 mins.	3	**44**	**47**	79	1	80	25	83	108
+30 mins.	**4**	35	39	63	3	66	**44**	**88**	**132**
+45 mins.	4	33	37	67	**5**	72	32	88	120
Total Volume	13	148	161	295	11	306	130	340	470
% App. Total	8.1	91.9		96.4	3.6		27.7	72.3	
PHF	.813	.841	.856	.858	.550	.869	.739	.966	.890

COUNTS UNLIMITED INC.
25424 JACLYN AVENUE
MORENO VALLEY CA. 92557
951-247-6716

CITY OF LA QUINTA
N/S: MADISON STREET
E/W: AVENUE 54
WEATHER: SUNNY

File Name : LQMA54PM
Site Code : 0092047
Start Date : 3/15/2006
Page No : 1

Groups Printed- TOTAL VOLUME

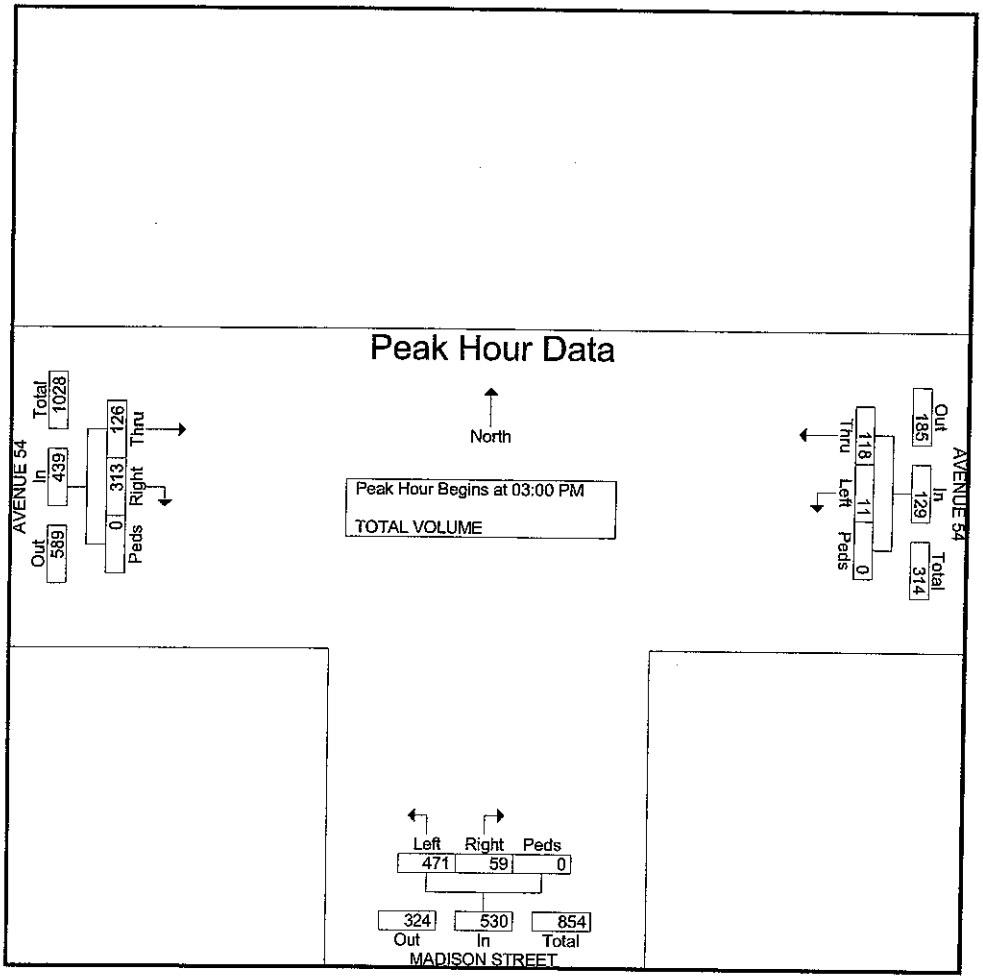
	AVENUE 54 Westbound				MADISON STREET Northbound				AVENUE 54 Eastbound				
Start Time	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Int. Total
02:00 PM	2	25	0	27	89	7	0	96	37	79	0	116	239
02:15 PM	2	27	0	29	87	9	0	96	34	72	0	106	231
02:30 PM	2	20	0	22	90	11	0	101	26	77	0	103	226
02:45 PM	4	13	0	17	100	8	0	108	32	71	0	103	228
Total	10	85	0	95	366	35	0	401	129	299	0	428	924
03:00 PM	3	25	0	28	110	8	0	118	27	87	0	114	260
03:15 PM	3	28	0	31	118	13	0	131	34	60	0	94	256
03:30 PM	0	39	0	39	132	26	0	158	39	87	0	126	323
03:45 PM	5	26	0	31	111	12	0	123	26	79	0	105	259
Total	11	118	0	129	471	59	0	530	126	313	0	439	1098
04:00 PM	1	22	0	23	114	6	0	120	33	70	0	103	246
04:15 PM	3	18	0	21	87	3	0	90	19	83	0	102	213
04:30 PM	1	23	0	24	90	3	0	93	17	66	0	83	200
04:45 PM	3	15	0	18	97	6	0	103	19	73	0	92	213
Total	8	78	0	86	388	18	0	406	88	292	0	380	872
05:00 PM	3	27	0	30	93	9	0	102	18	62	0	80	212
05:15 PM	0	27	0	27	79	4	0	83	24	71	0	95	205
05:30 PM	4	28	0	32	69	3	0	72	21	69	0	90	194
05:45 PM	1	20	0	21	68	2	0	70	21	63	0	84	175
Total	8	102	0	110	309	18	0	327	84	265	0	349	786
Grand Total	37	383	0	420	1534	130	0	1664	427	1169	0	1596	3680
Apprch %	8.8	91.2	0		92.2	7.8	0		26.8	73.2	0		
Total %	1	10.4	0	11.4	41.7	3.5	0	45.2	11.6	31.8	0	43.4	

	AVENUE 54 Westbound				MADISON STREET Northbound				AVENUE 54 Eastbound				
Start Time	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 03:00 PM													
03:00 PM	3	25	0	28	110	8	0	118	27	**87**	0	114	260
03:15 PM	3	28	0	31	118	13	0	131	34	60	0	94	256
03:30 PM	0	**39**	0	**39**	**132**	**26**	0	**158**	**39**	87	0	**126**	**323**
03:45 PM	**5**	26	0	31	111	12	0	123	26	79	0	105	259
Total Volume	11	118	0	129	471	59	0	530	126	313	0	439	1098
% App. Total	8.5	91.5	0		88.9	11.1	0		28.7	71.3	0		
PHF	.550	.756	.000	.827	.892	.567	.000	.839	.808	.899	.000	.871	.850

COUNTS UNLIMITED INC.
25424 JACLYN AVENUE
MORENO VALLEY CA. 92557
951-247-6716

CITY OF LA QUINTA
N/S: MADISON STREET
E/W: AVENUE 54
WEATHER: SUNNY

File Name : LQMA54PM
Site Code : 0092047
Start Date : 3/15/2006
Page No : 2



Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	03:00 PM				03:15 PM				03:00 PM			
+0 mins.	3	25	0	28	118	13	0	131	27	**87**	0	114
+15 mins.	3	28	0	31	**132**	**26**	0	**158**	34	60	0	94
+30 mins.	0	**39**	0	**39**	111	12	0	123	**39**	87	0	**126**
+45 mins.	**5**	26	0	31	114	6	0	120	26	79	0	105
Total Volume	11	118	0	129	475	57	0	532	126	313	0	439
% App. Total	8.5	91.5	0		89.3	10.7	0		28.7	71.3	0	
PHF	.550	.756	.000	.827	.900	.548	.000	.842	.808	.899	.000	.871

COUNTS UNLIMITED INC.
25424 JACLYN AVENUE
MORENO VALLEY CA. 92557
951-247-6716

CITY OF LA QUINTA
N/S: MONROE STREET
E/W: AVENUE 54
WEATHER: SUNNY

File Name : LQMO54AM
Site Code : 0092050
Start Date : 3/16/2006
Page No : 1

Groups Printed- TOTAL VOLUME

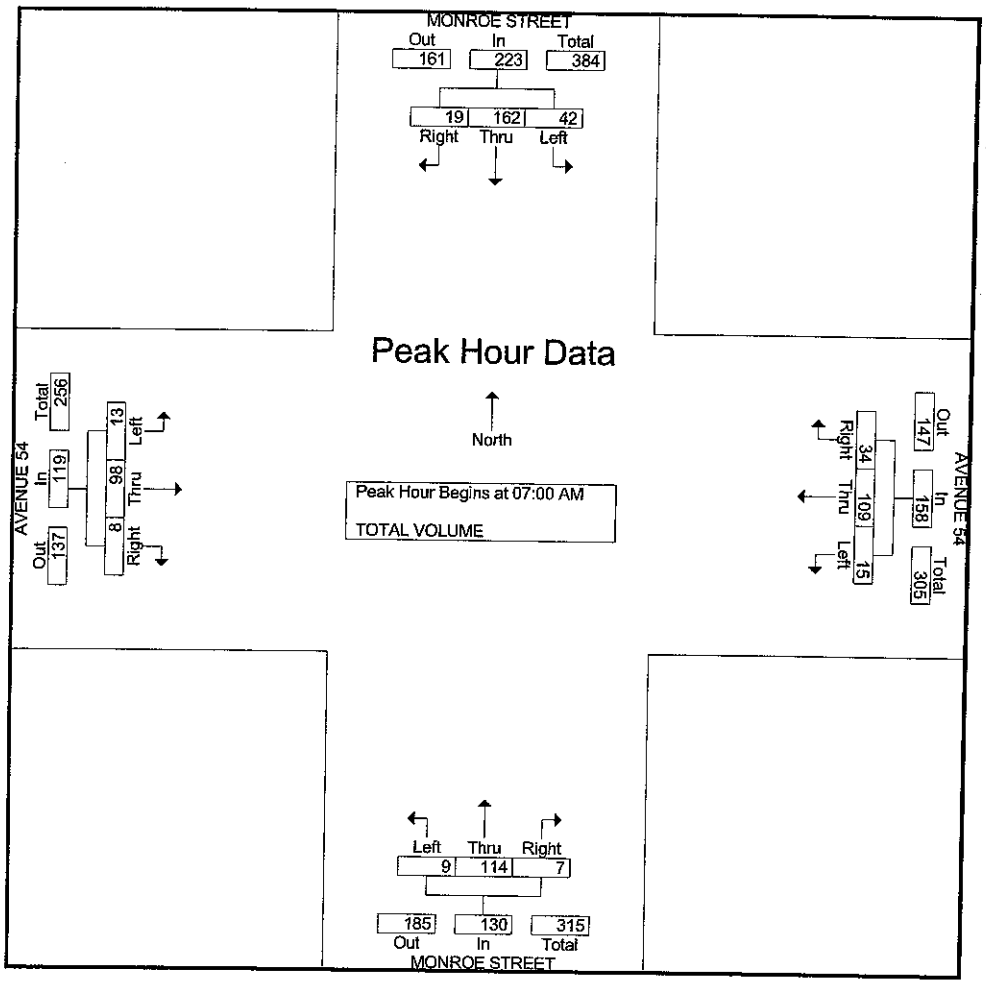
	MONROE STREET Southbound				AVENUE 54 Westbound				MONROE STREET Northbound				AVENUE 54 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	8	49	7	64	6	27	8	41	3	26	0	29	3	31	1	35	169
07:15 AM	7	40	2	49	3	33	12	48	2	23	2	27	4	27	2	33	157
07:30 AM	8	41	5	54	4	24	7	35	1	38	3	42	3	20	2	25	156
07:45 AM	19	32	5	56	2	25	7	34	3	27	2	32	3	20	3	26	148
Total	42	162	19	223	15	109	34	158	9	114	7	130	13	98	8	119	630
08:00 AM	10	23	5	38	5	26	7	38	4	27	0	31	2	24	2	28	135
08:15 AM	12	24	7	43	1	23	8	32	1	26	2	29	5	14	0	19	123
08:30 AM	6	37	4	47	1	15	7	23	1	26	3	30	3	12	2	17	117
08:45 AM	6	22	1	29	2	20	9	31	1	24	1	26	1	11	3	15	101
Total	34	106	17	157	9	84	31	124	7	103	6	116	11	61	7	79	476
Grand Total	76	268	36	380	24	193	65	282	16	217	13	246	24	159	15	198	1106
Apprch %	20	70.5	9.5		8.5	68.4	23		6.5	88.2	5.3		12.1	80.3	7.6		
Total %	6.9	24.2	3.3	34.4	2.2	17.5	5.9	25.5	1.4	19.6	1.2	22.2	2.2	14.4	1.4	17.9	

	MONROE STREET Southbound				AVENUE 54 Westbound				MONROE STREET Northbound				AVENUE 54 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	8	**49**	**7**	**64**	**6**	27	8	41	**3**	26	0	29	3	**31**	1	**35**	**169**
07:15 AM	7	40	2	49	3	**33**	**12**	**48**	2	23	2	27	**4**	27	2	33	157
07:30 AM	8	41	5	54	4	24	7	35	1	**38**	**3**	**42**	3	20	2	25	156
07:45 AM	**19**	32	5	56	2	25	7	34	3	27	2	32	3	20	**3**	26	148
Total Volume	42	162	19	223	15	109	34	158	9	114	7	130	13	98	8	119	630
% App. Total	18.8	72.6	8.5		9.5	69	21.5		6.9	87.7	5.4		10.9	82.4	6.7		
PHF	.553	.827	.679	.871	.625	.826	.708	.823	.750	.750	.583	.774	.813	.790	.667	.850	.932

COUNTS UNLIMITED INC.
25424 JACLYN AVENUE
MORENO VALLEY CA. 92557
951-247-6716

CITY OF LA QUINTA
N/S: MONROE STREET
E/W: AVENUE 54
WEATHER: SUNNY

File Name : LQMO54AM
Site Code : 0092050
Start Date : 3/16/2006
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:30 AM				07:00 AM			
+0 mins.	8	**49**	**7**	**64**	**6**	27	8	41	1	**38**	**3**	**42**	3	**31**	1	**35**
+15 mins.	7	40	2	49	3	**33**	**12**	**48**	3	27	2	32	**4**	27	2	33
+30 mins.	8	41	5	54	4	24	7	35	**4**	27	0	31	3	20	2	25
+45 mins.	**19**	32	5	56	2	25	7	34	1	26	2	29	3	20	**3**	26
Total Volume	42	162	19	223	15	109	34	158	9	118	7	134	13	98	8	119
% App. Total	18.8	72.6	8.5		9.5	69	21.5		6.7	88.1	5.2		10.9	82.4	6.7	
PHF	.553	.827	.679	.871	.625	.826	.708	.823	.563	.776	.583	.798	.813	.790	.667	.850

COUNTS UNLIMITED INC.
25424 JACLYN AVENUE
MORENO VALLEY CA. 92557
951-247-6716

CITY OF LA QUINTA
N/S: MONROE STREET
E/W: AVENUE 54
WEATHER: SUNNY

File Name : LQMO54PM
Site Code : 0092051
Start Date : 3/16/2006
Page No : 1

Groups Printed- TOTAL VOLUME

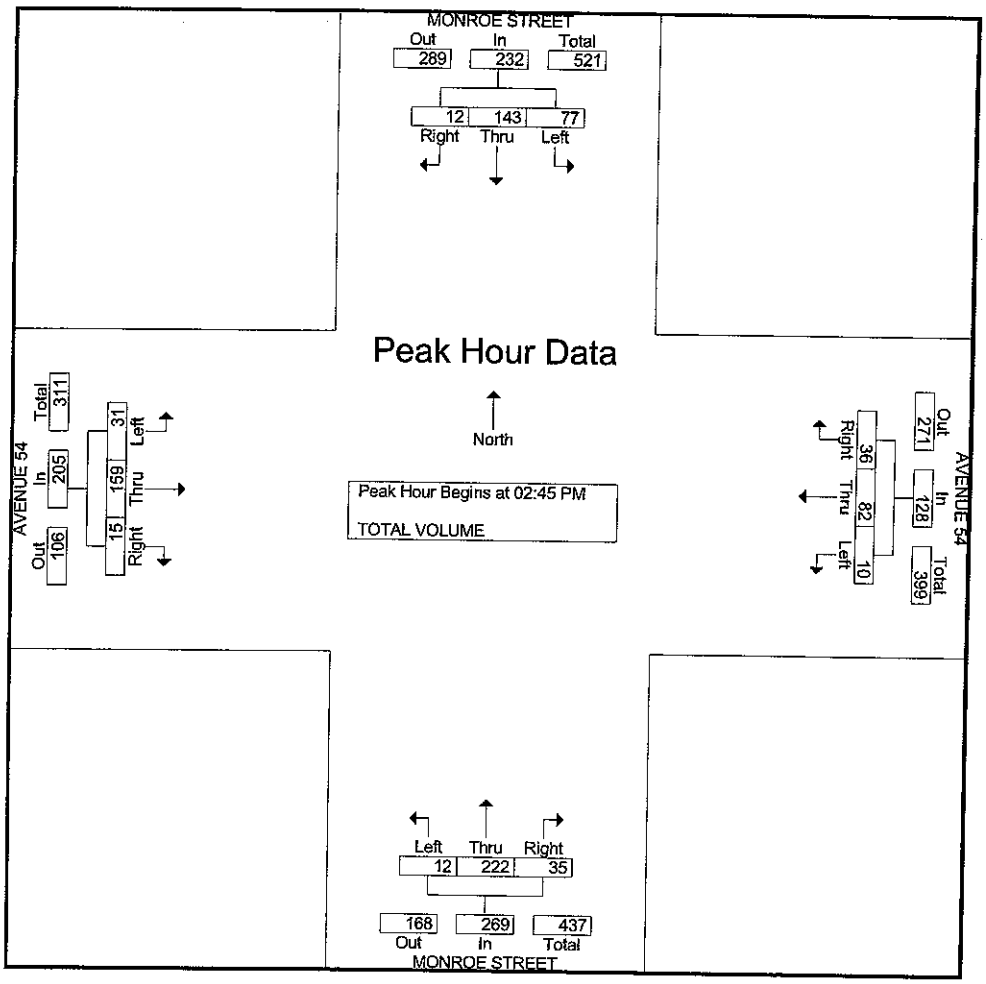
	MONROE STREET Southbound				AVENUE 54 Westbound				MONROE STREET Northbound				AVENUE 54 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
02:00 PM	1	33	1	35	5	11	0	16	2	47	2	51	4	11	5	20	122
02:15 PM	15	31	6	52	1	21	8	30	0	48	3	51	5	15	1	21	154
02:30 PM	23	40	3	66	1	16	6	23	5	34	6	45	6	20	3	29	163
02:45 PM	18	30	2	50	2	13	11	26	0	60	11	71	5	31	3	39	186
Total	57	134	12	203	9	61	25	95	7	189	22	218	20	77	12	109	625
03:00 PM	23	38	5	66	7	26	9	42	4	50	12	66	10	25	4	39	213
03:15 PM	16	34	4	54	1	29	4	34	7	42	5	54	7	33	2	42	184
03:30 PM	20	41	1	62	0	14	12	26	1	70	7	78	9	70	6	85	251
03:45 PM	24	38	1	63	1	19	3	23	1	36	3	40	4	33	2	39	165
Total	83	151	11	245	9	88	28	125	13	198	27	238	30	161	14	205	813
04:00 PM	22	33	5	60	1	26	8	35	1	41	1	43	2	27	3	32	170
04:15 PM	16	23	1	40	5	23	11	39	3	43	2	48	4	30	1	35	162
04:30 PM	12	34	1	47	1	23	11	35	1	29	0	30	2	16	2	20	132
04:45 PM	8	24	2	34	0	20	9	29	1	22	1	24	4	17	3	24	111
Total	58	114	9	181	7	92	39	138	6	135	4	145	12	90	9	111	575
05:00 PM	21	25	1	47	1	28	4	33	1	34	1	36	1	21	1	23	139
05:15 PM	12	26	10	48	3	24	8	35	3	17	1	21	7	18	1	26	130
05:30 PM	18	19	3	40	1	12	6	19	1	28	1	30	3	29	0	32	121
05:45 PM	9	24	2	35	1	17	3	21	0	15	3	18	0	14	1	15	89
Total	60	94	16	170	6	81	21	108	5	94	6	105	11	82	3	96	479
Grand Total	258	493	48	799	31	322	113	466	31	616	59	706	73	410	38	521	2492
Apprch %	32.3	61.7	6		6.7	69.1	24.2		4.4	87.3	8.4		14	78.7	7.3		
Total %	10.4	19.8	1.9	32.1	1.2	12.9	4.5	18.7	1.2	24.7	2.4	28.3	2.9	16.5	1.5	20.9	

	MONROE STREET Southbound				AVENUE 54 Westbound				MONROE STREET Northbound				AVENUE 54 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 02:45 PM																	
02:45 PM	18	30	2	50	2	13	11	26	0	60	11	71	5	31	3	39	186
03:00 PM	**23**	38	**5**	**66**	**7**	26	9	**42**	4	50	**12**	66	**10**	25	4	39	213
03:15 PM	16	34	4	54	1	**29**	4	34	**7**	42	5	54	7	33	2	42	184
03:30 PM	20	**41**	1	62	0	14	**12**	26	**1**	**70**	**7**	**78**	9	**70**	**6**	**85**	**251**
Total Volume	77	143	12	232	10	82	36	128	12	222	35	269	31	159	15	205	834
% App. Total	33.2	61.6	5.2		7.8	64.1	28.1		4.5	82.5	13		15.1	77.6	7.3		
PHF	.837	.872	.600	.879	.357	.707	.750	.762	.429	.793	.729	.862	.775	.568	.625	.603	.831

COUNTS UNLIMITED INC.
25424 JACLYN AVENUE
MORENO VALLEY CA. 92557
951-247-6716

CITY OF LA QUINTA
N/S: MONROE STREET
E/W: AVENUE 54
WEATHER: SUNNY

File Name : LQMO54PM
Site Code : 0092051
Start Date : 3/16/2006
Page No : 2



Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	03:00 PM				04:00 PM				02:45 PM				02:45 PM			
+0 mins.	23	38	**5**	**66**	1	**26**	8	35	0	60	11	71	5	31	3	39
+15 mins.	16	34	4	54	**5**	23	**11**	**39**	4	50	**12**	66	**10**	25	4	39
+30 mins.	20	**41**	1	62	1	23	11	35	**7**	42	5	54	7	33	2	42
+45 mins.	**24**	38	1	63	0	20	9	29	1	**70**	7	**78**	9	**70**	**6**	**85**
Total Volume	83	151	11	245	7	92	39	138	12	222	35	269	31	159	15	205
% App. Total	33.9	61.6	4.5		5.1	66.7	28.3		4.5	82.5	13		15.1	77.6	7.3	
PHF	.865	.921	.550	.928	.350	.885	.886	.885	.429	.793	.729	.862	.775	.568	.625	.603

COUNTS UNLIMITED INC.
25424 JACLYN AVENUE
MORENO VALLEY CA. 92557
951-247-6716

CITY OF OF LA QUINTA
N/S: MADISON STREET
E/W: AVENUE 58
WEATHER: SUNNY

File Name : LQMA58AM
Site Code : 0092051
Start Date : 3/15/2006
Page No : 1

Groups Printed- TOTAL VOLUME

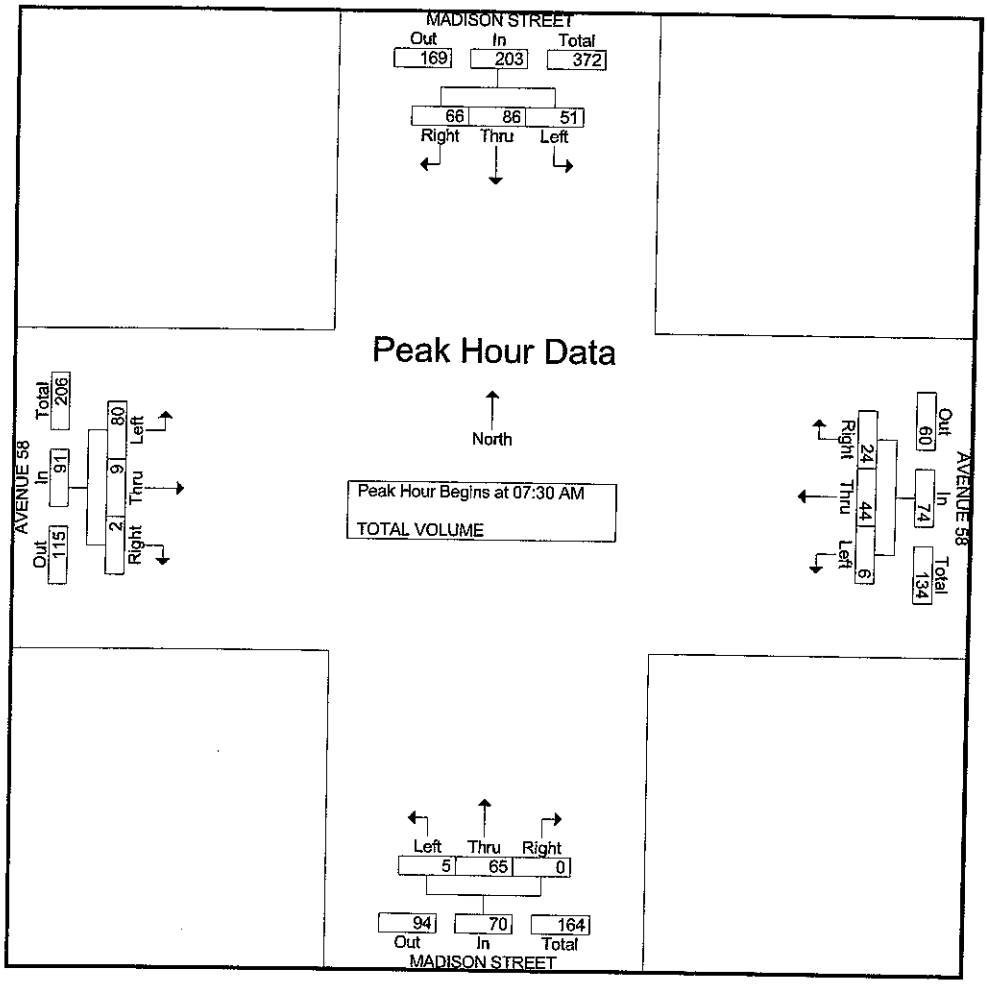
	MADISON STREET Southbound				AVENUE 58 Westbound				MADISON STREET Northbound				AVENUE 58 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	3	12	8	23	1	8	4	13	2	16	0	18	11	4	2	17	71
07:15 AM	3	16	10	29	0	14	2	16	1	29	2	32	13	7	1	21	98
07:30 AM	12	19	17	48	1	11	10	22	1	14	0	15	19	1	1	21	106
07:45 AM	13	24	23	60	0	9	3	12	1	15	0	16	17	3	0	20	108
Total	31	71	58	160	2	42	19	63	5	74	2	81	60	15	4	79	383
08:00 AM	12	22	14	48	1	13	4	18	2	21	0	23	23	4	0	27	116
08:15 AM	14	21	12	47	4	11	7	22	1	15	0	16	21	1	1	23	108
08:30 AM	12	12	15	39	0	10	11	21	1	24	1	26	15	3	0	18	104
08:45 AM	11	21	15	47	0	8	15	23	0	13	0	13	21	0	1	22	105
Total	49	76	56	181	5	42	37	84	4	73	1	78	80	8	2	90	433
Grand Total	80	147	114	341	7	84	56	147	9	147	3	159	140	23	6	169	816
Apprch %	23.5	43.1	33.4		4.8	57.1	38.1		5.7	92.5	1.9		82.8	13.6	3.6		
Total %	9.8	18	14	41.8	0.9	10.3	6.9	18	1.1	18	0.4	19.5	17.2	2.8	0.7	20.7	

	MADISON STREET Southbound				AVENUE 58 Westbound				MADISON STREET Northbound				AVENUE 58 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	12	19	17	48	1	11	**10**	**22**	1	14	0	15	19	1	**1**	21	106
07:45 AM	13	**24**	**23**	**60**	0	9	3	12	1	15	0	16	17	3	0	20	108
08:00 AM	12	22	14	48	1	**13**	4	18	**2**	**21**	0	**23**	**23**	**4**	0	**27**	**116**
08:15 AM	**14**	21	12	47	**4**	11	7	22	1	15	0	16	21	1	1	23	108
Total Volume	51	86	66	203	6	44	24	74	5	65	0	70	80	9	2	91	438
% App. Total	25.1	42.4	32.5		8.1	59.5	32.4		7.1	92.9	0		87.9	9.9	2.2		
PHF	.911	.896	.717	.846	.375	.846	.600	.841	.625	.774	.000	.761	.870	.563	.500	.843	.944

COUNTS UNLIMITED INC.
25424 JACLYN AVENUE
MORENO VALLEY CA. 92557
951-247-6716

CITY OF OF LA QUINTA
N/S: MADISON STREET
E/W: AVENUE 58
WEATHER: SUNNY

File Name : LQMA58AM
Site Code : 0092051
Start Date : 3/15/2006
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				08:00 AM				07:15 AM				07:30 AM			
+0 mins.	12	19	17	48	1	**13**	4	18	1	**29**	**2**	**32**	19	1	**1**	21
+15 mins.	13	**24**	**23**	**60**	**4**	11	7	22	1	14	0	15	17	3	0	20
+30 mins.	12	22	14	48	0	10	11	21	1	15	0	16	**23**	**4**	0	**27**
+45 mins.	**14**	21	12	47	0	8	**15**	**23**	**2**	21	0	23	21	1	1	23
Total Volume	51	86	66	203	5	42	37	84	5	79	2	86	80	9	2	91
% App. Total	25.1	42.4	32.5		6	50	44		5.8	91.9	2.3		87.9	9.9	2.2	
PHF	.911	.896	.717	.846	.313	.808	.617	.913	.625	.681	.250	.672	.870	.563	.500	.843

COUNTS UNLIMITED INC.
25424 JACLYN AVENUE
MORENO VALLEY CA. 92557
951-247-6716

CITY OF LA QUINTA
N/S: MADISON STREET
E/W: AVENUE 58
WEATHER: SUNNY

File Name : LQMA58PM
Site Code : 0032051
Start Date : 3/15/2006
Page No : 1

Groups Printed- TOTAL VOLUME

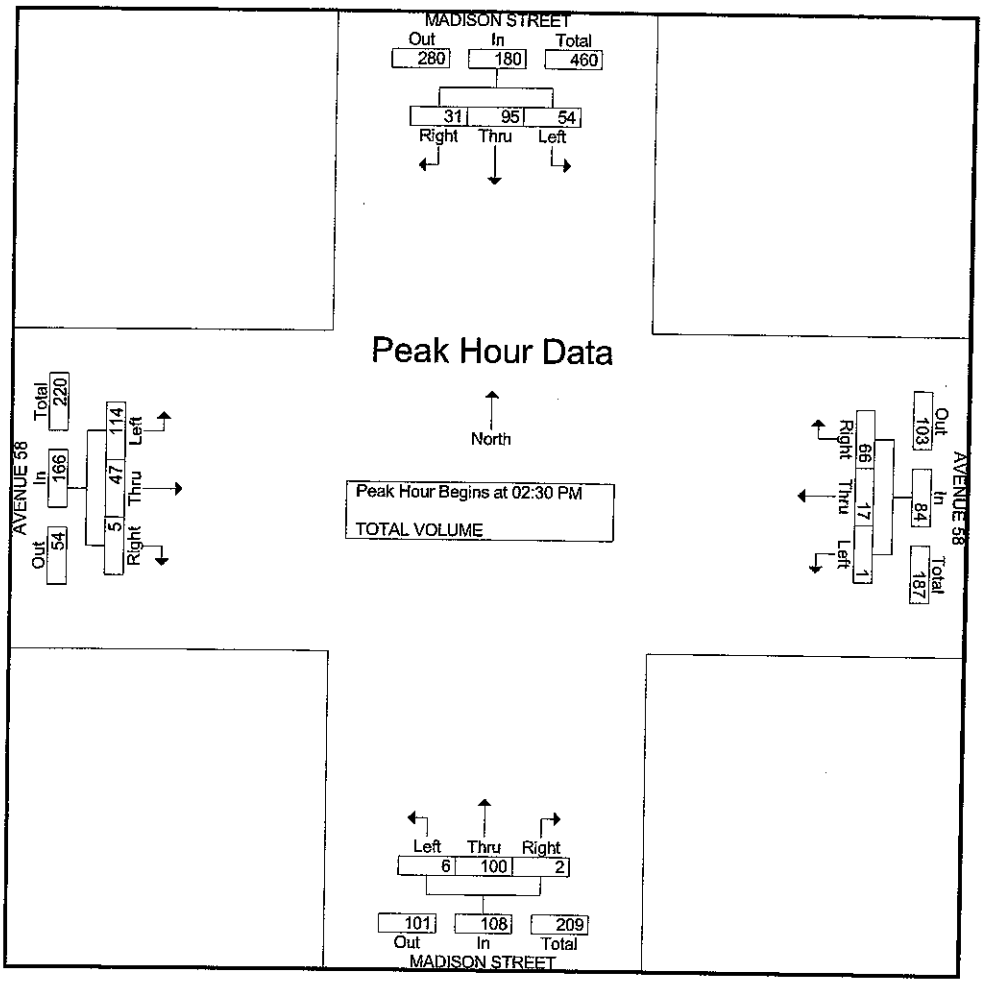
	MADISON STREET Southbound				AVENUE 58 Westbound				MADISON STREET Northbound				AVENUE 58 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
02:00 PM	10	26	9	45	3	5	12	20	0	22	0	22	23	5	1	29	116
02:15 PM	11	25	11	47	1	9	11	21	0	25	0	25	24	2	1	27	120
02:30 PM	12	24	10	46	0	7	16	23	1	27	0	28	42	16	1	59	156
02:45 PM	10	23	7	40	0	1	13	14	4	26	1	31	21	14	1	36	121
Total	43	98	37	178	4	22	52	78	5	100	1	106	110	37	4	151	513
03:00 PM	17	19	9	45	1	5	17	23	0	28	1	29	26	8	1	35	132
03:15 PM	15	29	5	49	0	4	20	24	1	19	0	20	25	9	2	36	129
03:30 PM	15	42	5	62	0	2	30	32	2	24	0	26	16	13	4	33	153
03:45 PM	4	28	7	39	0	4	15	19	0	26	0	26	16	3	0	19	103
Total	51	118	26	195	1	15	82	98	3	97	1	101	83	33	7	123	517
04:00 PM	8	17	11	36	0	3	19	22	0	30	1	31	23	3	0	26	115
04:15 PM	5	29	11	45	2	5	8	15	0	20	0	20	10	4	2	16	96
04:30 PM	7	20	7	34	0	3	6	9	0	30	1	31	9	4	2	15	89
04:45 PM	8	18	12	38	1	2	9	12	0	33	1	34	12	1	0	13	97
Total	28	84	41	153	3	13	42	58	0	113	3	116	54	12	4	70	397
05:00 PM	7	21	8	36	0	2	21	23	1	21	1	23	11	1	0	12	94
05:15 PM	2	21	8	31	1	0	7	8	0	20	0	20	9	1	2	12	71
05:30 PM	4	19	8	31	1	1	16	18	1	18	1	20	7	5	0	12	81
05:45 PM	3	26	6	35	2	3	13	18	0	11	0	11	12	3	0	15	79
Total	16	87	30	133	4	6	57	67	2	70	2	74	39	10	2	51	325
Grand Total	138	387	134	659	12	56	233	301	10	380	7	397	286	92	17	395	1752
Apprch %	20.9	58.7	20.3		4	18.6	77.4		2.5	95.7	1.8		72.4	23.3	4.3		
Total %	7.9	22.1	7.6	37.6	0.7	3.2	13.3	17.2	0.6	21.7	0.4	22.7	16.3	5.3	1	22.5	

	MADISON STREET Southbound				AVENUE 58 Westbound				MADISON STREET Northbound				AVENUE 58 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 02:30 PM																	
02:30 PM	12	24	**10**	46	0	**7**	16	23	1	27	0	28	**42**	**16**	1	**59**	**156**
02:45 PM	10	23	7	40	0	1	13	14	**4**	26	**1**	**31**	21	14	1	36	121
03:00 PM	**17**	19	9	45	**1**	5	17	23	0	**28**	1	29	26	8	1	35	132
03:15 PM	15	**29**	5	**49**	0	4	**20**	**24**	1	19	0	20	25	9	**2**	36	129
Total Volume	54	95	31	180	1	17	66	84	6	100	2	108	114	47	5	166	538
% App. Total	30	52.8	17.2		1.2	20.2	78.6		5.6	92.6	1.9		68.7	28.3	3		
PHF	.794	.819	.775	.918	.250	.607	.825	.875	.375	.893	.500	.871	.679	.734	.625	.703	.862

COUNTS UNLIMITED INC.
25424 JACLYN AVENUE
MORENO VALLEY CA. 92557
951-247-6716

CITY OF LA QUINTA
N/S: MADISON STREET
E/W: AVENUE 58
WEATHER: SUNNY

File Name : LQMA58PM
Site Code : 0032051
Start Date : 3/15/2006
Page No : 2



Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	02:45 PM				03:00 PM				04:00 PM				02:30 PM			
+0 mins.	10	23	7	40	**1**	**5**	17	23	0	30	**1**	31	**42**	**16**	1	**59**
+15 mins.	**17**	19	**9**	45	0	4	20	24	0	20	0	20	21	14	1	36
+30 mins.	15	29	5	49	0	2	**30**	**32**	0	30	1	31	26	8	1	35
+45 mins.	15	**42**	5	**62**	0	4	15	19	0	**33**	1	**34**	25	9	**2**	36
Total Volume	57	113	26	196	1	15	82	98	0	113	3	116	114	47	5	166
% App. Total	29.1	57.7	13.3		1	15.3	83.7		0	97.4	2.6		68.7	28.3	3	
PHF	.838	.673	.722	.790	.250	.750	.683	.766	.000	.856	.750	.853	.679	.734	.625	.703

Appendix B

HCM METHODOLOGY AND WORKSHEETS

Unsignalized Intersections

Signalized Intersections

Appendix B
Highway Capacity Manual
Unsignalized Intersection Methodology

Some of the key intersections in the study area are unsignalized and controlled by stop signs on one or more of the approaches. Unsignalized intersections are typically categorized as either two-way stop-controlled (TWSC) or all-way stop-controlled (AWSC) intersections. At TWSC intersections, the approaches controlled by the stop sign are referred to as the minor street approaches. Minor street approaches can be either public streets or private driveways. The intersection approaches that are not controlled by stop signs are called the major street approaches.

To evaluate the ability of these intersections to serve traffic demands during peak hours, the capacity is determined for each minor approach movement and the left-turn movements from the major street onto the minor street, and then compared to the demand for each movement. In this manner, the probable control delay can be estimated during the peak hour and the corresponding level of service from Table B-1.

Table B-1
HCM 2000 Unsignalized Intersection
Level of Service Criteria[a]

Level of Service[b]	Average Control Delay (Seconds/Vehicle)
A	≤ 10.0
B	>10.0 and ≤15.0
C	>15.0 and ≤25.0
D	>25.0 and ≤35.0
E	>35.0 and ≤50.0
F	> 50.0

a. Source: *Highway Capacity Manual,* Special Report 209", Transportation Research Board, 2000; pg. 17-2 and 17-32.

b. Note that a level of service is not defined for the overall TWSC intersection, but rather for individual movements and intersection approaches.

The methodology utilized to determine the maximum capacity of the minor approach movements and the left-turn movement onto the minor street (in passenger car equivalents per hour or PCPH) accounts for approach grade and speed, heavy vehicle mix, lane configuration, and type of traffic control. It allows the maximum potential capacity to be determined from the conflicting volumes and the critical gap associated with each type of vehicle maneuver. Once the capacity of each of the critical movements is calculated, the anticipated delay and the level of service for each of the intersection movements and each minor approach can be evaluated.

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*Greg*	Intersection	*Madison Street @ Avenue 52*
Agency/Co.	*Endo Engineering*	Jurisdiction	*La Quinta*
Date Performed	*5/2/2006*	Analysis Year	*Existing*
Analysis Time Period	*AM Peak Hour*		

Project Description	*TM 34642*
East/West Street: *Avenue 52*	North/South Street: *Madison Street*
Intersection Orientation: *East-West*	Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*33*	*233*	*99*	*71*	*256*	*23*
Peak-hour factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate (veh/h)	*33*	*233*	*99*	*71*	*256*	*23*
Proportion of heavy vehicles, P_{HV}	*8*	--	--	*8*	--	--
Median type	*Raised curb*					
RT Channelized?			*0*			*0*
Lanes	*0*	*2*	*0*	*1*	*1*	*0*
Configuration	*LT*		*TR*	*L*		*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	*7*	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*27*	*6*	*17*	*18*	*42*	*28*
Peak-hour factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate (veh/h)	*27*	*6*	*17*	*18*	*42*	*28*
Proportion of heavy vehicles, P_{HV}	*88*	*8*	*8*	*8*	*8*	*8*
Percent grade (%)		*0*			*0*	
Flared approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized?			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Control Delay, Queue Length, Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*	*L*		*LTR*			*LTR*	
Volume, v (vph)	*33*	*71*		*50*			*88*	
Capacity, c_m (vph)	*1238*	*1182*		*205*			*360*	
v/c ratio	*0.03*	*0.06*		*0.24*			*0.24*	
Queue length (95%)	*0.08*	*0.19*		*0.96*			*0.96*	
Control Delay (s/veh)	*8.0*	*8.2*		*28.2*			*18.2*	
LOS	*A*	*A*		*D*			*C*	
Approach delay (s/veh)	--	--	*28.2*			*18.2*		
Approach LOS	--	--	*D*			*C*		

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*Greg*	Intersection	*Madison Street @ Avenue 52*
Agency/Co.	*Endo Engineering*	Jurisdiction	*La Quinta*
Date Performed	*5/2/2006*	Analysis Year	*Existing*
Analysis Time Period	*PM Peak Hour*		

Project Description	*TM 34642*
East/West Street:	*Avenue 52*
North/South Street:	*Madison Street*
Intersection Orientation:	*East-West*
Study Period (hrs):	*1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*53*	*375*	*21*	*9*	*230*	*26*
Peak-hour factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate (veh/h)	*53*	*375*	*21*	*9*	*230*	*26*
Proportion of heavy vehicles, P_{HV}	*8*	--	--	*8*	--	--
Median type	*Raised curb*					
RT Channelized?			*0*			*0*
Lanes	*0*	*2*	*0*	*1*	*1*	*0*
Configuration	*LT*		*TR*	*L*		*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	*7*	*8*	*9*	*10*	*11*	*12*
	L	T	R	L	T	R
Volume (veh/h)	*67*	*90*	*71*	*25*	*4*	*17*
Peak-hour factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate (veh/h)	*67*	*90*	*71*	*25*	*4*	*17*
Proportion of heavy vehicles, P_{HV}	*88*	*8*	*8*	*8*	*8*	*8*
Percent grade (%)		*0*			*0*	
Flared approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized?			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Control Delay, Queue Length, Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*	*L*		*LTR*			*LTR*	
Volume, v (vph)	*53*	*9*		*228*			*46*	
Capacity, c_m (vph)	*1263*	*1117*		*288*			*340*	
v/c ratio	*0.04*	*0.01*		*0.79*			*0.14*	
Queue length (95%)	*0.13*	*0.02*		*8.81*			*0.47*	
Control Delay (s/veh)	*8.0*	*8.2*		*60.1*			*17.2*	
LOS	*A*	*A*		*F*			*C*	
Approach delay (s/veh)	--	--	*60.1*			*17.2*		
Approach LOS	--	--	*F*			*C*		

ALL-WAY STOP CONTROL ANALYSIS

General Information		Site Information	
Analyst	*Greg*	Intersection	*Jefferson St. @ Avenue 54*
Agency/Co.	*Endo Engineering*	Jurisdiction	*La Quinta*
Date Performed	*5/2/2006*	Analysis Year	*Existing*
Analysis Time Period	*AM Peak Hour*		

Project ID *TM 34642*

East/West Street: *Avenue 54* | North/South Street: *Jefferson Street*

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume	2	4	3	44	3	376
%Thrus Left Lane	50			50		

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume	3	188	27	505	207	9
%Thrus Left Lane	53			50		

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	*L*	*TR*	*LT*	*R*	*LT*	*TR*	*L*	*TR*
PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Flow Rate	*2*	*7*	*47*	*376*	*102*	*116*	*505*	*216*
% Heavy Vehicles	*8*	*8*	*8*	*8*	*8*	*8*	*8*	*8*
No. Lanes	*2*		*2*		*2*		*2*	
Geometry Group	*5*		*5*		*5*		*5*	
Duration, T	*1.00*							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns	*1.0*	*0.0*	*0.9*	*0.0*	*0.0*	*0.0*	*1.0*	*0.0*
Prop. Right-Turns	*0.0*	*0.4*	*0.0*	*1.0*	*0.0*	*0.2*	*0.0*	*0.0*
Prop. Heavy Vehicle								
hLT-adj	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*
hRT-adj	*-0.7*	*-0.7*	*-0.7*	*-0.7*	*-0.7*	*-0.7*	*-0.7*	*-0.7*
hHV-adj	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*
hadj, computed	*8.45*	*8.45*	*8.45*	*8.45*	*8.45*	*8.45*	*8.45*	*8.45*

Departure Headway and Service Time

hd, initial value	*3.20*	*3.20*	*3.20*	*3.20*	*3.20*	*3.20*	*3.20*	*3.20*
x, initial	*0.00*	*0.01*	*0.04*	*0.33*	*0.09*	*0.10*	*0.45*	*0.19*
hd, final value	*8.45*	*8.45*	*8.45*	*8.45*	*8.45*	*8.45*	*8.45*	*8.45*
x, final value	*0.00*	*0.01*	*0.10*	*0.67*	*0.20*	*0.22*	*0.96*	*0.38*
Move-up time, m	*2.3*		*2.3*		*2.3*		*2.3*	
Service Time	*6.1*	*5.3*	*6.1*	*5.3*	*6.1*	*5.3*	*6.1*	*5.3*

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity	*252*	*257*	*297*	*553*	*352*	*366*	*523*	*466*
Delay	*11.19*	*10.46*	*11.12*	*21.89*	*11.58*	*11.60*	*90.99*	*12.92*
LOS	*B*	*B*	*B*	*C*	*B*	*B*	*F*	*B*
Approach: Delay	*10.63*		*20.70*		*11.59*		*67.60*	
LOS	*B*		*C*		*B*		*F*	
Intersection Delay	*43.85*							
Intersection LOS	*E*							

ALL-WAY STOP CONTROL ANALYSIS

General Information		Site Information	
Analyst	*Greg*	Intersection	*Jefferson St. @ Avenue 54*
Agency/Co.	*Endo Engineering*	Jurisdiction	*La Quinta*
Date Performed	*5/2/2006*	Analysis Year	*Existing*
Analysis Time Period	*PM Peak Hour*		

Project ID *TM 34642*

East/West Street: *Avenue 54* | North/South Street: *Jefferson Street*

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume	13	15	2	42	2	541
%Thrus Left Lane	50			50		

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume	0	272	45	372	288	4
%Thrus Left Lane	56			50		

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	L	TR	LT	R	LT	TR	L	TR
PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flow Rate	13	17	44	541	152	165	372	292
% Heavy Vehicles	8	8	8	8	8	8	8	8
No. Lanes	2		2		2		2	
Geometry Group	5		5		5		5	
Duration, T	1.00							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns	1.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0
Prop. Right-Turns	0.0	0.1	0.0	1.0	0.0	0.3	0.0	0.0
Prop. Heavy Vehicle								
hLT-adj	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
hRT-adj	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7
hHV-adj	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
hadj, computed	9.04	9.04	9.04	9.04	9.04	9.04	9.04	9.04

Departure Headway and Service Time

hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.01	0.02	0.04	0.48	0.14	0.15	0.33	0.26
hd, final value	9.04	9.04	9.04	9.04	9.04	9.04	9.04	9.04
x, final value	0.03	0.04	0.10	1.00	0.33	0.35	0.80	0.59
Move-up time, m	2.3		2.3		2.3		2.3	
Service Time	6.7	6.2	6.7	6.2	6.7	6.2	6.7	6.2

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity	263	267	294	541	402	415	463	495
Delay	12.05	11.51	11.38	120.90	14.24	14.29	39.83	20.25
LOS	B	B	B	F	B	B	E	C
Approach: Delay	11.74		112.66		14.27		31.22	
LOS	B		F		B		D	
Intersection Delay	57.34							
Intersection LOS	F							

ALL-WAY STOP CONTROL ANALYSIS

General Information		Site Information	
Analyst	*Greg*	Intersection	*Jefferson St. @ Avenue 54*
Agency/Co.	*Endo Engineering*	Jurisdiction	*La Quinta*
Date Performed	*5/2/2006*	Analysis Year	*Year 2008 No Project*
Analysis Time Period	*AM Peak Hour*		

Project ID *TM 34642*

East/West Street: *Avenue 54* | North/South Street: *Jefferson Street*

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume	2	5	4	52	4	348
%Thrus Left Lane	50			50		

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume	4	211	32	346	242	11
%Thrus Left Lane	53			50		

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	*L*	*TR*	*LT*	*R*	*LT*	*TR*	*L*	*TR*
PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flow Rate	2	9	56	348	115	132	346	253
% Heavy Vehicles	8	8	8	8	8	8	8	8
No. Lanes	2		2		2		2	
Geometry Group	5		5		5		5	
Duration, T	1.00							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns	1.0	0.0	0.9	0.0	0.0	0.0	1.0	0.0
Prop. Right-Turns	0.0	0.4	0.0	1.0	0.0	0.2	0.0	0.0
Prop. Heavy Vehicle								
hLT-adj	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
hRT-adj	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7
hHV-adj	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
hadj, computed	8.06	8.06	8.06	8.06	8.06	8.06	8.06	8.06

Departure Headway and Service Time

hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.00	0.01	0.05	0.31	0.10	0.12	0.31	0.22
hd, final value	8.06	8.06	8.06	8.06	8.06	8.06	8.06	8.06
x, final value	0.00	0.02	0.11	0.59	0.22	0.24	0.65	0.44
Move-up time, m	2.3		2.3		2.3		2.3	
Service Time	5.8	4.9	5.8	4.9	5.8	4.9	5.8	4.9

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity	252	259	306	569	365	382	524	503
Delay	10.79	10.08	10.94	17.69	11.35	11.39	21.89	13.81
LOS	B	B	B	C	B	B	C	B
Approach: Delay	10.21		16.75		11.37		18.48	
LOS	B		C		B		C	
Intersection Delay	16.46							
Intersection LOS	C							

ALL-WAY STOP CONTROL ANALYSIS

General Information		Site Information	
Analyst	*Greg*	Intersection	*Jefferson St. @ Avenue 54*
Agency/Co.	*Endo Engineering*	Jurisdiction	*La Quinta*
Date Performed	*5/2/2006*	Analysis Year	*Year 2008 No Project*
Analysis Time Period	*PM Peak Hour*		

Project ID *TM 34642*

East/West Street: *Avenue 54* | North/South Street: *Jefferson Street*

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume	*15*	*18*	*2*	*50*	*2*	*332*
%Thrus Left Lane	*50*			*50*		

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume	*0*	*317*	*53*	*235*	*323*	*5*
%Thrus Left Lane	*56*			*50*		

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	*L*	*TR*	*LT*	*R*	*LT*	*TR*	*L*	*TR*
PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Flow Rate	*15*	*20*	*52*	*332*	*177*	*193*	*235*	*328*
% Heavy Vehicles	*8*	*8*	*8*	*8*	*8*	*8*	*8*	*8*
No. Lanes	*2*		*2*		*2*		*2*	
Geometry Group	*5*		*5*		*5*		*5*	
Duration, T	*1.00*							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns	*1.0*	*0.0*	*1.0*	*0.0*	*0.0*	*0.0*	*1.0*	*0.0*
Prop. Right-Turns	*0.0*	*0.1*	*0.0*	*1.0*	*0.0*	*0.3*	*0.0*	*0.0*
Prop. Heavy Vehicle								
hLT-adj	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*
hRT-adj	*-0.7*	*-0.7*	*-0.7*	*-0.7*	*-0.7*	*-0.7*	*-0.7*	*-0.7*
hHV-adj	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*
hadj, computed	*8.28*	*8.28*	*8.28*	*8.28*	*8.28*	*8.28*	*8.28*	*8.28*

Departure Headway and Service Time

hd, initial value	*3.20*	*3.20*	*3.20*	*3.20*	*3.20*	*3.20*	*3.20*	*3.20*
x, initial	*0.01*	*0.02*	*0.05*	*0.30*	*0.16*	*0.17*	*0.21*	*0.29*
hd, final value	*8.28*	*8.28*	*8.28*	*8.28*	*8.28*	*8.28*	*8.28*	*8.28*
x, final value	*0.03*	*0.04*	*0.11*	*0.59*	*0.33*	*0.35*	*0.46*	*0.59*
Move-up time, m	*2.3*		*2.3*		*2.3*		*2.3*	
Service Time	*6.0*	*5.4*	*6.0*	*5.4*	*6.0*	*5.4*	*6.0*	*5.4*

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity	*265*	*270*	*302*	*546*	*427*	*443*	*485*	*542*
Delay	*11.28*	*10.76*	*11.19*	*18.10*	*12.93*	*12.95*	*15.67*	*18.65*
LOS	*B*	*B*	*B*	*C*	*B*	*B*	*C*	*C*
Approach: Delay	*10.98*		*17.16*		*12.94*		*17.41*	
LOS	*B*		*C*		*B*		*C*	
Intersection Delay	*15.95*							
Intersection LOS	*C*							

ALL-WAY STOP CONTROL ANALYSIS

General Information

Analyst	*Greg*
Agency/Co.	*Endo Engineering*
Date Performed	*5/2/2006*
Analysis Time Period	*AM Peak Hour*

Site Information

Intersection	*Jefferson St. @ Avenue 54*
Jurisdiction	*La Quinta*
Analysis Year	*Year 2008 W/ Project*

Project ID *TM 34642*

East/West Street: *Avenue 54*

North/South Street: *Jefferson Street*

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume	*2*	*5*	*4*	*52*	*4*	*364*
%Thrus Left Lane	*50*			*50*		

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume	*4*	*211*	*32*	*351*	*242*	*11*
%Thrus Left Lane	*53*			*50*		

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	*L*	*TR*	*LT*	*R*	*LT*	*TR*	*L*	*TR*
PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Flow Rate	*2*	*9*	*56*	*364*	*115*	*132*	*351*	*253*
% Heavy Vehicles	*8*	*8*	*8*	*8*	*8*	*8*	*8*	*8*
No. Lanes	*2*		*2*		*2*		*2*	
Geometry Group	*5*		*5*		*5*		*5*	
Duration, T	*1.00*							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns	*1.0*	*0.0*	*0.9*	*0.0*	*0.0*	*0.0*	*1.0*	*0.0*
Prop. Right-Turns	*0.0*	*0.4*	*0.0*	*1.0*	*0.0*	*0.2*	*0.0*	*0.0*
Prop. Heavy Vehicle								
hLT-adj	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*
hRT-adj	*-0.7*	*-0.7*	*-0.7*	*-0.7*	*-0.7*	*-0.7*	*-0.7*	*-0.7*
hHV-adj	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*
hadj, computed	*8.12*	*8.12*	*8.12*	*8.12*	*8.12*	*8.12*	*8.12*	*8.12*

Departure Headway and Service Time

hd, initial value	*3.20*	*3.20*	*3.20*	*3.20*	*3.20*	*3.20*	*3.20*	*3.20*
x, initial	*0.00*	*0.01*	*0.05*	*0.32*	*0.10*	*0.12*	*0.31*	*0.22*
hd, final value	*8.12*	*8.12*	*8.12*	*8.12*	*8.12*	*8.12*	*8.12*	*8.12*
x, final value	*0.00*	*0.02*	*0.11*	*0.62*	*0.22*	*0.24*	*0.67*	*0.44*
Move-up time, m	*2.3*		*2.3*		*2.3*		*2.3*	
Service Time	*5.8*	*5.0*	*5.8*	*5.0*	*5.8*	*5.0*	*5.8*	*5.0*

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity	*252*	*259*	*306*	*568*	*365*	*382*	*519*	*503*
Delay	*10.86*	*10.14*	*10.97*	*18.91*	*11.46*	*11.51*	*22.91*	*14.00*
LOS	*B*	*B*	*B*	*C*	*B*	*B*	*C*	*B*
Approach: Delay	*10.27*		*17.85*		*11.49*		*19.18*	
LOS	*B*		*C*		*B*		*C*	
Intersection Delay	*17.18*							
Intersection LOS	*C*							

ALL-WAY STOP CONTROL ANALYSIS

General Information		Site Information	
Analyst	*Greg*	Intersection	*Jefferson St. @ Avenue 54*
Agency/Co.	*Endo Engineering*	Jurisdiction	*La Quinta*
Date Performed	*5/2/2006*	Analysis Year	*Year 2008 W/ Project*
Analysis Time Period	*PM Peak Hour*		

Project ID *TM 34642*

East/West Street: *Avenue 54* | North/South Street: *Jefferson Street*

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume	15	18	2	50	2	343
%Thrus Left Lane	50			50		

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume	0	317	53	253	323	5
%Thrus Left Lane	56			50		

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	L	TR	LT	R	LT	TR	L	TR
PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flow Rate	15	20	52	343	177	193	253	328
% Heavy Vehicles	8	8	8	8	8	8	8	8
No. Lanes	2		2		2		2	
Geometry Group	5		5		5		5	
Duration, T	1.00							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns	1.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0
Prop. Right-Turns	0.0	0.1	0.0	1.0	0.0	0.3	0.0	0.0
Prop. Heavy Vehicle								
hLT-adj	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
hRT-adj	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7
hHV-adj	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
hadj, computed	8.36	8.36	8.36	8.36	8.36	8.36	8.36	8.36

Departure Headway and Service Time

hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.01	0.02	0.05	0.30	0.16	0.17	0.22	0.29
hd, final value	8.36	8.36	8.36	8.36	8.36	8.36	8.36	8.36
x, final value	0.03	0.04	0.11	0.61	0.34	0.36	0.50	0.60
Move-up time, m	2.3		2.3		2.3		2.3	
Service Time	6.1	5.5	6.1	5.5	6.1	5.5	6.1	5.5

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity	265	270	302	544	427	443	499	538
Delay	11.36	10.84	11.25	19.15	13.10	13.13	16.76	18.97
LOS	B	B	B	C	B	B	C	C
Approach: Delay	11.07		18.11		13.12		18.01	
LOS	B		C		B		C	
Intersection Delay	16.55							
Intersection LOS	C							

ALL-WAY STOP CONTROL ANALYSIS

General Information		Site Information	
Analyst	*Greg*	Intersection	*Madison St. @ Avenue 54*
Agency/Co.	*Endo Engineering*	Jurisdiction	*La Quinta*
Date Performed	*5/2/2006*	Analysis Year	*Existing*
Analysis Time Period	*AM Peak Hour*		

Project ID *TM 34642*

East/West Street: *Avenue 54* | North/South Street: *Madison Street*

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume	*0*	*123*	*344*	*23*	*130*	*0*
%Thrus Left Lane	*100*			*50*		

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume	*295*	*0*	*11*	*0*	*0*	*0*
%Thrus Left Lane	*50*			*50*		

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	*T*	*TR*	*LT*		*L*	*R*		
PHF	*1.00*	*1.00*	*1.00*		*1.00*	*1.00*		
Flow Rate	*123*	*344*	*153*		*295*	*11*		
% Heavy Vehicles	*8*	*8*	*8*		*8*	*8*		
No. Lanes	*2*		*1*		*2*		*0*	
Geometry Group	*5*		*3b*		*1*			
Duration, T	*1.00*							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns	*0.0*	*0.0*	*0.2*		*1.0*	*0.0*		
Prop. Right-Turns	*0.0*	*1.0*	*0.0*		*0.0*	*1.0*		
Prop. Heavy Vehicle								
hLT-adj	*0.5*	*0.5*	*0.2*	*0.2*	*0.2*	*0.2*		
hRT-adj	*-0.7*	*-0.7*	*-0.6*	*-0.6*	*-0.6*	*-0.6*		
hHV-adj	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*		
hadj, computed	*5.78*	*5.78*	*5.78*		*5.78*	*5.78*		

Departure Headway and Service Time

hd, initial value	*3.20*	*3.20*	*3.20*		*3.20*	*3.20*		
x, initial	*0.11*	*0.31*	*0.14*		*0.26*	*0.01*		
hd, final value	*5.78*	*5.78*	*5.78*		*5.78*	*5.78*		
x, final value	*0.20*	*0.49*	*0.25*		*0.47*	*0.02*		
Move-up time, m	*2.3*		*2.0*		*2.0*			
Service Time	*3.5*	*2.8*	*3.5*	*2.8*	*3.5*	*2.8*	*3.5*	*2.8*

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity	*373*	*594*	*403*		*545*	*261*		
Delay	*9.91*	*12.54*	*11.04*		*13.76*	*8.00*		
LOS	*A*	*B*	*B*		*B*	*A*		
Approach: Delay	*11.85*		*11.04*		*13.56*			
LOS	*B*		*B*		*B*			
Intersection Delay	*12.28*							
Intersection LOS	*B*							

ALL-WAY STOP CONTROL ANALYSIS

General Information		Site Information	
Analyst	*Greg*	Intersection	*Madison St. @ Avenue 54*
Agency/Co.	*Endo Engineering*	Jurisdiction	*La Quinta*
Date Performed	*5/2/2006*	Analysis Year	*Existing*
Analysis Time Period	*PM Peak Hour*		

Project ID *TM 34642*

East/West Street: *Avenue 54* | North/South Street: *Madison Street*

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume	*0*	*126*	*313*	*11*	*118*	*0*
%Thrus Left Lane	*100*			*50*		

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume	*471*	*0*	*59*	*0*	*0*	*0*
%Thrus Left Lane	*50*			*50*		

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	*T*	*TR*	*LT*		*L*	*R*		
PHF	*1.00*	*1.00*	*1.00*		*1.00*	*1.00*		
Flow Rate	*126*	*313*	*129*		*471*	*59*		
% Heavy Vehicles	*8*	*8*	*8*		*8*	*8*		
No. Lanes	*2*		*1*		*2*		*0*	
Geometry Group	*5*		*3b*		*1*			
Duration, T	*1.00*							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns	*0.0*	*0.0*	*0.1*		*1.0*	*0.0*		
Prop. Right-Turns	*0.0*	*1.0*	*0.0*		*0.0*	*1.0*		
Prop. Heavy Vehicle								
hLT-adj	*0.5*	*0.5*	*0.2*	*0.2*	*0.2*	*0.2*		
hRT-adj	*-0.7*	*-0.7*	*-0.6*	*-0.6*	*-0.6*	*-0.6*		
hHV-adj	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*		
hadj, computed	*6.42*	*6.42*	*6.42*		*6.42*	*6.42*		

Departure Headway and Service Time

hd, initial value	*3.20*	*3.20*	*3.20*		*3.20*	*3.20*		
x, initial	*0.11*	*0.28*	*0.11*		*0.42*	*0.05*		
hd, final value	*6.42*	*6.42*	*6.42*		*6.42*	*6.42*		
x, final value	*0.22*	*0.50*	*0.24*		*0.75*	*0.08*		
Move-up time, m	*2.3*		*2.0*		*2.0*			
Service Time	*4.1*	*3.4*	*4.1*	*3.4*	*4.1*	*3.4*	*4.1*	*3.4*

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity	*376*	*563*	*379*		*616*	*309*		
Delay	*10.98*	*14.03*	*11.75*		*25.46*	*8.37*		
LOS	*B*	*B*	*B*		*D*	*A*		
Approach: Delay	*13.15*		*11.75*		*23.56*			
LOS	*B*		*B*		*C*			
Intersection Delay	*18.01*							
Intersection LOS	*C*							

ALL-WAY STOP CONTROL ANALYSIS

General Information		Site Information	
Analyst	*Greg*	Intersection	*Monroe St. @ Avenue 54*
Agency/Co.	*Endo Engineering*	Jurisdiction	*La Quinta*
Date Performed	*5/2/2006*	Analysis Year	*Existing*
Analysis Time Period	*AM Peak Hour*		

Project ID *TM 34642*

East/West Street: *Avenue 54* | North/South Street: *Monroe Street*

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume	*13*	*98*	*8*	*15*	*109*	*34*
%Thrus Left Lane	*50*			*50*		

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume	*9*	*114*	*7*	*42*	*162*	*19*
%Thrus Left Lane	*50*			*50*		

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	*LTR*		*LTR*		*LTR*		*LTR*	
PHF	*1.00*		*1.00*		*1.00*		*1.00*	
Flow Rate	*119*		*158*		*130*		*223*	
% Heavy Vehicles	*8*		*8*		*8*		*8*	
No. Lanes	*1*		*1*		*1*		*1*	
Geometry Group	*1*		*1*		*1*		*1*	
Duration, T	*1.00*							

Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
Prop. Left-Turns	*0.1*		*0.1*		*0.1*		*0.2*	
Prop. Right-Turns	*0.1*		*0.2*		*0.1*		*0.1*	
Prop. Heavy Vehicle								
hLT-adj	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*
hRT-adj	*-0.6*	*-0.6*	*-0.6*	*-0.6*	*-0.6*	*-0.6*	*-0.6*	*-0.6*
hHV-adj	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*
hadj, computed	*5.17*		*5.17*		*5.17*		*5.17*	

Departure Headway and Service Time

	Eastbound		Westbound		Northbound		Southbound	
hd, initial value	*3.20*		*3.20*		*3.20*		*3.20*	
x, initial	*0.11*		*0.14*		*0.12*		*0.20*	
hd, final value	*5.17*		*5.17*		*5.17*		*5.17*	
x, final value	*0.17*		*0.22*		*0.18*		*0.31*	
Move-up time, m	*2.0*		*2.0*		*2.0*		*2.0*	
Service Time	*3.2*		*3.2*		*3.2*		*3.2*	

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity	*369*		*408*		*380*		*473*	
Delay	*9.24*		*9.45*		*9.21*		*10.13*	
LOS	*A*		*A*		*A*		*B*	
Approach: Delay	*9.24*		*9.45*		*9.21*		*10.13*	
LOS	*A*		*A*		*A*		*B*	
Intersection Delay	*9.60*							
Intersection LOS	*A*							

ALL-WAY STOP CONTROL ANALYSIS

General Information		Site Information	
Analyst	*Greg*	Intersection	*Monroe St. @ Avenue 54*
Agency/Co.	*Endo Engineering*	Jurisdiction	*La Quinta*
Date Performed	*5/2/2006*	Analysis Year	*Existing*
Analysis Time Period	*PM Peak Hour*		

Project ID *TM 34642*

East/West Street: *Avenue 54* | North/South Street: *Monroe Street*

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume	*31*	*159*	*15*	*10*	*82*	*36*
%Thrus Left Lane	*50*			*50*		

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume	*12*	*222*	*35*	*77*	*143*	*12*
%Thrus Left Lane	*50*			*50*		

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	*LTR*		*LTR*		*LTR*		*LTR*	
PHF	*1.00*		*1.00*		*1.00*		*1.00*	
Flow Rate	*205*		*128*		*269*		*232*	
% Heavy Vehicles	*8*		*8*		*8*		*8*	
No. Lanes	*1*		*1*		*1*		*1*	
Geometry Group	*1*		*1*		*1*		*1*	
Duration, T	*1.00*							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns	*0.2*		*0.1*		*0.0*		*0.3*	
Prop. Right-Turns	*0.1*		*0.3*		*0.1*		*0.1*	
Prop. Heavy Vehicle								
hLT-adj	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*
hRT-adj	*-0.6*	*-0.6*	*-0.6*	*-0.6*	*-0.6*	*-0.6*	*-0.6*	*-0.6*
hHV-adj	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*
hadj, computed	*5.65*		*5.65*		*5.65*		*5.65*	

Departure Headway and Service Time

hd, initial value	*3.20*		*3.20*		*3.20*		*3.20*	
x, initial	*0.18*		*0.11*		*0.24*		*0.21*	
hd, final value	*5.65*		*5.65*		*5.65*		*5.65*	
x, final value	*0.32*		*0.20*		*0.40*		*0.35*	
Move-up time, m	*2.0*		*2.0*		*2.0*		*2.0*	
Service Time	*3.7*		*3.7*		*3.7*		*3.7*	

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity	*455*		*378*		*519*		*482*	
Delay	*11.33*		*10.09*		*11.86*		*11.49*	
LOS	*B*		*B*		*B*		*B*	
Approach: Delay	*11.33*		*10.09*		*11.86*		*11.49*	
LOS	*B*		*B*		*B*		*B*	
Intersection Delay	*11.36*							
Intersection LOS	*B*							

ALL-WAY STOP CONTROL ANALYSIS

General Information		Site Information	
Analyst	*Greg*	Intersection	*Monroe St. @ Avenue 54*
Agency/Co.	*Endo Engineering*	Jurisdiction	*La Quinta*
Date Performed	*5/2/2006*	Analysis Year	*Year 2008 No Project*
Analysis Time Period	*AM Peak Hour*		

Project ID *TM 34642*

East/West Street: *Avenue 54* | North/South Street: *Monroe Street*

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume	48	148	37	19	146	40
%Thrus Left Lane	50			50		

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume	27	137	8	50	194	34
%Thrus Left Lane	50			50		

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	L	TR	LTR		LTR		LTR	
PHF	1.00	1.00	1.00		1.00		1.00	
Flow Rate	48	185	205		172		278	
% Heavy Vehicles	8	8	8		8		8	
No. Lanes	2		1		1		1	
Geometry Group	5		4a		2		2	
Duration, T	1.00							

Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
Prop. Left-Turns	1.0	0.0	0.1		0.2		0.2	
Prop. Right-Turns	0.0	0.2	0.2		0.0		0.1	
Prop. Heavy Vehicle								
hLT-adj	0.5	0.5	0.2	0.2	0.2	0.2	0.2	0.2
hRT-adj	-0.7	-0.7	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6
hHV-adj	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
hadj, computed	6.82	6.82	6.82		6.82		6.82	

Departure Headway and Service Time

	Eastbound		Westbound		Northbound		Southbound	
hd, initial value	3.20	3.20	3.20		3.20		3.20	
x, initial	0.04	0.16	0.18		0.15		0.25	
hd, final value	6.82	6.82	6.82		6.82		6.82	
x, final value	0.09	0.32	0.33		0.28		0.43	
Move-up time, m	2.3		2.0		2.0		2.0	
Service Time	4.5	3.9	4.5	3.9	4.5	3.9	4.5	3.9

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity	298	435	455		422		528	
Delay	10.20	11.72	11.71		11.13		12.91	
LOS	B	B	B		B		B	
Approach: Delay	11.40		11.71		11.13		12.91	
LOS	B		B		B		B	
Intersection Delay	11.89							
Intersection LOS	B							

ALL-WAY STOP CONTROL ANALYSIS

General Information		Site Information	
Analyst	*Greg*	Intersection	*Monroe St. @ Avenue 54*
Agency/Co.	*Endo Engineering*	Jurisdiction	*La Quinta*
Date Performed	*5/2/2006*	Analysis Year	*Year 2008 No Project*
Analysis Time Period	*PM Peak Hour*		

Project ID *TM 34642*

East/West Street: *Avenue 54* | North/South Street: *Monroe Street*

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume	59	213	40	12	136	43
%Thrus Left Lane	50			50		

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume	47	266	43	91	172	51
%Thrus Left Lane	50			50		

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	L	TR	LTR		LTR		LTR	
PHF	1.00	1.00	1.00		1.00		1.00	
Flow Rate	59	253	191		356		314	
% Heavy Vehicles	8	8	8		8		8	
No. Lanes	2		1		1		1	
Geometry Group	5		4a		2		2	
Duration, T	1.00							

Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
Prop. Left-Turns	1.0	0.0	0.1		0.1		0.3	
Prop. Right-Turns	0.0	0.2	0.2		0.1		0.2	
Prop. Heavy Vehicle								
hLT-adj	0.5	0.5	0.2	0.2	0.2	0.2	0.2	0.2
hRT-adj	-0.7	-0.7	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6
hHV-adj	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
hadj, computed	7.85	7.85	7.85		7.85		7.85	

Departure Headway and Service Time

hd, initial value	3.20	3.20	3.20		3.20		3.20	
x, initial	0.05	0.22	0.17		0.32		0.28	
hd, final value	7.85	7.85	7.85		7.85		7.85	
x, final value	0.13	0.51	0.38		0.64		0.58	
Move-up time, m	2.3		2.0		2.0		2.0	
Service Time	5.6	4.9	5.6	4.9	5.6	4.9	5.6	4.9

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity	309	462	439		525		509	
Delay	11.71	17.32	14.47		20.99		18.48	
LOS	B	C	B		C		C	
Approach: Delay	16.26		14.47		20.99		18.48	
LOS	C		B		C		C	
Intersection Delay	18.00							
Intersection LOS	C							

ALL-WAY STOP CONTROL ANALYSIS

General Information		Site Information	
Analyst	*Greg*	Intersection	*Monroe St. @ Avenue 54*
Agency/Co.	*Endo Engineering*	Jurisdiction	*La Quinta*
Date Performed	*11/9/2006*	Analysis Year	*Year 2008 W/ Project*
Analysis Time Period	*AM Peak Hour*		

Project ID *TM 34642*

East/West Street: *Avenue 54* | North/South Street: *Monroe Street*

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume	55	150	38	20	146	40
%Thrus Left Lane	50			50		

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume	34	150	11	50	199	36
%Thrus Left Lane	50			50		

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	L	TR	LTR		LTR		LTR	
PHF	1.00	1.00	1.00		1.00		1.00	
Flow Rate	55	188	206		195		285	
% Heavy Vehicles	8	8	8		8		8	
No. Lanes	2		1		1		1	
Geometry Group	5		4a		2		2	
Duration, T	1.00							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns	1.0	0.0	0.1		0.2		0.2	
Prop. Right-Turns	0.0	0.2	0.2		0.1		0.1	
Prop. Heavy Vehicle								
hLT-adj	0.5	0.5	0.2	0.2	0.2	0.2	0.2	0.2
hRT-adj	-0.7	-0.7	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6
hHV-adj	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
hadj, computed	6.95	6.95	6.95		6.95		6.95	

Departure Headway and Service Time

hd, initial value	3.20	3.20	3.20		3.20		3.20	
x, initial	0.05	0.17	0.18		0.17		0.25	
hd, final value	6.95	6.95	6.95		6.95		6.95	
x, final value	0.11	0.33	0.34		0.32		0.45	
Move-up time, m	2.3		2.0		2.0		2.0	
Service Time	4.6	4.0	4.6	4.0	4.6	4.0	4.6	4.0

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity	305	438	456		445		535	
Delay	10.47	12.07	12.08		11.76		13.46	
LOS	B	B	B		B		B	
Approach: Delay	11.71		12.08		11.76		13.46	
LOS	B		B		B		B	
Intersection Delay	12.34							
Intersection LOS	B							

ALL-WAY STOP CONTROL ANALYSIS

General Information

Analyst	*Greg*
Agency/Co.	*Endo Engineering*
Date Performed	*11/9/2006*
Analysis Time Period	*PM Peak Hour*

Site Information

Intersection	*Monroe St. @ Avenue 54*
Jurisdiction	*La Quinta*
Analysis Year	*Year 2008 W/ Project*

Project ID *TM 34642*

East/West Street: *Avenue 54*

North/South Street: *Monroe Street*

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume	63	214	47	15	138	43
%Thrus Left Lane	50			50		

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume	52	274	44	91	186	59
%Thrus Left Lane	50			50		

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	L	TR	LTR		LTR		LTR	
PHF	1.00	1.00	1.00		1.00		1.00	
Flow Rate	63	261	196		370		336	
% Heavy Vehicles	8	8	8		8		8	
No. Lanes	2		1		1		1	
Geometry Group	5		4a		2		2	
Duration, T	1.00							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns	1.0	0.0	0.1		0.1		0.3	
Prop. Right-Turns	0.0	0.2	0.2		0.1		0.2	
Prop. Heavy Vehicle								
hLT-adj	0.5	0.5	0.2	0.2	0.2	0.2	0.2	0.2
hRT-adj	-0.7	-0.7	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6
hHV-adj	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
hadj, computed	8.09	8.09	8.09		8.09		8.09	

Departure Headway and Service Time

hd, initial value	3.20	3.20	3.20		3.20		3.20	
x, initial	0.06	0.23	0.17		0.33		0.30	
hd, final value	8.09	8.09	8.09		8.09		8.09	
x, final value	0.14	0.54	0.40		0.69		0.63	
Move-up time, m	2.3		2.0		2.0		2.0	
Service Time	5.8	5.1	5.8	5.1	5.8	5.1	5.8	5.1

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity	313	448	418		510		498	
Delay	12.13	18.80	15.46		24.33		21.39	
LOS	B	C	C		C		C	
Approach: Delay	17.50		15.46		24.33		21.39	
LOS	C		C		C		C	
Intersection Delay	20.30							
Intersection LOS	C							

ALL-WAY STOP CONTROL ANALYSIS

General Information		Site Information	
Analyst	*Greg*	Intersection	*Madison St. @ Avenue 58*
Agency/Co.	*Endo Engineering*	Jurisdiction	*La Quinta*
Date Performed	*5/2/2006*	Analysis Year	*Existing*
Analysis Time Period	*AM Peak Hour*		

Project ID *TM 34642*

East/West Street: *Avenue 58* | North/South Street: *Madison Street*

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume	*80*	*9*	*2*	*6*	*44*	*24*
%Thrus Left Lane	*50*			*50*		

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume	*5*	*65*	*0*	*51*	*86*	*66*
%Thrus Left Lane	*39*			*50*		

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	*L*	*TR*	*LT*	*R*	*LT*	*TR*	*L*	*TR*
PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Flow Rate	*80*	*11*	*50*	*24*	*30*	*40*	*51*	*152*
% Heavy Vehicles	*8*	*8*	*8*	*8*	*8*	*8*	*8*	*8*
No. Lanes	*2*		*2*		*2*		*2*	
Geometry Group	*5*		*5*		*5*		*5*	
Duration, T	*1.00*							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns	*1.0*	*0.0*	*0.1*	*0.0*	*0.2*	*0.0*	*1.0*	*0.0*
Prop. Right-Turns	*0.0*	*0.2*	*0.0*	*1.0*	*0.0*	*0.0*	*0.0*	*0.4*
Prop. Heavy Vehicle								
hLT-adj	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*
hRT-adj	*-0.7*	*-0.7*	*-0.7*	*-0.7*	*-0.7*	*-0.7*	*-0.7*	*-0.7*
hHV-adj	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*
hadj, computed	*5.89*	*5.89*	*5.89*	*5.89*	*5.89*	*5.89*	*5.89*	*5.89*

Departure Headway and Service Time

hd, initial value	*3.20*	*3.20*	*3.20*	*3.20*	*3.20*	*3.20*	*3.20*	*3.20*
x, initial	*0.07*	*0.01*	*0.04*	*0.02*	*0.03*	*0.04*	*0.05*	*0.14*
hd, final value	*5.89*	*5.89*	*5.89*	*5.89*	*5.89*	*5.89*	*5.89*	*5.89*
x, final value	*0.13*	*0.02*	*0.08*	*0.03*	*0.04*	*0.06*	*0.08*	*0.20*
Move-up time, m	*2.3*		*2.3*		*2.3*		*2.3*	
Service Time	*3.6*	*3.0*	*3.6*	*3.0*	*3.6*	*3.0*	*3.6*	*3.0*

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity	*330*	*261*	*300*	*274*	*280*	*290*	*301*	*402*
Delay	*9.47*	*8.04*	*8.62*	*7.57*	*8.31*	*8.30*	*8.85*	*8.80*
LOS	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*
Approach: Delay	*9.30*		*8.28*		*8.31*		*8.81*	
LOS	*A*		*A*		*A*		*A*	
Intersection Delay	*8.74*							
Intersection LOS	*A*							

ALL-WAY STOP CONTROL ANALYSIS

General Information		Site Information	
Analyst	*Greg*	Intersection	*Madison St. @ Avenue 58*
Agency/Co.	*Endo Engineering*	Jurisdiction	*La Quinta*
Date Performed	*5/2/2006*	Analysis Year	*Existing*
Analysis Time Period	*PM Peak Hour*		

Project ID *TM 34642*

East/West Street: *Avenue 58* | North/South Street: *Madison Street*

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume	*114*	*47*	*5*	*1*	*17*	*66*
%Thrus Left Lane	*50*			*50*		

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume	*6*	*100*	*2*	*54*	*95*	*31*
%Thrus Left Lane	*43*			*50*		

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	*L*	*TR*	*LT*	*R*	*LT*	*TR*	*L*	*TR*
PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Flow Rate	*114*	*52*	*18*	*66*	*49*	*59*	*54*	*126*
% Heavy Vehicles	*8*	*8*	*8*	*8*	*8*	*8*	*8*	*8*
No. Lanes	*2*		*2*		*2*		*2*	
Geometry Group	*5*		*5*		*5*		*5*	
Duration, T	*1.00*							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns	*1.0*	*0.0*	*0.1*	*0.0*	*0.1*	*0.0*	*1.0*	*0.0*
Prop. Right-Turns	*0.0*	*0.1*	*0.0*	*1.0*	*0.0*	*0.0*	*0.0*	*0.2*
Prop. Heavy Vehicle								
hLT-adj	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*
hRT-adj	*-0.7*	*-0.7*	*-0.7*	*-0.7*	*-0.7*	*-0.7*	*-0.7*	*-0.7*
hHV-adj	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*
hadj, computed	*5.97*	*5.97*	*5.97*	*5.97*	*5.97*	*5.97*	*5.97*	*5.97*

Departure Headway and Service Time

hd, initial value	*3.20*	*3.20*	*3.20*	*3.20*	*3.20*	*3.20*	*3.20*	*3.20*
x, initial	*0.10*	*0.05*	*0.02*	*0.06*	*0.04*	*0.05*	*0.05*	*0.11*
hd, final value	*5.97*	*5.97*	*5.97*	*5.97*	*5.97*	*5.97*	*5.97*	*5.97*
x, final value	*0.19*	*0.08*	*0.03*	*0.09*	*0.08*	*0.09*	*0.09*	*0.18*
Move-up time, m	*2.3*		*2.3*		*2.3*		*2.3*	
Service Time	*3.7*	*3.1*	*3.7*	*3.1*	*3.7*	*3.1*	*3.7*	*3.1*

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity	*364*	*302*	*268*	*316*	*299*	*309*	*304*	*376*
Delay	*10.06*	*8.56*	*8.47*	*8.06*	*8.72*	*8.71*	*9.20*	*9.13*
LOS	*B*	*A*	*A*	*A*	*A*	*A*	*A*	*A*
Approach: Delay	*9.59*		*8.15*		*8.71*		*9.15*	
LOS	*A*		*A*		*A*		*A*	
Intersection Delay	*9.04*							
Intersection LOS	*A*							

ALL-WAY STOP CONTROL ANALYSIS

General Information		Site Information	
Analyst	*Greg*	Intersection	*Madison St. @ Avenue 58*
Agency/Co.	*Endo Engineering*	Jurisdiction	*La Quinta*
Date Performed	*5/2/2006*	Analysis Year	*Year 2008 No Project*
Analysis Time Period	*AM Peak Hour*		

Project ID *TM 34642*

East/West Street: *Avenue 58* | North/South Street: *Madison Street*

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume	*95*	*11*	*2*	*7*	*52*	*29*
%Thrus Left Lane	*50*			*50*		

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume	*6*	*86*	*0*	*61*	*122*	*78*
%Thrus Left Lane	*42*			*50*		

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	*L*	*TR*	*LT*	*R*	*LT*	*TR*	*L*	*TR*
PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Flow Rate	*95*	*13*	*59*	*29*	*42*	*50*	*61*	*200*
% Heavy Vehicles	*8*	*8*	*8*	*8*	*8*	*8*	*8*	*8*
No. Lanes	*2*		*2*		*2*		*2*	
Geometry Group	*5*		*5*		*5*		*5*	
Duration, T	*1.00*							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns	*1.0*	*0.0*	*0.1*	*0.0*	*0.1*	*0.0*	*1.0*	*0.0*
Prop. Right-Turns	*0.0*	*0.2*	*0.0*	*1.0*	*0.0*	*0.0*	*0.0*	*0.4*
Prop. Heavy Vehicle								
hLT-adj	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*
hRT-adj	*-0.7*	*-0.7*	*-0.7*	*-0.7*	*-0.7*	*-0.7*	*-0.7*	*-0.7*
hHV-adj	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*
hadj, computed	*6.12*	*6.12*	*6.12*	*6.12*	*6.12*	*6.12*	*6.12*	*6.12*

Departure Headway and Service Time

hd, initial value	*3.20*	*3.20*	*3.20*	*3.20*	*3.20*	*3.20*	*3.20*	*3.20*
x, initial	*0.08*	*0.01*	*0.05*	*0.03*	*0.04*	*0.04*	*0.05*	*0.18*
hd, final value	*6.12*	*6.12*	*6.12*	*6.12*	*6.12*	*6.12*	*6.12*	*6.12*
x, final value	*0.16*	*0.02*	*0.09*	*0.04*	*0.06*	*0.08*	*0.10*	*0.28*
Move-up time, m	*2.3*		*2.3*		*2.3*		*2.3*	
Service Time	*3.8*	*3.2*	*3.8*	*3.2*	*3.8*	*3.2*	*3.8*	*3.2*

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity	*345*	*263*	*309*	*279*	*292*	*300*	*311*	*450*
Delay	*10.00*	*8.32*	*9.01*	*7.86*	*8.60*	*8.60*	*9.12*	*9.65*
LOS	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*
Approach: Delay	*9.79*		*8.63*		*8.60*		*9.52*	
LOS	*A*		*A*		*A*		*A*	
Intersection Delay	*9.28*							
Intersection LOS	*A*							

ALL-WAY STOP CONTROL ANALYSIS

General Information		Site Information	
Analyst	*Greg*	Intersection	*Madison St. @ Avenue 58*
Agency/Co.	*Endo Engineering*	Jurisdiction	*La Quinta*
Date Performed	*5/2/2006*	Analysis Year	*Year 2008 No Project*
Analysis Time Period	*PM Peak Hour*		

Project ID *TM 34642*

East/West Street: *Avenue 58* | North/South Street: *Madison Street*

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume	*135*	*56*	*6*	*1*	*20*	*78*
%Thrus Left Lane	*50*			*50*		

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume	*7*	*143*	*2*	*64*	*127*	*37*
%Thrus Left Lane	*46*			*50*		

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	*L*	*TR*	*LT*	*R*	*LT*	*TR*	*L*	*TR*
PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Flow Rate	*135*	*62*	*21*	*78*	*72*	*80*	*64*	*164*
% Heavy Vehicles	*8*	*8*	*8*	*8*	*8*	*8*	*8*	*8*
No. Lanes	*2*		*2*		*2*		*2*	
Geometry Group	*5*		*5*		*5*		*5*	
Duration, T	*1.00*							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns	*1.0*	*0.0*	*0.0*	*0.0*	*0.1*	*0.0*	*1.0*	*0.0*
Prop. Right-Turns	*0.0*	*0.1*	*0.0*	*1.0*	*0.0*	*0.0*	*0.0*	*0.2*
Prop. Heavy Vehicle								
hLT-adj	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*
hRT-adj	*-0.7*	*-0.7*	*-0.7*	*-0.7*	*-0.7*	*-0.7*	*-0.7*	*-0.7*
hHV-adj	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*
hadj, computed	*6.26*	*6.26*	*6.26*	*6.26*	*6.26*	*6.26*	*6.26*	*6.26*

Departure Headway and Service Time

hd, initial value	*3.20*	*3.20*	*3.20*	*3.20*	*3.20*	*3.20*	*3.20*	*3.20*
x, initial	*0.12*	*0.06*	*0.02*	*0.07*	*0.06*	*0.07*	*0.06*	*0.15*
hd, final value	*6.26*	*6.26*	*6.26*	*6.26*	*6.26*	*6.26*	*6.26*	*6.26*
x, final value	*0.23*	*0.10*	*0.03*	*0.11*	*0.12*	*0.13*	*0.11*	*0.25*
Move-up time, m	*2.3*		*2.3*		*2.3*		*2.3*	
Service Time	*4.0*	*3.4*	*4.0*	*3.4*	*4.0*	*3.4*	*4.0*	*3.4*

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity	*385*	*312*	*271*	*328*	*322*	*330*	*314*	*414*
Delay	*10.87*	*9.01*	*8.84*	*8.57*	*9.23*	*9.24*	*9.59*	*10.01*
LOS	*B*	*A*	*A*	*A*	*A*	*A*	*A*	*B*
Approach: Delay	*10.29*		*8.63*		*9.24*		*9.89*	
LOS	*B*		*A*		*A*		*A*	
Intersection Delay	*9.67*							
Intersection LOS	*A*							

ALL-WAY STOP CONTROL ANALYSIS

General Information		Site Information	
Analyst	*Greg*	Intersection	*Madison St. @ Avenue 58*
Agency/Co.	*Endo Engineering*	Jurisdiction	*La Quinta*
Date Performed	*5/2/2006*	Analysis Year	*Year 2008 W/ Project*
Analysis Time Period	*AM Peak Hour*		

Project ID *TM 34642*

East/West Street: *Avenue 58* | North/South Street: *Madison Street*

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume	95	11	2	7	52	29
%Thrus Left Lane	50			50		

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume	6	86	0	61	123	78
%Thrus Left Lane	42			50		

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	*L*	*TR*	*LT*	*R*	*LT*	*TR*	*L*	*TR*
PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Flow Rate	*95*	*13*	*59*	*29*	*42*	*50*	*61*	*201*
% Heavy Vehicles	*8*	*8*	*8*	*8*	*8*	*8*	*8*	*8*
No. Lanes	*2*		*2*		*2*		*2*	
Geometry Group	*5*		*5*		*5*		*5*	
Duration, T	*1.00*							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns	*1.0*	*0.0*	*0.1*	*0.0*	*0.1*	*0.0*	*1.0*	*0.0*
Prop. Right-Turns	*0.0*	*0.2*	*0.0*	*1.0*	*0.0*	*0.0*	*0.0*	*0.4*
Prop. Heavy Vehicle								
hLT-adj	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*
hRT-adj	*-0.7*	*-0.7*	*-0.7*	*-0.7*	*-0.7*	*-0.7*	*-0.7*	*-0.7*
hHV-adj	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*
hadj, computed	*6.12*	*6.12*	*6.12*	*6.12*	*6.12*	*6.12*	*6.12*	*6.12*

Departure Headway and Service Time

hd, initial value	*3.20*	*3.20*	*3.20*	*3.20*	*3.20*	*3.20*	*3.20*	*3.20*
x, initial	*0.08*	*0.01*	*0.05*	*0.03*	*0.04*	*0.04*	*0.05*	*0.18*
hd, final value	*6.12*	*6.12*	*6.12*	*6.12*	*6.12*	*6.12*	*6.12*	*6.12*
x, final value	*0.16*	*0.02*	*0.09*	*0.04*	*0.06*	*0.08*	*0.10*	*0.28*
Move-up time, m	*2.3*		*2.3*		*2.3*		*2.3*	
Service Time	*3.8*	*3.2*	*3.8*	*3.2*	*3.8*	*3.2*	*3.8*	*3.2*

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity	*345*	*263*	*309*	*279*	*292*	*300*	*311*	*451*
Delay	*10.00*	*8.33*	*9.01*	*7.86*	*8.61*	*8.60*	*9.12*	*9.66*
LOS	*B*	*A*	*A*	*A*	*A*	*A*	*A*	*A*
Approach: Delay	*9.80*		*8.63*		*8.60*		*9.54*	
LOS	*A*		*A*		*A*		*A*	
Intersection Delay	*9.29*							
Intersection LOS	*A*							

ALL-WAY STOP CONTROL ANALYSIS

General Information		Site Information	
Analyst	*Greg*	Intersection	*Madison St. @ Avenue 58*
Agency/Co.	*Endo Engineering*	Jurisdiction	*La Quinta*
Date Performed	*5/2/2006*	Analysis Year	*Year 2008 W/ Project*
Analysis Time Period	*PM Peak Hour*		

Project ID *TM 34642*

East/West Street: *Avenue 58* | North/South Street: *Madison Street*

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume	135	56	6	1	20	78
%Thrus Left Lane	50			50		

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume	7	143	2	64	127	37
%Thrus Left Lane	46			50		

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	L	TR	LT	R	LT	TR	L	TR
PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flow Rate	135	62	21	78	72	80	64	164
% Heavy Vehicles	8	8	8	8	8	8	8	8
No. Lanes	2		2		2		2	
Geometry Group	5		5		5		5	
Duration, T	1.00							

Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
Prop. Left-Turns	1.0	0.0	0.0	0.0	0.1	0.0	1.0	0.0
Prop. Right-Turns	0.0	0.1	0.0	1.0	0.0	0.0	0.0	0.2
Prop. Heavy Vehicle								
hLT-adj	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
hRT-adj	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7
hHV-adj	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
hadj, computed	6.26	6.26	6.26	6.26	6.26	6.26	6.26	6.26

Departure Headway and Service Time

	Eastbound		Westbound		Northbound		Southbound	
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.12	0.06	0.02	0.07	0.06	0.07	0.06	0.15
hd, final value	6.26	6.26	6.26	6.26	6.26	6.26	6.26	6.26
x, final value	0.23	0.10	0.03	0.11	0.12	0.13	0.11	0.25
Move-up time, m	2.3		2.3		2.3		2.3	
Service Time	4.0	3.4	4.0	3.4	4.0	3.4	4.0	3.4

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity	385	312	271	328	322	330	314	414
Delay	10.87	9.01	8.84	8.57	9.23	9.24	9.59	10.01
LOS	B	A	A	A	A	A	A	B
Approach: Delay	10.29		8.63		9.24		9.89	
LOS	B		A		A		A	
Intersection Delay	9.67							
Intersection LOS	A							

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*Greg*	Intersection	*East GR Access @ Avenue 54*
Agency/Co.	*Endo Engineering*	Jurisdiction	*La Quinta*
Date Performed	*7/11/2006*	Analysis Year	*Year 2008 No Project*
Analysis Time Period	*AM Peak Hour*		

Project Description	*TM 34642*
East/West Street: *Avenue 54*	North/South Street: *East Griffin Ranch Access*
Intersection Orientation: *East-West*	Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*0*	*206*	*16*	*9*	*196*	*0*
Peak-hour factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate (veh/h)	*0*	*206*	*16*	*9*	*196*	*0*
Proportion of heavy vehicles, P_{HV}	*0*	--	--	*8*	--	--
Median type	*Two Way Left Turn Lane*					
RT Channelized?			*0*			*0*
Lanes	*0*	*2*	*1*	*1*	*2*	*0*
Configuration		*T*	*R*	*L*	*T*	
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*48*	*0*	*27*	*0*	*0*	*0*
Peak-hour factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate (veh/h)	*48*	*0*	*27*	*0*	*0*	*0*
Proportion of heavy vehicles, P_{HV}	*8*	*0*	*8*	*0*	*0*	*0*
Percent grade (%)		*0*			*0*	
Flared approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized?			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Control Delay, Queue Length, Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*L*		*LR*				
Volume, v (vph)		*9*		*75*				
Capacity, c_m (vph)		*1302*		*735*				
v/c ratio		*0.01*		*0.10*				
Queue length (95%)		*0.02*		*0.34*				
Control Delay (s/veh)		*7.8*		*10.5*				
LOS		*A*		*B*				
Approach delay (s/veh)	--	--	*10.5*					
Approach LOS	--	--	*B*					

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*Greg*	Intersection	*East GR Access @ Avenue 54*
Agency/Co.	*Endo Engineering*	Jurisdiction	*La Quinta*
Date Performed	*7/11/2006*	Analysis Year	*Year 2008 No Project*
Analysis Time Period	*PM Peak Hour*		

Project Description	*TM 34642*
East/West Street: *Avenue 54*	North/South Street: *East Griffin Ranch Site Access*
Intersection Orientation: *East-West*	Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*0*	*293*	*53*	*30*	*204*	*0*
Peak-hour factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate (veh/h)	*0*	*293*	*53*	*30*	*204*	*0*
Proportion of heavy vehicles, P_{HV}	*0*	--	--	*8*	--	--
Median type	*Two Way Left Turn Lane*					
RT Channelized?			*0*			*0*
Lanes	*0*	*2*	*1*	*1*	*2*	*0*
Configuration		*T*	*R*	*L*	*T*	
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	*7*	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*31*	*0*	*18*	*0*	*0*	*0*
Peak-hour factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate (veh/h)	*31*	*0*	*18*	*0*	*0*	*0*
Proportion of heavy vehicles, P_{HV}	*8*	*0*	*8*	*0*	*0*	*0*
Percent grade (%)		*0*			*0*	
Flared approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized?			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Control Delay, Queue Length, Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*L*		*LR*				
Volume, v (vph)		*30*		*49*				
Capacity, c_m (vph)		*1168*		*654*				
v/c ratio		*0.03*		*0.07*				
Queue length (95%)		*0.08*		*0.24*				
Control Delay (s/veh)		*8.2*		*11.0*				
LOS		*A*		*B*				
Approach delay (s/veh)	--	--		*11.0*				
Approach LOS	--	--		*B*				

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*Greg*	Intersection	*East GR Access @ Avenue 54*
Agency/Co.	*Endo Engineering*	Jurisdiction	*La Quinta*
Date Performed	*11/9/2006*	Analysis Year	*Year 2008 W/ Project*
Analysis Time Period	*AM Peak Hour*		

Project Description *TM 34642*

East/West Street: *Avenue 54*	North/South Street: *East Griffin Ranch Access*
Intersection Orientation: *East-West*	Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*0*	*208*	*23*	*12*	*202*	*0*
Peak-hour factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate (veh/h)	*0*	*208*	*23*	*12*	*202*	*0*
Proportion of heavy vehicles, P_{HV}	*0*	--	--	*8*	--	--
Median type	*Two Way Left Turn Lane*					
RT Channelized?			*0*			*0*
Lanes	*0*	*2*	*1*	*1*	*2*	*0*
Configuration		*T*	*R*	*L*	*T*	
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*70*	*0*	*35*	*0*	*0*	*0*
Peak-hour factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate (veh/h)	*70*	*0*	*35*	*0*	*0*	*0*
Proportion of heavy vehicles, P_{HV}	*8*	*0*	*8*	*0*	*0*	*0*
Percent grade (%)		*0*			*0*	
Flared approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized?			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Control Delay, Queue Length, Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*L*		*LR*				
Volume, v (vph)		*12*		*105*				
Capacity, c_m (vph)		*1291*		*722*				
v/c ratio		*0.01*		*0.15*				
Queue length (95%)		*0.03*		*0.51*				
Control Delay (s/veh)		*7.8*		*10.8*				
LOS		*A*		*B*				
Approach delay (s/veh)	--	--		*10.8*				
Approach LOS	--	--		*B*				

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*Greg*	Intersection	*East GR Access @ Avenue 54*
Agency/Co.	*Endo Engineering*	Jurisdiction	*La Quinta*
Date Performed	*11/9/2006*	Analysis Year	*Year 2008 W/ Project*
Analysis Time Period	*PM Peak Hour*		

Project Description	*TM 34642*
East/West Street:	*Avenue 54*
North/South Street:	*East Griffin Ranch Site Access*
Intersection Orientation:	*East-West*
Study Period (hrs):	*1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*0*	*299*	*77*	*39*	*208*	*0*
Peak-hour factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate (veh/h)	*0*	*299*	*77*	*39*	*208*	*0*
Proportion of heavy vehicles, P_{HV}	*0*	--	--	*8*	--	--
Median type	*Two Way Left Turn Lane*					
RT Channelized?			*0*			*0*
Lanes	*0*	*2*	*1*	*1*	*2*	*0*
Configuration		*T*	*R*	*L*	*T*	
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*45*	*0*	*23*	*0*	*0*	*0*
Peak-hour factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate (veh/h)	*45*	*0*	*23*	*0*	*0*	*0*
Proportion of heavy vehicles, P_{HV}	*8*	*0*	*8*	*0*	*0*	*0*
Percent grade (%)		*0*			*0*	
Flared approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized?			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Control Delay, Queue Length, Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*L*		*LR*				
Volume, v (vph)		*39*		*68*				
Capacity, c_m (vph)		*1137*		*632*				
v/c ratio		*0.03*		*0.11*				
Queue length (95%)		*0.11*		*0.36*				
Control Delay (s/veh)		*8.3*		*11.4*				
LOS		*A*		*B*				
Approach delay (s/veh)	--	--	*11.4*					
Approach LOS	--	--	*B*					

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*Greg*	Intersection	*Monroe Street @ Site Access*
Agency/Co.	*Endo Engineering*	Jurisdiction	*La Quinta*
Date Performed	*11/9/2006*	Analysis Year	*Year 2008 W/ Project*
Analysis Time Period	*AM Peak Hour*		

Project Description	*TM 34642*
East/West Street:	*Site Access*
Intersection Orientation:	*North-South*
North/South Street:	*Monroe Street*
Study Period (hrs):	*1.00*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*1*	*173*	*0*	*0*	*251*	*7*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR	*1*	*173*	*0*	*0*	*251*	*7*
Percent Heavy Vehicles	*8*	--	--	*0*	--	--
Median Type	*Raised curb*					
RT Channelized			*0*			*0*
Lanes	*1*	*1*	*0*	*0*	*2*	*1*
Configuration	*L*	*T*			*T*	*R*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*0*	*0*	*21*	*0*	*3*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR	*0*	*0*	*0*	*21*	*0*	*3*
Percent Heavy Vehicles	*8*	*8*	*0*	*0*	*8*	*8*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*						*LR*	
v (vph)	*1*						*24*	
C (m) (vph)	*1261*						*647*	
v/c	*0.00*						*0.04*	
95% queue length	*0.00*						*0.12*	
Control Delay	*7.9*						*10.8*	
LOS	*A*						*B*	
Approach Delay	--	--				*10.8*		
Approach LOS	--	--				*B*		

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*Greg*	Intersection	*Monroe Street @ Site Access*
Agency/Co.	*Endo Engineering*	Jurisdiction	*La Quinta*
Date Performed	*11/9/2006*	Analysis Year	*Year 2008 W/ Project*
Analysis Time Period	*PM Peak Hour*		

Project Description *TM 34642*

East/West Street: *Site Access*	North/South Street: *Monroe Street*
Intersection Orientation: *North-South*	Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*4*	*357*	*0*	*0*	*225*	*24*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR	*4*	*357*	*0*	*0*	*225*	*24*
Percent Heavy Vehicles	*8*	--	--	*0*	--	--
Median Type	*Raised curb*					
RT Channelized			*0*			*0*
Lanes	*1*	*1*	*0*	*0*	*2*	*1*
Configuration	*L*	*T*			*T*	*R*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*0*	*0*	*14*	*0*	*2*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR	*0*	*0*	*0*	*14*	*0*	*2*
Percent Heavy Vehicles	*8*	*8*	*0*	*0*	*8*	*8*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*						*LR*	
v (vph)	*4*						*16*	
C (m) (vph)	*1271*						*562*	
v/c	*0.00*						*0.03*	
95% queue length	*0.01*						*0.09*	
Control Delay	*7.8*						*11:6*	
LOS	*A*						*B*	
Approach Delay	--	--					*11.6*	
Approach LOS	--	--					*B*	

Appendix B
Highway Capacity Manual
Signalized Intersection Methodology

The *Highway Capacity Manual* (HCM 2000) signalized intersection capacity and level of service methodology addresses the capacity and level of service of intersection approach land groups as well as the level of service of the intersection as a whole. The analysis is undertaken in terms of the ratio of demand flow rate to capacity (V/C ratio) for individual movements during a peak 15-minute interval and the composite V/C ratio for the sum of critical movements or lane groups within the intersection. The level of service is determined based upon average control delay per vehicle, as shown in Table B-2 below.

Table B-2
2000 HCM Signalized Intersection LOS Criteria

Level of Service	Traffic Flow Characteristics	Avg. Control Delay (Seconds/Vehicle)
A	Extremely favorable progression with very low control delay. Most vehicles arrive during the green phase. Many do not stop.	≤ 10
B	Good progression, short cycle lengths or both. More vehicles stop than with LOS A, causing higher levels of average delay.	> 10 and ≤ 20
C	Satisfactory operation with fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear. Cycle failure occurs when a given green phase does not serve queued vehicles and overflow occurs. A significant number of vehicles stop but many pass through without stopping.	> 20 and ≤ 35
D	Tolerable delay, where congestion becomes more noticeable and many vehicles stop. Individual cycle failures are noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high V/C ratios.	> 35 and ≤ 55
E	Unstable flow with poor progression, frequent cycle failures, long cycle lengths and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered the limit of acceptable delay by many agencies.	> 55 and ≤ 80
F	Oversaturation with arrival flow rates exceeding the capacity of intersection lane groups and many individual cycle failures. Poor progression and long cycle lengths as well as high V/C ratios and high delay values occur at LOS F. Considered unacceptable to most drivers.	> 80

Source: *Highway Capacity Manual,* Special Report 209, Transportation Research Board, Fourth Edition, 2000; pp. 10-16.

Typically, the movement with the longest average control delay or worst LOS defines the overall intersection evaluation; however, this may be tempered by engineering judgment, when conditions warrant it. Although the level of service is primarily related to the average control delay (which is given in terms of seconds of delay per vehicle by minor movement and intersection approach) other performance measures for TWSC and AWSC intersections include: delay to major street through vehicles, queue length, and volume-to-capacity ratio.

For example, left-turning motorists from the minor leg may experience delay consistent with LOS F operation, while the major street through movements experience little or no delay and LOS A. Since the major street through movements represent the majority of the traffic demand at the intersection, the overall intersection LOS would most likely be LOS A or LOS B. If the delay for the traffic on the minor leg is reduced by installing a signal, the overall intersection delay will increase, as large numbers of vehicles on the major street through moves are delayed by the signal. The increase in total delay may lower the overall intersection LOS. For this reason, excessive delays on the minor legs of TWSC intersections are only mitigated with a signal when the minor street can no longer effectively provide access, as evidenced by signal warrants being met. This eliminates situations where a large number of motorists are delayed for the benefit of only a few cars.

The delay equations can predict delays greater than 50 seconds per vehicle for minor-street movements under very low-volume conditions on the minor street (less than 25 vph). For a typical four-lane major street with random arrivals carrying 15,000 to 20,000 ADT, the delay equation will predict more than 50 seconds of delay (LOS F) for urban TWSC intersections that allow minor-street left-turn movements, regardless of the volume turning left. Even with LOS F, most low-volume minor street approaches would not meet warrants for signalization. Therefore, use of the HCM LOS thresholds to determine the design adequacy of TWSC intersections should be undertaken with caution.

Capacity Considerations

A two-way left-turn lane (TWLTL) or a raised or striped median allows a minor stream vehicle to cross one major traffic stream at a time. It results in two-stage gap acceptance, provided that sufficient storage space is available in the median or TWLTL to store vehicles. It reduces the critical gap (the minimum gap that would be acceptable to a driver on the minor approach) in the stream of traffic on the major street and increases the capacity of the minor approach.

A flared approach on the minor street increases the capacity of the minor street approach as it allows more vehicles to be served simultaneously. Increasing the length of the flared pavement improves access to the additional lane. Since vehicles seeking to use the flared lane may be delayed by queued vehicles blocking access to the additional lane, flaring does not increase the capacity of the approach to the extent that an additional lane would.

The presence of traffic signals on the major street upstream from the intersection will produce platoons and affect the capacity of the minor street approaches if the signal is located within 0.25 mile of the intersection. Four flow regimes can result: no platoons, platoons from the left only, platoons from the right only and platoons from both directions.

A movement can sometimes have a poorer level of service if it is given a separate lane than if it shares a lane with another movement. Left-turn movements will generally experience longer control delays than other movements because of the nature and priority of the movement. If left turns are placed in a shared lane, the control delay for vehicles in that lane may be less than the control delay for left turns in a separate lane. However, if delay for all vehicles is considered, providing separate lanes will result in lower total delay.

SHORT REPORT

General Information

Analyst	*Greg*
Agency or Co.	*Endo Engineering*
Date Performed	*5/3/2006*
Time Period	*AM Peak Hour*

Site Information

Intersection	*Madison Street @ Avenue 52*
Area Type	*All other areas*
Jurisdiction	*La Quinta*
Analysis Year	*Year 2008 No Project*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Num. of Lanes	*1*	*2*	*0*	*1*	*1*	*0*	*1*	*1*	*1*	*1*	*1*	*0*
Lane group	*L*	*TR*		*L*	*TR*		*L*	*T*	*R*	*L*	*TR*	
Volume (vph)	*39*	*277*	*227*	*125*	*304*	*27*	*135*	*225*	*100*	*21*	*295*	*33*
% Heavy veh	*0*	*8*	*8*	*8*	*8*	*0*	*8*	*0*	*8*	*0*	*0*	*0*
PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Actuated (P/A)	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*
Startup lost time	*2.0*	*2.0*		*2.0*	*2.0*		*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	
Ext. eff. green	*2.0*	*2.0*		*2.0*	*2.0*		*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	
Arrival type	*3*	*3*		*3*	*3*		*3*	*3*	*3*	*3*	*3*	
Unit Extension	*3.0*	*3.0*		*3.0*	*3.0*		*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	
Ped/Bike/RTOR Volume	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Lane Width	*12.0*	*12.0*		*12.0*	*12.0*		*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	
Parking/Grade/Parking	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*
Parking/hr												
Bus stops/hr	*0*	*0*		*0*	*0*		*0*	*0*	*0*	*0*	*0*	
Unit Extension	*3.0*	*3.0*		*3.0*	*3.0*		*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	

Phasing	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = *28.0*	G =	G =	G =	G = *24.0*	G =	G =	G =
	Y = *4*	Y =	Y =	Y =	Y = *4*	Y =	Y =	Y =

Duration of Analysis (hrs) = *1.00* | Cycle Length C = *60.0*

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adj. flow rate	*39*	*504*		*125*	*331*		*135*	*225*	*100*	*21*	*328*	
Lane group cap.	*441*	*1457*		*363*	*816*		*330*	*760*	*1495*	*447*	*748*	
v/c ratio	*0.09*	*0.35*		*0.34*	*0.41*		*0.41*	*0.30*	*0.07*	*0.05*	*0.44*	
Green ratio	*0.47*	*0.47*		*0.47*	*0.47*		*0.40*	*0.40*	*1.00*	*0.40*	*0.40*	
Unif. delay d1	*8.9*	*10.2*		*10.2*	*10.5*		*12.9*	*12.3*	*0.0*	*11.0*	*13.1*	
Delay factor k	*0.11*	*0.11*		*0.11*	*0.11*		*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	
Increm. delay d2	*0.1*	*0.1*		*0.6*	*0.3*		*0.8*	*0.2*	*0.0*	*0.0*	*0.4*	
PF factor	*1.000*	*1.000*		*1.000*	*1.000*		*1.000*	*1.000*	*0.950*	*1.000*	*1.000*	
Control delay	*9.0*	*10.3*		*10.7*	*10.9*		*13.7*	*12.5*	*0.0*	*11.1*	*13.5*	
Lane group LOS	*A*	*B*		*B*	*B*		*B*	*B*	*A*	*B*	*B*	
Apprch. delay	*10.2*			*10.8*			*10.1*			*13.4*		
Approach LOS	*B*			*B*			*B*			*B*		
Intersec. delay	*11.0*			Intersection LOS						*B*		

SHORT REPORT

General Information

Analyst	*Greg*
Agency or Co.	*Endo Engineering*
Date Performed	*5/3/2006*
Time Period	*PM Peak Hour*

Site Information

Intersection	*Madison Street @ Avenue 52*
Area Type	*All other areas*
Jurisdiction	*La Quinta*
Analysis Year	*Year 2008 No Project*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Num. of Lanes	*1*	*2*	*0*	*1*	*1*	*0*	*1*	*1*	*1*	*1*	*1*	*0*
Lane group	*L*	*TR*		*L*	*TR*		*L*	*T*	*R*	*L*	*TR*	
Volume (vph)	*63*	*446*	*173*	*109*	*273*	*31*	*226*	*433*	*145*	*30*	*324*	*20*
% Heavy veh	*0*	*8*	*8*	*8*	*8*	*0*	*8*	*0*	*8*	*0*	*0*	*0*
PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Actuated (P/A)	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*
Startup lost time	*2.0*	*2.0*		*2.0*	*2.0*		*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	
Ext. eff. green	*2.0*	*2.0*		*2.0*	*2.0*		*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	
Arrival type	*3*	*3*		*3*	*3*		*3*	*3*	*3*	*3*	*3*	
Unit Extension	*3.0*	*3.0*		*3.0*	*3.0*		*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	
Ped/Bike/RTOR Volume	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Lane Width	*12.0*	*12.0*		*12.0*	*12.0*		*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	
Parking/Grade/Parking	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*
Parking/hr												
Bus stops/hr	*0*	*0*		*0*	*0*		*0*	*0*	*0*	*0*	*0*	
Unit Extension	*3.0*	*3.0*		*3.0*	*3.0*		*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	

Phasing	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = *23.0*	G =	G =	G =	G = *29.0*	G =	G =	G =
	Y = *4*	Y =	Y =	Y =	Y = *4*	Y =	Y =	Y =

Duration of Analysis (hrs) = *1.00* — Cycle Length C = *60.0*

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adj. flow rate	*63*	*619*		*109*	*304*		*226*	*433*	*145*	*30*	*344*	
Lane group cap.	*355*	*1230*		*231*	*669*		*417*	*918*	*1495*	*375*	*910*	
v/c ratio	*0.18*	*0.50*		*0.47*	*0.45*		*0.54*	*0.47*	*0.10*	*0.08*	*0.38*	
Green ratio	*0.38*	*0.38*		*0.38*	*0.38*		*0.48*	*0.48*	*1.00*	*0.48*	*0.48*	
Unif. delay d1	*12.2*	*14.1*		*13.9*	*13.8*		*10.9*	*10.4*	*0.0*	*8.3*	*9.8*	
Delay factor k	*0.11*	*0.11*		*0.11*	*0.11*		*0.14*	*0.11*	*0.11*	*0.11*	*0.11*	
Increm. delay d2	*0.2*	*0.3*		*1.5*	*0.5*		*1.5*	*0.4*	*0.0*	*0.1*	*0.3*	
PF factor	*1.000*	*1.000*		*1.000*	*1.000*		*1.000*	*1.000*	*0.950*	*1.000*	*1.000*	
Control delay	*12.5*	*14.5*		*15.5*	*14.3*		*12.3*	*10.8*	*0.0*	*8.4*	*10.1*	
Lane group LOS	*B*	*B*		*B*	*B*		*B*	*B*	*A*	*A*	*B*	
Apprch. delay	*14.3*			*14.6*			*9.3*			*9.9*		
Approach LOS	*B*			*B*			*A*			*A*		
Intersec. delay	*11.8*			Intersection LOS						*B*		

SHORT REPORT

General Information

Analyst	*Greg*
Agency or Co.	*Endo Engineering*
Date Performed	*5/3/2006*
Time Period	*AM Peak Hour*

Site Information

Intersection	*Madison Street @ Avenue 52*
Area Type	*All other areas*
Jurisdiction	*La Quinta*
Analysis Year	*Year 2008 W/ Project*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Num. of Lanes	*1*	*2*	*0*	*1*	*1*	*0*	*1*	*1*	*1*	*1*	*1*	*0*
Lane group	*L*	*TR*		*L*	*TR*		*L*	*T*	*R*	*L*	*TR*	
Volume (vph)	*39*	*277*	*228*	*125*	*304*	*27*	*138*	*233*	*100*	*21*	*297*	*33*
% Heavy veh	*0*	*8*	*8*	*8*	*8*	*0*	*8*	*0*	*8*	*0*	*0*	*0*
PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Actuated (P/A)	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*
Startup lost time	*2.0*	*2.0*		*2.0*	*2.0*		*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	
Ext. eff. green	*2.0*	*2.0*		*2.0*	*2.0*		*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	
Arrival type	*3*	*3*		*3*	*3*		*3*	*3*	*3*	*3*	*3*	
Unit Extension	*3.0*	*3.0*		*3.0*	*3.0*		*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	
Ped/Bike/RTOR Volume	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Lane Width	*12.0*	*12.0*		*12.0*	*12.0*		*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	
Parking/Grade/Parking	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*
Parking/hr												
Bus stops/hr	*0*	*0*		*0*	*0*		*0*	*0*	*0*	*0*	*0*	
Unit Extension	*3.0*	*3.0*		*3.0*	*3.0*		*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	

Phasing	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = *28.0*	G =	G =	G =	G = *24.0*	G =	G =	G =
	Y = *4*	Y =	Y =	Y =	Y = *4*	Y =	Y =	Y =

Duration of Analysis (hrs) = *1.00* — Cycle Length C = *60.0*

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adj. flow rate	*39*	*505*		*125*	*331*		*138*	*233*	*100*	*21*	*330*	
Lane group cap.	*441*	*1457*		*362*	*816*		*328*	*760*	*1495*	*440*	*749*	
v/c ratio	*0.09*	*0.35*		*0.35*	*0.41*		*0.42*	*0.31*	*0.07*	*0.05*	*0.44*	
Green ratio	*0.47*	*0.47*		*0.47*	*0.47*		*0.40*	*0.40*	*1.00*	*0.40*	*0.40*	
Unif. delay d1	*8.9*	*10.2*		*10.2*	*10.5*		*13.0*	*12.3*	*0.0*	*11.0*	*13.1*	
Delay factor k	*0.11*	*0.11*		*0.11*	*0.11*		*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	
Increm. delay d2	*0.1*	*0.1*		*0.6*	*0.3*		*0.9*	*0.2*	*0.0*	*0.0*	*0.4*	
PF factor	*1.000*	*1.000*		*1.000*	*1.000*		*1.000*	*1.000*	*0.950*	*1.000*	*1.000*	
Control delay	*9.0*	*10.3*		*10.7*	*10.9*		*13.9*	*12.5*	*0.0*	*11.1*	*13.5*	
Lane group LOS	*A*	*B*		*B*	*B*		*B*	*B*	*A*	*B*	*B*	
Apprch. delay	*10.2*			*10.8*			*10.3*			*13.4*		
Approach LOS	*B*			*B*			*B*			*B*		
Intersec. delay	*11.0*			Intersection LOS						*B*		

SHORT REPORT

General Information

Analyst	*Greg*
Agency or Co.	*Endo Engineering*
Date Performed	*5/3/2006*
Time Period	*PM Peak Hour*

Site Information

Intersection	*Madison Street @ Avenue 52*
Area Type	*All other areas*
Jurisdiction	*La Quinta*
Analysis Year	*Year 2008 W/ Project*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Num. of Lanes	*1*	*2*	*0*	*1*	*1*	*0*	*1*	*1*	*1*	*1*	*1*	*0*
Lane group	*L*	*TR*		*L*	*TR*		*L*	*T*	*R*	*L*	*TR*	
Volume (vph)	*63*	*446*	*177*	*109*	*273*	*31*	*228*	*438*	*145*	*30*	*332*	*20*
% Heavy veh	*0*	*8*	*8*	*8*	*8*	*0*	*8*	*0*	*8*	*0*	*0*	*0*
PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Actuated (P/A)	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*
Startup lost time	*2.0*	*2.0*		*2.0*	*2.0*		*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	
Ext. eff. green	*2.0*	*2.0*		*2.0*	*2.0*		*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	
Arrival type	*3*	*3*		*3*	*3*		*3*	*3*	*3*	*3*	*3*	
Unit Extension	*3.0*	*3.0*		*3.0*	*3.0*		*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	
Ped/Bike/RTOR Volume	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Lane Width	*12.0*	*12.0*		*12.0*	*12.0*		*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	
Parking/Grade/Parking	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*
Parking/hr												
Bus stops/hr	*0*	*0*		*0*	*0*		*0*	*0*	*0*	*0*	*0*	
Unit Extension	*3.0*	*3.0*		*3.0*	*3.0*		*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	

Phasing	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = *24.0*	G =	G =	G =	G = *28.0*	G =	G =	G =
	Y = *4*	Y =	Y =	Y =	Y = *4*	Y =	Y =	Y =

Duration of Analysis (hrs) = *1.00* — Cycle Length C = *60.0*

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adj. flow rate	*63*	*623*		*109*	*304*		*228*	*438*	*145*	*30*	*352*	
Lane group cap.	*376*	*1283*		*244*	*698*		*391*	*887*	*1495*	*350*	*879*	
v/c ratio	*0.17*	*0.49*		*0.45*	*0.44*		*0.58*	*0.49*	*0.10*	*0.09*	*0.40*	
Green ratio	*0.40*	*0.40*		*0.40*	*0.40*		*0.47*	*0.47*	*1.00*	*0.47*	*0.47*	
Unif. delay d1	*11.6*	*13.4*		*13.1*	*13.1*		*11.7*	*11.1*	*0.0*	*8.9*	*10.5*	
Delay factor k	*0.11*	*0.11*		*0.11*	*0.11*		*0.17*	*0.11*	*0.11*	*0.11*	*0.11*	
Increm. delay d2	*0.2*	*0.3*		*1.3*	*0.4*		*2.2*	*0.4*	*0.0*	*0.1*	*0.3*	
PF factor	*1.000*	*1.000*		*1.000*	*1.000*		*1.000*	*1.000*	*0.950*	*1.000*	*1.000*	
Control delay	*11.8*	*13.7*		*14.5*	*13.5*		*14.0*	*11.5*	*0.0*	*9.0*	*10.8*	
Lane group LOS	*B*	*B*		*B*	*B*		*B*	*B*	*A*	*A*	*B*	
Apprch. delay	*13.5*			*13.8*			*10.2*			*10.7*		
Approach LOS	*B*			*B*			*B*			*B*		
Intersec. delay	*11.9*			Intersection LOS						*B*		

SHORT REPORT

General Information

Analyst	*Greg*
Agency or Co.	*Endo Engineering*
Date Performed	*5/4/2006*
Time Period	*AM Peak Hour*

Site Information

Intersection	*Madison Street @ Avenue 54*
Area Type	*All other areas*
Jurisdiction	*La Quinta*
Analysis Year	*Year 2008 No Project*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Num. of Lanes	*1*	*2*	*0*	*1*	*2*	*0*	*2*	*2*	*1*	*1*	*2*	*0*
Lane group	*L*	*TR*		*L*	*TR*		*L*	*T*	*R*	*L*	*TR*	
Volume (vph)	*25*	*104*	*172*	*32*	*139*	*115*	*219*	*180*	*16*	*117*	*273*	*48*
% Heavy veh	*0*	*8*	*8*	*8*	*8*	*0*	*8*	*0*	*8*	*0*	*0*	*0*
PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Actuated (P/A)	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*
Startup lost time	*2.0*	*2.0*		*2.0*	*2.0*		*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	
Ext. eff. green	*2.0*	*2.0*		*2.0*	*2.0*		*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	
Arrival type	*3*	*3*		*3*	*3*		*3*	*3*	*3*	*3*	*3*	
Unit Extension	*3.0*	*3.0*		*3.0*	*3.0*		*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	
Ped/Bike/RTOR Volume	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Lane Width	*12.0*	*12.0*		*12.0*	*12.0*		*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	
Parking/Grade/Parking	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*
Parking/hr												
Bus stops/hr	*0*	*0*		*0*	*0*		*0*	*0*	*0*	*0*	*0*	
Unit Extension	*3.0*	*3.0*		*3.0*	*3.0*		*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	

Phasing	EW Perm	02	03	04	Excl. Left	Thru & RT	07	08
Timing	G = *21.0*	G =	G =	G =	G = *11.0*	G = *16.0*	G =	G =
	Y = *4*	Y =	Y =	Y =	Y = *4*	Y = *4*	Y =	Y =

Duration of Analysis (hrs) = *1.00*

Cycle Length C = *60.0*

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adj. flow rate	*25*	*276*		*32*	*254*		*219*	*180*	*16*	*117*	*321*	
Lane group cap.	*395*	*1063*		*359*	*1130*		*595*	*965*	*1022*	*331*	*943*	
v/c ratio	*0.06*	*0.26*		*0.09*	*0.22*		*0.37*	*0.19*	*0.02*	*0.35*	*0.34*	
Green ratio	*0.35*	*0.35*		*0.35*	*0.35*		*0.18*	*0.27*	*0.68*	*0.18*	*0.27*	
Unif. delay d1	*13.0*	*13.9*		*13.1*	*13.8*		*21.5*	*17.0*	*3.0*	*21.4*	*17.7*	
Delay factor k	*0.11*	*0.11*		*0.11*	*0.11*		*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	
Increm. delay d2	*0.1*	*0.1*		*0.1*	*0.1*		*0.4*	*0.1*	*0.0*	*0.7*	*0.2*	
PF factor	*1.000*	*1.000*		*1.000*	*1.000*		*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	
Control delay	*13.0*	*14.1*		*13.2*	*13.9*		*21.8*	*17.1*	*3.0*	*22.0*	*18.0*	
Lane group LOS	*B*	*B*		*B*	*B*		*C*	*B*	*A*	*C*	*B*	
Apprch. delay	*14.0*			*13.8*			*19.0*			*19.1*		
Approach LOS	*B*			*B*			*B*			*B*		
Intersec. delay	*16.9*			Intersection LOS						*B*		

SHORT REPORT

General Information

Analyst	*Greg*
Agency or Co.	*Endo Engineering*
Date Performed	*5/4/2006*
Time Period	*PM Peak Hour*

Site Information

Intersection	*Madison Street @ Avenue 54*
Area Type	*All other areas*
Jurisdiction	*La Quinta*
Analysis Year	*Year 2008 No Project*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Num. of Lanes	*1*	*2*	*0*	*1*	*2*	*0*	*2*	*2*	*1*	*1*	*2*	*0*
Lane group	*L*	*TR*		*L*	*TR*		*L*	*T*	*R*	*L*	*TR*	
Volume (vph)	*59*	*86*	*170*	*18*	*70*	*179*	*283*	*330*	*76*	*183*	*260*	*37*
% Heavy veh	*0*	*8*	*8*	*8*	*8*	*0*	*8*	*0*	*8*	*0*	*0*	*0*
PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Actuated (P/A)	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*
Startup lost time	*2.0*	*2.0*		*2.0*	*2.0*		*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	
Ext. eff. green	*2.0*	*2.0*		*2.0*	*2.0*		*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	
Arrival type	*3*	*3*		*3*	*3*		*3*	*3*	*3*	*3*	*3*	
Unit Extension	*3.0*	*3.0*		*3.0*	*3.0*		*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	
Ped/Bike/RTOR Volume	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Lane Width	*12.0*	*12.0*		*12.0*	*12.0*		*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	
Parking/Grade/Parking	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*
Parking/hr												
Bus stops/hr	*0*	*0*		*0*	*0*		*0*	*0*	*0*	*0*	*0*	
Unit Extension	*3.0*	*3.0*		*3.0*	*3.0*		*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	

Phasing	EW Perm	02	03	04	Excl. Left	Thru & RT	07	08
Timing	G = *19.0*	G =	G =	G =	G = *15.0*	G = *14.0*	G =	G =
	Y = *4*	Y =	Y =	Y =	Y = *4*	Y = *4*	Y =	Y =
Duration of Analysis (hrs) = *1.00*						Cycle Length C = *60.0*		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adj. flow rate	*59*	*256*		*18*	*249*		*283*	*330*	*76*	*183*	*297*	
Lane group cap.	*360*	*955*		*331*	*1000*		*812*	*844*	*922*	*451*	*828*	
v/c ratio	*0.16*	*0.27*		*0.05*	*0.25*		*0.35*	*0.39*	*0.08*	*0.41*	*0.36*	
Green ratio	*0.32*	*0.32*		*0.32*	*0.32*		*0.25*	*0.23*	*0.62*	*0.25*	*0.23*	
Unif. delay d1	*14.8*	*15.3*		*14.3*	*15.2*		*18.5*	*19.4*	*4.6*	*18.8*	*19.2*	
Delay factor k	*0.11*	*0.11*		*0.11*	*0.11*		*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	
Increm. delay d2	*0.2*	*0.2*		*0.1*	*0.1*		*0.3*	*0.3*	*0.0*	*0.6*	*0.3*	
PF factor	*1.000*	*1.000*		*1.000*	*1.000*		*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	
Control delay	*15.0*	*15.5*		*14.3*	*15.3*		*18.7*	*19.7*	*4.7*	*19.4*	*19.5*	
Lane group LOS	*B*	*B*		*B*	*B*		*B*	*B*	*A*	*B*	*B*	
Apprch. delay	*15.4*			*15.3*			*17.7*			*19.5*		
Approach LOS	*B*			*B*			*B*			*B*		
Intersec. delay	*17.4*			Intersection LOS						*B*		

SHORT REPORT

General Information		Site Information	
Analyst	*Greg*	Intersection	*Madison Street @ Avenue 54*
Agency or Co.	*Endo Engineering*	Area Type	*All other areas*
Date Performed	*5/3/2006*	Jurisdiction	*La Quinta*
Time Period	*AM Peak Hour*	Analysis Year	*Year 2008 W/ Project*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Num. of Lanes	*1*	*2*	*0*	*1*	*2*	*0*	*2*	*2*	*1*	*1*	*2*	*0*
Lane group	*L*	*TR*		*L*	*TR*		*L*	*T*	*R*	*L*	*TR*	
Volume (vph)	*25*	*110*	*172*	*33*	*156*	*126*	*219*	*180*	*16*	*121*	*273*	*48*
% Heavy veh	*0*	*8*	*8*	*8*	*8*	*0*	*8*	*0*	*8*	*0*	*0*	*0*
PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Actuated (P/A)	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*
Startup lost time	*2.0*	*2.0*		*2.0*	*2.0*		*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	
Ext. eff. green	*2.0*	*2.0*		*2.0*	*2.0*		*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	
Arrival type	*3*	*3*		*3*	*3*		*3*	*3*	*3*	*3*	*3*	
Unit Extension	*3.0*	*3.0*		*3.0*	*3.0*		*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	
Ped/Bike/RTOR Volume	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Lane Width	*12.0*	*12.0*		*12.0*	*12.0*		*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	
Parking/Grade/Parking	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*
Parking/hr												
Bus stops/hr	*0*	*0*		*0*	*0*		*0*	*0*	*0*	*0*	*0*	
Unit Extension	*3.0*	*3.0*		*3.0*	*3.0*		*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	

Phasing	EW Perm	02	03	04	Excl. Left	Thru & RT	07	08
Timing	G = *22.0*	G =	G =	G =	G = *11.0*	G = *15.0*	G =	G =
	Y = *4*	Y =	Y =	Y =	Y = *4*	Y = *4*	Y =	Y =

Duration of Analysis (hrs) = *1.00*

Cycle Length C = *60.0*

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adj. flow rate	*25*	*282*		*33*	*282*		*219*	*180*	*16*	*121*	*321*	
Lane group cap.	*403*	*1116*		*374*	*1185*		*595*	*905*	*1022*	*331*	*884*	
v/c ratio	*0.06*	*0.25*		*0.09*	*0.24*		*0.37*	*0.20*	*0.02*	*0.37*	*0.36*	
Green ratio	*0.37*	*0.37*		*0.37*	*0.37*		*0.18*	*0.25*	*0.68*	*0.18*	*0.25*	
Unif. delay d1	*12.3*	*13.3*		*12.4*	*13.2*		*21.5*	*17.8*	*3.0*	*21.4*	*18.6*	
Delay factor k	*0.11*	*0.11*		*0.11*	*0.11*		*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	
Increm. delay d2	*0.1*	*0.1*		*0.1*	*0.1*		*0.4*	*0.1*	*0.0*	*0.7*	*0.3*	
PF factor	*1.000*	*1.000*		*1.000*	*1.000*		*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	
Control delay	*12.4*	*13.4*		*12.5*	*13.3*		*21.8*	*17.9*	*3.0*	*22.1*	*18.8*	
Lane group LOS	*B*	*B*		*B*	*B*		*C*	*B*	*A*	*C*	*B*	
Apprch. delay	*13.3*			*13.2*			*19.4*			*19.7*		
Approach LOS	*B*			*B*			*B*			*B*		
Intersec. delay	*16.9*			Intersection LOS						*B*		

SHORT REPORT

General Information

Analyst	*Greg*
Agency or Co.	*Endo Engineering*
Date Performed	*5/4/2006*
Time Period	*PM Peak Hour*

Site Information

Intersection	*Madison Street @ Avenue 54*
Area Type	*All other areas*
Jurisdiction	*La Quinta*
Analysis Year	*Year 2008 W/ Project*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Num. of Lanes	*1*	*2*	*0*	*1*	*2*	*0*	*2*	*2*	*1*	*1*	*2*	*0*
Lane group	*L*	*TR*		*L*	*TR*		*L*	*T*	*R*	*L*	*TR*	
Volume (vph)	*59*	*104*	*170*	*18*	*81*	*186*	*283*	*330*	*77*	*195*	*260*	*37*
% Heavy veh	*0*	*8*	*8*	*8*	*8*	*0*	*8*	*0*	*8*	*0*	*0*	*0*
PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Actuated (P/A)	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*
Startup lost time	*2.0*	*2.0*		*2.0*	*2.0*		*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	
Ext. eff. green	*2.0*	*2.0*		*2.0*	*2.0*		*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	
Arrival type	*3*	*3*		*3*	*3*		*3*	*3*	*3*	*3*	*3*	
Unit Extension	*3.0*	*3.0*		*3.0*	*3.0*		*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	
Ped/Bike/RTOR Volume	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Lane Width	*12.0*	*12.0*		*12.0*	*12.0*		*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	
Parking/Grade/Parking	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*
Parking/hr												
Bus stops/hr	*0*	*0*		*0*	*0*		*0*	*0*	*0*	*0*	*0*	
Unit Extension	*3.0*	*3.0*		*3.0*	*3.0*		*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	

Phasing	EW Perm	02	03	04	Excl. Left	Thru & RT	07	08
Timing	G = *17.0*	G =	G =	G =	G = *15.0*	G = *16.0*	G =	G =
	Y = *4*	Y =	Y =	Y =	Y = *4*	Y = *4*	Y =	Y =
Duration of Analysis (hrs) = *1.00*						Cycle Length C = *60.0*		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adj. flow rate	*59*	*274*		*18*	*267*		*283*	*330*	*77*	*195*	*297*	
Lane group cap.	*316*	*861*		*291*	*896*		*812*	*965*	*922*	*451*	*947*	
v/c ratio	*0.19*	*0.32*		*0.06*	*0.30*		*0.35*	*0.34*	*0.08*	*0.43*	*0.31*	
Green ratio	*0.28*	*0.28*		*0.28*	*0.28*		*0.25*	*0.27*	*0.62*	*0.25*	*0.27*	
Unif. delay d1	*16.3*	*16.9*		*15.7*	*16.8*		*18.5*	*17.8*	*4.6*	*18.9*	*17.6*	
Delay factor k	*0.11*	*0.11*		*0.11*	*0.11*		*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	
Increm. delay d2	*0.3*	*0.2*		*0.1*	*0.2*		*0.3*	*0.2*	*0.0*	*0.7*	*0.2*	
PF factor	*1.000*	*1.000*		*1.000*	*1.000*		*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	
Control delay	*16.6*	*17.1*		*15.8*	*17.0*		*18.7*	*18.0*	*4.7*	*19.6*	*17.8*	
Lane group LOS	*B*	*B*		*B*	*B*		*B*	*B*	*A*	*B*	*B*	
Apprch. delay	*17.0*			*16.9*			*16.8*			*18.5*		
Approach LOS	*B*			*B*			*B*			*B*		
Intersec. delay	*17.3*			Intersection LOS						*B*		

Appendix C

TRAFFIC SIGNAL WARRANTS

Appendix C
MUTCD Traffic Control Signal Warrants

The Federal Highway Administration (FHWA) publishes the MUTCD, which contains all national design, application, and placement standards for traffic control devices. The purpose of these devices, which includes signs, signals, and pavement markings, is to promote highway safety, efficiency, and uniformity so that traffic can move efficiently on the Nation's streets and highways. All traffic control devices nationwide must conform to the MUTCD. Although the FHWA adopts the standards, the individual State and local highway agencies, not the FHWA, select, install, operate, and maintain traffic control devices on all roadways (including the Interstate and the U.S. numbered systems) nationwide.

A traffic signal assigns intersection right-of-way and promotes the orderly movement of pedestrians and vehicles. However, improper signal controls sometimes lead to intentional violations, unnecessary delays and traffic diversion to less desirable routes.

The selection and use of traffic control signals should be based on an engineering study of roadway, traffic, and other conditions. A careful analysis of traffic operations, pedestrian and bicyclist needs, and other factors at a large number of signalized and unsignalized intersections, coupled with engineering judgment, has provided a series of signal warrants detailed in the *MUTCD* (2003 Edition)[1] and the *MUTCD 2003 California Supplement* that define the minimum conditions under which installing traffic control signals might be justified.

In order to justify the installation of a traffic control signal, a traffic control signal needs study is required that demonstrates delay, congestion, approach conditions, driver confusion, future land use, physical characteristics of the location, the factors contained in the traffic signal warrants, and/or other evidence of the need for right-of-way assignment beyond that which could be provided by a STOP sign. The *MUTCD* (2003 Edition) and the *MUTCD 2003 California Supplement* (May 20, 2004) provide guidance and signal warrant sheets for use in developing traffic control signal needs studies.

The following are warrants for installation of a traffic control signal.

Warrant 1 - Eight Hour Vehicular Volume (including minimum vehicle volume and interruption of continuous traffic warrants)

Warrant 2 - Four-Hour Vehicular Volume

Warrant 3 - Peak Hour

Warrant 4 - Pedestrian Volume

Warrant 5 - School Crossing

Warrant 6 - Coordinated Signal System

Warrant 7 - Crash Warrant

Warrant 8 - Roadway Network

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1. U.S. Department of Transportation, Federal Highway Administration, *Manual on Uniform Traffic Control Devices for Streets and Highways,* (2003 Edition), Part 4.

Disadvantages of Signalization

Improperly designed or installed traffic signals, those that are poorly maintained, and unjustified traffic signals can result in one or more of the following disadvantages:

- Excessive delay;
- Excessive disobedience of the signal indications;
- Increased use of less adequate routes (as road users attempt to avoid traffic signals); and
- Significant increases in the frequency of collisions (especially rear-end collisions).

Advantages of Signalization

Traffic signals that are properly designed, located, operated, and maintained have one or more of the following advantages:

- They provide for the orderly movement of traffic.
- The increase the traffic handling capacity of the intersection (if the signal operational parameters are reviewed and updated on a regular basis and when land use changes have occurred).
- They reduce the frequency and severity of certain types of crashes (especially right- angle collisions).
- They are coordinated to provide for continuous or nearly continuous movement of traffic at a definite speed along a given route under favorable conditions.
- They interrupt heavy traffic at intervals to permit other traffic (vehicular or pedestrian) to cross.

Roadway Capacity Considerations

Delays at signalized intersections can often be reduced by widening the major roadway, the minor street, or both. In urban areas, the effect of widening can be achieved by eliminating parking on intersection approaches. It is desirable to have at least two lanes for moving traffic on each approach to a signalized intersection.

Additional width on the departure side of the intersection as well as on the approach side, will sometimes be needed to clear traffic through the intersection effectively. However, before an intersection is widened, the additional green time pedestrians need to cross the widened roadway should be considered to determine if it will exceed the green time saved through improved vehicular flow.

Alternatives to Signalization

Since vehicular delay and the frequency of some types of collisions can be greater under traffic signal control than under STOP sign control, consideration should be given to providing alternatives to traffic signals even if one or more of the signal warrants has been satisfied.[2]

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2. U.S. Department of Transportation, Federal Highway Administration, *Manual on Uniform Traffic Control Devices for Streets and Highways,* (2003 Edition), Part 4B.04.

Alternatives for consideration may include:

- Improving the sight distance at the intersection by moving the stop line(s) and making other changes;
- Adding one or more lanes on a minor street approach to reduce the number of vehicles per lane on the approach;
- Channelizing vehicular movements;
- Installing roadway lighting if a disproportionate number of collisions occur at night;
- Restricting one or more turning movements, perhaps on a time-of-day basis, if alternative routes are available;
- Installing multiway STOP sign control if the warrant is satisfied;
- Installing a roundabout intersection;
- Installing warning signs on the major street regarding the approaching intersection;
- Installing flashing beacons or warning signs in advance of the intersection or at the intersection; and
- Installing measures designed to reduce speeds on the approaches.

General Notes

1. The satisfaction of a traffic signal warrant or warrants shall not, in itself, require the installation of a traffic control signal.

2. A traffic control signal should not be installed unless an engineering study indicates that installing a traffic control signal will improve the overall safety and/or operation of the intersection.

3. A signal should not be installed if it will seriously disrupt progressive traffic flow.

4. Bicycles may be counted as either vehicles or pedestrians for signal warrant analysis.

5. Pedestrian volume counts should be taken on each crosswalk during the same periods as the vehicular counts and during the hours of highest pedestrian volume.

6. Pedestrian delay time should be quantified for at least two 30-minute peak pedestrian delay periods of an average weekday (or like periods of a Saturday or Sunday).

7. The posted or statutory speed limit or the 85th-percentile speed on the uncontrolled approaches to the location should be noted.

8. The distance to the nearest traffic control signals should be noted.

9. Where feasible, the queue length on stop-controlled approaches should be noted.

10. For signal warrant analysis, a location with a wide median (even if the median is greater than 30 feet) should be considered as one intersection.

11. For detailed guidance regarding the application of signal warrants refer to the *MUTCD* (2003 Edition) Section 4C.01 page 4C-2.

Peak Hour Volume Warrant

Intersection: Madison Street @ Avenue 52
Major Approach: 2+ Lanes Minor Approach: 1 Lane Rural Warrants

Approach	AM Pk Hr Existing	2008 Ambient	2008+ Project		PM Pk Hr Existing	2008 Ambient	2008+ Project
Eastbound	365	543	544		449	681	685
Westbound	350	457	457		265	413	413
North/Southbound	88	460	471		228	804	811
Meets 1-Hr. Warrant	No	Yes	Yes		Yes	Yes	Yes

Intersection: Jefferson Street @ Avenue 54
Major Approach: 2+ Lanes Minor Approach: 2+ Lanes Rural Warrants

Approach	AM Pk Hr Existing	2008 Ambient	2008+ Project		PM Pk Hr Existing	2008 Ambient	2008+ Project
Northbound	218	247	247		317	370	370
Southbound	721	599	604		664	562	581
Westbound	423	404	420		585	384	395
Meets 1-Hr. Warrant	Yes	Yes	Yes		Yes	Yes	Yes

Intersection: Madison Street @ Avenue 54
Major Approach: 2+ Lanes Minor Approach: 2+ Lanes Rural Warrants

Approach	AM Pk Hr Existing	2008 Ambient	2008+ Project		PM Pk Hr Existing	2008 Ambient	2008+ Project
Major E/N	467	416	416		439	689	689
Major W/S	153	438	442		129	480	492
Minor N/E	306	301	314		530	315	333
Meets 1-Hr. Warrant	Yes	Yes	Yes		Yes	Yes	Yes

Intersection: Monroe Street @ Avenue 54
Major Approach: 1 Lane Minor Approach: 1 Lane Rural Warrants

Approach	AM Pk Hr Existing	2008 Ambient	2008+ Project		PM Pk Hr Existing	2008 Ambient	2008+ Project
Northbound	130	172	174		269	356	359
Southbound	223	278	284		232	315	336
East/Westbound	158	233	259		205	312	334
Meets 1-Hr. Warrant	No	No	No		Yes	Yes	Yes

Intersection: Madison Street @ Avenue 58
Major Approach: 2+ Lanes Minor Approach: 2+ Lanes Rural Warrants

Approach	AM Pk Hr Existing	2008 Ambient	2008+ Project		PM Pk Hr Existing	2008 Ambient	2008+ Project
Northbound	70	92	92		108	152	153
Southbound	203	261	262		180	228	228
Eastbound	91	108	108		166	197	197
Meets 1-Hr. Warrant	No	No	No		No	No	No

Intersection: East Site Access @ Avenue 54
Major Approach: 2+ Lanes Minor Approach: 1 Lane Rural Warrants

Approach	AM Pk Hr Existing	2008 Ambient	2008+ Project		PM Pk Hr Existing	2008 Ambient	2008+ Project
Eastbound	119	222	232		205	346	377
Westbound	137	205	209		106	234	247
Northbound	0	75	126		0	49	83
Meets 1-Hr. Warrant	No	No	No		No	No	No

Planning Level Daily Traffic Signal Warrants

(Based on Estimated Average Daily Traffic)

Urban ☐ Rural ☐ Major Street Speed Limit _____	**Minimum Requirements Estimated ADT**			
1. Minimum Vehicular Satisified ☐ Not Satisified ☐	Vehicles per day on major street (total of both approaches)		Vehicles per day on higher-volume minor-street approach (one direction only)	
Number of lanes for moving traffic on each approach Major Street / Minor Street	Urban	Rural	Urban	Rural
1 ..... 1	8,000	5,600	2,400	1,680
2 or more 1	9,600	6,720	2,400	1,680
2 or more ..... 2 or more	9,600	6,720	3,200	2,240
1 ..... 2 or more	8,000	5,600	3,200	2,240
2. Interruption of Continuous Traffic Satisified ☐ Not Satisified ☐	Vehicles per day on major street (total of both approaches)		Vehicles per day on higher-volume minor-street approach (one direction only)	
Number of lanes for moving traffic on each approach Major Street / Minor Street	Urban	Rural	Urban	Rural
1 ..... 1	12,000	8,400	1,200	850
2 or more 1	14,400	10,080	1,200	850
2 or more ..... 2 or more	14,400	10,080	1,600	1,120
1 ..... 2 or more	12,000	8,400	1,600	1,120
3. Combination of Warrants Satisfied ☐ Not Satisifed ☐ No one warrant satisified but following warrants fulfilled 80% or more: ☐ 1 ☐ 2	2 Warrants		2 Warrants	

Source: "Traffic Manual" State of California Revised 4/20/77

Notes: 1. Left turn movements from the major street may be included with minor street volumes if a separate signal phase is to be provided for the left-turn movement.
2. To be used only for NEW INTERSECTIONS or other locations where actual traffic volumes cannot be counted.

Appendix D

TRAFFIC GLOSSARY

Appendix D - Traffic Glossary

AASHTO -- American Association of State Highway and Transportation Officials.

Access point -- An intersection, driveway, or opening on the right-hand side of a roadway. An entry on the opposite side of a roadway or a median opening also can be considered as an access point if it is expected to influence traffic flow significantly in the direction of interest.

All-way stop controlled -- An intersection with stop signs at all approaches. The driver's decision to proceed is based on the rules of the road (e.g., the driver on the right has the right-of-way) and also on the traffic conditions of the other approaches.

Annual Average Daily Traffic (AADT) -- The total volume passing a point or segment of a highway facility in both directions for one year divided by the number of days in the year.

Average Daily Traffic (ADT) -- The total volume passing a point or segment of a highway facility in both directions on an average day during a specified interval (which can be the peak month or weekdays etc.).

Average Day -- A day representing traffic volumes normally and repeatedly found at a location, typically a weekday when volumes are influenced by employment or a weekend day when volumes are influenced by entertainment or recreation.

Approach -- All lanes of traffic moving towards an intersection of a midblock location from one direction including any adjacent parking lanes.

Arterial -- Signalized streets that serve primarily through traffic and provide access to abutting properties as a secondary function, having signal spacing of 2 miles or less and turn movements at intersections that usually do not exceed 20 percent of total traffic.

Average approach delay -- Average stopped-time delay at a signalized intersection plus average time lost because of deceleration to and acceleration from a stop, generally estimated as 1.3 times the average stopped time delay.

Average control delay -- the total time vehicles are stopped in an intersection approach during a specified time interval divided by the volume departing from the approach during the same time period. It does not include queue follow-up time (i.e. the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position).

Average stopped-time delay -- The total time vehicles are stopped in an intersection approach or lane group during a specified time interval divided by the volume departing from the approach or lane group during the same time period, in seconds per vehicle.

Average total delay -- The total additional travel time experienced by drivers, passengers, or pedestrians as a result of control measures and interaction with other users of the facility divided by the volume departing from the corresponding cross section of the facility.

AWSC intersection -- an all-way stop-controlled intersection (which can be a three-way stop if the intersection has only three legs or a four-way stop if the intersection has four legs).

Bike lane -- A portion of a roadway that has been designated by striping, signing, and pavement markings for the preferential or exclusive use of bicycles.

Bike path -- A bikeway physically separated from motorized traffic by an open space or barrier, either within the highway right-of-way or within an independent right-of-way.

Bikeway -- Any road, path, or way that in some manner is specifically designated as being open to bicycle travel, regardless of whether such facilities are designated for the exclusive use of bicyclists or are to be shared with other vehicles.

Capacity -- The maximum rate of flow at which persons or vehicles can be reasonable expected to traverse a point or uniform segment of a lane or roadway during a specified time period under prevailing roadway, traffic, and control conditions, usually expressed as vehicles per hour or persons per hour.

Clearance lost time -- The minimum possible time interval between the departure of one bus from a bus berth and the entrance of another.

Clearance time -- The time, in seconds, between signal phases during which an intersection is not used by any traffic.

Conflicting approach -- The approach at approximately 90 degrees to the subject approach at an all-way stop-controlled (AWSC) intersection.

Conflicting traffic volume -- The volume of traffic that conflicts with a specific movement at an unsignalized intersection.

Control delay -- The component of delay that results when a control signal causes a lane group to reduce speed or to stop; it is measured by comparison with the uncontrolled condition.

CMP -- Congestion Management Program, designed to ensure that a balanced transportation system is developed which relates population growth, traffic growth and land use decisions to transportation system level of service performance standards to help reduce traffic congestion and improve air quality.

Constrained operation -- An operating conditions in a weaving area in which, because of geometric constraints, weaving vehicles are unable to occupy as large a portion of available lanes as required to achieve balanced operation.

Critical gap -- The minimum time interval between vehicles in a major traffic stream that permits side-street vehicles in a stop-controlled approach to enter the intersection under prevailing traffic and roadway conditions, in seconds.

Critical lane group -- The lane groups that have the highest flow ratio for a given signal phase.

Critical volume-to-capacity ratio -- The proportion of available intersection capacity used by vehicles in critical lane groups.

Crosswalk -- That part of a roadway at an intersection included within the connections of the lateral lines of the sidewalks on opposite sides of the highway measured from the curbs (or in the absence of curbs, from the edges of the traversable roadway) and in the absence of a sidewalk on one side of the roadway, the part of a roadway included within the extension of the lateral lines of the sidewalk at right angles to the centerline. Any portion of a roadway at an intersection or elsewhere distinctly indicated as a pedestrian crossing by lines on the surface, which may be supplemented by a contrasting pavement texture, style or color.

Cycle -- Any complete sequence of signal indications.

Cycle length -- The total time required for one complete sequence of signal indications.

Deceleration lane -- A paved auxiliary lane, including tapered areas, allowing vehicles leaving the through-traffic lane of the roadway to decelerate.

Delay -- Additional travel time experienced by a driver, passenger, or pedestrian beyond what would reasonably be desired for a given trip.

Demand volume -- The traffic volume expected to desire service past a point or segment of the highway system at some future time, or the traffic currently arriving or desiring service past such a point, usually expressed as vehicles per hour.

Effective green time -- The time allocated for a given traffic movement (green plus yellow) at a signalized intersection less the start-up and clearance lost times for the movement.

Exclusive turn lane -- A designated left- or right-turn lane or lanes used only by vehicles making those turns.

Expressway -- An arterial which increases vehicular capacity by reducing at-grade access and increased signal spacing.

Flared approach -- A shared right-turn lane that allows right-turning vehicles to complete their movement while other vehicles are occupying the lane.

FHWA -- Federal Highway Administration.

Free flow speed -- (1) The theoretical speed of traffic when density is zero, that is, when no vehicles are present; (2) the average speed of vehicles over an arterial segment not close to signalized intersections under conditions of low volume.

Gap acceptance -- The process by which a minor-street vehicle accepts an available gap to maneuver.

Green time -- The actual length of the green indication for a given movement at a signalized intersection.

HCM -- Highway Capacity Manual.

HCS -- Highway Capacity Software implementing the Highway Capacity Manual procedures.

Ideal conditions-- Characteristics for a given type of facility that are assumed to be the best possible from the point of view of capacity, that is, characteristics that if further improved would not result increased capacity.

Intersection -- The area embraced within the prolongation or connection of the lateral curb lines, or if none the lateral boundary lines of the roadways of two highways that join one another at, or approximately at right angles, or the area within which vehicles traveling on different highways that join at any other angle might come into conflict. The junction of an alley or driveway with a roadway or highway does not constitute an intersection.

Intersection delay -- The total additional travel time experienced by drivers, passengers, or pedestrians as a result of control measures and interaction with other users of the facility, divided by the volume departing from the corresponding cross section of the facility.

Interval -- The part of a signal cycle during which signal indications do not change..

ITE -- Institute of Transportation Engineers.

Level of service (LOS) -- A qualitative measure describing operational conditions within a traffic stream, generally described in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety.

Lost time -- Time during which the intersection is not effectively used by any movement; clearance lost time plus start-up lost time.

Major street -- The street not controlled by stop signs at a two-way stop-controlled intersection. The street normally carrying the higher volume of vehicular traffic.

Maximum service flow rate -- The highest 15-minute rate of flow that can be accommodated on a highway facility under ideal conditions while maintaining the operating characteristics for a stated level of service, expressed as passenger cars per hour per lane.

Minor street -- The street controlled by stop signs at a two-way stop-controlled intersection; also referred to as a side street. The street normally carrying the lower volume of vehicular traffic.

Passenger car equivalent -- The number of passenger cars that are displaced by a single heavy vehicle of a particular type under prevailing roadway, traffic, and control conditions.

Peak hour -- The hour during which the greatest number of vehicles are traveling on a given facility.

Peak hour factor -- The hourly volume during the maximum volume hour of the day divided by the peak 15-minute rate of flow within the peak hour; a measure of traffic demand fluctuation within the peak hour.

Pedestrian Clearance Time -- The time provided for a pedestrian crossing in a crosswalk, after leaving the curb or shoulder, to travel to the far side of the traveled way or to a median.

Performance measure -- A quantitative or qualitative characteristic describing the quality of service provided by a transportation facility or service.

Permitted plus protected -- Compound left-turn protection that displays the permitted phase before the protected phase.

Permitted turns -- Left or right turns at a signalized intersection that are made against an opposing or conflicting vehicular or pedestrian flow.

Phase -- The part of a signal cycle allocated to any combination of traffic movements receiving the right-of-way simultaneously during one or more intervals.

Planning analysis -- A use of capacity analysis procedures to estimate the number of lanes required by a facility in order to provide for a specified level of service based on approximate and general planning data in the early stages of project development.

Platoon -- A group of vehicles or pedestrians traveling together as a group, either voluntarily or involuntarily because of signal control, geometrics, or other factors.

Platoon -- A group of vehicles or pedestrians traveling together as a group, either voluntarily or involuntarily, because of traffic signal controls, geometrics, or other factors.

Protected turns -- Left or right turns at a signalized intersection made with no opposing or conflicting vehicular or pedestrian flow.

Queue -- A line of vehicles or persons waiting to be served by the system in which the rate of low from the front of the queue determines the average speed within the queue. Slowly moving vehicles or people joining the rear of the queue are usually considered a part of the queue. The internal queue dynamics may involve a series of starts and stops. A faster-moving line of vehicles is often referred to as a moving queue or a platoon.

Red Clearance Interval -- An optional interval that follows a yellow change interval and precedes the next conflicting green interval.

Right-of-Way Assignment -- The permitting of vehicles and/or pedestrians to proceed in a lawful manner in preference to other vehicles or pedestrians by the display of signal indications.

Roadway Network -- A geographical arrangement of intersecting roadways.

RTIP -- Regional Transportation Improvement Program is a list of transportation projects, their costs and projected funding sources, and their anticipated date of completion.

RTP -- Regional Transportation Plan is a plan adopted for the region's transit, highways, bicycle programs, commuter and inter-city rail lines.

Shared lane capacity -- The capacity of a lane at an unsignalized intersection that is shared by two or three movements, in passenger cars per hour.

Signal Coordination -- The establishment of timed relationships between adjacent traffic control signals.

Signal Phase -- the right-of-way, yellow change, and red clearance intervals in a cycle that are assigned to an independent traffic movement or combination of movements.

Signal System -- two or more traffic control signals operating in signal coordination.

Signal Timing -- the amount of time allocated for the display of a signal indication.

Signal Warrant -- a threshold condition that, if found to be satisfied as part of an engineering study, shall result in analysis of other traffic conditions or factors to determine whether a traffic control signal or other improvement is justified.

TCM -- Transportation Control Measures.

TDM -- Transportation Demand Management is a program designed to decrease the demand for peak hour commute and truck travel and increase the use of alternative transportation modes.

TIS -- Traffic Impact Study. A Congestion Management Program (TIS) analysis is required for all large projects.

Total delay -- The sum of all components of delay for any lane group, including control delay, traffic delay, geometric delay, and incident delay.

Trip-end -- one end of a trip at either the origin or the destination; i.e. each trip has two trip-ends.

Traffic -- pedestrians, bicyclists, ridden or herded animals, vehicles, streetcars, and other conveyances either singularly or together while using any highway for purposes of travel.

Traffic Control Signal -- any highway traffic signal by which traffic is alternately directed to stop and permitted to proceed.

Travel speed -- The average speed, in miles per hour, of a traffic stream computed as the length of a highway segment divided by the average travel time of the vehicles traversing the segment.

Travel time -- The average time spent by vehicles traversing a highway segment, including control delay, in seconds per vehicle or minutes per vehicle.

TSM -- Transportation Systems Management is a program to facilitate low cost traffic flow improvements like coordinating traffic signals, metering freeway ramps and incident management.

Two-way left-turn lane (TWLTL) -- The center lane on a three-lane or multi-lane highway that is used continuously for vehicles turning left in either direction of flow at mid-block locations.

Two-way stop-controlled -- The type of traffic control at an intersection where drivers on the minor street or a driver turning left from the major street wait for a gap in the major-street traffic to complete a maneuver.

Unconstrained operation -- An operating conditions in a weaving area where geometric constraints do not limit the ability of weaving vehicles to achieve balanced operation.

Unsignalized intersection -- Any intersection not controlled by traffic signals.

V/C ratio -- The ratio of demand flow rate to capacity for a traffic facility.

Volume -- The number of persons or vehicles passing a point on a lane, roadway, sidewalk etc. during some time interval, often taken to be one hour, expressed in vehicles.

VMT -- Vehicle miles traveled.

Yellow Change Interval -- the first interval following the green interval during which the yellow signal indication is displayed.

Appendix E

ENGINEERING BULLETIN NUMBER 03-08

City of La Quinta

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ENGINEERING BULLETIN # 03-08

TO: All Interested Parties

FROM: Timothy R. Jonasson, Public Works Directory/City Engineer

DATE: December 16, 2003

SUBJECT: Auxiliary Lanes and Traffic Impact Studies Required for Proposed Development Projects

This Engineering Bulletin establishes the City's policy on when auxiliary lanes and traffic impact studies will be required for proposed development projects.

AUXILIARY LANES

Auxiliary lanes shall be installed on all Primary Arterial streets, and higher order street classification according to the following criteria:

a) A left-turn deceleration lane with taper and storage length is required for any driveway with a projected peak hour left ingress turning volume greater than 25 vehicles per hour (vph). The taper length will be included within the required deceleration lane length.

b) A right-turn deceleration lane with taper and storage length is required for any driveway with a projected peak hour right ingress turning volume greater than 50 vehicles per hour (vph). The taper length will be included within the required deceleration lane length.

c) Right-turn deceleration will not generally be required on streets with more than three travel lanes in the direction of the right-turn lane.

Auxiliary lanes will also be required to meet the following criteria:

1. The minimum lane length shall be 100 feet plus taper length.
2. The right-of-way must be widened 12 feet to accommodate the 12-foot wide auxiliary lane.
3. No reductions in the width of the landscape buffer will be permitted to construct the auxiliary lane.
4. All auxiliary lanes must be contained within the development project limits.

TRAFFIC IMPACT STUDIES

All proposed development projects will be required to prepare a traffic impact study if they meet the following criteria:

1. The project is anticipated to generate 50, or more, peak hour trips;
2. The City Engineer reserves the right to require a traffic impact study when in his/her judgment the project will create potentially significant impacts to the level of service to any adjacent streets or intersections

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APPENDIX A

Deceleration Lane Length

The length of the deceleration lane is based on the following design criteria assumptions:

1. The motorist decreases his/her travel speed in the outside lane before entering the deceleration lane by 10 MPH below the posted Speed Limit for the street segment in question.

2. The motorist decelerates in the deceleration lane to a final speed of 10 MPH which is the assumed speed that the motorist turns the corner to enter the access drive.

3. The rate of deceleration is 6.5 feet per second.

Given the foregoing design criteria, please use the deceleration lane lengths in the following table.

POSTED SPEED LIMIT	DECELERATION LENGTH*	TRANSITION LENGTH
4O MPH	132 feet	120 feet
45 MPH	186 feet	120 feet
50 MPH	248 feet	150 feet
55 MPH	484 feet	150 feet

* These deceleration lengths shall apply unless there is insufficient property frontage to accommodate the required length as noted in the policy statements contained in the Engineer Bulletin.

Appendix A added 11/10/05