Transportation Impact Study for the Sonoma Hotel Project

Prepared for the City of Sonoma

Submitted by
W-Trans

August 30, 2022

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Executive Summary

The project as proposed would result in construction of a 62-room hotel, 80-seat restaurant, a spa with six treatment rooms, and eight residential units on a site located at 117, 135, and 153 West Napa Street in the City of Sonoma. The project site would be accessed via two driveways, one on West Napa Street and the other on First Street West. There are four existing buildings on the site, three of which would be demolished to make way for the project. The Lynch Building, which includes retail tenants, offices, and residential units, would be retained.

The project is expected to generate an average of 549 new daily trips, including 41 a.m. peak hour trips and 48 p.m. peak hour trips.

Under Existing conditions, all six study intersections operate acceptably at Level of Service (LOS) of D or better during both the weekday and weekend p.m. peak hours and would continue to do so upon the addition of project-generated traffic. Under Future conditions, the intersections of West Napa Street/Fifth Street West, West Napa Street/Second Street West, and East Napa Street/First Street East would operate acceptably at LOS D during both peak periods. The intersections of West Spain Street/First Street West, West Napa Street/First Street West, and Napa Street/Broadway would operate at LOS E or F during one or both peak periods, which is considered acceptable under the City's General Plan policies as intersections along Sonoma Plaza are exempt from LOS standards. With the addition of project-related traffic to Future conditions, all study intersections would operate at the same service levels. The project would therefore have an effect on traffic operation that is considered acceptable under the City's policies.

Sight distances along West Napa Street and First Street West would be adequate from the proposed project's driveways. The need for a westbound left-turn lane at the project driveway was evaluated, and volumes are insufficient to meet the warrant. The project includes a delivery plan which would permit only vans and smaller vehicles to enter the site to access the loading zone directly, while a loading zone on First Street West is being requested to accommodate deliveries from larger trucks, which would be limited to off-peak hours. Therefore, site access is expected to be adequate for all trips and to accommodate the required deliveries.

The proposed project would be served by two on-site parking lots, providing a total of 130 spaces. This includes a 122-space lot that would be used by the proposed hotel, restaurant, and spa as well as existing adjacent land uses. The proposed residential units would have a dedicated lot with one space per unit. The estimated parking demand would be met through the combination of the on-site spaces and the use of nine spaces in a lot on the north side of West Napa Street, which is owned by the applicant. The project includes the provision of secure bicycle parking for employees, along with showers to encourage bicycle commuting, and bicycle racks would be provided for use by the public. A fleet of bicycles would also be made available for use by guests.

Introduction

This report presents an analysis of the potential transportation impacts and adverse operational effects that would be associated with development of a proposed hotel, restaurant, spa, and apartments to be located on West Napa Street and 1st Street West, near the southwest corner of Sonoma Plaza in the City of Sonoma. The traffic study was completed in accordance with the criteria established by the City and is consistent with standard traffic engineering techniques.

Potential environmental impacts as defined under the California Environmental Quality Act (CEQA) are addressed in the Environmental Impact Report (EIR) document. With the implementation of SB 743, the delay-based metric of Level of Service (LOS) is no longer used to determine transportation impacts under CEQA; therefore, this report was prepared to analyze the traffic operations impacts of the Sonoma project. While the traffic operations report is provided as an appendix to the EIR, it is not part of the CEQA determination.

Prelude

The purpose of a traffic impact study is to provide City staff and policymakers with data they can use to make an informed decision regarding the potential adverse effects on traffic operation of a proposed project, and any associated improvements that would be required to address adverse effects. Vehicular traffic operation is evaluated by determining the number of new trips that the proposed use would be expected to generate, distributing these trips to the surrounding street system based on existing travel patterns or anticipated travel patterns specific to the proposed project, then analyzing if the new traffic would be expected to have an adverse effect on operation of critical intersections or roadway segments. Adequacy of off-street parking is also addressed.

Project Profile

The project includes four parcels that would be developed as a single site; the parcels are located at 117, 135, and 153 West Napa Street. The proposed land uses include a 62-room hotel, 80-seat restaurant and bar, a spa with six treatment rooms, and an eight-unit residential building.

There are four existing buildings on the site:

- the 2,460 square foot office building (former Chateau Sonoma building) at 153 West Napa Street;
- the approximately 13,709 square foot Lynch Building at 135 West Napa Street, which includes retail tenants, offices, and seven market-rate studio apartments;
- a 7,690 square foot warehouse/office building at 135 West Napa Street; and
- a 3,813 square foot warehouse at 117 West Napa Street

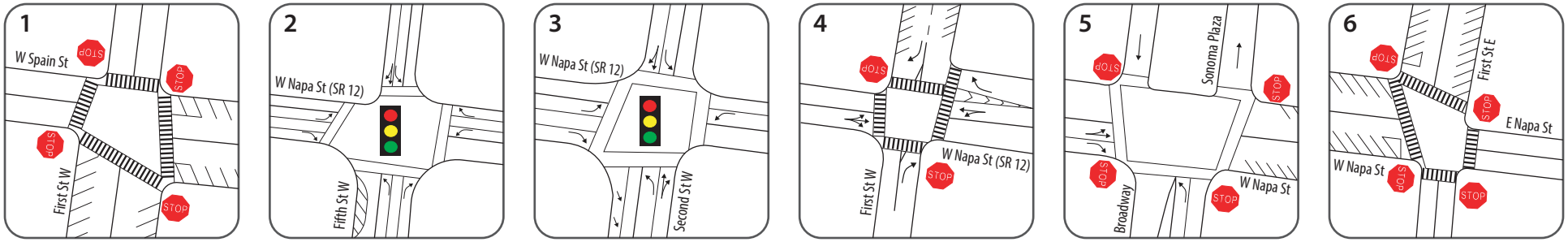
The Lynch Building and all of its existing uses would be retained, while the other three buildings on the site would be removed as part of the project.

The project would be served by two on-site parking lots. A 130-space parking lot would serve all uses except for the proposed residential uses in a shared lot, which would also serve existing uses in the Lynch Building and Sonoma Index-Tribune Building, which include 14,399 square feet of office uses, a 2,093 square-foot bank, and seven residential units. The proposed eight residential units would have designated parking spaces in a separate parking lot which would also be located on the project site.

Access to the site and the main parking lot would be via an existing driveway on West Napa Street, and egress would be either from this driveway or from a driveway on First Street West that would connect to the underground

parking garage. Parking for the proposed eight residential units would be accessed from a separate driveway on First Street West.

The location of the project site is shown in Figure 1.



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Transportation Impact Study for the Sonoma Hotel Project

Figure 1 – Study Area and Lane Configurations

Transportation Setting

Study Area and Periods

The study area varies depending on the topic. For pedestrian trips it consists of all streets within a half-mile of the project site that would lie along primary routes of pedestrian travel, or those leading to nearby generators or attractors such as the businesses surrounding The Plaza as well as The Plaza itself. For bicycle trips it consists of all streets within one mile of the project site that would lie along primary routes of bicycle travel. For the safety and operational analyses, it consists of the project frontage and the following intersections:

1. West Spain Street/First Street West
2. West Napa Street (SR 12)/Fifth Street West
3. West Napa Street (SR 12)/Second Street West
4. West Napa Street (SR 12)/First Street West
5. Napa Street (SR 12)/Broadway
6. East Napa Street/First Street East

It is noted that the project driveway was not considered as a study intersection. The *California Vehicle Code* defines an intersection as "the area embraced within the prolongation of the lateral curb lines, or, if none, then the lateral boundary lines of the roadways, of two highways which join one another at approximately right angles or the area within which vehicles traveling upon different highways joining at any other angle may come in conflict." This definition specifies that intersections are created where two "highways," or public streets, intersect. As driveways are not public streets, where they connect with a public road is not an intersection, so it would be unreasonable to evaluate it as such. The driveway connection should, however, be evaluated for operational issues such as adequacy of sight distance, need for turn lanes, and delay may be relevant in some cases, though it would not be associated with a Level of Service.

Operating conditions during the weekday and weekend p.m. peak periods were evaluated as these time periods reflect the highest traffic volumes areawide and for the proposed project. The evening peak hour on weekdays occurs between 4:00 and 6:00 p.m. and typically reflects the highest level of congestion of the day during the homeward bound commute; the 4:00 to 6:00 p.m. period was also identified as the peak period for the project area on the weekend. Counts for the study intersections were obtained in May 2018; these volumes were used since they were collected prior to the COVID-19 pandemic and therefore reflect typical conditions.

Validity of 2018 Traffic Volumes

Traffic analysis is typically conducted using counts obtained within the previous two years. Due to the COVID-19 pandemic, travel behaviors in the project area and more broadly throughout the region were substantially altered, so many recent traffic studies have used older data to approximate typical traffic patterns; as noted, May 2018 traffic volumes were used for this analysis.

With the easing of the pandemic, traffic has begun to again more closely approximate pre-pandemic levels, though the pattern varies by time period and location. To evaluate the adequacy of the 2018 counts for analysis of this project, mobile device-based data (also known as "big data") from Streetlight Data for West Napa Street near the project driveway and for West Fifth Street south of the West Napa Street intersection was reviewed. An advantage of the mobile device-based data over traditional two-hour traffic counts is that they consist of a substantially larger sample size, reducing the likelihood of counts being impacted by atypical conditions. Since the methodology of collecting this data differs from that of counts collected in the field, this analysis focused on the variation in the mobile device-based volumes across different time periods rather than comparing them directly to field-collected counts. The ratio between pre-COVID mobile device-based traffic volumes and more

recent estimates is expected to be comparable to a similar comparison of field-collected volumes. Two issues were considered: 1) variation in volumes by time of year, and 2) the impacts of the COVID-19 pandemic on travel patterns.

Spring Versus Harvest Season Volumes

The field counts used in the traffic operations analysis were collected in May 2018, so a similar time period was looked at for the mobile device-based volumes. Since reliable 2018 data were not available, May 2019 data were used to represent a similar period that preceded the COVID-19 pandemic. These volumes were compared to data from September and October 2019, which is generally considered the harvest season in Sonoma County, when volumes are often at their peak. The same weekday and weekend peak periods as the field-collected counts were analyzed. To provide a larger, more reliable sample, the 4 to 6 p.m. period was reviewed for all Tuesdays, Wednesdays, and Thursdays of the study months to represent weekdays, while the 4 to 6 p.m. weekend peak was analyzed by looking at all Saturdays of these periods.

For the weekday peak period, the 2019 volumes were found to be two percent higher during September-October 2019 than during May 2019. The variation of traffic volumes from day to day or season to season is generally expected to be approximately 10 percent. For the weekend peak period, the volumes in May 2019 were found to be 10 percent higher than the harvest season volumes. Since the difference between the two time periods is within this range, for the purpose of analyzing typical conditions the May volumes used would adequately represent fall conditions. While the 10 percent difference for the weekend volumes is at the upper end of this range, since the higher volumes were recorded in May, the analysis would reasonably be expected to represent the highest peak for traffic volumes. Assuming that the ratio of the May to harvest season volumes in 2019 is typical, volumes collected in May of 2018 should provide a reasonable, if not conservative, representation of traffic operation during the harvest season.

Pre-COVID Versus Recent Volumes

To evaluate whether the 2018 data would reflect 2022 conditions, a similar approach was used. Since harvest season data are not available for 2022, September and October volumes for 2019 were compared to 2021 volumes. It is noted that most of the masking requirements had been lifted or eased by this time and after 18 months of restricted activity and continuing concerns about air travel, tourism was again at more typical levels though more visitors arrived in their personal vehicles (versus rented vehicles or transportation services) than may have been the norm previously.

For the weekday peak period, the 2019 (pre-COVID) volumes were found to be three percent higher than the 2021 volumes. As indicated, this is within the typical variation of counts from day to day under normal conditions. The weekday p.m. peak period volumes were also found to be similar in 2019 and 2021, with the 2021 volumes five percent higher than those from 2019. As with the weekday volumes, this is considered within the typical normal range of variation.

This analysis indicates that by 2021, traffic volumes had generally recovered from their pandemic lows, reaching levels that represent typical conditions. Based on the trends, the use of 2018 peak hour volumes appears to accurately represent typical conditions and should be considered valid for the purposes of the traffic operations analysis.

The results of the analysis described above are summarized in Table 1.

Table 1 – Comparison of Traffic Volumes for Selected Time Periods		
Time Period	**Weekday P.M. Peak Period**	**Weekend P.M. Peak Period**
Spring vs. Harvest Period, 2019		
May 2019	1,981	2,513
Sept-Oct 2019	2,025	2,256
Difference	-44 (-2%)	257 (+10%)
Harvest Period, 2019 vs. 2021		
Sept-Oct 2019	2,025	2,256
Sept-Oct 2021	2,086	2,150
Difference	-61 (-3%)	106 (+5%)

Source: Streetlight Data, 2022

Study Intersections

West Spain Street/First Street West is a four-legged intersection with stop controls and crosswalks on all approaches.

West Napa Street (SR 12)/Fifth Street West is a four-legged, signalized intersection with protected left-turn phasing on the eastbound and westbound approaches; the Fifth Street West approach operate separately under split phasing. Crosswalks and pedestrian signal phasing on all legs.

West Napa Street (SR 12)/Second Street West is a signalized intersection with split phasing on the northbound and southbound approaches and protected left-turn phasing on the eastbound and westbound approaches. Crosswalks with pedestrian signal phasing are provided across all approaches.

West Napa Street (SR 12)/First Street West is a four-legged intersection with stop signs on the northbound and southbound approaches, both of which are restricted to right turns only. High visibility, ladder-style crosswalks are provided across all legs of the intersection.

Napa Street/Broadway is a four-way stop-controlled intersection with crosswalks across all approaches. The northbound and eastbound approaches, which carry State Route 12 (SR 12), each have two lanes, while the southbound and westbound approaches each have one lane. The Sonoma Plaza is on the north side of the intersection, and the north leg serves as a driveway to City Hall, which is in the Plaza.

East Napa Street/First Street East is a four-legged intersection, with stop controls and crosswalks on all legs.

The locations of the study intersections and the existing lane configurations and controls are shown in Figure 1.

Study Roadways

Highway 12 is a two-lane east-west highway that traverses the City of Sonoma along the alignments of three local streets and changes alignment twice. Designated as an arterial street in Figure CE-4 of the Circulation Element, the highway enters the City at the north as "Sonoma Highway," a north-south street, turns easterly as "West Napa Street," which runs in the east-west direction, and turns south to "Broadway," which runs in the north-south direction. The Sonoma Highway and West Napa Street segments generally have one lane in each direction and a center turn lane or dedicated turn lanes at intersections. Along West Napa Street near the Plaza, Highway 12

carried approximately 15,000 vehicles per day on average according to counts collected in 2017, the most recent data available from Caltrans. Broadway has two lanes in each direction with a center turn lane or dedicated intersection turn lanes and carried an average of 13,000 vehicles daily based on 2017 counts. Parallel parking is permitted in both directions along West Napa Street between West Second Street, and also on Broadway. The route has posted speed limits of 30 miles per hour (mph) on Sonoma Highway and 25 mph on West Napa Street and Broadway.

Spain Street (designated West Spain Street west of the midpoint of the block along the north side of the Plaza and East Spain Street to the east) is identified as a collector street in the Circulation Element and connects the historic Plaza to Highway 12 along an east-west alignment. This street has a posted speed limit of 30 mph and one lane in each direction and carried an estimated 9,100 vehicles per day in 2017.

Fifth Street West is a collector street with a north-south orientation connecting Leveroni Road to the south of the City with Verano Avenue to the north. It has one lane in each direction as well as a center turn lane south of West Napa Street, and a speed limit of 25 mph. Traffic volumes were estimated to be 14,700 vehicles per day in 2017.

Second Street West is a north-south collector with one lane in each direction. Parallel parking is allowed in select locations along the corridor. The speed limit is 25 mph.

First Street West is a two-lane, north-south street that provides access to the Sonoma Plaza north of Napa Street and is designated as a collector north of West Napa Street and as a local street to the south. In general, street parking is parallel except adjacent to the Plaza, where there is diagonal parking. The speed limit for the road is 25 mph.

First Street East is a two-lane, north-south street that borders the east side of Sonoma Plaza. Diagonal parking is present along both sides of the street. It is designated as a local street, and has a speed limit of 25 mph.

Collision History

The collision history for the study area was reviewed to determine any trends or patterns that may indicate a safety issue. Collision rates were calculated based on records available from the California Highway Patrol as published in their Statewide Integrated Traffic Records System (SWITRS) reports. The most current five-year period available is August 1, 2016, through July 31, 2021.

As presented in Table 2, the calculated collision rates for the study intersections were compared to average collision rates for similar facilities statewide, as indicated in *2018 Collision Data on California State Highways*, California Department of Transportation (Caltrans). These average rates statewide are for intersections in the same environment (urban, suburban, or rural), with the same number of approaches (three or four), and the same controls (all-way stop, two-way stop, or traffic signal). Of the six study intersections evaluated, two had collision rates above the statewide average for similar facilities, so were further evaluated. The collision rate calculations are summarized in Table 2 and copies of the spreadsheets are provided in Appendix A.

Table 2 – Collision Rates for the Study Intersections			
Study Intersection	**Number of Collisions (2016–2021)**	**Calculated Collision Rate (c/mve)**	**Statewide Average Collision Rate (c/mve)**
1. W Spain St/First St W	11	**0.62**	0.43
2. W Napa St (SR 12)/Fifth St W	9	0.20	0.42
3. W Napa St (SR 12)/Second St W	10	0.35	0.42
4. W Napa St (SR 12)/First St W	9	**0.41**	0.24
5. Napa St (SR 12)/Broadway	5	0.22	0.43
6. E Napa St/First St E	3	0.20	0.24

Note: c/mve = collisions per million vehicles entering

The collision rate at West Spain Street/First Street West was higher than the statewide average. Of the 11 reported collisions, seven were sideswipes, three were broadsides, and one was a rear-end. Three of the sideswipes had a primary collision factor of improper turning. One injury was recorded and the injury rate was 9.1 percent, substantially below the statewide average of 40.3 percent for similar facilities. It is noted that the intersection has an atypical configuration and there is angled parking on two legs, which may contribute to unusual maneuvers by drivers. It is also noted that the collision analysis includes collisions that occurred within 250 feet of the intersection, and only four of the eleven collisions were recorded in the intersection. Given the slow speeds and below-average injury rate together with the number of crashes that occurred near, but not at, the intersection, there does not appear to be an underlying intersection safety concern.

The collision rate at West Napa Street/First Street West was also higher than the statewide average. Of the nine reported collisions, there were four broadsides, two sideswipes, one hit object, one head-on, and one rear end. Three of the four broadside collisions had a primary collision factor of improper turning. The injury rate was well below the statewide average, 22.2 percent compared to 41.2 percent. Since the injury rate was below average and vehicle speeds are low at this location, there no evidence of an underlying intersection safety concern.

It is noted that the *City of Sonoma Systemic Safety Analysis Report*, 2019, included several recommendations for the study intersections. Relevant excerpts from the report are provided in Appendix B.

Alternative Modes

Pedestrian Facilities

Pedestrian facilities include sidewalks, crosswalks, pedestrian signal phases, curb ramps, curb extensions, and various streetscape amenities such as lighting, benches, etc. In general, a network of sidewalks, crosswalks, pedestrian signals, and curb ramps provide access for pedestrians in the vicinity of the project site.

- **West Napa Street-East Napa Street** – Continuous sidewalk coverage is provided along both sides of Napa Street throughout the downtown area. Crosswalks are present on all legs of the five study intersections along the corridor. Curb ramps and overhead streetlights are present.

- **First Street West** – Continuous sidewalks are provided on both sides of First Street West between West Spain Street and Andrieux Street. Crosswalks are present at the two study intersections along Sonoma Plaza, and a midblock crossing is present between West Spain Street and West Napa Street. Streetlights are provided along this segment.

- **Broadway** – Continuous sidewalks are provided on Broadway, and crosswalks are provided at several uncontrolled crossings with side street stop controls. Curb ramps and streetlights are present along the corridor. The need for pedestrian crossing improvements at the intersection of Broadway/Maple Street was identified in the City's bicycle and pedestrian master plan.

- **Fifth Street West** – Sidewalks are present throughout the corridor, serving commercial and residential land uses. Crosswalks are provided at both controlled and uncontrolled locations; crosswalks are also provided on the side street approaches. Curb ramps and streetlights are present throughout the corridor.

- **West Spain Street** – Continuous sidewalks are present along both sides of the street in the vicinity of Sonoma Plaza. Crosswalks are present at most intersections, including across side street approaches.

Bicycle Facilities

Existing and Planned Bicycle Facilities

The *Highway Design Manual*, Caltrans, 2020, classifies bikeways into four categories:

- **Class I Multi-Use Path** – a completely separated right-of-way for the exclusive use of bicycles and pedestrians with cross flows of motorized traffic minimized.
- **Class II Bike Lane** – a striped and signed lane for one-way bike travel on a street or highway.
- **Class III Bike Route** – signing only for shared use with motor vehicles within the same travel lane on a street or highway.
- **Class IV Bikeway** – also known as a separated bikeway, a Class IV Bikeway is for the exclusive use of bicycles and includes a separation between the bikeway and the motor vehicle traffic lane. The separation may include, but is not limited to, grade separation, flexible posts, inflexible physical barriers, or on-street parking.

In the project area, Class II bike lanes exist on Broadway between Napa Street and MacArthur Street and are proposed on West Napa Street from Broadway to the city limits. Bicyclists ride in the roadway and/or on sidewalks along all other streets within the project study area. Table 3 summarizes the existing and planned bicycle facilities in the project vicinity, as contained in the *Sonoma Bicycle and Pedestrian Master Plan*, 2014 update.

Table 3 – Bicycle Facility Summary

Status Facility	Class	Length (miles)	Begin Point	End Point
Existing				
Sonoma City Trail	I	1.5	SR 12	4th St E
5th St W	II	0.7	Studley St	Harrington Dr
Broadway	II	0.5	Napa St	W MacArthur St
2nd St E	III	0.7	Sonoma City Trail	E MacArthur St
3rd St W	III	0.7	Sonoma City Trail	Arroyo St
Planned				
W Napa St	II	1.0	Broadway	City Limits
E Napa St	III	1.4	Broadway	City Limits
Andrieux St	III	0.6	Broadway	5th St W

Source: *Sonoma Bicycle and Pedestrian Master Plan*, 2014 update

Transit Facilities

Existing Transit Facilities

Sonoma County Transit (SCT) provides fixed route bus service in the City of Sonoma and throughout the county. Routes 30, 30X, 32, 34, and 40 provide local and regional service from the Sonoma Plaza stop near the project site. Routes 30, 30X, and 34 provide service between Sonoma and Santa Rosa, while Route 32 provides local service within and near Sonoma, and Route 40 connects Sonoma to Petaluma. Existing transit routes and their operations are summarized in Table 4.

Table 4 – Sonoma County Transit Routes

Transit Agency Route	Distance to Stop (mi)1	Service			Connection
		Days of Operation	Time	Frequency	
Route #30	0.1	Daily	6:00 a.m.-7:00 p.m.	45 min-2 hrs 35 min	Sonoma Plaza, Sonoma Valley, Santa Rosa Transit Mall
Route #30X	0.1	Daily	7:30 p.m.-9:00 p.m.	1 per day	Sonoma Plaza, Sonoma Valley, Santa Rosa Transit Mall
Route #32	0.1	Monday-Saturday	8:00 a.m.-4:00 p.m.	30-60 min	Sonoma Plaza, Sonoma Valley Hospital
Route #34	0.1	Monday-Friday	6:45 a.m. – eastbound 3:50 p.m. – westbound	1 per day per direction	Sonoma Plaza, Sonoma Valley, Santa Rosa Transit Mall
Route #40	0.1	Monday-Friday	6:00 a.m.-10:00 p.m.	90 min-4hrs	Sonoma Plaza, Petaluma Transit Mall

Note: [1] Defined as the shortest walking distance between the project site and the nearest bus stop
Source: www.sctransit.com

All Sonoma County Transit buses include racks that can accommodate two or three bicycles. Bike rack space is on a first come, first served basis. Additional bicycles are allowed on SCT buses at the discretion of the driver.

Sonoma County Paratransit offers door-to-door service for those who are unable to independently use the transit system due to a physical or mental disability. Service is available within three-fourths of a mile of SCT fixed route service during the same hours of operation.

Capacity Analysis

Intersection Level of Service Methodologies

Level of Service (LOS) is used to rank traffic operation on various types of facilities based on traffic volumes and roadway capacity using a series of letter designations ranging from A to F. Generally, Level of Service A represents free flow conditions and Level of Service F represents forced flow or breakdown conditions. A unit of measure that indicates a level of delay generally accompanies the LOS designation.

The study intersections were analyzed using methodologies published in the *Highway Capacity Manual* (HCM), 6th Edition, Transportation Research Board, 2018. This source contains methodologies for various types of intersection control, all of which are related to a measurement of delay in average number of seconds per vehicle.

The Levels of Service for the intersections with side street stop controls, or those which are unsignalized and have one or two approaches stop controlled, were analyzed using the "Two-Way Stop-Controlled" intersection capacity method from the HCM. This methodology determines a level of service for each minor turning movement by estimating the level of average delay in seconds per vehicle. Results are presented for individual movements together with the weighted overall average delay for the intersection.

The study intersections with stop signs on all approaches were analyzed using the "All-Way Stop-Controlled" Intersection methodology from the HCM. This methodology evaluates delay for each approach based on turning movements, opposing and conflicting traffic volumes, and the number of lanes. Average vehicle delay is computed for the intersection as a whole and is then related to a Level of Service.

The study intersections that are currently controlled by a traffic signal, or may be in the future, were evaluated using the signalized methodology from the HCM. This methodology is based on factors including traffic volumes, green time for each movement, phasing, whether the signals are coordinated or not, truck traffic, and pedestrian activity. Average stopped delay per vehicle in seconds is used as the basis for evaluation in this LOS methodology. For purposes of this study, delays were calculated using signal timing obtained from the City.

The ranges of delay associated with the various levels of service are indicated in Table 5.

Table 5 – Intersection Level of Service Criteria			
LOS	**Two-Way Stop-Controlled**	**All-Way Stop-Controlled**	**Signalized**
A	Delay of 0 to 10 seconds. Gaps in traffic are readily available for drivers exiting the minor street.	Delay of 0 to 10 seconds. Upon stopping, drivers are immediately able to proceed.	Delay of 0 to 10 seconds. Most vehicles arrive during the green phase, so do not stop at all.
B	Delay of 10 to 15 seconds. Gaps in traffic are somewhat less readily available than with LOS A, but no queuing occurs on the minor street.	Delay of 10 to 15 seconds. Drivers may wait for one or two vehicles to clear the intersection before proceeding from a stop.	Delay of 10 to 20 seconds. More vehicles stop than with LOS A, but many drivers still do not have to stop.
C	Delay of 15 to 25 seconds. Acceptable gaps in traffic are less frequent, and drivers may approach while another vehicle is already waiting to exit the side street.	Delay of 15 to 25 seconds. Drivers will enter a queue of one or two vehicles on the same approach, and wait for vehicle to clear from one or more approaches prior to entering the intersection.	Delay of 20 to 35 seconds. The number of vehicles stopping is significant, although many still pass through without stopping.
D	Delay of 25 to 35 seconds. There are fewer acceptable gaps in traffic, and drivers may enter a queue of one or two vehicles on the side street.	Delay of 25 to 35 seconds. Queues of more than two vehicles are encountered on one or more approaches.	Delay of 35 to 55 seconds. The influence of congestion is noticeable, and most vehicles have to stop.
E	Delay of 35 to 50 seconds. Few acceptable gaps in traffic are available, and longer queues may form on the side street.	Delay of 35 to 50 seconds. Longer queues are encountered on more than one approach to the intersection.	Delay of 55 to 80 seconds. Most, if not all, vehicles must stop and drivers consider the delay excessive.
F	Delay of more than 50 seconds. Drivers may wait for long periods before there is an acceptable gap in traffic for exiting the side streets, creating long queues.	Delay of more than 50 seconds. Drivers enter long queues on all approaches.	Delay of more than 80 seconds. Vehicles may wait through more than one cycle to clear the intersection.

Reference: *Highway Capacity Manual,* 6th Edition, Transportation Research Board, 2018

Traffic Operation Standards

In the 2016 Circulation Element of the *City of Sonoma General Plan*, the following policy was adopted.

> ***Policy 1.5****: Establish a motor vehicle Level of Service (LOS) standard of LOS D at intersections. The following shall be taken into consideration in applying this standard:*
>
> - *Efforts to meet the vehicle LOS standard shall not result in diminished safety for other modes including walking, bicycling, or transit (see Policy 1.6).*
> - *The standard shall be applied to the overall intersection operation and not that of any individual approach or movement.*
> - *Consideration shall be given to the operation of the intersection over time, rather than relying exclusively on peak period conditions.*
> - *The five intersections surrounding the historic Sonoma Plaza shall be exempt from vehicle LOS standards in order to maintain the historic integrity of the Plaza and prioritize non-auto modes.*

Existing Conditions

The Existing Conditions scenario provides an evaluation of current operation based on existing traffic volumes during the weekday and weekend p.m. peak periods. These periods were selected as they reflect the highest volumes for the project as well as areawide. Lower volumes are typically experienced during the morning peak hour, so this time period would be encompassed by the analysis performed. This condition does not include project-generated traffic volumes. Volume data was collected in May 2018, while local schools were in session. This timeframe predates the COVID-19 pandemic and therefore was determined to better represent typical traffic patterns than taking new counts would.

Under existing conditions, all of the study intersections are operating acceptably at LOS D or better during the weekday and weekend peak periods. The existing traffic volumes are shown in Figure 2. A summary of the intersection Level of Service calculations is contained in Table 6, and copies of the calculations are provided in Appendix C.

Table 6 – Existing Peak Hour Intersection Levels of Service

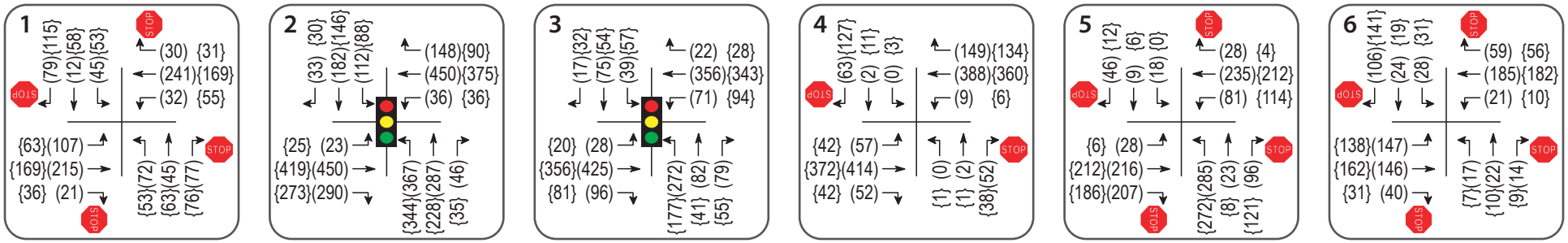
Study Intersection ***Approach***	**Weekday PM Peak**		**Weekend PM Peak**	
	Delay	**LOS**	**Delay**	**LOS**
1. W Spain St/First St W	23.1	C	19.4	C
2. W Napa St (SR 12)/Fifth St W	30.0	C	26.4	C
3. W Napa St (SR 12)/Second St W	27.0	C	23.3	C
4. W Napa St (SR 12)/First St W	26.6	D	25.7	D
Northbound (First St W) Right turn	*11.4*	*B*	*11.6*	*B*
Southbound (First St W) Right turn	*11.7*	*B*	*16.0*	*C*
5. Napa St (SR 12)/Broadway	26.7	D	20.7	C
6. E Napa St/First St E	13.6	B	13.3	B

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics*

Future Conditions

Segment volumes for the horizon year of 2040 were obtained from the Sonoma County Transportation Authority (SCTA) travel demand model and translated to turning movement volumes at each of the study intersections using a combination of the "Furness" method and factoring, depending on how the model was configured at each intersection. The Furness method is an iterative process that employs existing turn movement data, existing link volumes and future link volumes to project likely turning future movement volumes at intersections.

Under the anticipated Future volumes, all study intersections are expected to operate acceptably. It is noted that the intersections of West Spain Street/First Street West, West Napa Street/First Street West, and Napa Street/Broadway would operate below LOS D during the weekday and/or weekend peak period but this is considered acceptable for these locations under City policy. Future volumes are shown in Figure 3 and operating conditions are summarized in Table 7.



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Transportation Impact Study for the Sonoma Hotel Project

Figure 2 – Existing Traffic Volumes

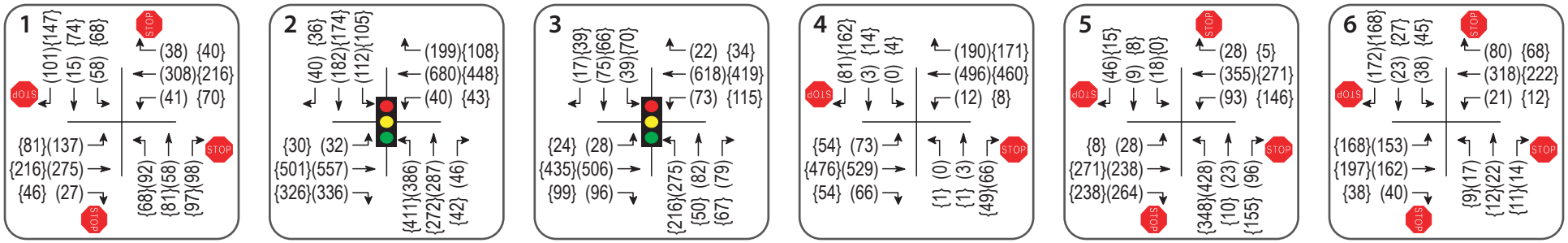

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Figure 3 – Future Traffic Volumes

Table 7 – Future Peak Hour Intersection Levels of Service					
Study Intersection ***Approach***		**Weekday PM Peak**		**Weekend PM Peak**	
		Delay	**LOS**	**Delay**	**LOS**
1.	W Spain St/First St W	48.0	E	36.1	E
2.	W Napa St (SR 12)/Fifth St W	40.5	D	31.9	C
3.	W Napa St (SR 12)/Second St W	32.2	C	25.3	C
4.	W Napa St (SR 12)/First St W	35.7	E	28.0	D
	Northbound (First St W) Right turn	*10.7*	*B*	*10.7*	*B*
	Southbound (First St W) Right turn	*10.9*	*B*	*12.6*	*B*
5.	Napa St (SR 12)/Broadway	73.7	F	39.0	E
6.	E Napa St/First St E	15.4	C	15.1	C

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics*

Project Description

The project includes four parcels that would be developed as a single site; the parcels are located at 117, 135, and 153 West Napa Street. The proposed land uses include a 62-room hotel, 80-seat restaurant and bar, a spa with six treatment rooms, and an eight-unit residential building. There are four existing buildings on the site: 1) a 2,460 square foot office building (former Chateau Sonoma building) at 153 West Napa Street, 2) the 13,709 square foot Lynch Building that includes retail uses, offices, and residences, 3) a 7,690 square foot warehouse/office building at 135 West Napa Street, and 4) a 3,813 square foot warehouse at 117 West Napa Street. The Lynch Building and its existing uses would be retained, while the other three buildings would all be removed as part of the project.

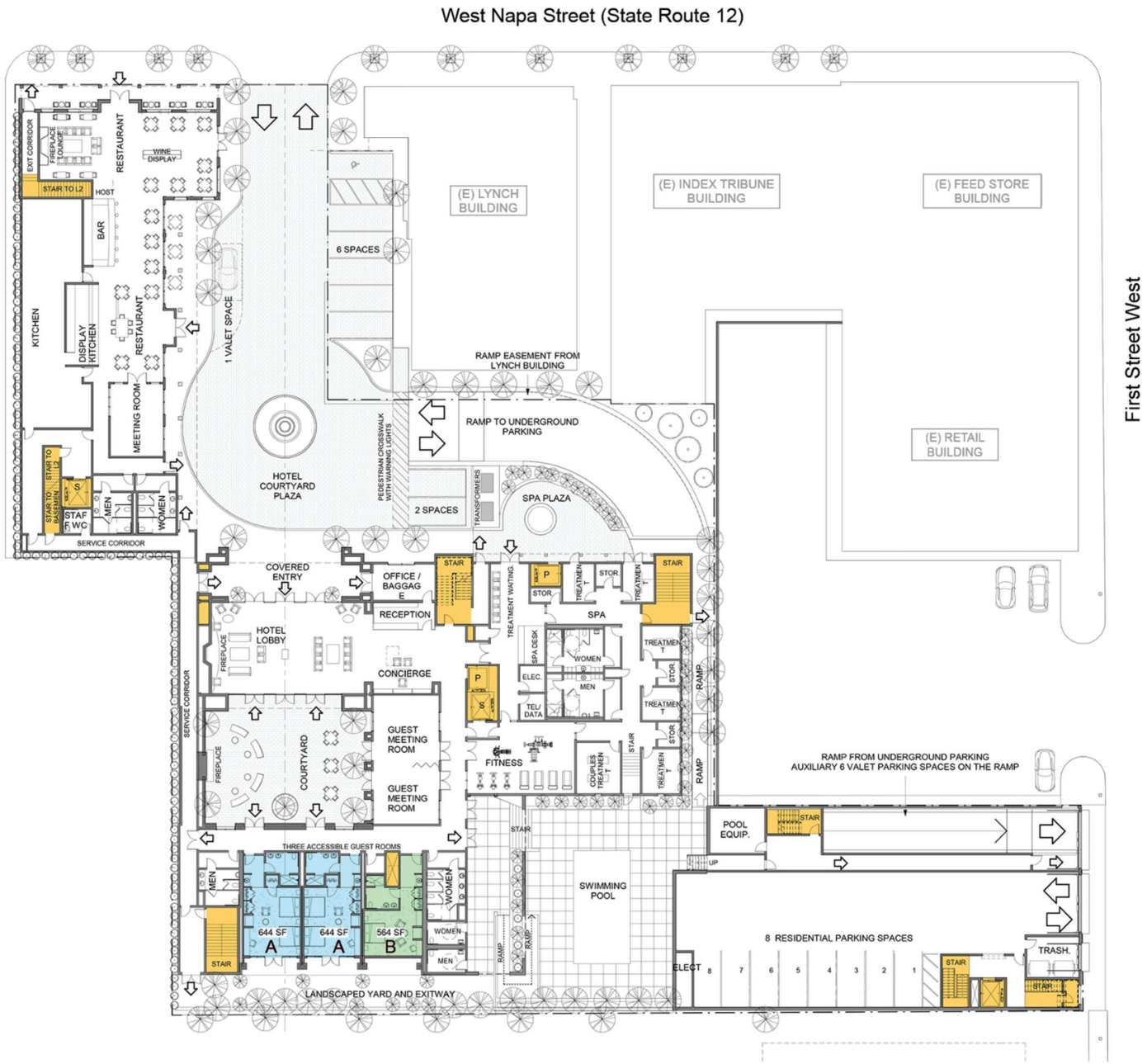
Access to the site and the main parking lot would be via an existing driveway on West Napa Street, and egress would be either from this driveway or from a driveway on First Street West that would connect to the underground parking garage. Parking for the proposed residential units would be provided in a separate parking lot and accessed from a dedicated driveway on First Street West.

The two on-site parking lots would provide a total of 130 parking spaces. Eight spaces would be provided for the proposed residential units in a parking lot designated for use by residents, while the remaining 122 spaces would be provided in a shared lot accessed from West Napa Street that would serve the other proposed uses as well as existing uses in the adjacent Lynch Building and Sonoma Index-Tribune Building. These uses include offices, a bank, and seven residential units.

The proposed project site plan is shown in Figure 4.

Trip Generation

The anticipated trip generation for the proposed project was estimated using standard rates published by the Institute of Transportation Engineers (ITE) in *Trip Generation Manual*, 11th Edition, 2021 for "Hotel" (Land Use #310) and "Multifamily Housing (Low-Rise)" (Land Use #220). It is noted that the description for the "Hotel" land use specifies that in addition to the lodging, such facilities typically include ancillary uses including restaurants, bars, and spas, so the single rate applied would be expected to account for all the trips associated with the hotel as well as these other components.



Source: Ross Drulis Cusenbery, 6/2021

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Transportation Impact Study for the Sonoma Hotel Project

Figure 4 – Site Plan

The proposed project is expected to generate an average of 549 net new trips per day, including 41 trips during the weekday p.m. peak hour and 48 trips during the weekend p.m. peak hour. The expected trip generation potential for the proposed project is indicated in Table 8. To provide a conservative assessment, no deductions were taken for the existing uses that would be replaced by the project though these existing uses generate trips that would cease upon construction of the project.

Table 8 – Trip Generation Summary

Land Use	Units	Daily		Weekday PM Peak Hour				Weekend PM Peak Hour			
		Rate	Trips	Rate	Trips	In	Out	Rate	Trips	In	Out
Proposed											
Hotel	62 rm	7.99	495	0.59	37	19	18	0.72	45	25	20
Multifamily Housing	8 du	6.74	54	0.51	4	2	2	0.41	3	2	1
Net New Trips			**549**		**41**	**21**	**20**		**48**	**27**	**21**

Note: ksf = 1,000 square feet; rm = rooms; du = dwelling units

Trip Distribution

The pattern used to allocate new project trips to the street network was based on existing travel patterns within the study area, including turning movement ratios at the various study intersections, probable origins and destinations for guests, and anticipated residency of potential employees. The applied distribution assumptions and resulting trips are shown in Table 9.

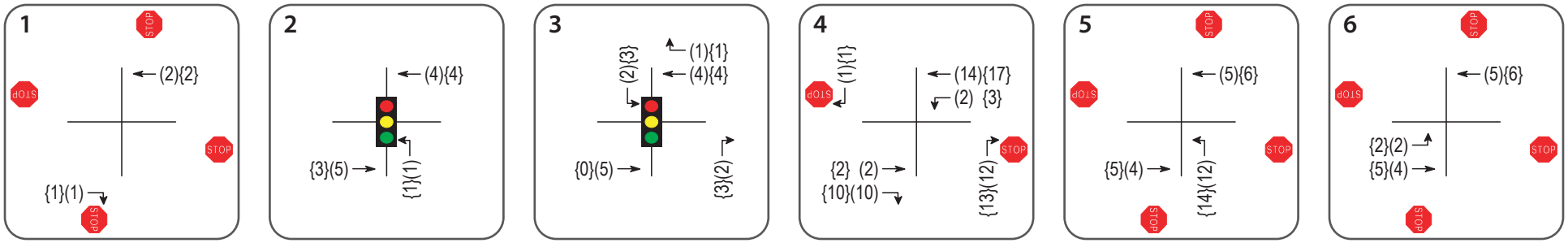
Table 9 – Trip Distribution Assumptions

Route	Percent	Daily Trips	Weekday PM	Weekend PM
W Napa St to/from the West	20%	110	8	10
E Napa St to/from the East	20%	110	8	10
Broadway to/from the South	40%	219	17	18
W Spain St to/from the West	10%	55	4	5
First St W to/from the South	10%	55	4	5
TOTAL	**100%**	**549**	**41**	**48**

Intersection Operation

Existing plus Project Conditions

Upon the addition of project-related traffic to the Existing volumes, the study intersections are expected to operate acceptably under the standard applied at the same Levels of Service during both peak periods. These results are summarized in Table 10. Project traffic volumes are shown in Figure 5.



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Transportation Impact Study for the Sonoma Hotel Project

Figure 5 – Project Traffic Volumes

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Table 10 – Existing and Existing plus Project Peak Hour Intersection Levels of Service								
Study Intersection ***Approach***		**Existing Conditions**				**Existing plus Project**			
		Weekday PM Peak		**Weekend PM Peak**		**Weekday PM Peak**		**Weekend PM Peak**	
		Delay	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**
1.	W Spain St/First St W	23.1	C	19.4	C	23.4	C	19.6	C
2.	W Napa St (SR 12)/Fifth St W	30.0	C	26.4	C	30.2	C	26.5	C
3.	W Napa St (SR 12)/Second St W	27.0	C	23.3	C	27.1	C	23.3	C
4.	W Napa St (SR 12)/First St W	26.6	D	25.7	D	34.0	D	31.5	D
	Northbound (First St W) Right turn	*11.4*	*B*	*11.6*	*B*	*12.2*	*B*	*12.7*	*B*
	Southbound (First St W) Right turn	*11.7*	*B*	*16.0*	*C*	*12.2*	*B*	*17.4*	*C*
5.	Napa St (SR 12)/Broadway	26.7	D	20.7	C	28.9	D	22.2	C
6.	E Napa St/First St E	13.6	B	13.3	B	13.8	B	13.6	B

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics*

Finding – The study intersections are expected to continue operating acceptably under the standards applied at the same Levels of Service upon the addition of project-generated traffic.

Future plus Project Conditions

Upon the addition of project-generated traffic to the anticipated Future volumes, all study intersections are expected to continue to operate acceptably under the City's policies at the same service levels as without project traffic during both peak periods. The Future plus Project operating conditions are summarized in Table 11.

Table 11 – Future and Future plus Project Peak Hour Intersection Levels of Service									
Study Intersection ***Approach***		**Future Conditions**				**Future plus Project**			
		Weekday PM Peak		**Weekend PM Peak**		**Weekday PM Peak**		**Weekend PM Peak**	
		Delay	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**
1.	W Spain St/First St W	48.0	E	36.1	E	48.9	E	36.7	E
2.	W Napa St (SR 12)/Fifth St W	40.5	D	31.9	C	40.9	D	32.0	C
3.	W Napa St (SR 12)/Second St W	32.2	C	25.3	C	32.6	C	25.3	C
4.	W Napa St (SR 12)/First St W	35.7	E	28.0	D	40.9	E	32.9	D
	Northbound (First St W) Right turn	*10.7*	*B*	*10.7*	*B*	*11.1*	*B*	*11.2*	*B*
	Southbound (First St W) Right turn	*10.9*	*B*	*12.6*	*B*	*11.1*	*B*	*13.0*	*B*
5.	Napa St (SR 12)/Broadway	73.7	F	39.0	E	79.0	F	42.3	E
6.	E Napa St/First St E	15.4	C	15.1	C	15.8	C	15.5	C

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics*

Finding – The study intersections will continue operating acceptably with project traffic added to Future volumes, at the same Levels of Service as without it.

Alternative Modes

Pedestrian Facilities

Given the project location in Downtown Sonoma and its proximity to Sonoma Plaza and a large number of commercial uses, it is reasonable to assume that some project patrons, employees, and residents will want to walk between the project site and nearby destinations.

It is noted that the intersection of West Napa Street/First Street West was identified in the *Sonoma Systemic Safety Analysis Report*, 2019 for enhancements to facilitate pedestrian crossings. Under existing conditions, there are high pedestrian volumes at this location. Although there are no traffic controls for east-west traffic along West Napa Street, drivers are required to yield to crossing pedestrians. As a result of pedestrian crossings, traffic conditions along West Napa Street tend to be congested during peak travel times for pedestrians. The *Sonoma Systemic Safety Analysis Report* includes a concept plan that includes curb extensions on all four corners at this intersection as well as rectangular rapid flashing beacons (RRFBs) on the northwest and southeast corners.

Finding – Pedestrian facilities are adequate, though crossing improvements planned at the West Napa Street/First Street West intersection would improve access. Because specific plans for these improvements have not been determined, the project would not be able to implement these changes, but a contribution toward the eventual cost of the project should be made.

Recommendation – The project should contribute 50 percent of the cost of pedestrian crossing enhancements at the West Napa Street/First Street West intersection since it would otherwise be reasonable to expect the improvements on one of the two westerly corners of the intersection to be constructed as part of the project.

Bicycle Facilities

Existing bicycle facilities, including nearby paths and bike lanes, together with shared use of minor streets provide adequate access for bicyclists. West Napa Street has been identified in the City's *Bicycle and Pedestrian Master Plan* for future bike lanes, which would further enhance bicycle facilities in the project area.

Bicycle Storage

Sonoma City Code Section 19.48.110 states that the requirements for bicycle parking for multifamily residential and commercial development are to be determined on a case-by-case basis. The project would provide a fleet of bicycles for use by hotel employees and guests. Secure bicycle parking would be provided for use by employees in the parking garage. In addition, bike racks would be provided for short-term use by the public. Showers would also be provided for use by employees to encourage bicycling to work.

Finding – Bicycle facilities serving the project site are adequate. With the completion of the proposed West Napa Street bike lanes in the future, bicycle access would be enhanced.

Transit

Existing transit routes are adequate to accommodate project-generated transit trips. Existing stops are within an acceptable walking distance of the site.

Finding – Transit facilities serving the project site are adequate.

Parking

The project was analyzed to determine whether the proposed parking supply would be sufficient for the anticipated parking demand. The project site as proposed would include two on-site lots with a total of 130 parking spaces. Of this total, 122 parking spaces would be devoted to the hotel and its associated uses as well as the existing uses in the Lynch Building and Sonoma Index-Tribune Building; these spaces would be accessed from the project driveway on West Napa Street. The residential portion of the project would include eight covered, street-level parking spaces, one for each unit, and would be accessed from First Street West. In addition, the applicant owns the Bank of Marin property at 14 West Napa Street, across from the project; the parking requirement for the existing use is 23 off-street spaces, while the existing supply is 48 spaces. The 25 spaces in excess of the required capacity could potentially be used by the project.

City of Sonoma parking supply requirements are based on the Sonoma Municipal Code, Chapter 19.48; Parking and Loading. The assessment of the adequacy of the parking supply considered the code requirements for the project and for the uses at the Lynch Building and Sonoma Index-Tribune Building to be served by the parking lot; based on information provided by the applicant, there would be a maximum number of 40 employees per shift at the hotel. It is noted that the code includes provisions for potentially reducing the parking supply for mixed use projects as well as projects that include a second use in a single building. These reductions can be applied at the discretion of the Planning Commission and were not assumed in this analysis. Based on the code requirements, 200 parking spaces would be required for the project plus the existing uses in the Lynch Building and Sonoma Index-Tribune Building. With a proposed parking supply of 130 spaces, the supply would not meet the City requirements.

The parking supply was also evaluated using a shared parking model from the Urban Land Institute (ULI). The ULI model was used in 2018 to evaluate the adequacy of the parking for a previous iteration of this project, and the assumptions were subsequently assessed in a peer review. Since the completion of the EIR, the ULI model has been updated; therefore, a shared parking analysis was conducted using the current ULI model but applying the assumptions previously recommended in the peer review from the 2018 EIR. It is noted that in terms of parking demand, the only change to the project description was the addition of the eight residential units. Since the eight parking spaces associated with the proposed residential units would not be accessed from the main parking lot, they were treated as designated spaces; it was assumed that any parking demand generated by the residential units beyond those eight spaces would need to be accommodated in the shared parking lot, which was considered in calculating the adequacy of the spaces to be provided. The proposed parking supply, expected demand, and City requirements are shown in Table 12.

Table 12 – Parking Analysis			
Land Use	**Units**	**Rate**	**Parking Spaces**
City Required Parking			
Proposed			
Hotel	62 rm	1 space/rm 1 space/2 employees (max shift)	82
Restaurant	80 seats	1 space/4 seats	20
Residential	8 du	1.5 spaces/unit plus 25% of required resident spaces for guests	15
Spa	4.9 ksf	1 space/300 sf	16
Existing			
Office	14.4 ksf	1 space/300 sf	47
Residential	7 du	1.5 spaces/unit plus 25% of required resident spaces for guests	13
Bank	2.1 ksf	1 space/300 sf	7
City Required Parking Total*			**200**
ULI Parking Demand Estimate – Shared Parking**			**139**
Proposed Parking Supply			**130**

Notes: ksf = 1,000 square feet; du = dwelling unit; * Per the Planning Commission, requirements may be reduced for mixed use projects; ** 8 spaces assumed designated for proposed residential units

Finding – The proposed parking supply for the proposed hotel and related uses as well as the residential component of the project do not meet City Code requirements but would accommodate the anticipated parking demand based on a shared parking analysis.

Recommendation – The applicant should designate a minimum of nine spaces off-site for use as employee parking for the project. With the addition of these spaces to the project's off-street parking capacity, the parking provided by the project would be adequate to meet the anticipated demand.

Access and Circulation

Site Access

With the exception of the proposed residential uses, access to the site would be via two existing driveways, one on West Napa Street and the other on First Street West. The West Napa Street driveway would provide for entrance to and egress from the site. The driveway on First Street West would be used for egress only from the underground parking garage; vehicles exiting here would be required to turn right onto West First Street. The project could use up to 25 spaces within the existing parking lot at 136 West Napa Street, across (north) of the project site, for employee parking, and will need to use at least five spaces to achieve an adequate supply. For the residential portion of the project, a separate resident-only parking lot would be accessed from First Street West.

Sight Distance

At unsignalized intersections or driveways, a substantially clear line of sight should be maintained between the driver of a vehicle waiting at the crossroad or driveway and the driver of an approaching vehicle. Sight distances along West Napa Street and First Street West at the project driveways were evaluated based on sight distance criteria contained in the *Highway Design Manual* published by Caltrans. The recommended sight distances for minor street approaches that are either a private road or a driveway are based on stopping sight distance which is related to the approach travel speeds. For the posted 25 mile-per-hour (mph) speed limit on West Napa Street, 125 feet of stopping sight distance is required. There is not a posted speed limit on First Street West, but the commercial and residential uses result in a *prima facie* speed limit of 25 mph, so the same 125 feet of stopping sight distance would be required.

Although sight distance requirements are not technically applicable to urban driveways, as a safety consideration the stopping sight distance at the proposed driveway locations was measured using aerial photography and the site plan. The driveway locations on both West Napa Street and First Street East currently have more than 150 feet of stopping sight distance in all directions, which exceeds the minimum required.

Access Analysis

Left-Turn Lane Warrants

The need for a left-turn lane on West Napa Street at the project driveway was evaluated based on criteria contained in the *Intersection Channelization Design Guide*, National Cooperative Highway Research Program (NCHRP) Report No. 279, Transportation Research Board, 1985, as well as an update of the methodology developed by the Washington State Department of Transportation and published in the *Method for Prioritizing Intersection Improvements*, January 1997. The NCHRP report references a methodology developed by M. D. Harmelink that includes equations that can be applied to expected or actual traffic volumes to determine the need for a left-turn pocket based on safety issues. This methodology is consistent with the "Guidelines for Reconstruction of Intersections," August 1985, which was referenced in Section 405.2, Left-turn Channelization, of previous editions of the Caltrans *Highway Design Manual*, though this reference has been deleted from the most recent edition of this manual.

Trips generated by the existing uses that would share the parking lot with the proposed hotel were included in the analysis of the need for a left-turn lane on West Napa Street at the project driveway as they would also use the project driveway. It was conservatively assumed that all the traffic coming from the east and north would enter via the driveway, and that all site-generated traffic would use the project driveway, though some trips would be to the parking lot on the north side of West Napa Street and the residential parking lot on First Street West. To

access the driveway on West Napa Street from the south on First Street West, a restricted left-turn would be required, so this option was not assumed.

Based on the existing conditions with the addition of project trips, a left-turn lane is not warranted on West Napa Street at the project driveway during either of the peak periods evaluated. Future peak-hour volumes, including project-generated traffic, were also reviewed to determine if turn lanes would be warranted with anticipated increases in traffic on West Napa Street. Under these future conditions, which represent a worst-case scenario, with 70 percent of all project-generated inbound traffic turning left, a left-turn lane is not warranted on West Napa Street at the project driveway during either of the peak periods evaluated. The analysis was conservative, as some project trips would be oriented to the parking lot on the north side of West Napa Street rather than accessing the project at the driveway.

The need for a turn lane into the off-site parking lot was also evaluated; however, as the volumes would be less than those used in the analysis for the project driveway while the volumes on West Napa Street would be the same, it is clear the turn lanes would not be warranted at that location either.

The warrant analysis is provided in Appendix D.

Finding – The project access point would not meet the warrants for a left turn lane on West Napa Street.

Deliveries

Information provided by the applicant indicates that approximately 15 deliveries per week are anticipated to serve the proposed project, or an average of just over two per day. Deliveries would be primarily for the restaurant and most of these deliveries are expected to occur using 14-foot box trucks or vans. As proposed, vans and other smaller vehicles would enter the site via the West Napa Street driveway and proceed to a loading zone in the basement garage. Deliveries from larger vehicles would take place adjacent to the First Street West driveway, where deliveries would be transferred to a forklift and carried to the receiving area in the hotel basement. A loading zone would be requested on First Street West to facilitate such deliveries, and the deliveries would be scheduled to occur before 11:00 a.m. or other off-peak times. The limiting of deliveries to non-peak times and the proposed procedures for facilitating deliveries by large trucks would minimize impacts on traffic circulation in the vicinity of the project. In addition, it is understood that many of the vendors for the restaurant already deliver food and beverages to other restaurants in the vicinity, so such deliveries would result in a nominal change in traffic to the project area compared to existing conditions.

Finding – The proposed parking lot design and delivery procedures would be adequate. If the applicant's request for a loading zone on First Street West is not approved, this would result in double-parking by large trucks when making deliveries to the site, resulting in a potential safety hazard.

Recommendation – Since deliveries would only take place before 11 a.m., the designation of a loading zone between the hours of 7 a.m. and noon would address the hotel's delivery needs while maintaining the on-street parking capacity at this location during hours of peak usage.

Conclusions and Recommendations

Conclusions

- The proposed project is expected to generate an average of 549 trips per day on weekdays, including 41 trips during the weekday p.m. peak hour as well as 48trips during the weekend p.m. peak hour.
- The study intersections operate acceptably overall during both peak hours under existing conditions and are expected to continue doing so under all volume scenarios evaluated based on the standards applied.
- Pedestrian, bicycle and transit facilities are adequate to serve the project.
- A left-turn lane would not be warranted at the project driveway on West Napa Street.
- Sight distances at the project driveways are adequate.
- The off-street parking supply proposed on the project site would be five spaces less than the anticipated demand, based on a shared parking analysis.

Recommendations

- The project should contribute 50 percent of the cost of pedestrian crossing enhancements at the intersection of West Napa Street/First Street West.
- A loading zone should be implemented on First Street West from 7 a.m. to noon to facilitate project deliveries and minimize circulation impacts.
- The applicant should designate a minimum of five parking spaces in the 144 West Napa Street parking lot for use as employee parking for the project.

Study Participants and References

Study Participants

Principal in Charge	Dalene J. Whitlock, PE, PTOE
Senior Traffic Engineer	Kenny Jeong, PE
Senior Transportation Planner	Barry Bergman, AICP
Assistant Engineer	Sid Gangrade
Graphics	Cameron Wong
Editing/Formatting	Hannah Yung-Boxdell
Quality Control	Dalene J. Whitlock, PE, PTOE

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Appendix A

Collision Rate Calculations

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Intersection Collision Rate Worksheet

Sonoma Hotel Traffic Study

Intersection # 1: West Spain Street & First Street West
Date of Count: Tuesday, May 8, 2018

Number of Collisions: 11
Number of Injuries: 1
Number of Fatalities: 0
Average Daily Traffic (ADT): 9800
Start Date: August 1, 2016
End Date: July 31, 2021
Number of Years: 5

Intersection Type: Four-Legged
Control Type: 4 Way Stop
Area: Suburban

$$\text{Collision Rate} = \frac{\text{Number of Collisions x 1 Million}}{\text{ADT x Days per Year x Number of Years}}$$

$$\text{Collision Rate} = \frac{11 \times 1{,}000{,}000}{9{,}800 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.62 c/mve**	**0.0%**	**9.1%**
Statewide Average*	**0.43 c/mve**	**0.7%**	**40.3%**

Notes
ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2018 Collision Data on California State Highways, Caltrans

Intersection # 2: West Napa Street (SR12) & Fifth Street West
Date of Count: Tuesday, May 8, 2018

Number of Collisions: 9
Number of Injuries: 4
Number of Fatalities: 0
Average Daily Traffic (ADT): 24200
Start Date: August 1, 2016
End Date: July 31, 2021
Number of Years: 5

Intersection Type: Four-Legged
Control Type: Signals
Area: Suburban

$$\text{Collision Rate} = \frac{\text{Number of Collisions x 1 Million}}{\text{ADT x Days per Year x Number of Years}}$$

$$\text{Collision Rate} = \frac{9 \times 1{,}000{,}000}{24{,}200 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.20 c/mve**	**0.0%**	**44.4%**
Statewide Average*	**0.42 c/mve**	**0.5%**	**37.4%**

Notes
ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2018 Collision Data on California State Highways, Caltrans

Intersection Collision Rate Worksheet

Sonoma Hotel Traffic Study

Intersection # 3: West Napa Street (SR 12) & Second Street West
Date of Count: Tuesday, May 8, 2018

Number of Collisions: 10
Number of Injuries: 3
Number of Fatalities: 0
Average Daily Traffic (ADT): 15600
Start Date: August 1, 2016
End Date: July 31, 2021
Number of Years: 5

Intersection Type: Four-Legged
Control Type: Signals
Area: Suburban

$$\text{Collision Rate} = \frac{\text{Number of Collisions x 1 Million}}{\text{ADT x Days per Year x Number of Years}}$$

$$\text{Collision Rate} = \frac{10 \times 1{,}000{,}000}{15{,}600 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.35 c/mve**	**0.0%**	**30.0%**
Statewide Average*	**0.42 c/mve**	**0.5%**	**37.4%**

Notes
ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2018 Collision Data on California State Highways, Caltrans

Intersection # 4: West Napa Street (SR 12) & First Street West
Date of Count: Tuesday, May 8, 2018

Number of Collisions: 9
Number of Injuries: 2
Number of Fatalities: 0
Average Daily Traffic (ADT): 11900
Start Date: August 1, 2016
End Date: July 31, 2021
Number of Years: 5

Intersection Type: Four-Legged
Control Type: Stop & Yield Controls
Area: Suburban

$$\text{Collision Rate} = \frac{\text{Number of Collisions x 1 Million}}{\text{ADT x Days per Year x Number of Years}}$$

$$\text{Collision Rate} = \frac{9 \times 1{,}000{,}000}{11{,}900 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.41 c/mve**	**0.0%**	**22.2%**
Statewide Average*	**0.24 c/mve**	**1.7%**	**41.2%**

Notes
ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2018 Collision Data on California State Highways, Caltrans

Intersection Collision Rate Worksheet

Sonoma Hotel Traffic Study

Intersection # 5: W Napa St (SR 12)-E Napa St & Broadway (SR 12)
Date of Count: Tuesday, May 8, 2018

Number of Collisions: 5
Number of Injuries: 3
Number of Fatalities: 0
Average Daily Traffic (ADT): 12700
Start Date: August 1, 2016
End Date: July 31, 2021
Number of Years: 5

Intersection Type: Four-Legged
Control Type: 4 Way Stop
Area: Suburban

$$\text{Collision Rate} = \frac{\text{Number of Collisions x 1 Million}}{\text{ADT x Days per Year x Number of Years}}$$

$$\text{Collision Rate} = \frac{5 \times 1{,}000{,}000}{12{,}700 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.22 c/mve**	**0.0%**	**60.0%**
Statewide Average*	**0.43 c/mve**	**0.7%**	**40.3%**

Notes
ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2018 Collision Data on California State Highways, Caltrans

Intersection # 6: East Napa Street & First Street East
Date of Count: Tuesday, May 8, 2018

Number of Collisions: 3
Number of Injuries: 1
Number of Fatalities: 0
Average Daily Traffic (ADT): 8100
Start Date: August 1, 2016
End Date: July 31, 2021
Number of Years: 5

Intersection Type: Four-Legged
Control Type: Stop & Yield Controls
Area: Suburban

$$\text{Collision Rate} = \frac{\text{Number of Collisions x 1 Million}}{\text{ADT x Days per Year x Number of Years}}$$

$$\text{Collision Rate} = \frac{3 \times 1{,}000{,}000}{8{,}100 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.20 c/mve**	**0.0%**	**33.3%**
Statewide Average*	**0.24 c/mve**	**1.7%**	**41.2%**

Notes
ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2018 Collision Data on California State Highways, Caltrans

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Appendix B

SSAR Recommendations

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Sonoma Highway (SR 12)/West Napa Street

The total benefits resulting from providing a protected left-turn phase, in addition to improving signal timing, amount to $468,000. Implementing these countermeasures would be expected to cost $38,600. The expected benefit cost ratio is 12.1.

Fifth Street West/West Napa Street

Safety at the intersection of Fifth Street West and West Napa Street could be improved by updating the signal timing and installing pedestrian countdown heads. Implementation of this countermeasure is estimated to provide $355,600 in benefits. This countermeasure would be expected to cost approximately $9,800 and would result in a benefit/cost ratio of 36.3.

First Street West/West Napa Street

Safety at the intersection could be improved by implementing directional median openings to restrict left turns for northbound and southbound vehicles. Additionally, installing "through traffic does not stop" and "right turn only" signs could also enhance safety. The two countermeasures combined are estimated to provide a benefit of $587,800, and have an implementation cost estimated at $36,000, resulting in a benefit/cost ratio of 16.3.

Broadway/West Napa Street (SR 12)

A total benefit of $3.667 million is estimated for the conversion of the intersection from all-way stop control to a roundabout at the intersection of Napa Street and Broadway, based solely on the collision reduction factor calculations. Implementing this countermeasure is estimated to cost 4 million dollars resulting in a benefit/cost ratio less than one.

First Street East/East Napa Street

Approximately $29,000 in benefits would be expected for installing flashing beacons on the approaches at the intersection of First Street East and East Napa Street. Implementing this countermeasure is estimated to cost $20,000, resulting in a benefit/cost ratio of 1.5.

Fifth Street East/East Napa Street

A single property damage only collision was reported at this intersection during the study period. No countermeasures were identified for this intersection.

Eighth Street East/East Napa Street

Upgrading the pavement markings at the tee intersection of Eighth Street East and East Napa Street is expected provide $90,000 in benefits. New striping at the intersection is expected to cost $45,000, resulting in a 2.0 benefit-cost ratio. It should be noted that the intersection has on-street parking on one side of East Napa Street and commercial businesses on the other side of East Napa Street. Additionally, there is no crosswalk for pedestrians to use when crossing either East Napa Street or Eighth Street East. A pedestrian crossing with enhanced safety features should be implemented so that pedestrians can cross safely.

Fifth Street West/Studley Street (Option 1)

Safety at the tee intersection of Fifth Street West and Studley Street could be improved by installing a traffic signal and upgrading the intersection pavement markings. Installing a traffic signal and upgrading intersection

pavement markings have a combined benefit of $3.636 million. The resulting benefit/cost ratio is 8.6 as the estimated costs for implementing these two countermeasures is approximately $425,000.

Fifth Street West/Studley Street (Option 2)

Safety at the tee intersection at Fifth Street West and Studley Street could alternatively be improved by installing a raised median to create a pedestrian refuge on the south leg of the intersection, which has an estimated benefit of $4.191 million. The benefit-cost ratio is 69.8 as the estimated cost for implementing a raised median is $60,000. Bulb-outs could also be implemented on the southeast and southwest corners of the intersection to allow for a shorter crossing distance for pedestrians, as well as increased visibility.

Fifth Street West/West MacArthur Street

Safety at the intersection of Fifth Street West/West MacArthur Street could be improved by installing flashing beacons at the stop-controlled intersection, which are expected to provide $67,500 in benefits. The installation of beacons is expected to cost $20,000, resulting in a benefit-cost ratio of 1.5.

Broadway/MacArthur Street

Safety at the four-legged signalized intersection of Broadway/MacArthur Street could be improved by updating the signal timing. An estimated benefit of $57,500 is expected with a cost of $5,000, yielding a benefit-cost ratio of 11.5.

Fifth Street East/East MacArthur Street

No countermeasures were identified for this intersection due to the low number of reported collisions.

Fifth Street West/Leveroni Road

Safety at the signalized tee intersection of Fifth Street West/Leveroni Road (Napa Road) could be improved by updating the signal timing and installing advanced dilemma zone detection. The estimated benefit of providing these two countermeasures is $115,000. The estimated cost of these two countermeasures is $30,000, which would yield a benefit-cost ratio of 3.8.

Broadway/Leveroni Road-Napa Road

Improving signal timing at the four-legged signalized intersection of Broadway/Leveroni Road-Napa Road could improve safety. The estimated benefit of implementing this countermeasure is $122,000 while costs are estimated at $5,000. Implementation of this countermeasure would have an expected benefit-cost ratio of 24.3.

Fifth Street East/Napa Road

Given the low number of reported collisions as this intersection, no countermeasures were identified.

Eighth Street East/Napa Road

The intersection at Eighth Street East/Napa Road can be characterized as a suburban intersection with rural characteristics. In reviewing the reported collisions at the intersection, it was determined that the majority were rear-end collisions caused by motorists traveling above the posted speed limit. The LRSM does not provide counter measures to prevent motorists from traveling above the speed limit, thus no countermeasures were identified for this intersection.

Conceptual Improvements to West Napa Street near Plaza
City of Sonoma

0 30' 60'

Figure 2
Rapid Rectangular Flashing Beacons at 1st St. W.

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Appendix C

Intersection Level of Service Calculations

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HCM 6th AWSC
1: 1st St W & W. Spain St/E. Spain St 03/30/2022

Intersection	
Intersection Delay, s/veh	23.1
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	107	215	21	32	241	30	72	45	77	45	12	79
Future Vol, veh/h	107	215	21	32	241	30	72	45	77	45	12	79
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.70	0.70	0.70	0.70	0.70	0.70
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	134	269	26	40	301	38	103	64	110	64	17	113
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	29.7	23.8	18	14.7
HCM LOS	D	C	C	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	37%	31%	11%	33%
Vol Thru, %	23%	63%	80%	9%
Vol Right, %	40%	6%	10%	58%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	194	343	303	136
LT Vol	72	107	32	45
Through Vol	45	215	241	12
RT Vol	77	21	30	79
Lane Flow Rate	277	429	379	194
Geometry Grp	1	1	1	1
Degree of Util (X)	0.538	0.786	0.7	0.386
Departure Headway (Hd)	6.988	6.596	6.651	7.159
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	515	549	545	499
Service Time	5.056	4.616	4.674	5.239
HCM Lane V/C Ratio	0.538	0.781	0.695	0.389
HCM Control Delay	18	29.7	23.8	14.7
HCM Lane LOS	C	D	C	B
HCM 95th-tile Q	3.2	7.3	5.5	1.8

HCM 6th Signalized Intersection Summary
2: 5th St W & W. Napa Street 03/30/2022

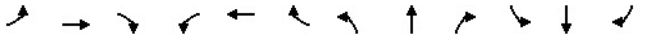
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	450	290	36	450	148	367	287	46	112	182	33
Future Volume (veh/h)	23	450	290	36	450	148	367	287	46	112	182	33
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.97	1.00		0.98	1.00		0.96
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	1885	1870	1885	1885	1870	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	24	474	305	38	474	156	386	302	48	118	192	35
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	2	1	1	2	1	1	1	1	1	1	1
Cap, veh/h	118	586	495	149	619	510	471	494	410	299	257	47
Arrive On Green	0.07	0.31	0.31	0.08	0.33	0.33	0.26	0.26	0.26	0.17	0.17	0.17
Sat Flow, veh/h	1795	1870	1580	1795	1870	1543	1795	1885	1564	1795	1540	281
Grp Volume(v), veh/h	24	474	305	38	474	156	386	302	48	118	0	227
Grp Sat Flow(s),veh/h/ln	1795	1870	1580	1795	1870	1543	1795	1885	1564	1795	0	1820
Q Serve(g_s), s	1.1	20.0	14.1	1.7	19.5	6.5	17.4	12.1	2.0	5.0	0.0	10.2
Cycle Q Clear(g_c), s	1.1	20.0	14.1	1.7	19.5	6.5	17.4	12.1	2.0	5.0	0.0	10.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.15
Lane Grp Cap(c), veh/h	118	586	495	149	619	510	471	494	410	299	0	303
V/C Ratio(X)	0.20	0.81	0.62	0.25	0.77	0.31	0.82	0.61	0.12	0.39	0.00	0.75
Avail Cap(c_a), veh/h	522	1109	937	522	1109	915	751	789	655	710	0	719
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	0.00	1.00
Uniform Delay (d), s/veh	38.0	27.1	25.1	36.9	25.8	21.4	29.8	27.9	24.2	32.0	0.0	34.1
Incr Delay (d2), s/veh	0.8	2.7	1.2	0.9	2.0	0.3	3.9	1.2	0.1	0.8	0.0	3.7
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	0.5	9.2	5.4	0.8	8.8	2.4	7.9	5.5	0.8	2.2	0.0	4.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.9	29.9	26.4	37.8	27.8	21.8	33.8	29.1	24.3	32.8	0.0	37.8
LnGrp LOS	D	C	C	D	C	C	C	C	C	C	A	D
Approach Vol, veh/h		803			668			736			345	
Approach Delay, s/veh		28.8			27.0			31.2			36.1	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.2	32.0		17.8	8.7	33.5		26.1				
Change Period (Y+Rc), s	3.0	5.0		3.5	3.0	5.0		3.5				
Max Green Setting (Gmax), s	25.0	51.0		34.0	25.0	51.0		36.0				
Max Q Clear Time (g_c+I1), s	3.7	22.0		12.2	3.1	21.5		19.4				
Green Ext Time (p_c), s	0.1	4.7		1.7	0.0	4.1		3.1				

Intersection Summary	
HCM 6th Ctrl Delay	30.0
HCM 6th LOS	C

HCM 6th Signalized Intersection Summary
3: 2nd Street W & W. Napa Street

03/30/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	425	96	71	356	22	272	82	79	39	75	17
Future Volume (veh/h)	28	425	96	71	356	22	272	82	79	39	75	17
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.96	1.00		0.97	1.00		0.93
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	1885	1870	1885	1885	1870	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	29	434	98	72	363	22	278	84	81	40	77	17
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	1	2	1	1	2	1	1	1	1	1	1	1
Cap, veh/h	109	562	474	263	673	41	355	172	165	290	238	53
Arrive On Green	0.06	0.30	0.30	0.15	0.39	0.39	0.20	0.20	0.20	0.16	0.16	0.16
Sat Flow, veh/h	1795	1870	1578	1795	1740	105	1795	867	836	1795	1473	325
Grp Volume(v), veh/h	29	434	98	72	0	385	278	0	165	40	0	94
Grp Sat Flow(s),veh/h/ln	1795	1870	1578	1795	0	1846	1795	0	1703	1795	0	1799
Q Serve(g_s), s	1.2	15.9	3.5	2.7	0.0	12.1	11.0	0.0	6.5	1.4	0.0	3.5
Cycle Q Clear(g_c), s	1.2	15.9	3.5	2.7	0.0	12.1	11.0	0.0	6.5	1.4	0.0	3.5
Prop In Lane	1.00		1.00	1.00		0.06	1.00		0.49	1.00		0.18
Lane Grp Cap(c), veh/h	109	562	474	263	0	713	355	0	337	290	0	291
V/C Ratio(X)	0.27	0.77	0.21	0.27	0.00	0.54	0.78	0.00	0.49	0.14	0.00	0.32
Avail Cap(c_a), veh/h	239	661	558	263	0	713	599	0	568	670	0	672
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	33.6	23.9	19.6	28.4	0.0	17.8	28.5	0.0	26.7	26.9	0.0	27.8
Incr Delay (d2), s/veh	1.3	6.5	0.5	0.6	0.0	1.5	3.8	0.0	1.1	0.2	0.0	0.6
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	0.5	7.7	1.3	1.2	0.0	5.2	5.0	0.0	2.7	0.6	0.0	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.9	30.4	20.0	29.0	0.0	19.3	32.3	0.0	27.8	27.2	0.0	28.4
LnGrp LOS	C	C	C	C	A	B	C	A	C	C	A	C
Approach Vol, veh/h		561			457			443			134	
Approach Delay, s/veh		28.8			20.8			30.6			28.1	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	2	3	4		6	7	8					
Phs Duration (G+Y+Rc), s	18.3	14.0	27.0		15.6	7.5	33.5					
Change Period (Y+Rc), s	3.5	3.0	4.5		3.5	3.0	4.5					
Max Green Setting (Gmax), s	25.0	11.0	26.5		28.0	10.0	27.5					
Max Q Clear Time (g_c+I1), s	13.0	4.7	17.9		5.5	3.2	14.1					
Green Ext Time (p_c), s	1.5	0.1	3.4		0.6	0.0	3.5					

Intersection Summary	
HCM 6th Ctrl Delay	27.0
HCM 6th LOS	C

HCM 6th AWSC
4: 1st St W & W. Napa Street

03/30/2022

Intersection	
Intersection Delay, s/veh	26.6
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	57	414	52	9	388	149	0	2	52	0	2	63
Future Vol, veh/h	57	414	52	9	388	149	0	2	52	0	2	63
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.50	0.50	0.50	0.50	0.50	0.50
Heavy Vehicles, %	1	2	1	1	2	1	1	1	1	1	1	1
Mvmt Flow	63	460	58	10	431	166	0	4	104	0	4	126
Number of Lanes	0	1	0	0	1	1	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	39.3	20.4	11.4	11.7
HCM LOS	E	C	B	B

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	11%	2%	0%	0%
Vol Thru, %	4%	79%	98%	0%	3%
Vol Right, %	96%	10%	0%	100%	97%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	54	523	397	149	65
LT Vol	0	57	9	0	0
Through Vol	2	414	388	0	2
RT Vol	52	52	0	149	63
Lane Flow Rate	108	581	441	166	130
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.201	0.901	0.741	0.246	0.238
Departure Headway (Hd)	6.691	5.58	6.048	5.342	6.603
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	539	645	591	664	546
Service Time	4.7	3.669	3.845	3.138	4.612
HCM Lane V/C Ratio	0.2	0.901	0.746	0.25	0.238
HCM Control Delay	11.4	39.3	24.4	9.9	11.7
HCM Lane LOS	B	E	C	A	B
HCM 95th-tile Q	0.7	11.2	6.4	1	0.9

Intersection	
Intersection Delay, s/veh	26.7
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	28	216	207	81	235	28	285	23	96	18	9	46
Future Vol, veh/h	28	216	207	81	235	28	285	23	96	18	9	46
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	1	2	1	1	1	1	1	2	1	1	1	1
Mvmt Flow	33	254	244	95	276	33	335	27	113	21	11	54
Number of Lanes	0	1	1	0	1	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	2
HCM Control Delay	18.7	39.9	26.8	14.1
HCM LOS	C	E	D	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	100%	0%	11%	0%	24%	25%
Vol Thru, %	0%	19%	89%	0%	68%	12%
Vol Right, %	0%	81%	0%	100%	8%	63%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	285	119	244	207	344	73
LT Vol	285	0	28	0	81	18
Through Vol	0	23	216	0	235	9
RT Vol	0	96	0	207	28	46
Lane Flow Rate	335	140	287	244	405	86
Geometry Grp	7	7	7	7	6	6
Degree of Util (X)	0.761	0.276	0.606	0.462	0.846	0.209
Departure Headway (Hd)	8.169	7.091	7.597	6.835	7.522	8.771
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	443	505	474	524	482	411
Service Time	5.937	4.859	5.372	4.61	5.592	6.771
HCM Lane V/C Ratio	0.756	0.277	0.605	0.466	0.84	0.209
HCM Control Delay	32.7	12.6	21.5	15.4	39.9	14.1
HCM Lane LOS	D	B	C	C	E	B
HCM 95th-tile Q	6.4	1.1	3.9	2.4	8.5	0.8

Intersection	
Intersection Delay, s/veh	13.6
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	147	146	40	21	185	59	17	22	14	28	24	106
Future Vol, veh/h	147	146	40	21	185	59	17	22	14	28	24	106
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	184	183	50	26	231	74	21	28	18	35	30	133
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	15.8	12.9	10	11.1
HCM LOS	C	B	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	32%	44%	8%	18%
Vol Thru, %	42%	44%	70%	15%
Vol Right, %	26%	12%	22%	67%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	53	333	265	158
LT Vol	17	147	21	28
Through Vol	22	146	185	24
RT Vol	14	40	59	106
Lane Flow Rate	66	416	331	198
Geometry Grp	1	1	1	1
Degree of Util (X)	0.113	0.6	0.477	0.306
Departure Headway (Hd)	6.15	5.19	5.18	5.581
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	580	695	696	642
Service Time	4.217	3.231	3.224	3.635
HCM Lane V/C Ratio	0.114	0.599	0.476	0.308
HCM Control Delay	10	15.8	12.9	11.1
HCM Lane LOS	A	C	B	B
HCM 95th-tile Q	0.4	4	2.6	1.3

Intersection	
Intersection Delay, s/veh	19.4
Intersection LOS	C

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Vol, veh/h	63	169	36	1	54	169	31	53	63	76	53	58
Future Vol, veh/h	63	169	36	1	54	169	31	53	63	76	53	58
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.70	0.70	0.70	0.70	0.70
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	79	211	45	1	68	211	39	76	90	109	76	83
Number of Lanes	0	1	0	0	0	1	0	0	1	0	0	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	20.9	19.9	17.3	19.2
HCM LOS	C	C	C	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	28%	24%	21%	23%
Vol Thru, %	33%	63%	67%	26%
Vol Right, %	40%	13%	12%	51%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	192	268	255	226
LT Vol	53	63	54	53
Through Vol	63	169	170	58
RT Vol	76	36	31	115
Lane Flow Rate	274	335	319	323
Geometry Grp	1	1	1	1
Degree of Util (X)	0.523	0.632	0.605	0.598
Departure Headway (Hd)	6.87	6.79	6.836	6.667
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	524	529	526	539
Service Time	4.93	4.845	4.892	4.722
HCM Lane V/C Ratio	0.523	0.633	0.606	0.599
HCM Control Delay	17.3	20.9	19.9	19.2
HCM Lane LOS	C	C	C	C
HCM 95th-tile Q	3	4.4	4	3.9

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBR
Lane Configurations	
Traffic Vol, veh/h	115
Future Vol, veh/h	115
Peak Hour Factor	0.70
Heavy Vehicles, %	1
Mvmt Flow	164
Number of Lanes	0

Approach	
Opposing Approach	
Opposing Lanes	
Conflicting Approach Left	
Conflicting Lanes Left	
Conflicting Approach Right	
Conflicting Lanes Right	
HCM Control Delay	
HCM LOS	

HCM 6th Signalized Intersection Summary
2: 5th St W & W. Napa Street

03/30/2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	419	273	36	375	90	344	228	35	88	146	30
Future Volume (veh/h)	25	419	273	36	375	90	344	228	35	88	146	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.96	1.00		0.98	1.00		0.96
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	1885	1870	1885	1885	1870	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	25	423	276	36	379	91	347	230	35	89	147	32
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.95
Percent Heavy Veh, %	1	2	1	1	2	1	1	1	1	1	1	1
Cap, veh/h	126	558	471	151	584	481	443	466	386	314	260	57
Arrive On Green	0.07	0.30	0.30	0.08	0.31	0.31	0.25	0.25	0.25	0.17	0.17	0.17
Sat Flow, veh/h	1795	1870	1579	1795	1870	1541	1795	1885	1562	1795	1487	324
Grp Volume(v), veh/h	25	423	276	36	379	91	347	230	35	89	0	179
Grp Sat Flow(s),veh/h/ln	1795	1870	1579	1795	1870	1541	1795	1885	1562	1795	0	1811
Q Serve(g_s), s	1.0	15.7	11.4	1.4	13.4	3.3	13.8	8.0	1.3	3.3	0.0	6.9
Cycle Q Clear(g_c), s	1.0	15.7	11.4	1.4	13.4	3.3	13.8	8.0	1.3	3.3	0.0	6.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.18
Lane Grp Cap(c), veh/h	126	558	471	151	584	481	443	466	386	314	0	317
V/C Ratio(X)	0.20	0.76	0.59	0.24	0.65	0.19	0.78	0.49	0.09	0.28	0.00	0.56
Avail Cap(c_a), veh/h	586	1246	1052	586	1246	1026	844	886	734	797	0	804
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	0.00	1.00
Uniform Delay (d), s/veh	33.6	24.4	22.8	32.8	22.7	19.3	26.9	24.7	22.2	27.4	0.0	28.9
Incr Delay (d2), s/veh	0.8	2.1	1.2	0.8	1.2	0.2	3.1	0.8	0.1	0.5	0.0	1.6
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	0.5	7.0	4.3	0.7	5.9	1.2	6.1	3.6	0.5	1.4	0.0	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.3	26.5	24.0	33.6	23.9	19.4	30.0	25.5	22.3	27.9	0.0	30.5
LnGrp LOS	C	C	C	C	C	B	C	C	C	C	A	C
Approach Vol, veh/h		724			506			612			268	
Approach Delay, s/veh		25.8			23.8			27.9			29.6	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.4	27.8		16.9	8.4	28.9		22.4				
Change Period (Y+Rc), s	3.0	5.0		3.5	3.0	5.0		3.5				
Max Green Setting (Gmax), s	25.0	51.0		34.0	25.0	51.0		36.0				
Max Q Clear Time (g_c+I1), s	3.4	17.7		8.9	3.0	15.4		15.8				
Green Ext Time (p_c), s	0.1	4.2		1.3	0.0	3.0		2.6				
Intersection Summary												
HCM 6th Ctrl Delay			26.4									
HCM 6th LOS			C									

HCM 6th Signalized Intersection Summary
3: 2nd Street W & W. Napa Street

03/30/2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	356	81	94	343	28	177	41	55	57	54	32
Future Volume (veh/h)	20	356	81	94	343	28	177	41	55	57	54	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.96	1.00		0.97	1.00		0.94
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	1885	1870	1885	1885	1870	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	22	387	88	102	373	30	192	45	60	62	59	35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	2	1	1	2	1	1	1	1	1	1	1
Cap, veh/h	90	555	468	290	695	56	274	109	146	316	190	113
Arrive On Green	0.05	0.30	0.30	0.16	0.41	0.41	0.15	0.15	0.15	0.18	0.18	0.18
Sat Flow, veh/h	1795	1870	1578	1795	1702	137	1795	717	956	1795	1079	640
Grp Volume(v), veh/h	22	387	88	102	0	403	192	0	105	62	0	94
Grp Sat Flow(s),veh/h/ln	1795	1870	1578	1795	0	1838	1795	0	1673	1795	0	1719
Q Serve(g_s), s	0.8	12.5	2.8	3.4	0.0	11.3	6.9	0.0	3.9	2.0	0.0	3.2
Cycle Q Clear(g_c), s	0.8	12.5	2.8	3.4	0.0	11.3	6.9	0.0	3.9	2.0	0.0	3.2
Prop In Lane	1.00		1.00	1.00		0.07	1.00		0.57	1.00		0.37
Lane Grp Cap(c), veh/h	90	555	468	290	0	751	274	0	255	316	0	302
V/C Ratio(X)	0.25	0.70	0.19	0.35	0.00	0.54	0.70	0.00	0.41	0.20	0.00	0.31
Avail Cap(c_a), veh/h	264	729	615	290	0	751	660	0	615	739	0	708
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	31.1	21.2	17.8	25.3	0.0	15.2	27.3	0.0	26.1	23.9	0.0	24.4
Incr Delay (d2), s/veh	1.4	3.6	0.4	0.7	0.0	1.4	3.3	0.0	1.1	0.3	0.0	0.6
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	0.4	5.7	1.0	1.5	0.0	4.7	3.1	0.0	1.6	0.9	0.0	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.5	24.8	18.2	26.0	0.0	16.6	30.6	0.0	27.1	24.2	0.0	25.0
LnGrp LOS	C	C	B	C	A	B	C	A	C	C	A	C
Approach Vol, veh/h		497			505			297			156	
Approach Delay, s/veh		24.0			18.5			29.4			24.7	
Approach LOS		C			B			C			C	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		13.9	14.0	24.7		15.5	6.4	32.3				
Change Period (Y+Rc), s		3.5	3.0	4.5		3.5	3.0	4.5				
Max Green Setting (Gmax), s		25.0	11.0	26.5		28.0	10.0	27.5				
Max Q Clear Time (g_c+I1), s		8.9	5.4	14.5		5.2	2.8	13.3				
Green Ext Time (p_c), s		1.1	0.1	3.8		0.7	0.0	3.8				
Intersection Summary												
HCM 6th Ctrl Delay			23.3									
HCM 6th LOS			C									

Intersection	
Intersection Delay, s/veh	25.7
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	42	372	42	6	360	134	1	1	38	3	11	127
Future Vol, veh/h	42	372	42	6	360	134	1	1	38	3	11	127
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.50	0.50	0.50	0.50	0.50	0.50
Heavy Vehicles, %	1	2	1	1	2	1	1	1	1	1	1	1
Mvmt Flow	47	413	47	7	400	149	2	2	76	6	22	254
Number of Lanes	0	1	0	0	1	1	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	36.9	22.4	11.6	16
HCM LOS	E	C	B	C

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	3%	9%	2%	0%	2%
Vol Thru, %	3%	82%	98%	0%	8%
Vol Right, %	95%	9%	0%	100%	90%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	40	456	366	134	141
LT Vol	1	42	6	0	3
Through Vol	1	372	360	0	11
RT Vol	38	42	0	134	127
Lane Flow Rate	80	507	407	149	282
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.16	0.867	0.749	0.245	0.506
Departure Headway (Hd)	7.183	6.158	6.63	5.923	6.462
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	497	588	545	604	556
Service Time	5.267	4.211	4.387	3.68	4.52
HCM Lane V/C Ratio	0.161	0.862	0.747	0.247	0.507
HCM Control Delay	11.6	36.9	26.7	10.6	16
HCM Lane LOS	B	E	D	B	C
HCM 95th-tile Q	0.6	9.7	6.5	1	2.8

Intersection	
Intersection Delay, s/veh	20.7
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Vol, veh/h	6	212	186	114	212	4	1	271	8	121	0	6
Future Vol, veh/h	6	212	186	114	212	4	1	271	8	121	0	6
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	1	2	1	1	1	1	1	1	2	1	1	1
Mvmt Flow	7	249	219	134	249	5	1	319	9	142	0	7
Number of Lanes	0	1	1	0	1	0	0	1	1	0	0	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	2
HCM Control Delay	14.8	28.3	20.7	11.5
HCM LOS	B	D	C	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	100%	0%	3%	0%	35%	0%
Vol Thru, %	0%	6%	97%	0%	64%	33%
Vol Right, %	0%	94%	0%	100%	1%	67%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	272	129	218	186	330	18
LT Vol	272	0	6	0	114	0
Through Vol	0	8	212	0	212	6
RT Vol	0	121	0	186	4	12
Lane Flow Rate	320	152	256	219	388	21
Geometry Grp	7	7	7	7	6	6
Degree of Util (X)	0.678	0.272	0.498	0.381	0.753	0.047
Departure Headway (Hd)	7.626	6.443	6.989	6.276	6.984	8.049
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	477	560	516	573	520	444
Service Time	5.342	4.158	4.725	4.012	5.002	6.108
HCM Lane V/C Ratio	0.671	0.271	0.496	0.382	0.746	0.047
HCM Control Delay	25	11.6	16.5	12.8	28.3	11.5
HCM Lane LOS	C	B	C	B	D	B
HCM 95th-tile Q	5	1.1	2.7	1.8	6.5	0.1

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBR
Lane Configurations	
Traffic Vol, veh/h	12
Future Vol, veh/h	12
Peak Hour Factor	0.85
Heavy Vehicles, %	1
Mvmt Flow	14
Number of Lanes	0

Approach	
Opposing Approach	
Opposing Lanes	
Conflicting Approach Left	
Conflicting Lanes Left	
Conflicting Approach Right	
Conflicting Lanes Right	
HCM Control Delay	
HCM LOS	

Intersection	
Intersection Delay, s/veh	13.3
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	138	162	31	10	182	56	7	10	9	31	19	141
Future Vol, veh/h	138	162	31	10	182	56	7	10	9	31	19	141
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	173	203	39	13	228	70	9	13	11	39	24	176
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	15.5	12.3	9.5	11.4
HCM LOS	C	B	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	27%	42%	4%	16%
Vol Thru, %	38%	49%	73%	10%
Vol Right, %	35%	9%	23%	74%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	26	331	248	191
LT Vol	7	138	10	31
Through Vol	10	162	182	19
RT Vol	9	31	56	141
Lane Flow Rate	32	414	310	239
Geometry Grp	1	1	1	1
Degree of Util (X)	0.055	0.593	0.444	0.357
Departure Headway (Hd)	6.098	5.162	5.155	5.39
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	585	699	698	666
Service Time	4.16	3.197	3.194	3.435
HCM Lane V/C Ratio	0.055	0.592	0.444	0.359
HCM Control Delay	9.5	15.5	12.3	11.4
HCM Lane LOS	A	C	B	B
HCM 95th-tile Q	0.2	3.9	2.3	1.6

HCM 6th AWSC
1: 1st St W & W. Spain St/E. Spain St 03/30/2022

Intersection	
Intersection Delay, s/veh	48
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	137	275	27	41	308	38	92	58	98	58	15	101
Future Vol, veh/h	137	275	27	41	308	38	92	58	98	58	15	101
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.80	0.80	0.80	0.80	0.80	0.80
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	152	306	30	46	342	42	115	73	123	73	19	126
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	74.3	47.6	27.1	19.7
HCM LOS	F	E	D	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	37%	31%	11%	33%
Vol Thru, %	23%	63%	80%	9%
Vol Right, %	40%	6%	10%	58%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	248	439	387	174
LT Vol	92	137	41	58
Through Vol	58	275	308	15
RT Vol	98	27	38	101
Lane Flow Rate	310	488	430	218
Geometry Grp	1	1	1	1
Degree of Util (X)	0.685	1.021	0.896	0.5
Departure Headway (Hd)	8.146	7.533	7.678	8.493
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	446	483	477	426
Service Time	6.146	5.533	5.678	6.493
HCM Lane V/C Ratio	0.695	1.01	0.901	0.512
HCM Control Delay	27.1	74.3	47.6	19.7
HCM Lane LOS	D	F	E	C
HCM 95th-tile Q	5.1	14.2	9.9	2.7

HCM 6th Signalized Intersection Summary
2: 5th St W & W. Napa Street 03/30/2022

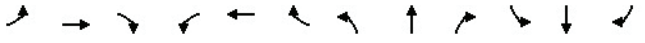
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	557	336	40	680	199	386	287	46	112	182	40
Future Volume (veh/h)	32	557	336	40	680	199	386	287	46	112	182	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.97	1.00		0.98	1.00		0.96
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	1885	1870	1885	1885	1870	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	32	557	336	40	680	199	386	287	46	112	182	40
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, %	1	2	1	1	2	1	1	1	1	1	1	1
Cap, veh/h	131	737	624	136	743	614	441	464	384	274	226	50
Arrive On Green	0.07	0.39	0.39	0.08	0.40	0.40	0.25	0.25	0.25	0.15	0.15	0.15
Sat Flow, veh/h	1795	1870	1583	1795	1870	1546	1795	1885	1562	1795	1483	326
Grp Volume(v), veh/h	32	557	336	40	680	199	386	287	46	112	0	222
Grp Sat Flow(s),veh/h/ln	1795	1870	1583	1795	1870	1546	1795	1885	1562	1795	0	1809
Q Serve(g_s), s	1.9	29.2	18.6	2.4	39.2	10.1	23.5	15.4	2.6	6.4	0.0	13.5
Cycle Q Clear(g_c), s	1.9	29.2	18.6	2.4	39.2	10.1	23.5	15.4	2.6	6.4	0.0	13.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.18
Lane Grp Cap(c), veh/h	131	737	624	136	743	614	441	464	384	274	0	276
V/C Ratio(X)	0.25	0.76	0.54	0.29	0.92	0.32	0.87	0.62	0.12	0.41	0.00	0.81
Avail Cap(c_a), veh/h	395	839	710	395	839	694	568	597	495	537	0	541
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	0.00	1.00
Uniform Delay (d), s/veh	49.8	29.7	26.5	49.7	32.5	23.7	41.2	38.1	33.3	43.6	0.0	46.6
Incr Delay (d2), s/veh	1.0	3.5	0.7	1.2	13.6	0.3	11.7	1.4	0.1	1.0	0.0	5.5
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	13.8	7.1	1.1	20.3	3.8	11.8	7.3	1.0	3.0	0.0	6.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.7	33.2	27.2	50.9	46.1	24.0	52.9	39.5	33.4	44.5	0.0	52.1
LnGrp LOS	D	C	C	D	D	C	D	D	C	D	A	D
Approach Vol, veh/h		925			919			719			334	
Approach Delay, s/veh		31.6			41.5			46.3			49.5	
Approach LOS		C			D			D			D	

Timer - Assigned Phs	1	2	4	5	6	8
Phs Duration (G+Y+Rc), s	11.6	49.8	20.8	11.3	50.1	31.5
Change Period (Y+Rc), s	3.0	5.0	3.5	3.0	5.0	3.5
Max Green Setting (Gmax), s	25.0	51.0	34.0	25.0	51.0	36.0
Max Q Clear Time (g_c+I1), s	4.4	31.2	15.5	3.9	41.2	25.5
Green Ext Time (p_c), s	0.1	5.1	1.6	0.0	4.0	2.5

Intersection Summary	
HCM 6th Ctrl Delay	40.5
HCM 6th LOS	D

HCM 6th Signalized Intersection Summary
3: 2nd Street W & W. Napa Street

03/30/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	506	96	73	618	22	275	82	79	39	75	17
Future Volume (veh/h)	28	506	96	73	618	22	275	82	79	39	75	17
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.96	1.00		0.97	1.00		0.93
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	1885	1870	1885	1885	1870	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	28	506	96	73	618	22	275	82	79	39	75	17
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, %	1	2	1	1	2	1	1	1	1	1	1	1
Cap, veh/h	105	594	502	255	719	26	349	169	163	284	231	52
Arrive On Green	0.06	0.32	0.32	0.14	0.40	0.40	0.19	0.19	0.19	0.16	0.16	0.16
Sat Flow, veh/h	1795	1870	1580	1795	1792	64	1795	867	836	1795	1465	332
Grp Volume(v), veh/h	28	506	96	73	0	640	275	0	161	39	0	92
Grp Sat Flow(s),veh/h/ln	1795	1870	1580	1795	0	1855	1795	0	1703	1795	0	1797
Q Serve(g_s), s	1.2	19.6	3.4	2.8	0.0	24.4	11.3	0.0	6.5	1.4	0.0	3.5
Cycle Q Clear(g_c), s	1.2	19.6	3.4	2.8	0.0	24.4	11.3	0.0	6.5	1.4	0.0	3.5
Prop In Lane	1.00		1.00	1.00		0.03	1.00		0.49	1.00		0.18
Lane Grp Cap(c), veh/h	105	594	502	255	0	745	349	0	331	284	0	284
V/C Ratio(X)	0.27	0.85	0.19	0.29	0.00	0.86	0.79	0.00	0.49	0.14	0.00	0.32
Avail Cap(c_a), veh/h	232	641	541	255	0	745	580	0	550	650	0	650
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	34.8	24.7	19.2	29.7	0.0	21.1	29.6	0.0	27.7	28.0	0.0	28.9
Incr Delay (d2), s/veh	1.3	11.5	0.4	0.6	0.0	10.7	4.0	0.0	1.1	0.2	0.0	0.7
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	0.5	10.2	1.3	1.2	0.0	12.2	5.1	0.0	2.7	0.6	0.0	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.2	36.1	19.6	30.3	0.0	31.8	33.6	0.0	28.8	28.2	0.0	29.6
LnGrp LOS	D	D	B	C	A	C	C	A	C	C	A	C
Approach Vol, veh/h		630			713			436			131	
Approach Delay, s/veh		33.6			31.7			31.8			29.2	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	2	3	4		6	7	8
Phs Duration (G+Y+Rc), s	18.5	14.0	29.1		15.7	7.5	35.6
Change Period (Y+Rc), s	3.5	3.0	4.5		3.5	3.0	4.5
Max Green Setting (Gmax), s	25.0	11.0	26.5		28.0	10.0	27.5
Max Q Clear Time (g_c+I1), s	13.3	4.8	21.6		5.5	3.2	26.4
Green Ext Time (p_c), s	1.5	0.1	2.5		0.6	0.0	0.7

Intersection Summary	
HCM 6th Ctrl Delay	32.2
HCM 6th LOS	C

HCM 6th AWSC
4: 1st St W & W. Napa Street

03/30/2022

Intersection	
Intersection Delay, s/veh	35.7
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	73	529	66	12	496	190	0	3	66	0	3	81
Future Vol, veh/h	73	529	66	12	496	190	0	3	66	0	3	81
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
Heavy Vehicles, %	1	2	1	1	2	1	1	1	1	1	1	1
Mvmt Flow	73	529	66	12	496	190	0	3	66	0	3	81
Number of Lanes	0	1	0	0	1	1	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	54	23.6	10.7	10.9
HCM LOS	F	C	B	B

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	11%	2%	0%	0%
Vol Thru, %	4%	79%	98%	0%	4%
Vol Right, %	96%	10%	0%	100%	96%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	69	668	508	190	84
LT Vol	0	73	12	0	0
Through Vol	3	529	496	0	3
RT Vol	66	66	0	190	81
Lane Flow Rate	69	668	508	190	84
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.127	0.986	0.813	0.267	0.154
Departure Headway (Hd)	6.651	5.312	5.762	5.057	6.586
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	535	681	630	709	542
Service Time	4.736	3.354	3.508	2.803	4.665
HCM Lane V/C Ratio	0.129	0.981	0.806	0.268	0.155
HCM Control Delay	10.7	54	28.8	9.7	10.9
HCM Lane LOS	B	F	D	A	B
HCM 95th-tile Q	0.4	15.2	8.3	1.1	0.5

Intersection	
Intersection Delay, s/veh	73.7
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	28	238	264	93	355	28	428	23	96	18	9	46
Future Vol, veh/h	28	238	264	93	355	28	428	23	96	18	9	46
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	1	2	1	1	1	1	1	2	1	1	1	1
Mvmt Flow	31	264	293	103	394	31	476	26	107	20	10	51
Number of Lanes	0	1	1	0	1	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	2
HCM Control Delay	24.7	122.8	86	16.2
HCM LOS	C	F	F	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	100%	0%	11%	0%	20%	25%
Vol Thru, %	0%	19%	89%	0%	75%	12%
Vol Right, %	0%	81%	0%	100%	6%	63%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	428	119	266	264	476	73
LT Vol	428	0	28	0	93	18
Through Vol	0	23	238	0	355	9
RT Vol	0	96	0	264	28	46
Lane Flow Rate	476	132	296	293	529	81
Geometry Grp	7	7	7	7	6	6
Degree of Util (X)	1.107	0.269	0.667	0.602	1.161	0.214
Departure Headway (Hd)	8.836	7.75	8.763	7.997	8.33	10.42
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	414	467	414	455	439	346
Service Time	6.536	5.45	6.463	5.697	6.33	8.42
HCM Lane V/C Ratio	1.15	0.283	0.715	0.644	1.205	0.234
HCM Control Delay	106.2	13.3	27.3	22.1	122.8	16.2
HCM Lane LOS	F	B	D	C	F	C
HCM 95th-tile Q	16	1.1	4.7	3.9	18.7	0.8

Intersection	
Intersection Delay, s/veh	15.4
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	153	162	40	21	318	80	17	22	14	28	24	106
Future Vol, veh/h	153	162	40	21	318	80	17	22	14	28	24	106
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	170	180	44	23	353	89	19	24	16	31	27	118
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	15.5	17.6	10.2	11.2
HCM LOS	C	C	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	32%	43%	5%	18%
Vol Thru, %	42%	46%	76%	15%
Vol Right, %	26%	11%	19%	67%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	53	355	419	158
LT Vol	17	153	21	28
Through Vol	22	162	318	24
RT Vol	14	40	80	106
Lane Flow Rate	59	394	466	176
Geometry Grp	1	1	1	1
Degree of Util (X)	0.105	0.582	0.66	0.284
Departure Headway (Hd)	6.406	5.311	5.107	5.83
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	556	678	708	613
Service Time	4.485	3.358	3.153	3.894
HCM Lane V/C Ratio	0.106	0.581	0.658	0.287
HCM Control Delay	10.2	15.5	17.6	11.2
HCM Lane LOS	B	C	C	B
HCM 95th-tile Q	0.3	3.8	5	1.2

HCM 6th AWSC
1: 1st St W & W. Spain St/E. Spain St 03/30/2022

Intersection	
Intersection Delay, s/veh	36.1
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	81	216	46	70	216	40	68	81	97	68	74	147
Future Vol, veh/h	81	216	46	70	216	40	68	81	97	68	74	147
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.80	0.80	0.80	0.80	0.80	0.80
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	90	240	51	78	240	44	85	101	121	85	93	184
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	41.7	37.7	28.3	35.1
HCM LOS	E	E	D	E

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	28%	24%	21%	24%
Vol Thru, %	33%	63%	66%	26%
Vol Right, %	39%	13%	12%	51%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	246	343	326	289
LT Vol	68	81	70	68
Through Vol	81	216	216	74
RT Vol	97	46	40	147
Lane Flow Rate	308	381	362	361
Geometry Grp	1	1	1	1
Degree of Util (X)	0.699	0.846	0.811	0.792
Departure Headway (Hd)	8.179	7.987	8.057	7.897
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	440	454	449	459
Service Time	6.255	6.056	6.129	5.97
HCM Lane V/C Ratio	0.7	0.839	0.806	0.786
HCM Control Delay	28.3	41.7	37.7	35.1
HCM Lane LOS	D	E	E	E
HCM 95th-tile Q	5.3	8.4	7.5	7.1

HCM 6th Signalized Intersection Summary
2: 5th St W & W. Napa Street 03/30/2022

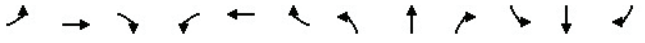
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	501	326	43	448	108	411	272	42	105	174	36
Future Volume (veh/h)	30	501	326	43	448	108	411	272	42	105	174	36
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.97	1.00		0.98	1.00		0.96
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	1885	1870	1885	1885	1870	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	30	501	326	43	448	108	411	272	42	105	174	36
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, %	1	2	1	1	2	1	1	1	1	1	1	1
Cap, veh/h	136	606	512	157	627	517	484	508	422	278	232	48
Arrive On Green	0.08	0.32	0.32	0.09	0.34	0.34	0.27	0.27	0.27	0.15	0.15	0.15
Sat Flow, veh/h	1795	1870	1580	1795	1870	1543	1795	1885	1565	1795	1502	311
Grp Volume(v), veh/h	30	501	326	43	448	108	411	272	42	105	0	210
Grp Sat Flow(s),veh/h/ln	1795	1870	1580	1795	1870	1543	1795	1885	1565	1795	0	1813
Q Serve(g_s), s	1.4	22.6	16.0	2.0	19.1	4.6	19.8	11.2	1.8	4.8	0.0	10.1
Cycle Q Clear(g_c), s	1.4	22.6	16.0	2.0	19.1	4.6	19.8	11.2	1.8	4.8	0.0	10.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.17
Lane Grp Cap(c), veh/h	136	606	512	157	627	517	484	508	422	278	0	281
V/C Ratio(X)	0.22	0.83	0.64	0.27	0.71	0.21	0.85	0.54	0.10	0.38	0.00	0.75
Avail Cap(c_a), veh/h	492	1045	883	492	1045	862	708	744	617	669	0	675
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	0.00	1.00
Uniform Delay (d), s/veh	39.6	28.5	26.3	38.9	26.5	21.7	31.6	28.4	25.0	34.6	0.0	36.9
Incr Delay (d2), s/veh	0.8	3.0	1.3	0.9	1.5	0.2	6.5	0.9	0.1	0.8	0.0	4.0
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	0.7	10.4	6.1	0.9	8.6	1.7	9.3	5.2	0.7	2.2	0.0	4.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.4	31.4	27.6	39.9	28.0	21.9	38.1	29.3	25.1	35.5	0.0	40.9
LnGrp LOS	D	C	C	D	C	C	D	C	C	D	A	D
Approach Vol, veh/h		857			599			725			315	
Approach Delay, s/veh		30.3			27.8			34.0			39.1	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2	4	5	6	8
Phs Duration (G+Y+Rc), s	11.0	34.6	17.6	9.9	35.6	28.1
Change Period (Y+Rc), s	3.0	5.0	3.5	3.0	5.0	3.5
Max Green Setting (Gmax), s	25.0	51.0	34.0	25.0	51.0	36.0
Max Q Clear Time (g_c+I1), s	4.0	24.6	12.1	3.4	21.1	21.8
Green Ext Time (p_c), s	0.1	5.0	1.5	0.0	3.6	2.8

Intersection Summary	
HCM 6th Ctrl Delay	31.9
HCM 6th LOS	C

HCM 6th Signalized Intersection Summary
3: 2nd Street W & W. Napa Street

03/30/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	435	99	115	419	34	216	50	67	70	66	39
Future Volume (veh/h)	24	435	99	115	419	34	216	50	67	70	66	39
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.96	1.00		0.97	1.00		0.94
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	1885	1870	1885	1885	1870	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	24	435	99	115	419	34	216	50	67	70	66	39
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, %	1	2	1	1	2	1	1	1	1	1	1	1
Cap, veh/h	95	576	486	276	695	56	294	117	157	308	185	110
Arrive On Green	0.05	0.31	0.31	0.15	0.41	0.41	0.16	0.16	0.16	0.17	0.17	0.17
Sat Flow, veh/h	1795	1870	1579	1795	1700	138	1795	715	958	1795	1080	638
Grp Volume(v), veh/h	24	435	99	115	0	453	216	0	117	70	0	105
Grp Sat Flow(s),veh/h/ln	1795	1870	1579	1795	0	1838	1795	0	1674	1795	0	1718
Q Serve(g_s), s	0.9	15.0	3.3	4.1	0.0	13.8	8.2	0.0	4.5	2.4	0.0	3.9
Cycle Q Clear(g_c), s	0.9	15.0	3.3	4.1	0.0	13.8	8.2	0.0	4.5	2.4	0.0	3.9
Prop In Lane	1.00		1.00	1.00		0.08	1.00		0.57	1.00		0.37
Lane Grp Cap(c), veh/h	95	576	486	276	0	751	294	0	274	308	0	295
V/C Ratio(X)	0.25	0.76	0.20	0.42	0.00	0.60	0.73	0.00	0.43	0.23	0.00	0.36
Avail Cap(c_a), veh/h	251	693	585	276	0	751	628	0	585	703	0	673
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.5	22.3	18.3	27.4	0.0	16.6	28.4	0.0	26.9	25.5	0.0	26.1
Incr Delay (d2), s/veh	1.4	5.5	0.4	1.0	0.0	2.1	3.5	0.0	1.1	0.4	0.0	0.7
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	0.4	7.2	1.2	1.8	0.0	5.9	3.7	0.0	1.8	1.0	0.0	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.9	27.8	18.7	28.4	0.0	18.6	32.0	0.0	27.9	25.9	0.0	26.9
LnGrp LOS	C	C	B	C	A	B	C	A	C	C	A	C
Approach Vol, veh/h		558			568			333			175	
Approach Delay, s/veh		26.5			20.6			30.5			26.5	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	2	3	4		6	7	8
Phs Duration (G+Y+Rc), s	15.2	14.0	26.5		15.8	6.8	33.7
Change Period (Y+Rc), s	3.5	3.0	4.5		3.5	3.0	4.5
Max Green Setting (Gmax), s	25.0	11.0	26.5		28.0	10.0	27.5
Max Q Clear Time (g_c+I1), s	10.2	6.1	17.0		5.9	2.9	15.8
Green Ext Time (p_c), s	1.2	0.1	3.7		0.8	0.0	3.9

Intersection Summary	
HCM 6th Ctrl Delay	25.3
HCM 6th LOS	C

HCM 6th AWSC
4: 1st St W & W. Napa Street

03/30/2022

Intersection	
Intersection Delay, s/veh	28
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	54	476	54	8	460	171	1	1	49	4	14	162
Future Vol, veh/h	54	476	54	8	460	171	1	1	49	4	14	162
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
Heavy Vehicles, %	1	2	1	1	2	1	1	1	1	1	1	1
Mvmt Flow	54	476	54	8	460	171	1	1	49	4	14	162
Number of Lanes	0	1	0	0	1	1	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	40	22.7	10.7	12.6
HCM LOS	E	C	B	B

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	2%	9%	2%	0%	2%
Vol Thru, %	2%	82%	98%	0%	8%
Vol Right, %	96%	9%	0%	100%	90%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	51	584	468	171	180
LT Vol	1	54	8	0	4
Through Vol	1	476	460	0	14
RT Vol	49	54	0	171	162
Lane Flow Rate	51	584	468	171	180
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.099	0.906	0.783	0.253	0.324
Departure Headway (Hd)	6.958	5.582	6.022	5.319	6.484
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	517	642	594	669	558
Service Time	4.969	3.666	3.813	3.109	4.484
HCM Lane V/C Ratio	0.099	0.91	0.788	0.256	0.323
HCM Control Delay	10.7	40	27.4	9.9	12.6
HCM Lane LOS	B	E	D	A	B
HCM 95th-tile Q	0.3	11.4	7.4	1	1.4

Intersection	
Intersection Delay, s/veh	39
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	271	238	146	271	5	348	10	155	0	8	15
Future Vol, veh/h	8	271	238	146	271	5	348	10	155	0	8	15
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	1	2	1	1	1	1	1	2	1	1	1	1
Mvmt Flow	9	301	264	162	301	6	387	11	172	0	9	17
Number of Lanes	0	1	1	0	1	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	2
HCM Control Delay	21	65.4	36.5	13.1
HCM LOS	C	F	E	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	100%	0%	3%	0%	35%	0%
Vol Thru, %	0%	6%	97%	0%	64%	35%
Vol Right, %	0%	94%	0%	100%	1%	65%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	348	165	279	238	422	23
LT Vol	348	0	8	0	146	0
Through Vol	0	10	271	0	271	8
RT Vol	0	155	0	238	5	15
Lane Flow Rate	387	183	310	264	469	26
Geometry Grp	7	7	7	7	6	6
Degree of Util (X)	0.881	0.358	0.664	0.514	0.985	0.066
Departure Headway (Hd)	8.203	7.029	7.71	6.991	7.564	9.309
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	441	511	468	516	478	383
Service Time	5.945	4.77	5.461	4.741	5.606	7.401
HCM Lane V/C Ratio	0.878	0.358	0.662	0.512	0.981	0.068
HCM Control Delay	47.3	13.7	24.5	17	65.4	13.1
HCM Lane LOS	E	B	C	C	F	B
HCM 95th-tile Q	9.2	1.6	4.8	2.9	12.8	0.2

Intersection	
Intersection Delay, s/veh	15.1
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	168	197	38	12	222	68	9	12	11	38	23	172
Future Vol, veh/h	168	197	38	12	222	68	9	12	11	38	23	172
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	187	219	42	13	247	76	10	13	12	42	26	191
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	18.2	13.6	9.9	12.4
HCM LOS	C	B	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	28%	42%	4%	16%
Vol Thru, %	38%	49%	74%	10%
Vol Right, %	34%	9%	23%	74%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	32	403	302	233
LT Vol	9	168	12	38
Through Vol	12	197	222	23
RT Vol	11	38	68	172
Lane Flow Rate	36	448	336	259
Geometry Grp	1	1	1	1
Degree of Util (X)	0.063	0.661	0.497	0.402
Departure Headway (Hd)	6.381	5.314	5.327	5.584
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	557	676	674	642
Service Time	4.471	3.365	3.383	3.646
HCM Lane V/C Ratio	0.065	0.663	0.499	0.403
HCM Control Delay	9.9	18.2	13.6	12.4
HCM Lane LOS	A	C	B	B
HCM 95th-tile Q	0.2	5	2.8	1.9

HCM 6th AWSC
1: 1st St W & W. Spain St/E. Spain St 03/30/2022

Intersection	
Intersection Delay, s/veh	23.4
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	107	215	22	32	243	30	72	45	77	45	12	79
Future Vol, veh/h	107	215	22	32	243	30	72	45	77	45	12	79
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.70	0.70	0.70	0.70	0.70	0.70
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	134	269	28	40	304	38	103	64	110	64	17	113
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	30.2	23.9	18	14.8
HCM LOS	D	C	C	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	37%	31%	10%	33%
Vol Thru, %	23%	62%	80%	9%
Vol Right, %	40%	6%	10%	58%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	194	344	305	136
LT Vol	72	107	32	45
Through Vol	45	215	243	12
RT Vol	77	22	30	79
Lane Flow Rate	277	430	381	194
Geometry Grp	1	1	1	1
Degree of Util (X)	0.539	0.791	0.702	0.387
Departure Headway (Hd)	7.005	6.621	6.627	7.18
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	513	550	545	499
Service Time	5.072	4.621	4.686	5.255
HCM Lane V/C Ratio	0.54	0.782	0.699	0.389
HCM Control Delay	18	30.2	23.9	14.8
HCM Lane LOS	C	D	C	B
HCM 95th-tile Q	3.2	7.4	5.5	1.8

HCM 6th Signalized Intersection Summary
2: 5th St W & W. Napa Street 03/30/2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	455	290	36	454	148	368	287	46	112	182	33
Future Volume (veh/h)	23	455	290	36	454	148	368	287	46	112	182	33
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.97	1.00		0.98	1.00		0.96
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	1885	1870	1885	1885	1870	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	24	479	305	38	478	156	387	302	48	118	192	35
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	2	1	1	2	1	1	1	1	1	1	1
Cap, veh/h	118	590	498	149	622	513	471	494	410	299	256	47
Arrive On Green	0.07	0.32	0.32	0.08	0.33	0.33	0.26	0.26	0.26	0.17	0.17	0.17
Sat Flow, veh/h	1795	1870	1580	1795	1870	1543	1795	1885	1564	1795	1539	281
Grp Volume(v), veh/h	24	479	305	38	478	156	387	302	48	118	0	227
Grp Sat Flow(s),veh/h/ln	1795	1870	1580	1795	1870	1543	1795	1885	1564	1795	0	1820
Q Serve(g_s), s	1.1	20.4	14.2	1.7	19.8	6.5	17.6	12.2	2.0	5.1	0.0	10.3
Cycle Q Clear(g_c), s	1.1	20.4	14.2	1.7	19.8	6.5	17.6	12.2	2.0	5.1	0.0	10.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.15
Lane Grp Cap(c), veh/h	118	590	498	149	622	513	471	494	410	299	0	303
V/C Ratio(X)	0.20	0.81	0.61	0.25	0.77	0.30	0.82	0.61	0.12	0.40	0.00	0.75
Avail Cap(c_a), veh/h	518	1101	930	518	1101	908	746	784	650	705	0	715
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	0.00	1.00
Uniform Delay (d), s/veh	38.3	27.3	25.2	37.2	25.9	21.5	30.1	28.1	24.3	32.2	0.0	34.4
Incr Delay (d2), s/veh	0.8	2.8	1.2	0.9	2.0	0.3	4.1	1.2	0.1	0.8	0.0	3.7
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	0.5	9.3	5.4	0.8	9.0	2.4	8.0	5.6	0.8	2.3	0.0	4.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.1	30.1	26.4	38.1	28.0	21.8	34.2	29.3	24.4	33.1	0.0	38.1
LnGrp LOS	D	C	C	D	C	C	C	C	C	C	A	D
Approach Vol, veh/h		808			672			737			345	
Approach Delay, s/veh		28.9			27.1			31.5			36.4	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.2	32.3		17.9	8.7	33.8		26.2				
Change Period (Y+Rc), s	3.0	5.0		3.5	3.0	5.0		3.5				
Max Green Setting (Gmax), s	25.0	51.0		34.0	25.0	51.0		36.0				
Max Q Clear Time (g_c+I1), s	3.7	22.4		12.3	3.1	21.8		19.6				
Green Ext Time (p_c), s	0.1	4.7		1.7	0.0	4.1		3.1				

Intersection Summary	
HCM 6th Ctrl Delay	30.2
HCM 6th LOS	C

HCM 6th Signalized Intersection Summary
3: 2nd Street W & W. Napa Street

03/30/2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	430	96	71	360	23	272	82	81	41	75	17
Future Volume (veh/h)	28	430	96	71	360	23	272	82	81	41	75	17
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.96	1.00		0.97	1.00		0.93
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	1885	1870	1885	1885	1870	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	29	439	98	72	367	23	278	84	83	42	77	17
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	1	2	1	1	2	1	1	1	1	1	1	1
Cap, veh/h	108	564	476	263	672	42	355	169	167	290	238	53
Arrive On Green	0.06	0.30	0.30	0.15	0.39	0.39	0.20	0.20	0.20	0.16	0.16	0.16
Sat Flow, veh/h	1795	1870	1579	1795	1736	109	1795	856	845	1795	1473	325
Grp Volume(v), veh/h	29	439	98	72	0	390	278	0	167	42	0	94
Grp Sat Flow(s),veh/h/ln	1795	1870	1579	1795	0	1845	1795	0	1701	1795	0	1799
Q Serve(g_s), s	1.2	16.1	3.5	2.7	0.0	12.4	11.1	0.0	6.6	1.5	0.0	3.5
Cycle Q Clear(g_c), s	1.2	16.1	3.5	2.7	0.0	12.4	11.1	0.0	6.6	1.5	0.0	3.5
Prop In Lane	1.00		1.00	1.00		0.06	1.00		0.50	1.00		0.18
Lane Grp Cap(c), veh/h	108	564	476	263	0	715	355	0	337	290	0	291
V/C Ratio(X)	0.27	0.78	0.21	0.27	0.00	0.55	0.78	0.00	0.50	0.14	0.00	0.32
Avail Cap(c_a), veh/h	239	659	556	263	0	715	597	0	565	668	0	669
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	33.8	24.0	19.6	28.6	0.0	17.9	28.6	0.0	26.8	27.1	0.0	27.9
Incr Delay (d2), s/veh	1.3	6.7	0.5	0.6	0.0	1.5	3.8	0.0	1.1	0.2	0.0	0.6
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	0.5	7.9	1.3	1.2	0.0	5.3	5.0	0.0	2.7	0.7	0.0	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.1	30.7	20.0	29.1	0.0	19.4	32.4	0.0	28.0	27.3	0.0	28.5
LnGrp LOS	D	C	C	C	A	B	C	A	C	C	A	C
Approach Vol, veh/h		566			462			445			136	
Approach Delay, s/veh		29.1			21.0			30.8			28.1	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	2	3	4		6	7	8
Phs Duration (G+Y+Rc), s	18.4	14.0	27.2		15.7	7.5	33.6
Change Period (Y+Rc), s	3.5	3.0	4.5		3.5	3.0	4.5
Max Green Setting (Gmax), s	25.0	11.0	26.5		28.0	10.0	27.5
Max Q Clear Time (g_c+I1), s	13.1	4.7	18.1		5.5	3.2	14.4
Green Ext Time (p_c), s	1.5	0.1	3.4		0.6	0.0	3.5

Intersection Summary	
HCM 6th Ctrl Delay	27.1
HCM 6th LOS	C

HCM 6th AWSC
4: 1st St W & W. Napa Street

03/30/2022

Intersection	
Intersection Delay, s/veh	34
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	57	416	62	11	402	149	0	2	64	0	2	64
Future Vol, veh/h	57	416	62	11	402	149	0	2	64	0	2	64
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.50	0.50	0.50	0.50	0.50	0.50
Heavy Vehicles, %	1	2	1	1	2	1	1	1	1	1	1	1
Mvmt Flow	63	462	69	12	447	166	0	4	128	0	4	128
Number of Lanes	0	1	0	0	1	1	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	53	25.1	12.2	12.2
HCM LOS	F	D	B	B

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	11%	3%	0%	0%
Vol Thru, %	3%	78%	97%	0%	3%
Vol Right, %	97%	12%	0%	100%	97%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	66	535	413	149	66
LT Vol	0	57	11	0	0
Through Vol	2	416	402	0	2
RT Vol	64	62	0	149	64
Lane Flow Rate	132	594	459	166	132
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.252	0.969	0.806	0.258	0.252
Departure Headway (Hd)	6.86	5.869	6.322	5.612	6.86
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	521	624	574	639	521
Service Time	4.929	3.869	4.072	3.362	4.929
HCM Lane V/C Ratio	0.253	0.952	0.8	0.26	0.253
HCM Control Delay	12.2	53	30.4	10.3	12.2
HCM Lane LOS	B	F	D	B	B
HCM 95th-tile Q	1	13.8	7.9	1	1

Intersection	
Intersection Delay, s/veh	28.9
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	28	220	207	81	240	28	297	23	96	18	9	46
Future Vol, veh/h	28	220	207	81	240	28	297	23	96	18	9	46
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	1	2	1	1	1	1	1	2	1	1	1	1
Mvmt Flow	33	259	244	95	282	33	349	27	113	21	11	54
Number of Lanes	0	1	1	0	1	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	2
HCM Control Delay	19.5	43.3	29.8	14.3
HCM LOS	C	E	D	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	100%	0%	11%	0%	23%	25%
Vol Thru, %	0%	19%	89%	0%	69%	12%
Vol Right, %	0%	81%	0%	100%	8%	63%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	297	119	248	207	349	73
LT Vol	297	0	28	0	81	18
Through Vol	0	23	220	0	240	9
RT Vol	0	96	0	207	28	46
Lane Flow Rate	349	140	292	244	411	86
Geometry Grp	7	7	7	7	6	6
Degree of Util (X)	0.799	0.278	0.624	0.469	0.868	0.213
Departure Headway (Hd)	8.227	7.148	7.697	6.936	7.609	8.918
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	440	501	467	516	476	405
Service Time	5.999	4.92	5.479	4.717	5.685	6.918
HCM Lane V/C Ratio	0.793	0.279	0.625	0.473	0.863	0.212
HCM Control Delay	36.7	12.7	22.5	15.8	43.3	14.3
HCM Lane LOS	E	B	C	C	E	B
HCM 95th-tile Q	7.2	1.1	4.2	2.5	9.1	0.8

Intersection	
Intersection Delay, s/veh	13.8
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	149	150	40	21	190	59	17	22	14	28	24	106
Future Vol, veh/h	149	150	40	21	190	59	17	22	14	28	24	106
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	186	188	50	26	238	74	21	28	18	35	30	133
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	16.2	13.1	10.1	11.2
HCM LOS	C	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	32%	44%	8%	18%
Vol Thru, %	42%	44%	70%	15%
Vol Right, %	26%	12%	22%	67%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	53	339	270	158
LT Vol	17	149	21	28
Through Vol	22	150	190	24
RT Vol	14	40	59	106
Lane Flow Rate	66	424	338	198
Geometry Grp	1	1	1	1
Degree of Util (X)	0.114	0.613	0.488	0.308
Departure Headway (Hd)	6.195	5.208	5.202	5.62
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	576	691	692	638
Service Time	4.265	3.25	3.247	3.677
HCM Lane V/C Ratio	0.115	0.614	0.488	0.31
HCM Control Delay	10.1	16.2	13.1	11.2
HCM Lane LOS	B	C	B	B
HCM 95th-tile Q	0.4	4.2	2.7	1.3

Intersection	
Intersection Delay, s/veh	19.6
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	63	169	37	55	171	31	53	63	76	53	58	115
Future Vol, veh/h	63	169	37	55	171	31	53	63	76	53	58	115
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.70	0.70	0.70	0.70	0.70	0.70
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	79	211	46	69	214	39	76	90	109	76	83	164
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	21.1	20.2	17.4	19.4
HCM LOS	C	C	C	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	28%	23%	21%	23%
Vol Thru, %	33%	63%	67%	26%
Vol Right, %	40%	14%	12%	51%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	192	269	257	226
LT Vol	53	63	55	53
Through Vol	63	169	171	58
RT Vol	76	37	31	115
Lane Flow Rate	274	336	321	323
Geometry Grp	1	1	1	1
Degree of Util (X)	0.525	0.636	0.611	0.6
Departure Headway (Hd)	6.893	6.804	6.849	6.687
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	521	531	527	539
Service Time	4.955	4.861	4.908	4.746
HCM Lane V/C Ratio	0.526	0.633	0.609	0.599
HCM Control Delay	17.4	21.1	20.2	19.4
HCM Lane LOS	C	C	C	C
HCM 95th-tile Q	3	4.4	4.1	3.9

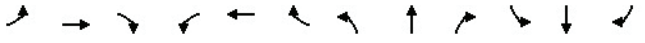
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	419	273	36	379	90	345	228	35	88	146	30
Future Volume (veh/h)	25	419	273	36	379	90	345	228	35	88	146	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.96	1.00		0.98	1.00		0.96
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	1885	1870	1885	1885	1870	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	25	423	276	36	383	91	348	230	35	89	147	32
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.95
Percent Heavy Veh, %	1	2	1	1	2	1	1	1	1	1	1	1
Cap, veh/h	126	558	471	150	584	481	444	466	386	314	260	57
Arrive On Green	0.07	0.30	0.30	0.08	0.31	0.31	0.25	0.25	0.25	0.17	0.17	0.17
Sat Flow, veh/h	1795	1870	1579	1795	1870	1541	1795	1885	1562	1795	1487	324
Grp Volume(v), veh/h	25	423	276	36	383	91	348	230	35	89	0	179
Grp Sat Flow(s),veh/h/ln	1795	1870	1579	1795	1870	1541	1795	1885	1562	1795	0	1811
Q Serve(g_s), s	1.0	15.7	11.4	1.4	13.6	3.3	13.9	8.0	1.3	3.3	0.0	6.9
Cycle Q Clear(g_c), s	1.0	15.7	11.4	1.4	13.6	3.3	13.9	8.0	1.3	3.3	0.0	6.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.18
Lane Grp Cap(c), veh/h	126	558	471	150	584	481	444	466	386	314	0	317
V/C Ratio(X)	0.20	0.76	0.59	0.24	0.66	0.19	0.78	0.49	0.09	0.28	0.00	0.57
Avail Cap(c_a), veh/h	586	1245	1051	586	1245	1026	843	885	734	796	0	803
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	0.00	1.00
Uniform Delay (d), s/veh	33.6	24.4	22.9	32.8	22.8	19.3	26.9	24.7	22.2	27.5	0.0	29.0
Incr Delay (d2), s/veh	0.8	2.1	1.2	0.8	1.3	0.2	3.1	0.8	0.1	0.5	0.0	1.6
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	0.5	7.0	4.3	0.7	6.0	1.2	6.1	3.6	0.5	1.4	0.0	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.4	26.5	24.0	33.6	24.1	19.5	30.0	25.5	22.3	27.9	0.0	30.5
LnGrp LOS	C	C	C	C	C	B	C	C	C	C	A	C
Approach Vol, veh/h		724			510			613			268	
Approach Delay, s/veh		25.9			23.9			27.9			29.7	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.4	27.9		16.9	8.4	28.9		22.5				
Change Period (Y+Rc), s	3.0	5.0		3.5	3.0	5.0		3.5				
Max Green Setting (Gmax), s	25.0	51.0		34.0	25.0	51.0		36.0				
Max Q Clear Time (g_c+I1), s	3.4	17.7		8.9	3.0	15.6		15.9				
Green Ext Time (p_c), s	0.1	4.2		1.3	0.0	3.1		2.6				

Intersection Summary	
HCM 6th Ctrl Delay	26.5
HCM 6th LOS	C

HCM 6th Signalized Intersection Summary
3: 2nd Street W & W. Napa Street

04/11/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	356	81	94	347	29	177	41	58	60	54	32
Future Volume (veh/h)	20	356	81	94	347	29	177	41	58	60	54	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.96	1.00		0.97	1.00		0.94
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	1885	1870	1885	1885	1870	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	22	387	88	102	377	32	192	45	63	65	59	33
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.98
Percent Heavy Veh, %	1	2	1	1	2	1	1	1	1	1	1	1
Cap, veh/h	90	554	468	290	691	59	274	106	148	316	195	109
Arrive On Green	0.05	0.30	0.30	0.16	0.41	0.41	0.15	0.15	0.15	0.18	0.18	0.18
Sat Flow, veh/h	1795	1870	1578	1795	1693	144	1795	695	974	1795	1106	618
Grp Volume(v), veh/h	22	387	88	102	0	409	192	0	108	65	0	92
Grp Sat Flow(s),veh/h/ln	1795	1870	1578	1795	0	1837	1795	0	1669	1795	0	1724
Q Serve(g_s), s	0.8	12.5	2.8	3.4	0.0	11.5	6.9	0.0	4.0	2.1	0.0	3.2
Cycle Q Clear(g_c), s	0.8	12.5	2.8	3.4	0.0	11.5	6.9	0.0	4.0	2.1	0.0	3.2
Prop In Lane	1.00		1.00	1.00		0.08	1.00		0.58	1.00		0.36
Lane Grp Cap(c), veh/h	90	554	468	290	0	750	274	0	254	316	0	304
V/C Ratio(X)	0.25	0.70	0.19	0.35	0.00	0.55	0.70	0.00	0.42	0.21	0.00	0.30
Avail Cap(c_a), veh/h	264	729	615	290	0	750	660	0	614	739	0	710
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	31.1	21.2	17.8	25.3	0.0	15.3	27.3	0.0	26.1	23.9	0.0	24.4
Incr Delay (d2), s/veh	1.4	3.6	0.4	0.7	0.0	1.5	3.3	0.0	1.1	0.3	0.0	0.6
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	0.4	5.7	1.0	1.5	0.0	4.8	3.1	0.0	1.6	0.9	0.0	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.5	24.8	18.2	26.1	0.0	16.8	30.6	0.0	27.2	24.3	0.0	24.9
LnGrp LOS	C	C	B	C	A	B	C	A	C	C	A	C
Approach Vol, veh/h		497			511			300			157	
Approach Delay, s/veh		24.0			18.6			29.4			24.7	
Approach LOS		C			B			C			C	

Timer - Assigned Phs	2	3	4		6	7	8					
Phs Duration (G+Y+Rc), s	13.9	14.0	24.7		15.5	6.4	32.3					
Change Period (Y+Rc), s	3.5	3.0	4.5		3.5	3.0	4.5					
Max Green Setting (Gmax), s	25.0	11.0	26.5		28.0	10.0	27.5					
Max Q Clear Time (g_c+I1), s	8.9	5.4	14.5		5.2	2.8	13.5					
Green Ext Time (p_c), s	1.1	0.1	3.8		0.7	0.0	3.9					

Intersection Summary	
HCM 6th Ctrl Delay	23.3
HCM 6th LOS	C

HCM 6th AWSC
4: 1st St W & W. Napa Street

04/11/2022

Intersection	
Intersection Delay, s/veh	31.5
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	42	374	52	9	377	134	1	1	51	3	11	128
Future Vol, veh/h	42	374	52	9	377	134	1	1	51	3	11	128
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.50	0.50	0.50	0.50	0.50	0.50
Heavy Vehicles, %	1	2	1	1	2	1	1	1	1	1	1	1
Mvmt Flow	47	416	58	10	419	149	2	2	102	6	22	256
Number of Lanes	0	1	0	0	1	1	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	47	28	12.7	17.4
HCM LOS	E	D	B	C

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	2%	9%	2%	0%	2%
Vol Thru, %	2%	80%	98%	0%	8%
Vol Right, %	96%	11%	0%	100%	90%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	53	468	386	134	142
LT Vol	1	42	9	0	3
Through Vol	1	374	377	0	11
RT Vol	51	52	0	134	128
Lane Flow Rate	106	520	429	149	284
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.222	0.924	0.819	0.255	0.533
Departure Headway (Hd)	7.547	6.396	6.876	6.165	6.753
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	479	562	523	578	531
Service Time	5.547	4.479	4.665	3.953	4.843
HCM Lane V/C Ratio	0.221	0.925	0.82	0.258	0.535
HCM Control Delay	12.7	47	33.9	11.1	17.4
HCM Lane LOS	B	E	D	B	C
HCM 95th-tile Q	0.8	11.5	8	1	3.1

Intersection	
Intersection Delay, s/veh	22.2
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	217	186	114	218	4	286	8	121	0	6	12
Future Vol, veh/h	6	217	186	114	218	4	286	8	121	0	6	12
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	1	2	1	1	1	1	1	2	1	1	1	1
Mvmt Flow	7	255	219	134	256	5	336	9	142	0	7	14
Number of Lanes	0	1	1	0	1	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	2
HCM Control Delay	15.3	30.5	22.7	11.7
HCM LOS	C	D	C	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	100%	0%	3%	0%	34%	0%
Vol Thru, %	0%	6%	97%	0%	65%	33%
Vol Right, %	0%	94%	0%	100%	1%	67%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	286	129	223	186	336	18
LT Vol	286	0	6	0	114	0
Through Vol	0	8	217	0	218	6
RT Vol	0	121	0	186	4	12
Lane Flow Rate	336	152	262	219	395	21
Geometry Grp	7	7	7	7	6	6
Degree of Util (X)	0.718	0.275	0.517	0.388	0.776	0.048
Departure Headway (Hd)	7.687	6.521	7.093	6.379	7.071	8.195
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	471	552	509	565	514	436
Service Time	5.403	4.236	4.831	4.117	5.091	6.259
HCM Lane V/C Ratio	0.713	0.275	0.515	0.388	0.768	0.048
HCM Control Delay	27.7	11.7	17.2	13.1	30.5	11.7
HCM Lane LOS	D	B	C	B	D	B
HCM 95th-tile Q	5.7	1.1	2.9	1.8	7	0.2

Intersection	
Intersection Delay, s/veh	13.6
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	140	167	31	10	188	56	7	10	9	31	19	141
Future Vol, veh/h	140	167	31	10	188	56	7	10	9	31	19	141
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	175	209	39	13	235	70	9	13	11	39	24	176
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	16	12.5	9.6	11.5
HCM LOS	C	B	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	27%	41%	4%	16%
Vol Thru, %	38%	49%	74%	10%
Vol Right, %	35%	9%	22%	74%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	26	338	254	191
LT Vol	7	140	10	31
Through Vol	10	167	188	19
RT Vol	9	31	56	141
Lane Flow Rate	32	422	318	239
Geometry Grp	1	1	1	1
Degree of Util (X)	0.056	0.608	0.457	0.36
Departure Headway (Hd)	6.152	5.183	5.181	5.435
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	579	697	695	661
Service Time	4.219	3.219	3.221	3.482
HCM Lane V/C Ratio	0.055	0.605	0.458	0.362
HCM Control Delay	9.6	16	12.5	11.5
HCM Lane LOS	A	C	B	B
HCM 95th-tile Q	0.2	4.1	2.4	1.6

HCM 6th AWSC
1: 1st St W & W. Spain St/E. Spain St 03/30/2022

Intersection	
Intersection Delay, s/veh	48.9
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	137	275	28	41	310	38	92	58	98	58	15	101
Future Vol, veh/h	137	275	28	41	310	38	92	58	98	58	15	101
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.80	0.80	0.80	0.80	0.80	0.80
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	152	306	31	46	344	42	115	73	123	73	19	126
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	75.7	48.7	27.3	19.8
HCM LOS	F	E	D	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	37%	31%	11%	33%
Vol Thru, %	23%	62%	80%	9%
Vol Right, %	40%	6%	10%	58%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	248	440	389	174
LT Vol	92	137	41	58
Through Vol	58	275	310	15
RT Vol	98	28	38	101
Lane Flow Rate	310	489	432	218
Geometry Grp	1	1	1	1
Degree of Util (X)	0.687	1.026	0.902	0.502
Departure Headway (Hd)	8.173	7.552	7.697	8.523
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	446	484	475	426
Service Time	6.173	5.552	5.697	6.523
HCM Lane V/C Ratio	0.695	1.01	0.909	0.512
HCM Control Delay	27.3	75.7	48.7	19.8
HCM Lane LOS	D	F	E	C
HCM 95th-tile Q	5.1	14.3	10	2.7

HCM 6th Signalized Intersection Summary
2: 5th St W & W. Napa Street 03/30/2022

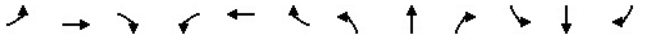
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	562	336	40	684	199	387	287	46	112	182	40
Future Volume (veh/h)	32	562	336	40	684	199	387	287	46	112	182	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.97	1.00		0.98	1.00		0.96
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	1885	1870	1885	1885	1870	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	32	562	336	40	684	199	387	287	46	112	182	40
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, %	1	2	1	1	2	1	1	1	1	1	1	1
Cap, veh/h	130	739	626	135	745	616	442	464	384	273	226	50
Arrive On Green	0.07	0.40	0.40	0.08	0.40	0.40	0.25	0.25	0.25	0.15	0.15	0.15
Sat Flow, veh/h	1795	1870	1583	1795	1870	1546	1795	1885	1562	1795	1483	326
Grp Volume(v), veh/h	32	562	336	40	684	199	387	287	46	112	0	222
Grp Sat Flow(s),veh/h/ln	1795	1870	1583	1795	1870	1546	1795	1885	1562	1795	0	1809
Q Serve(g_s), s	1.9	29.7	18.6	2.4	39.7	10.2	23.7	15.5	2.6	6.5	0.0	13.6
Cycle Q Clear(g_c), s	1.9	29.7	18.6	2.4	39.7	10.2	23.7	15.5	2.6	6.5	0.0	13.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.18
Lane Grp Cap(c), veh/h	130	739	626	135	745	616	442	464	384	273	0	275
V/C Ratio(X)	0.25	0.76	0.54	0.30	0.92	0.32	0.88	0.62	0.12	0.41	0.00	0.81
Avail Cap(c_a), veh/h	392	834	706	392	834	689	565	593	491	533	0	537
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	0.00	1.00
Uniform Delay (d), s/veh	50.1	29.9	26.6	50.0	32.7	23.8	41.5	38.4	33.5	43.9	0.0	46.9
Incr Delay (d2), s/veh	1.0	3.7	0.7	1.2	14.1	0.3	12.0	1.3	0.1	1.0	0.0	5.5
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	14.1	7.2	1.1	20.7	3.8	12.0	7.4	1.0	3.0	0.0	6.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.1	33.6	27.3	51.2	46.8	24.1	53.5	39.7	33.6	44.9	0.0	52.4
LnGrp LOS	D	C	C	D	D	C	D	D	C	D	A	D
Approach Vol, veh/h		930			923			720			334	
Approach Delay, s/veh		31.9			42.1			46.7			49.9	
Approach LOS		C			D			D			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.6	50.2		20.9	11.3	50.6		31.7				
Change Period (Y+Rc), s	3.0	5.0		3.5	3.0	5.0		3.5				
Max Green Setting (Gmax), s	25.0	51.0		34.0	25.0	51.0		36.0				
Max Q Clear Time (g_c+I1), s	4.4	31.7		15.6	3.9	41.7		25.7				
Green Ext Time (p_c), s	0.1	5.1		1.6	0.0	3.9		2.5				

Intersection Summary	
HCM 6th Ctrl Delay	40.9
HCM 6th LOS	D

HCM 6th Signalized Intersection Summary
3: 2nd Street W & W. Napa Street

03/30/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	511	96	73	622	23	275	82	81	41	75	17
Future Volume (veh/h)	28	511	96	73	622	23	275	82	81	41	75	17
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.96	1.00		0.97	1.00		0.93
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	1885	1870	1885	1885	1870	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	28	511	96	73	622	23	275	82	81	41	75	17
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, %	1	2	1	1	2	1	1	1	1	1	1	1
Cap, veh/h	105	596	503	255	719	27	349	166	164	284	231	52
Arrive On Green	0.06	0.32	0.32	0.14	0.40	0.40	0.19	0.19	0.19	0.16	0.16	0.16
Sat Flow, veh/h	1795	1870	1580	1795	1789	66	1795	856	845	1795	1465	332
Grp Volume(v), veh/h	28	511	96	73	0	645	275	0	163	41	0	92
Grp Sat Flow(s),veh/h/ln	1795	1870	1580	1795	0	1855	1795	0	1701	1795	0	1797
Q Serve(g_s), s	1.2	19.9	3.4	2.8	0.0	24.7	11.3	0.0	6.6	1.5	0.0	3.5
Cycle Q Clear(g_c), s	1.2	19.9	3.4	2.8	0.0	24.7	11.3	0.0	6.6	1.5	0.0	3.5
Prop In Lane	1.00		1.00	1.00		0.04	1.00		0.50	1.00		0.18
Lane Grp Cap(c), veh/h	105	596	503	255	0	746	349	0	331	284	0	284
V/C Ratio(X)	0.27	0.86	0.19	0.29	0.00	0.86	0.79	0.00	0.49	0.14	0.00	0.32
Avail Cap(c_a), veh/h	232	639	540	255	0	746	579	0	548	648	0	649
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	34.9	24.8	19.2	29.8	0.0	21.2	29.7	0.0	27.8	28.1	0.0	29.0
Incr Delay (d2), s/veh	1.3	12.0	0.4	0.6	0.0	11.1	4.0	0.0	1.1	0.2	0.0	0.7
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	0.5	10.4	1.3	1.2	0.0	12.4	5.2	0.0	2.8	0.7	0.0	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.3	36.8	19.6	30.4	0.0	32.4	33.7	0.0	29.0	28.4	0.0	29.6
LnGrp LOS	D	D	B	C	A	C	C	A	C	C	A	C
Approach Vol, veh/h		635			718			438			133	
Approach Delay, s/veh		34.1			32.2			31.9			29.2	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	2	3	4		6	7	8
Phs Duration (G+Y+Rc), s	18.6	14.0	29.2		15.8	7.5	35.7
Change Period (Y+Rc), s	3.5	3.0	4.5		3.5	3.0	4.5
Max Green Setting (Gmax), s	25.0	11.0	26.5		28.0	10.0	27.5
Max Q Clear Time (g_c+I1), s	13.3	4.8	21.9		5.5	3.2	26.7
Green Ext Time (p_c), s	1.5	0.1	2.4		0.6	0.0	0.5

Intersection Summary	
HCM 6th Ctrl Delay	32.6
HCM 6th LOS	C

HCM 6th AWSC
4: 1st St W & W. Napa Street

03/30/2022

Intersection	
Intersection Delay, s/veh	40.9
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	73	531	76	14	510	190	0	3	78	0	3	82
Future Vol, veh/h	73	531	76	14	510	190	0	3	78	0	3	82
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
Heavy Vehicles, %	1	2	1	1	2	1	1	1	1	1	1	1
Mvmt Flow	73	531	76	14	510	190	0	3	78	0	3	82
Number of Lanes	0	1	0	0	1	1	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	62.6	27.1	11.1	11.1
HCM LOS	F	D	B	B

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	11%	3%	0%	0%
Vol Thru, %	4%	78%	97%	0%	4%
Vol Right, %	96%	11%	0%	100%	96%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	81	680	524	190	85
LT Vol	0	73	14	0	0
Through Vol	3	531	510	0	3
RT Vol	78	76	0	190	82
Lane Flow Rate	81	680	524	190	85
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.152	1.018	0.852	0.272	0.159
Departure Headway (Hd)	6.742	5.392	5.853	5.146	6.724
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	527	673	618	695	530
Service Time	4.838	3.446	3.613	2.905	4.819
HCM Lane V/C Ratio	0.154	1.01	0.848	0.273	0.16
HCM Control Delay	11.1	62.6	33.4	9.8	11.1
HCM Lane LOS	B	F	D	A	B
HCM 95th-tile Q	0.5	16.6	9.4	1.1	0.6

Intersection	
Intersection Delay, s/veh	79
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	28	242	264	93	360	28	440	23	96	18	9	46
Future Vol, veh/h	28	242	264	93	360	28	440	23	96	18	9	46
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	1	2	1	1	1	1	1	2	1	1	1	1
Mvmt Flow	31	269	293	103	400	31	489	26	107	20	10	51
Number of Lanes	0	1	1	0	1	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	2
HCM Control Delay	25.3	128.9	95.6	16.4
HCM LOS	D	F	F	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	100%	0%	10%	0%	19%	25%
Vol Thru, %	0%	19%	90%	0%	75%	12%
Vol Right, %	0%	81%	0%	100%	6%	63%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	440	119	270	264	481	73
LT Vol	440	0	28	0	93	18
Through Vol	0	23	242	0	360	9
RT Vol	0	96	0	264	28	46
Lane Flow Rate	489	132	300	293	534	81
Geometry Grp	7	7	7	7	6	6
Degree of Util (X)	1.141	0.27	0.678	0.603	1.177	0.214
Departure Headway (Hd)	8.865	7.778	8.853	8.087	8.398	10.546
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	416	465	411	449	438	342
Service Time	6.565	5.478	6.553	5.787	6.398	8.546
HCM Lane V/C Ratio	1.175	0.284	0.73	0.653	1.219	0.237
HCM Control Delay	117.8	13.3	28.3	22.3	128.9	16.4
HCM Lane LOS	F	B	D	C	F	C
HCM 95th-tile Q	17.2	1.1	4.9	3.9	19.3	0.8

Intersection	
Intersection Delay, s/veh	15.8
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	155	166	40	21	323	80	17	22	14	28	24	106
Future Vol, veh/h	155	166	40	21	323	80	17	22	14	28	24	106
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	172	184	44	23	359	89	19	24	16	31	27	118
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	15.9	18	10.3	11.3
HCM LOS	C	C	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	32%	43%	5%	18%
Vol Thru, %	42%	46%	76%	15%
Vol Right, %	26%	11%	19%	67%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	53	361	424	158
LT Vol	17	155	21	28
Through Vol	22	166	323	24
RT Vol	14	40	80	106
Lane Flow Rate	59	401	471	176
Geometry Grp	1	1	1	1
Degree of Util (X)	0.105	0.593	0.67	0.286
Departure Headway (Hd)	6.445	5.324	5.122	5.864
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	552	678	702	609
Service Time	4.527	3.374	3.17	3.929
HCM Lane V/C Ratio	0.107	0.591	0.671	0.289
HCM Control Delay	10.3	15.9	18	11.3
HCM Lane LOS	B	C	C	B
HCM 95th-tile Q	0.3	3.9	5.2	1.2

HCM 6th AWSC
1: 1st St W & W. Spain St/E. Spain St 03/30/2022

Intersection	
Intersection Delay, s/veh	36.7
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	81	216	47	70	218	40	68	81	97	68	74	147
Future Vol, veh/h	81	216	47	70	218	40	68	81	97	68	74	147
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.80	0.80	0.80	0.80	0.80	0.80
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	90	240	52	78	242	44	85	101	121	85	93	184
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	42.5	38.6	28.6	35.6
HCM LOS	E	E	D	E

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	28%	24%	21%	24%
Vol Thru, %	33%	63%	66%	26%
Vol Right, %	39%	14%	12%	51%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	246	344	328	289
LT Vol	68	81	70	68
Through Vol	81	216	218	74
RT Vol	97	47	40	147
Lane Flow Rate	308	382	364	361
Geometry Grp	1	1	1	1
Degree of Util (X)	0.702	0.851	0.818	0.796
Departure Headway (Hd)	8.214	8.013	8.081	7.93
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	440	451	448	455
Service Time	6.293	6.085	6.156	6.004
HCM Lane V/C Ratio	0.7	0.847	0.813	0.793
HCM Control Delay	28.6	42.5	38.6	35.6
HCM Lane LOS	D	E	E	E
HCM 95th-tile Q	5.3	8.5	7.7	7.2

HCM 6th Signalized Intersection Summary
2: 5th St W & W. Napa Street 03/30/2022

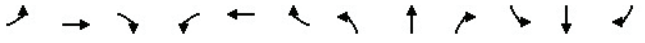
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	501	326	43	452	108	412	272	42	105	174	36
Future Volume (veh/h)	30	501	326	43	452	108	412	272	42	105	174	36
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.97	1.00		0.98	1.00		0.96
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	1885	1870	1885	1885	1870	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	30	501	326	43	452	108	412	272	42	105	174	36
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, %	1	2	1	1	2	1	1	1	1	1	1	1
Cap, veh/h	136	606	512	157	627	517	485	509	423	278	232	48
Arrive On Green	0.08	0.32	0.32	0.09	0.34	0.34	0.27	0.27	0.27	0.15	0.15	0.15
Sat Flow, veh/h	1795	1870	1580	1795	1870	1543	1795	1885	1565	1795	1502	311
Grp Volume(v), veh/h	30	501	326	43	452	108	412	272	42	105	0	210
Grp Sat Flow(s),veh/h/ln	1795	1870	1580	1795	1870	1543	1795	1885	1565	1795	0	1812
Q Serve(g_s), s	1.4	22.6	16.1	2.0	19.4	4.6	19.9	11.2	1.8	4.8	0.0	10.1
Cycle Q Clear(g_c), s	1.4	22.6	16.1	2.0	19.4	4.6	19.9	11.2	1.8	4.8	0.0	10.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.17
Lane Grp Cap(c), veh/h	136	606	512	157	627	517	485	509	423	278	0	280
V/C Ratio(X)	0.22	0.83	0.64	0.27	0.72	0.21	0.85	0.53	0.10	0.38	0.00	0.75
Avail Cap(c_a), veh/h	491	1044	882	491	1044	861	707	743	617	668	0	674
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	0.00	1.00
Uniform Delay (d), s/veh	39.7	28.5	26.3	39.0	26.6	21.7	31.6	28.4	25.0	34.7	0.0	36.9
Incr Delay (d2), s/veh	0.8	3.0	1.3	0.9	1.6	0.2	6.6	0.9	0.1	0.8	0.0	4.0
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	0.7	10.4	6.1	0.9	8.8	1.7	9.4	5.2	0.7	2.2	0.0	4.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.5	31.5	27.6	39.9	28.2	21.9	38.2	29.3	25.1	35.5	0.0	40.9
LnGrp LOS	D	C	C	D	C	C	D	C	C	D	A	D
Approach Vol, veh/h		857			603			726			315	
Approach Delay, s/veh		30.3			27.9			34.1			39.1	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2	4	5	6	8
Phs Duration (G+Y+Rc), s	11.0	34.6	17.6	9.9	35.6	28.2
Change Period (Y+Rc), s	3.0	5.0	3.5	3.0	5.0	3.5
Max Green Setting (Gmax), s	25.0	51.0	34.0	25.0	51.0	36.0
Max Q Clear Time (g_c+I1), s	4.0	24.6	12.1	3.4	21.4	21.9
Green Ext Time (p_c), s	0.1	5.0	1.5	0.0	3.7	2.8

Intersection Summary	
HCM 6th Ctrl Delay	32.0
HCM 6th LOS	C

HCM 6th Signalized Intersection Summary
3: 2nd Street W & W. Napa Street

03/30/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	435	99	115	423	35	216	50	70	73	66	39
Future Volume (veh/h)	24	435	99	115	423	35	216	50	70	73	66	39
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.96	1.00		0.97	1.00		0.94
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	1885	1870	1885	1885	1870	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	24	435	99	115	423	35	216	50	70	73	66	39
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, %	1	2	1	1	2	1	1	1	1	1	1	1
Cap, veh/h	95	576	486	276	693	57	295	114	160	308	185	110
Arrive On Green	0.05	0.31	0.31	0.15	0.41	0.41	0.16	0.16	0.16	0.17	0.17	0.17
Sat Flow, veh/h	1795	1870	1579	1795	1697	140	1795	696	974	1795	1080	638
Grp Volume(v), veh/h	24	435	99	115	0	458	216	0	120	73	0	105
Grp Sat Flow(s),veh/h/ln	1795	1870	1579	1795	0	1838	1795	0	1670	1795	0	1718
Q Serve(g_s), s	0.9	15.0	3.3	4.1	0.0	14.1	8.2	0.0	4.6	2.5	0.0	3.9
Cycle Q Clear(g_c), s	0.9	15.0	3.3	4.1	0.0	14.1	8.2	0.0	4.6	2.5	0.0	3.9
Prop In Lane	1.00		1.00	1.00		0.08	1.00		0.58	1.00		0.37
Lane Grp Cap(c), veh/h	95	576	486	276	0	751	295	0	274	308	0	295
V/C Ratio(X)	0.25	0.76	0.20	0.42	0.00	0.61	0.73	0.00	0.44	0.24	0.00	0.36
Avail Cap(c_a), veh/h	251	693	585	276	0	751	627	0	583	702	0	672
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.5	22.3	18.3	27.4	0.0	16.7	28.4	0.0	26.9	25.6	0.0	26.1
Incr Delay (d2), s/veh	1.4	5.5	0.4	1.0	0.0	2.2	3.5	0.0	1.1	0.4	0.0	0.7
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	0.4	7.2	1.2	1.8	0.0	6.0	3.7	0.0	1.9	1.1	0.0	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.9	27.9	18.7	28.4	0.0	18.8	31.9	0.0	28.0	26.0	0.0	26.9
LnGrp LOS	C	C	B	C	A	B	C	A	C	C	A	C
Approach Vol, veh/h		558			573			336			178	
Approach Delay, s/veh		26.5			20.7			30.6			26.5	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	2	3	4		6	7	8
Phs Duration (G+Y+Rc), s	15.2	14.0	26.5		15.8	6.8	33.7
Change Period (Y+Rc), s	3.5	3.0	4.5		3.5	3.0	4.5
Max Green Setting (Gmax), s	25.0	11.0	26.5		28.0	10.0	27.5
Max Q Clear Time (g_c+I1), s	10.2	6.1	17.0		5.9	2.9	16.1
Green Ext Time (p_c), s	1.2	0.1	3.7		0.8	0.0	3.9

Intersection Summary	
HCM 6th Ctrl Delay	25.3
HCM 6th LOS	C

HCM 6th AWSC
4: 1st St W & W. Napa Street

03/30/2022

Intersection	
Intersection Delay, s/veh	32.9
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	54	478	64	11	477	171	1	1	62	4	14	163
Future Vol, veh/h	54	478	64	11	477	171	1	1	62	4	14	163
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
Heavy Vehicles, %	1	2	1	1	2	1	1	1	1	1	1	1
Mvmt Flow	54	478	64	11	477	171	1	1	62	4	14	163
Number of Lanes	0	1	0	0	1	1	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	46.8	27.9	11.2	13
HCM LOS	E	D	B	B

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	2%	9%	2%	0%	2%
Vol Thru, %	2%	80%	98%	0%	8%
Vol Right, %	97%	11%	0%	100%	90%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	64	596	488	171	181
LT Vol	1	54	11	0	4
Through Vol	1	478	477	0	14
RT Vol	62	64	0	171	163
Lane Flow Rate	64	596	488	171	181
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.126	0.941	0.846	0.263	0.334
Departure Headway (Hd)	7.102	5.797	6.239	5.532	6.65
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	506	632	586	653	543
Service Time	5.135	3.797	3.939	3.232	4.673
HCM Lane V/C Ratio	0.126	0.943	0.833	0.262	0.333
HCM Control Delay	11.2	46.8	34.1	10.2	13
HCM Lane LOS	B	E	D	B	B
HCM 95th-tile Q	0.4	12.7	9.1	1.1	1.5

Intersection	
Intersection Delay, s/veh	42.3
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	276	238	146	277	5	362	10	155	0	8	15
Future Vol, veh/h	8	276	238	146	277	5	362	10	155	0	8	15
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	1	2	1	1	1	1	1	2	1	1	1	1
Mvmt Flow	9	307	264	162	308	6	402	11	172	0	9	17
Number of Lanes	0	1	1	0	1	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	2
HCM Control Delay	21.6	71.9	40	13.2
HCM LOS	C	F	E	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	100%	0%	3%	0%	34%	0%
Vol Thru, %	0%	6%	97%	0%	65%	35%
Vol Right, %	0%	94%	0%	100%	1%	65%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	362	165	284	238	428	23
LT Vol	362	0	8	0	146	0
Through Vol	0	10	276	0	277	8
RT Vol	0	155	0	238	5	15
Lane Flow Rate	402	183	316	264	476	26
Geometry Grp	7	7	7	7	6	6
Degree of Util (X)	0.908	0.355	0.676	0.513	1.01	0.066
Departure Headway (Hd)	8.286	7.11	7.836	7.116	7.644	9.522
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	442	510	464	510	476	378
Service Time	5.986	4.81	5.536	4.816	5.653	7.522
HCM Lane V/C Ratio	0.91	0.359	0.681	0.518	1	0.069
HCM Control Delay	52	13.7	25.4	17.1	71.9	13.2
HCM Lane LOS	F	B	D	C	F	B
HCM 95th-tile Q	9.9	1.6	4.9	2.9	13.6	0.2

Intersection	
Intersection Delay, s/veh	15.5
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	170	202	38	12	228	68	9	12	11	38	23	172
Future Vol, veh/h	170	202	38	12	228	68	9	12	11	38	23	172
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	189	224	42	13	253	76	10	13	12	42	26	191
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	18.8	13.9	10	12.5
HCM LOS	C	B	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	28%	41%	4%	16%
Vol Thru, %	38%	49%	74%	10%
Vol Right, %	34%	9%	22%	74%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	32	410	308	233
LT Vol	9	170	12	38
Through Vol	12	202	228	23
RT Vol	11	38	68	172
Lane Flow Rate	36	456	342	259
Geometry Grp	1	1	1	1
Degree of Util (X)	0.064	0.675	0.509	0.405
Departure Headway (Hd)	6.435	5.336	5.352	5.626
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	552	674	671	637
Service Time	4.527	3.387	3.409	3.689
HCM Lane V/C Ratio	0.065	0.677	0.51	0.407
HCM Control Delay	10	18.8	13.9	12.5
HCM Lane LOS	A	C	B	B
HCM 95th-tile Q	0.2	5.2	2.9	2

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Appendix D

Left-Turn Lane Warrants

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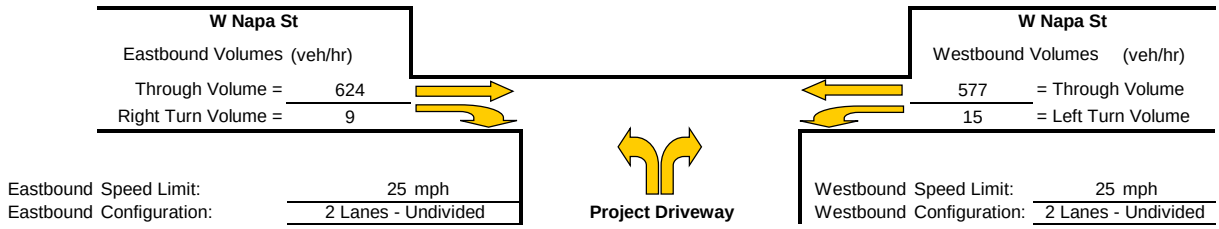
Turn Lane Warrant Analysis - Tee Intersections

Study Intersection: West Napa St/Hotel Sonoma Driveway
Study Scenario: Future Plus Project - Weekday PM Peak Hour

Direction of Analysis Street: East/West
Cross Street Intersects: From the South



Eastbound Speed Limit: 25 mph
Eastbound Configuration: 2 Lanes - Undivided

Westbound Speed Limit: 25 mph
Westbound Configuration: 2 Lanes - Undivided

Eastbound Right Turn Lane Warrants

1. Check for right turn volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for turn lane

Advancing Volume Threshold	AV =	982.6
Advancing Volume	Va =	633
If AV<Va then warrant is met		No

Right Turn Lane Warranted: **NO**

Eastbound Right Turn Taper Warrants
(evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

NOT WARRANTED - Less than 20 vehicles

2. Check advance volume threshold criteria for taper

Advancing Volume Threshold	AV =	-
Advancing Volume	Va =	633
If AV<Va then warrant is met		-

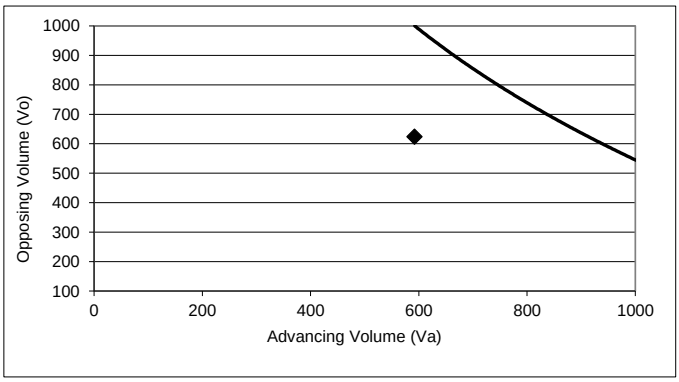
Right Turn Taper Warranted: **NO**

Westbound Left Turn Lane Warrants

Percentage Left Turns %lt 2.5 %

Advancing Volume Threshold AV 913 veh/hr

If AV<Va then warrant is met



◆ Study Intersection

Two lane roadway warrant threshold for: 25 mph

Turn lane warranted if point falls to right of warrant threshold line

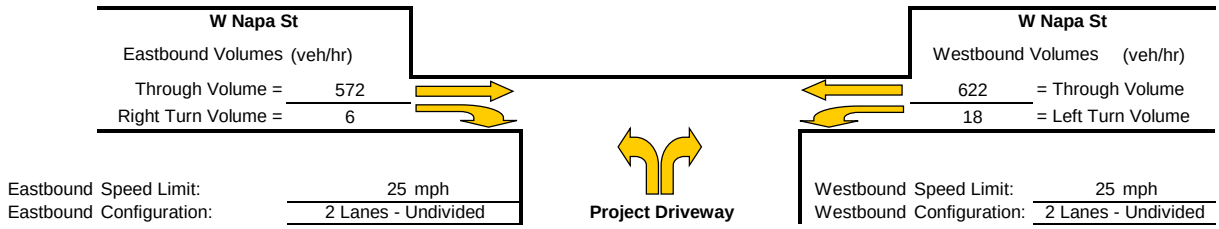
Left Turn Lane Warranted: **NO**

Methodology based on Washington State Transportation Center Research Report *Method For Prioritizing Intersection Improvements* , January 1997.
The right turn lane and taper analysis is based on work conducted by Cottrell in 1981.
The left turn lane analysis is based on work conducted by M.D. Harmelink in 1967, and modified by Kikuchi and Chakroborty in 1991.

Turn Lane Warrant Analysis - Tee Intersections

Study Intersection: West Napa St/Chateau Sonoma Dirveway
Study Scenario: Future plus Project - Weekend PM Peak Hour

Direction of Analysis Street: East/West
Cross Street Intersects: From the South



Eastbound Speed Limit: 25 mph
Eastbound Configuration: 2 Lanes - Undivided

Westbound Speed Limit: 25 mph
Westbound Configuration: 2 Lanes - Undivided

Eastbound Right Turn Lane Warrants

1. Check for right turn volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for turn lane

Advancing Volume Threshold	AV =	1005.1
Advancing Volume	Va =	578
If AV<Va then warrant is met		No

Right Turn Lane Warranted: **NO**

Eastbound Right Turn Taper Warrants
(evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

NOT WARRANTED - Less than 20 vehicles

2. Check advance volume threshold criteria for taper

Advancing Volume Threshold	AV =	-
Advancing Volume	Va =	578
If AV<Va then warrant is met		-

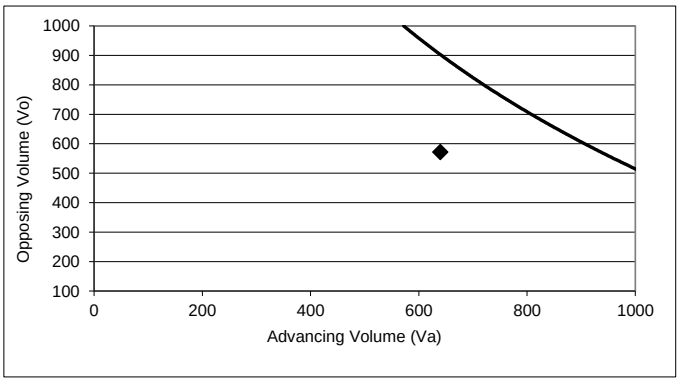
Right Turn Taper Warranted: **NO**

Westbound Left Turn Lane Warrants

Percentage Left Turns %lt 2.8 %

Advancing Volume Threshold AV 936 veh/hr

If AV<Va then warrant is met



◆ Study Intersection

Two lane roadway warrant threshold for: 25 mph

Turn lane warranted if point falls to right of warrant threshold line

Left Turn Lane Warranted: **NO**

Methodology based on Washington State Transportation Center Research Report *Method For Prioritizing Intersection Improvements* , January 1997.
The right turn lane and taper analysis is based on work conducted by Cottrell in 1981.
The left turn lane analysis is based on work conducted by M.D. Harmelink in 1967, and modified by Kikuchi and Chakroborty in 1991.