



City Council Staff Report

DATE: December 7, 2016 UNFINISHED BUSINESS
SUBJECT: INDIAN CANYON DRIVE TWO-WAY CONVERSION
FROM: David H. Ready, City Manager
BY: Engineering Services Department

SUMMARY:

On October 12, 2016, the City Council Subcommittee (Foat/Roberts) for the Indian Canyon Drive Improvements reviewed alternatives for conversion of Indian Canyon Drive from one-way traffic circulation to two-way traffic circulation. The Subcommittee has recommended the City Council approve Alternative No. 1, which would preserve on-street parking and provide one lane southbound, a center turn lane, and two lanes northbound. The Subcommittee requested staff to obtain proposals from its on-call engineering consultants for preparing the required designs to implement the proposed one-way to two-way traffic conversion. This action will review the recommendation of the Subcommittee, and consider proceeding with the project.

RECOMMENDATION:

1. Approve Alternative No. 1 from the Indian Canyon Drive Two-Way Conversion Study prepared by Albert Grover & Associates (September 2013) as the Preferred Alternative for conversion of Indian Canyon Drive from one-way traffic circulation to two-way traffic circulation; and
2. Provide direction to staff for further action.

BACKGROUND:

On February 20, 2013, the City Council approved an agreement with Albert Grover & Associates (AGA) to prepare a feasibility study to analyze the conversion of Indian Canyon Drive from one-way traffic circulation to two-way traffic circulation. Subsequently, in September 2013, AGA prepared a feasibility study called the *Indian Canyon Drive Two-Way Conversion Study*, (the "Study"), which evaluated four different alternatives for modifying the existing one-way traffic circulation Indian Canyon Drive between Ramon Road and Alejo Road. A copy of the Study is included as **Attachment 1**.

The four alternatives considered in the Study are summarized as follows:

Alternative 1: This alternative would convert the existing four one-way northbound traffic lanes to two-way traffic by maintaining two northbound traffic lanes, creating a continuous two-way center turn lane, and creating one southbound traffic lane. Existing parallel parking on both sides of Indian Canyon Drive would be maintained. Alternative 1 is shown in Figure 1.

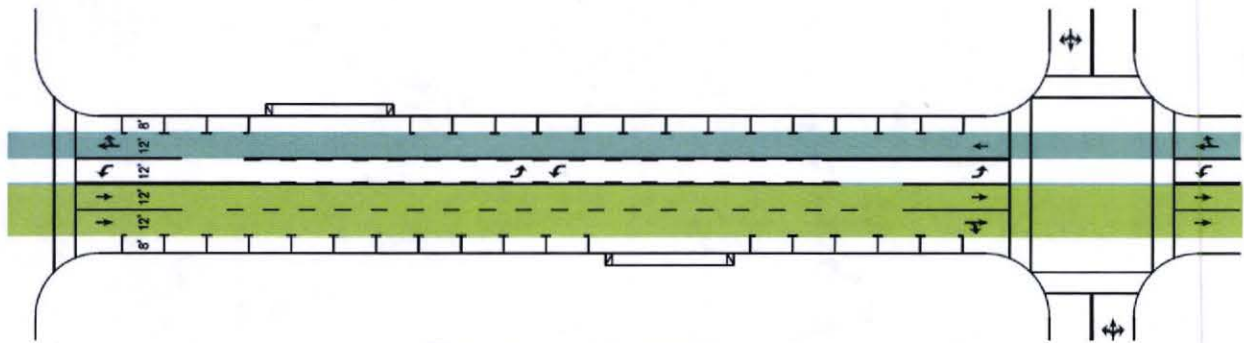


Figure 1 – Alternative No. 1

Alternative 2: This alternative would convert the existing four one-way northbound traffic lanes to two-way traffic by maintaining three northbound traffic lanes, creating a continuous two-way center turn lane, and creating one southbound traffic lane. Existing parallel parking on the west side of Indian Canyon Drive would be maintained, but existing parallel parking on the east side of Indian Canyon Drive would be eliminated (resulting in the loss of approximately 125 spaces). Alternative 2 is shown in Figure 2.

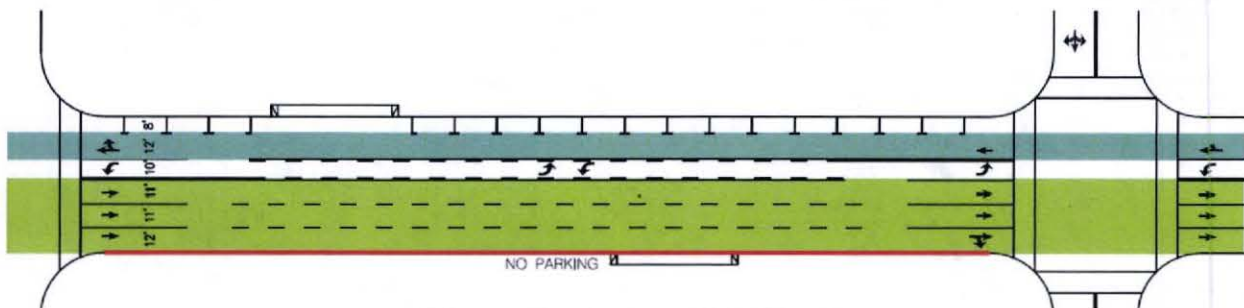


Figure 2 – Alternative No. 2

Alternative 3: This alternative would convert the existing four one-way northbound traffic lanes to two-way traffic by maintaining three northbound traffic lanes, creating a continuous two-way center turn lane, and creating one southbound traffic lane. Existing parallel parking on the west side of Indian Canyon Drive would be eliminating, (resulting in the loss of approximately 120 spaces), but existing parallel parking on the east side of Indian Canyon Drive would be maintained. Alternative 3 is shown in Figure 3.

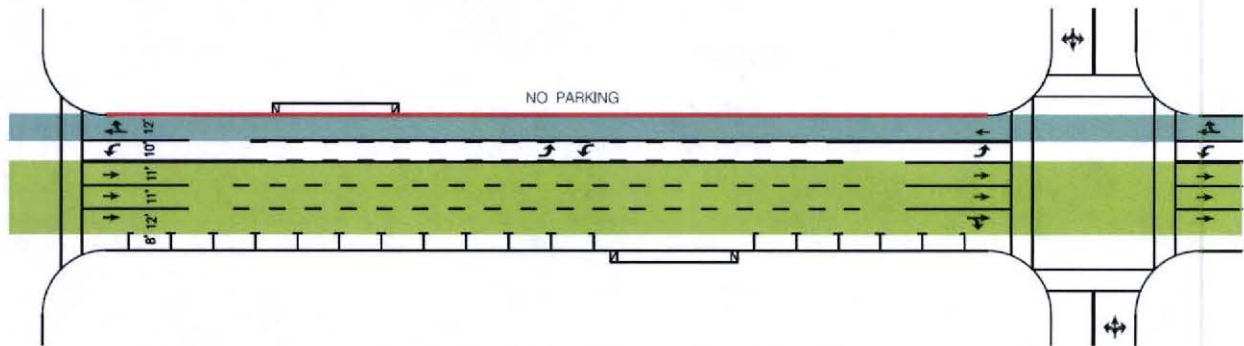


Figure 3 – Alternative No. 3

Alternative 4: This alternative maintains the one-way northbound traffic circulation, but eliminates one of the four northbound traffic lanes to allow for new diagonal parking spaces along the west side of Indian Canyon Drive, (resulting in a net increase of approximately 24 spaces for a total of 144 spaces), and maintains the existing parallel parking on the east side of Indian Canyon Drive. Alternative 4 is shown in Figure 4.



Figure 4 – Alternative No. 4

As part of the Study, AGA completed traffic analyses of each of the four studied alternatives, including intersection and arterial Level of Service ("LOS") analyses for existing and future traffic volumes. As stated in the Study, the analysis results indicate that with existing and future traffic volumes, all of the studied alternatives will operate at an acceptable LOS during the peak hours.

The Study also evaluate traffic speed along the Indian Canyon Drive arterial, and determined that traffic speeds for Alternative 1 will be slightly slower than the other alternatives as Alternative 1 only provides two northbound lanes while the other alternatives provide three northbound lanes. The Study determined that Alternative 2 would result in higher northbound traffic speeds than Alternative 3 and 4 because parking is not provided on the east side of the street for Alternative 2, but is provided for Alternatives 3 and 4. Since parking is not provided on the west side of Indian Canyon Drive in Alternative 3, the southbound movement for Alternative 3 would result in higher traffic speeds than Alternative 2. The Study concluded that the existing one-way traffic circulation allows for higher traffic speeds than any of the four studied alternatives.

On December 4, 2013, staff presented the Study to the City Council, and the City Council considered the analysis, but deferred any action. At that time, a City Council Subcommittee was appointed consisting of Councilmember Foat and former Councilmember Hutcheson.

In April 2014, the City Council Subcommittee met with staff and various stakeholders, and at that time recommended a Preferred Alternative consisting of a revised Alternative 3 eliminating on-street parking along the west side of Indian Canyon Drive and providing a Class II bike lane, one southbound traffic lane, a continuous two-way center turn lane, two northbound traffic lanes, and maintaining on-street parking on the east side of Indian Canyon Drive.

On September 18, 2014, the City Council Subcommittee met to review the Preferred Alternative for the two-way conversion, and confirmed the recommendation with direction to schedule for formal City Council consideration.

On October 1, 2014, the City Council Subcommittee's recommendation was presented to the City Council for consideration, and at that time formal action was deferred, and staff was directed to consider developing further alternatives for converting Indian Canyon Drive to two-way traffic circulation in ways that would enhance commercial businesses.

More recently, at the May 18, 2016, City Council meeting, Councilmember Foat requested an update of the Indian Canyon Drive Two-Way Conversion Project. At that time, staff provided the Study and background information to the current City Council Subcommittee (Foat/Roberts) for further evaluation and direction to staff.

On October 12, 2016, the City Council Subcommittee met with staff to review the Study and the four studied alternatives, and the Subcommittee determined that Alternative 1 was the Preferred Alternative, and directed staff to obtain proposals from the City's on-call engineering firms to prepare the required designs to implement the proposed one-way to two-way traffic conversion. The Subcommittee recommended that the two-way conversion extend south of Ramon Road to Camino Parocela, and also recommended that the conceptual design for Alternative 1 incorporate curb pop-outs at the intersections to improve pedestrian safety, and include some raised landscaped median islands to improve the aesthetics along Indian Canyon Drive.

As directed by the City Council Subcommittee, staff solicited proposals from its on-call engineering firms, and has received three proposals. Staff has reviewed the proposals, and confirmed the scopes of work provided by each firm are consistent with the City's request. On the basis that all of these firms were previously solicited by the City through an open and competitive qualifications-based process, staff considers the proposed budget and fee, and schedule, of each of the firm's proposals in determining a recommendation for City Council consideration. A summary of the three proposals received is included in Table 1.

Company	Fee	Project Schedule
Albert A. Webb & Associates	\$194,850	9 Months
Willdan	\$358,670	9.5 Months
Harris & Associates	\$413,918	10 Months

Table 1

Staff recommends that the City Council consider the recommendation from the City Council Subcommittee to identify Alternative 1 from the Study as the Preferred Alternative.

If it is the direction of the City Council to proceed with engineering design of the two-way conversion, staff recommends the City Council authorize issuance of a purchase order to Albert A. Webb & Associates in the amount of \$194,850 to prepare conceptual plans and construction drawings to implement Alternative 1, which includes extending the two-way conversion south of Ramon Road to Camino Parocela, curb pop-outs, and raised landscaped median islands as recommended by the City Council Subcommittee.

ENVIRONMENTAL IMPACT:

Section 21084 of the California Public Resources Code requires Guidelines for Implementation of the California Environmental Quality Act ("CEQA"). The Guidelines are required to include a list of classes of projects which have been determined not to have a significant effect on the environment and which are exempt from the provisions of CEQA. In response to that mandate, the Secretary for Resources identified classes of projects that do not have a significant effect on the environment, and are declared to

be categorically exempt from the requirement for the preparation of environmental documents. In accordance with Section 15301 "Existing Facilities," Class 1 projects consist of the operation, repair, maintenance, permitting, leasing, licensing, or minor alteration of existing highways and streets, sidewalks, gutters, bicycle and pedestrian trails, and similar facilities; therefore, the Indian Canyon Drive Two-Way Conversion Project, City Project No. 13-13, is considered categorically exempt from CEQA, and a Notice of Exemption will be prepared and filed with the Riverside County Clerk.

FISCAL IMPACT:

The City Council has not yet appropriated funding to implement the conversion of Indian Canyon Drive to two-way traffic circulation. The Study prepared by AGA identified a preliminary cost estimate range of \$1,400,000 to \$1,750,000 as shown in the following Table:

Table 8: Indian Canyon Drive Two-Way Conversion Cost Estimate

Description	Construction Cost (\$)	Design Cost (\$)	Total (\$)
I Intersection and Signal Modification Costs			
Indian Canyon Road @ Ramon Road	50,000 to 80,000	8,500	58,500 to 88,500
Indian Canyon Road @ Baristo Road	50,000 to 80,000	8,500	58,500 to 88,500
Indian Canyon Road @ Arenas Road	50,000 to 80,000	8,500	58,500 to 88,500
Indian Canyon Road @ La Plaza	60,000 to 90,000	8,500	68,500 to 98,500
Indian Canyon Road @ Tahquitz Canyon Way	60,000 to 90,000	8,500	68,500 to 98,500
Indian Canyon Road @ Andreas Road	50,000 to 80,000	8,500	58,500 to 88,500
Indian Canyon Road @ Amado Road	50,000 to 80,000	8,500	58,500 to 88,500
Indian Canyon Road @ Alejo Road	100,000 to 130,000	18,500	118,500 to 148,500
II Restriping Costs	50,000 to 70,000	10,000	60,000 to 80,000
III Signal Interconnect and Coordination Costs	150,000	50,000	200,000
Subtotals:	670,000 to 930,000	138,000	808,000 to 1,068,000

Administration/Contract Management (12%): 96,960 to 128,160

Plan Checking/Inspections (12%): 96,960 to 128,160

Miscellaneous/Contingencies (15%): 121,200 to 160,200

Total: 1,123,120 to 1,484,520

Rounded: 1,200,000 to 1,500,000

Replacing Marbelite Poles for Eastbound & Northbound Traffic: 200,000 to 250,000

Grand Total: 1,400,000 to 1,750,000

However, AGA's preliminary estimate did not include extending the two-way conversion south of Ramon Road to Camino Parocela, or the cost for curb pop-outs at each intersection, and raised landscaped median islands.

In its recent request for proposals from the City's on-call engineering firms, staff requested that the firms review AGA's preliminary estimate, and provide updated estimates for budgeting purposes. The range of construction estimates is identified in the following Table.

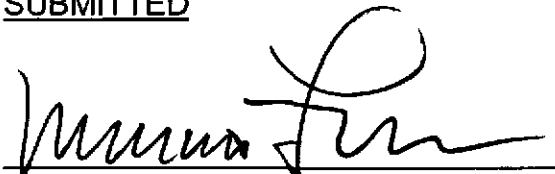
Company	Estimate
Albert A. Webb & Associates	\$2,180,720
Willdan	\$3,729,798
Harris & Associates	\$2,429,880

For budgeting purposes, staff recommends the City Council consider the average of the three estimates, approximately \$2,750,000 as the cost for converting Indian Canyon Drive to two-way traffic circulation.

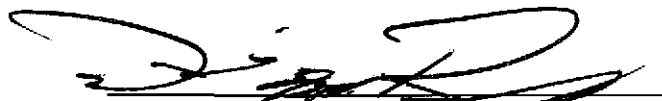
Alternatives for funding this project are to allocate budget from General Fund reserves, or to forward to the Measure J Commission to consider as a project to be funded by the Measure J Fund.

To the extent the City Council directs staff to proceed with engineering design, the City Council may consider authorizing approval of a Purchase Order in the amount of \$194,850 to Albert A. Webb & Associates, with funding appropriated from General Fund reserves.

SUBMITTED



Marcus L. Fuller, MPA, P.E., P.L.S.
Assistant City Manager/City Engineer



David H. Ready, Esq., Ph.D.
City Manager

Attachment:

1. Indian Canyon Drive Two-Way Conversion Study

Attachment 1



INDIAN CANYON DRIVE TWO-WAY CONVERSION STUDY

SUBMITTED TO
CITY OF PALM SPRINGS

SEPTEMBER 2013

SUBMITTED BY

ALBERT
GROVER &
ASSOCIATES
GA

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EXECUTIVE SUMMARY

The City of Palm Springs has periodically been asked by Downtown business owners and/or operators to study the feasibility of converting Indian Canyon Drive from one-way to two-way operation in order to enhance access and circulation to businesses within the Downtown area. In 1998, Albert Grover & Associates (AGA), a municipal and transportation engineering consulting firm, prepared a traffic study which illustrated the feasibility of providing two-way traffic flow on Indian Canyon Drive between Camino Parocela to the south and Granvia Valmonte to the north. During the past 15 years a portion of Indian Canyon Drive (from Granvia Valmonte to Alejo Road) has actually been converted to provide two-way traffic flow. Additionally, two previously Stop controlled intersections along Indian Canyon Drive (La Plaza and Baristo Road) have been signalized. In light of the forthcoming redevelopment of the Palm Springs Promenade, the City has requested that AGA conduct an updated traffic engineering study to re-assess the feasibility of converting Indian Canyon Drive from one-way operation to two-way operation in the Downtown Palm Springs area. Because of available street widths, only Indian Canyon Drive is being evaluated. Palm Canyon Drive is too narrow for similar consideration.

In developing the two-way alternatives, it was important to consider the immediate as well as the long-term impacts of two-way traffic on Indian Canyon Drive; to minimize the costs associated with the conversion; and to provide improved accessibility to downtown businesses. Professional judgment indicates that, for all two-way conversion alternatives, a two-way left turn lane should be included to enhance access to businesses; that the signals on Indian Canyon Drive need to be linked together and synchronized to reduce delays and queuing; and that the section at the south end of Indian Canyon Drive between Ramon Road and Camino Parocela be retained as a one-way street to avoid the traffic control complexities of a potential five-legged intersection of Palm Canyon Drive/Indian Canyon Drive/Camino Parocela. Additionally, since Palm Canyon Drive provides three lanes for southbound traffic, it was assumed that southbound through traffic, destined beyond downtown, would continue using Palm Canyon Drive, and that primarily traffic with a destination on Indian Canyon Drive or traffic that is circulating in the downtown area would use the additional southbound lane on Indian Canyon Drive. It was also determined that if more than one southbound lane were to be implemented, there would be inadequate capacity for the northbound traffic demand, resulting in a poor/unacceptable Level of Service (LOS) and potential diversion of traffic away from the downtown area.

The following four alternatives were evaluated for Indian Canyon Drive between Ramon Road and Alejo Road:

Alternative 1: This two-way alternative would consist of two lanes northbound and one lane southbound with a two-way left turn lane. The existing parallel parking on both sides of Indian Canyon Drive will be retained for the most part. The existing 64-foot curb-to-curb street width allows three 12-foot travel lanes and a 12-foot two-way left turn lane with eight feet for parking on both sides of the street as exists today.

Alternative 2: This two-way alternative would consist of three lanes northbound and one lane southbound with a two-way left turn lane. Parallel parking would only be allowed on the west side of the street. No parking would be allowed on the east side of the street (eliminating approximately 125 spaces), thus reducing overall downtown parking availability. The existing 64-foot curb-to-curb street width would allow for one 12-foot southbound lane, a 10-foot two-

way left turn lane, three northbound lanes (11'+11'+12') and an eight-foot parking lane on the west side of the street.

Alternative 3: This two-way alternative is similar to Alternative 2 except that parallel parking is allowed only on the east side of the street. No parking would be allowed on the west side of the street (eliminating approximately 120 spaces). The lane widths would be similar to those in Alternative 2.

Alternative 4: Pursuant to the City's request, this alternative considered angle parking along Indian Canyon Drive. Various degrees of angle parking (30, 45 or 60 degree) cannot be accommodated on both sides of Indian Canyon Drive with existing one-way lanes or any two-way conversion alternative within the 64-foot curb-to-curb street width. Furthermore, with two-way conversion, angle parking cannot be provided on only one side of the street because with that option, the street width would only accommodate three travel lanes rather than the required four lanes (one southbound through, a two-way left turn lane and two northbound through). An acceptable LOS can be achieved by providing angle parking (60 degree from curb line) on one side while maintaining three standard 12-foot one-way northbound lanes with parallel parking on the other side of Indian Canyon Drive. The analysis in this report included the angle parking on the west side and maintained parallel parking on the east side in order to provide better parking access to the downtown area. The existing 120 parallel parking spaces on the west side can be increased by approximately 20% with angle parking conversion between Ramon Road and Amado Road. Traffic flow transitions north of Amado Road are not compatible with angle parking, thus those parallel spaces would remain.

In order to compare the existing one-way operation on Indian Canyon Drive with the two-way operation alternatives, existing traffic volumes were redistributed on the street network based on existing and projected traffic flow patterns, revised lane geometries, access to local businesses, land-use growth potential in the area and two-way operation capacity availability. There was no diversion of traffic away from the downtown.

Intersection and arterial LOS analyses were conducted for the existing one-way condition and the four alternative configurations for the existing traffic volumes, projected two-way conversion year 2015 traffic volumes, and the future 2035 traffic volumes. Intersection and arterial LOS analyses were conducted by AGA engineering staff, aided by the Synchro Program. The analyses indicated that the existing geometric condition and all four alternative configurations operate at acceptable LOS during the midday and p.m. peak periods, for Year 2013, Year 2015 and Year 2035. Further, the analyses indicated that the existing one-way configuration on Indian Canyon Drive operates with slightly less travel time than any of the four alternatives for existing, Year 2015, and Year 2035 traffic volumes.

This study concludes that it is feasible to convert Indian Canyon Drive between Ramon Road and Alejo Road into a two-way street (Alternatives 1, 2 or 3). Alternative 4 with three one-way lanes and angle parking on the west side and parallel parking on the east side is also a feasible alternative. Alternative 4 operates at an acceptable LOS and provides approximately 20% more parking spaces on the west side of Indian Canyon Drive.

The cost to implement the conversion to two-way traffic on Indian Canyon Drive is estimated to be approximately \$1.4 to \$1.75 million. The cost estimate for Alternative 4 is in the range of \$75 to \$100 thousand.

INTRODUCTION

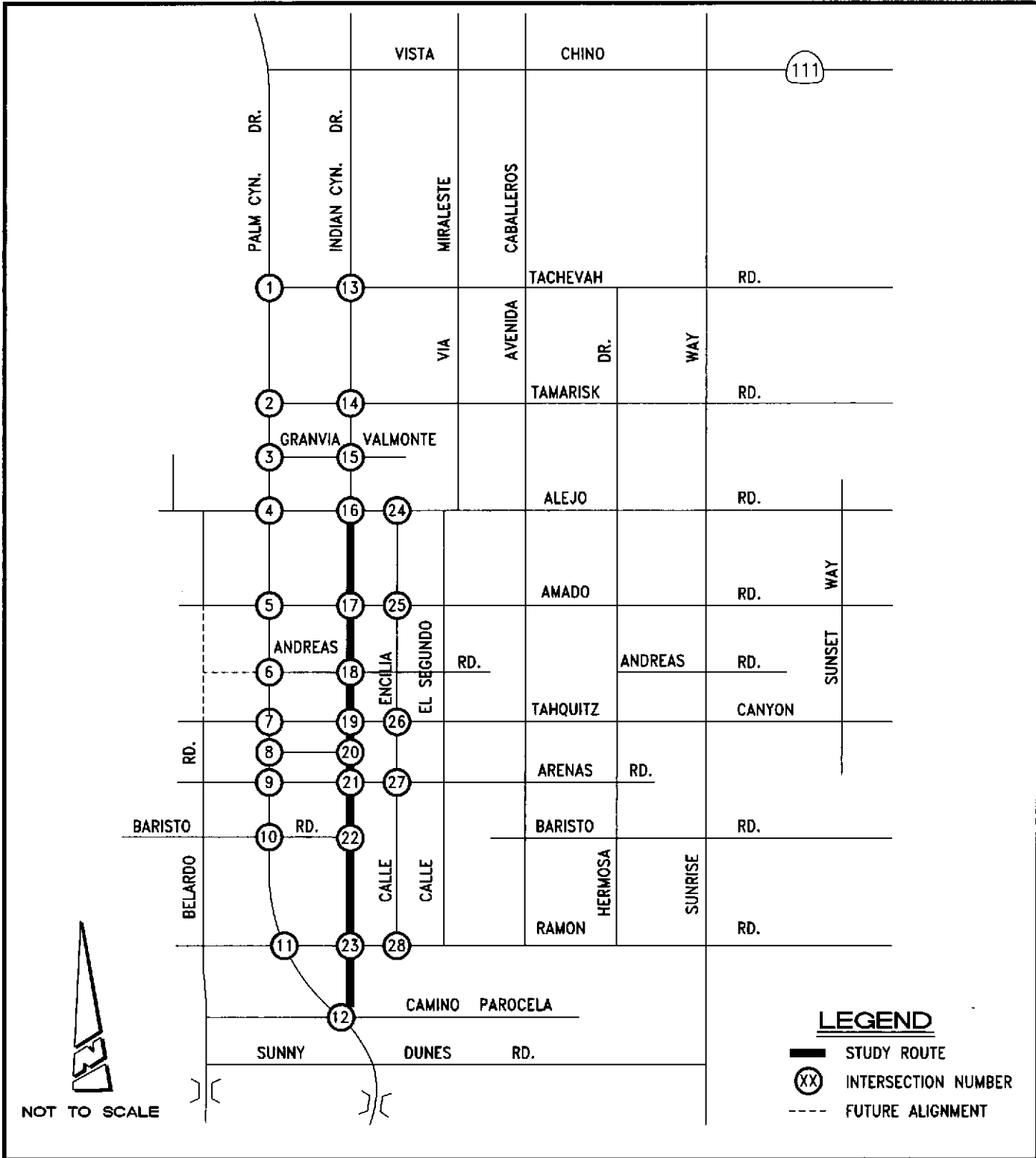
Palm Canyon Drive and Indian Canyon Drive, between Camino Parocela and Alejo Road, currently function as a one-way couplet in Downtown Palm Springs, with Palm Canyon Drive serving the southbound traffic and Indian Canyon Drive serving the northbound traffic. In light of the forthcoming redevelopment of the Palm Springs Promenade, the City has requested that AGA conduct an updated traffic engineering study to assess the feasibility of converting Indian Canyon Drive from one-way operation to two-way operation in the Downtown Palm Springs area. Because of available street widths, only Indian Canyon Drive is being evaluated. Palm Canyon Drive is too narrow for similar consideration. AGA's previous 1998 study had shown the feasibility of two-way traffic flow on Indian Canyon Drive, between Camino Parocela on the south and Granvia Valmonte on the north, in Downtown Palm Springs.

This report provides updates reflecting conditions that have changed in the past fifteen years. With several notable exceptions, the relatively minor amount of development/redevelopment that has occurred along Indian Canyon Drive since 1998 means that much of the "groundwork" previously conducted by AGA is still valid. Two major changes in the area since the 1998 study are the addition of the Downtown Parking Structure (which is located on the corner of Indian Canyon Drive and Baristo Road and provides approximately 300 parking spaces) and the conversion of one block of Indian Canyon Drive (between Granvia Valmonte and Alejo Road) from one-way to two-way operation. Other changes include the signalization of the following intersections:

- Andreas Road at Palm Canyon Drive
- La Plaza at Palm Canyon Drive
- La Plaza at Indian Canyon Drive
- Baristo Road at Indian Canyon Drive

As part of evaluating two-way operation on Indian Canyon Drive between Camino Parocela and Alejo Road, a total of 28 intersections were identified for analysis purposes. A total of 23 intersections are located on Palm Canyon Drive and Indian Canyon Drive, while five intersections are located on Calle Encilia. The study intersections are identified in **Figure 1**. It should be noted that even though the intersections of Palm Canyon Drive and Indian Canyon Drive at Vista Chino, and the intersections of Alejo Road, Amado Road, Tahquitz Canyon, Arenas and Ramon Road at Calle El Segundo were analyzed in the 1998 report, they are not analyzed in this report, as the previous report determined that there is no significant impact on these intersection resulting from the two-way conversion of Indian Canyon Drive.

The study procedure involved evaluating the study route and the 28 study intersections for the existing configuration (2013) and for change-over to a two-way configuration for both the conversion year (assumed to be 2015) and for the future year (2035); identifying improvements needed to accommodate the two-way traffic; and preparing cost estimates. The intersection and arterial Level of Service (LOS) analyses were conducted using the procedures contained in the Highway Capacity Manual.



STUDY INTERSECTIONS

FIGURE 1

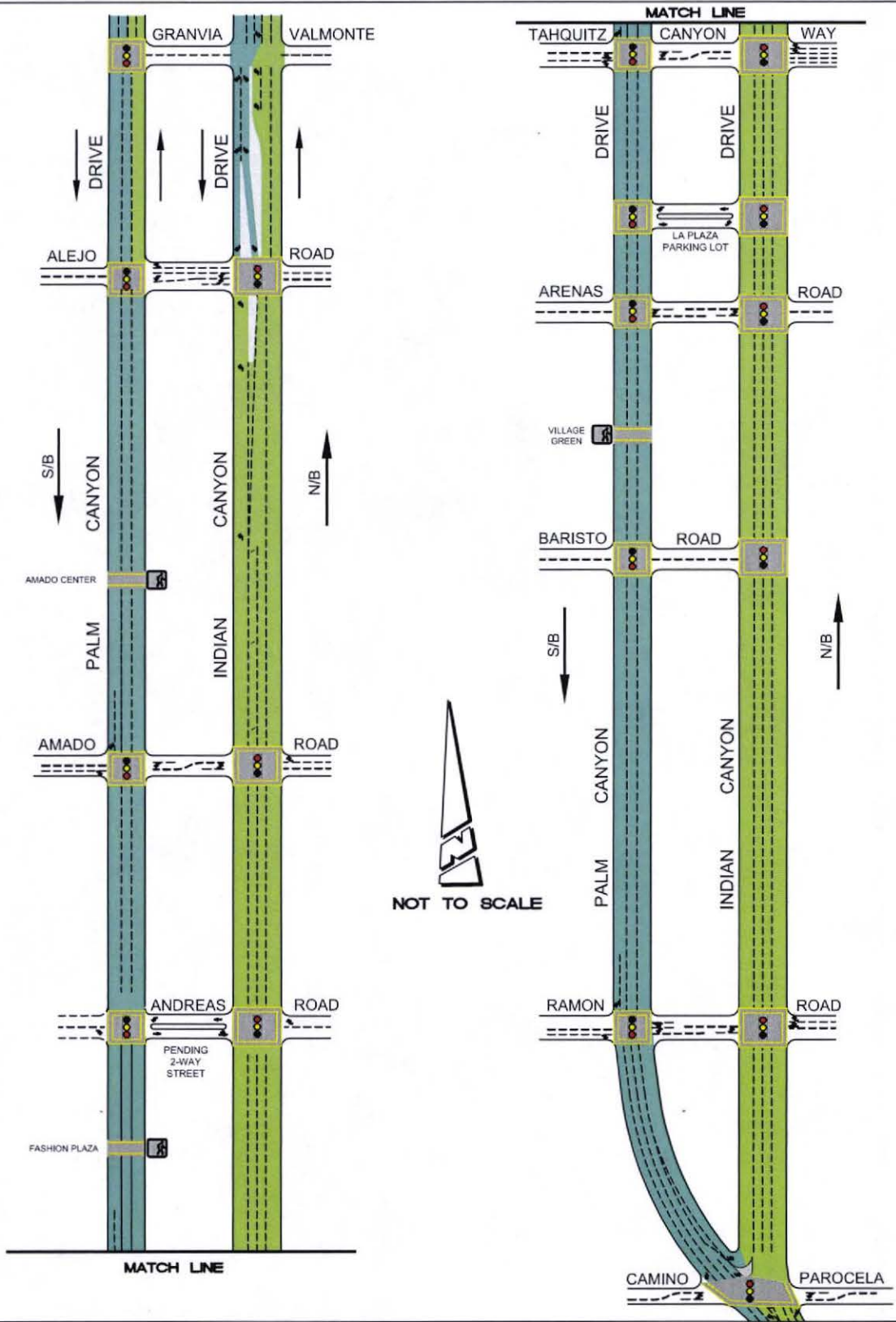
EXISTING CONDITIONS

Indian Canyon Drive between Camino Parocela on the south and Alejo Road on the north is a one-way roadway serving the northbound traffic, while Palm Canyon Drive serves the southbound traffic, in Downtown Palm Springs. Indian Canyon Drive north of Alejo Road and Palm Canyon Drive north of Granvia Valmonte are two-way roadways with two lanes in each direction for the northbound and southbound traffic. Indian Canyon Drive has four travel lanes with parking on both sides of the street. The curb-to-curb street width on Indian Canyon Drive between Camino Parocela and Alejo Road is 64 feet, and 60 feet between Alejo Road and Granvia Valmonte. The lanes are 12-feet wide. The existing one-way configuration for Indian Canyon Drive and Palm Canyon Drive is shown in **Figure 2**. The City of Palm Springs Bikeways map shows Indian Canyon Drive as a Class III Bike Route (trails provide for shared use with pedestrian or motor vehicle traffic and do not have on-street striping, but are signed) between Racquet Club Road and Ramon Road.

Palm Canyon Drive and Indian Canyon Drive, along with nine cross-streets, provide local access and circulation in the downtown area. A majority of the intersections, along with several mid-block pedestrian crossings in the study area, are signalized. The existing lane geometrics for all study intersections are provided in **Figures 3a** and **3b**.

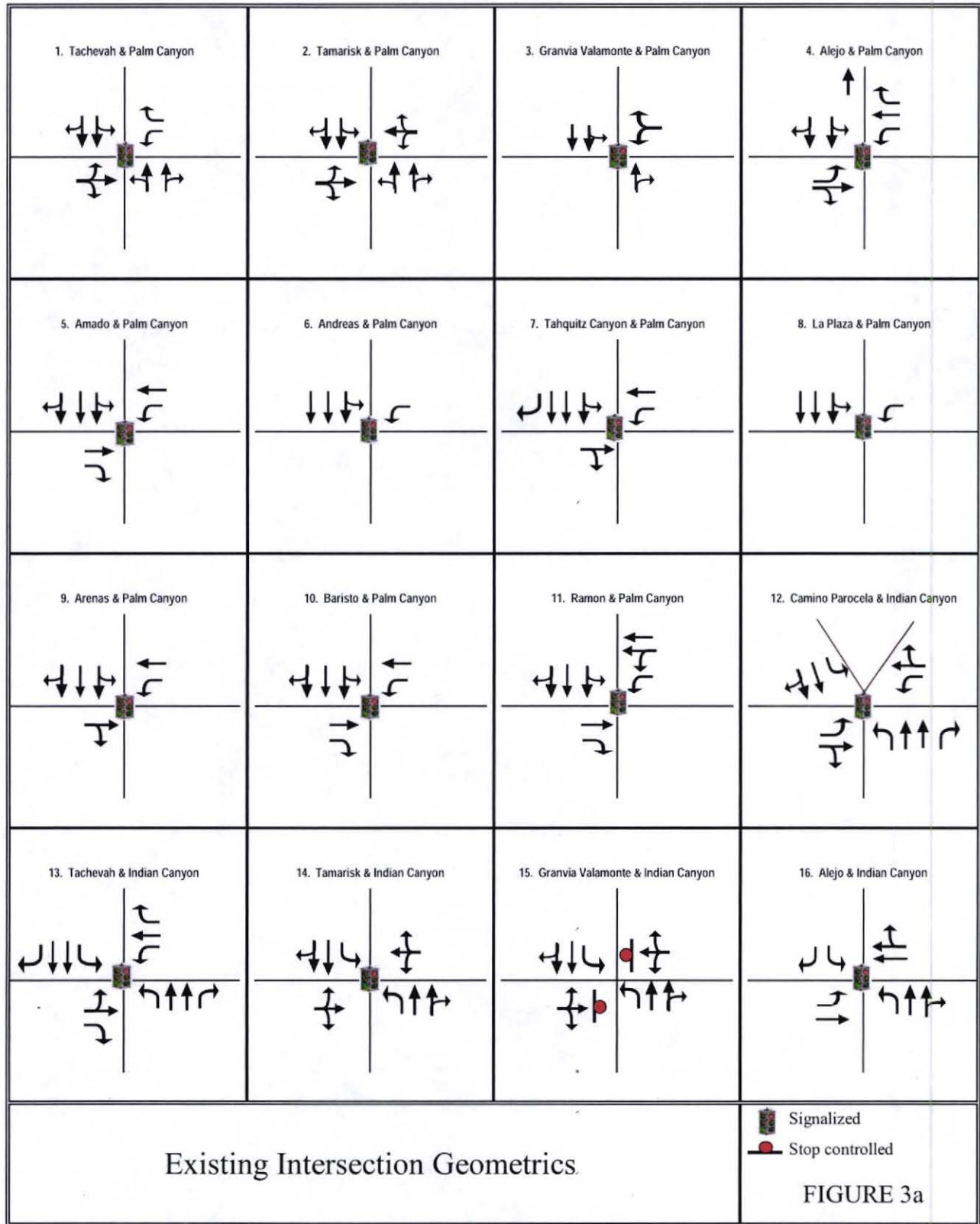
Year 2013 existing p.m. peak turning movement counts and Average Daily Traffic (ADT) counts were provided by the City. A review of the 24-hour traffic volumes indicates that the ADT on Indian Canyon Drive between Ramon Road and Tahquitz Canyon Way is approximately 13,700 vehicles per day. This is a 20% decrease from the 17,800 ADT counts collected in 1996 for the previous study. Additionally, the traffic counts indicate that the peak hour is during the midday, generally between 11:30 a.m. and 1:30 p.m., but no count data was available for this period. Indian Canyon Drive carries an average of 10% more vehicles during the midday than during the "traditional" 4:00-6:00 p.m. peak period. To calculate 2013 midday peak hour turning movement volumes, a 10% increase was applied to the 2013 p.m. peak turning movement counts. The existing traffic volumes for all study intersections are provided in **Figures 4a** and **4b**. Note that the only significant change between the 1996 and 2013 turning movement volumes at the study intersections were at the intersections of Palm Canyon/Granvia Valmonte, Palm Canyon/Alejo, Indian Canyon/Granvia Valmonte, and Indian Canyon/Alejo. This change was due to the two-way conversion of Indian Canyon Drive and Palm Canyon Drive between Granvia Valmonte and Alejo Road. Level of Service (LOS) analyses at the study intersections were conducted for both the midday and the p.m. peak periods.

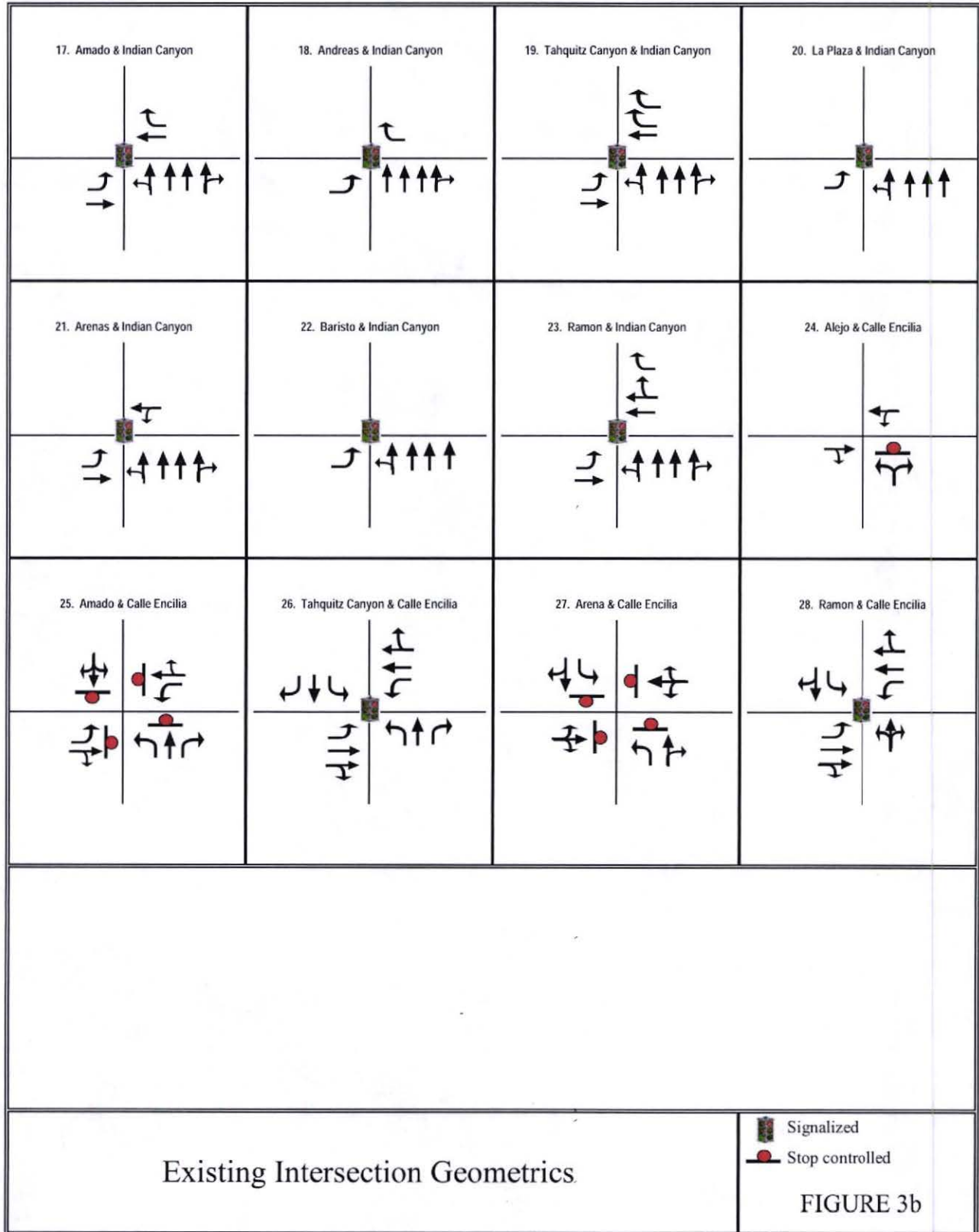
Intersection and arterial LOS were analyzed using Synchro Software. An analysis of existing LOS at the study intersections during both the midday and p.m. peak periods indicates a LOS of B or better. LOS analyses worksheets are provided in **Appendix A**. The existing arterial LOS for Indian Canyon Drive between Camino Parocela and Tachevah Drive is LOS C. Arterial LOS worksheets are provided in **Appendix D**.

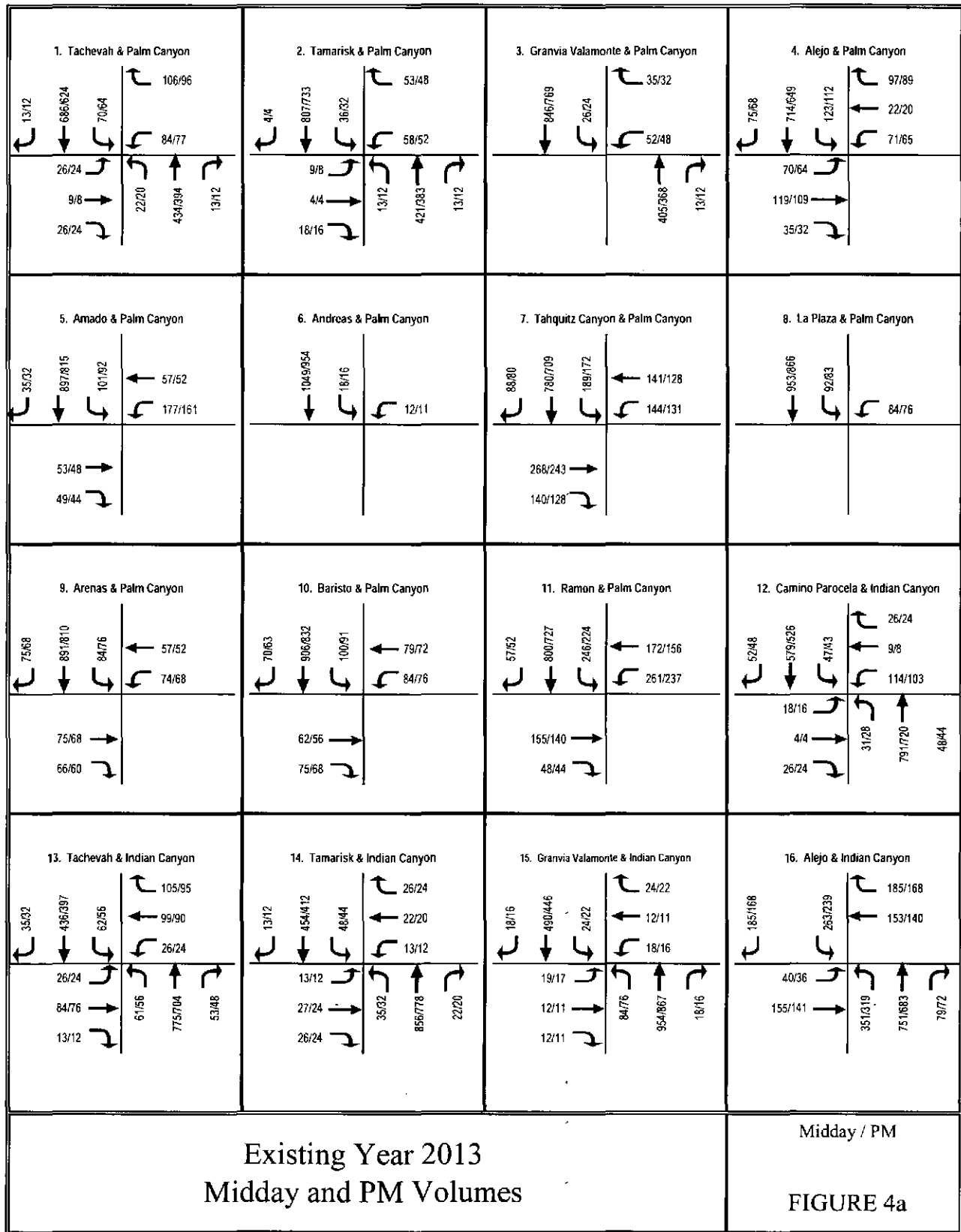


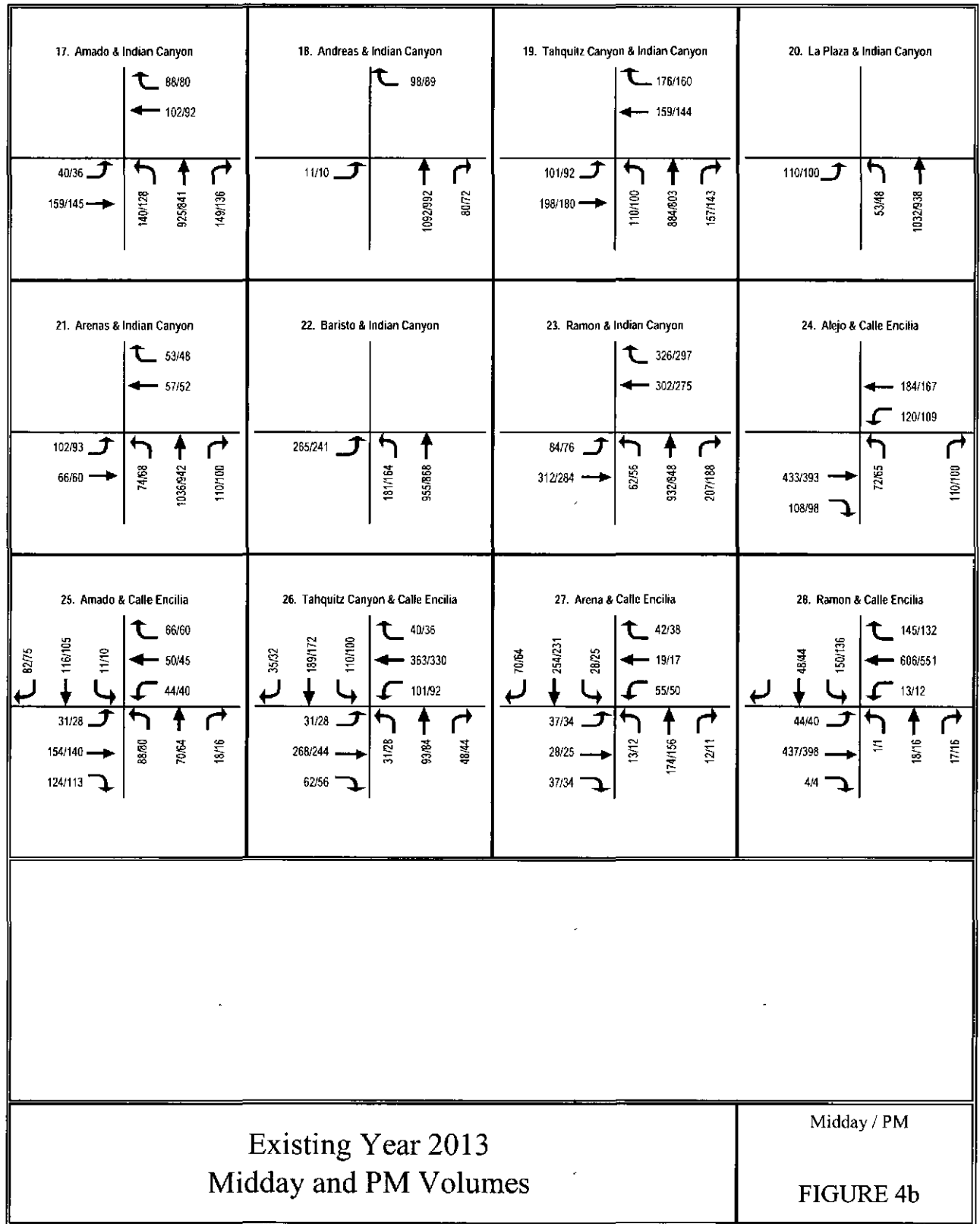
**EXISTING ONE-WAY
ROADWAY CONFIGURATION**

FIGURE 2









ALTERNATIVE STREET CONFIGURATIONS

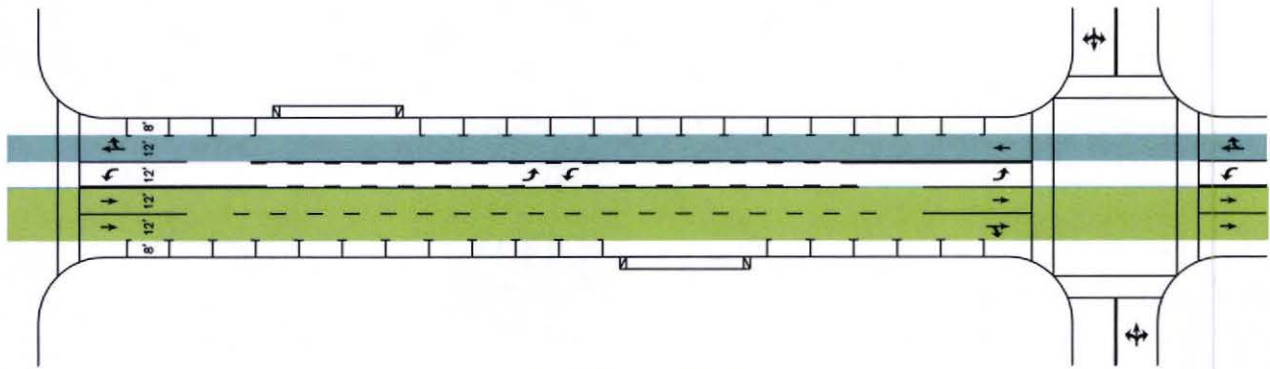
In conjunction with City staff, AGA developed various alternatives to be evaluated that would provide two-way traffic on Indian Canyon Drive between Camino Parocela and Alejo Road. In developing the two-way alternatives, the following important factors were taken into consideration:

- Immediate as well as the long-term impacts of two-way traffic on Indian Canyon Drive.
- Minimizing the costs associated with the conversion.
- Providing improved accessibility to downtown businesses.

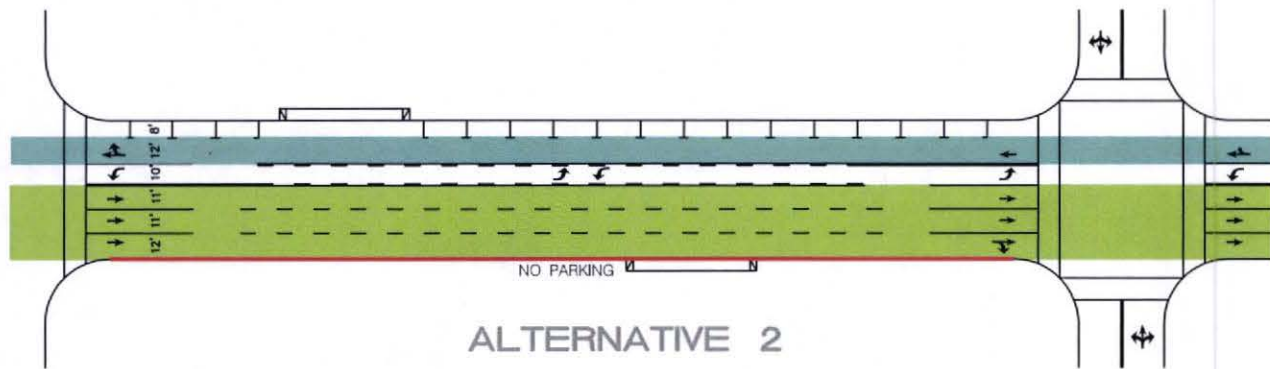
Based on field review observations and findings, it was determined that the alternatives being evaluated would be based on the following assumptions/conditions:

1. Currently Palm Canyon Drive provides three lanes for southbound traffic. It is assumed that southbound through traffic would continue using Palm Canyon Drive. Therefore, only one southbound lane was considered for Indian Canyon Drive, thereby maximizing the remaining available street width for northbound traffic and/or parking. Typically, only the traffic with a destination on Indian Canyon Drive or traffic that is circulating in the downtown area would use the new southbound portion of Indian Canyon Drive.
2. Due to the many driveways on Indian Canyon Drive, and for safety and circulation reasons, a continuous two-way left turn lane that provides enhanced access to the businesses is included in all two-way conversion alternatives. Standard left-turn pockets are provided at each intersection.
3. The intersection of Indian Canyon Drive/Palm Canyon Drive/Camino Parocela would require additional right-of-way and/or major reconfiguration to operate efficiently if a two-way operation is implemented on Indian Canyon Drive south of Ramon Road. Therefore, in order to avoid re-configuring the intersection of Indian Canyon Drive/Camino Parocela, the existing one-way configuration on Indian Canyon Drive between Camino Parocela and Ramon Road is retained for all alternatives.
4. Traffic signal coordination must be maintained on Indian Canyon Drive to reduce delays and stops. Due to the close proximity of the downtown intersections on both Palm Canyon Drive and Indian Canyon Drive, the signals should be coordinated to provide minimum queues and delays to side street traffic as well as north-south traffic.
5. Indian Canyon Drive currently does not have striped bike lanes, meaning bicyclists share the road. The 64-foot road width does not accommodate striped bike lanes; therefore this study assumed that bicyclists will continue to share the road and any Bike Route would have to be a Class 3.

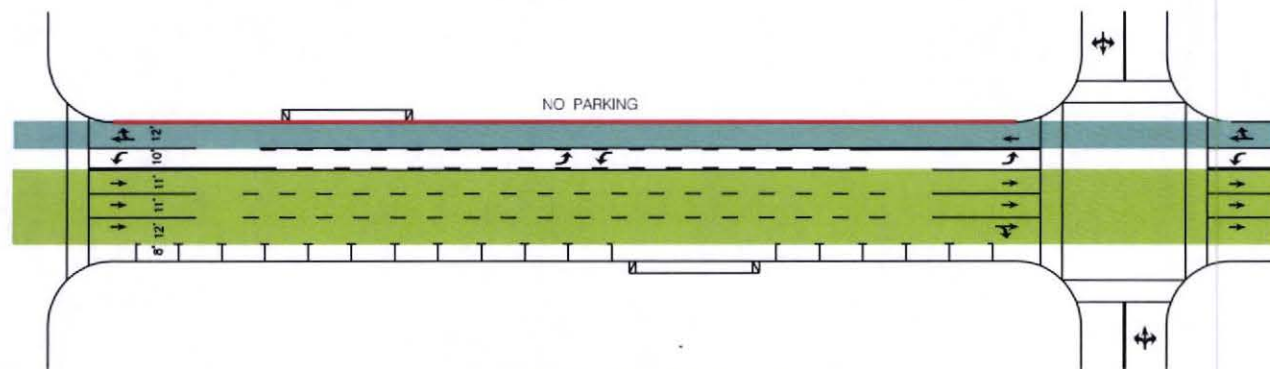
The following four alternative street configurations were evaluated for Indian Canyon Drive between Ramon Road and Alejo Road. The alternatives are shown on **Figures 5a** and **5b**.




ALTERNATIVE 1



ALTERNATIVE 2



ALTERNATIVE 3


 NOT TO SCALE

TWO-WAY ALTERNATIVES FOR INDIAN CANYON DRIVE

FIGURE 5a



Alternative 1: This two-way alternative would consist of two lanes northbound and one lane southbound with a two-way left turn lane. The existing parking on both sides of Indian Canyon Drive will be retained for the most part. The existing 64-foot curb-to-curb street width allows three 12-foot travel lanes and a 12-foot two-way left turn lane with eight feet for parking on both sides of the street.

Alternative 2: This two-way alternative would consist of three lanes northbound and one lane southbound with a two-way left turn lane. Parking is allowed only on the west side of the street. No parking is allowed on the east side of the street (eliminating approximately 125 parking spaces). The existing 64-foot curb-to-curb street width allows for one 12-foot southbound lane, a 10-foot two-way left turn lane, three northbound lanes (11'+11'+12') and an eight-foot parking lane on the west side of the street.

Alternative 3: This two-way alternative is similar to Alternative 2 except that parking is allowed only on the east side of the street. No parking is allowed on the west side of the street (eliminating approximately 120 parking spaces). The lane widths will be similar to Alternative 2.

Alternative 4: Pursuant to the City's request, this alternative considered angle parking along Indian Canyon Drive. Various degrees of angle parking (30, 45 or 60 degree) cannot be accommodated on both sides of Indian Canyon Drive with existing one-way lanes or any two-way conversion alternative within the 64-foot curb-to-curb street width. Furthermore, with two-way conversion, angle parking cannot be provided on only one side of the street because with that option, the remaining street width would only accommodate three travel lanes rather than the required four lanes (one southbound through, a two-way left turn lane and two northbound through). With the existing one-way operation, providing angle parking on both sides would reduce Indian Canyon Drive to two travel lanes and increase delay due to parking maneuvers, resulting in unacceptable LOS. The reason that two lanes are inadequate with angle parking is because both lanes are impacted by parking maneuvers, while in Alternative 1 two lanes are adequate due to parking maneuvers only occurring on one side of the two lanes. An acceptable LOS can be achieved by providing angle parking (60 degree from curb line) on one side while maintaining three standard 12-foot one-way northbound lanes with parallel parking on the other side of Indian Canyon Drive. The 60 degree angle parking was selected for this alternative because it provides more parking spaces than the existing, whereas 30 or 45 degree angle parking reduces the existing parking spaces (by approximately 5 to 15%). The analysis in this report included the angle parking on the west side and maintained parallel parking on the east side in order to provide better parking access to the downtown area. The existing 120 parallel parking spaces on the west side can be increased by approximately 20% with angle parking conversion between Ramon Road and Amado Road. Traffic flow transitions north of Amado Road are not compatible with angle parking, thus those parallel spaces would remain.

Safety concerns include accidents/near-accidents due to wrong-way turns into the one-way sections of both Indian Canyon Drive and Palm Canyon Drive. While a two-way street could potentially reduce the number of these occurrences, they would not be eliminated completely, as they also occur on normal two-way streets due to driver mistakes. It should be noted that one-way streets are typically safer than two-way streets, as they provide fewer conflicts between vehicles moving in opposite directions. It can be expected that there would be more accidents in total with two-way operations on Indian Canyon Drive than currently with one-way operations. There is no significant difference in number of accidents with angle parking versus parallel parking.

TRAFFIC VOLUME PROJECTIONS

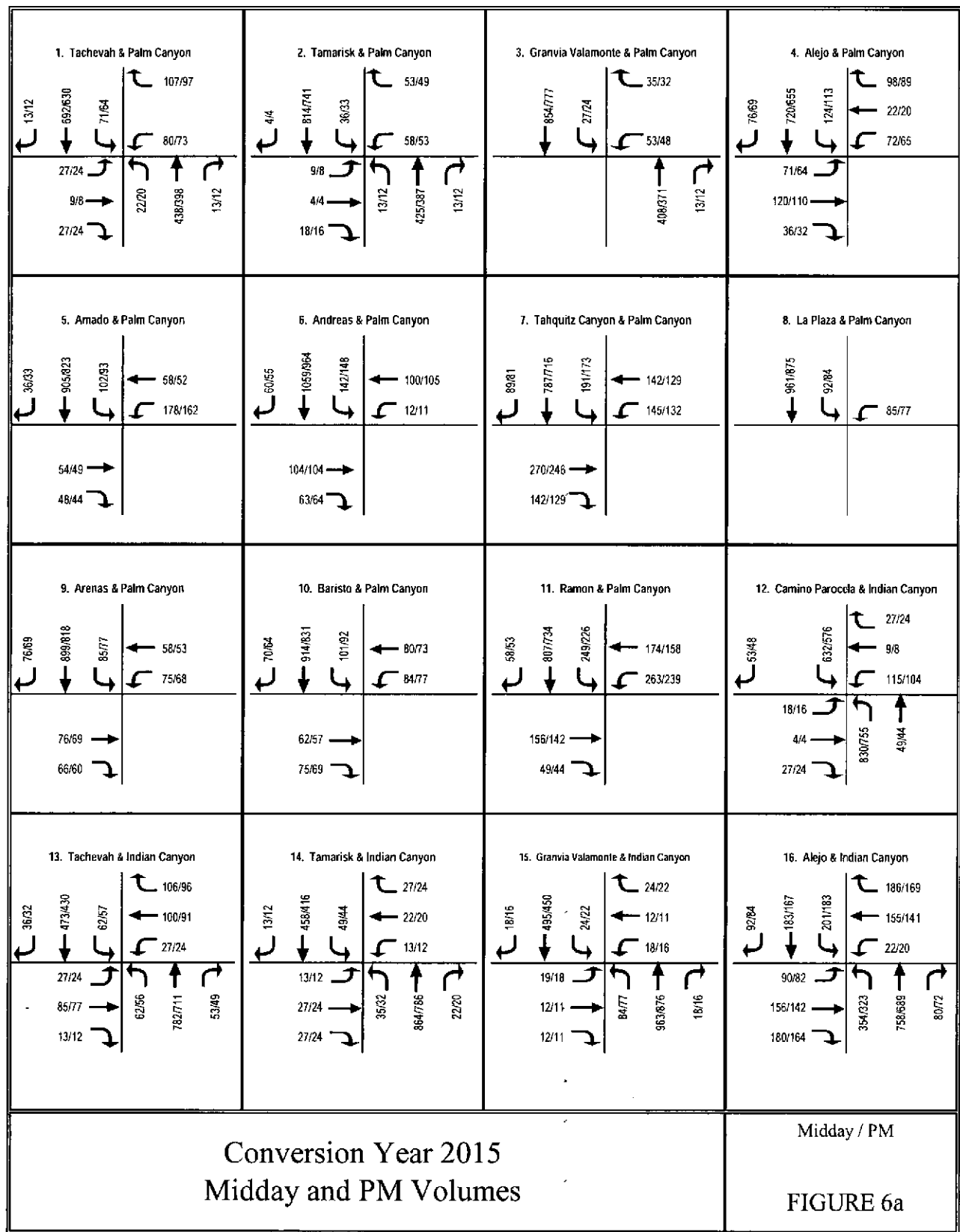
Two-Way Conversion Project Year 2015

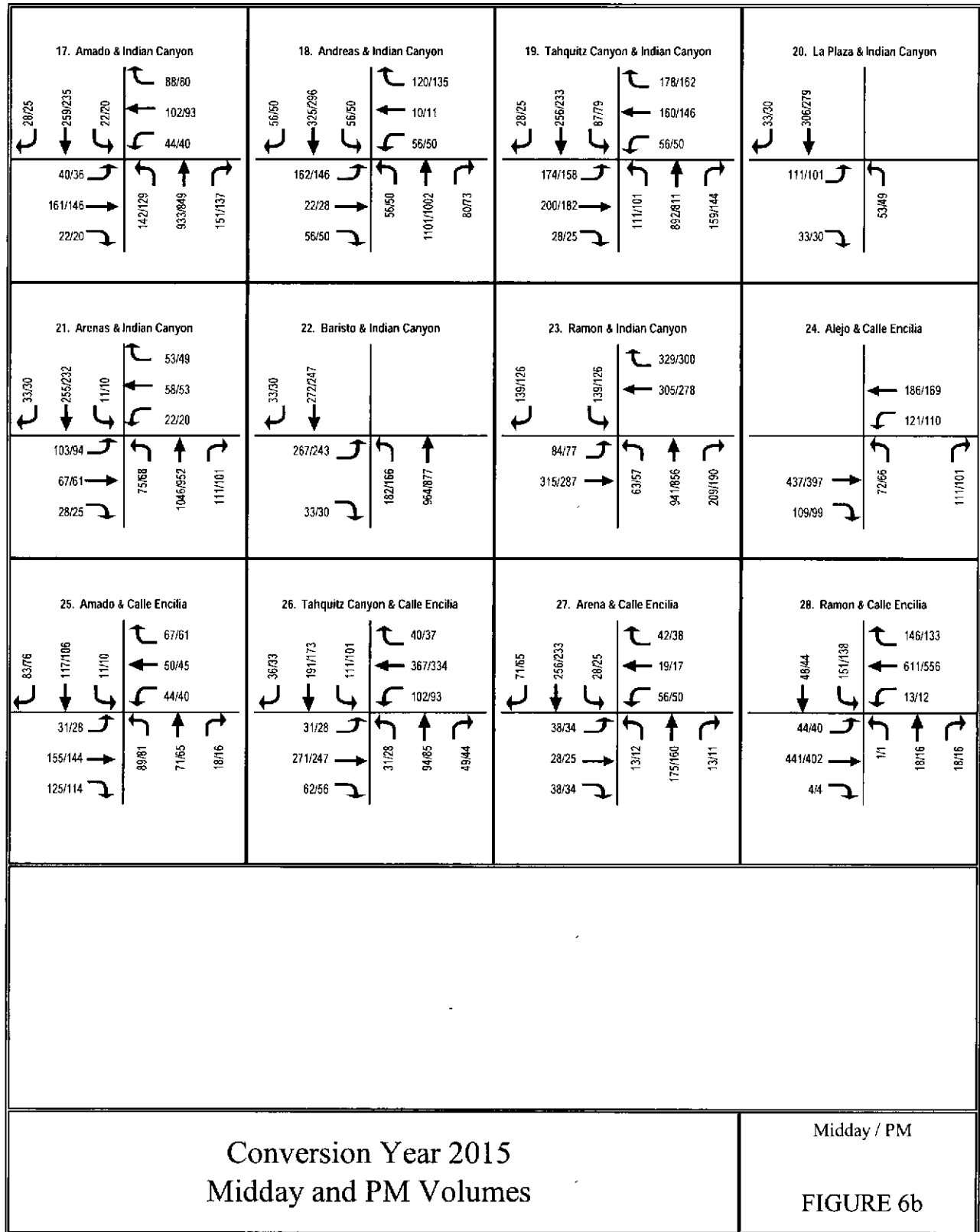
In order to compare the existing one-way operation on Indian Canyon Drive with a two-way operation, the existing traffic volumes were redistributed based on existing and projected traffic flow patterns, revised lane geometries, access to local businesses, land-use growth potential in the area and two-way operation capacity availability. There was no diversion of traffic away from the downtown area, and in order to analyze worse case conditions the southbound volume that was allocated to Indian Canyon Drive did not get deducted from the southbound Palm Canyon Drive volumes. For analysis purposes the conversion year for two-way operation on Indian Canyon Drive was assumed to be Year 2015. A 1% growth factor was applied to existing Year 2013 traffic volumes to determine Year 2015 traffic volumes. Year 2015 two-way conversion traffic volumes are provided in **Figure 6a** and **6b**.

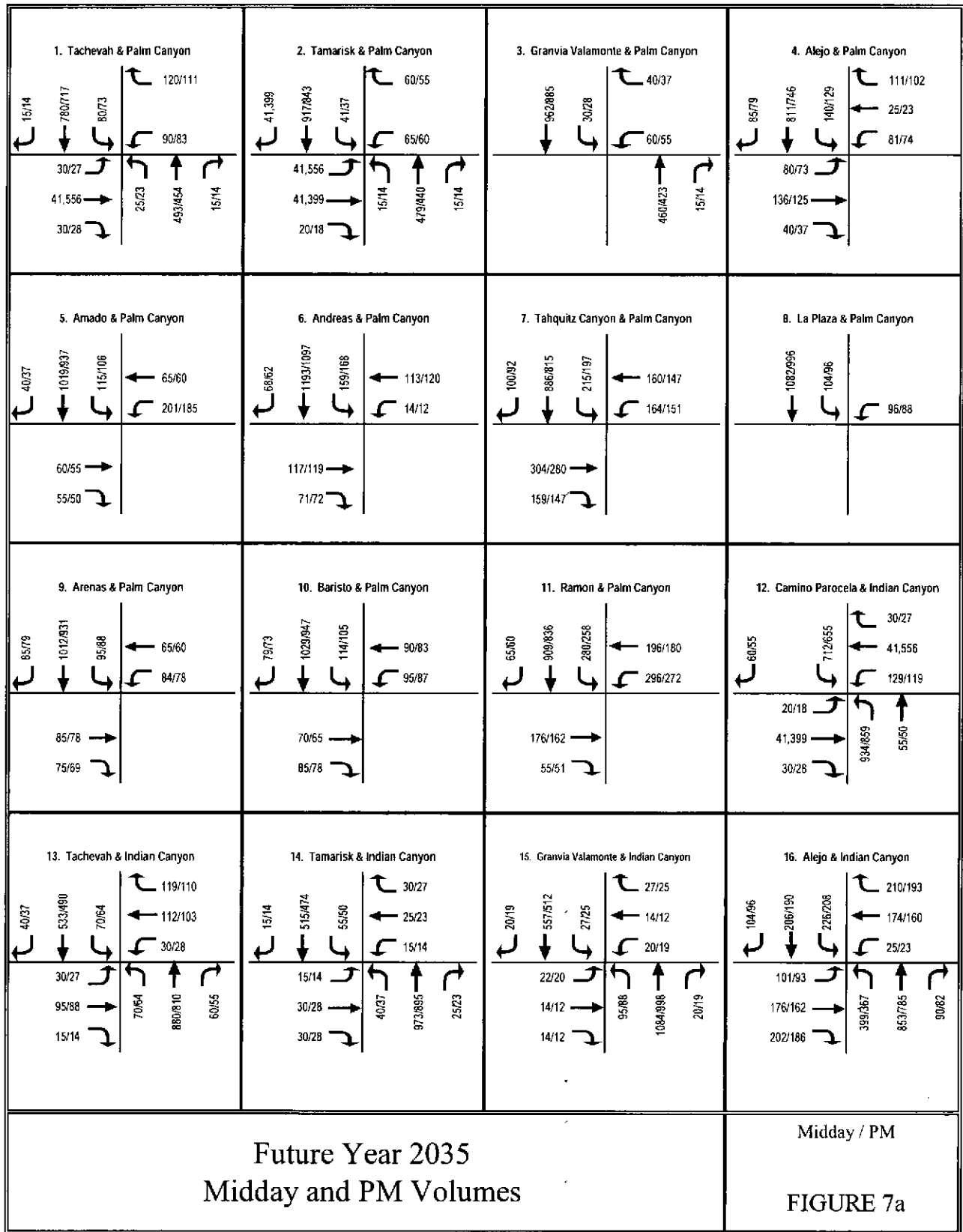
Due to the proposed redevelopment of the Palm Springs Promenade, the City requested that Andreas Road be analyzed as a two-way roadway between Indian Canyon Drive and Palm Canyon Drive with access to the Promenade/Belardo Road on the west side. Traffic volumes were provided by the City from the Museum Market Plaza Specific Plan Traffic Impact Study prepared by Endo Engineering, September 2008.

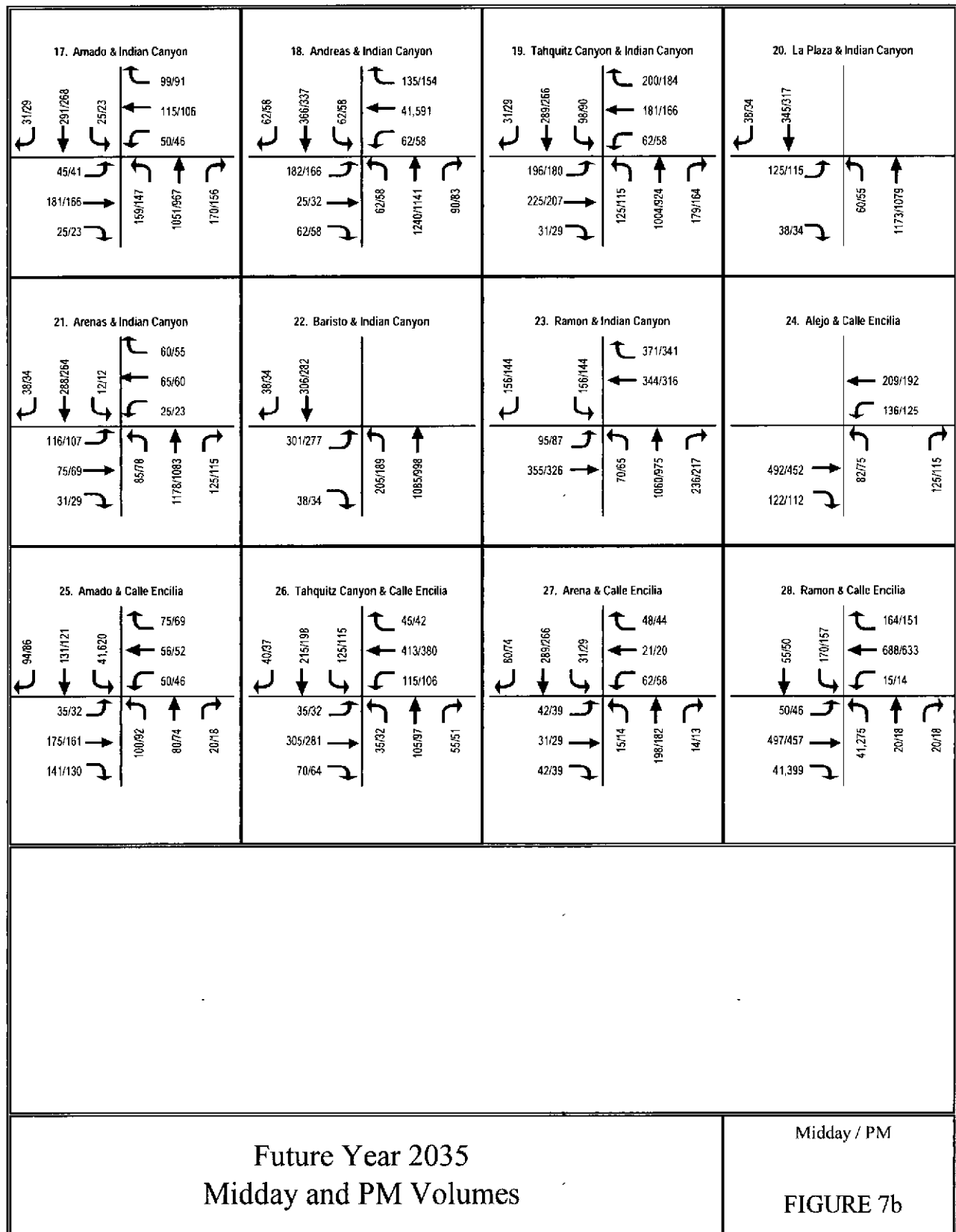
Future Year 2035

Future Year 2035 traffic volumes are based on review and comparison of traffic data collected for the 1998 report and existing Year 2013 traffic data provided by the City. Considering the proposed redevelopment of the Palm Springs Promenade and the City's efforts in revitalizing the Palm Springs Downtown Area, a 15% growth was applied to existing traffic volumes to determine future Year 2035 traffic volumes. The Year 2035 future traffic volumes at the study intersections are provided in **Figures 7a** and **7b**.









TRAFFIC ANALYSIS

Intersection and arterial Level of Service (LOS) analyses were conducted for the existing one-way configuration and the four alternative configurations for the existing traffic conditions; for the two-way conversion Year 2015 traffic conditions; and for the future Year 2035 traffic conditions. Intersection and arterial Level of Service (LOS) analyses were conducted using the Synchro Program.

Analysis Methodology

The Highway Capacity Manual defines the intersection Level of Service (LOS) in terms of average vehicle delay. The LOS values range from LOS A, with an average vehicle delay of less than ten seconds, indicating excellent conditions to a LOS F, with an average delay of more than 80 seconds, typically indicating oversaturated conditions. The LOS criteria for signalized and unsignalized intersections based on the HCM methodology is provided in Table 1.

Level of Service (LOS)	Average Total Delay Per Vehicle (seconds) and Type of Intersection Control	
	Signalized	Unsignalized/ STOP Controlled
A (minimal delay)	< 10	< 10
B (short delay)	> 10 and < 20	> 10 and < 15
C (average delay)	> 20 and < 35	> 15 and < 25
D (long delay)	> 35 and < 55	> 25 and < 35
E (very long delay)	> 55 and < 80	> 35 and < 50
F (extreme delay/jammed)	> 80	> 50

Additionally, the Highway Capacity Manual provides procedures to evaluate the LOS of an existing or proposed facility for the purpose of planning, design or operation of arterials. The methodology does not address arterial capacity, which is generally determined by the capacity of the arterial's signalized intersections. The operation of vehicles on arterial streets is influenced by three main factors: the arterial environment, the interaction between vehicles, and the effect of traffic signals.

The Highway Capacity Manual defines the arterial LOS in terms of average through vehicle travel speeds. The average travel speed includes the delays such as those caused at intersections as well as those due to parking maneuvers, lane changes, vehicles entering or exiting the roadway through various driveways, level of pedestrian activity, the proportion of buses and trucks, and turning movements. The Synchro program utilized is compatible with the Highway Capacity Manual. The Synchro program assumes the analyzed one-lane southbound on Indian

Canyon Drive as an arterial for determining arterial LOS. Operationally the southbound lane functions as a “downtown” type street for downtown circulation.

Level of Service Analysis

Analysis results indicate that with the Existing Year 2013, Year 2015 (Conversion Year), and Future Year 2035 the current one-way configuration, as well as all of the studied alternatives, operate at an acceptable LOS during the peak hours. All of the study intersections operate at LOS C or better during the midday and the p.m. peak hours. Additionally, the Arterial Level of Service for Indian Canyon Drive between Camino Parocela and Tachevah Drive is LOS C or better for the various alternatives.

- Existing Year 2013 midday and p.m. peak hour intersection LOS analyses results for the various alternatives are summarized in **Tables 2a** and **2b**. The results of existing Year 2013 arterial LOS analyses for the existing condition and the four alternative scenarios are summarized in **Table 3**.
- Year 2015 intersection LOS are summarized in **Tables 4a** and **4b** for the midday and p.m. peak hours and the intersection LOS worksheets are provided in **Appendix B**. The results of arterial LOS analyses for the Year 2015 traffic volumes are summarized in **Table 5**. Year 2015 Arterial LOS worksheets are provided in **Appendix E**.
- Year 2035 intersection LOS are summarized in **Tables 6a** and **6b** for the midday and p.m. peak hours. Intersection LOS worksheets for Year 2035 are provided in **Appendix C**. The results of arterial LOS analyses for the Year 2035 traffic volumes are summarized in **Table 7**. Year 2035 Arterial LOS worksheets are provided in **Appendix F**.

The arterial LOS analyses indicated that the existing geometrics and all four alternatives operate at LOS C during the midday and p.m. peak periods, for Year 2013, Year 2015 and Year 2035. Even though all alternatives operate at LOS C, the calculated arterial speeds are slightly different for each alternative. The speeds for Alternative 1 are slightly slower than the other alternatives because it only provides two northbound lanes while the other alternatives provide three northbound lanes. Alternative 2 has higher northbound speeds than Alternative 3 and 4 because parking is not provided on the east side of the street for Alternative 2 but it is provided for Alternatives 3 and 4. Since parking is not provided on the west side of Indian Canyon Drive in Alternative 3 the southbound movement for Alternative 3 has better speeds than Alternative 2. Further, the analyses indicate that the Existing configurations on Indian Canyon Drive operate at a slightly higher speed (and, therefore, slightly better LOS), for existing, Year 2015 and Year 2035 traffic volumes, than any of the four alternatives.

Both this study and the 1998 study results show that it is viable to reduce the number of northbound lanes on Indian Canyon Drive and provide a single southbound lane, enhancing access to downtown businesses. The previous study concluded that the southbound lane would operate basically as a downtown local street and not as a through arterial street. In this study, primarily because of the reduction in traffic volumes mostly due to the recession, the Synchro Arterial Analysis shows that the southbound lane operates as an arterial street and functions the

same as the northbound lanes. If traffic volumes increase greater than what is projected in this study, the findings of the previous study may be more reflected of traffic flow operational LOS. This means that the three northbound lanes can function with acceptable LOS, but the new southbound lane may function at a lesser LOS, however it will enhance circulation and still provide acceptable operation as a “downtown” type street, not as an arterial intended to carry through traffic.

All four alternatives permit bicyclists to continue to share the road. “Sharrow” markings (shared lane marking) can also be utilized for all four alternatives.

Table 2a: Intersection Level of Service for Existing Year 2013 - Midday Peak

No.	Existing		Alternative 1		Alternative 2 & 3		Alternative 4		
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	
1	N. Palm Canyon Drive @ E. Tachevah Drive	9.2	A	9.9	A	9.0	A	9.2	A
2	N. Palm Canyon Drive @ E. Tamarisk Road	5.1	A	4.2	A	4.4	A	4.8	A
3	N. Palm Canyon Drive @ Granvia Valmonte	8.6	A	7.0	A	7.9	A	8.3	A
4	N. Palm Canyon Drive @ E. Alejo Road	11.2	B	11.9	B	12.1	B	12.5	B
5	N. Palm Canyon Drive @ E. Amado Road	6.2	A	7.5	A	7.6	A	7.5	A
6	N. Palm Canyon Drive @ Andreas Road	1.0	A	1.0	A	0.9	A	1.0	A
7	N. Palm Canyon Drive @ E. Tahquitz Canyon Way	18.2	B	18.9	B	14.0	B	14.9	B
8	S. Palm Canyon Drive @ La Plaza	4.5	A	7.7	A	4.0	A	4.6	A
9	S. Palm Canyon Drive @ Arenas Road	8.1	A	9.1	A	7.6	A	7.7	A
10	S. Palm Canyon Drive @ Baristo Road	7.2	A	9.4	A	7.2	A	7.0	A
11	S. Palm Canyon Drive @ Ramon Road	16.6	B	16.2	B	16.1	B	16.2	B
12	S. Palm Canyon Drive @ Camino Parocela	10.1	B	11.0	B	10.2	B	9.9	A
13	Indian Canyon Drive @ E. Tachevah Drive	6.1	A	7.5	A	6.5	A	6.1	A
14	Indian Canyon Drive @ E. Tamarisk Road	13.0	B	12.8	B	12.4	B	12.5	B
15	Indian Canyon Drive @ Granvia Valmonte	2.9	A	2.9	A	2.9	A	2.9	A
16	Indian Canyon Drive @ E. Alejo Road	11.7	B	14.9	B	12.6	B	13.9	B
17	Indian Canyon Drive @ E. Amado Road	8.5	A	9.4	A	7.5	A	9.6	A
18	Indian Canyon Drive @ Andreas Road	4.9	A	7.2	A	6.5	A	4.8	A
19	Indian Canyon Drive @ E. Tahquitz Canyon Way	7.4	A	13.3	B	11.9	B	6.9	A
20	Indian Canyon Drive @ La Plaza	4.2	A	7.0	A	3.9	A	4.3	A
21	Indian Canyon Drive @ Arenas Road	6.7	A	8.8	A	6.6	A	6.8	A
22	Indian Canyon Drive @ Baristo Road	8.7	A	8.9	A	7.8	A	9.2	A
23	Indian Canyon Drive @ Ramon Road	12.3	B	17.3	B	14.5	B	11.7	B
24	N. Calle Encilia @ W. Alejo Road	5.4	A	5.2	A	5.3	A	5.4	A
25	N. Calle Encilia @ E. Amado Road	10.6	B	10.6	B	10.6	A	10.6	B
26	N. Calle Encilia @ E. Tahquitz Canyon Way	11.6	B	11.0	B	12.9	B	11.6	B
27	S. Calle Encilia @ Arenas Road	10.3	B	10.3	B	10.3	B	10.3	B
28	S. Calle Encilia @ Ramon Road	18.6	B	23.8	C	22.3	C	19.8	B

Table 2b: Intersection Level of Service for Existing Year 2013 - PM Peak

No.	Existing		Alternative 1		Alternative 2 & 3		Alternative 4		
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	
1	N. Palm Canyon Drive @ E. Tachevah Drive	8.9	A	9.5	A	8.8	A	8.9	A
2	N. Palm Canyon Drive @ E. Tamarisk Road	4.7	A	4.1	A	4.3	A	4.7	A
3	N. Palm Canyon Drive @ Granvia Valmonte	7.5	A	6.8	A	7.4	A	7.5	A
4	N. Palm Canyon Drive @ E. Alejo Road	11.1	B	11.7	B	11.4	B	11.5	B
5	N. Palm Canyon Drive @ E. Amado Road	7.1	A	7.8	A	8.3	A	8.3	A
6	N. Palm Canyon Drive @ Andreas Road	1.1	A	1.1	A	1.0	A	1.0	A
7	N. Palm Canyon Drive @ E. Tahquitz Canyon Way	13.9	B	14.3	B	13.0	B	13.7	B
8	S. Palm Canyon Drive @ La Plaza	4.5	A	3.1	A	3.6	A	4.4	A
9	S. Palm Canyon Drive @ Arenas Road	7.8	A	7.2	A	7.2	A	7.5	A
10	S. Palm Canyon Drive @ Baristo Road	7.1	A	9.2	A	7.2	A	7.0	A
11	S. Palm Canyon Drive @ Ramon Road	15.8	B	16.8	B	15.4	B	15.5	B
12	S. Palm Canyon Drive @ Camino Parocela	9.5	A	9.6	A	9.7	A	9.6	A
13	Indian Canyon Drive @ E. Tachevah Drive	6.0	A	7.3	A	6.4	A	6.0	A
14	Indian Canyon Drive @ E. Tamarisk Road	12.4	B	12.3	B	12.4	B	12.6	B
15	Indian Canyon Drive @ Granvia Valmonte	2.4	A	2.4	A	2.4	A	2.4	A
16	Indian Canyon Drive @ E. Alejo Road	11.4	B	13.6	B	12.1	B	12.7	B
17	Indian Canyon Drive @ E. Amado Road	7.7	A	7.7	A	7.5	A	9.1	A
18	Indian Canyon Drive @ Andreas Road	5.6	A	6.6	A	5.8	A	5.3	A
19	Indian Canyon Drive @ E. Tahquitz Canyon Way	6.9	A	11.6	B	11.2	B	7	A
20	Indian Canyon Drive @ La Plaza	4.1	A	3.9	A	3.9	A	4.3	A
21	Indian Canyon Drive @ Arenas Road	6.6	A	7.0	A	6.2	A	6.8	A
22	Indian Canyon Drive @ Baristo Road	8.4	A	8.3	A	7.4	A	8.7	A
23	Indian Canyon Drive @ Ramon Road	10.5	B	19.3	B	12.7	B	10.9	B
24	N. Calle Encilia @ W. Alejo Road	4.5	A	4.5	A	4.5	A	4.5	A
25	N. Calle Encilia @ E. Amado Road	9.9	A	9.9	A	9.9	A	9.9	A
26	N. Calle Encilia @ E. Tahquitz Canyon Way	11.6	B	11.9	B	12.8	B	11.4	B
27	S. Calle Encilia @ Arenas Road	9.6	A	9.6	A	9.6	A	9.6	A
28	S. Calle Encilia @ Ramon Road	20.8	B	21.4	C	23.5	C	20.7	C

Table 3. Arterial Level of Service for Existing Year 2013

Arterial (Segment)	Dir	Length (mi)	Existing (One-Way) ¹		Alternative 1 (Two-Way) ²		Alternative 2 (Two-Way) ³		Alternatives 3 (Two-Way) ⁴		Alternatives 4 (One-Way) ⁵	
			Arterial Speed MPH	Arterial LOS	Arterial Speed MPH	Arterial LOS	Arterial Speed MPH	Arterial LOS	Arterial Speed MPH	Arterial LOS	Arterial Speed MPH	Arterial LOS
Midday Peak Hour												
Indian Canyon Drive (Camino Parocela to Tachevah Drive)	NB	1.7	22.2	C	17.3	C	22.7	C	17.9	C	19.2	C
Indian Canyon Drive (Tachevah Drive to Ramon Road)	SB	1.6			15.4	C	16.9	C	19.7	C		
PM Peak Hour												
Indian Canyon Drive (Camino Parocela to Tachevah Drive)	NB	1.7	22.7	C	17.7	C	23.0	C	18.2	C	19.6	C
Indian Canyon Drive (Tachevah Drive to Ramon Road)	SB	1.6			16.8	C	18.1	C	21.2	C		

- Notes: 1. Existing Configuration - one-way with four NB lanes and parking on both sides.
 2. Alternative 1 - Two-way with one southbound lane, two NB lanes and parking on both sides.
 3. Alternative 2 - Two-way with one southbound lane, three NB lanes and parking only on the west side (No parking on the east side).
 4. Alternative 3 - Two-way with one southbound lane, three NB lanes and parking only on the east side (No parking on the west side).
 5. Alternative 4 - One-way with three NB lanes, angle parking on the west side, and parallel parking on the east side.

Table 4a: Intersection Level of Service for Conversion Year 2015 - Midday Peak

No.		Existing		Alternative 1		Alternative 2 & 3		Alternative 4	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	N. Palm Canyon Drive @ E. Tachevah Drive	9.3	A	9.9	A	9.1	A	9.3	A
2	N. Palm Canyon Drive @ E. Tamarisk Road	5.0	A	4.3	A	4.4	A	4.8	A
3	N. Palm Canyon Drive @ Granvia Valmonte	8.7	A	7.2	A	8.0	A	8.4	A
4	N. Palm Canyon Drive @ E. Alejo Road	11.5	B	12.2	B	12.6	B	12.4	B
5	N. Palm Canyon Drive @ E. Amado Road	6.4	A	7.1	A	7.8	A	7.2	A
6	N. Palm Canyon Drive @ Andreas Road	7.1	A	7.0	A	8.2	A	7.4	A
7	N. Palm Canyon Drive @ E. Tahquitz Canyon Way	17.7	B	18.7	B	13.3	B	14.5	B
8	S. Palm Canyon Drive @ La Plaza	4.6	A	7.7	A	4.1	A	4.6	A
9	S. Palm Canyon Drive @ Arenas Road	8.2	A	9.2	A	7.6	A	7.7	A
10	S. Palm Canyon Drive @ Baristo Road	7.1	A	9.4	A	7.2	A	7.0	A
11	S. Palm Canyon Drive @ Ramon Road	16.7	B	16.3	B	16.2	B	16.2	B
12	S. Palm Canyon Drive @ Camino Parocela	10.2	B	11.1	B	10.2	B	10.0	A
13	Indian Canyon Drive @ E. Tachevah Drive	6.1	A	7.6	A	6.6	A	6.1	A
14	Indian Canyon Drive @ E. Tamarisk Road	13.1	B	13.2	B	12.3	B	12.3	B
15	Indian Canyon Drive @ Granvia Valmonte	2.9	A	2.9	A	2.9	A	2.9	A
16	Indian Canyon Drive @ E. Alejo Road	12.4	B	15.3	B	14.3	B	13.8	B
17	Indian Canyon Drive @ E. Amado Road	8.1	A	10.0	A	7.6	A	8.4	A
18	Indian Canyon Drive @ Andreas Road	10.6	B	14.1	B	11.4	B	8.9	A
19	Indian Canyon Drive @ E. Tahquitz Canyon Way	7.4	A	12.9	B	12.0	B	6.9	A
20	Indian Canyon Drive @ La Plaza	4.3	A	7.0	A	4.0	A	4.2	A
21	Indian Canyon Drive @ Arenas Road	6.7	A	8.8	A	6.5	A	6.9	A
22	Indian Canyon Drive @ Baristo Road	8.7	A	8.9	A	7.9	A	9.2	A
23	Indian Canyon Drive @ Ramon Road	12.3	B	17.6	B	14.8	B	11.8	B
24	N. Calle Encilia @ W. Alejo Road	5.5	A	5.3	A	5.4	A	5.6	A
25	N. Calle Encilia @ E. Amado Road	10.6	B	10.6	B	10.6	B	10.6	B
26	N. Calle Encilia @ E. Tahquitz Canyon Way	11.6	B	11.0	B	12.9	B	11.6	B
27	S. Calle Encilia @ Arenas Road	10.3	B	10.3	B	10.3	B	10.3	B
28	S. Calle Encilia @ Ramon Road	18.6	B	23.7	C	22.2	C	19.8	B

Table 4b: Intersection Level of Service for Conversion Year 2015 - PM Peak

No.		Existing		Alternative 1		Alternative 2 & 3		Alternative 4	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	N. Palm Canyon Drive @ E. Tachevah Drive	9.0	A	11.0	A	8.8	A	8.9	A
2	N. Palm Canyon Drive @ E. Tamarisk Road	4.7	A	4.5	A	4.4	A	4.7	A
3	N. Palm Canyon Drive @ Granvia Valmonte	7.5	A	6.9	A	7.4	A	7.5	A
4	N. Palm Canyon Drive @ E. Alejo Road	11.1	B	11.4	B	11.8	B	11.4	B
5	N. Palm Canyon Drive @ E. Amado Road	6.7	A	7.2	A	7.7	A	7.0	A
6	N. Palm Canyon Drive @ Andreas Road	8.2	A	7.3	A	9.1	A	7.1	A
7	N. Palm Canyon Drive @ E. Tahquitz Canyon Way	13.4	B	13.7	B	12.8	B	13.3	B
8	S. Palm Canyon Drive @ La Plaza	4.6	A	3.1	A	3.7	A	4.5	A
9	S. Palm Canyon Drive @ Arenas Road	7.8	A	7.2	A	7.3	A	7.5	A
10	S. Palm Canyon Drive @ Baristo Road	7.1	A	9.2	A	7.2	A	7.1	A
11	S. Palm Canyon Drive @ Ramon Road	15.8	B	16.9	B	15.4	B	15.5	B
12	S. Palm Canyon Drive @ Camino Parocela	9.5	A	9.6	A	9.7	A	9.6	A
13	Indian Canyon Drive @ E. Tachevah Drive	6.0	A	7.6	A	6.4	A	6.0	A
14	Indian Canyon Drive @ E. Tamarisk Road	12.2	B	12.6	B	12.3	B	12.3	B
15	Indian Canyon Drive @ Granvia Valmonte	2.4	A	2.4	A	2.4	A	2.4	A
16	Indian Canyon Drive @ E. Alejo Road	11.8	B	14.2	B	14.6	B	12.8	B
17	Indian Canyon Drive @ E. Amado Road	8.9	A	9.0	A	7.5	A	8.6	A
18	Indian Canyon Drive @ Andreas Road	7	A	15.2	B	9.9	A	8	A
19	Indian Canyon Drive @ E. Tahquitz Canyon Way	6.9	A	11.5	B	11.2	B	7	A
20	Indian Canyon Drive @ La Plaza	4.1	A	3.8	A	4.2	A	4.2	A
21	Indian Canyon Drive @ Arenas Road	6.6	A	7.1	A	6.5	A	6.8	A
22	Indian Canyon Drive @ Baristo Road	8.4	A	8.3	A	7.6	A	8.7	A
23	Indian Canyon Drive @ Ramon Road	10.6	B	19.5	B	12.9	B	11	B
24	N. Calle Encilia @ W. Alejo Road	4.6	A	4.5	A	4.5	A	4.6	A
25	N. Calle Encilia @ E. Amado Road	9.9	A	9.9	A	9.9	A	9.9	A
26	N. Calle Encilia @ E. Tahquitz Canyon Way	11.6	B	11.9	B	12.8	B	11.5	B
27	S. Calle Encilia @ Arenas Road	9.7	A	9.7	A	9.7	A	9.7	A
28	S. Calle Encilia @ Ramon Road	20.7	B	21.4	C	23.6	C	20.6	C

Table 5. Arterial Level of Service for Conversion Year 2015

Arterial (Segment)	Dir	Length (mi)	Existing (One-Way) ¹		Alternative 1 (Two-Way) ²		Alternative 2 (Two-Way) ³		Alternatives 3 (Two-Way) ⁴		Alternatives 4 (One-Way) ⁵	
			Arterial Speed MPH	Arterial LOS	Arterial Speed MPH	Arterial LOS	Arterial Speed MPH	Arterial LOS	Arterial Speed MPH	Arterial LOS	Arterial Speed MPH	Arterial LOS
Midday Peak Hour												
Indian Canyon Drive (Camino Parocela to Tachevah Drive)	NB	1.7	22.0	C	16.9	C	21.9	C	17.8	C	19.0	C
Indian Canyon Drive (Tachevah Drive to Ramon Road)	SB	1.6			15.2	C	16.5	C	19.2	C		
PM Peak Hour												
Indian Canyon Drive (Camino Parocela to Tachevah Drive)	NB	1.7	22.4	C	17.1	C	21.9	C	18.0	C	19.4	C
Indian Canyon Drive (Tachevah Drive to Ramon Road)	SB	1.6			16.4	C	17.6	C	20.6	C		

- Notes: 1. Existing Configuration - one-way with four NB lanes and parking on both sides.
 2. Alternative 1 - Two-way with one southbound lane, two NB lanes and parking on both sides.
 3. Alternative 2 - Two-way with one southbound lane, three NB lanes and parking only on the west side (No parking on the east side).
 4. Alternative 3 - Two-way with one southbound lane, three NB lanes and parking only on the east side (No parking on the west side).
 5. Alternative 4 - One-way with three NB lanes, angle parking on the west side, and parallel parking on the east side.

Table 6a: Intersection Level of Service for Future Year 2035 - Midday Peak

No.		Existing		Alternative 1		Alternative 2 & 3		Alternative 4	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	N. Palm Canyon Drive @ E. Tachevah Drive	9.9	A	10.2	B	9.5	A	9.9	A
2	N. Palm Canyon Drive @ E. Tamarisk Road	5.1	A	4.3	A	4.5	A	4.9	A
3	N. Palm Canyon Drive @ Granvia Valmonte	9.9	A	8.4	A	9.3	A	9.6	A
4	N. Palm Canyon Drive @ E. Alejo Road	12.9	B	14.2	B	14.2	B	14.1	B
5	N. Palm Canyon Drive @ E. Amado Road	6.6	A	7.1	A	8.2	A	7.4	A
6	N. Palm Canyon Drive @ Andreas Road	7.0	A	7.1	A	8.2	A	7.3	A
7	N. Palm Canyon Drive @ E. Tahquitz Canyon Way	20.5	C	21.6	C	15.0	B	16.8	B
8	S. Palm Canyon Drive @ La Plaza	4.7	A	9.2	A	4.1	A	4.8	A
9	S. Palm Canyon Drive @ Arenas Road	9.1	A	10.9	B	8.4	A	8.4	A
10	S. Palm Canyon Drive @ Baristo Road	7.2	A	9.4	A	7.3	A	6.9	A
11	S. Palm Canyon Drive @ Ramon Road	18.1	B	17.5	B	17.4	B	17.3	B
12	S. Palm Canyon Drive @ Camino Parocela	10.6	B	11.6	B	10.7	B	10.4	B
13	Indian Canyon Drive @ E. Tachevah Drive	6.1	A	7.8	A	6.8	A	6.1	A
14	Indian Canyon Drive @ E. Tamarisk Road	13.1	B	13.5	B	13.0	B	12.3	B
15	Indian Canyon Drive @ Granvia Valmonte	4.4	A	4.3	A	4.3	A	4.4	A
16	Indian Canyon Drive @ E. Alejo Road	13.4	B	16.7	B	15.8	B	16.0	B
17	Indian Canyon Drive @ E. Amado Road	8.4	A	11.0	B	7.7	A	8.7	A
18	Indian Canyon Drive @ Andreas Road	10.6	B	16	B	13.1	B	9.4	A
19	Indian Canyon Drive @ E. Tahquitz Canyon Way	7.5	A	14.1	B	12.1	B	7.7	A
20	Indian Canyon Drive @ La Plaza	4.3	A	7.7	A	4.5	A	4.4	A
21	Indian Canyon Drive @ Arenas Road	6.8	A	9.7	A	7.0	A	7.1	A
22	Indian Canyon Drive @ Baristo Road	9.5	A	9.4	A	8.3	A	10.1	B
23	Indian Canyon Drive @ Ramon Road	12.4	B	19.4	B	16.5	B	13	B
24	N. Calle Encilia @ W. Alejo Road	8.3	A	7.6	A	7.7	A	8.3	A
25	N. Calle Encilia @ E. Amado Road	11.9	B	11.9	B	11.9	B	11.9	B
26	N. Calle Encilia @ E. Tahquitz Canyon Way	11.7	B	11.1	B	13.1	B	11.8	B
27	S. Calle Encilia @ Arenas Road	11.6	B	11.6	B	11.6	B	11.6	B
28	S. Calle Encilia @ Ramon Road	19.1	B	22.5	C	22.2	C	18.9	B

Table 6b: Intersection Level of Service for Future Year 2035 - PM Peak

No.		Existing		Alternative 1		Alternative 2 & 3		Alternative 4	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	N. Palm Canyon Drive @ E. Tachevah Drive	9.4	A	10.0	A	9.2	A	9.4	A
2	N. Palm Canyon Drive @ E. Tamarisk Road	4.8	A	4.5	A	4.4	A	4.8	A
3	N. Palm Canyon Drive @ Granvia Valmonte	8.8	A	7.5	A	8.4	A	8.8	A
4	N. Palm Canyon Drive @ E. Alejo Road	12.5	B	12.8	B	13.0	B	12.8	B
5	N. Palm Canyon Drive @ E. Amado Road	6.7	A	7.2	A	8.2	A	7.4	A
6	N. Palm Canyon Drive @ Andreas Road	7.9	A	7.3	A	9.6	A	7.5	A
7	N. Palm Canyon Drive @ E. Tahquitz Canyon Way	15.6	B	15.5	B	14.4	B	15.3	B
8	S. Palm Canyon Drive @ La Plaza	4.9	A	3.1	A	4.3	A	4.7	A
9	S. Palm Canyon Drive @ Arenas Road	8.6	A	7.9	A	7.9	A	8.1	A
10	S. Palm Canyon Drive @ Baristo Road	7.1	A	9.4	A	7.2	A	7.1	A
11	S. Palm Canyon Drive @ Ramon Road	17.0	B	17.4	B	16.5	B	16.5	B
12	S. Palm Canyon Drive @ Camino Parocela	10.0	A	10.1	A	10.4	A	10.1	A
13	Indian Canyon Drive @ E. Tachevah Drive	6.1	A	7.7	A	6.6	A	6.1	A
14	Indian Canyon Drive @ E. Tamarisk Road	12.2	B	13.0	B	12.5	B	12.3	B
15	Indian Canyon Drive @ Granvia Valmonte	3.2	A	3.2	A	3.2	A	3.2	A
16	Indian Canyon Drive @ E. Alejo Road	13.0	B	15.4	B	15.6	B	14.2	B
17	Indian Canyon Drive @ E. Amado Road	8.8	A	10.2	B	7.6	A	8.6	A
18	Indian Canyon Drive @ Andreas Road	7.5	A	17.1	B	11.4	B	8.9	A
19	Indian Canyon Drive @ E. Tahquitz Canyon Way	6.9	A	12.6	B	12.0	B	7	A
20	Indian Canyon Drive @ La Plaza	4.1	A	3.9	A	4.7	A	4.3	A
21	Indian Canyon Drive @ Arenas Road	6.7	A	7.7	A	6.9	A	6.9	A
22	Indian Canyon Drive @ Baristo Road	9.1	A	8.6	A	8.0	A	9.5	A
23	Indian Canyon Drive @ Ramon Road	11	B	19.6	B	14.7	B	11.4	B
24	N. Calle Encilia @ W. Alejo Road	6.1	A	5.8	A	5.8	A	6.1	A
25	N. Calle Encilia @ E. Amado Road	11	B	11	B	11.0	B	11.0	B
26	N. Calle Encilia @ E. Tahquitz Canyon Way	11.8	B	11.9	B	13.0	B	11.7	B
27	S. Calle Encilia @ Arenas Road	10.7	B	10.7	B	10.7	B	10.7	B
28	S. Calle Encilia @ Ramon Road	20.7	B	21.5	C	23.6	C	19.5	C

Table 7. Arterial Level of Service for Future Year 2035

Arterial (Segment)	Dir	Length (mi)	Existing (One-Way) ¹		Alternative 1 (Two-Way) ²		Alternative 2 (Two-Way) ³		Alternatives 3 (Two-Way) ⁴		Alternatives 4 (One-Way) ⁵	
			Arterial Speed MPH	Arterial LOS	Arterial Speed MPH	Arterial LOS	Arterial Speed MPH	Arterial LOS	Arterial Speed MPH	Arterial LOS	Arterial Speed MPH	Arterial LOS
Midday Peak Hour												
Indian Canyon Drive (Camino Parocela to Tachevah Drive)	NB	1.7	21.8	C	16.3	C	21.4	C	17.5	C	18.5	C
Indian Canyon Drive (Tachevah Drive to Ramon Road)	SB	1.6			14.8	C	15.4	C	18.2	C		
PM Peak Hour												
Indian Canyon Drive (Camino Parocela to Tachevah Drive)	NB	1.7	22.0	C	16.6	C	21.5	C	17.7	C	19.1	C
Indian Canyon Drive (Tachevah Drive to Ramon Road)	SB	1.6			15.5	C	16.4	C	18.9	C		

- Notes:
- Existing Configuration - one-way with four NB lanes and parking on both sides.
 - Alternative 1 - Two-way with one southbound lane, two NB lanes and parking on both sides.
 - Alternative 2 - Two-way with one southbound lane, three NB lanes and parking only on the west side (No parking on the east side).
 - Alternative 3 - Two-way with one southbound lane, three NB lanes and parking only on the east side (No parking on the west side).
 - Alternative 4 - One-way with three NB lanes, angle parking on the west side, and parallel parking on the east side.

CONCLUSIONS

This study concludes that it is feasible to convert Indian Canyon Drive between Ramon Road and Alejo Road into a two-way street (Alternative 1, 2 or 3). All three alternative scenarios that include two-way traffic will provide an acceptable Level of Service (LOS) C. Alternative 4 with three one-way northbound lanes (and no southbound lanes), angle parking on the west side, and parallel parking on the east side is also a feasible alternative. Alternative 4 operates at an acceptable LOS C and provides approximately 20% more parking spaces on the west side of Indian Canyon Drive.

While it is clear that Alternative 4 with angle parking can provide more on-street parking, it is difficult to ascertain specific business advantages for any of the three viable two-way conversion alternatives other than enhanced traffic circulation in the downtown business area with no degradation in level of service.

Improvement Cost Estimates

The cost to implement the conversion to two-way traffic on Indian Canyon Drive is estimated to be approximately \$1.4 to \$1.75 million. The cost details are summarized in **Table 8**. This cost includes the following improvements on Indian Canyon Drive:

- Re-striping of Indian Canyon Drive between Alejo Road and south of Ramon Road.
- Signal modifications at the intersections of Indian Canyon Drive at Ramon Road, Baristo Road, Arenas Road, La Plaza, Tahquitz Canyon Way, Andreas Road, Amado Road and Alejo Road.
- At signalized intersections where Marbelite poles are currently used for the eastbound and westbound traffic, replace with new poles to meet current standards.
- Installation and implementation of traffic signal interconnect and synchronization.

The signal modifications will typically not require left turn phasing. Northbound and southbound left turn pockets will be provided at all intersections. New signal poles would be required to enable the installation of traffic signal indications on mast arms. Because of the existing monument in the median on Tahquitz Canyon Way at Indian Canyon Drive, the eastbound left turn would be converted from PPLT (Protected/ Permissive Left Turn Phasing) to permissive phasing, and the existing westbound through lane would be converted to a shared through/left lane with permissive phasing to allow for a westbound left turn movement.

A cost to implement Alternative 4 (three one-way northbound lanes with angle parking on west side and parallel parking on the east side) is in the range of \$75 to \$100 thousand. The cost details for Alternative 4 are summarized in **Table 9**.

Table 8: Indian Canyon Drive Two-Way Conversion Cost Estimate

Description	Construction Cost (\$)	Design Cost (\$)	Total (\$)
I Intersection and Signal Modification Costs			
Indian Canyon Road @ Ramon Road	50,000 to 80,000	8,500	58,500 to 88,500
Indian Canyon Road @ Baristo Road	50,000 to 80,000	8,500	58,500 to 88,500
Indian Canyon Road @ Arenas Road	50,000 to 80,000	8,500	58,500 to 88,500
Indian Canyon Road @ La Plaza	60,000 to 90,000	8,500	68,500 to 98,500
Indian Canyon Road @ Tahquitz Canyon Way	60,000 to 90,000	8,500	68,500 to 98,500
Indian Canyon Road @ Andreas Road	50,000 to 80,000	8,500	58,500 to 88,500
Indian Canyon Road @ Amado Road	50,000 to 80,000	8,500	58,500 to 88,500
Indian Canyon Road @ Alejo Road	100,000 to 130,000	18,500	118,500 to 148,500
II Restriping Costs	50,000 to 70,000	10,000	60,000 to 80,000
III Signal Interconnect and Coordination Costs	150,000	50,000	200,000
Subtotals:	670,000 to 930,000	138,000	808,000 to 1,068,000

Administration/Contract Management (12%): 96,960 to 128,160

Plan Checking/Inspections (12%): 96,960 to 128,160

Miscellaneous/Contingencies (15%): 121,200 to 160,200

Total: 1,123,120 to 1,484,520

Rounded: 1,200,000 to 1,500,000

Replacing Marbelite Poles for Eastbound & Northbound Traffic: 200,000 to 250,000

Grand Total: 1,400,000 to 1,750,000

Table 9: Indian Canyon Drive Alternative 4 Cost Estimate

	Construction Cost (\$)	Design Cost (\$)	Total (\$)
Restriping Costs	45,000 to 60,000	10,000	55,000 to 70,000
Subtotals:	45,000 to 60,000	10,000	55,000 to 70,000

Administration/Contract Management (12%): 6,600 to 8,400
 Plan Checking/Inspections (12%): 6,600 to 8,400
 Miscellaneous/Contingencies (15%): 8,250 to 10,500
Total: 76,450 to 97,300
Call: 75,000 to 100,000