Traffic Impact Study – Kimley Horn

Traffic Impact Study

Bell Avenue Commercial Development
Sacramento, California

DRAFT
November 18, 2020

Prepared for:

City of Sacramento

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INTRODUCTION

Purpose

This report documents the results of a traffic assessment completed for the proposed Bell Avenue Commercial Development (the "Proposed Project" or "Project"), located at the southwest corner of the Bell Avenue intersection with Raley Boulevard in Sacramento, California.

The purpose of this study is to prepare a focused traffic access evaluation and queuing assessment of the proposed project on the adjacent transportation system, limited to consideration of Existing plus Proposed Project Conditions. More specifically, this study has been requested to assess project impacts to the adjacent intersections, and to assess project site access for the proposed use. This study was performed in accordance with the City of Sacramento's *Traffic Impact Guidelines*[1] and the *2035 General Plan* policies.

Project Description

Kimley-Horn understands that the project applicant proposes to rezone approximately 0.34 acres from single-family residential to general commercial. The project applicant proposes to construct two (2) drive-through restaurants at 3,150 and 2,670 square-feet respectively. In addition, the project applicant proposes to construct a 16,965 square-foot, two-story retail and office building. The project applicant proposes three (3) full-access driveways, one each along Raley Boulevard, Bell Avenue, and Katharine Avenue. The proposed project is located at the southwestern corner of the Raley Boulevard intersection with Bell Avenue. Furthermore, we understand that Bell Avenue, from Raley Boulevard east towards Pinell Street, is part of a planned streetscape project that is anticipated to reduce travel lanes along Bell Avenue.

The project location is shown in Figure 1. Three full-access driveways are proposed with one each along along Bell Avenue, Raley Boulevard, and Kathrine Avenue as depicted in the site plan provided in Figure 2. The appropriateness of the Kathrine Avenue driveway and any access restrictions on the remaining driveways are reviewed in the Other Considerations section of this report.

Study Area

The following intersection is included in this evaluation:

1. Bell Avenue @ Raley Boulevard

[1] *Traffic Impact Guidelines*, City of Sacramento, February 1996 (updated with the adopted LOS policies of the *Sacramento 2035 General Plan*).

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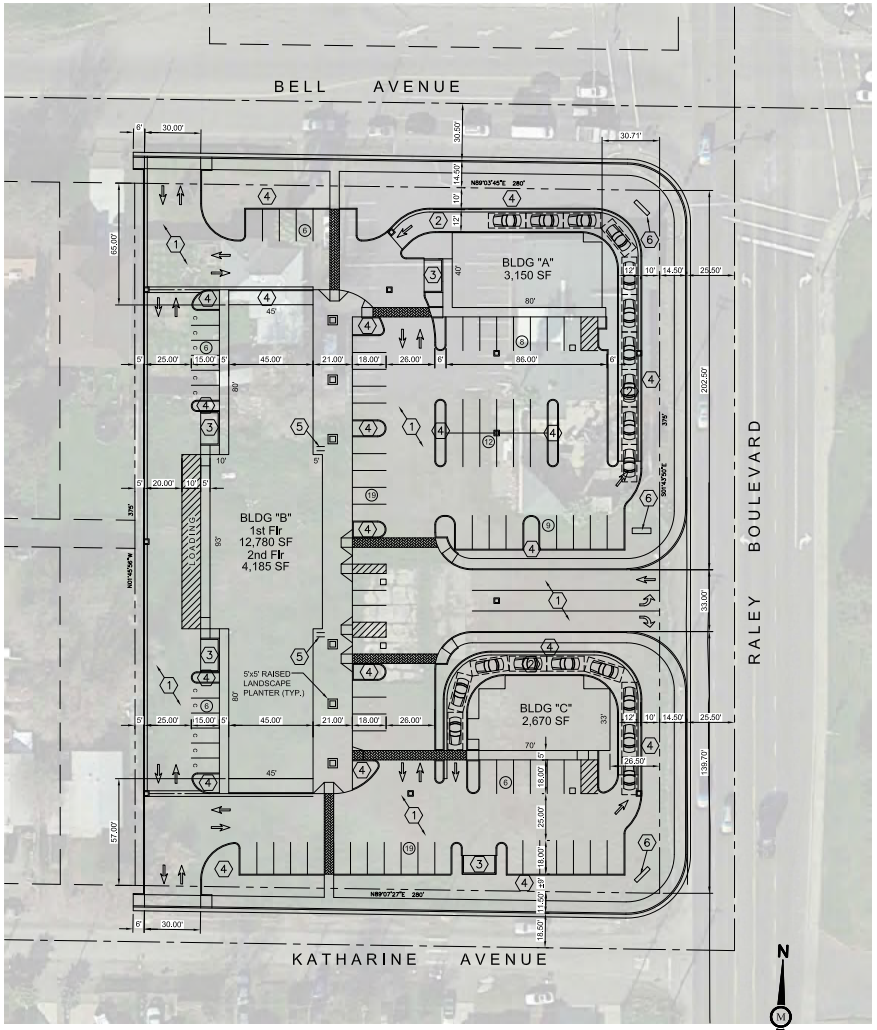
Figure 1
Project Vicinity Map

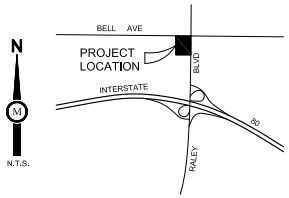
BELL AVENUE CENTER

1556 BELL AVENUE, SACRAMENTO, CA 9838



SITE PLAN

SCALE 1" = 30'
0 30 60



VICINITY MAP

CONSTRUCTION NOTES

1. NEW ASPHALT CONCRETE PAVEMENT
2. NEW PORTLAND CEMENT CONCRETE SIDEWALK
3. NEW TRASH ENCLOSURE
4. NEW LANDSCAPE AREA
5. NEW BIKE RACK
6. NEW MONUMENT SIGN

PROPERTY OWNER/ APPLICANT

MIKE IQBAL
1556 BELL AVENUE
SACRAMENTO, CA 95838
PHONE: (916) 925-0577

DESIGN FIRM

MILESTONE ASSOCIATES
CONTACT: JULIO TINAJERO
1000 LINCOLN ROAD, STE. H202
YUBA CITY, CA 95991
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DD9.3	BLDG "B" - BUILDING SECTIONS
DD10.1	BLDG "C" - FLOOR PLAN
DD10.2	BLDG "C" - EXTERIOR ELEVATIONS
DD10.3	BLDG "C" - BUILDING SECTIONS

LOT DATA:

ASSESSOR'S PARCEL NUMBER(S): 237-0162-007, 008, 009, 010, 011, 012

PARCEL SIZE: 101,005 SF (2.34 AC) COMBINED TOTAL

EXISTING ZONING: C-2-R GENERAL COMMERCIAL / REVIEW R-1 SINGLE FAMILY RESIDENCE

PROPOSED ZONING: C-2-R GENERAL COMMERCIAL / REVIEW

EXISTING USE: VACANT / EXISTI. BLDG.

PROPOSED USE: COMMERCIAL CENTER

SITE COVERAGE:

BUILDING COVERAGE:	18,600 SF (18.4%)
LANDSCAPE AREA:	24,210 SF (24.0%)
PAVED SURFACE AREA:	58,195 SF (57.6%)

PARKING DATA:

REQUIRED:

BLDG "A" - RESTAURANT (3,150 SF) (1 SPACE PER 125 SF)	=	26 SPACES
BLDG "B" - RETAIL (1ST FLR 12,780 SF) (1 SPACE PER 400 SF)	=	32 SPACES
BLDG "B" - OFFICE (2ND FLR 4,185 SF) (1 SPACE PER 400 SF)	=	11 SPACES
BLDG "C" - RESTAURANT (2,670 SF) (1 SPACE PER 125 SF)	=	22 SPACES
REQUIRED:		91 SPACES

PROVIDED:

STANDARD SPACE (9'x18')	75 SPACES
COMPACT SPACE (8'x15')	12 SPACES
ACCESSIBLE SPACE (9'x18')	4 SPACES
PROVIDED:	91 SPACES

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JULIO J. TINAJERO
LEAD DESIGNER

CHRISTOPHER L. DAY, P.E.
PROJECT ENGINEER

STAMP: REGISTERED PROFESSIONAL ENGINEER — CHRISTOPHER LLOYD DAY — No. C 84508 — exp. 6/30/19 — CIVIL — STATE OF CALIFORNIA

SUBMITTAL DATE

PLANNING DEPT: .
BUILDING DEPT: .
PUBLIC WORKS: .
SURVEY: .

REVISIONS

No.	Description	Date

SITE PLAN

PROPOSED BELL AVENUE CENTER
a IQBAL DEVELOPMENT PROJECT
1556 BELL AVENUE
SACRAMENTO, CA 95838
A.P.N.(s) 237-0162-009,-08,-07,-10,-11,-12

DATE: 7-1-20
SCALE: 1" = 30'
DRAFTER: STAFF
JOB NUMBER: 18-002

SHEET: DD1

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ENVIRONMENTAL SETTING

This traffic impact analysis was conducted for the above-listed study facilities for the following scenarios:

A. Existing (2020) Conditions
B. Existing (2020) plus CIP Projects Conditions
C. Existing (2020) plus CIP Projects plus Proposed Project Conditions

Project Area Roadways

The following are descriptions of the primary roadways near the project site.

Bell Avenue is an east-west arterial bordering the northern edge of the project site. Bell Avenue connects the residential areas to the west of the site with the industrial areas to the east. Along the project frontage, Bell Avenue has one lane in each direction. As part of the City's Capital Improvement Project (CIP) program, the City will be reducing travel lanes along Bell Avenue, east of Raley Boulevard, to one lane in each direction. Construction is expected to begin in 2021. There is currently a sidewalk along the northern edge of Bell Avenue.

Raley Boulevard is a north-south arterial west of the project site. To the south, this roadway provides connectivity to Interstate 80 (I-80), south of which it is renamed to Marysville Boulevard. Between Bell Avenue and I-80, two travel lanes in each direction and a two-way left-turn lane are provided. There is currently a sidewalk along the eastern side of Raley Boulevard.

Public Transit System

Sacramento Regional Transit District (RT) provides transit service in the greater Sacramento metropolitan area. The nearest transit stops to the proposed project are located along Grand Avenue, roughly one mile away from the project site[2]. The stops are served by RT Routes 15 and 86 as shown in Figure 3.

Existing/Planned Pedestrian and Bicycle Facilities

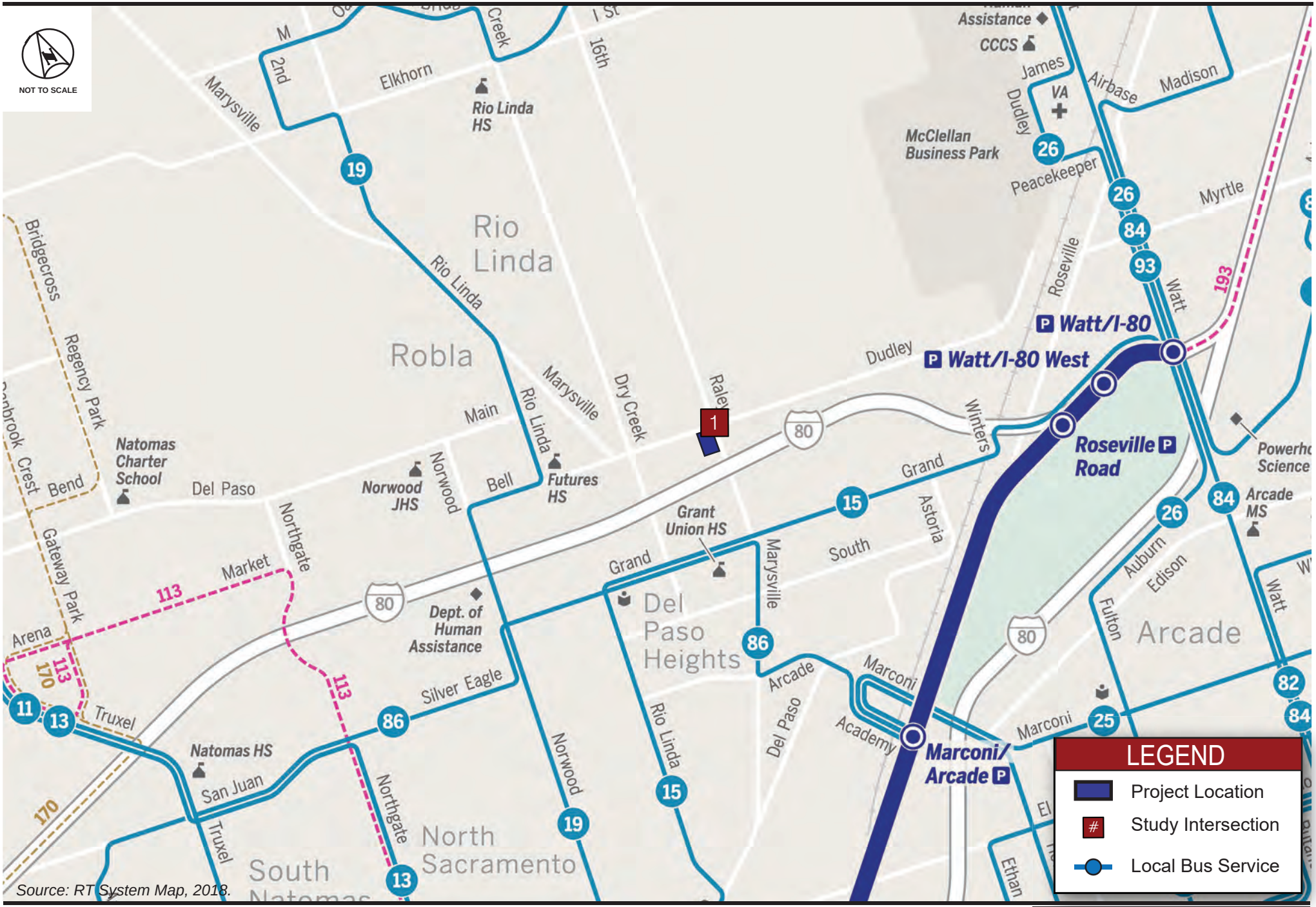
As noted above, there are existing sidewalks along both Raley Boulevard and Bell Avenue, opposite the project site. Currently, there are gaps in the existing Raley Boulevard sidewalks which lead to lack of connectivity. There are currently streetlights located along the project frontage.

According to the City's *Bicycle Master Plan*[3] (see Figure 4), on-street bicycle facilities are proposed along Raley Boulevard between Bell Avenue and I-80, and along Bell Avenue, west of Raley Boulevard and east of Astoria Street. The addition of these facilities will improve the connectivity of the bicycle network in the vicinity of the proposed project.

Existing Intersection Geometry

Figure 5 illustrates the study facilities, existing traffic control, and existing lane configurations.

[2] Sacramento Regional Transit District, http://www.sacrt.com/systemmap/A1.stm.
[3] *Bicycle Master Plan*, City of Sacramento. August 2016.



Source: RT System Map, 2018.

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Figure 3
Sacramento RT Transit System Map

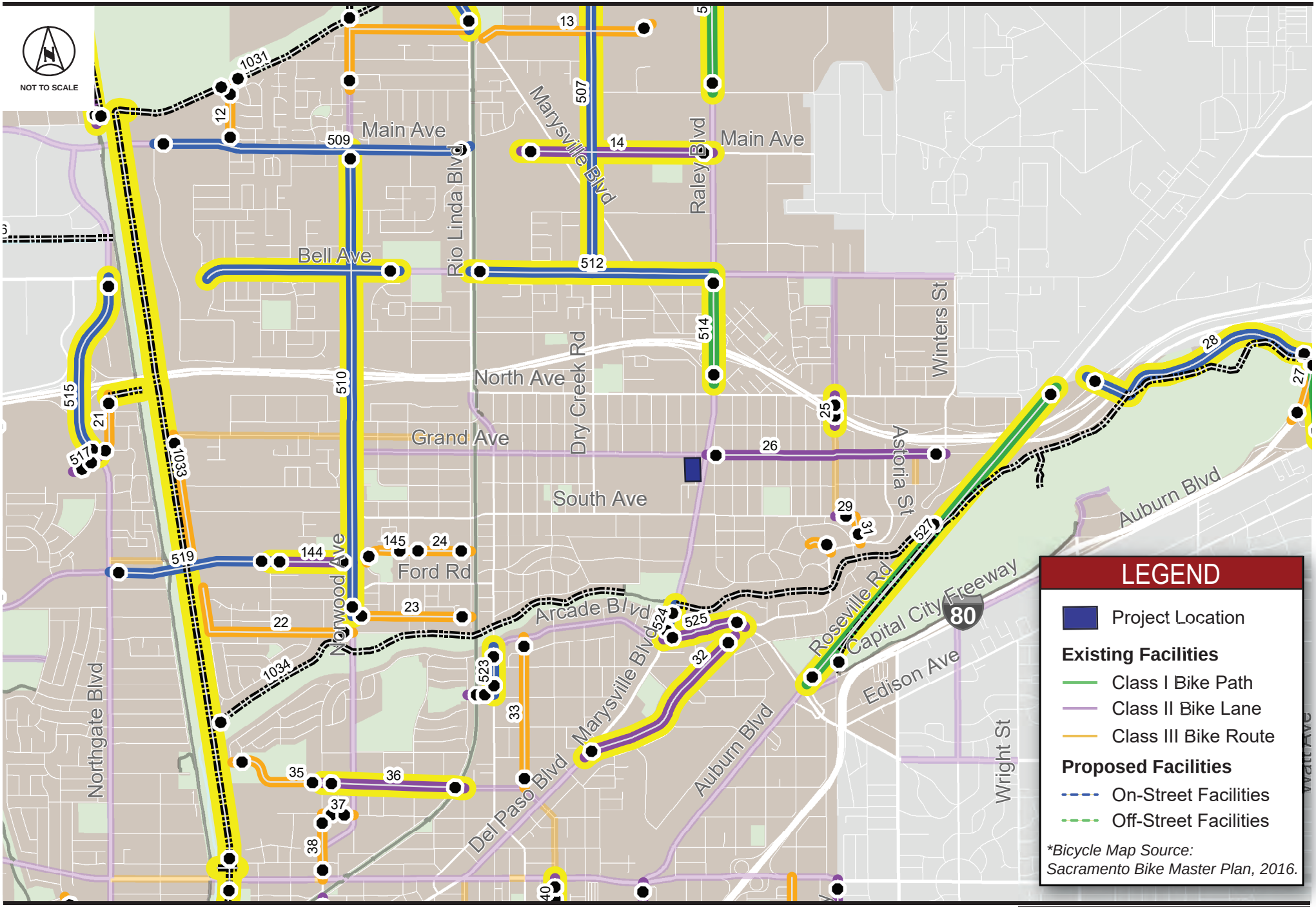

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Figure 4
Excerpt from City's Bicycle Master Plan

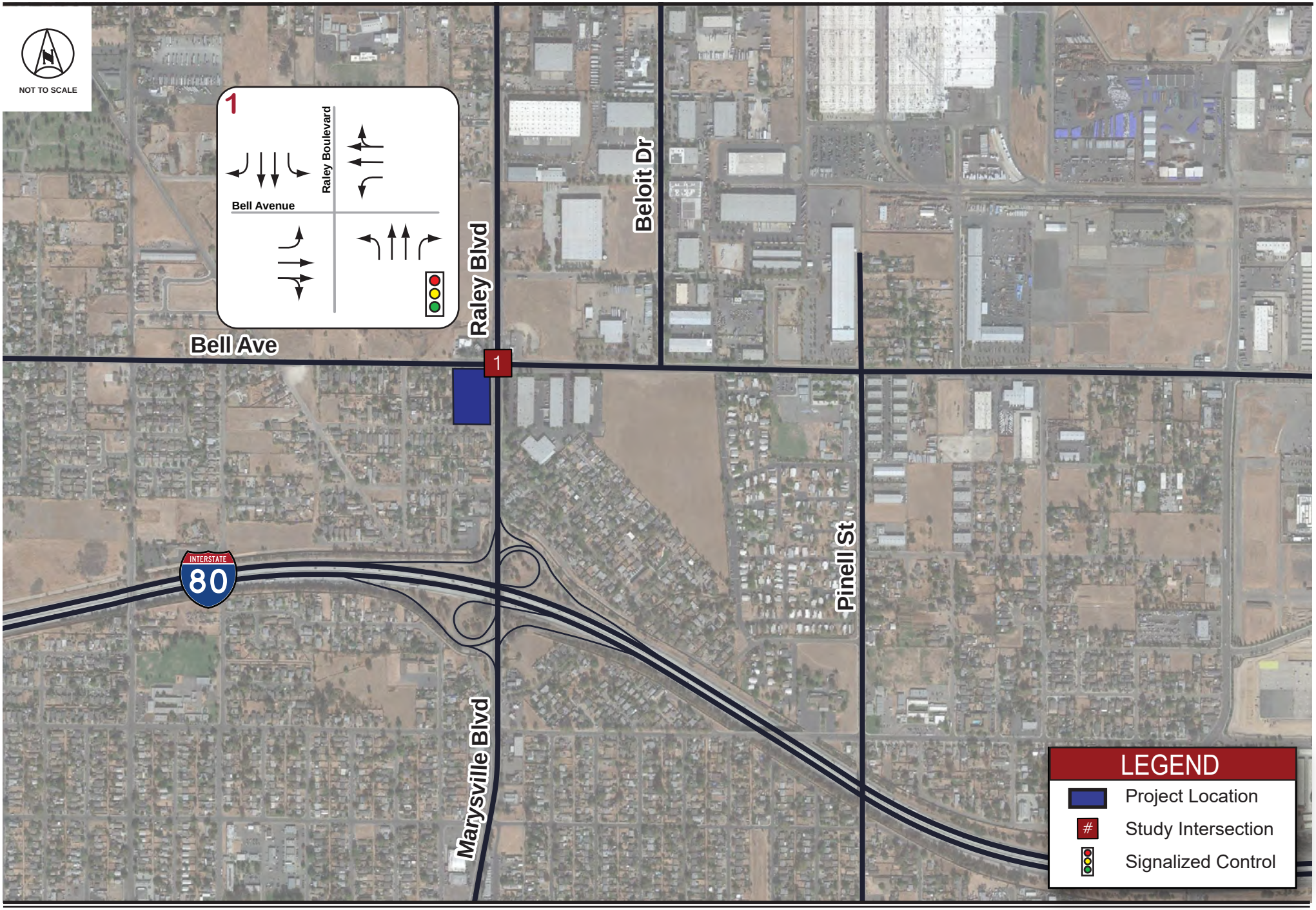

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Figure 5
Study Intersection, Traffic Control, and Lane Geometry

REGULATORY SETTING

Methodology

A field review was completed of the immediate project vicinity and study facilities to observe existing operations and lane configurations, vehicle storage lengths, existing traffic control, speed limits, lane utilization, adjacent land uses, and other readily apparently features for the study facilities that were deemed to be relevant to the study. Weekday peak-hour conditions are used as the time period during which to assess the transportation facilities' operations both existing, and with the addition of project traffic volumes.

Analysis of transportation facility consistency with the City's General Plan is based on the concept of Level of Service (LOS). The LOS of a facility is a qualitative measure used to describe operational conditions. LOS ranges from A (best), which represents minimal delay, to F (worst), which represents heavy delay and a facility that is operating at or near its functional capacity.

City of Sacramento

On March 3, 2015, the City of Sacramento City Council adopted the *2035 General Plan*. The Mobility Element of the City of Sacramento's *2035 General Plan* outlines goals and policies that coordinate the transportation and circulation system with planned land uses. The following LOS policy is relevant to this study:

> ***Policy M 1.2.2*** *The City shall implement a flexible context-sensitive Level of Service (LOS) standard, and will measure traffic operations against the vehicle LOS thresholds established in this policy. The City will measure vehicle LOS based on the methodology contained in the latest version of the Highway Capacity Manual (HCM) published by the Transportation Research Board. The City's specific vehicle LOS thresholds have been defined based on community values with respect to modal priorities, land use context, economic development, and environmental resources and constraints. As such, the City has established variable LOS thresholds appropriate for the unique characteristics of the City's diverse neighborhoods and communities. The City will strive to operate the roadway network at LOS D or better for vehicles during typical weekday conditions including AM and PM peak hour with certain exceptions mapped on Figure M1 (and listed in the General Plan document).*
>
> A. *Core Area (Central City Community Plan Area) – LOS F allowed*
> B. *Priority Investment Areas – LOS F allowed*
> C. *LOS E Roadways – LOS E is allowed for the following roadways because expansion of these facilities would result in undesirable impacts or conflicts with other community values:*
>   - *65th Street: Elvas Avenue to 14th Avenue*
>   - *Arden Way: Royal Oaks Drive to I-80 Business*
>   - *Broadway: Stockton Boulevard to 65th Street*
>   - *College Town Drive: Hornet Drive to La Rivera Drive*
>   - *El Camino Avenue: I-80 Business to Howe Avenue*
>   - *Elder Creek Road: Stockton Boulevard to Florin Perkins Road*
>   - *Elder Creek Road: South Watt Avenue to Hedge Avenue*
>   - *Fruitridge Road: Franklin Boulevard to SR 99*
>   - *Fruitridge Road: SR 99 to 44th Street*
>   - *Howe Avenue: El Camino Avenue to Auburn Boulevard*
>   - *Sutterville Road: Riverside Boulevard to Freeport Boulevard*
>
>   *LOS E is also allowed on all roadway segments and associated intersections located within ½ mile walking distance of light rail stations.*
> D. *Other LOS F Roadways - LOS F is allowed for the following roadways because expansion of the roadways would cause undesirable impacts or conflict with other community values.*
>   - *47th Avenue: State Route 99 to Stockton Boulevard*
>   - *Arcade Boulevard: Marysville Boulevard to Roseville Road*

- *Carlson Drive: Moddison Avenue to H Street*
- *El Camino Avenue: Grove Avenue to Del Paso Boulevard*
- *Elvas Avenue: J Street to Folsom Boulevard*
- *Elvas Avenue/56th Street: 52nd Street to H Street*
- *Florin Road: Havenside Drive to Interstate 5*
- *Florin Road: Freeport Boulevard to Franklin Boulevard*
- *Florin Road: Interstate 5 to Freeport Boulevard*
- *Folsom Boulevard: 47th Street to 65th Street*
- *Folsom Boulevard: Howe Avenue to Jackson Highway*
- *Folsom Boulevard: US 50 to Howe Avenue*
- *Freeport Boulevard: Sutterville Road (North) to Sutterville Road (South)*
- *Freeport Boulevard: 21st Street to Sutterville Road (North)*
- *Freeport Boulevard: Broadway to 21st Street*
- *Garden Highway: Truxel Road to Northgate Boulevard*
- *H Street: Alhambra Boulevard to 45th Street*
- *H Street 45th: Street to Carlson Drive*
- *Hornet Drive: US 50 Westbound On-ramp to Folsom Boulevard*
- *Howe Avenue: US 50 to Fair Oaks Boulevard*
- *Howe Avenue: US 50 to 14th Avenue*
- *Raley Boulevard: Bell Avenue to Interstate 80*
- *South Watt Avenue: US 50 to Kiefer Boulevard*
- *West El Camino Avenue: Northgate Boulevard to Grove Avenue*

E. *If maintaining the above LOS standards would, in the City's judgment be infeasible and/or conflict with the achievement of other goals, LOS E or F conditions may be accepted provided that provisions are made to improve the overall system, promote non-vehicular transportation, and/or implement vehicle trip reduction measures as part of a development project or a city initiated project. Additionally the City shall not expand the physical capacity of the planned roadway network to accommodate a project beyond that identified in Figure M4 and M4a (2035 General Plan Roadway Classification and Lanes).*

Study Intersection LOS Thresholds

In accordance with the City of Sacramento's General Plan Policy M 1.2.2, the following LOS thresholds apply to the study intersections:

1. Intersection #1 (Bell Avenue and Raley Boulevard) – LOS F (Raley Boulevard)

Existing Traffic Volumes

Weekday AM and PM peak-period turning movement traffic counts were collected on May 7, 2019 at the existing study intersections. The counts were conducted between 7:00 a.m. and 9:00 a.m. and between 4:00 p.m. and 6:00 p.m. Due to the pandemic time experiencing lower traffic volumes on City streets, these counts were assumed to represent 2020 conditions. Thus, the analysis is considered conservative. Existing (2020) peak-hour turning movement volumes are presented in Figure 6 and the traffic count data sheets are provided in Appendix A.

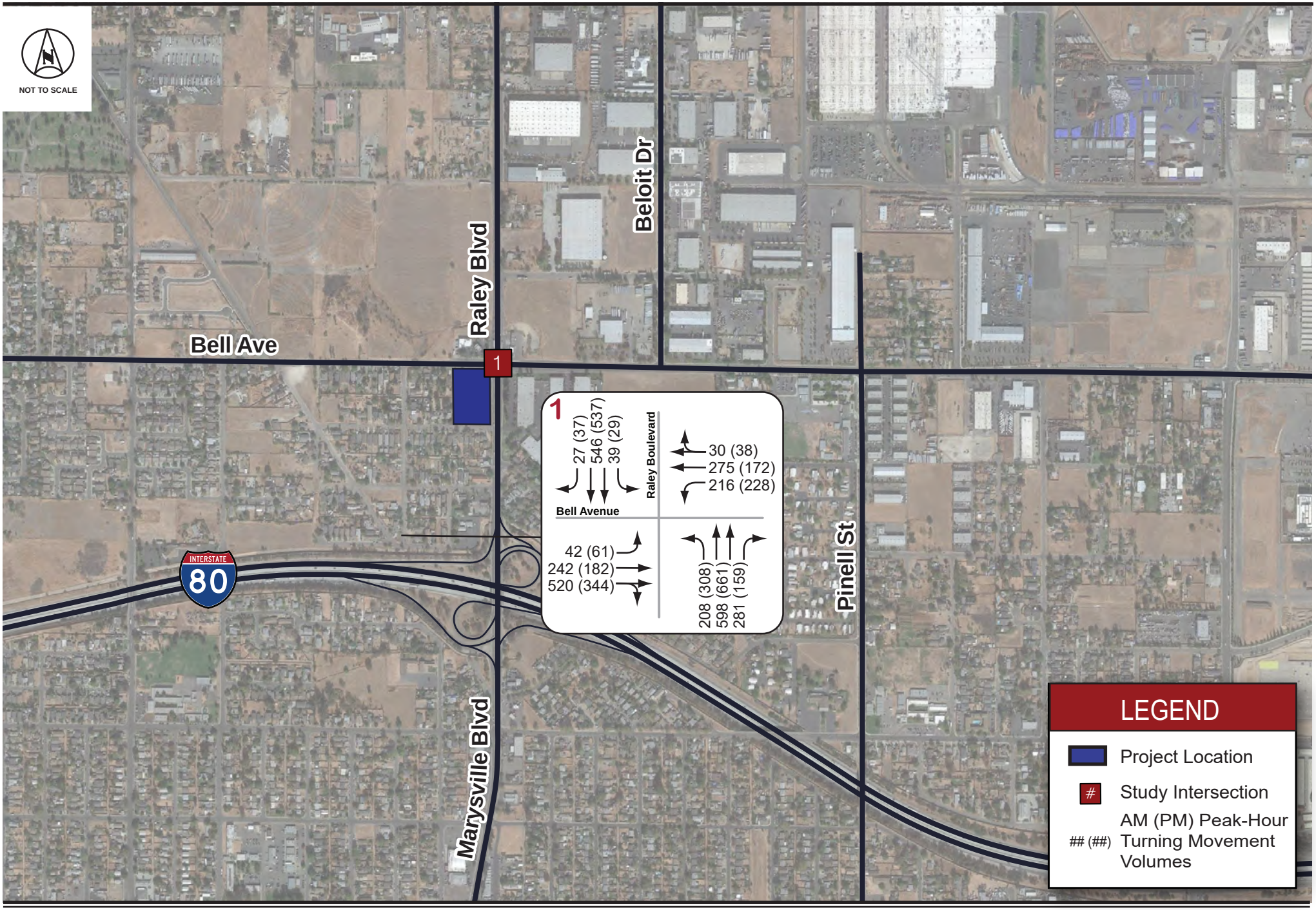

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Figure 6
Existing (2020) Peak-Hour Traffic Volumes

Intersection Analysis

Levels of Service for this study were determined using methods defined in the Highway Capacity Manual, 6th Edition (HCM) and appropriate traffic analysis software. The HCM includes procedures for analyzing side-street stop controlled (SSSC), all-way stop controlled (AWSC), and signalized intersections. The SSSC procedure defines LOS as a function of average control delay for each minor street approach movement. Table 1 presents intersection LOS definitions as defined in the HCM.

Table 1 – Intersection Level of Service Criteria

Level of Service (LOS)	Unsignalized	Signalized
	Average Control Delay (sec/veh)	Control Delay per Vehicle (sec/veh)
A	≤ 10	≤ 10
B	> 10 – 15	> 10 – 20
C	> 15 – 25	> 20 – 35
D	> 25 – 35	> 35 – 55
E	> 35 – 50	> 55 – 80
F	> 50	> 80

Source: Highway Capacity Manual, 6th Edition
Note: SSSC delay is based on the worst approach movement.

As previously discussed, the purpose of this study is to prepare a focused traffic evaluation of the effect of the proposed project on the surrounding transportation system, limited to consideration of Existing (2020) and Existing (2020) plus Proposed Project Conditions. The cumulative impacts on roadway segments, transit, bicycle facilities, pedestrian circulation, and parking from planned *2035 General Plan* development were identified and analyzed in the *2035 General Plan Master EIR*. Because the proposed project is consistent with the *2035 General Plan*, this study only reviews such issues on a project-specific basis only (no cumulative conditions analyses).

Results of Existing Conditions Analysis

Table 2 presents the peak-hour intersection operating conditions for this analysis scenario. As indicated in Table 2, the intersection operates between LOS C and LOS D for the AM and PM peak-hours. Analysis worksheets for this scenario are provided in Appendix B.

Table 2 – Existing (2020) Intersection Levels of Service

ID	Intersection	Control	Threshold	Peak Hour	Existing (2020)	
					Delay (sec)	LOS
1	Raley Boulevard @ Bell Avenue	Signal	F	AM	37.0	D
				PM	31.1	C

Bolded represents unacceptable conditions.

INTRODUCTION TO ANALYSIS

Project Land Use and Circulation

Land Use

As previously discussed and shown in Figure 2, the project applicant is proposing to rezone approximately 0.34 acres from single-family residential to general commercial. The project applicant proposes to construct two (2) drive-through restaurants at 3,150 and 2,670 square-feet respectively. In addition, the project applicant proposes to construct a 16,965 square-foot, two-story retail and office building.

Access

The project site is located at the southwestern corner of the Bell Avenue intersection with Raley Boulevard. The project applicant proposes three (3) full-access driveways, one each along Raley Boulevard, Bell Avenue, and Katharine Avenue, as depicted in the site plan provided in Figure 2.

Trip Generation

The number of trips anticipated to be generated by proposed project was approximated using data included in the *Trip Generation Manual, 10th Edition*, published by the Institute of Transportation Engineers (ITE). The project site is proposed to be rezoned as general commercial and the trips generated by the project are summarized by two (2) land uses, including Shopping Center (ITE Code 820) and Fast-Food Restaurant with Drive Thru (ITE Code 934). The trips generated by the proposed project are presented in Table 3. Details regarding the specific land uses are provided below:

- Trip generation equations for the peak-hour of adjacent street traffic were used to estimate the daily, AM, and PM peak-hour trips for the Shopping Center land use (820).
- Trip generation average rates were used to estimate the daily, AM, and PM peak-hour trips for the Fast-Food Restaurant with Drive-thru land uses (934).

Table 3 – Proposed Project Trip Generation

Land Use (ITE Code)	Size (ksf)	Daily Trips	AM Peak-Hour					PM Peak-Hour				
			Total Trips	In		Out		Total Trips	In		Out	
				%	Trips	%	Trips		%	Trips	%	Trips
Shopping Center (820)	16.965	1,800	160	62%	99	38%	61	146	48%	70	52%	76
Fast-Food Restaurant w/ D.T. (934)	5.820	2,742	234	51%	119	49%	115	190	52%	99	48%	91
Subtotal of Trips		4,542	394		218		176	336		169		167
Pass-by Trip Reduction [1]:		--	-119		-61		-58	-95		-50		-45
Net New External Trips (Proposed Project):		**4,542**	**275**		**157**		**118**	**241**		**119**		**122**

Source: Trip Generation Manual, 10th Edition.

[1] Pass-by reductions based on values contained in the *Trip Generation Handbook, 3rd Edition* published by the Institute of Transportation Engineers.
A 49% and 50% reduction were assumed for ITE land use 934 in the AM and PM peak respectively. No pass-by reduction was assumed for LUC 820.

As shown in Table 3, a pass-by trip reduction was assumed for the Fast-food restaurant land uses (934) consistent with data collected and published by ITE in their *Trip Generation Handbook, 3rd Edition*. A pass-by trip is a trip that consists of a vehicle stopping at the project on their way to another location. Therefore, a 50 percent pass-by trip reduction assumes that 50 percent of all the trips generated by a project are people who are already driving on the road network and decide to stop at the project site before continuing on their way. The proposed project is estimated to generate 4,542 daily trips, with 394 and 336 trips occurring during the AM and PM peak-hours, respectively. It is estimated that 119 and 95 trips will not be new trips on the roadway but pass-by trips to the proposed project. Therefor the proposed project is estimated to generate 275 and 241 net new AM and PM peak-hour trips, respectively.

Trip Distribution

The distribution of proposed project trips was based on general knowledge of project area traffic patterns, the proposed project layout, and engineering judgement. The majority of project trips are anticipated to come from I-80, as well as from Bell Avenue to the east and west and Raley Boulevard to the north. The proposed project trip distribution percentages and the project trip assignment (with CIP improvements added) are illustrated in **Figure 7** and **Figure 8**, respectively.

ANALYSIS

Method of Analysis

Peak-hour traffic associated with the proposed project was added to the existing traffic volumes. Consistency with the City's General Plan was determined by comparing traffic operating conditions associated with the project scenario to traffic operating conditions without the project.

Traffic Volumes & Intersection Geometry

Figure 9 provides the AM and PM peak-hour traffic volumes at the study intersection for the Existing (2020) plus Capital Improvement Project (CIP) conditions. Bell Avenue is part of a planned streetscape project that is anticipated to reduce travel lanes along Bell Avenue in the vicinity of the proposed project, east of Raley Boulevard. The Capital Improvement Project (CIP) would reduce the travel lanes along Bell Avenue from two lanes in each direction to one lane in each direction with a two-way left-turn lane (TWLTL) in the median of the roadway. Intersection geometry at Intersections #1 would also be modified as a result of the CIP, and the modified geometry is shown in **Figure 10**.

Intersection Operations

Existing (2020) with Capital Improvement Project (CIP) Conditions

As indicated in **Table 4**, the study intersection operates between LOS E and F with the addition of CIP project during the AM and PM peak-hours. Analysis worksheets for this scenario are provided in **Appendix C**.

Table 4 – Existing (2020) with CIP Project Intersection Levels of Service

ID	Intersection	Control	Threshold	Peak Hour	Existing (2020) with CIP Project	
					Delay (sec)	LOS
1	Raley Boulevard @ Bell Avenue	Signal	F	AM	82.4	F
				PM	70.7	E

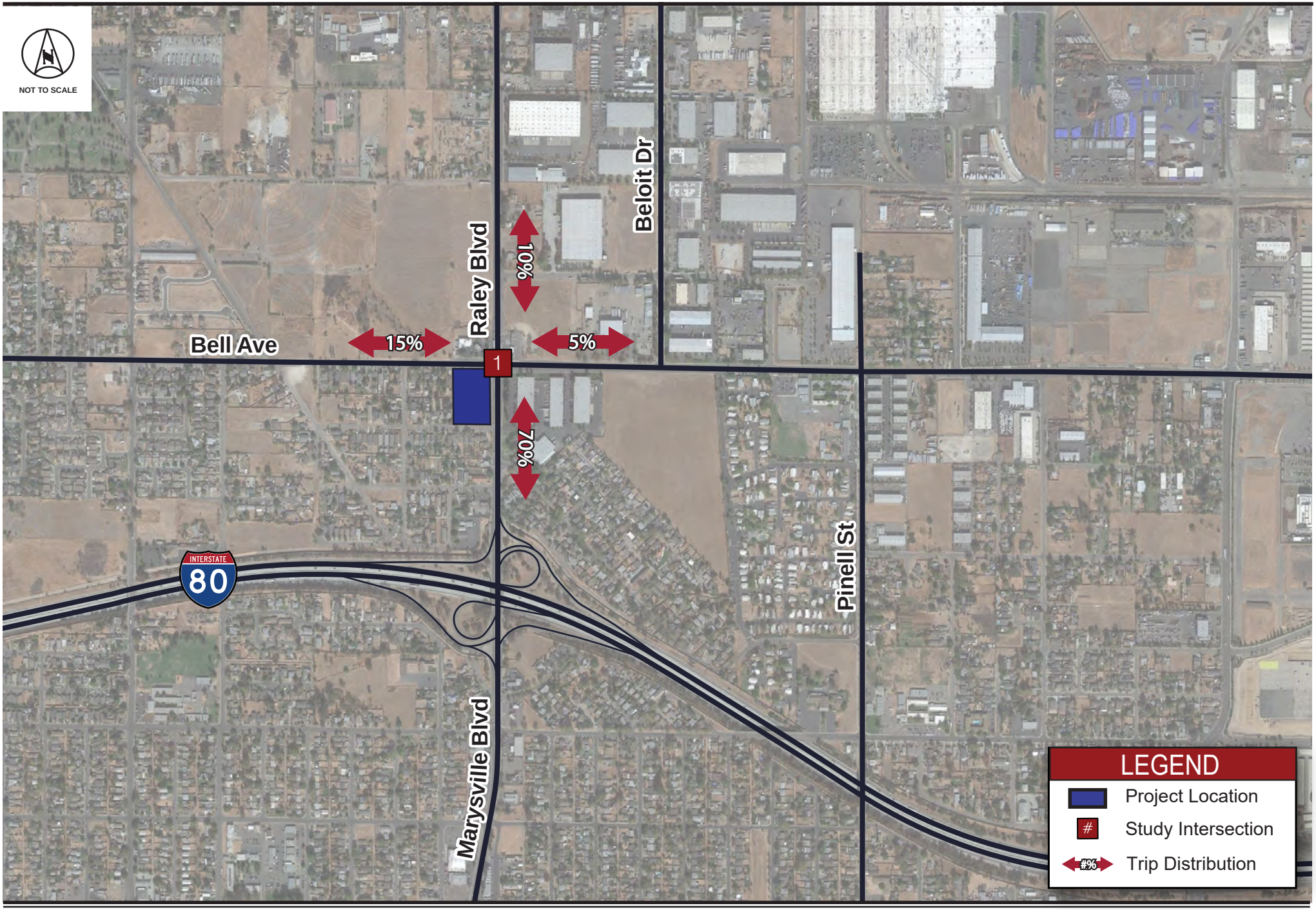

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Figure 7
Proposed Project Trip Distribution

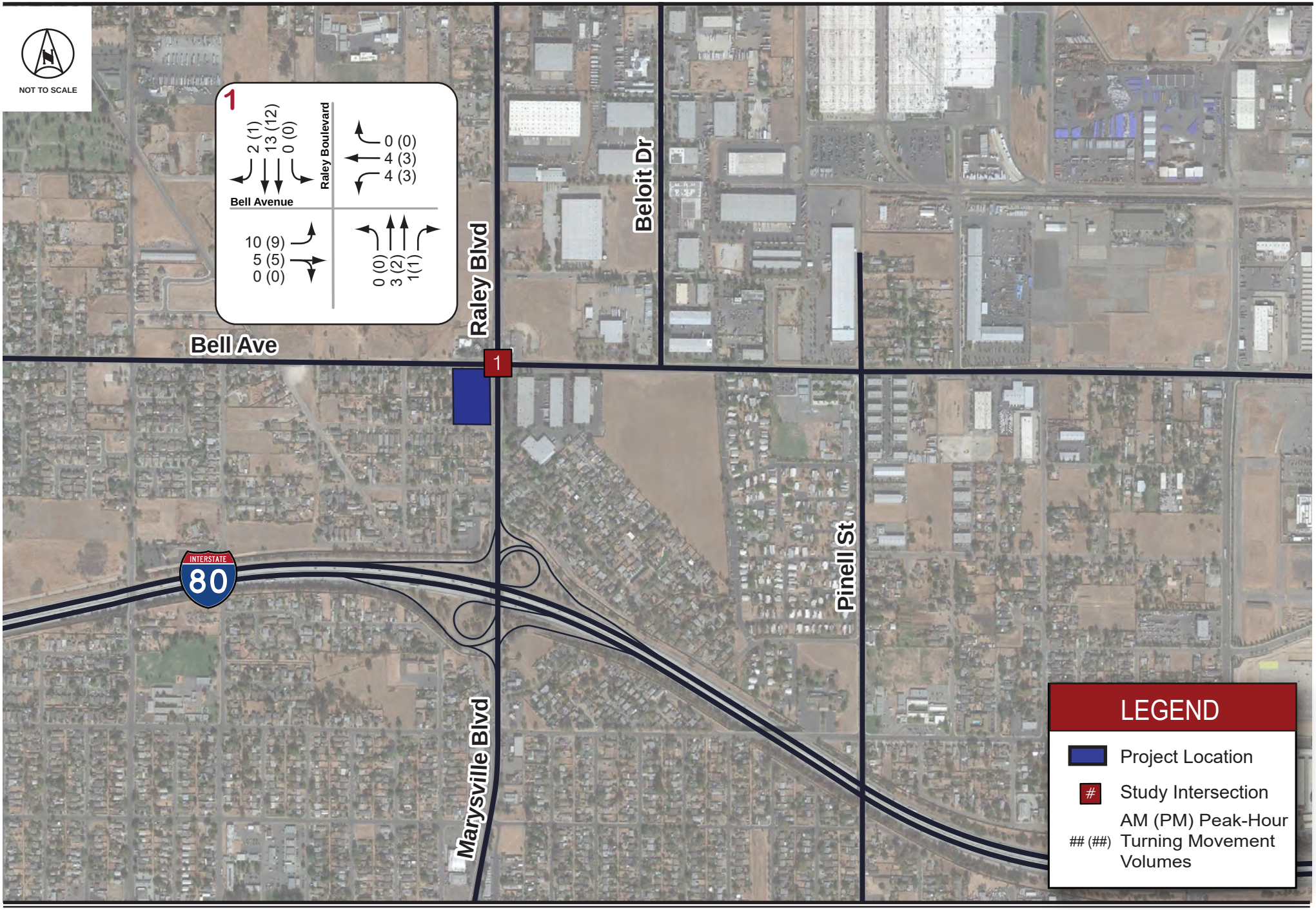

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Figure 8
Project Trip Assignment wiith CIP

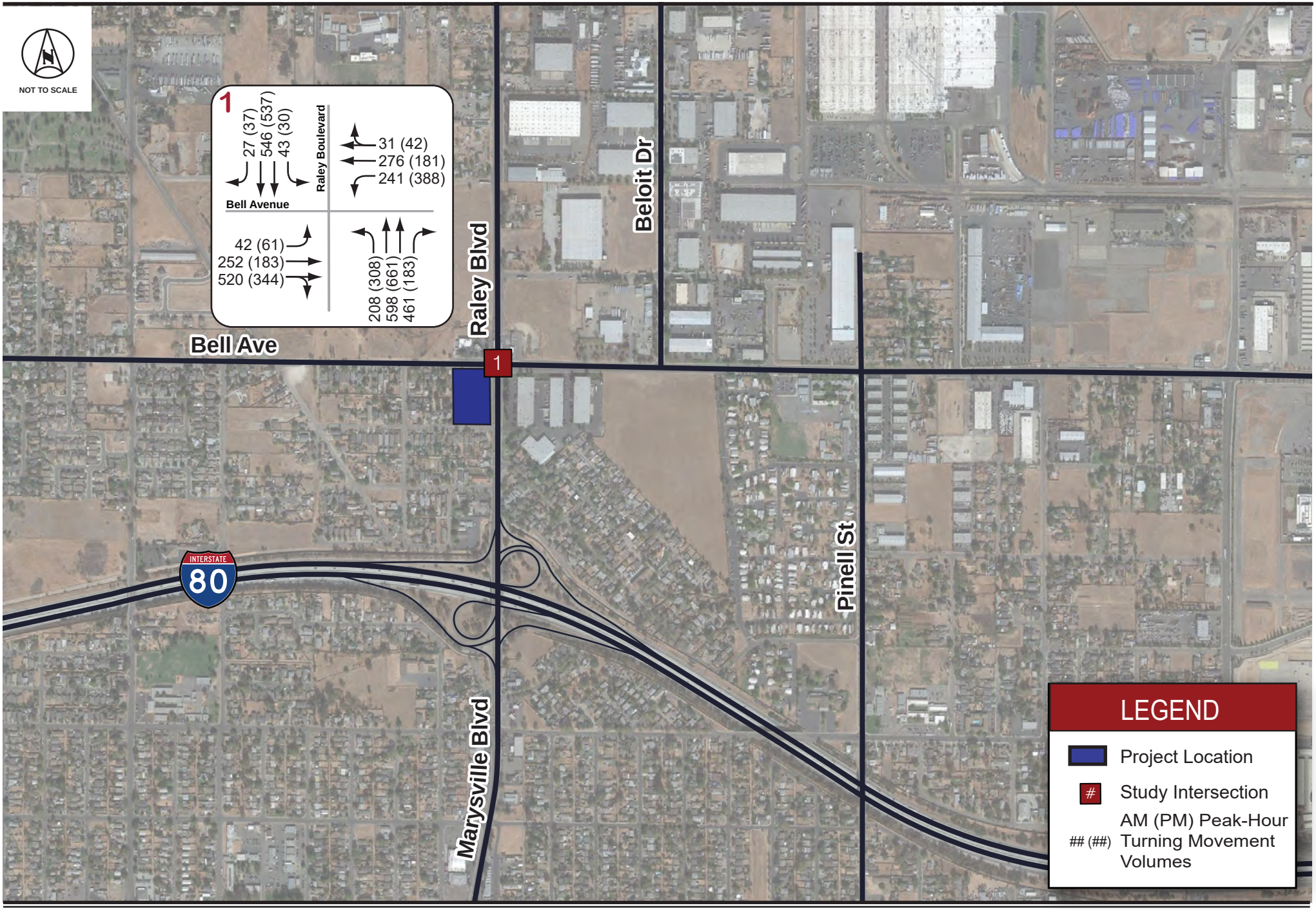

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Figure 9
Existing (2020) with CIP Peak-Hour Traffic Volumes

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Figure 10
Study Intersection, Traffic Control, and Lane Geometry with CIP

Existing (2020) with Capital Improvement Project plus Proposed Project Conditions

Figure 11 provides the AM and PM peak-hour traffic volumes at the study intersection for the Existing (2020) with CIP plus Proposed Project Conditions. As indicated in Table 5, the study intersection operates between LOS E and F without the addition of proposed project traffic during the AM and PM peak-hours. Analysis worksheets for this scenario are provided in Appendix D. As indicated in Table 5, the study intersection operates at LOS E with the addition of proposed project traffic during the AM and PM peak-hours. Under this analysis scenario, signal timings at the study intersection have been optimized to allow for more efficient traffic operations.

Table 5 – Existing (2020) with CIP and Existing (2020) with CIP plus Proposed Project Levels of Service

ID	Intersection	Control	Threshold	Peak Hour	Existing (2020) with CIP		Existing (2020) with CIP plus Project, Signal Optimized	
					Delay (sec)	LOS	Delay (sec)	LOS
1	Raley Boulevard @ Bell Avenue	Signal	F	AM	82.4	F	89.8	F
				PM	70.7	E	69.7	E

Bolded represents unacceptable conditions.

Analysis Summary

Intersections

The addition of the proposed project increases traffic volumes at the study intersections. As reflected in Table 5, the study intersection is shown to be consistent with the City's LOS requirement for the study area by operating at LOS F or better during the weekday peak-hours for all scenarios.

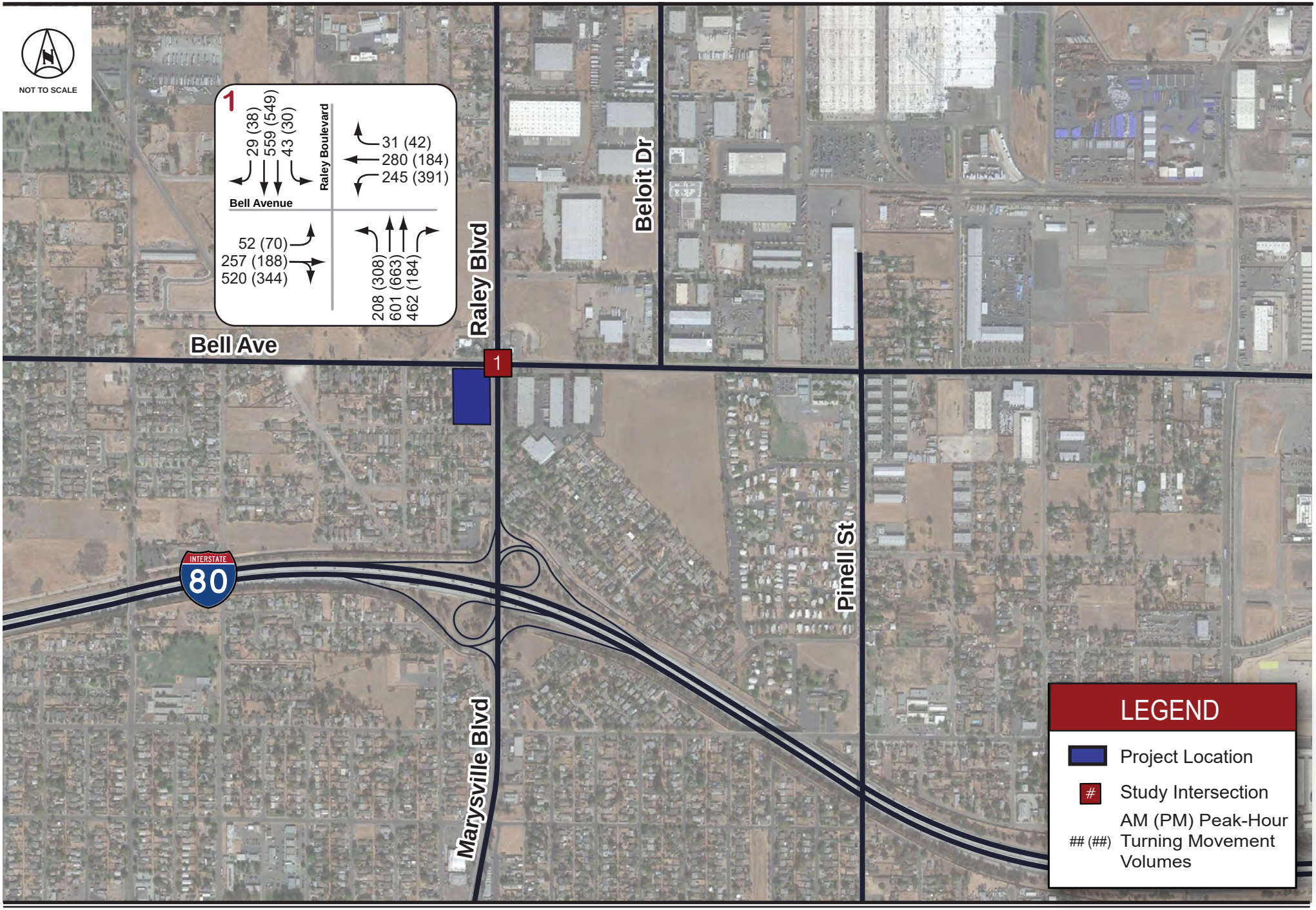
To satisfy General Plan Policy M.1.2.2 goals and ensure more efficient traffic operations (i.e., less delay, improved LOS, and reduced queuing potential to block adjacent lanes or driveways), it may be beneficial for the City to consider reallocating the traffic signal green time to more efficiently accommodate the anticipated traffic volumes at Intersection #1 (Raley Boulevard/Bell Avenue). Traffic signal timing optimization is anticipated to result in a nearly 12-second reduction in delay for the AM peak-hour (LOS E) and a nearly 2-second reduction in delay for the PM peak-hour (LOS E). The results in a LOS improvement in both the AM and PM peak-hours and the associated reduction in delay would be supportive of more efficient traffic operations. Therefore, it is recommended to optimize traffic signal timings at Intersection #1 (Raley Boulevard/Bell Avenue). While the signal timing improvements and redistribution of traffic due to access changes at the project improve the operations at the intersection, this does not necessarily result in a reduction in queue length at critical movements. Both the northbound and eastbound left turn movements are expected to increase by less than one vehicle length with these improvements and access modifications. Analysis worksheets for this recommendation are provided in Appendix E.

Transit System

The project would not adversely affect existing or planned transit operations. The project would not add noticeable transit demand. Any additional demand is anticipated to be adequately accommodated by the existing/planned transit system.

Bicycle Facilities and Pedestrian Circulation

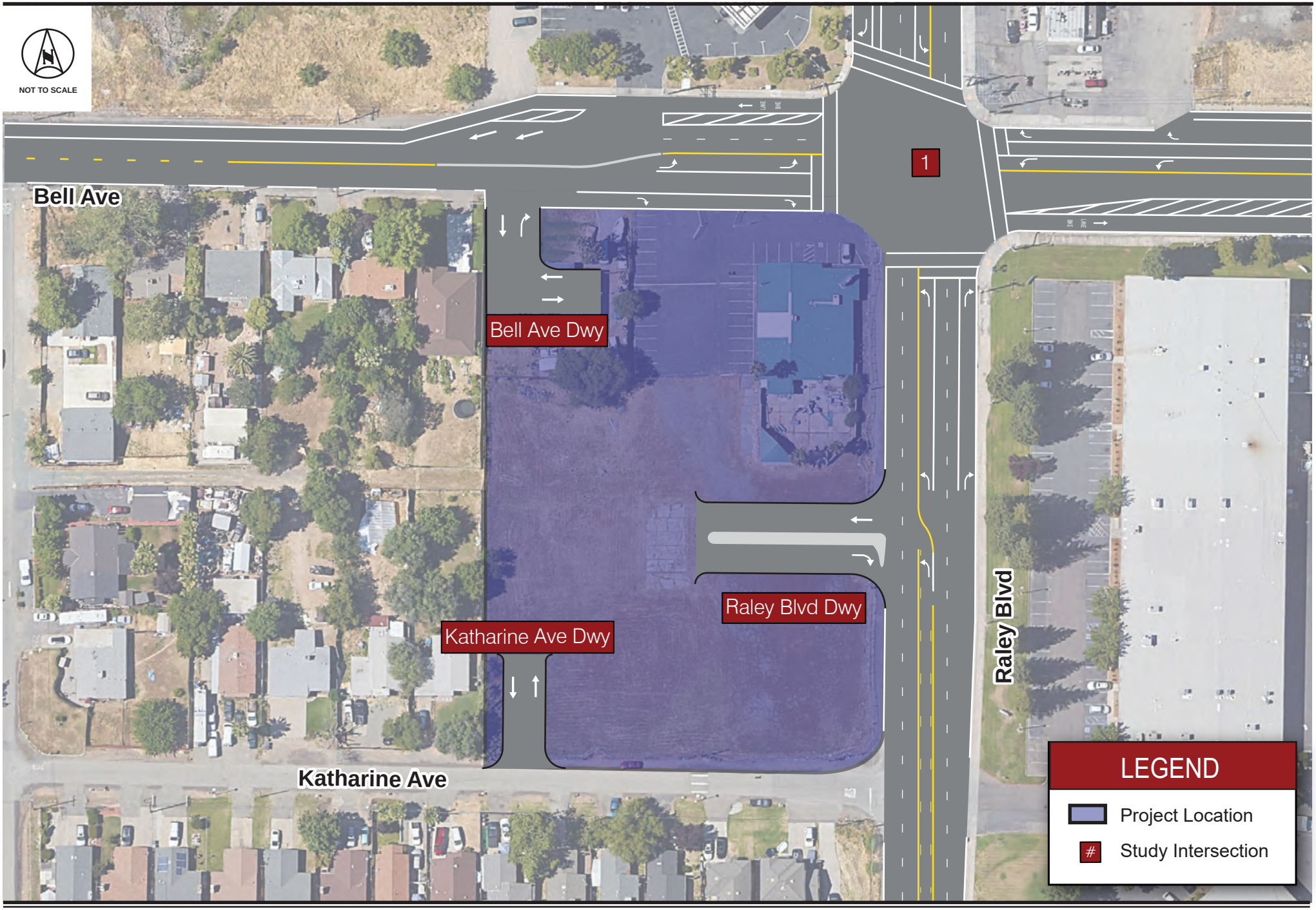
As previously discussed, there are existing bicycle facilities in the vicinity of the project site. The project will not result in removal of any existing pedestrian facility or bikeway/bike lane. The project would not add noticeable demand for pedestrian or bicycle facilities.



Kimley»Horn

Figure 11

Existing (2020) with CIP plus Proposed Project Peak-Hour Traffic Volumes



Kimley»Horn

Figure 12

Existing (2020) with CIP plus Proposed Project plus Proposed Access Restriction Recommendations

Construction-Related Traffic

Construction-related activity may potentially disrupt the existing transportation network in the surrounding project area. Possible temporary lane closures, street closures, sidewalk closures, and bikeway closures may impact pedestrian, bicycle, and transit accessibility. Heavy vehicles will access the site and may need to be staged for construction. As a result of these activities, existing roadway operation conditions may be degraded.

The City Code (City Code 12.20.030) requires that a construction traffic control plan is prepared and approved prior to the beginning of project construction, to the satisfaction of the City Traffic Engineer and subject to review by all affected agencies. All work performed during construction must conform to the conditions and requirements of the approved plan. The plan shall ensure that safe and efficient movement of traffic through the construction work zone(s) is maintained. At a minimum, the plan shall include the following:

- Time and day of street closures
- Proper advance warning and posted signage regarding street closures
- Provision of driveway access plan to ensure safe vehicular, pedestrian, and bicycle movements
- Safe and efficient access routes for emergency vehicles
- Provisions for pedestrian safety
- Use of manual traffic control when necessary
- Number of anticipated truck trips, and time of day of arrival and departure of trucks
- Provision of a truck circulation pattern and staging area with a limitation on the number of trucks that can be waiting and any limitations on the size and type of trucks appropriate for the surrounding transportation network

The plan must be available at the site for inspection by the City representative during all work. With the implementation of the traffic control plan, local roadways and freeway facilities will continue to operate at acceptable operating conditions.

PROJECT ON-SITE OPERATIONS AND ACCESS EVALUATION

On-Site Operations

The project site plan as seen in **Figure 2** was reviewed for the purposes of completing a focused assessment of site access, internal circulation, and on-site queuing storage. Based on the site plan, three driveways, one each along Bell Avenue, Raley Boulevard, and Katharine Avenue are anticipated to serve circulation through the project site.

The two drive-thru fast-food restaurants contain entrances to their drive-thru queuing away from the on-site circulation lanes and do not conflict with any parking spaces. In addition, the drive-thru exits directly into the circulation lanes to limit internal conflicts and minimize driving through parking areas again limiting conflicts with vehicles attempting to park. It is anticipated that a minimum of 180-feet of storage is provided.

Project Access

The following is a discussion of each of the project's access driveways. Please note that all signing and striping necessary to accomplish the access conditions described below should be installed in a manner consistent with City of Sacramento standards and the requirements of the *California Manual on Uniform Traffic Control Devices (CMUTCD), 2014 Edition (Revision 4, March 29, 2019).* Per the City of Sacramento Design Procedures Manual for street design guidelines, left turns are prohibited without a two-way, left-turn-lane (TWLTL) and a turn pocket.

While the Katharine Avenue Driveway is expected to only serve those vehicles originating from or destined for I-80, it would be the primary access point for delivery vehicles. As discussed in the queuing section later in the report, the addition of the project is not expected to increase the length of the northbound left queue such that it would block vehicles from entering or exiting the Raley Boulevard driveway. In addition, the Katharine Avenue driveway is expected to be the delivery vehicle access point and serve a minimal number of project trips. Thus, the required throat depth at the driveway is 25-feet due to the minimal conflicting volume along Katharine Avenue. As shown in **Figure 2**, adequate throat depth for the Katharine Avenue driveway is provided.

A median prohibiting left-in and left-out movements at the Bell Avenue driveway is recommended. Vehicles destined for westbound Bell Avenue would turn right out of the Bell Avenue driveway and proceed east to the Bell Avenue/Raley Boulevard intersection and perform an eastbound U-turn at the intersection. Because eastbound U-turns are not currently prohibited at the Bell Avenue/Raley Boulevard intersection and remain unprohibited under the Bell Avenue CIP project, this recommendation is consistent with both existing conditions and planned improvements. In addition, to help reduce queuing at the eastbound approach, it is recommended that the project construct a right turn pocket on the eastbound approach of the Raley Boulevard intersection with Bell Avenue as shown in **Figure 12**.

Based on the 95th-percentile queue for the northbound left-turn movement at the study intersection, modified median striping is recommended at the Raley Boulevard driveway to allow left-turns in, but not left-turns out (right-in, left-in, right-out only). In addition, it is recommended that a pork chop median be installed on the project site for the Raley Boulevard driveway to further restrict lefts out of the project. Vehicles that would have made the left-turn out at the Raley Boulevard driveway would make a northbound right turn at the Bell Avenue driveway and then either proceed eastbound along Bell Avenue or make an eastbound left-turn onto Raley Boulevard. No additional vehicles are anticipated to make a northbound left turn out of the Bell Avenue driveway as a result of this median configuration because the trip generation analysis assumes 100% of vehicles destined for westbound Bell Avenue will turn left out of the Bell Avenue driveway. It is recommended to stripe an "S-type end" at the south end of the left-turn pocket along Raley Boulevard to clearly delineate the northbound left turns into the project site and prevent eastbound left turns out of the project site, as shown in **Figure 12**.

Minimum Required Throat Depth

Access to the site would be provided by the three driveways located along Bell Avenue, Raley Boulevard, and Katharine Avenue. According to the site plan depicted in **Figure 2**, the available throat depth for the Bell Avenue and Raley Boulevard driveways, measured from the back of the sidewalk to the first drive aisle, is approximately 45-feet and 150-feet, respectively. As summarized in **Table 6**, the minimum required throat depth (MRTD) was calculated for these two driveways under Existing (2020) with CIP plus Proposed Project Conditions. Under this analysis scenario, the Katherine Avenue driveway was excluded assuming it will serve as the delivery vehicle access and will have a minimal number of project trips. For the minimum required throat depth calculations, trips were assigned to two driveways (Bell Avenue and Raley Boulevard). The required throat depth for these two driveways is 25-feet and 125-feet, respectively, showing that adequate throat depth is provided.

Table 6 – Minimum Required Throat Depth for Two-Driveway Configuration

ID	Intersection	Peak-Hour	TS	Lanes	Approach Volume	ConflVol (Left)	ConflVol (Right)	LT Out	RT Out	RT%	Minimum Required Throat Depth (MRTD)	Available Storage
101	Bell Avenue @ Project Driveway North	AM	1	1	51	782	510	28	23	45%	**25**	**45**
		PM	1	1	42	563	523	23	19	45%	**25**	
102	Raley Boulevard @ Project Driveway East	AM	1	2	135	1446	1300	5	130	96%	**125**	**150**
		PM	1	2	115	1389	1264	5	110	96%	**125**	

OTHER CONSIDERATIONS

Vehicle Miles Traveled (VMT) Analysis

The City of Sacramento is currently updating its transportation impact study guidelines to incorporate the VMT metric for CEQA review purposes, in accordance with the intent of Senate Bill 743 (SB 743). The most authoritative guidance on implementing SB 743 VMT metrics comes from the Governor's Office of Planning and Research (OPR).

In December 2018, OPR published technical guidance recommending approaches to analyzing transportation and land use projects. Because new retail development often redistributes trips rather than creating new travel demand, the OPR guidance recommends that lead agencies analyze the net change in VMT to indicate the transportation impact of retail projects. The potential for VMT impacts, according to this approach, hinges on whether the project can be considered local-serving or regional. By adding retail opportunities within existing neighborhoods, local-serving retail projects can shorten trips and reduce overall VMT. In contrast, regional destination retail projects would draw customers from larger trade areas, potentially substituting for shorter trips and increasing VMT.

The OPR guidance suggests that any retail projects including stores larger than 50,000 square-feet might be considered as regional serving retail and therefore require an analysis of net change in VMT. As this project is composed of retail store(s) and drive-thru food establishments totaling less than 50,000 square-feet, consistent with OPR Guidelines it was determined that a quantitative analysis was not necessary.

Deceleration Lanes

Per the City of Sacramento Design Procedure manual, deceleration lanes may be required at driveways and minor intersections based on the street designation, design speed, and projected volumes. Two of the project driveways are located along Bell Avenue and Raley Boulevard, which have a posted speed limit of 40 mph and 45 mph, respectively. According to the City's Design Procedure manual, a deceleration lane is not recommended for the driveway along Bell Avenue due to the proximity to the Bell Avenue intersection with Raley Boulevard and the limited number of vehicles expected to enter and exit at that driveway. A deceleration lane is not recommended along Raley Boulevard due to the posted speeds and low number of vehicles expected to enter the proposed project at the Raley Boulevard driveway.

Vehicle Queuing at Intersections

Off-site vehicle queuing was considered for the critical movements at the study intersection. The calculated 95th percentile vehicle queues were compared to actual vehicle storage/segment lengths. As presented in Table 7, the calculated vehicle queues are less than the available storage. It is important to note that ninety-five percent of the time during peak-hours the vehicle queuing will be less than or equal to those reported. Analysis sheets that include the anticipated vehicle queues are presented in Appendices B, C, D, and E.

Table 7 – Intersection Queuing Evaluation Results

Intersection / Analysis Scenario	Movement	AM Peak-Hour		PM Peak-Hour	
		Available Storage (ft)	95th % Queue (ft)	Available Storage (ft)	95th % Queue (ft)
#1, Raley Boulevard @ Bell Avenue	EBL				
Existing (2020)		115	89	115	84
Existing (2020) with CIP			143		159
Existing with CIP plus Proposed Project, without Katharine Ave			147		174
Existing with CIP plus Proposed Project, with Katharine Ave			156		174
#1, Raley Boulevard @ Bell Avenue	EBTR				
Existing (2020)		-	338	-	251
Existing (2020) with CIP			2073		1405
Existing with CIP plus Proposed Project, without Katharine Ave			2316		1966
Existing with CIP plus Proposed Project, with Katharine Ave			2397		1789
#1, Raley Boulevard @ Bell Avenue	NBL				
Existing (2020)		155	210	155	200
Existing (2020) with CIP			210		185
Existing with CIP plus Proposed Project, without Katharine Ave			205		195
Existing with CIP plus Proposed Project, with Katharine Ave			202		193

Note: Shaded represents a where the queuing exceeds the storage by one vehicle length (25 feet).

SUMMARY OF RECOMMENDATIONS

Intersections

- It is recommended to optimize traffic signal timing at the intersection of Raley Boulevard and Bell Avenue (Intersection #1) to reduce vehicular queuing and improve delay.

Project Access

- According to the site plan depicted in **Figure 2**, the available throat depth for the Bell Avenue and Raley Boulevard driveways, measured from the back of the sidewalk to the first drive aisle, is approximately 45-feet and 150-feet, respectively. As summarized in **Table 6**, the minimum required throat depth (MRTD) was calculated for both driveways under Existing (2020) with CIP plus Proposed Project Conditions. The required throat depth for these two driveways is 25-feet and 125-feet, respectively, showing that adequate throat depth is provided. In addition, the Katharine Avenue driveway is expected to be the delivery vehicle access point and serve a minimal number of project trips. Thus, the required throat depth at the driveway is 25-feet due to the minimal conflicting volume along Katharine Avenue. As shown in **Figure 2**, adequate throat depth for the Katharine Avenue driveway is provided.
- The project driveway along Raley Boulevard will allow access for northbound left turns into the project site, and the resulting project trip assignment does not generate northbound u-turns at the study intersection.
- It is recommended to stripe an "S-type end" at the south end of the northbound left-turn pocket along Raley Boulevard to clearly delineate the northbound left turns into the project site and prevent eastbound left turns out of the project site, as shown in **Figure 12**. In addition, it is recommended that a pork chop median be installed on the project site for the Raley Boulevard driveway to further restrict lefts out of the project.

- It is recommended to install a median along Bell Avenue at the Bell Avenue driveway prohibiting left turns into the project site and left turns out of the project site. In addition, it is recommended that the project construct a right turn pocket on the eastbound approach of the Raley Boulevard intersection with Bell Avenue.

Deceleration Lanes

- A deceleration lane is not recommended for the driveway along Bell Avenue due to the proximity to the Bell Avenue intersection with Raley Boulevard and the limited number of vehicles expected to enter and exit at that driveway. A deceleration lane is not recommended along Raley Boulevard due to the posted speeds and low number of vehicles expected to enter and exit the proposed project at the Raley Boulevard driveway.

Appendix A

Traffic Count Data Sheets

National Data & Surveying Services

Intersection Turning Movement Count

Location: Raley Blvd & Bell Ave
City: Sacramento
Control: Signalized

Project ID: 19-07171-001
Date: 5/7/2019

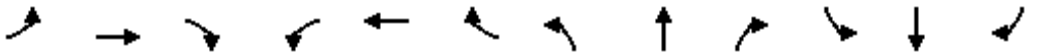
Total

NS/EW Streets:	Raley Blvd				Raley Blvd				Bell Ave				Bell Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	1	0	1	2	0	0	1	2	0	0	1	1.5	0.5	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	44	127	50	0	4	132	9	0	8	30	142	0	51	29	10	0	636
7:15 AM	37	123	67	0	3	144	9	0	10	49	163	0	52	25	7	0	689
7:30 AM	54	147	104	0	13	130	8	0	11	67	116	0	54	61	6	0	771
7:45 AM	47	164	72	0	12	143	7	0	15	67	142	0	51	63	5	0	788
8:00 AM	53	145	67	0	8	138	6	0	6	46	132	0	56	79	8	0	744
8:15 AM	54	142	38	0	6	135	6	0	10	62	130	0	55	72	11	0	721
8:30 AM	57	106	40	0	3	166	7	0	15	28	134	0	36	29	9	0	630
8:45 AM	51	120	44	0	4	118	8	0	9	24	120	0	35	19	7	0	559
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	397	1074	482	0	53	1106	60	0	84	373	1079	0	390	377	63	0	5538
APPROACH %'s :	20.33%	54.99%	24.68%	0.00%	4.35%	90.73%	4.92%	0.00%	5.47%	24.28%	70.25%	0.00%	46.99%	45.42%	7.59%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	208	598	281	0	39	546	27	0	42	242	520	0	216	275	30	0	3024
PEAK HR FACTOR :	0.963	0.912	0.675	0.000	0.750	0.955	0.844	0.000	0.700	0.903	0.915	0.000	0.964	0.870	0.682	0.000	0.959
	0.891				0.944				0.897				0.911				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	1	0	1	2	0	0	1	2	0	0	1	1.5	0.5	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	82	169	40	0	3	160	8	0	16	51	89	1	59	43	13	0	734
4:15 PM	70	134	37	0	8	122	8	0	20	43	84	0	54	28	12	0	620
4:30 PM	74	166	41	0	14	124	9	0	17	45	80	0	61	60	7	0	698
4:45 PM	82	192	41	0	4	131	12	0	6	43	91	1	54	41	6	0	704
5:00 PM	86	164	30	0	13	127	17	0	12	43	69	0	77	40	11	0	689
5:15 PM	81	157	23	0	4	126	11	0	8	56	75	0	49	43	9	0	642
5:30 PM	99	182	29	0	4	121	12	0	9	40	73	0	31	30	4	0	634
5:45 PM	90	154	23	0	6	108	8	0	14	47	68	0	43	25	5	0	591
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	664	1318	264	0	56	1019	85	0	102	368	629	2	428	310	67	0	5312
APPROACH %'s :	29.56%	58.68%	11.75%	0.00%	4.83%	87.84%	7.33%	0.00%	9.26%	33.42%	57.13%	0.18%	53.17%	38.51%	8.32%	0.00%	
PEAK HR :	04:00 PM - 05:00 PM																TOTAL
PEAK HR VOL :	308	661	159	0	29	537	37	0	59	182	344	2	228	172	38	0	2756
PEAK HR FACTOR :	0.939	0.861	0.970	0.000	0.518	0.839	0.771	0.000	0.738	0.892	0.945	0.500	0.934	0.717	0.731	0.000	0.939
	0.895				0.882				0.935				0.855				

Appendix B

Analysis Worksheets for
Existing (2020) Conditions



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	242	520	216	275	30	208	598	281	39	546	27
Future Volume (veh/h)	42	242	520	216	275	30	208	598	281	39	546	27
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	42	242	520	216	275	30	208	598	281	39	546	27
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	647	636	568	250	406	44	241	872	389	140	670	299
Arrive On Green	0.36	0.36	0.36	0.14	0.13	0.13	0.14	0.25	0.25	0.08	0.19	0.19
Sat Flow, veh/h	1781	1777	1585	1781	3234	350	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	42	242	520	216	150	155	208	598	281	39	546	27
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1807	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	1.6	10.3	32.0	12.1	8.2	8.4	11.7	15.6	6.5	2.1	15.0	1.4
Cycle Q Clear(g_c), s	1.6	10.3	32.0	12.1	8.2	8.4	11.7	15.6	6.5	2.1	15.0	1.4
Prop In Lane	1.00		1.00	1.00		0.19	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	647	636	568	250	223	227	241	872	389	140	670	299
V/C Ratio(X)	0.06	0.38	0.92	0.87	0.67	0.68	0.86	0.69	0.72	0.28	0.81	0.09
Avail Cap(c_a), veh/h	647	791	705	461	791	804	444	1557	695	444	1557	695
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.2	24.3	31.3	42.9	42.6	42.7	43.2	34.9	5.4	44.3	39.7	34.2
Incr Delay (d2), s/veh	0.0	0.1	13.2	3.5	4.8	4.9	3.5	0.4	1.0	0.4	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	4.2	13.6	5.4	3.8	3.9	5.2	6.4	5.4	0.9	6.4	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.2	24.5	44.5	46.4	47.4	47.6	46.7	35.3	6.3	44.7	40.6	34.2
LnGrp LOS	C	C	D	D	D	D	D	D	A	D	D	C
Approach Vol, veh/h		804			521			1087			612	
Approach Delay, s/veh		37.2			47.0			30.0			40.6	
Approach LOS		D			D			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	41.6	17.4	18.4	24.5	17.9	41.1	12.6	30.3
Change Period (Y+Rc), s	* 4.6	* 4.6	* 4.6	* 5.3	* 3.6	* 4.6	* 4.6	* 5.3
Max Green Setting (Gmax), s	* 26	* 45	* 25	* 45	* 26	* 45	* 25	* 45
Max Q Clear Time (g_c+I1), s	3.6	10.4	13.7	17.0	14.1	34.0	4.1	17.6
Green Ext Time (p_c), s	0.0	2.4	0.2	2.2	0.2	2.6	0.0	2.9

Intersection Summary	
HCM 6th Ctrl Delay	37.0
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Summary of All Intervals

Run Number	1	10	2	3	4	5	6
Start Time	6:50	6:50	6:50	6:50	6:50	6:50	6:50
End Time	8:00	8:00	8:00	8:00	8:00	8:00	8:00
Total Time (min)	70	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	5	5	5	5	5	5	5
# of Recorded Intervals	4	4	4	4	4	4	4
Vehs Entered	3031	2967	3069	2950	2978	3056	2992
Vehs Exited	3024	2939	3076	2958	3002	3070	3011
Starting Vehs	114	91	122	115	134	111	107
Ending Vehs	121	119	115	107	110	97	88
Travel Distance (mi)	3429	3330	3463	3338	3369	3458	3396
Travel Time (hr)	120.1	119.4	122.2	117.0	120.3	122.3	118.6
Total Delay (hr)	36.1	37.3	37.5	35.0	37.8	37.5	35.1
Total Stops	2363	2278	2295	2218	2295	2330	2301
Fuel Used (gal)	110.2	106.9	111.8	107.4	108.5	111.6	108.9

Summary of All Intervals

Run Number	7	8	9	Avg
Start Time	6:50	6:50	6:50	6:50
End Time	8:00	8:00	8:00	8:00
Total Time (min)	70	70	70	70
Time Recorded (min)	60	60	60	60
# of Intervals	5	5	5	5
# of Recorded Intervals	4	4	4	4
Vehs Entered	3009	2921	2994	2997
Vehs Exited	3009	2914	3018	3002
Starting Vehs	105	117	127	114
Ending Vehs	105	124	103	109
Travel Distance (mi)	3406	3293	3396	3388
Travel Time (hr)	119.0	113.6	121.6	119.4
Total Delay (hr)	35.4	33.0	38.7	36.4
Total Stops	2236	2205	2311	2285
Fuel Used (gal)	109.8	104.6	109.7	109.0

Interval #0 Information Seeding

Start Time	6:50
End Time	7:00
Total Time (min)	10

Volumes adjusted by Growth Factors.
No data recorded this interval.

Interval #1 Information

Start Time	7:00
End Time	7:15
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	780	746	778	704	755	737	734
Vehs Exited	778	735	768	718	784	747	739
Starting Vehs	114	91	122	115	134	111	107
Ending Vehs	116	102	132	101	105	101	102
Travel Distance (mi)	883	826	872	805	866	832	832
Travel Time (hr)	32.7	29.9	31.8	27.9	30.8	28.8	28.9
Total Delay (hr)	11.0	9.4	10.6	8.0	9.7	8.4	8.4
Total Stops	658	583	594	511	583	547	574
Fuel Used (gal)	29.0	26.4	28.5	25.7	27.9	26.6	26.8

Interval #1 Information

Start Time	7:00
End Time	7:15
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	753	695	766	744
Vehs Exited	732	717	770	749
Starting Vehs	105	117	127	114
Ending Vehs	126	95	123	109
Travel Distance (mi)	839	798	868	842
Travel Time (hr)	29.6	26.5	32.2	29.9
Total Delay (hr)	9.0	7.1	11.0	9.3
Total Stops	560	512	625	574
Fuel Used (gal)	27.0	25.3	28.2	27.1

Interval #2 Information

Start Time	7:15
End Time	7:30
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	749	758	729	775	738	764	773
Vehs Exited	738	745	758	712	726	748	739
Starting Vehs	116	102	132	101	105	101	102
Ending Vehs	127	115	103	164	117	117	136
Travel Distance (mi)	839	849	840	844	826	857	856
Travel Time (hr)	28.8	30.7	28.7	30.3	28.9	30.1	30.4
Total Delay (hr)	8.3	9.9	8.2	9.6	8.6	9.1	9.3
Total Stops	543	572	523	606	552	583	619
Fuel Used (gal)	26.9	27.6	26.6	27.4	26.2	27.7	27.6

Interval #2 Information

Start Time	7:15
End Time	7:30
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	790	724	738	754
Vehs Exited	791	709	748	742
Starting Vehs	126	95	123	109
Ending Vehs	125	110	113	122
Travel Distance (mi)	890	808	836	844
Travel Time (hr)	31.1	28.5	29.7	29.7
Total Delay (hr)	9.2	8.6	9.3	9.0
Total Stops	574	568	563	569
Fuel Used (gal)	28.5	25.7	26.7	27.1

Interval #3 Information

Start Time	7:30
End Time	7:45
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	774	735	788	739	726	792	759
Vehs Exited	787	734	766	776	724	782	781
Starting Vehs	127	115	103	164	117	117	136
Ending Vehs	114	116	125	127	119	127	114
Travel Distance (mi)	886	833	881	855	814	888	870
Travel Time (hr)	30.7	28.9	31.1	30.0	28.8	31.2	31.0
Total Delay (hr)	9.1	8.3	9.5	9.0	9.0	9.4	9.7
Total Stops	613	557	605	562	552	592	580
Fuel Used (gal)	28.4	26.5	28.6	27.7	26.3	28.3	27.9

Interval #3 Information

Start Time	7:30
End Time	7:45
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	749	720	739	753
Vehs Exited	757	736	723	757
Starting Vehs	125	110	113	122
Ending Vehs	117	94	129	118
Travel Distance (mi)	860	822	830	854
Travel Time (hr)	30.2	27.8	29.1	29.9
Total Delay (hr)	9.2	7.7	8.8	9.0
Total Stops	554	527	535	568
Fuel Used (gal)	28.0	25.8	26.7	27.4

Interval #4 Information Recording

Start Time	7:45
End Time	8:00
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	728	728	774	732	759	763	726
Vehs Exited	721	725	784	752	768	793	752
Starting Vehs	114	116	125	127	119	127	114
Ending Vehs	121	119	115	107	110	97	88
Travel Distance (mi)	821	822	870	835	863	881	839
Travel Time (hr)	28.0	29.9	30.6	28.8	31.8	32.1	28.3
Total Delay (hr)	7.8	9.7	9.2	8.4	10.6	10.6	7.7
Total Stops	549	566	573	539	608	608	528
Fuel Used (gal)	25.8	26.5	28.1	26.7	28.1	29.0	26.6

Interval #4 Information Recording

Start Time	7:45
End Time	8:00
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	717	782	751	745
Vehs Exited	729	752	777	754
Starting Vehs	117	94	129	118
Ending Vehs	105	124	103	109
Travel Distance (mi)	817	865	862	848
Travel Time (hr)	28.1	30.8	30.6	29.9
Total Delay (hr)	8.0	9.6	9.6	9.1
Total Stops	548	598	588	571
Fuel Used (gal)	26.3	27.8	28.2	27.3

1: Raley Blvd & Bell Ave Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	1.8	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.5	2.1	3.7	3.1	2.7	0.1	3.7	5.9	0.7	0.6	6.1	0.1
Total Del/Veh (s)	46.3	31.4	25.2	51.7	33.8	16.6	61.6	35.8	8.8	56.0	40.0	10.0
Stop Delay (hr)	0.5	1.7	2.8	2.8	2.2	0.1	3.2	4.2	0.3	0.6	4.9	0.0
Stop Del/Veh (s)	42.9	25.5	19.1	45.4	27.5	15.0	52.5	25.3	3.7	51.2	31.8	6.3

1: Raley Blvd & Bell Ave Performance by movement

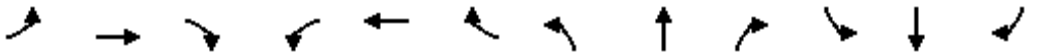
Movement	All
Denied Delay (hr)	0.1
Denied Del/Veh (s)	0.1
Total Delay (hr)	29.4
Total Del/Veh (s)	34.7
Stop Delay (hr)	23.1
Stop Del/Veh (s)	27.3

Intersection: 1: Raley Blvd & Bell Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	T	R	L	T
Maximum Queue (ft)	123	193	413	253	240	192	180	376	364	180	175	268
Average Queue (ft)	34	101	207	149	93	71	152	208	188	85	44	160
95th Queue (ft)	89	177	338	244	176	151	210	333	313	180	114	238
Link Distance (ft)		1480	1480		2611	2611		1703	1703			1463
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	115			235			155			155	190	
Storage Blk Time (%)	0	8		2	0		15	12	6	0	0	4
Queuing Penalty (veh)	0	3		3	0		44	25	16	0	0	1

Intersection: 1: Raley Blvd & Bell Ave

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	271	125
Average Queue (ft)	158	26
95th Queue (ft)	242	94
Link Distance (ft)	1463	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		100
Storage Blk Time (%)	26	0
Queuing Penalty (veh)	7	0



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	182	344	228	172	38	308	661	159	29	537	37
Future Volume (veh/h)	61	182	344	228	172	38	308	661	159	29	537	37
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	61	182	344	228	172	38	308	661	159	29	537	37
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	514	451	402	267	302	65	347	1128	503	124	683	305
Arrive On Green	0.29	0.25	0.25	0.15	0.10	0.10	0.19	0.32	0.32	0.07	0.19	0.19
Sat Flow, veh/h	1781	1777	1585	1781	2907	628	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	61	182	344	228	104	106	308	661	159	29	537	37
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1757	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	2.2	7.4	17.9	10.8	4.8	5.0	14.6	13.5	2.7	1.3	12.5	1.7
Cycle Q Clear(g_c), s	2.2	7.4	17.9	10.8	4.8	5.0	14.6	13.5	2.7	1.3	12.5	1.7
Prop In Lane	1.00		1.00	1.00		0.36	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	514	451	402	267	185	183	347	1128	503	124	683	305
V/C Ratio(X)	0.12	0.40	0.86	0.85	0.56	0.58	0.89	0.59	0.32	0.23	0.79	0.12
Avail Cap(c_a), veh/h	541	931	831	543	931	921	522	1834	818	522	1834	818
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.7	26.9	30.8	35.9	36.9	37.0	33.9	24.8	3.8	38.1	33.3	28.9
Incr Delay (d2), s/veh	0.0	0.2	2.1	3.0	3.6	4.0	8.6	0.2	0.1	0.4	0.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	3.0	6.7	4.7	2.2	2.3	6.7	5.3	2.1	0.6	5.1	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.7	27.1	32.9	38.9	40.6	41.0	42.5	25.0	3.9	38.5	34.1	29.0
LnGrp LOS	C	C	C	D	D	D	D	C	A	D	C	C
Approach Vol, veh/h		587			438			1128			603	
Approach Delay, s/veh		30.0			39.8			26.8			34.0	
Approach LOS		C			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	29.6	13.6	21.5	22.0	16.6	26.6	10.6	32.8
Change Period (Y+Rc), s	* 4.6	* 4.6	* 4.6	* 5.3	* 3.6	* 4.6	* 4.6	* 5.3
Max Green Setting (Gmax), s	* 26	* 45	* 25	* 45	* 26	* 45	* 25	* 45
Max Q Clear Time (g_c+I1), s	4.2	7.0	16.6	14.5	12.8	19.9	3.3	15.5
Green Ext Time (p_c), s	0.1	1.7	0.3	2.2	0.3	2.1	0.0	3.0

Intersection Summary	
HCM 6th Ctrl Delay	31.1
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Summary of All Intervals

Run Number	1	10	2	3	4	5	6
Start Time	4:50	4:50	4:50	4:50	4:50	4:50	4:50
End Time	6:00	6:00	6:00	6:00	6:00	6:00	6:00
Total Time (min)	70	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	5	5	5	5	5	5	5
# of Recorded Intervals	4	4	4	4	4	4	4
Vehs Entered	2896	2888	2820	2850	2801	2840	2895
Vehs Exited	2892	2862	2803	2864	2824	2837	2861
Starting Vehs	126	111	103	118	150	112	102
Ending Vehs	130	137	120	104	127	115	136
Travel Distance (mi)	3599	3598	3514	3553	3516	3553	3601
Travel Time (hr)	121.6	128.5	121.2	122.3	120.6	121.3	122.7
Total Delay (hr)	33.7	40.8	35.4	35.4	34.8	34.7	34.9
Total Stops	2308	2531	2304	2385	2367	2341	2363
Fuel Used (gal)	113.5	116.1	112.3	113.4	112.0	113.2	114.6

Summary of All Intervals

Run Number	7	8	9	Avg
Start Time	4:50	4:50	4:50	4:50
End Time	6:00	6:00	6:00	6:00
Total Time (min)	70	70	70	70
Time Recorded (min)	60	60	60	60
# of Intervals	5	5	5	5
# of Recorded Intervals	4	4	4	4
Vehs Entered	2850	2790	2868	2849
Vehs Exited	2835	2788	2865	2843
Starting Vehs	108	109	121	113
Ending Vehs	123	111	124	125
Travel Distance (mi)	3560	3494	3589	3558
Travel Time (hr)	121.3	118.7	124.5	122.3
Total Delay (hr)	34.8	33.0	37.1	35.5
Total Stops	2326	2266	2429	2363
Fuel Used (gal)	113.8	111.2	115.2	113.5

Interval #0 Information Seeding

Start Time	4:50
End Time	5:00
Total Time (min)	10

Volumes adjusted by Growth Factors.
No data recorded this interval.

Interval #1 Information

Start Time	5:00
End Time	5:15
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	731	719	735	700	715	682	757
Vehs Exited	729	704	702	712	742	681	732
Starting Vehs	126	111	103	118	150	112	102
Ending Vehs	128	126	136	106	123	113	127
Travel Distance (mi)	894	895	895	883	910	856	925
Travel Time (hr)	30.6	31.6	31.3	29.3	33.1	27.8	32.4
Total Delay (hr)	8.7	9.8	9.4	7.7	11.1	6.9	9.9
Total Stops	599	589	584	559	667	559	632
Fuel Used (gal)	28.3	28.7	28.7	28.0	29.6	26.7	29.8

Interval #1 Information

Start Time	5:00
End Time	5:15
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	711	673	746	717
Vehs Exited	675	663	723	705
Starting Vehs	108	109	121	113
Ending Vehs	144	119	144	125
Travel Distance (mi)	878	828	913	888
Travel Time (hr)	29.9	26.9	31.3	30.4
Total Delay (hr)	8.6	6.7	9.0	8.8
Total Stops	576	522	595	588
Fuel Used (gal)	28.0	25.8	29.1	28.3

Interval #2 Information

Start Time	5:15
End Time	5:30
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	687	699	671	760	676	714	669
Vehs Exited	695	708	698	715	677	698	695
Starting Vehs	128	126	136	106	123	113	127
Ending Vehs	120	117	109	151	122	129	101
Travel Distance (mi)	866	873	858	926	837	881	847
Travel Time (hr)	28.1	32.3	28.7	33.3	27.2	30.6	27.5
Total Delay (hr)	7.1	11.1	7.8	10.6	6.7	9.1	6.9
Total Stops	538	669	564	656	532	587	531
Fuel Used (gal)	27.1	28.5	27.2	29.7	26.2	28.0	26.8

Interval #2 Information

Start Time	5:15
End Time	5:30
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	741	745	716	710
Vehs Exited	760	728	753	712
Starting Vehs	144	119	144	125
Ending Vehs	125	136	107	124
Travel Distance (mi)	933	928	921	887
Travel Time (hr)	32.4	32.4	33.4	30.6
Total Delay (hr)	9.7	9.7	11.1	9.0
Total Stops	608	615	641	595
Fuel Used (gal)	29.9	29.6	30.2	28.3

Interval #3 Information

Start Time	5:30
End Time	5:45
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	723	778	710	716	710	746	722
Vehs Exited	724	744	691	734	724	736	695
Starting Vehs	120	117	109	151	122	129	101
Ending Vehs	119	151	128	133	108	139	128
Travel Distance (mi)	908	946	877	892	899	928	891
Travel Time (hr)	30.5	33.8	31.3	31.5	31.2	33.6	30.2
Total Delay (hr)	8.3	10.7	10.0	9.7	9.2	10.9	8.5
Total Stops	565	684	608	615	608	626	587
Fuel Used (gal)	28.6	30.6	28.2	28.7	28.9	30.5	28.5

Interval #3 Information

Start Time	5:30
End Time	5:45
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	731	695	692	721
Vehs Exited	735	714	677	717
Starting Vehs	125	136	107	124
Ending Vehs	121	117	122	127
Travel Distance (mi)	909	875	865	899
Travel Time (hr)	30.3	29.9	28.7	31.1
Total Delay (hr)	8.4	8.4	7.5	9.2
Total Stops	585	581	568	601
Fuel Used (gal)	29.1	28.2	27.6	28.9

Interval #4 Information Recording

Start Time	5:45
End Time	6:00
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	755	692	704	674	700	698	747
Vehs Exited	744	706	712	703	681	722	739
Starting Vehs	119	151	128	133	108	139	128
Ending Vehs	130	137	120	104	127	115	136
Travel Distance (mi)	930	885	884	852	869	888	939
Travel Time (hr)	32.4	30.8	29.9	28.3	29.0	29.4	32.6
Total Delay (hr)	9.7	9.2	8.3	7.4	7.7	7.7	9.6
Total Stops	606	589	548	555	560	569	613
Fuel Used (gal)	29.5	28.3	28.3	27.0	27.2	28.1	29.6

Interval #4 Information Recording

Start Time	5:45
End Time	6:00
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	667	677	714	702
Vehs Exited	665	683	712	705
Starting Vehs	121	117	122	127
Ending Vehs	123	111	124	125
Travel Distance (mi)	840	863	891	884
Travel Time (hr)	28.6	29.5	31.1	30.2
Total Delay (hr)	8.1	8.3	9.4	8.5
Total Stops	557	548	625	575
Fuel Used (gal)	26.8	27.6	28.4	28.1

1: Raley Blvd & Bell Ave Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	40.4	35.1	21.9	46.0	34.7	15.1	70.2	33.6	7.3	52.2	37.3	9.1

1: Raley Blvd & Bell Ave Performance by movement

Movement	All
Denied Del/Veh (s)	0.0
Total Del/Veh (s)	36.5

Intersection: 1: Raley Blvd & Bell Ave

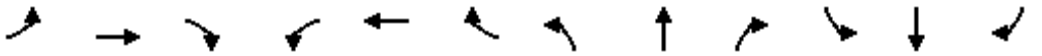
Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	T	R	L	T
Maximum Queue (ft)	108	186	307	253	214	118	180	593	491	168	149	284
Average Queue (ft)	39	71	145	146	56	52	172	325	224	52	35	157
95th Queue (ft)	84	139	251	241	136	100	200	549	440	124	99	238
Link Distance (ft)		2141	2141		2806	2806		1658	1658			1290
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	115			235			155			155	190	
Storage Blk Time (%)	1	2		2			36	11	2	0		4
Queuing Penalty (veh)	1	1		2			119	33	4	0		1

Intersection: 1: Raley Blvd & Bell Ave

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	281	125
Average Queue (ft)	153	35
95th Queue (ft)	236	109
Link Distance (ft)	1290	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		100
Storage Blk Time (%)	24	0
Queuing Penalty (veh)	9	0

Appendix C

Analysis Worksheets for
Existing (2020) with CIP Project Conditions



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	252	520	241	276	31	208	598	461	43	546	27
Future Volume (veh/h)	42	252	520	241	276	31	208	598	461	43	546	27
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	42	252	520	241	276	31	208	598	461	43	546	27
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	615	207	428	270	333	282	237	852	380	136	652	291
Arrive On Green	0.35	0.38	0.38	0.15	0.18	0.18	0.13	0.24	0.24	0.08	0.18	0.18
Sat Flow, veh/h	1781	545	1124	1781	1870	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	42	0	772	241	276	31	208	598	461	43	546	27
Grp Sat Flow(s),veh/h/ln	1781	0	1668	1781	1870	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	1.9	0.0	45.4	15.8	17.0	1.5	13.7	18.3	12.5	2.7	17.7	1.7
Cycle Q Clear(g_c), s	1.9	0.0	45.4	15.8	17.0	1.5	13.7	18.3	12.5	2.7	17.7	1.7
Prop In Lane	1.00		0.67	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	615	0	635	270	333	282	237	852	380	136	652	291
V/C Ratio(X)	0.07	0.00	1.22	0.89	0.83	0.11	0.88	0.70	1.21	0.32	0.84	0.09
Avail Cap(c_a), veh/h	615	0	635	394	712	603	379	1332	594	379	1332	594
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.2	0.0	36.9	49.7	47.2	22.8	50.8	41.4	8.6	52.1	47.0	40.5
Incr Delay (d2), s/veh	0.0	0.0	111.0	12.7	7.1	0.2	8.1	0.4	109.7	0.5	1.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	37.2	7.9	8.4	0.8	6.5	7.8	15.3	1.2	7.7	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.2	0.0	147.9	62.3	54.4	23.0	58.9	41.8	118.3	52.6	48.1	40.5
LnGrp LOS	C	A	F	E	D	C	E	D	F	D	D	D
Approach Vol, veh/h		814			548			1267			616	
Approach Delay, s/veh		141.7			56.1			72.5			48.1	
Approach LOS		F			E			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	45.8	25.8	20.4	27.2	21.6	50.0	13.7	33.9
Change Period (Y+Rc), s	* 4.6	* 4.6	* 4.6	* 5.3	* 3.6	* 4.6	* 4.6	* 5.3
Max Green Setting (Gmax), s	* 26	* 45	* 25	* 45	* 26	* 45	* 25	* 45
Max Q Clear Time (g_c+I1), s	3.9	19.0	15.7	19.7	17.8	47.4	4.7	20.3
Green Ext Time (p_c), s	0.0	2.3	0.2	2.2	0.2	0.0	0.0	3.2

Intersection Summary	
HCM 6th Ctrl Delay	82.4
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Summary of All Intervals

Run Number	1	10	2	3	4	5	6
Start Time	6:50	6:50	6:50	6:50	6:50	6:50	6:50
End Time	8:00	8:00	8:00	8:00	8:00	8:00	8:00
Total Time (min)	70	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	5	5	5	5	5	5	5
# of Recorded Intervals	4	4	4	4	4	4	4
Vehs Entered	3222	3061	3123	3088	3141	3117	3159
Vehs Exited	3137	2995	3058	3059	3084	3033	3078
Starting Vehs	178	170	180	211	186	147	176
Ending Vehs	263	236	245	240	243	231	257
Travel Distance (mi)	4063	3864	3919	3922	3995	3913	3987
Travel Time (hr)	336.7	315.5	278.4	254.4	294.5	278.6	271.2
Total Delay (hr)	232.7	215.9	177.4	153.5	191.8	178.1	168.4
Total Stops	2705	2648	2810	2641	2582	2699	2678
Fuel Used (gal)	172.2	162.6	155.3	149.4	160.5	155.1	154.9

Summary of All Intervals

Run Number	7	8	9	Avg
Start Time	6:50	6:50	6:50	6:50
End Time	8:00	8:00	8:00	8:00
Total Time (min)	70	70	70	70
Time Recorded (min)	60	60	60	60
# of Intervals	5	5	5	5
# of Recorded Intervals	4	4	4	4
Vehs Entered	3141	3163	3149	3136
Vehs Exited	3087	3100	3077	3071
Starting Vehs	189	175	181	179
Ending Vehs	243	238	253	246
Travel Distance (mi)	3994	4008	3964	3963
Travel Time (hr)	291.1	266.6	279.6	286.7
Total Delay (hr)	187.9	163.8	177.5	184.7
Total Stops	2553	2824	2605	2678
Fuel Used (gal)	160.0	154.5	156.1	158.1

Interval #0 Information Seeding

Start Time	6:50
End Time	7:00
Total Time (min)	10

Volumes adjusted by Growth Factors.
No data recorded this interval.

Interval #1 Information

Start Time	7:00
End Time	7:15
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	837	822	827	790	798	824	808
Vehs Exited	784	751	761	785	760	743	771
Starting Vehs	178	170	180	211	186	147	176
Ending Vehs	231	241	246	216	224	228	213
Travel Distance (mi)	1013	979	983	995	972	982	988
Travel Time (hr)	53.5	51.6	44.5	50.0	53.1	50.5	48.4
Total Delay (hr)	27.4	26.5	19.2	24.3	28.1	25.4	23.0
Total Stops	767	717	787	797	735	814	818
Fuel Used (gal)	35.9	34.4	33.1	34.4	34.6	34.8	34.0

Interval #1 Information

Start Time	7:00
End Time	7:15
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	816	847	833	819
Vehs Exited	769	772	794	769
Starting Vehs	189	175	181	179
Ending Vehs	236	250	220	231
Travel Distance (mi)	987	1022	1022	994
Travel Time (hr)	59.4	50.4	53.1	51.5
Total Delay (hr)	33.9	24.3	26.9	25.9
Total Stops	736	906	852	791
Fuel Used (gal)	36.9	35.1	35.8	34.9

Interval #2 Information

Start Time	7:15
End Time	7:30
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	797	753	732	754	744	802	787
Vehs Exited	789	745	788	753	739	785	769
Starting Vehs	231	241	246	216	224	228	213
Ending Vehs	239	249	190	217	229	245	231
Travel Distance (mi)	1012	963	948	956	958	1020	994
Travel Time (hr)	72.9	70.6	64.4	56.6	65.6	69.5	61.8
Total Delay (hr)	47.1	45.7	40.0	31.9	41.0	43.3	36.1
Total Stops	602	602	790	636	591	713	627
Fuel Used (gal)	40.4	38.6	37.5	35.5	37.2	39.7	37.3

Interval #2 Information

Start Time	7:15
End Time	7:30
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	801	787	764	774
Vehs Exited	816	797	736	771
Starting Vehs	236	250	220	231
Ending Vehs	221	240	248	231
Travel Distance (mi)	1049	1009	955	987
Travel Time (hr)	72.5	61.1	59.5	65.4
Total Delay (hr)	45.6	35.3	34.7	40.1
Total Stops	613	809	607	659
Fuel Used (gal)	41.2	37.9	35.8	38.1

Interval #3 Information

Start Time	7:30
End Time	7:45
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	791	726	772	783	788	733	788
Vehs Exited	786	736	729	770	777	758	792
Starting Vehs	239	249	190	217	229	245	231
Ending Vehs	244	239	233	230	240	220	227
Travel Distance (mi)	1027	940	971	1000	1015	957	1020
Travel Time (hr)	96.8	85.1	73.8	68.1	79.3	73.1	73.1
Total Delay (hr)	70.4	61.0	48.6	42.3	53.0	48.6	46.7
Total Stops	713	602	596	591	599	562	647
Fuel Used (gal)	46.4	41.6	39.1	38.7	42.0	39.1	40.7

Interval #3 Information

Start Time	7:30
End Time	7:45
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	774	735	737	763
Vehs Exited	743	737	772	760
Starting Vehs	221	240	248	231
Ending Vehs	252	238	213	233
Travel Distance (mi)	985	940	957	981
Travel Time (hr)	75.6	69.6	76.9	77.1
Total Delay (hr)	49.9	45.4	52.3	51.8
Total Stops	616	553	515	601
Fuel Used (gal)	40.1	37.8	39.9	40.5

Interval #4 Information Recording

Start Time	7:45
End Time	8:00
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	797	760	792	761	811	758	776
Vehs Exited	778	763	780	751	808	747	746
Starting Vehs	244	239	233	230	240	220	227
Ending Vehs	263	236	245	240	243	231	257
Travel Distance (mi)	1010	981	1016	970	1050	954	984
Travel Time (hr)	113.6	108.1	95.8	79.8	96.5	85.4	87.8
Total Delay (hr)	87.8	82.7	69.6	55.0	69.7	60.8	62.6
Total Stops	623	727	637	617	657	610	586
Fuel Used (gal)	49.5	48.0	45.6	40.9	46.7	41.6	42.9

Interval #4 Information Recording

Start Time	7:45
End Time	8:00
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	750	794	815	782
Vehs Exited	759	794	775	770
Starting Vehs	252	238	213	233
Ending Vehs	243	238	253	246
Travel Distance (mi)	972	1037	1031	1001
Travel Time (hr)	83.6	85.6	90.1	92.6
Total Delay (hr)	58.4	58.8	63.6	66.9
Total Stops	588	556	631	624
Fuel Used (gal)	41.8	43.7	44.6	44.5

1: Raley Blvd & Bell Ave Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	1.4	0.6	1.4	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	3.7	20.3	41.2	5.7	4.2	0.2	5.0	7.8	2.5	0.8	6.9	0.1
Total Del/Veh (s)	382.5	359.2	349.7	81.3	52.9	20.1	85.7	46.3	19.4	62.9	45.5	10.8
Stop Delay (hr)	3.4	18.3	37.6	5.0	3.3	0.1	4.4	5.5	1.4	0.7	5.7	0.1
Stop Del/Veh (s)	351.1	324.5	319.3	70.7	41.4	12.7	74.4	32.6	10.6	58.0	37.3	7.0

1: Raley Blvd & Bell Ave Performance by movement

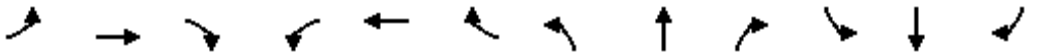
Movement	All
Denied Delay (hr)	0.1
Denied Del/Veh (s)	0.2
Total Delay (hr)	98.4
Total Del/Veh (s)	112.7
Stop Delay (hr)	85.4
Stop Del/Veh (s)	97.8

Intersection: 1: Raley Blvd & Bell Ave

Movement	EB	EB	B21	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	TR	T	L	T	R	L	T	T	R	L	T
Maximum Queue (ft)	140	1845	734	225	646	175	180	470	483	180	195	288
Average Queue (ft)	51	1750	559	190	289	33	164	275	262	145	53	179
95th Queue (ft)	143	2073	999	262	568	131	210	436	436	221	134	253
Link Distance (ft)		1734	680		3165			2348	2348			1153
Upstream Blk Time (%)		81	72									
Queuing Penalty (veh)		0	0									
Storage Bay Dist (ft)	115			200		150	155			155	190	
Storage Blk Time (%)	0	69		20	19	0	27	19	11	4		7
Queuing Penalty (veh)	0	29		61	52	0	82	39	50	11		3

Intersection: 1: Raley Blvd & Bell Ave

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	297	124
Average Queue (ft)	182	31
95th Queue (ft)	263	105
Link Distance (ft)	1153	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		100
Storage Blk Time (%)	36	0
Queuing Penalty (veh)	10	0



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	183	344	388	181	42	308	661	183	30	537	37
Future Volume (veh/h)	61	183	344	388	181	42	308	661	183	30	537	37
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	61	183	344	388	181	42	308	661	183	30	537	37
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	688	189	354	336	224	190	323	1061	473	105	626	279
Arrive On Green	0.39	0.32	0.32	0.19	0.12	0.12	0.18	0.30	0.30	0.06	0.18	0.18
Sat Flow, veh/h	1781	581	1093	1781	1870	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	61	0	527	388	181	42	308	661	183	30	537	37
Grp Sat Flow(s),veh/h/ln	1781	0	1674	1781	1870	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	3.0	0.0	43.4	26.4	13.2	2.4	23.9	22.4	4.5	2.3	20.5	2.8
Cycle Q Clear(g_c), s	3.0	0.0	43.4	26.4	13.2	2.4	23.9	22.4	4.5	2.3	20.5	2.8
Prop In Lane	1.00		0.65	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	688	0	543	336	224	190	323	1061	473	105	626	279
V/C Ratio(X)	0.09	0.00	0.97	1.15	0.81	0.22	0.95	0.62	0.39	0.29	0.86	0.13
Avail Cap(c_a), veh/h	688	0	543	336	607	514	323	1135	506	323	1135	506
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.3	0.0	46.6	56.8	60.0	28.8	56.7	42.3	4.7	63.0	56.0	48.6
Incr Delay (d2), s/veh	0.0	0.0	31.0	98.0	9.1	0.8	37.2	0.6	0.2	0.5	1.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	22.3	20.8	6.8	1.4	13.9	9.7	4.5	1.0	9.1	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.3	0.0	77.6	154.8	69.1	29.6	93.9	42.9	4.9	63.6	57.3	48.7
LnGrp LOS	C	A	E	F	E	C	F	D	A	E	E	D
Approach Vol, veh/h		588			611			1152			604	
Approach Delay, s/veh		72.4			120.8			50.5			57.1	
Approach LOS		E			F			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	58.6	21.4	30.0	29.9	30.0	50.0	12.9	47.1
Change Period (Y+Rc), s	* 4.6	* 4.6	* 4.6	* 5.3	* 3.6	* 4.6	* 4.6	* 5.3
Max Green Setting (Gmax), s	* 26	* 45	* 25	* 45	* 26	* 45	* 25	* 45
Max Q Clear Time (g_c+I1), s	5.0	15.2	25.9	22.5	28.4	45.4	4.3	24.4
Green Ext Time (p_c), s	0.1	1.6	0.0	2.1	0.0	0.0	0.0	2.9

Intersection Summary	
HCM 6th Ctrl Delay	70.7
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Summary of All Intervals

Run Number	1	10	2	3	4	5	6
Start Time	4:50	4:50	4:50	4:50	4:50	4:50	4:50
End Time	6:00	6:00	6:00	6:00	6:00	6:00	6:00
Total Time (min)	70	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	5	5	5	5	5	5	5
# of Recorded Intervals	4	4	4	4	4	4	4
Vehs Entered	3080	2995	3013	2925	3008	2998	3021
Vehs Exited	2854	2798	2760	2838	2796	2844	2830
Starting Vehs	220	170	186	187	179	175	161
Ending Vehs	446	367	439	274	391	329	352
Travel Distance (mi)	4253	4159	4149	4171	4179	4235	4226
Travel Time (hr)	308.3	269.2	299.2	224.9	266.4	251.0	243.7
Total Delay (hr)	197.6	160.6	191.0	116.4	157.6	141.1	133.8
Total Stops	4776	4358	4330	3774	4003	4402	4051
Fuel Used (gal)	168.4	157.6	163.6	147.9	157.7	156.1	152.8

Summary of All Intervals

Run Number	7	8	9	Avg
Start Time	4:50	4:50	4:50	4:50
End Time	6:00	6:00	6:00	6:00
Total Time (min)	70	70	70	70
Time Recorded (min)	60	60	60	60
# of Intervals	5	5	5	5
# of Recorded Intervals	4	4	4	4
Vehs Entered	2933	2943	3039	2994
Vehs Exited	2804	2804	2784	2812
Starting Vehs	177	173	198	184
Ending Vehs	306	312	453	364
Travel Distance (mi)	4139	4125	4196	4183
Travel Time (hr)	233.4	246.9	324.8	266.8
Total Delay (hr)	125.3	139.5	215.8	157.9
Total Stops	3925	4034	4713	4236
Fuel Used (gal)	148.7	151.6	169.7	157.4

Interval #0 Information Seeding

Start Time	4:50
End Time	5:00
Total Time (min)	10

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information

Start Time	5:00
End Time	5:15
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	760	741	755	741	727	707	714
Vehs Exited	709	698	707	708	682	694	674
Starting Vehs	220	170	186	187	179	175	161
Ending Vehs	271	213	234	220	224	188	201
Travel Distance (mi)	1062	1041	1051	1050	1026	1023	1011
Travel Time (hr)	59.4	48.6	52.3	52.0	50.8	45.2	45.9
Total Delay (hr)	31.8	21.5	25.0	24.7	24.0	18.4	19.6
Total Stops	1106	971	989	995	921	818	829
Fuel Used (gal)	38.7	35.1	36.5	36.0	35.3	34.4	33.8

Interval #1 Information

Start Time	5:00
End Time	5:15
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	710	738	782	738
Vehs Exited	702	699	694	698
Starting Vehs	177	173	198	184
Ending Vehs	185	212	286	223
Travel Distance (mi)	1030	1036	1068	1040
Travel Time (hr)	44.8	49.7	64.6	51.3
Total Delay (hr)	17.9	22.8	36.9	24.3
Total Stops	841	958	1117	954
Fuel Used (gal)	34.1	36.0	39.2	35.9

Interval #2 Information

Start Time	5:15
End Time	5:30
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	742	741	733	729	740	778	749
Vehs Exited	716	685	680	729	711	700	713
Starting Vehs	271	213	234	220	224	188	201
Ending Vehs	297	269	287	220	253	266	237
Travel Distance (mi)	1052	1013	1016	1059	1041	1062	1049
Travel Time (hr)	71.2	59.2	67.5	57.6	58.9	58.2	53.5
Total Delay (hr)	43.9	32.8	40.9	30.1	31.8	30.7	26.3
Total Stops	1155	1062	1115	927	926	1124	895
Fuel Used (gal)	40.8	36.8	39.0	37.6	38.0	38.0	36.6

Interval #2 Information

Start Time	5:15
End Time	5:30
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	766	730	703	741
Vehs Exited	722	706	692	705
Starting Vehs	185	212	286	223
Ending Vehs	229	236	297	259
Travel Distance (mi)	1077	1031	1012	1041
Travel Time (hr)	50.9	53.6	74.0	60.5
Total Delay (hr)	22.9	26.8	47.6	33.4
Total Stops	968	958	1106	1024
Fuel Used (gal)	35.8	36.0	40.3	37.9

Interval #3 Information

Start Time	5:30
End Time	5:45
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	773	731	741	703	744	741	744
Vehs Exited	719	698	665	724	694	719	701
Starting Vehs	297	269	287	220	253	266	237
Ending Vehs	351	302	363	199	303	288	280
Travel Distance (mi)	1064	1036	1017	1032	1034	1059	1045
Travel Time (hr)	79.7	72.1	80.2	55.2	66.7	71.2	65.5
Total Delay (hr)	51.8	45.1	53.6	28.3	39.7	43.9	38.2
Total Stops	1173	1099	1065	872	1024	1190	1100
Fuel Used (gal)	42.7	40.7	41.4	36.8	39.1	40.5	38.7

Interval #3 Information

Start Time	5:30
End Time	5:45
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	734	727	754	738
Vehs Exited	675	680	677	695
Starting Vehs	229	236	297	259
Ending Vehs	288	283	374	301
Travel Distance (mi)	1013	1013	1032	1035
Travel Time (hr)	63.1	66.3	83.2	70.3
Total Delay (hr)	36.6	40.1	56.2	43.4
Total Stops	1083	1004	1196	1081
Fuel Used (gal)	38.1	38.2	42.4	39.9

Interval #4 Information Recording

Start Time	5:45
End Time	6:00
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	805	782	784	752	797	772	814
Vehs Exited	710	717	708	677	709	731	742
Starting Vehs	351	302	363	199	303	288	280
Ending Vehs	446	367	439	274	391	329	352
Travel Distance (mi)	1074	1070	1066	1030	1078	1092	1121
Travel Time (hr)	98.0	89.2	99.3	60.1	90.1	76.4	78.9
Total Delay (hr)	70.1	61.3	71.5	33.3	62.1	48.1	49.7
Total Stops	1342	1226	1161	980	1132	1270	1227
Fuel Used (gal)	46.2	45.0	46.8	37.5	45.3	43.2	43.7

Interval #4 Information Recording

Start Time	5:45
End Time	6:00
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	723	748	800	778
Vehs Exited	705	719	721	713
Starting Vehs	288	283	374	301
Ending Vehs	306	312	453	364
Travel Distance (mi)	1019	1045	1084	1068
Travel Time (hr)	74.5	77.2	103.1	84.7
Total Delay (hr)	48.0	49.8	75.0	56.9
Total Stops	1033	1114	1294	1179
Fuel Used (gal)	40.6	41.4	47.9	43.8

1: Raley Blvd & Bell Ave Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.6	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	2.5	7.5	12.8	45.3	20.4	4.1	24.9	18.5	2.9	0.6	7.7	0.1
Total Del/Veh (s)	141.5	151.0	130.3	394.5	382.6	344.8	286.9	98.2	59.5	67.2	51.0	13.8
Stop Delay (hr)	2.1	6.2	10.8	42.1	18.9	3.8	23.6	11.9	1.5	0.6	6.4	0.1
Stop Del/Veh (s)	121.0	125.0	109.7	367.1	354.7	319.2	271.9	63.3	30.7	61.7	42.1	9.4

1: Raley Blvd & Bell Ave Performance by movement

Movement	All
Denied Delay (hr)	0.1
Denied Del/Veh (s)	0.1
Total Delay (hr)	147.4
Total Del/Veh (s)	175.3
Stop Delay (hr)	128.0
Stop Del/Veh (s)	152.3

Intersection: 1: Raley Blvd & Bell Ave

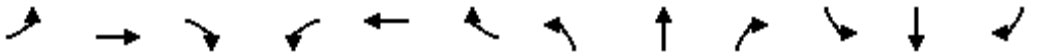
Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	T	T	R	L	T	T
Maximum Queue (ft)	140	1192	225	3193	133	180	1215	1196	180	190	314	316
Average Queue (ft)	65	716	222	1807	16	178	754	734	114	47	193	197
95th Queue (ft)	159	1405	231	3221	75	185	1441	1420	227	131	276	283
Link Distance (ft)		2335		4120			1705	1705			1488	1488
Upstream Blk Time (%)				0			1	1				
Queuing Penalty (veh)				0			6	3				
Storage Bay Dist (ft)	115		200		150	155			155	190		
Storage Blk Time (%)	2	61	71	17	0	73	24	25	0	0	11	39
Queuing Penalty (veh)	9	37	159	72	0	241	74	47	1	0	3	14

Intersection: 1: Raley Blvd & Bell Ave

Movement	SB
Directions Served	R
Maximum Queue (ft)	125
Average Queue (ft)	37
95th Queue (ft)	114
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Appendix D

Analysis Worksheets for
Existing (2020) with CIP plus Proposed Project Conditions



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	257	520	245	280	31	208	601	462	43	559	29
Future Volume (veh/h)	52	257	520	245	280	31	208	601	462	43	559	29
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	52	257	520	245	280	31	208	601	462	43	559	29
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	652	229	464	249	338	287	215	789	352	134	627	280
Arrive On Green	0.37	0.42	0.42	0.14	0.18	0.18	0.12	0.22	0.22	0.08	0.18	0.18
Sat Flow, veh/h	1781	552	1117	1781	1870	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	52	0	777	245	280	31	208	601	462	43	559	29
Grp Sat Flow(s),veh/h/ln	1781	0	1669	1781	1870	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	2.3	0.0	50.9	16.8	17.7	1.5	14.2	19.4	11.6	2.8	18.8	1.9
Cycle Q Clear(g_c), s	2.3	0.0	50.9	16.8	17.7	1.5	14.2	19.4	11.6	2.8	18.8	1.9
Prop In Lane	1.00		0.67	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	652	0	693	249	338	287	215	789	352	134	627	280
V/C Ratio(X)	0.08	0.00	1.12	0.99	0.83	0.11	0.97	0.76	1.31	0.32	0.89	0.10
Avail Cap(c_a), veh/h	652	0	693	249	869	736	215	789	352	174	699	312
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.4	0.0	35.8	52.6	48.4	24.3	53.6	44.6	8.6	53.7	49.3	42.3
Incr Delay (d2), s/veh	0.0	0.0	72.3	52.8	7.0	0.2	51.5	3.9	159.6	0.5	11.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	33.6	11.0	8.7	0.8	9.3	8.7	19.1	1.2	9.1	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.4	0.0	108.2	105.4	55.4	24.5	105.1	48.6	168.2	54.2	61.2	42.4
LnGrp LOS	C	A	F	F	E	C	F	D	F	D	E	D
Approach Vol, veh/h		829			556			1271			631	
Approach Delay, s/veh		103.0			75.7			101.3			59.9	
Approach LOS		F			E			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	49.4	26.8	19.4	26.9	20.7	55.5	13.8	32.5
Change Period (Y+Rc), s	* 4.6	* 4.6	* 4.6	* 5.3	* 3.6	* 4.6	* 4.6	* 5.3
Max Green Setting (Gmax), s	* 11	* 57	* 15	* 24	* 17	* 51	* 12	* 27
Max Q Clear Time (g_c+I1), s	4.3	19.7	16.2	20.8	18.8	52.9	4.8	21.4
Green Ext Time (p_c), s	0.0	2.5	0.0	0.8	0.0	0.0	0.0	1.8

Intersection Summary	
HCM 6th Ctrl Delay	89.4
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Summary of All Intervals

Run Number	1	10	2	3	4	5	6
Start Time	6:50	6:50	6:50	6:50	6:50	6:50	6:50
End Time	8:00	8:00	8:00	8:00	8:00	8:00	8:00
Total Time (min)	70	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	5	5	5	5	5	5	5
# of Recorded Intervals	4	4	4	4	4	4	4
Vehs Entered	3454	3394	3408	3404	3515	3424	3407
Vehs Exited	3459	3331	3417	3363	3483	3417	3408
Starting Vehs	148	107	162	99	144	147	149
Ending Vehs	143	170	153	140	176	154	148
Travel Distance (mi)	2683	2593	2650	2619	2678	2639	2620
Travel Time (hr)	310.3	228.3	296.2	274.7	239.5	230.7	254.3
Total Delay (hr)	240.9	161.4	227.7	207.0	170.7	162.7	186.7
Total Stops	2645	2528	2696	2676	2691	2504	2552
Fuel Used (gal)	143.0	121.1	138.5	133.4	126.5	123.8	128.7

Summary of All Intervals

Run Number	7	8	9	Avg
Start Time	6:50	6:50	6:50	6:50
End Time	8:00	8:00	8:00	8:00
Total Time (min)	70	70	70	70
Time Recorded (min)	60	60	60	60
# of Intervals	5	5	5	5
# of Recorded Intervals	4	4	4	4
Vehs Entered	3473	3462	3457	3439
Vehs Exited	3447	3404	3466	3420
Starting Vehs	148	106	181	136
Ending Vehs	174	164	172	156
Travel Distance (mi)	2700	2630	2674	2649
Travel Time (hr)	272.2	235.2	283.6	262.5
Total Delay (hr)	202.5	167.3	214.6	194.1
Total Stops	3206	2725	2733	2695
Fuel Used (gal)	134.7	124.3	136.6	131.0

Interval #0 Information Seeding

Start Time	6:50
End Time	7:00
Total Time (min)	10

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information

Start Time	7:00
End Time	7:15
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	877	884	889	841	852	891	860
Vehs Exited	843	846	898	789	837	909	863
Starting Vehs	148	107	162	99	144	147	149
Ending Vehs	182	145	153	151	159	129	146
Travel Distance (mi)	665	666	687	633	632	684	659
Travel Time (hr)	54.0	37.2	49.1	38.4	36.6	38.4	44.5
Total Delay (hr)	36.8	20.1	31.4	21.9	20.3	20.6	27.4
Total Stops	781	718	683	684	661	729	670
Fuel Used (gal)	29.8	26.0	29.8	25.7	25.1	27.2	27.9

Interval #1 Information

Start Time	7:00
End Time	7:15
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	904	885	885	878
Vehs Exited	882	820	905	859
Starting Vehs	148	106	181	136
Ending Vehs	170	171	161	152
Travel Distance (mi)	698	647	699	667
Travel Time (hr)	41.9	33.1	53.8	42.7
Total Delay (hr)	23.9	16.5	35.8	25.5
Total Stops	761	695	690	705
Fuel Used (gal)	28.5	24.8	31.2	27.6

Interval #2 Information

Start Time	7:15
End Time	7:30
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	837	815	825	851	873	832	853
Vehs Exited	872	810	825	836	878	812	854
Starting Vehs	182	145	153	151	159	129	146
Ending Vehs	147	150	153	166	154	149	145
Travel Distance (mi)	670	640	640	652	671	631	656
Travel Time (hr)	69.6	50.1	63.9	56.1	51.8	46.4	56.0
Total Delay (hr)	52.3	33.5	47.4	39.2	34.6	30.2	39.1
Total Stops	658	613	600	680	587	533	658
Fuel Used (gal)	34.2	28.3	31.8	30.2	30.0	27.7	30.5

Interval #2 Information

Start Time	7:15
End Time	7:30
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	896	837	873	848
Vehs Exited	888	826	830	842
Starting Vehs	170	171	161	152
Ending Vehs	178	182	204	158
Travel Distance (mi)	694	633	655	654
Travel Time (hr)	61.2	49.6	67.6	57.2
Total Delay (hr)	43.3	33.2	50.6	40.3
Total Stops	757	662	795	652
Fuel Used (gal)	32.5	28.2	32.9	30.6

Interval #3 Information

Start Time	7:30
End Time	7:45
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	886	841	866	876	905	838	841
Vehs Exited	869	852	866	867	886	821	841
Starting Vehs	147	150	153	166	154	149	145
Ending Vehs	164	139	153	175	173	166	145
Travel Distance (mi)	673	643	681	689	695	644	647
Travel Time (hr)	86.3	62.0	85.7	82.5	67.7	63.3	68.8
Total Delay (hr)	68.8	45.5	68.1	65.0	49.8	46.9	52.1
Total Stops	607	552	775	719	708	551	612
Fuel Used (gal)	38.0	31.4	37.7	37.7	33.9	31.6	33.2

Interval #3 Information

Start Time	7:30
End Time	7:45
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	842	880	857	865
Vehs Exited	836	929	906	868
Starting Vehs	178	182	204	158
Ending Vehs	184	133	155	155
Travel Distance (mi)	652	706	681	671
Travel Time (hr)	80.4	69.9	76.2	74.3
Total Delay (hr)	63.5	51.6	58.7	57.0
Total Stops	908	688	644	677
Fuel Used (gal)	35.9	35.1	35.8	35.0

Interval #4 Information Recording

Start Time	7:45
End Time	8:00
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	854	854	828	836	885	863	853
Vehs Exited	875	823	828	871	882	875	850
Starting Vehs	164	139	153	175	173	166	145
Ending Vehs	143	170	153	140	176	154	148
Travel Distance (mi)	676	645	642	644	681	679	657
Travel Time (hr)	100.5	79.0	97.5	97.8	83.4	82.6	85.0
Total Delay (hr)	83.0	62.3	80.8	81.0	66.0	65.0	68.1
Total Stops	599	645	638	593	735	691	612
Fuel Used (gal)	40.9	35.4	39.3	39.7	37.5	37.3	37.2

Interval #4 Information Recording

Start Time	7:45
End Time	8:00
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	831	860	842	851
Vehs Exited	841	829	825	850
Starting Vehs	184	133	155	155
Ending Vehs	174	164	172	156
Travel Distance (mi)	656	645	639	656
Travel Time (hr)	88.7	82.6	86.0	88.3
Total Delay (hr)	71.7	65.9	69.5	71.3
Total Stops	780	680	604	659
Fuel Used (gal)	37.9	36.2	36.6	37.8

1: Raley Blvd & Bell Ave Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	6.6	30.6	66.8	0.1	0.0	0.0	0.1	0.1	0.3	0.0	0.0	0.0
Denied Del/Veh (s)	449.9	440.3	454.0	0.7	0.5	0.8	2.5	0.5	2.6	0.0	0.0	0.0
Total Delay (hr)	3.5	15.3	30.7	6.7	5.0	0.3	4.5	7.1	2.4	0.9	7.4	0.1
Total Del/Veh (s)	307.7	282.3	269.3	93.2	61.3	32.2	78.0	41.8	18.2	69.9	46.3	13.3
Stop Delay (hr)	3.1	13.4	27.3	5.8	3.9	0.2	4.0	5.1	1.3	0.8	6.0	0.1
Stop Del/Veh (s)	276.5	247.1	238.9	80.6	48.1	22.2	69.1	30.0	10.3	64.2	37.7	8.8

1: Raley Blvd & Bell Ave Performance by movement

Movement	All
Denied Delay (hr)	104.7
Denied Del/Veh (s)	114.5
Total Delay (hr)	83.8
Total Del/Veh (s)	95.4
Stop Delay (hr)	71.0
Stop Del/Veh (s)	80.8

Intersection: 1: Raley Blvd & Bell Ave

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	T	T	R	L	T	T
Maximum Queue (ft)	140	1416	225	730	161	180	442	465	180	205	293	290
Average Queue (ft)	52	1344	193	339	23	161	250	241	140	63	191	193
95th Queue (ft)	142	1574	267	771	103	213	392	400	220	164	276	281
Link Distance (ft)		2701		3649			2852	2852			1819	1819
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	115		200		150	155			155	190		
Storage Blk Time (%)	0	69	21	18	0	24	14	10	4		9	37
Queuing Penalty (veh)	0	36	67	50	0	71	30	46	12		4	11

Intersection: 1: Raley Blvd & Bell Ave

Movement	SB
Directions Served	R
Maximum Queue (ft)	125
Average Queue (ft)	31
95th Queue (ft)	108
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	188	344	391	184	42	308	663	184	30	549	38
Future Volume (veh/h)	70	188	344	391	184	42	308	663	184	30	549	38
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	70	188	344	391	184	42	308	663	184	30	549	38
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	658	169	309	387	234	199	312	1018	454	112	619	276
Arrive On Green	0.37	0.29	0.29	0.22	0.13	0.13	0.17	0.29	0.29	0.06	0.17	0.17
Sat Flow, veh/h	1781	592	1083	1781	1870	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	70	0	532	391	184	42	308	663	184	30	549	38
Grp Sat Flow(s),veh/h/ln	1781	0	1675	1781	1870	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	3.2	0.0	34.9	26.6	11.7	2.1	21.1	20.0	4.2	2.0	18.5	2.5
Cycle Q Clear(g_c), s	3.2	0.0	34.9	26.6	11.7	2.1	21.1	20.0	4.2	2.0	18.5	2.5
Prop In Lane	1.00		0.65	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	658	0	478	387	234	199	312	1018	454	112	619	276
V/C Ratio(X)	0.11	0.00	1.11	1.01	0.79	0.21	0.99	0.65	0.41	0.27	0.89	0.14
Avail Cap(c_a), veh/h	658	0	478	387	771	653	312	1018	454	175	697	311
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.3	0.0	43.7	47.9	51.9	24.5	50.3	38.3	4.8	54.6	49.3	42.7
Incr Delay (d2), s/veh	0.0	0.0	75.7	48.1	7.7	0.7	47.5	1.2	0.2	0.5	11.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	24.1	16.7	5.9	1.2	13.2	8.6	4.0	0.9	8.9	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.3	0.0	119.4	95.9	59.6	25.2	97.9	39.5	5.0	55.1	60.7	42.8
LnGrp LOS	C	A	F	F	E	C	F	D	A	E	E	D
Approach Vol, veh/h		602			617			1155			617	
Approach Delay, s/veh		108.4			80.3			49.5			59.3	
Approach LOS		F			F			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	49.8	19.9	26.0	26.6	30.2	39.5	12.3	40.3
Change Period (Y+Rc), s	* 4.6	* 4.6	* 4.6	* 5.3	* 3.6	* 4.6	* 4.6	* 5.3
Max Green Setting (Gmax), s	* 11	* 50	* 21	* 24	* 27	* 35	* 12	* 33
Max Q Clear Time (g_c+I1), s	5.2	13.7	23.1	20.5	28.6	36.9	4.0	22.0
Green Ext Time (p_c), s	0.0	1.6	0.0	0.8	0.0	0.0	0.0	2.4

Intersection Summary	
HCM 6th Ctrl Delay	69.7
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Summary of All Intervals

Run Number	1	10	2	3	4	5	6
Start Time	4:50	4:50	4:50	4:50	4:50	4:50	4:50
End Time	6:00	6:00	6:00	6:00	6:00	6:00	6:00
Total Time (min)	70	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	5	5	5	5	5	5	5
# of Recorded Intervals	4	4	4	4	4	4	4
Vehs Entered	3293	3323	3363	3284	3290	3353	3393
Vehs Exited	3115	3164	3166	3134	3165	3248	3231
Starting Vehs	141	139	131	159	187	159	166
Ending Vehs	319	298	328	309	312	264	328
Travel Distance (mi)	2924	2976	2948	2936	2956	3010	3000
Travel Time (hr)	230.8	248.7	228.6	216.0	234.9	220.6	218.5
Total Delay (hr)	156.8	173.8	154.3	142.3	160.5	144.6	143.0
Total Stops	4145	4445	4063	3897	4446	4167	3963
Fuel Used (gal)	126.3	131.0	126.5	122.9	128.6	126.0	125.2

Summary of All Intervals

Run Number	7	8	9	Avg
Start Time	4:50	4:50	4:50	4:50
End Time	6:00	6:00	6:00	6:00
Total Time (min)	70	70	70	70
Time Recorded (min)	60	60	60	60
# of Intervals	5	5	5	5
# of Recorded Intervals	4	4	4	4
Vehs Entered	3263	3228	3290	3306
Vehs Exited	3109	3071	3140	3154
Starting Vehs	123	147	153	150
Ending Vehs	277	304	303	303
Travel Distance (mi)	2915	2886	2989	2954
Travel Time (hr)	220.0	198.5	241.4	225.8
Total Delay (hr)	146.7	125.3	166.3	151.4
Total Stops	3975	3895	4473	4147
Fuel Used (gal)	123.9	118.2	130.0	125.9

Interval #0 Information Seeding

Start Time	4:50
End Time	5:00
Total Time (min)	10

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information

Start Time	5:00
End Time	5:15
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	822	840	827	803	860	828	825
Vehs Exited	777	767	782	793	827	801	835
Starting Vehs	141	139	131	159	187	159	166
Ending Vehs	186	212	176	169	220	186	156
Travel Distance (mi)	726	733	731	733	775	744	773
Travel Time (hr)	41.5	48.2	39.3	44.1	52.2	41.5	38.1
Total Delay (hr)	23.0	29.7	20.9	25.8	32.7	22.8	18.7
Total Stops	964	1110	898	965	1168	939	830
Fuel Used (gal)	27.3	29.0	27.5	28.8	31.4	28.2	28.4

Interval #1 Information

Start Time	5:00
End Time	5:15
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	814	810	854	829
Vehs Exited	773	807	773	793
Starting Vehs	123	147	153	150
Ending Vehs	164	150	234	184
Travel Distance (mi)	725	732	760	743
Travel Time (hr)	35.2	36.7	49.1	42.6
Total Delay (hr)	16.8	18.1	29.9	23.8
Total Stops	771	811	1107	956
Fuel Used (gal)	26.1	26.8	30.1	28.4

Interval #2 Information

Start Time	5:15
End Time	5:30
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	825	849	850	815	784	871	857
Vehs Exited	765	790	801	758	775	820	830
Starting Vehs	186	212	176	169	220	186	156
Ending Vehs	246	271	225	226	229	237	183
Travel Distance (mi)	731	758	767	747	725	784	765
Travel Time (hr)	54.9	61.2	50.6	46.4	59.1	49.1	42.7
Total Delay (hr)	36.5	42.1	31.3	27.7	41.0	29.4	23.5
Total Stops	1025	1149	1099	927	1094	1081	922
Fuel Used (gal)	31.2	33.1	30.6	29.0	32.1	30.9	29.0

Interval #2 Information

Start Time	5:15
End Time	5:30
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	866	770	848	832
Vehs Exited	781	738	819	788
Starting Vehs	164	150	234	184
Ending Vehs	249	182	263	227
Travel Distance (mi)	745	702	776	750
Travel Time (hr)	54.4	42.5	63.7	52.5
Total Delay (hr)	35.8	24.6	44.2	33.6
Total Stops	1083	934	1228	1054
Fuel Used (gal)	31.3	27.6	34.1	30.9

Interval #3 Information

Start Time	5:30
End Time	5:45
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	817	831	840	824	818	824	874
Vehs Exited	783	817	780	813	807	815	779
Starting Vehs	246	271	225	226	229	237	183
Ending Vehs	280	285	285	237	240	246	278
Travel Distance (mi)	726	765	715	734	750	739	742
Travel Time (hr)	60.9	68.0	61.9	56.0	56.6	60.8	57.5
Total Delay (hr)	42.4	48.8	43.9	37.5	37.7	42.0	38.8
Total Stops	1028	1122	1017	914	1130	1040	1112
Fuel Used (gal)	32.1	34.8	32.1	31.2	32.0	32.3	31.5

Interval #3 Information

Start Time	5:30
End Time	5:45
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	793	818	762	822
Vehs Exited	782	756	810	795
Starting Vehs	249	182	263	227
Ending Vehs	260	244	215	255
Travel Distance (mi)	724	719	734	735
Travel Time (hr)	64.1	52.4	62.0	60.0
Total Delay (hr)	45.9	34.2	43.5	41.5
Total Stops	1088	1059	1048	1056
Fuel Used (gal)	33.0	30.1	32.7	32.2

Interval #4 Information Recording

Start Time	5:45
End Time	6:00
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	829	803	846	842	828	830	837
Vehs Exited	790	790	803	770	756	812	787
Starting Vehs	280	285	285	237	240	246	278
Ending Vehs	319	298	328	309	312	264	328
Travel Distance (mi)	741	719	735	723	706	743	721
Travel Time (hr)	73.6	71.2	76.8	69.5	66.9	69.1	80.1
Total Delay (hr)	54.9	53.1	58.3	51.4	49.1	50.4	62.0
Total Stops	1128	1064	1049	1091	1054	1107	1099
Fuel Used (gal)	35.7	34.1	36.3	33.9	33.1	34.5	36.3

Interval #4 Information Recording

Start Time	5:45
End Time	6:00
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	790	830	826	823
Vehs Exited	773	770	738	778
Starting Vehs	260	244	215	255
Ending Vehs	277	304	303	303
Travel Distance (mi)	722	733	719	726
Travel Time (hr)	66.3	66.9	66.6	70.7
Total Delay (hr)	48.2	48.4	48.6	52.4
Total Stops	1033	1091	1090	1081
Fuel Used (gal)	33.5	33.7	33.0	34.4

1: Raley Blvd & Bell Ave Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.1	0.1	0.0	0.0	0.0
Denied Del/Veh (s)	2.1	0.6	0.5	1.2	0.8	1.0	2.7	0.4	2.6	0.0	0.0	0.0
Total Delay (hr)	3.0	8.1	12.8	49.3	22.9	4.9	19.4	13.4	1.9	0.6	8.2	0.2
Total Del/Veh (s)	150.2	148.8	135.2	427.9	414.7	370.2	220.8	71.8	36.1	71.1	52.6	15.8
Stop Delay (hr)	2.6	6.7	10.7	46.3	21.4	4.6	18.0	8.6	0.9	0.5	6.7	0.1
Stop Del/Veh (s)	127.9	122.3	113.2	401.8	387.6	346.7	204.6	46.0	16.5	64.9	43.1	10.7

1: Raley Blvd & Bell Ave Performance by movement

Movement	All
Denied Delay (hr)	0.7
Denied Del/Veh (s)	0.9
Total Delay (hr)	144.7
Total Del/Veh (s)	169.3
Stop Delay (hr)	127.1
Stop Del/Veh (s)	148.7

Intersection: 1: Raley Blvd & Bell Ave

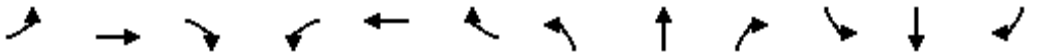
Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	T	T	R	L	T	T
Maximum Queue (ft)	140	1150	225	3448	173	180	862	845	180	214	303	307
Average Queue (ft)	73	745	223	1989	22	178	603	531	114	44	199	205
95th Queue (ft)	165	1222	235	3452	95	183	923	835	226	139	283	290
Link Distance (ft)		4397		3877			2831	2831			2380	2380
Upstream Blk Time (%)				1								
Queuing Penalty (veh)				0								
Storage Bay Dist (ft)	115		200		150	155			155	190		
Storage Blk Time (%)	2	65	71	19	0	77	13	27	0	0	12	41
Queuing Penalty (veh)	11	46	160	84	0	253	41	50	1	0	4	16

Intersection: 1: Raley Blvd & Bell Ave

Movement	SB
Directions Served	R
Maximum Queue (ft)	125
Average Queue (ft)	36
95th Queue (ft)	112
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Appendix E

Analysis Worksheets for
Existing (2020) with CIP plus Proposed Project Conditions (Optimized Signal Timings)



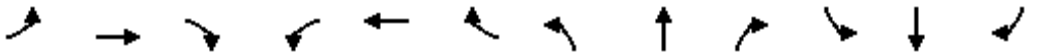
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	257	520	245	280	31	208	601	462	43	559	29
Future Volume (veh/h)	52	257	520	245	280	31	208	601	462	43	559	29
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	52	257	520	245	280	31	208	601	462	43	559	29
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	652	229	464	249	338	287	215	789	352	134	627	280
Arrive On Green	0.37	0.42	0.42	0.14	0.18	0.18	0.12	0.22	0.22	0.08	0.18	0.18
Sat Flow, veh/h	1781	552	1117	1781	1870	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	52	0	777	245	280	31	208	601	462	43	559	29
Grp Sat Flow(s),veh/h/ln	1781	0	1669	1781	1870	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	2.3	0.0	50.9	16.8	17.7	1.5	14.2	19.4	11.6	2.8	18.8	1.9
Cycle Q Clear(g_c), s	2.3	0.0	50.9	16.8	17.7	1.5	14.2	19.4	11.6	2.8	18.8	1.9
Prop In Lane	1.00		0.67	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	652	0	693	249	338	287	215	789	352	134	627	280
V/C Ratio(X)	0.08	0.00	1.12	0.99	0.83	0.11	0.97	0.76	1.31	0.32	0.89	0.10
Avail Cap(c_a), veh/h	652	0	693	249	869	736	215	789	352	174	699	312
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.4	0.0	35.8	52.6	48.4	24.3	53.6	44.6	8.6	53.7	49.3	42.3
Incr Delay (d2), s/veh	0.0	0.0	72.3	52.8	7.0	0.2	51.5	3.9	159.6	0.5	11.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	33.6	11.0	8.7	0.8	9.3	8.7	19.1	1.2	9.1	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.4	0.0	108.2	105.4	55.4	24.5	105.1	48.6	168.2	54.2	61.2	42.4
LnGrp LOS	C	A	F	F	E	C	F	D	F	D	E	D
Approach Vol, veh/h		829			556			1271			631	
Approach Delay, s/veh		103.0			75.7			101.3			59.9	
Approach LOS		F			E			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	49.4	26.8	19.4	26.9	20.7	55.5	13.8	32.5
Change Period (Y+Rc), s	* 4.6	* 4.6	* 4.6	* 5.3	* 3.6	* 4.6	* 4.6	* 5.3
Max Green Setting (Gmax), s	* 11	* 57	* 15	* 24	* 17	* 51	* 12	* 27
Max Q Clear Time (g_c+I1), s	4.3	19.7	16.2	20.8	18.8	52.9	4.8	21.4
Green Ext Time (p_c), s	0.0	2.5	0.0	0.8	0.0	0.0	0.0	1.8

Intersection Summary	
HCM 6th Ctrl Delay	89.4
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	188	344	391	184	42	308	663	184	30	549	38
Future Volume (veh/h)	70	188	344	391	184	42	308	663	184	30	549	38
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	70	188	344	391	184	42	308	663	184	30	549	38
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	658	169	309	387	234	199	312	1018	454	112	619	276
Arrive On Green	0.37	0.29	0.29	0.22	0.13	0.13	0.17	0.29	0.29	0.06	0.17	0.17
Sat Flow, veh/h	1781	592	1083	1781	1870	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	70	0	532	391	184	42	308	663	184	30	549	38
Grp Sat Flow(s),veh/h/ln	1781	0	1675	1781	1870	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	3.2	0.0	34.9	26.6	11.7	2.1	21.1	20.0	4.2	2.0	18.5	2.5
Cycle Q Clear(g_c), s	3.2	0.0	34.9	26.6	11.7	2.1	21.1	20.0	4.2	2.0	18.5	2.5
Prop In Lane	1.00		0.65	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	658	0	478	387	234	199	312	1018	454	112	619	276
V/C Ratio(X)	0.11	0.00	1.11	1.01	0.79	0.21	0.99	0.65	0.41	0.27	0.89	0.14
Avail Cap(c_a), veh/h	658	0	478	387	771	653	312	1018	454	175	697	311
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.3	0.0	43.7	47.9	51.9	24.5	50.3	38.3	4.8	54.6	49.3	42.7
Incr Delay (d2), s/veh	0.0	0.0	75.7	48.1	7.7	0.7	47.5	1.2	0.2	0.5	11.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	24.1	16.7	5.9	1.2	13.2	8.6	4.0	0.9	8.9	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.3	0.0	119.4	95.9	59.6	25.2	97.9	39.5	5.0	55.1	60.7	42.8
LnGrp LOS	C	A	F	F	E	C	F	D	A	E	E	D
Approach Vol, veh/h		602			617			1155			617	
Approach Delay, s/veh		108.4			80.3			49.5			59.3	
Approach LOS		F			F			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	49.8	19.9	26.0	26.6	30.2	39.5	12.3	40.3
Change Period (Y+Rc), s	* 4.6	* 4.6	* 4.6	* 5.3	* 3.6	* 4.6	* 4.6	* 5.3
Max Green Setting (Gmax), s	* 11	* 50	* 21	* 24	* 27	* 35	* 12	* 33
Max Q Clear Time (g_c+I1), s	5.2	13.7	23.1	20.5	28.6	36.9	4.0	22.0
Green Ext Time (p_c), s	0.0	1.6	0.0	0.8	0.0	0.0	0.0	2.4

Intersection Summary	
HCM 6th Ctrl Delay	69.7
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Appendix F

Analysis Worksheets for
Existing (2020) with CIP plus Proposed Project (Two-Driveway Configuration and Optimized Signal Timings) Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	258	520	245	280	31	208	598	461	43	559	29
Future Volume (veh/h)	55	258	520	245	280	31	208	598	461	43	559	29
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	55	258	520	245	280	31	208	598	461	43	559	29
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	655	231	465	249	338	287	212	783	349	134	627	280
Arrive On Green	0.37	0.42	0.42	0.14	0.18	0.18	0.12	0.22	0.22	0.08	0.18	0.18
Sat Flow, veh/h	1781	554	1116	1781	1870	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	55	0	778	245	280	31	208	598	461	43	559	29
Grp Sat Flow(s),veh/h/ln	1781	0	1670	1781	1870	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	2.5	0.0	51.1	16.8	17.7	1.5	14.3	19.3	11.5	2.8	18.8	1.9
Cycle Q Clear(g_c), s	2.5	0.0	51.1	16.8	17.7	1.5	14.3	19.3	11.5	2.8	18.8	1.9
Prop In Lane	1.00		0.67	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	655	0	696	249	338	287	212	783	349	134	627	280
V/C Ratio(X)	0.08	0.00	1.12	0.99	0.83	0.11	0.98	0.76	1.32	0.32	0.89	0.10
Avail Cap(c_a), veh/h	655	0	696	249	872	739	212	783	349	174	699	312
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.3	0.0	35.7	52.6	48.4	24.4	53.8	44.8	8.6	53.7	49.3	42.3
Incr Delay (d2), s/veh	0.0	0.0	71.1	52.8	7.0	0.2	55.7	4.0	162.5	0.5	11.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	33.5	11.0	8.7	0.8	9.5	8.7	19.2	1.2	9.1	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.3	0.0	106.9	105.4	55.4	24.6	109.5	48.8	171.1	54.2	61.2	42.4
LnGrp LOS	C	A	F	F	E	C	F	D	F	D	E	D
Approach Vol, veh/h		833			556			1267			631	
Approach Delay, s/veh		101.5			75.7			103.3			59.9	
Approach LOS		F			E			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	49.6	26.8	19.2	26.9	20.7	55.7	13.8	32.3
Change Period (Y+Rc), s	* 4.6	* 4.6	* 4.6	* 5.3	* 3.6	* 4.6	* 4.6	* 5.3
Max Green Setting (Gmax), s	* 11	* 57	* 15	* 24	* 17	* 51	* 12	* 27
Max Q Clear Time (g_c+I1), s	4.5	19.7	16.3	20.8	18.8	53.1	4.8	21.3
Green Ext Time (p_c), s	0.0	2.5	0.0	0.8	0.0	0.0	0.0	1.8

Intersection Summary	
HCM 6th Ctrl Delay	89.8
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Summary of All Intervals

Run Number	1	10	2	3	4	5	6
Start Time	6:50	6:50	6:50	6:50	6:50	6:50	6:50
End Time	8:00	8:00	8:00	8:00	8:00	8:00	8:00
Total Time (min)	70	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	5	5	5	5	5	5	5
# of Recorded Intervals	4	4	4	4	4	4	4
Vehs Entered	3579	3563	3534	3684	3595	3773	3554
Vehs Exited	3516	3490	3460	3561	3511	3624	3542
Starting Vehs	180	145	151	133	171	116	196
Ending Vehs	243	218	225	256	255	265	208
Travel Distance (mi)	3374	3329	3288	3378	3347	3571	3336
Travel Time (hr)	232.8	177.9	223.7	239.6	238.0	224.3	242.7
Total Delay (hr)	146.8	92.9	139.8	153.6	152.6	133.2	157.2
Total Stops	3669	3529	3684	4022	3664	3752	3315
Fuel Used (gal)	138.0	123.7	134.0	139.7	138.6	140.6	139.4

Summary of All Intervals

Run Number	7	8	9	Avg
Start Time	6:50	6:50	6:50	6:50
End Time	8:00	8:00	8:00	8:00
Total Time (min)	70	70	70	70
Time Recorded (min)	60	60	60	60
# of Intervals	5	5	5	5
# of Recorded Intervals	4	4	4	4
Vehs Entered	3687	3548	3664	3619
Vehs Exited	3635	3447	3626	3543
Starting Vehs	182	144	152	156
Ending Vehs	234	245	190	234
Travel Distance (mi)	3452	3337	3483	3389
Travel Time (hr)	278.9	250.2	199.3	230.7
Total Delay (hr)	190.9	165.2	110.8	144.3
Total Stops	3995	3449	3185	3627
Fuel Used (gal)	150.8	140.6	133.0	137.9

Interval #0 Information Seeding

Start Time	6:50
End Time	7:00
Total Time (min)	10

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information

Start Time	7:00
End Time	7:15
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	918	917	899	903	918	943	903
Vehs Exited	909	904	846	850	903	887	906
Starting Vehs	180	145	151	133	171	116	196
Ending Vehs	189	158	204	186	186	172	193
Travel Distance (mi)	853	858	815	811	867	872	838
Travel Time (hr)	49.1	36.5	46.5	42.5	46.4	39.2	49.6
Total Delay (hr)	27.3	14.6	25.6	21.9	24.3	17.0	28.0
Total Stops	893	813	996	903	1038	846	982
Fuel Used (gal)	32.5	29.7	30.7	29.9	32.5	30.4	32.4

Interval #1 Information

Start Time	7:00
End Time	7:15
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	954	877	959	920
Vehs Exited	923	822	906	885
Starting Vehs	182	144	152	156
Ending Vehs	213	199	205	190
Travel Distance (mi)	877	791	894	848
Travel Time (hr)	51.6	40.2	43.6	44.5
Total Delay (hr)	29.1	20.0	20.9	22.9
Total Stops	949	808	897	912
Fuel Used (gal)	33.9	29.2	32.1	31.3

Interval #2 Information

Start Time	7:15
End Time	7:30
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	864	885	905	956	910	934	834
Vehs Exited	855	874	906	913	872	905	853
Starting Vehs	189	158	204	186	186	172	193
Ending Vehs	198	169	203	229	224	201	174
Travel Distance (mi)	824	830	856	896	830	892	781
Travel Time (hr)	50.5	37.3	54.1	57.6	54.3	49.1	51.8
Total Delay (hr)	29.6	16.0	32.2	34.8	33.3	26.4	31.9
Total Stops	922	814	917	1146	920	999	559
Fuel Used (gal)	32.5	29.4	34.0	35.6	33.2	33.3	31.6

Interval #2 Information

Start Time	7:15
End Time	7:30
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	906	921	886	899
Vehs Exited	881	897	881	883
Starting Vehs	213	199	205	190
Ending Vehs	238	223	210	207
Travel Distance (mi)	811	860	843	842
Travel Time (hr)	64.4	55.5	48.5	52.3
Total Delay (hr)	43.7	33.5	27.1	30.9
Total Stops	983	745	815	881
Fuel Used (gal)	35.3	34.2	32.2	33.1

Interval #3 Information

Start Time	7:30
End Time	7:45
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	897	895	895	921	885	952	922
Vehs Exited	870	850	859	883	888	942	858
Starting Vehs	198	169	203	229	224	201	174
Ending Vehs	225	214	239	267	221	211	238
Travel Distance (mi)	833	827	822	842	836	930	850
Travel Time (hr)	62.1	48.3	58.9	66.2	63.2	58.3	64.9
Total Delay (hr)	40.7	27.2	37.9	44.7	41.8	34.7	43.0
Total Stops	882	1037	899	1015	761	898	855
Fuel Used (gal)	34.8	31.4	34.2	36.6	35.5	36.7	36.1

Interval #3 Information

Start Time	7:30
End Time	7:45
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	934	867	893	906
Vehs Exited	924	882	887	884
Starting Vehs	238	223	210	207
Ending Vehs	248	208	216	226
Travel Distance (mi)	905	833	847	853
Travel Time (hr)	80.0	73.1	50.9	62.6
Total Delay (hr)	57.0	51.9	29.4	40.8
Total Stops	1088	895	732	907
Fuel Used (gal)	40.9	37.2	33.0	35.6

Interval #4 Information Recording

Start Time	7:45
End Time	8:00
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	900	866	835	904	882	944	895
Vehs Exited	882	862	849	915	848	890	925
Starting Vehs	225	214	239	267	221	211	238
Ending Vehs	243	218	225	256	255	265	208
Travel Distance (mi)	864	814	795	830	815	877	867
Travel Time (hr)	71.1	55.7	64.3	73.3	74.1	77.6	76.5
Total Delay (hr)	49.3	35.1	44.0	52.2	53.3	55.1	54.2
Total Stops	972	865	872	958	945	1009	919
Fuel Used (gal)	38.2	33.2	35.1	37.7	37.5	40.3	39.4

Interval #4 Information Recording

Start Time	7:45
End Time	8:00
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	893	883	926	894
Vehs Exited	907	846	952	888
Starting Vehs	248	208	216	226
Ending Vehs	234	245	190	234
Travel Distance (mi)	859	853	898	847
Travel Time (hr)	82.9	81.4	56.3	71.3
Total Delay (hr)	61.1	59.7	33.4	49.7
Total Stops	975	1001	741	924
Fuel Used (gal)	40.8	39.9	35.6	37.8

1: Raley Blvd & Bell Ave Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	1.7	8.2	16.1	0.0	0.0	0.0	0.1	0.1	0.3	0.0	0.0	0.0
Denied Del/Veh (s)	116.8	113.2	112.3	0.4	0.4	0.4	2.3	0.6	2.4	0.0	0.0	0.0
Total Delay (hr)	4.0	18.7	36.5	9.6	6.3	0.4	8.6	12.3	5.4	0.7	8.4	0.1
Total Del/Veh (s)	287.8	275.0	267.1	133.5	79.2	45.5	143.6	71.2	41.4	62.8	52.8	16.0
Stop Delay (hr)	3.5	16.0	31.6	8.4	4.9	0.3	7.9	9.4	3.7	0.7	6.9	0.1
Stop Del/Veh (s)	252.5	234.4	231.2	116.8	61.9	32.1	131.7	54.4	28.5	56.8	43.2	10.9

1: Raley Blvd & Bell Ave Performance by movement

Movement	All
Denied Delay (hr)	26.6
Denied Del/Veh (s)	29.1
Total Delay (hr)	111.1
Total Del/Veh (s)	120.5
Stop Delay (hr)	93.3
Stop Del/Veh (s)	101.2

Intersection: 1: Raley Blvd & Bell Ave

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	T	T	R	L	T	T
Maximum Queue (ft)	140	1957	225	885	174	180	661	678	180	213	310	319
Average Queue (ft)	61	1686	207	431	23	171	393	395	162	56	193	195
95th Queue (ft)	156	2397	259	967	103	202	706	730	223	153	279	287
Link Distance (ft)		3811		5105			2957	2957			2418	2418
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	115		200		150	155			155	190		
Storage Blk Time (%)	0	61	40	16	0	48	21	24	11	0	11	43
Queuing Penalty (veh)	3	33	124	45	0	143	44	112	33	0	5	12

Intersection: 1: Raley Blvd & Bell Ave

Movement	SB
Directions Served	R
Maximum Queue (ft)	125
Average Queue (ft)	37
95th Queue (ft)	118
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	72	189	344	391	184	42	308	661	183	30	549	38
Future Volume (veh/h)	72	189	344	391	184	42	308	661	183	30	549	38
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	72	189	344	391	184	42	308	661	183	30	549	38
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	658	171	310	385	234	198	312	1018	454	112	619	276
Arrive On Green	0.37	0.29	0.29	0.22	0.13	0.13	0.17	0.29	0.29	0.06	0.17	0.17
Sat Flow, veh/h	1781	594	1081	1781	1870	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	72	0	533	391	184	42	308	661	183	30	549	38
Grp Sat Flow(s),veh/h/ln	1781	0	1676	1781	1870	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	3.2	0.0	35.1	26.4	11.7	2.1	21.1	19.9	4.2	2.0	18.5	2.5
Cycle Q Clear(g_c), s	3.2	0.0	35.1	26.4	11.7	2.1	21.1	19.9	4.2	2.0	18.5	2.5
Prop In Lane	1.00		0.65	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	658	0	481	385	234	198	312	1018	454	112	619	276
V/C Ratio(X)	0.11	0.00	1.11	1.02	0.79	0.21	0.99	0.65	0.40	0.27	0.89	0.14
Avail Cap(c_a), veh/h	658	0	481	385	762	645	312	1018	454	175	697	311
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.3	0.0	43.6	48.0	51.9	24.5	50.3	38.3	4.8	54.6	49.3	42.7
Incr Delay (d2), s/veh	0.0	0.0	74.0	50.2	7.8	0.7	47.5	1.2	0.2	0.5	11.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	24.0	16.8	5.9	1.2	13.2	8.6	3.9	0.9	8.9	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.4	0.0	117.6	98.2	59.7	25.2	97.9	39.4	5.0	55.1	60.7	42.8
LnGrp LOS	C	A	F	F	E	C	F	D	A	E	E	D
Approach Vol, veh/h		605			617			1152			617	
Approach Delay, s/veh		106.6			81.7			49.6			59.3	
Approach LOS		F			F			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	49.8	19.9	26.0	26.6	30.0	39.7	12.3	40.3
Change Period (Y+Rc), s	* 4.6	* 4.6	* 4.6	* 5.3	* 3.6	* 4.6	* 4.6	* 5.3
Max Green Setting (Gmax), s	* 12	* 50	* 21	* 24	* 26	* 35	* 12	* 33
Max Q Clear Time (g_c+I1), s	5.2	13.7	23.1	20.5	28.4	37.1	4.0	21.9
Green Ext Time (p_c), s	0.0	1.6	0.0	0.8	0.0	0.0	0.0	2.4

Intersection Summary	
HCM 6th Ctrl Delay	69.7
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Summary of All Intervals

Run Number	1	10	2	3	4	5	6
Start Time	4:50	4:50	4:50	4:50	4:50	4:50	4:50
End Time	6:00	6:00	6:00	6:00	6:00	6:00	6:00
Total Time (min)	70	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	5	5	5	5	5	5	5
# of Recorded Intervals	4	4	4	4	4	4	4
Vehs Entered	3315	3289	3343	3354	3317	3299	3349
Vehs Exited	3152	3165	3162	3246	3162	3216	3261
Starting Vehs	96	106	113	123	126	137	122
Ending Vehs	259	230	294	231	281	220	210
Travel Distance (mi)	2504	2470	2485	2518	2513	2531	2527
Travel Time (hr)	184.6	169.1	225.9	163.8	201.4	219.8	165.0
Total Delay (hr)	120.8	106.0	162.3	99.6	136.9	155.3	100.4
Total Stops	3803	3963	4452	4018	4103	3856	3450
Fuel Used (gal)	110.0	105.9	119.3	107.0	113.7	119.9	107.3

Summary of All Intervals

Run Number	7	8	9	Avg
Start Time	4:50	4:50	4:50	4:50
End Time	6:00	6:00	6:00	6:00
Total Time (min)	70	70	70	70
Time Recorded (min)	60	60	60	60
# of Intervals	5	5	5	5
# of Recorded Intervals	4	4	4	4
Vehs Entered	3287	3221	3382	3317
Vehs Exited	3201	3196	3235	3197
Starting Vehs	129	124	109	116
Ending Vehs	215	149	256	234
Travel Distance (mi)	2481	2483	2525	2504
Travel Time (hr)	163.1	130.5	181.8	180.5
Total Delay (hr)	99.5	67.1	116.9	116.5
Total Stops	3836	3322	4294	3906
Fuel Used (gal)	105.1	97.9	110.7	109.7

Interval #0 Information Seeding

Start Time	4:50
End Time	5:00
Total Time (min)	10

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information

Start Time	5:00
End Time	5:15
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	804	821	844	824	799	879	808
Vehs Exited	787	760	765	804	770	816	813
Starting Vehs	96	106	113	123	126	137	122
Ending Vehs	113	167	192	143	155	200	117
Travel Distance (mi)	606	620	634	633	612	660	609
Travel Time (hr)	32.2	35.6	41.4	33.6	38.1	42.2	33.4
Total Delay (hr)	16.8	19.8	25.1	17.5	22.5	25.4	17.9
Total Stops	782	920	1069	879	972	1033	862
Fuel Used (gal)	24.3	24.9	26.8	25.1	25.3	27.5	24.4

Interval #1 Information

Start Time	5:00
End Time	5:15
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	831	786	844	825
Vehs Exited	851	796	790	796
Starting Vehs	129	124	109	116
Ending Vehs	109	114	163	146
Travel Distance (mi)	636	625	623	626
Travel Time (hr)	30.7	30.3	38.1	35.6
Total Delay (hr)	14.4	14.3	22.1	19.6
Total Stops	721	770	1027	904
Fuel Used (gal)	24.3	24.1	25.8	25.2

Interval #2 Information

Start Time	5:15
End Time	5:30
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	833	810	829	822	831	817	847
Vehs Exited	793	802	785	821	787	795	798
Starting Vehs	113	167	192	143	155	200	117
Ending Vehs	153	175	236	144	199	222	166
Travel Distance (mi)	636	614	602	617	636	612	629
Travel Time (hr)	37.2	36.2	53.1	34.0	43.5	55.6	34.3
Total Delay (hr)	20.9	20.5	37.7	18.2	27.2	40.0	18.2
Total Stops	861	877	1141	867	1016	1033	871
Fuel Used (gal)	25.4	24.8	28.7	25.0	27.0	29.7	25.3

Interval #2 Information

Start Time	5:15
End Time	5:30
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	806	838	829	827
Vehs Exited	742	815	817	795
Starting Vehs	109	114	163	146
Ending Vehs	173	137	175	176
Travel Distance (mi)	593	621	631	619
Travel Time (hr)	37.4	33.2	40.8	40.5
Total Delay (hr)	22.1	17.3	24.5	24.7
Total Stops	981	856	1025	951
Fuel Used (gal)	24.6	24.4	26.7	26.2

Interval #3 Information

Start Time	5:30
End Time	5:45
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	856	814	821	867	852	793	835
Vehs Exited	763	793	826	819	818	813	811
Starting Vehs	153	175	236	144	199	222	166
Ending Vehs	246	196	231	192	233	202	190
Travel Distance (mi)	628	604	630	637	640	624	625
Travel Time (hr)	50.1	43.8	60.4	42.2	56.8	60.0	43.7
Total Delay (hr)	34.1	28.4	44.3	25.9	40.4	44.1	27.6
Total Stops	1059	1055	1195	1044	1056	881	793
Fuel Used (gal)	28.2	26.5	31.1	27.0	30.5	30.8	27.2

Interval #3 Information

Start Time	5:30
End Time	5:45
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	815	769	853	824
Vehs Exited	797	795	824	805
Starting Vehs	173	137	175	176
Ending Vehs	191	111	204	200
Travel Distance (mi)	616	617	641	626
Travel Time (hr)	41.8	32.0	46.5	47.7
Total Delay (hr)	25.9	16.4	30.1	31.7
Total Stops	954	772	1113	993
Fuel Used (gal)	26.5	24.5	28.1	28.0

Interval #4 Information Recording

Start Time	5:45
End Time	6:00
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	822	844	849	841	835	810	859
Vehs Exited	809	810	786	802	787	792	839
Starting Vehs	246	196	231	192	233	202	190
Ending Vehs	259	230	294	231	281	220	210
Travel Distance (mi)	634	633	619	632	626	635	663
Travel Time (hr)	65.1	53.5	71.1	54.0	63.0	62.0	53.6
Total Delay (hr)	49.0	37.3	55.2	38.0	46.9	45.8	36.7
Total Stops	1101	1111	1047	1228	1059	909	924
Fuel Used (gal)	32.1	29.7	32.8	29.9	31.0	31.8	30.3

Interval #4 Information Recording

Start Time	5:45
End Time	6:00
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	835	828	856	837
Vehs Exited	811	790	804	803
Starting Vehs	191	111	204	200
Ending Vehs	215	149	256	234
Travel Distance (mi)	636	619	630	633
Travel Time (hr)	53.3	35.0	56.4	56.7
Total Delay (hr)	37.1	19.1	40.2	40.5
Total Stops	1180	924	1129	1061
Fuel Used (gal)	29.7	24.9	30.2	30.2

1: Raley Blvd & Bell Ave Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.3	1.1	1.7	0.1	0.0	0.0	0.3	0.2	0.2	0.0	0.0	0.0
Denied Del/Veh (s)	16.1	20.4	18.2	0.5	0.5	0.5	3.1	0.9	3.2	0.0	0.0	0.0
Total Delay (hr)	4.2	11.9	19.5	23.5	10.0	1.8	15.4	11.0	1.3	0.5	8.2	0.2
Total Del/Veh (s)	208.7	223.2	208.1	201.1	185.2	140.9	175.5	59.3	26.2	62.2	52.6	16.4
Stop Delay (hr)	3.7	10.5	17.5	20.5	8.6	1.5	14.2	6.8	0.6	0.4	6.7	0.1
Stop Del/Veh (s)	187.1	197.7	187.1	175.3	158.7	118.0	162.1	37.1	10.9	56.3	43.1	10.9

1: Raley Blvd & Bell Ave Performance by movement

Movement	All
Denied Delay (hr)	3.8
Denied Del/Veh (s)	4.5
Total Delay (hr)	107.3
Total Del/Veh (s)	126.7
Stop Delay (hr)	91.2
Stop Del/Veh (s)	107.6

Intersection: 1: Raley Blvd & Bell Ave

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	T	T	R	L	T	T
Maximum Queue (ft)	140	1542	225	1621	163	180	779	770	180	206	302	298
Average Queue (ft)	77	1002	223	967	26	178	496	471	104	41	192	196
95th Queue (ft)	174	1789	234	1857	106	193	866	850	216	128	272	278
Link Distance (ft)		3281		4165			2157	2157			2217	2217
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	115		200		150	155			155	190		
Storage Blk Time (%)	1	69	65	14	0	69	13	19	0	0	11	43
Queuing Penalty (veh)	6	50	146	62	0	228	39	34	0	0	3	16

Intersection: 1: Raley Blvd & Bell Ave

Movement	SB
Directions Served	R
Maximum Queue (ft)	125
Average Queue (ft)	42
95th Queue (ft)	123
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	0
Queuing Penalty (veh)	0