Appendix F: Traffic Report

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The San Joaquin Regional Rail Commission (SJRRC) proposes to construct a grade separation of two principal railroad lines at the Stockton Diamond in Stockton, California.

The Stockton Diamond Grade Separation Project (Project) is a critical passenger and freight mobility project. The current Altamont Corridor Express (ACE) and Amtrak San Joaquins passenger rail services are constrained by the Stockton Diamond Interlock at-grade crossing, which can reduce reliability and on-time performance for both passenger and freight rail. The grade separation would help improve operational performance for SJRRC and the San Joaquin Joint Powers Authority (SJJPA) as they provide service between the Central Valley, Sacramento, and the San Francisco Bay Area.

Currently, the BNSF Railway (BNSF) Stockton Subdivision and the Union Pacific Railroad (UP) Fresno Subdivision consist of two main tracks each, and they intersect each other at a level, at-grade crossing known as the Stockton Diamond. This rail intersection, located just south of Downtown Stockton near South Aurora Street and East Scotts Avenue, is the busiest at-grade railway junction in California. The at-grade crossing experiences substantial congestion and delays service for people and freight throughout the Central Valley—and for freight on the broader national network. The current, at-grade configuration results in critical delays to passenger and freight trains in the area, including those serving the Port of Stockton. Train congestion also causes vehicle delays at roadway-rail crossings and creates potential motor vehicle, rail, bicycle, and pedestrian conflicts.

The proposed Project would construct a grade separation of the BNSF and UP rail lines to reduce rail congestion and allow passenger and freight rail traffic to flow uninterrupted through the crossing. The reduction in rail congestion would reduce delays for passenger and freight rail providers and improve freight mobility, which may lead to lower costs for freight shipping and reduce travel times for motor vehicle, bicyclist, and pedestrian traffic. The reduction in train congestion and motor vehicle wait times at these roadway-rail grade crossings would reduce locomotive and automobile idling and air emissions.

The proposed Project's public benefits would extend to motorists, pedestrians, rail passengers, freight shippers, and residents throughout the region. Additional benefits would include reduced fuel consumption, lower freight rail transportation costs, and improved travel times and reliability. Passenger and commuter rail reliability is essential for those residing and working in the region, especially those in rural communities who need improved access to essential services and economic centers. The proposed Project is aligned with San Joaquin County's goals to enhance existing rail infrastructure and to improve the rail network's efficiency and capacity—including safe, reliable transportation choices—while also improving the local economy through economic growth, job retention, and job creation.

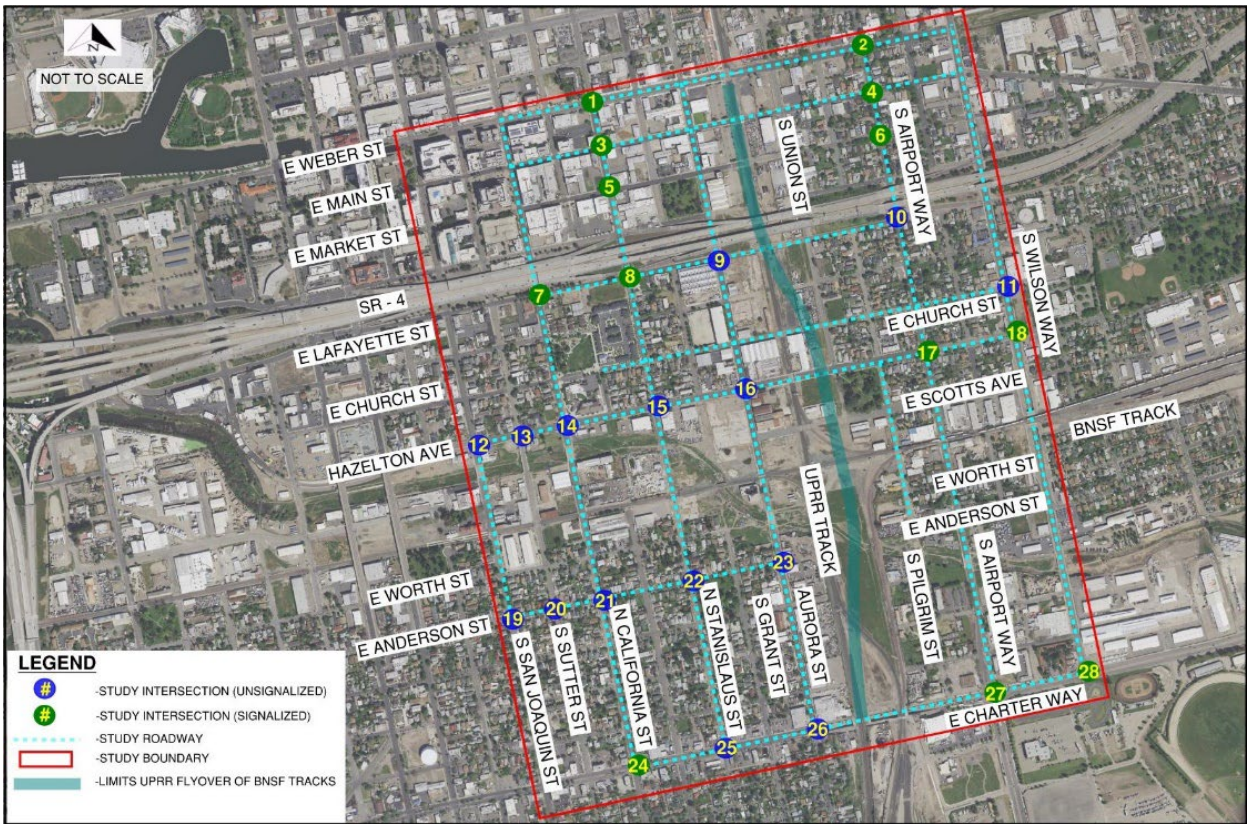
This traffic report presents the Existing, No Project Alternative (2045), and Proposed Project (2045) traffic conditions analysis for the Project. The report includes the following sections:

1. Traffic Study Area
2. Available and new data
3. Analysis approach
4. Existing traffic conditions analysis
5. No Project Alternative (2045) traffic conditions analysis
6. Proposed Project (2045) traffic conditions analysis.

1.0 Traffic Study Area

The Traffic Study Area shown in **Figure 1-1** includes the intersections, roadways, and multimodal transportation systems being analyzed for existing conditions. It will also be the basis for analyzing and presenting future conditions to be evaluated later in this project. The Traffic Study Area was defined to address the full range of potential grade separation alignment concepts recently developed for the Project. The intersections and roadways identified in the Study Area provide the foundation for the comprehensive transportation impact analysis for existing (2019), No Project (2045), and future (2045) proposed Project conditions.

Figure 1-1: Traffic Analysis Study Area and Location of Intersections



The Study Area intersections shown in **Table 1-1** include a total of 28 intersections, 13 of which are signalized in addition to 15 unsignalized intersections. Available and new data (refer to Section 2) was obtained to represent existing 2019 conditions, primarily due to COVID-19, which has limited the ability of agencies to collect observed 2020 data. Roadways analyzed for existing conditions are represented in the intersections shown in the Traffic Study Area for both north-south and east-west oriented roadways in the Study Area.

There are 7 at-grade roadway crossings of UP tracks in the Traffic Study Area. These at-grade railroad crossings are at East Weber Avenue, East Main Street, East Market Street, East Lafayette Street, East Church Street, East Hazelton Avenue and East Scotts Avenue.

Table 1-1: Intersections Located in the Traffic Study Area

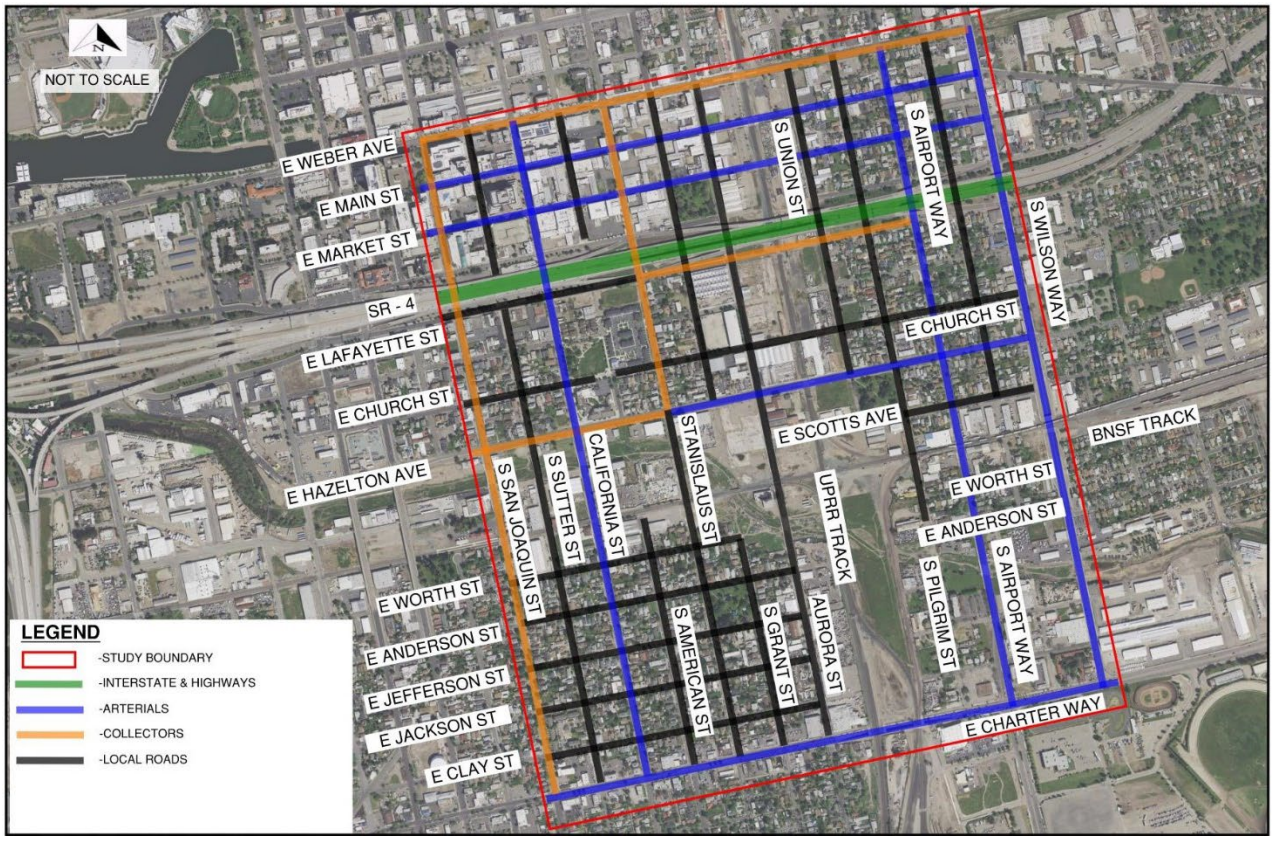
Intersection #	Intersection Name	Signalized or Unsignalized
1	S Stanislaus St /E Weber Ave	Signalized
2	S Airport Way/E Weber Ave	Signalized
3	S Stanislaus St/E Main St	Signalized
4	S Airport Way/E Main St	Signalized
5	S Stanislaus St/ E Market St	Signalized
6	S Airport Way/Market St	Signalized
7	E Lafayette Street and California Street	Signalized
8	E Lafayette Street and S Stanislaus Street	Signalized
9	E Lafayette Street and Aurora Street	Unsignalized

Intersection #	Intersection Name	Signalized or Unsignalized
10	E Lafayette Street and S Airport Way	Unsignalized
11	S Wilson Way and E Church Street	Unsignalized
12	E Hazelton Avenue and S San Joaquin Street	Unsignalized
13	E Hazelton Avenue and S Sutter Street	Unsignalized
14	E Hazelton Avenue and California Street	Unsignalized
15	E Hazelton Avenue and S Stanislaus Street	Unsignalized
16	E Hazelton Avenue and Aurora Street	Unsignalized
17	E Hazelton Avenue and S Airport Way	Signalized
18	E Hazelton Avenue and S Wilson Way	Signalized
19	E Anderson Street and S San Joaquin Street	Unsignalized
20	E Anderson Street and S Sutter Street	Unsignalized

Intersection #	Intersection Name	Signalized or Unsignalized
21	E Anderson Street and California Street	Unsignalized
22	E Anderson Street and S Stanislaus Street	Unsignalized
23	E Anderson Street and Aurora Street	Unsignalized
24	E Charter Way and California Street	Signalized
25	E Charter Way and S Stanislaus Street	Unsignalized
26	E Charter Way and Aurora Street	Unsignalized
27	E Charter Way and S Airport Way	Signalized
28	E Charter Way and S Wilson Way	Signalized

Figure 1-2 shows the roadways in the Study Area, which include freeway, arterial, collector, and local road functional classes.

Figure 1-2: Roadways by Functional Classification in the Traffic Study Area



State Route 4 (SR-4), the freeway traveling through the northern portion of the Study Area, travels east-west through the Study Area between I-5 to the west and State Route 99 (SR-99). The other roadways by functional class in the Study Area include:

- Arterials with north to south movements include California Street, S Airport Way, and South Wilson Way, and arterials with east to west movements include East Main Street, East Market Street, East Hazelton Avenue (between South Stanislaus Street and South Wilson Way) and East Charter Way
- Collectors, with north to south movements include South San Joaquin Street and South Stanislaus Street (between East Main Street and East Hazelton Avenue) with east to west collectors include East Weber Ave, East Lafayette Street (between South Stanislaus Street and South Airport Way) and East Hazelton Avenue (between South San Joaquin Street and South Stanislaus Street) identified in the Study Area
- Local Roads comprise the remainder of the Study Area roadways, with north to south movements on South Sutter Street, South American Street, South Stanislaus Street (between East Hazelton Ave and East Charter Way), South Grant Street, Aurora Street, South Union Street, and S Pilgrim Street, and with east to west movements on East Lafayette Street (between South San Joaquin Street and South Stanislaus Street), East Church Street, East Scotts Avenue, East Worth Street, East Anderson Street, East Jefferson Street, East Jackson Street, and East Clay Street.

2.0 Available and New Data

Transportation data was collected from both available and new sources to develop the existing traffic conditions for turning movements and volumes that encompass the intersections and roadways in the Traffic Study Area. These available and new sources of data were collected, combined, and formatted to represent the existing 2019 average weekday traffic conditions, which is being used as the foundation of the traffic analysis for existing conditions and the later future conditions analysis. Existing traffic conditions were defined to represent average weekday traffic conditions for 2019 based on the following factors:

- Traditionally, data collection of observed roadway volumes and intersection turning movements are scheduled for the Fall and Spring annually to avoid heavy vacation (Summer) and holiday (Winter) periods, with the Fall and Spring representative of normal commute and school travel (Note – 2020 observed data were not collected in the Study Area before COVID-19 impacts of early March 2020.)
- Available traffic data obtained and used in this analysis were collected prior to 2020, primarily due to data not being collected in 2020 due to COVID-19 (Note – 2019 volumes more accurately reflect average weekday traffic conditions. Limited, if any data has been collected in 2020 due to COVID-19.)
- The use of data prior to March 2020 has become standard practice for Traffic Impact Analysis during the Covid Pandemic. While traffic conditions have increased consistently over the last year, there are still differences in travel patterns and changes in peak conditions that cannot be projected accurately. When performing traffic projections for a long-range (2045) forecast, it is safe to assume that there will be temporary cyclical variations during the peak traffic periods. Pre-COVID conditions present a more conservative approach than relying on post-COVID counts since we have no idea when the transition to a new normal will be completed or if they will last a longer period of time.
- New 2019 data was obtained to represent average weekday travel conditions for 2019.

Available roadway volumes and intersection turning movements, multimodal (pedestrian, bicycle, bus, truck) movements, roadway and intersection geometry, intersection signal timings and controls, and multimodal infrastructure (bus routes, bicycle paths), and accident data were collected from the following sources:

- City of Stockton traffic volume maps available online from the City's website
- City of Stockton intersection turning movement, geometric, and signal timing plans
- U.S. Department of Transportation (US DOT) Road-Rail Crossing Inventory roadway volumes
- Envision Stockton, 2040 General Plan Update and Utility Master Plan Supplements Draft EIR, June 2018, Transportation Section traffic volumes, forecasts, planned infrastructure, and multimodal (roadway, pedestrian, bicycle, transit, freight) characteristics
- City of Stockton Truck Route map including STAA Truck Route map available online from the City's website

- San Joaquin Council of Governments Three-County Model (TCM) developed as part of the San Joaquin Valley Model Improvement Plan, Phase 2 (VMIP2)
- Caltrans Traffic Volume summaries (on-line) by multiple years (up to 2019) representing on- and off-ramp Average Annual Daily Traffic (AADT) and Peak Hour Volumes for state owned roadways impacting the Study Area
- San Joaquin Regional Transit District transit routes and schedules
- City of Stockton Bike Master Plan, 2017
- UC Berkeley Transportation Injury Mapping System, 2017-2019 crash data.

Upon the review and assessment of the available traffic data compiled above, while there was good coverage of average annual daily traffic (AADT) of Study Area roadways, the coverage of intersection turning movements was limited, with 4 of the 28 intersections providing representative morning and afternoon peak hour volumes.

In order to develop a more complete profile of existing turning movements for the Study Area intersections, STREETLIGHT DATA was purchased to provide turning movements for each of the 28 intersections. This supplementary (new) data included morning and afternoon peak hour turning movements for each intersection representing average weekday traffic conditions for 2019. Streetlight data was represented average weekday traffic conditions collected in the following periods:

- Collected from March 2019 to April 2019 and September 2019 to October 2019
- Tuesdays through Thursdays
- 12 AM to 12 PM.

Figure 2-1 shows the 2019 intersection turning movements developed and formatted from both the available and new data sources identified above. **Figure 2-2** shows the morning (AM) and afternoon (PM) peak hour turning movement volumes for each of the 28 intersections. In addition, morning (AM) and afternoon (PM) peak hour roadway volumes, prepared from the intersection turning movement volumes, are presented in **Figure 2-5** and **Figure 2-6**.

Figure 2-1: 2019 Turning Movement Diagrams for Study Area Intersections

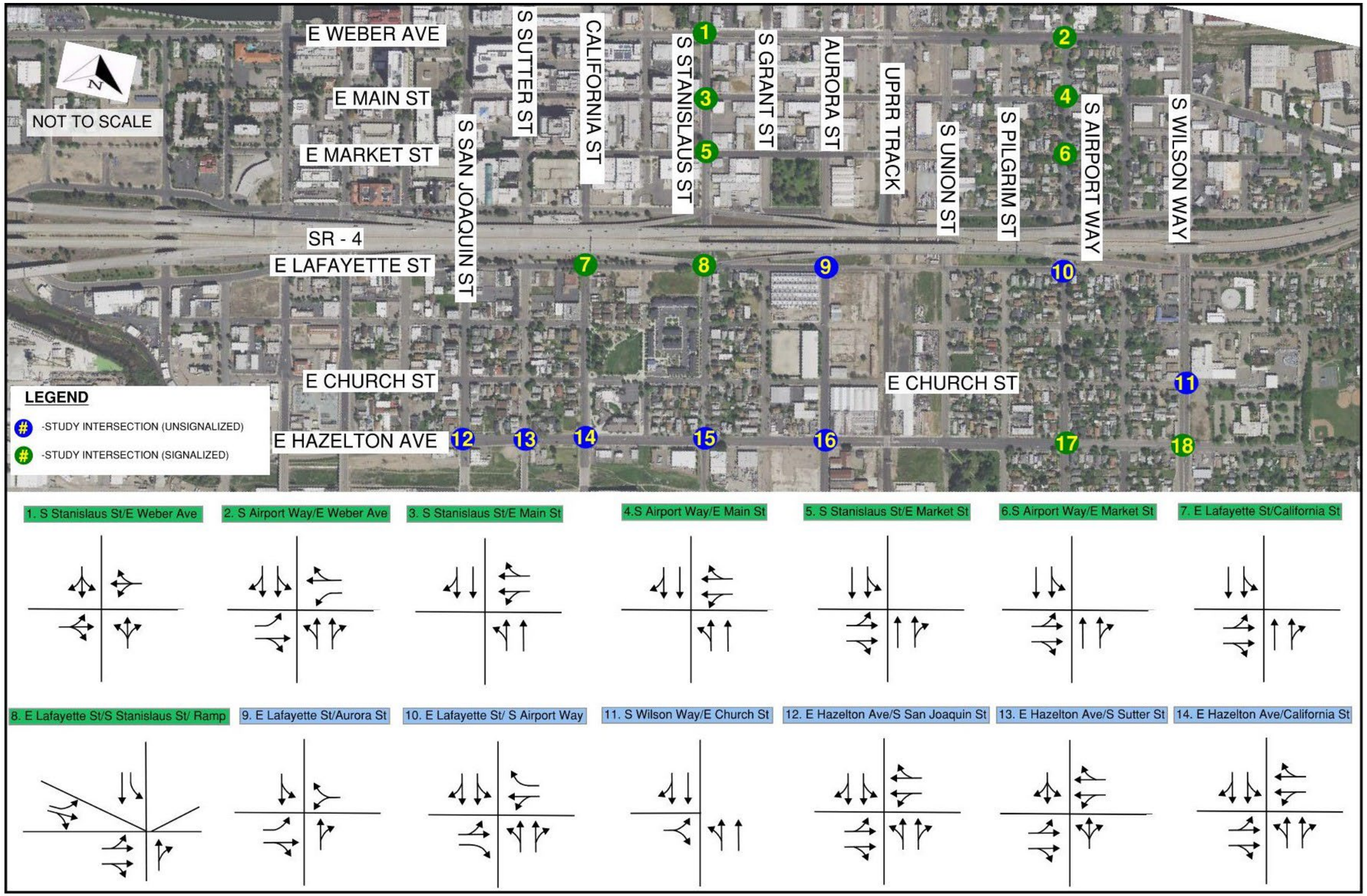


Figure 2-2: 2019 Turning Movement Diagrams for Study Area Intersections (continued)

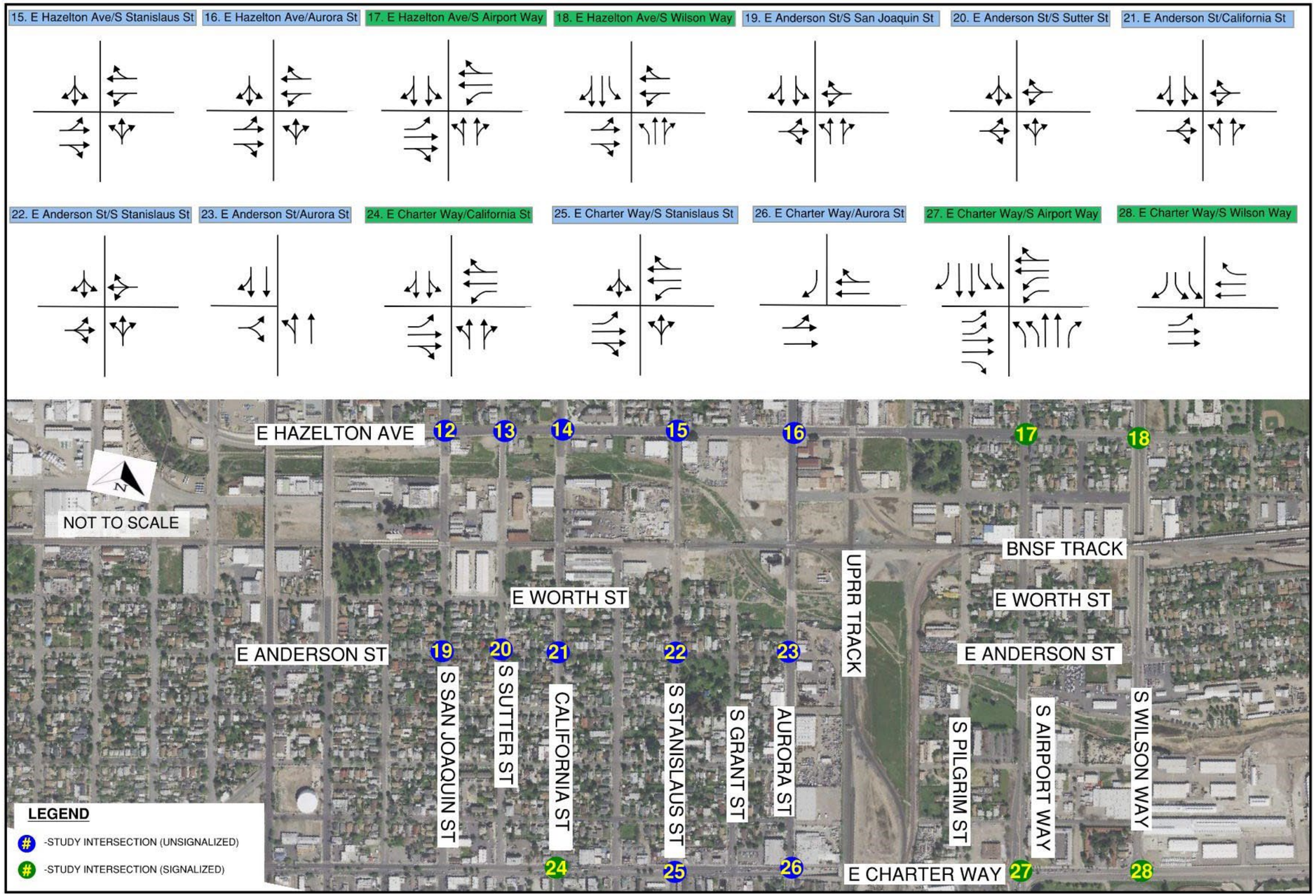


Figure 2-3: 2019 AM and PM Peak Hour Turning Movement Volumes for Study Area Intersections

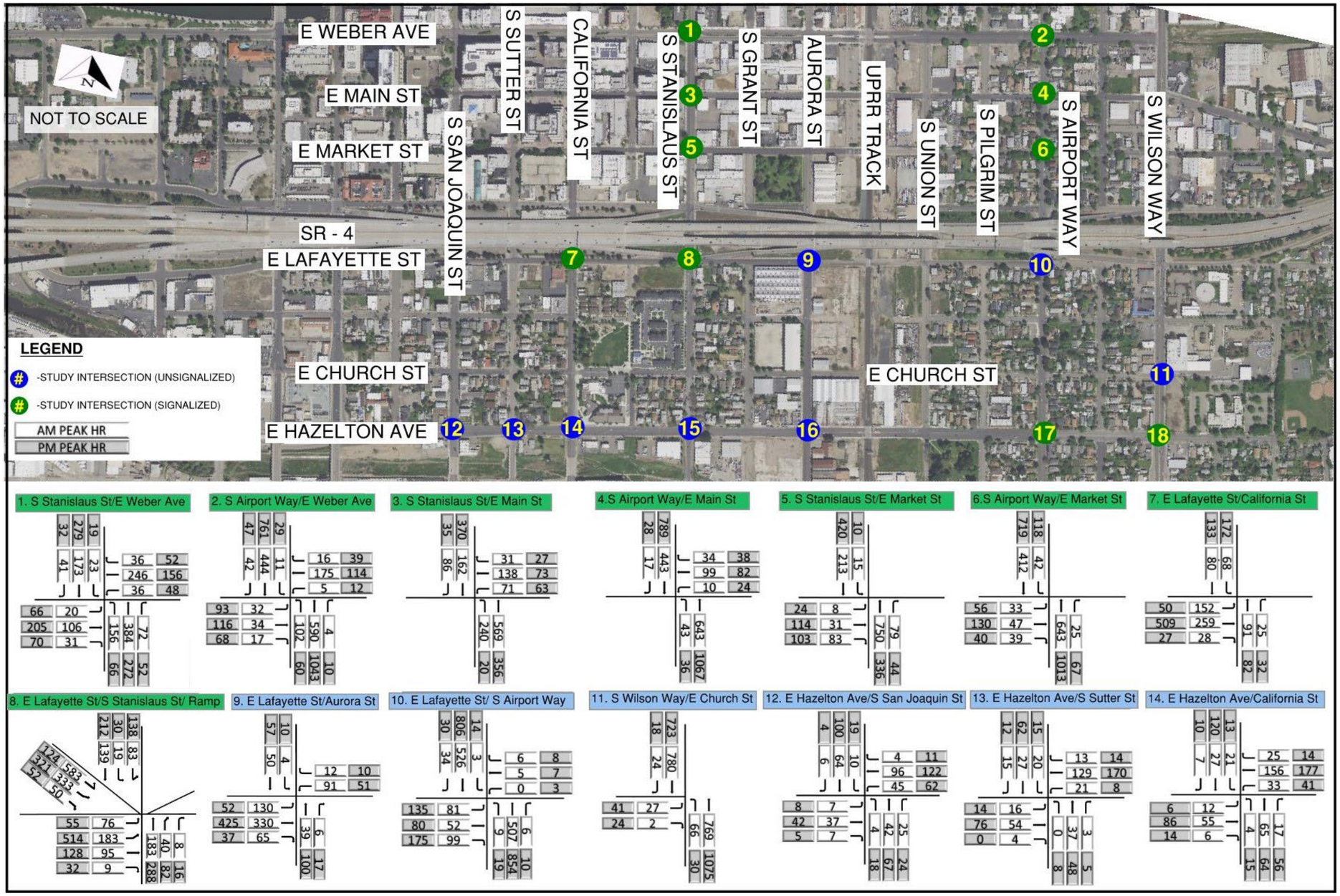


Figure 2-4: 2019 AM and PM Peak Hour Turning Movement Volumes for Study Area Intersections (continued)

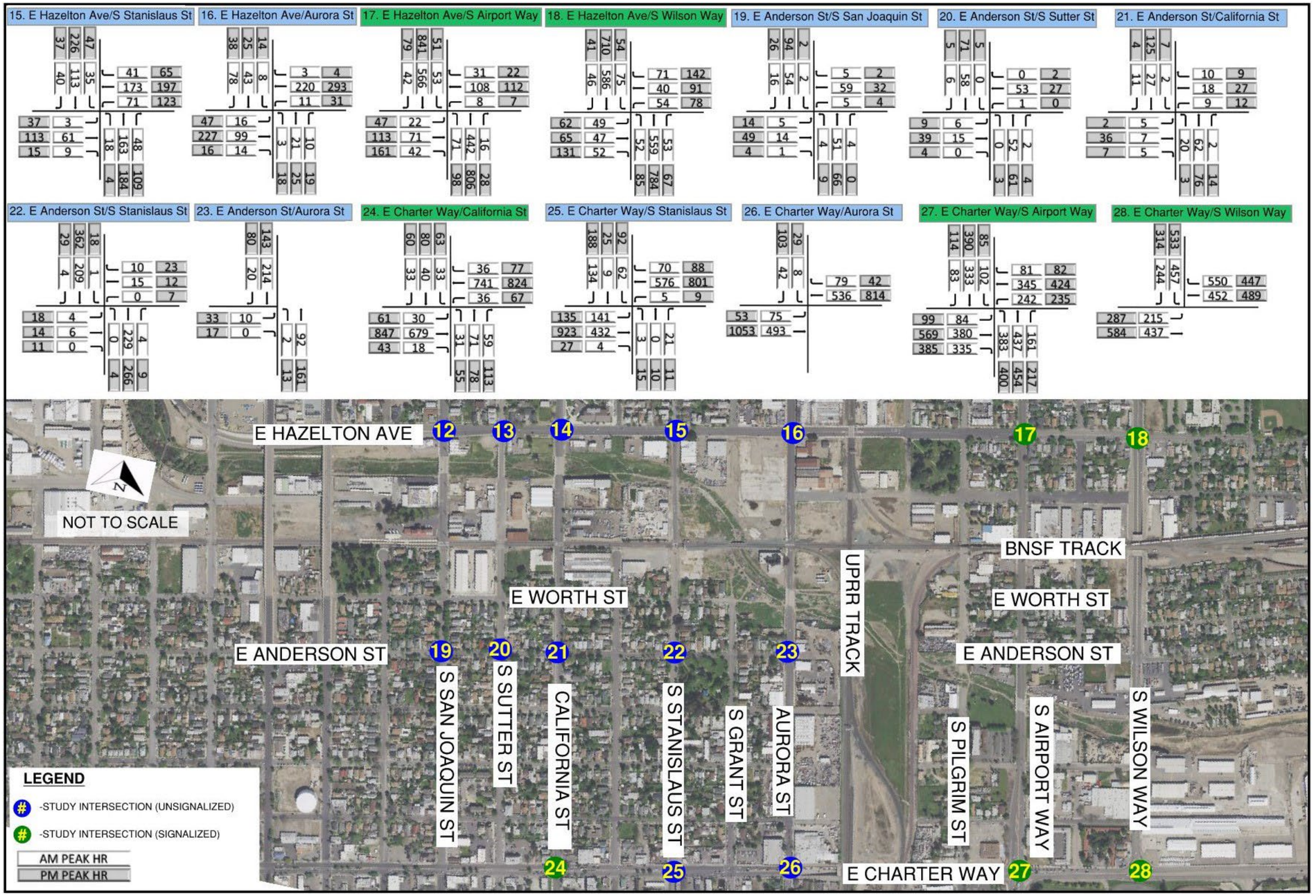


Figure 2-5: 2019 AM Peak Hour Roadway Volumes in the Study Area

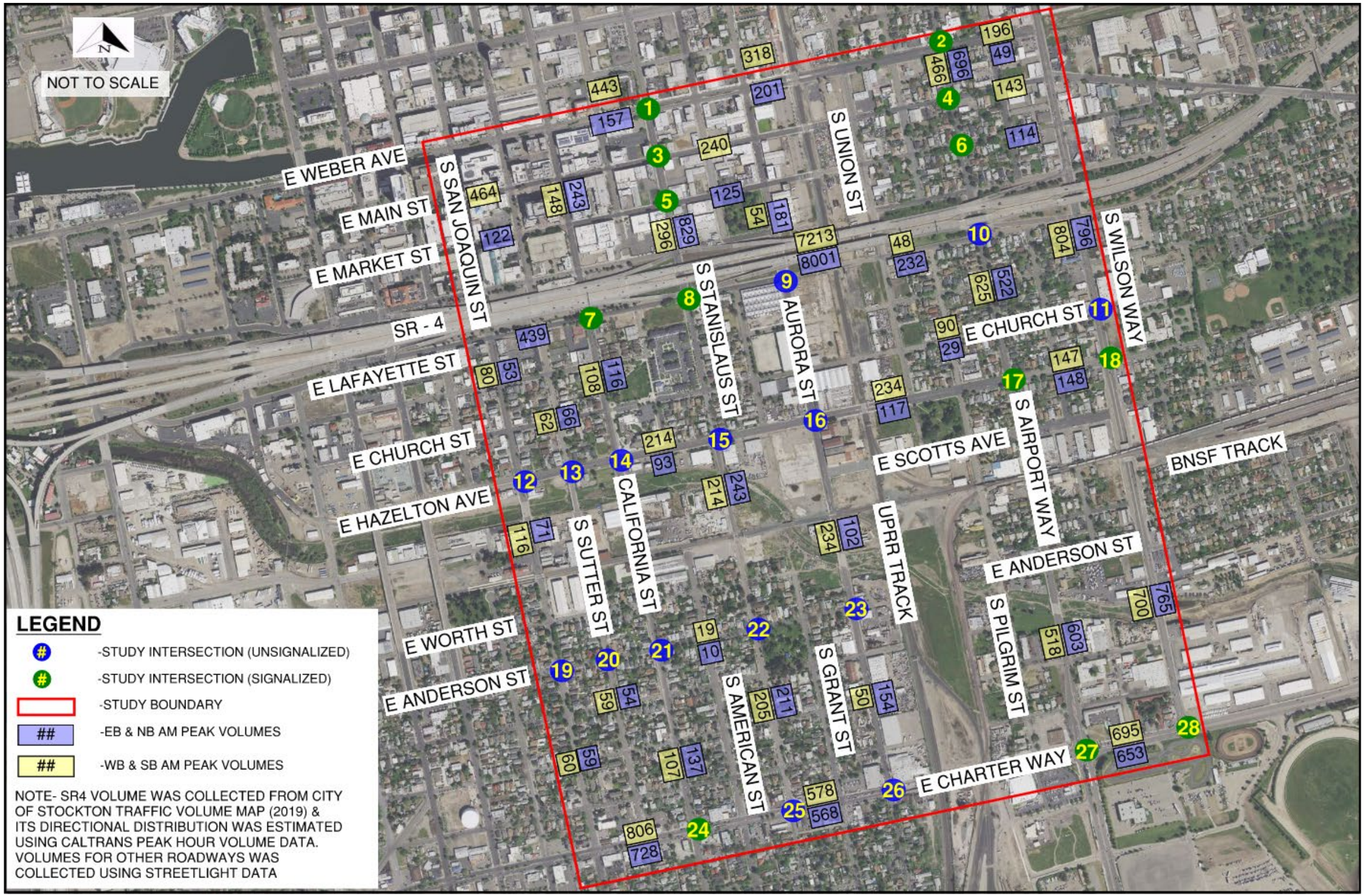
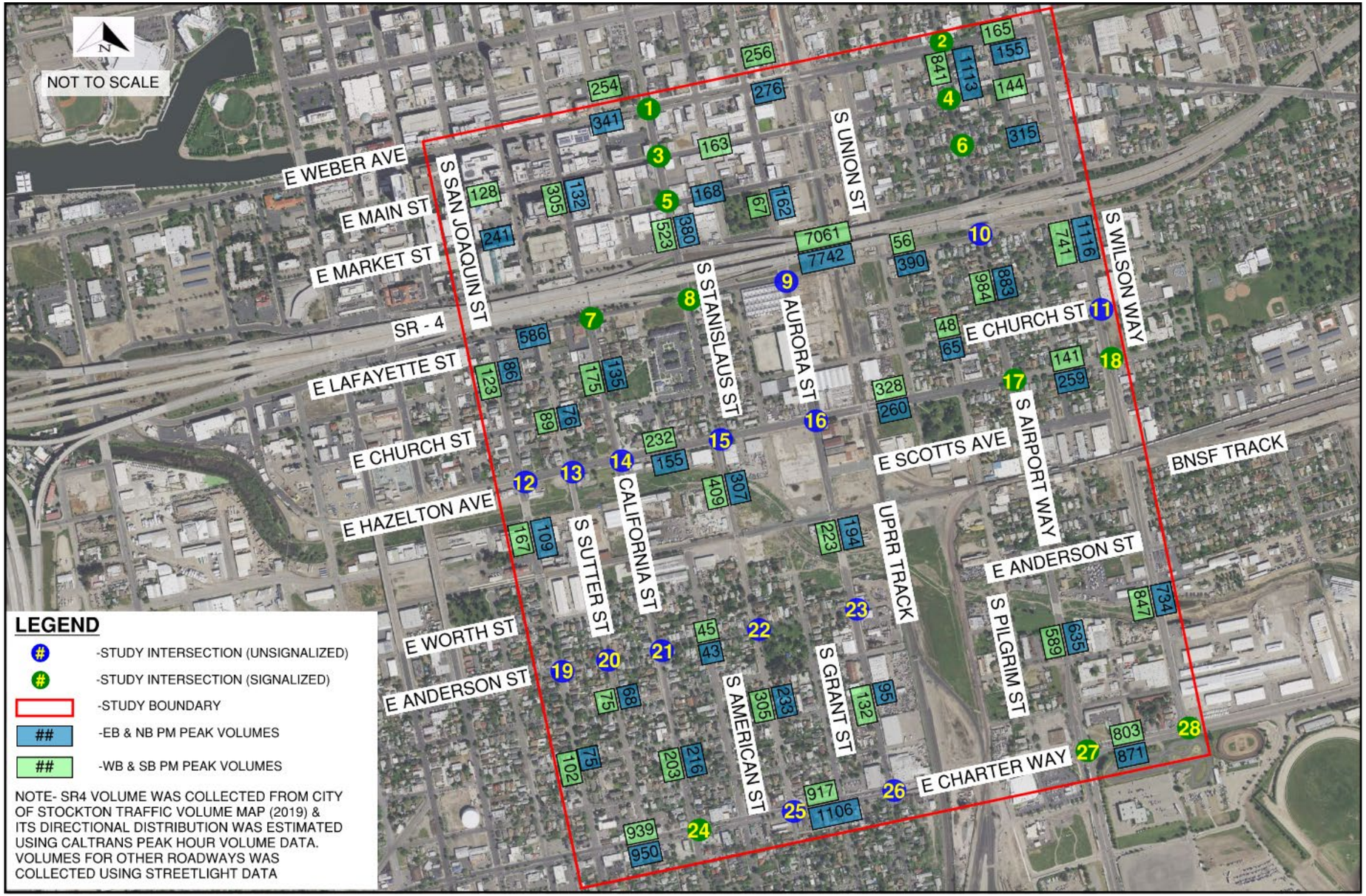


Figure 2-6: 2019 PM Peak Hour Roadway Volumes in the Study Area



3.0 Analysis Approach

This section presents the analysis methods applied to identify the 2019 existing conditions analysis for the Study Area for intersections, roadways, pedestrians, bicyclists, transit, freight, and safety.

3.1. INTERSECTION LEVEL OF SERVICE

Accepted, state-of-the practice traffic analysis methods were used to assess the morning and afternoon peak hour intersection operations and levels of service. The 2019 existing traffic profile developed and presented above in Section 2, in addition to the detailed intersection geometry and traffic signal timing and phasing, and unsignalized intersection geometry and controls, were used as primary inputs in this analysis. The intersection operational analysis procedure outlined in the 2010 *Highway Capacity Manual* was implemented using the Synchro 10 traffic analysis software.

This commonly accepted methodology and software is applied to "grade" the intersection operations with levels of service (LOS) from LOS A through LOS F, characterized by the average stopped delay per vehicle. LOS is a measure of driver and/or passenger discomfort, frustration, fuel consumption, and lost travel time. This technique uses 1,900 vehicles per hour per lane as a maximum saturation volume of an intersection, which is adjusted accordingly given varying lane widths, on-street parking availability, pedestrian movements, traffic composition, and shared lane movements at any given intersection. **Table 3-1** presents the LOS definitions and criteria used for this analysis. The City of Stockton's current General Plan designates the standard as LOS E for intersections in the Downtown area (bounded by Harding Way, the Union Pacific railroad tracks, Dr. Martin Luther King Jr. Boulevard, I-5, and Pershing Avenue). All other intersections within the City limits require intersection LOS D or better to be acceptable. Most of the study intersections are within the Downtown area and therefore the acceptable LOS is E. The study intersections along South Airport Way and along South Wilson Way are considered outside of the Downtown area which require a LOS D to be acceptable.

Table 3-1: Definitions for Signalized Intersection LOS

Average Stopped Delay Per Vehicle (seconds)	LOS Characteristics
<10.0	LOS A is typically assigned when the volume-to-capacity ratio is low and either progression is exceptionally favorable, or the cycle length is very short. If it is due to favorable progression, most vehicles arrive during the green indication and travel through the intersection without stopping.
10.1–20.0	LOS B is typically assigned when the volume-to-capacity ratio is low and either progression is highly favorable, or the cycle length is short. More vehicles stop than with LOS A.

Average Stopped Delay Per Vehicle (seconds)	LOS Characteristics
20.1–35.0	LOS C is typically assigned when progression is favorable, or the cycle length is moderate. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is substantial, although many vehicles still pass through the intersection without stopping.
35.1–55.0	LOS D is typically assigned when the volume-to-capacity ratio is high and either progression is ineffective, or the cycle length is long. Many vehicles stop and individual cycle failures are noticeable
55.1–80.0	LOS E is typically assigned when the volume-to-capacity ratio is high, progression is unfavorable, and the cycle length is long. Individual cycle failures are frequent.
>80.0	LOS F is typically assigned when the volume-to-capacity ratio is very high, progression is very poor, and the cycle length is long. Most cycles fail to clear the queue.

Source: *Highway Capacity Manual* (2010)

3.2. ROADWAY PERFORMANCE

Roadway segments were evaluated using a volume-to-capacity (v/c) ratio to measure performance. A v/c analysis is a traditional measure used to assess roadway operations where if the v/c is greater than 1.0, the roadway is over capacity and likely experiences delays. Since speed is difficult to predict for future conditions for freeway and highway segments, the v/c was used to analyze all roadway segments for both the AM and PM peak hours.

Within the traffic project area, State Route 4 (SR-4) and S Airport Way are considered Regional Congestion Management Program (RCMP) facilities by the San Joaquin County. The LOS standard established for RCMP facilities is LOS D, with the exception of the LOS F standard for SR-4 segments located in the Traffic Study Area. These standards are being used to support the roadway performance analysis presented later in Section 4.

3.3. PEDESTRIANS AND BICYCLE INVENTORY

Pedestrian movements were identified from limited available data to provide a general inventory of pedestrian movements in the Study Area. Availability of pedestrian crossings for the at-grade roadway crossings with both of the railroads (Union Pacific and Burlington Northern Santa Fe) were identified in the Study Area. The Study Area does not currently include any of the City of Stockton's Class 1 – Off-Road Bike Trail, Class 2 – On-Road Bike Lane, Class 3 – Bike Route – Mixed Traffic, and/or Class 4 - Separated Bikeway designations documented in the Envision Stockton, 2040 General Plan Update and Utility Master Plan Supplements Draft EIR, June 2018 and City of Stockton Bike Master Plan, 2017.

3.4. TRANSIT ROUTE COVERAGE INVENTORY

An inventory of the SJ RTD's transit routes and schedules that currently provide access to the Study Area was prepared, including designated Express Routes, Hopper Routes, and Local Routes.

3.5. FREIGHT INVENTORY

An inventory of the existing truck routes and intermodal (truck and rail) facilities were documented for City Truck Routes, in the Envision Stockton, 2040 General Plan Update and Utility Master Plan Supplemental Draft EIR, June 2018.

3.6. SAFETY/CRASH INVENTORY

Crash data from 2017 to 2019 was compiled from UC Berkeley's Transportation Injury Mapping System. This data encompassed detailed crash (all modes) history by intersection and roadway locations in the traffic study by fatality, severe injury, other vehicle injury, and complaint of pan injury.

4.0 Existing Traffic Conditions Analysis

This section presents the 2019 existing traffic conditions in the Study Area. Traffic, pedestrian, bicycle, transit and truck conditions were evaluated to provide a multimodal assessment of the transportation system consistent with the approach used by the city of Stockton.

4.1. INTERSECTION OPERATIONS

As presented in Section 3, the data (turning movements, geometry, signal timing, and unsignalized controls) compiled above from available and new sources were input into the Synchro 10 traffic analysis software to calculate both morning (AM) and afternoon peak (PM) hour level of service analysis for each of the 28 intersections being evaluated. **Table 4-1** summarizes existing AM and PM peak hour LOS and average delay (in seconds) at each intersection.

The results of the AM peak hour indicate that the majority of the intersections operate at excellent to good levels of service with most intersections currently operating at LOS C or better during the 2019 AM peak hour except for intersection #8, E Lafayette St/S Stanislaus St operating at LOS F.

Similarly, in the 2019 PM peak hour, most of the intersections also operate with excellent to good levels of service C or better except for the following four intersections: intersection #8, E Lafayette St/S Stanislaus St, intersection #10, E Lafayette St/S Airport Way, intersection #15, E Hazelton Ave/S Stanislaus St, and intersection #25, E Charter Way and S Stanislaus St. All three intersections except intersection #15, East Hazelton Avenue/South Stanislaus Street, operate at poor levels of service of LOS F in PM peak hour conditions. Intersection #15, East Hazelton Avenue/South Stanislaus Street operate at the City of Stockton's acceptable LOS E.

Intersection #8, E Lafayette St/S Stanislaus St has LOS F and does not meet the City of Stockton's acceptable level of service Standard (LOS E) during AM peak hour due to follow reasons:

- Higher SR4 off ramp volume

  - 54 percent of total intersection volume come from SR4 off ramp
- SR4 off ramp v/c ratio is greater than 1
  - Vehicles turning left from SR4 off ramp has v/c ratio of 1.89
  - Vehicles going thru/right from SR4 off ramp has v/c ratio of 1.25

The following intersections have LOS F and does not meet the City of Stockton's acceptable level of Standard during PM Peak hour.

Intersection #8, E Lafayette Street and South Stanislaus Street

- Higher eastbound volumes on East Lafayette Street.
  - Eastbound thru volume on E Lafayette Street (entering SR4 on ramp) totals 26 percent of total intersection volumes
- SR4 off ramp and E Lafayette St eastbound v/c ratio is greater than 1.
  - Vehicles going thru/right from SR4 off ramp has v/c ratio of 1.31
  - Vehicles entering SR4 on ramp via E Lafayette St has v/c ratio of 1.01

Intersection #10, E Lafayette St/S Airport Way

- Inadequate gaps in traffic
  - Eastbound left volume is the cause for LOS F at this intersection. Although only 6 percent of total intersection vehicles are turning left from E Lafayette St, these stop-controlled vehicles do not have sufficient gaps in traffic to make left turns because of heavy northbound/southbound movements
  - V/c ratio for eastbound direction is 3.29

Intersection #25, E Charter Way and S Stanislaus St

- Inadequate gaps in traffic
  - Northbound thru/left volume and southbound thru/left volume are the causes for LOS F at this intersection. Only 1 percent of the total intersection volumes are for northbound thru/left vehicles and only 5 percent of the total intersection volumes are for southbound thru/left vehicles. These stop-controlled vehicles do not have sufficient gaps in traffic to pass the intersection because of the heavy eastbound/westbound movements
  - V/c ratios for northbound and southbound direction are 2.71 and 3.85 respectively

Table 4-1: 2019 AM and PM Peak Hour Intersection Level of Service and Delay

	Intersection	AM		PM	
		Delay (seconds)	LOS	Delay (seconds)	LOS
1	S Stanislaus St and E Weber Ave	15.8	B	16.9	B
2	S Airport Way and E Weber Ave	11.8	B	14.5	B
3	S Stanislaus St and E Main St	9.2	A	8.8	A
4	S Airport Way and E Main St	9.6	A	7.8	A
5	S Stanislaus St and E Market St	11.8	B	8.3	A
6	S Airport Way and Market St	9.2	A	11.2	B
7	E Lafayette St and California St	16.1	B	18.3	B
8	E Lafayette St and S Stanislaus St	192.2	F	87.8	F
9	E Lafayette St and Aurora St	11.8	B	15.6	B
1	E Lafayette St and S Airport Way	6.6	A	117.6	F
1	S Wilson Way and E Church St	1.6	A	2	A
1	E Hazelton Ave and S San Joaquin St	8.3	A	8.9	A
1	E Hazelton Ave and S Sutter St	4.2	A	4.5	A
1	E Hazelton Ave and California St	8.5	A	9.3	A
1	E Hazelton Ave and S Stanislaus St	9.8	A	62.6	E
1	E Hazelton Ave and Aurora St	8.7	A	9.7	A
1	E Hazelton Ave and S Airport Way	8	A	9.8	A
1	E Hazelton Ave and S Wilson Way	14.3	B	16	B
1	E Anderson St and S San Joaquin St	7.6	A	7.9	A
2	E Anderson St and S Sutter St	7.5	A	7.6	A
2	E Anderson St and California St	3.8	A	3.3	A
2	E Anderson St and S Stanislaus St	0.9	A	1.9	A
2	E Anderson St and Aurora St	0.4	A	1.5	A
2	E Charter Way and California St	12.7	B	18.4	B
2	E Charter Way and S Stanislaus St	6.5	A	95.5	F
2	E Charter Way and Aurora St	1	A	0.7	A
2	E Charter Way and S Airport Way	21.4	C	23.3	C
2	E Charter Way and S Wilson Way	21.9	C	24.2	C

4.2. ROADWAY CONDITIONS

As summarized above in Section 3, roadway segments for both AM and PM peak hours in the Study Area were evaluated using v/c ratios to measure performance. **Figure 4-1** and **Figure 4-2** show the v/c results by roadway segment in the Study Area, for the AM peak hour and PM peak hour respectively. The following parameters and methods were used from the Highway Capacity Manual (HCM) 2010 to analyze roadway v/c ratios for local roads, arterials, collectors, and freeways:

- 1200 Vehicles/hour/lane capacity on Local Roadways
- 1780 Vehicles/hour/lane capacity on Arterials and Collectors

2400 Vehicles/hour/lane capacity on Freeways (SR-4 Crosstown Freeway).

The resulting volume to capacity (v/c) ratios for roadways in morning peak hour for 2019 include:

- Local roads
  - East Lafayette Street between South San Joaquin St and South Stanislaus Street operates at LOS B with v/c ratio of 0.37
  - All other local roads operate at LOS A with v/c ratio less than 0.30
- Collectors
  - South Stanislaus Street north of East Lafayette Street operates at LOS B with v/c ratio of 0.38
  - All other collector roads within Study Area operate at LOS A with v/c ratios less than 0.30
- Arterials
  - E Main Street, W Market Street and California Street operate at LOS A with v/c ratio less than 0.30
  - E Charter Way, S Airport Way and S Wilson Way operate at LOS B with v/c ratios between 0.31 to 0.50
- Freeways
  - SR-4 operates at LOS F with v/c ratio of 1.11

The resulting volume to capacity (v/c) ratios for roadways in afternoon peak hour include:

- Local roads
  - E Lafayette Street between S San Joaquin St and South Stanislaus Street operates at LOS B with v/c ratio of 0.48
  - All other local roads operate at LOS A with v/c ratio less than 0.30
- Collector
  - All collector roads within Study Area operate at LOS A with v/c ratios less than 0.30

  - South Stanislaus Street north of East Anderson Street also operates at LOS B with v/c ratio of 0.34
  - All collector roads within Study Area operate at LOS A with v/c ratios less than 0.30
- Arterials
  - E Main Street, E Market Street and California Street operate at LOS A with v/c ratio less than 0.30
  - E Charter Way between S San Joaquin St and Aurora St operates at LOS C with v/c ratio of 0.62
  - E Charter Way between Aurora St and S Wilson Way operates at LOS B with v/c ratio of 0.49
  - S Airport Way between E Charter Way and E Lafayette St operates at LOS B with v/c ratio of 0.49
  - S Airport Way between E Lafayette St and E Weber Ave operates at LOS C with v/c ratio of 0.63
  - S Wilson Way between E Charter Way and E Church St operates at LOS B with v/c ratio of 0.41
  - S Wilson Way between E Church St and E Weber Ave operates at LOS C with v/c ratio of 0.62
- Freeways
  - SR-4 operates at LOS F with v/c ratio of 1.08.

Figure 4-1: 2019 AM Peak Hour Roadway Volume to Capacity Ratios in the Study Area

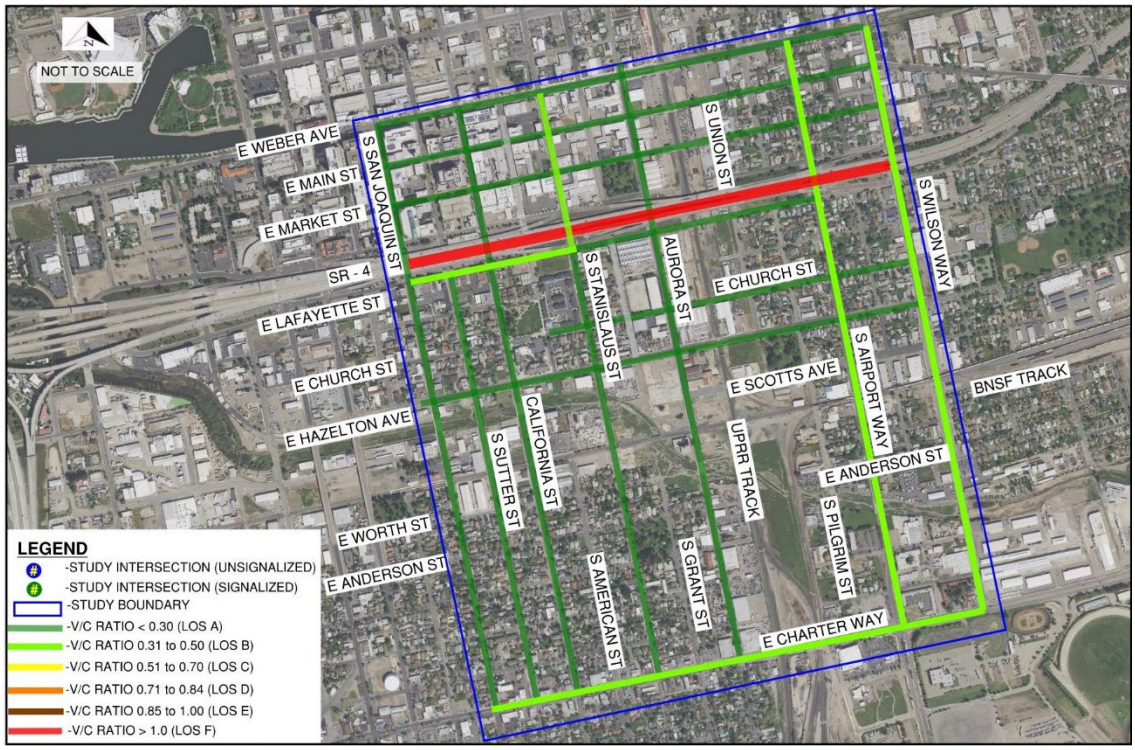
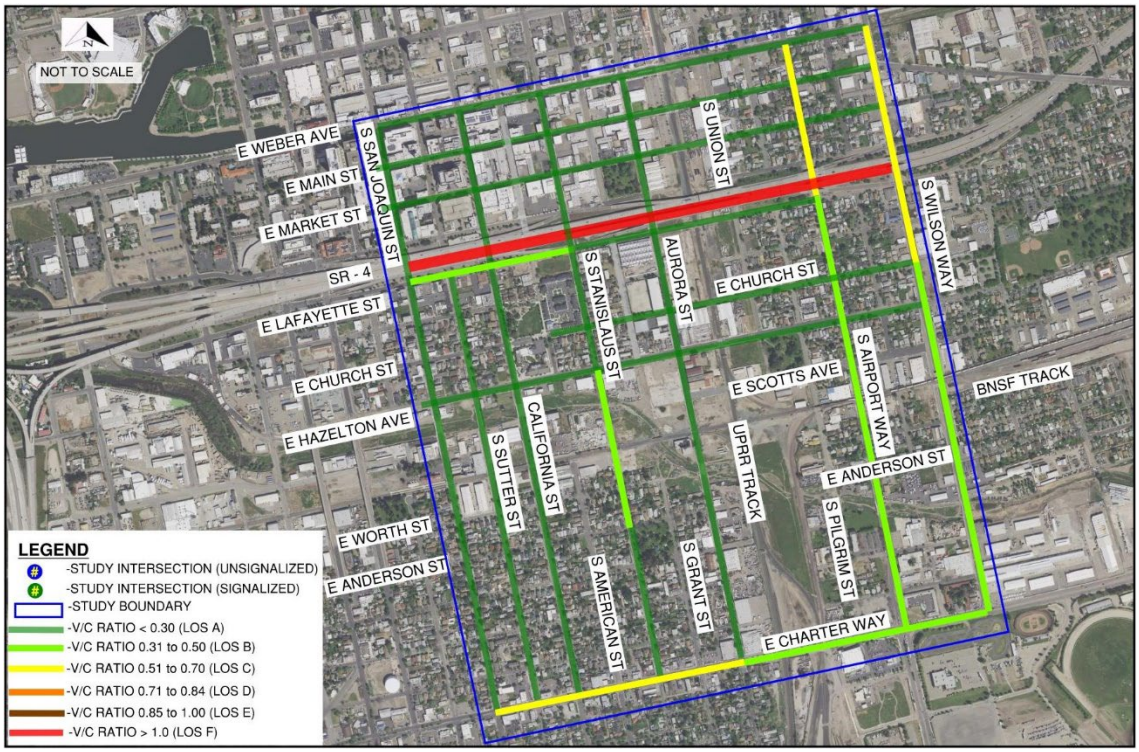


Figure 4-2: 2019 PM Peak Hour Roadway Volume to Capacity Ratios in the Study Area



4.3. EXISTING PEDESTRIAN CONDITIONS

There is limited data available to identify pedestrian activity in the Study Area. Currently, there are seven at-grade roadway crossings of UP tracks and seven at-grade roadway crossings of BNSF tracks in the Traffic Study Area. The pedestrian inventory identified only four of the 14 intersections meeting ADA compliance. **Table 4-2** below provides an inventory of pedestrian accessibility at these crossings with ADA compliance indicated. The crossings of BNSF tracks are not affected by the proposed project and therefore no improvements are planned at these crossings.

Table 4-2: Pedestrian Facilities with at-Grade Roadway/Rail Crossings in the Traffic Study Area

Intersection	Sidewalk	ADA Compliant Sidewalk	Reason for ADA Non Compliance
E Weber Ave/UPRR	Yes	No	No Sidewalk east of track
E Main St/UPRR	Yes	Yes	N/A
E Market St/UPRR	Yes	No	Missing detectable warning panel on RR crossing. Missing Audible active warning devices and automated pedestrian gates. No Sidewalk east of track
E Lafayette St/UPRR	No	No	Missing Sidewalk
E Church St/UPRR	No	No	Railroad Light Post/Crossbuck on sidewalk Missing detectable warning panel on RR crossing. Missing Audible active warning devices and automated pedestrian gates. Missing Sidewalk
E Hazelton Ave/UPRR	Yes	Yes	N/A
E Scotts Ave/UPRR	No	No	Missing Sidewalk
S San Joaquin St/BNSF	Yes	Yes	N/A

Intersection	Sidewalk	ADA Compliant Sidewalk	Reason for ADA Non Compliance
S Sutter St/BNSF	Yes	No	Railroad Light Post/Crossbuck and utility post on pedestrian travel path. Missing detectable warning panel on RR crossing. Missing Audible active warning devices and automated pedestrian gates. No southeast Sidewalk.
California St/BNSF	No	No	Railroad Light Post/Crossbuck and utility post on pedestrian travel path. Missing detectable warning panel on RR crossing. Missing Audible active warning devices and automated pedestrian gates Missing Sidewalk.
S Stanislaus St/BNSF	No	No	Missing Sidewalk
Aurora St/BNSF	Yes	No	Sidewalk exists only on the western side of the road. Missing Audible active warning devices. Missing automated pedestrian gates south of BNSF track. Flangeway gaps on RR track.
S Pilgrim St/BNSF	No	No	Missing Sidewalk
S Airport Way/BNSF	Yes	No	Railroad Light Post/Crossbuck on pedestrian travel path. Missing detectable warning panel on RR crossing. Missing Audible active warning devices and automated pedestrian gates.

4.4. BICYCLE CONDITIONS

Bikeway facilities in the Study Area include the following classes defined in the Envision Stockton, 2040 General Plan Update and Utility Master Plan Supplemental Draft EIR (also following Caltrans bike designation criteria):

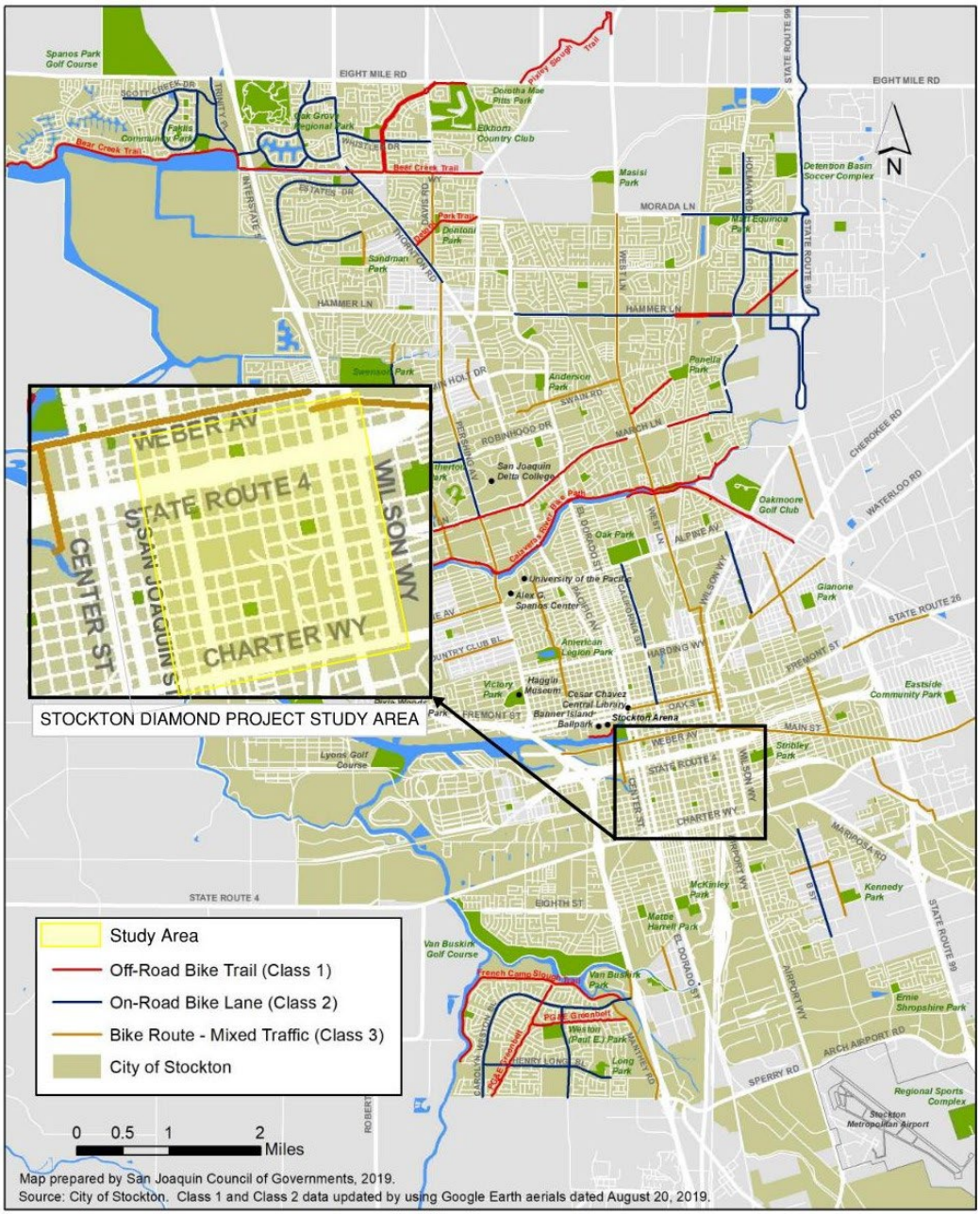
- Class 1 – Off-Road Bike Trail, facilities with exclusive right of way for bicyclists and pedestrians, away from the roadway and with cross flows by motor traffic minimized
- Class 2 – On-Road Bike Lane, facilities established along streets and defined by pavement striping and signage to delineate a portion of a roadway for bicycle travel
- Class 3 – Bike Route – Mixed Traffic, facilities designated as a preferred route for bicyclists on streets shared with motorized traffic not served by dedicated bikeways often marked by route signs
- Class 4 - Separated Bikeway, facilities established along streets and defined by not only pavement striping and signage, but also a complete separation with barriers such as on-street parking, grade separation, delineator poles to delineate a portion of roadway for bicycle travel.

Bicycle movements, based on information obtained from the City of Stockton, mirror the low level of activity shown with pedestrian movements in the Study Area. For both the AM and PM peak hours, bicycle movements are less than 1 percent of traffic volumes for a sample of Study Area intersections. There are no current designated bicycle network routes and facilities (Classes 1-4) and limited bicycle access available in the Study Area. The following takeaways from the "City of Stockton Bicycle Master Plan" mirror the bicycle facilities and movements in the Study Area:

- Lack of north/south and east/west connectors for commuters and recreational riders
- Bicycle parking is not available at most locations and bikes are often stolen
- Existing facilities are not always family friendly and many need maintenance and many traffic lights and intersections do not detect or accommodate bikes.

Figure 4-3 shows that there is no existing bicycle network (by Class 1, 2, and 3) available to users in the Study Area.

Figure 4-3: 2019 Bicycle Route Network in the Traffic Study Area

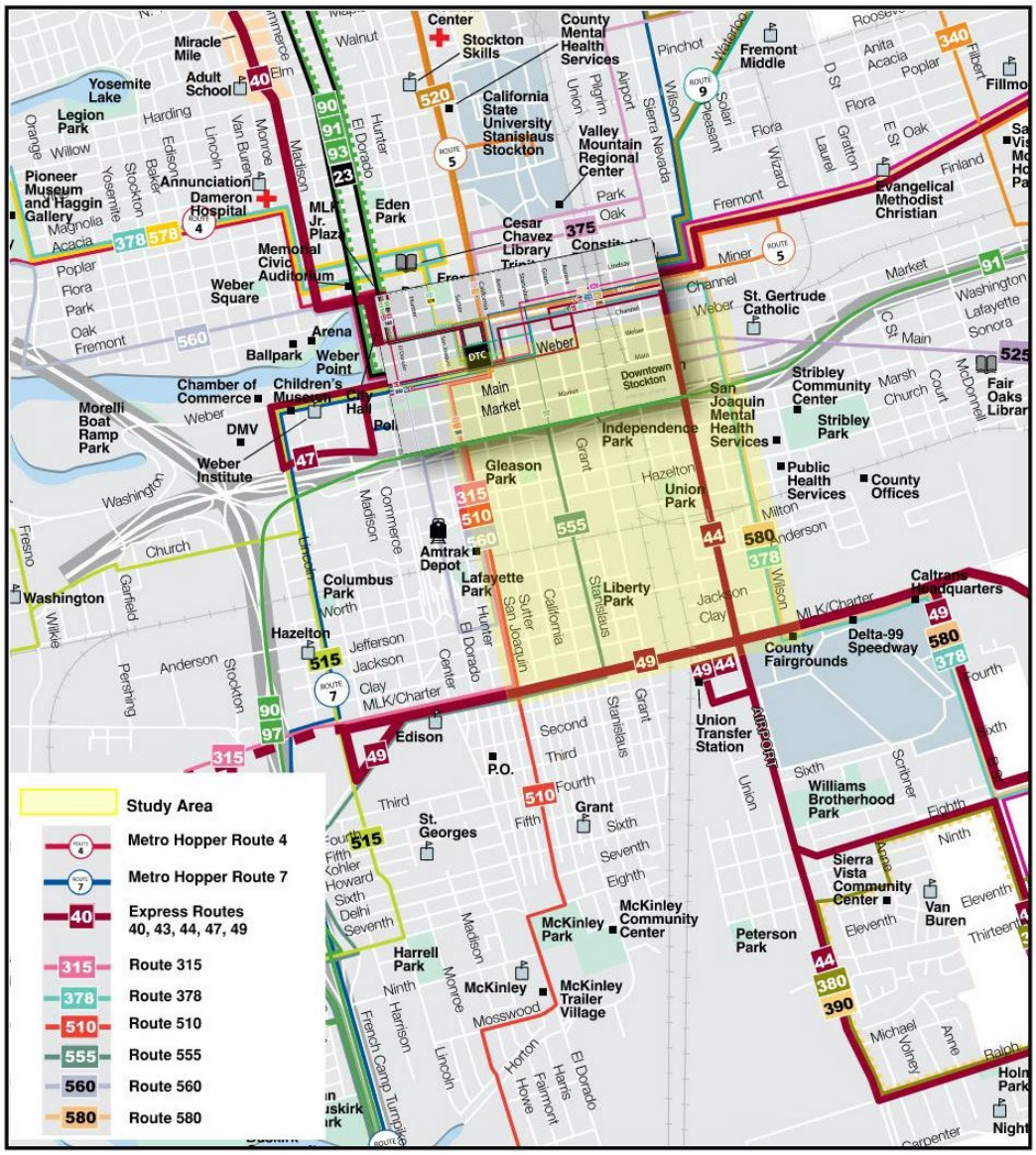


4.5. TRANSIT CONDITIONS

Public transit service in the Study Area is primarily provided by the San Joaquin Regional Transit. There are 12 transit routes within our Study Area. Metro Hopper route 4 and 7 operate on E Weber Avenue. Transit routes 315, 510, and 560 operate northbound/southbound on San Joaquin Street, transit route 555 operates northbound/southbound on S Stanislaus St, express route 44 operates northbound/southbound on S Airport Way and transit routes 378 and 580 operate northbound/southbound on S Wilson Way. Express route 49 operates eastbound/westbound on E

Charter Way, and express routes 44 and 47 operate eastbound/westbound on E Weber Ave. **Figure 4-4** shows the routes in the Traffic Study Area. Note, currently due to COVID19, San Joaquin RTD has limited services while operating typical weekend schedule during weekdays.

Figure 4-4: San Joaquin Regional Transit Routes in the Traffic Study Area

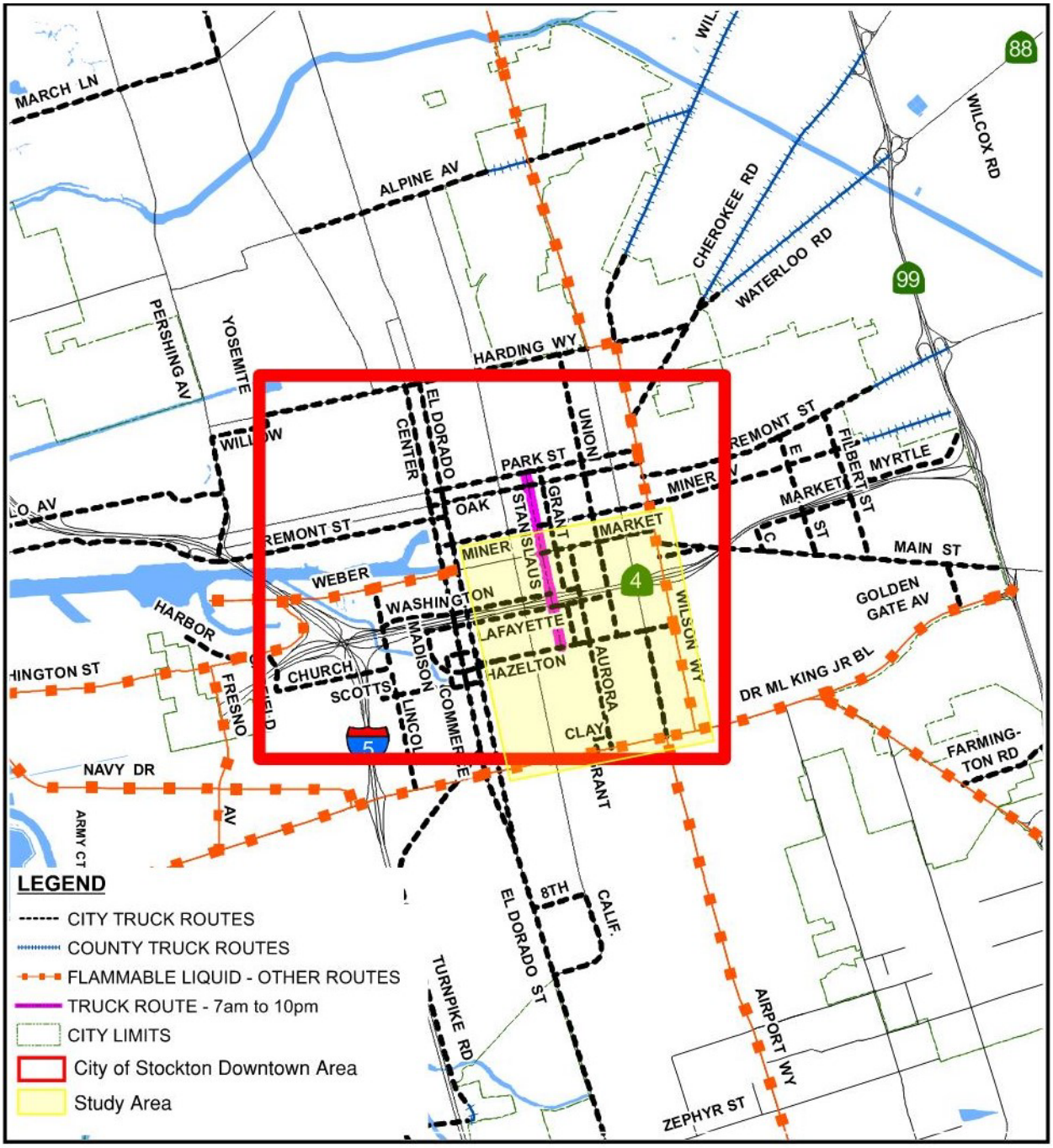


Source: San Joaquin RDT Weekday System Map

4.6. FREIGHT CONDITIONS

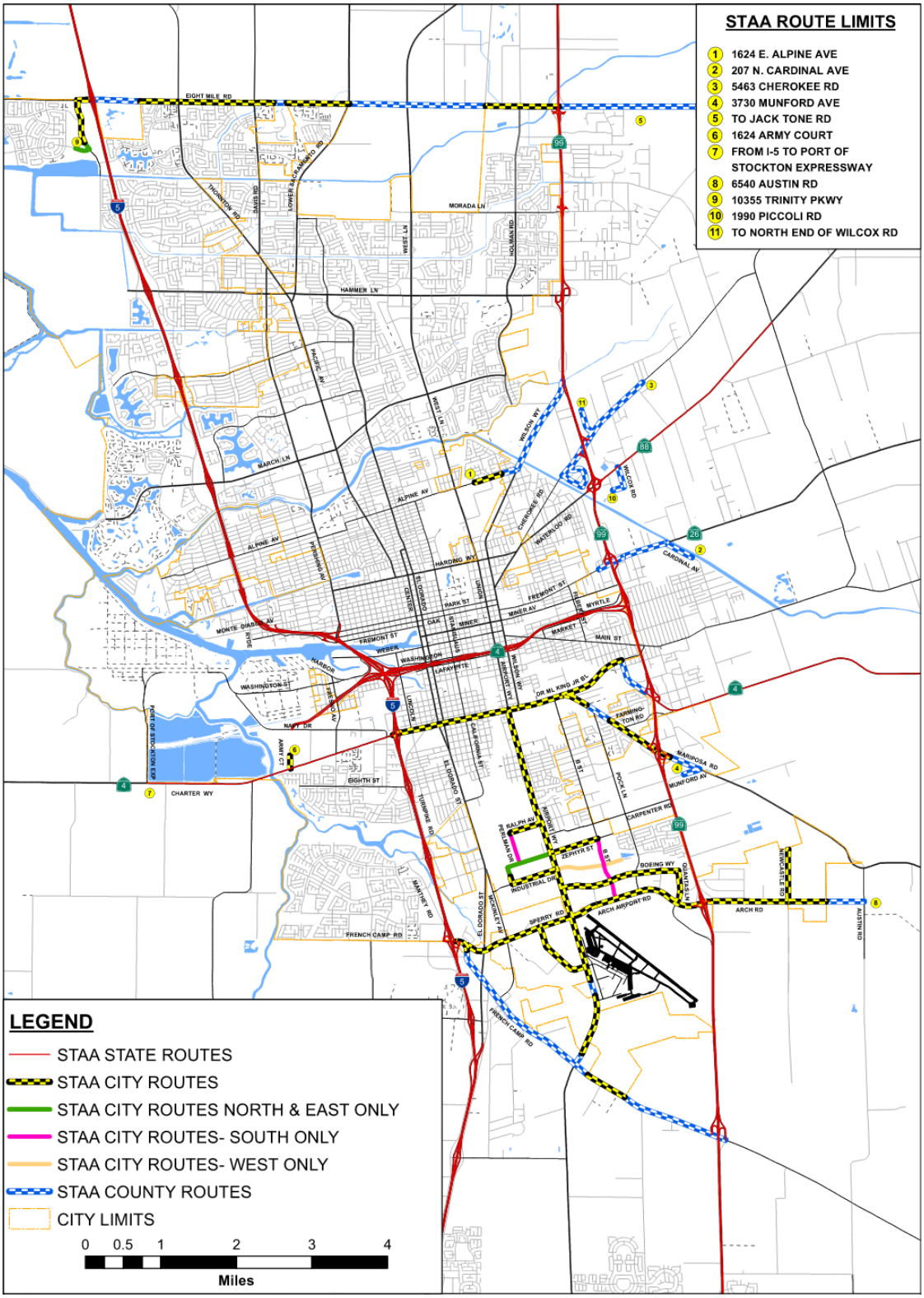
Truck routes in Stockton consist primarily of the State Highway system and major arterials within the City. **Figure 4-5** shows the truck routes operating in the Traffic Study Area and city of Stockton. **Figure 4-6** shows the STAA truck routes operating in the Traffic Study Area and city of Stockton.

Figure 4-5: Truck Route Designations in the Traffic Study Area



Source: *City Of Stockton. Truck Routes Map dated October 2009.*

Figure 4-6: STAA Truck Route Designations in the Traffic Study Area



Source: *City Of Stockton. STAA Truck Routes Map dated November 2017.*

SR 99 and I-5 are considered major truck routes connecting Central Valley cities to other metropolitan areas throughout the state, with the crosstown freeway, SR-4, and Arch-Airport Road supporting citywide truck circulation, as well as providing connections to the airport and BNSF intermodal facility. Truck route designations include City Truck Routes, County Truck Routes, Flammable Liquid-Other Routes, and Truck Routes operating from 7am to 10pm. Currently, with the exception of County Truck Routes, the Study Area includes roadways with each of the other three designations (in some cases roadways include multiple designations):

- City Truck Routes on South Airport Way, East Hazelton Avenue, East Lafayette Street, East Market Street, East Weber Ave, Aurora Street and South Union Street
- Flammable Liquid-Other Routes on East Charter Way, South Wilson Way, and South Airport Way
- Truck Route–7 am to 10 pm on South Stanislaus Street

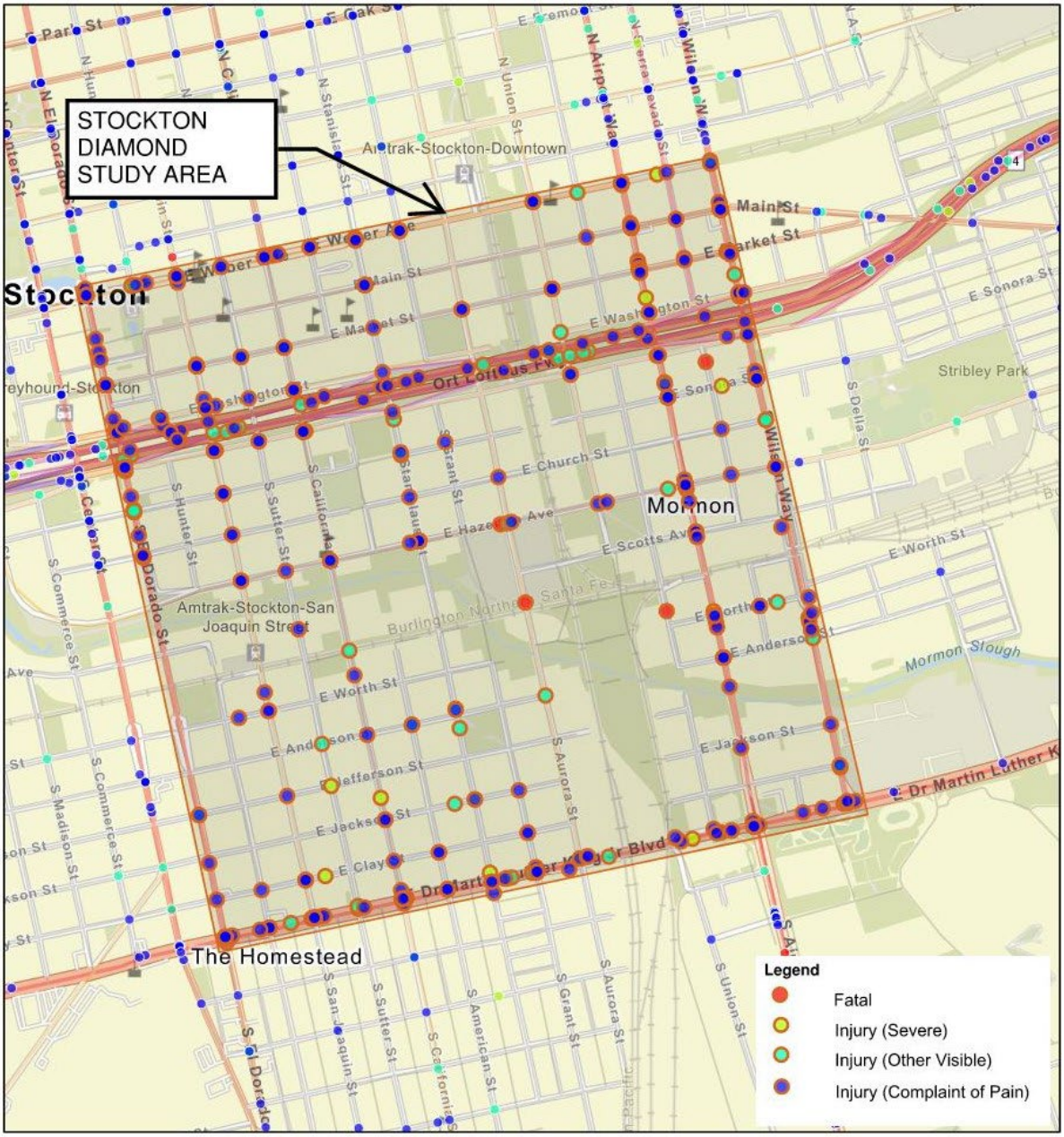
East Charter Way is the only roadway in the Study Area which is designated as an STAA truck route.

4.7. SAFETY ANALYSIS

Crash data for all transportation modes from 2017 to 2019 was compiled from the University of California Berkeley Transportation Injury Mapping System (TIMS). During this 3-year period, 562 incidents were reported within the Traffic Study Area (**Figure 4-7**). These included 12 fatalities and 790 injuries. Of the 12 fatalities, 4 were pedestrians, 4 were bicyclists, and remaining 4 were motorists.

In addition to the TIMS data, crashes that occurred at the railroad crossings published by Federal Railroad Administration (FRA) were also compiled to understand road-rail crash locations in the Traffic Study Area. This crash data from 2015 to 2019 were obtained, reviewed, and summarized in **Table 4-3**. This data also shows crashes at these locations by pedestrians, bicycles, and total vehicles. In this 4-year period, a total of 10 accidents occurred at these at-grade road/rail locations, with six involving pedestrians and bicycles (with freight trains) and four involving vehicles with trains).

Figure 4-7: 2017-2019 Multimodal Crash Locations in the Traffic Study Area



Source: *SWITRS GIS MAP-UC Berkeley Transportation Injury Mapping System (TIMS)*

Table 4-3: Accidents on at-grade Crossings between 2015 to 2019

Intersection	Injury		Fatal		Non-Injury		Total By Location
	Bike/ Ped	Vehicle	Bike/ Ped	Vehicle	Bike/ Ped	Vehicle	
E Weber Ave/UPRR						1	1
E Market St/UPRR	1						1
E Scotts Ave/UPRR						1	1
S San Joaquin St/BNSF	1		1				2
S Sutter St/BNSF	1						1
California St/BNSF	1						1
S Stanislaus St/BNSF	1						1
S Pilgrim St/BNSF						1	1
S Airport Way/BNSF						1	1
Total by Type	5	0	1	0	0	4	10

Source: Department of Transportation Federal Railroad Administration (FRA) Incident Report

5.0 No Project Alternative (2045) Traffic Condition Analysis

This section presents the expected future transportation condition in the Study Area assuming other anticipated transportation improvements (planned as part of other plans and studies) would move forward. The No Project Alternative traffic conditions does not include the proposed grade separation project being evaluated. The anticipated transportation infrastructure improvement projects, future growth rate and 2045 No Project Alternative Traffic conditions are presented in this section.

5.1. ANTICIPATED TRANSPORTATION INFRASTRUCTURE IMPROVEMENT PROJECTS

Table 5-1 shows the anticipated transportation infrastructure (intersections and roadway) improvement projects identified in the Traffic Study Area by the City of Stockton while **Table 5-2** shows the specific intersection and roadway improvements from the listing above that were built into the No Project Alternative traffic conditions analysis.

Table 5-1: Anticipated Future Changes to Transportation Infrastructure

Location	Project
E. Hazelton Avenue and S Airport Way	Signal re-modeling and sidewalk gap closure installation at railroad crossing Existing City Project PW 1902)
	Install left-turn phasing on Airport Way Existing City Project PW 1902)
E Hazelton Ave and E Stanislaus St	Conversion of side street stop-controlled intersection to all way stop controlled intersection
E. Charter Way and California Street	Traffic signal remodeling (City Project PW 1713)
E. Charter Way and Aurora Street	Sidewalk, Median, and fencing improvement (City project PW 1903)
California Street	California Street Road Diet project (City Project PW1805)
South Airport Way	South Airport Way separated Bike-way (City project PW1808)

Table 5-2: Traffic Improvements Built into the No Project Alternative traffic Conditions Analysis

Location	Project
E. Hazelton Avenue and S Airport Way	Install left-turn phasing on Airport Way
E Hazelton Ave and E Stanislaus St	Conversion of side street stop-controlled intersection to all way stop controlled intersection

Figure 5-1 shows the 2045 intersection turning movements developed from traffic improvement project identified earlier in **Table 5-2** above.

5.2. FUTURE GROWTH RATE

Traffic growth rates were required to estimate future expected 2045 traffic volumes. Several sources of available information were used to support the development of annualized traffic growth rates, including traffic volume flow maps, volumes, and reports from the City of Stockton traffic flow maps, travel model forecasts, and most recent General Plan, Caltrans counts, and discussions with City of Stockton Traffic Engineering staff, to determine an annual traffic growth rate for application in this analysis.

Based on this analysis, the City's traffic flow maps from 2015 to 2019 including a combination of major and minor roads within the Traffic Study Area including close by segments of I-5, SR-99 and SR-4 provided an annual growth rate of 0.063 percent per year. The travel demand model for the City of Stockton, which is based on population and employment estimates to determine future travel demand, considered a growth rate of between 1.0 percent to1.5 percent annually.

Based on the City's traffic consultant recommendation, annual traffic growth by major and minor roads within the Project Traffic Study Area was identified at 1.0 percent. Therefore, the average annual growth rate was computed at an average of 1.0 percent, compounded annually to 2045. This growth rate was well within the range identified by the City's consultant for this area near Downtown Stockton. The 1.5 percent annual growth rate was estimated for areas outside of/peripheral to Downtown Stockton area.

Although 1.0 percent growth rate is much higher than the computed rate of 0.063 percent (based on historical traffic counts), a conservative approach was applied using 1.0 percent annual growth rate to apply to the existing traffic volumes to estimate 2045 No Project Alternative traffic volumes. With the exception on SR4, the traffic growth rate of 0.063 percent per year was applied for this facility, which based on historical traffic volume analysis, considers zero annual growth since 2015.

5.3. FUTURE LAND USE DEVELOPMENTS IMPACTING THE STUDY AREA

HDR reached out to the City of Stockton to inquire about any future land use developments impacting the Study Area. Currently there are no planned future land use developments within or adjacent to the project's Study Area.

5.4. INTERSECTION OPERATIONS

The 2045 No Project Alternative traffic volumes were generated by applying the annualized growth rates to the 2019 existing traffic volumes. **Figure 5-2** illustrates the 2045 No Project Alternative turning movements for each of the 28 intersections being analyzed. **Figure 5-3** shows the morning (AM) and afternoon (PM) peak hour turning movement volumes for those intersections. In addition, the 2045 No Project Alternative morning (AM) and afternoon (PM) peak hour roadway volumes, prepared for the intersection turning movement volumes, are presented in **Figure 5-4** and **Figure 5-5**.

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Figure 5-1: 2045 No Project Alternative Turning Movement Diagrams for Study Area Intersections

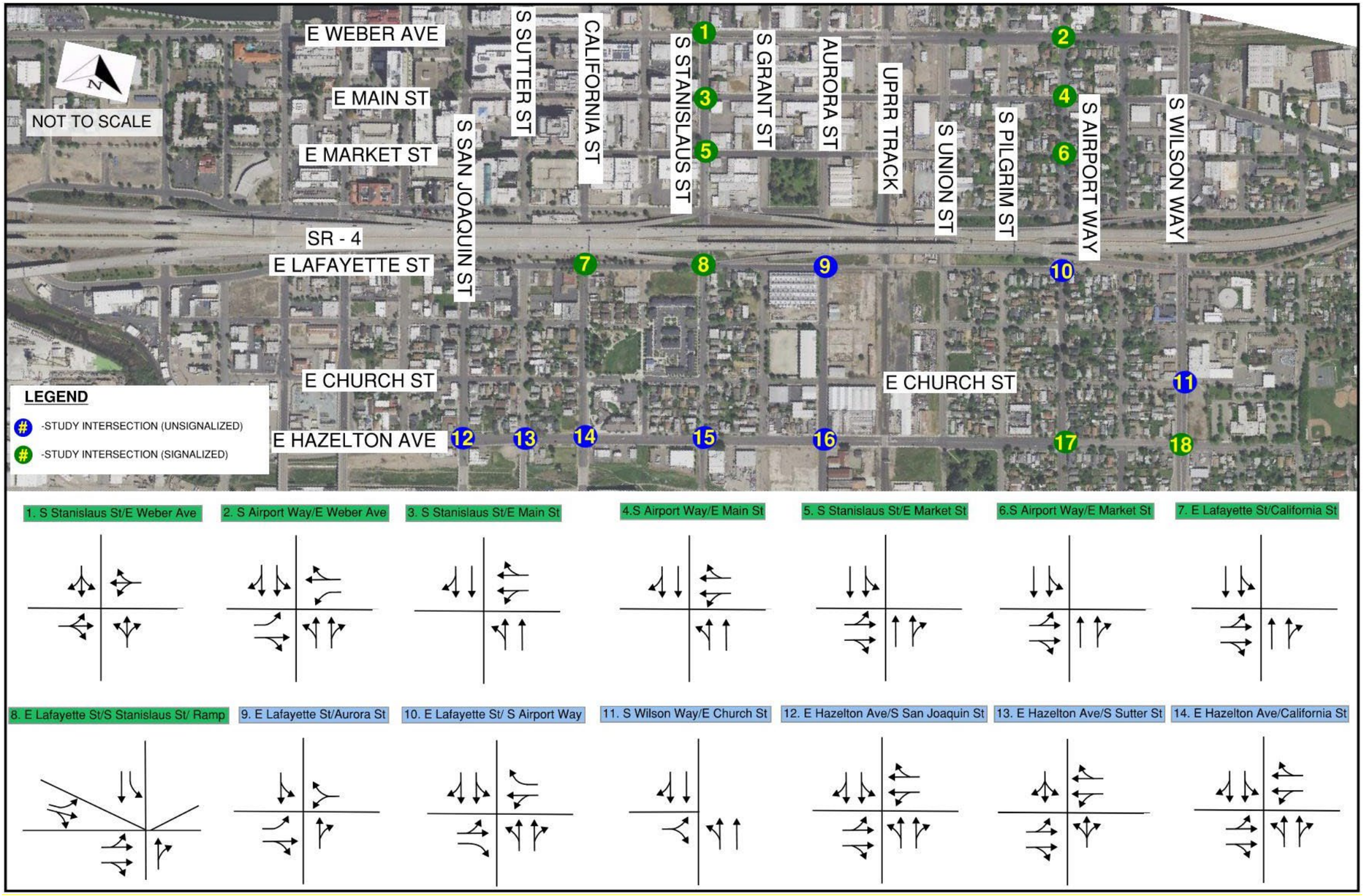


Figure 5-1: 2045 No Project Alternative Turning Movement Diagrams for Study Area Intersections (continued)

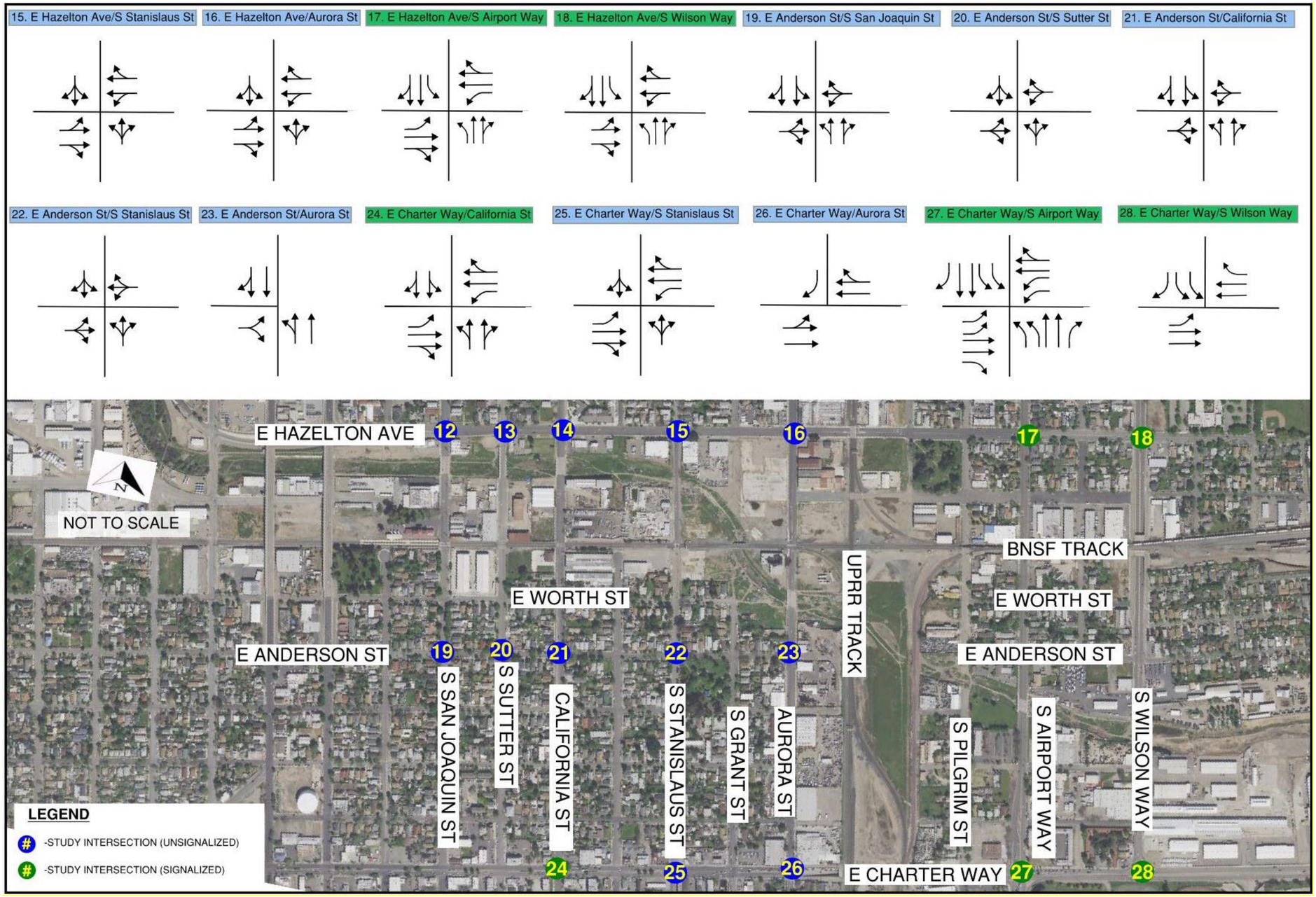


Figure 5-2: 2045 No Project Alternative AM and PM Peak Hour Turning Movement Volumes for Study Area Intersections

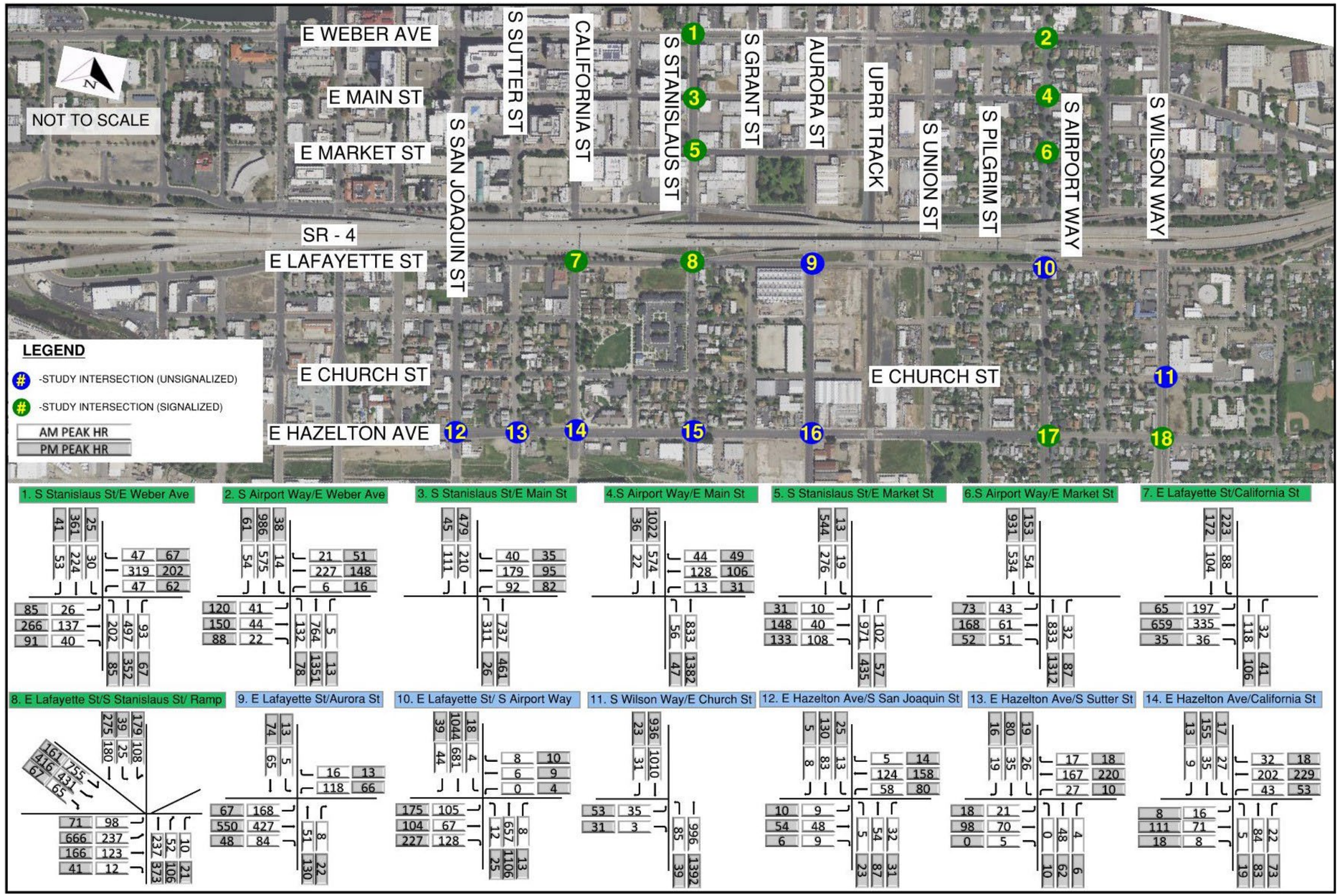


Figure 5-2: 2045 No Project Alternative AM and PM Peak Hour Turning Movement Volumes for Study Area Intersections (continued)

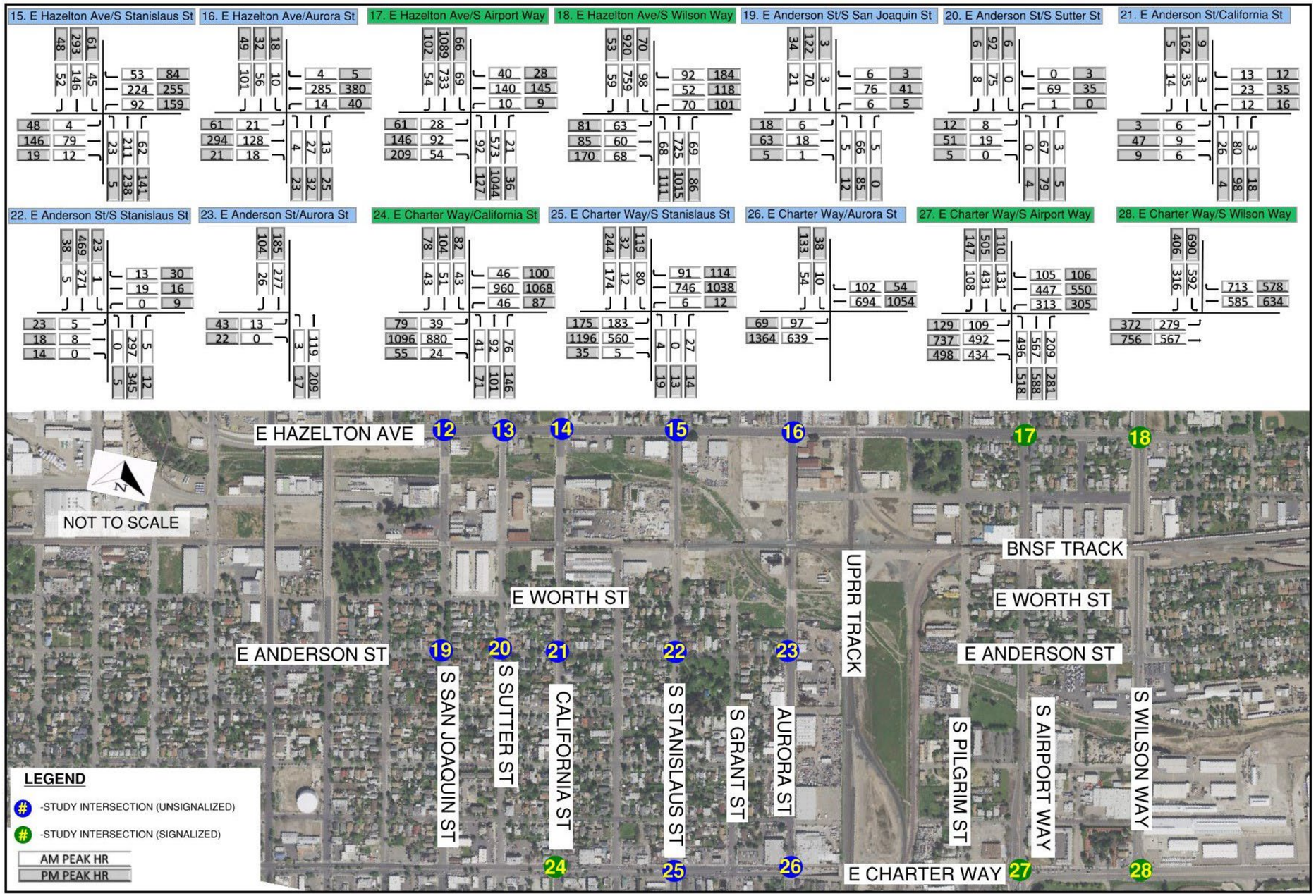


Figure 5-3: 2045 No Project Alternative AM Peak Hour Roadway Volumes in the Study Area

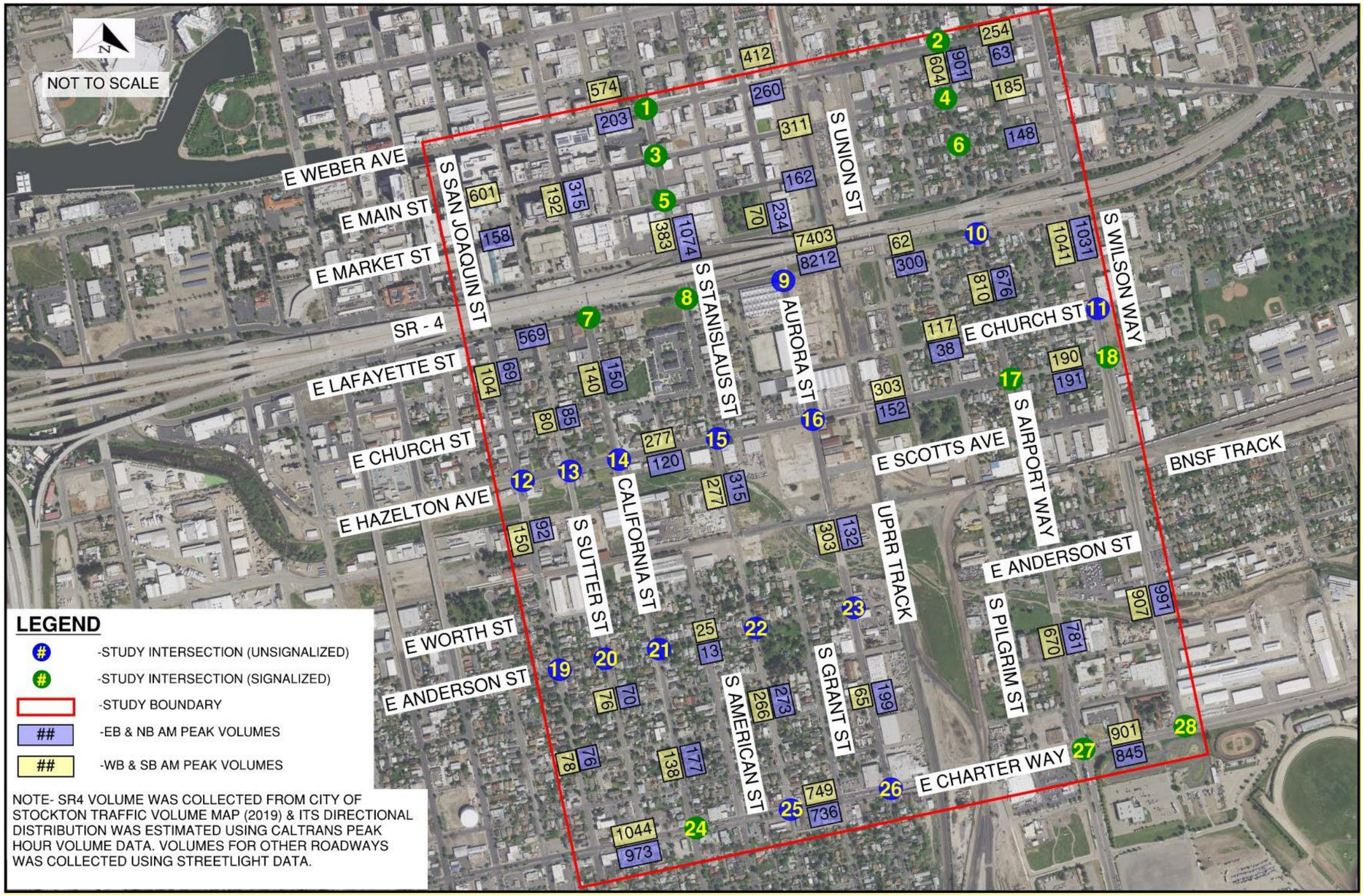
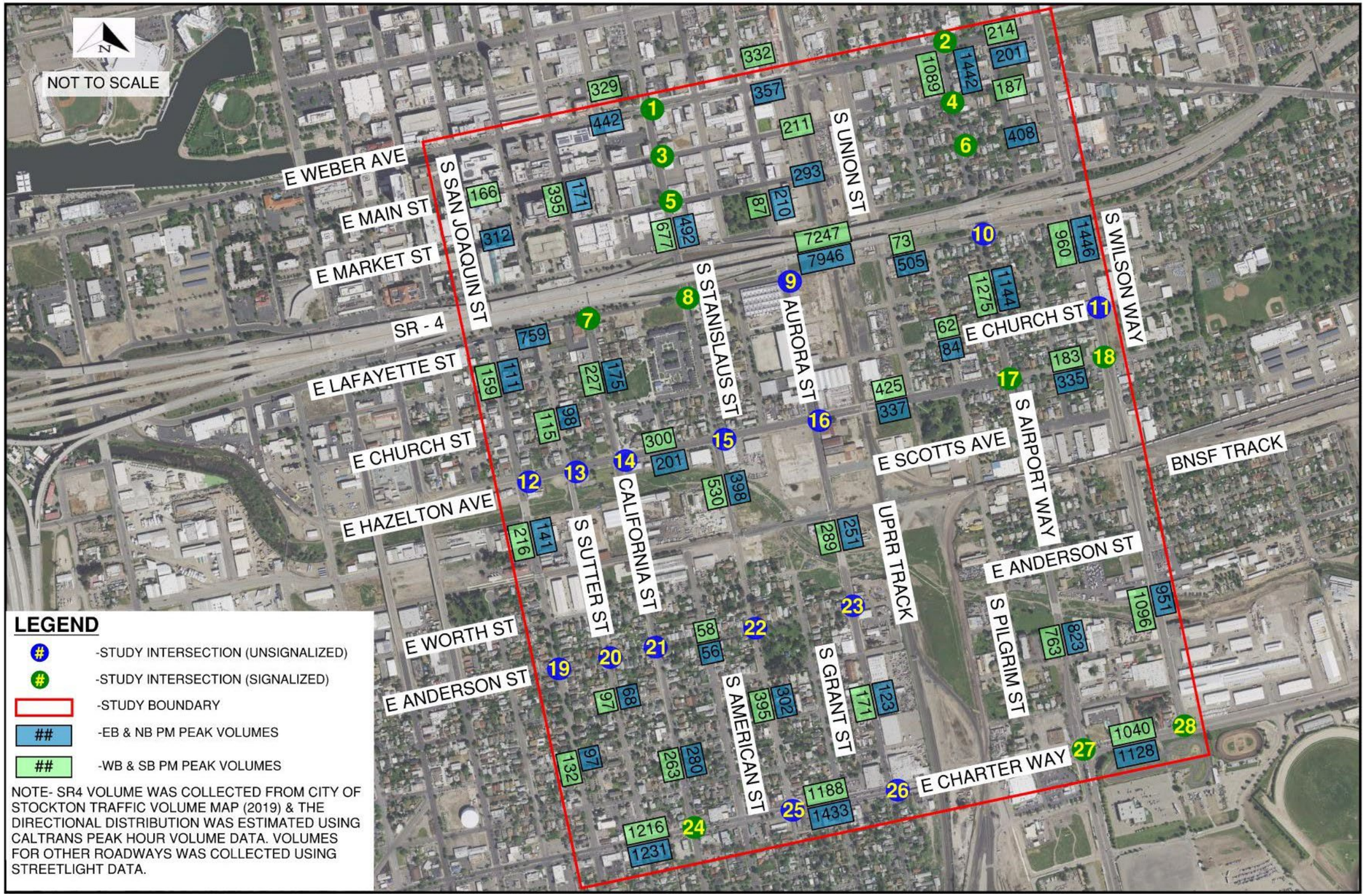


Figure 5-4: 2045 No Project Alternative PM Peak Hour Roadway Volumes in the Study Area



The 2045 No Project Alternative intersection operations were analyzed for the study intersections. Identical to the assessment of the 2019 Existing Condition, intersection operations in 2045 No Project Alternative condition were evaluated for the AM and PM peak hours. LOS analysis was conducted according to procedures outlined in the 2010 Highway Capacity Manual using Synchro 10 traffic analysis software per City and County standards. As discussed in the existing condition section, LOS E or better represents the acceptable LOS in City of Stockton.

Table 5-3 below summarizes and compares the intersection LOS results in the 2045 No Project Alternative with the Existing Conditions (2019) during the AM peak hour. All intersections operate at an acceptable LOS under the 2045 No project Alternative AM condition, except for East Lafayette Street and North Stanislaus Street (#8). This intersection is anticipated to operate at LOS F during the AM Peak hour. The increase in delay at this intersection is due to the anticipated volume increase from 2019 to 2045.

Table 5-3: Existing and 2045 No Project Alternative AM Intersection LOS Comparison

		EXISTING (AM)		2045 NO PROJECT (AM)		DIFFER-ENCE	
	Intersection	Delay (sec)	LOS	Delay (sec)	LOS	Delay Diff. (sec)	LOS Change
1	S Stanislaus St and E	15.8	B	24.2	C	8.4	B to C
2	S Airport Way and E Weber	11.8	B	14.2	B	2.4	N/A
3	S Stanislaus St and E Main	9.2	A	17.3	B	8.1	A to B
4	S Airport Way and E Main St	9.6	A	11	B	1.4	A to B
5	S Stanislaus St and E	11.8	B	13.9	B	2.1	N/A
6	S Airport Way and Market St	9.2	A	10.2	B	1	A to B
7	E Lafayette St and California	16.1	B	17.8	B	1.7	N/A
8	E Lafayette St and S	192.2	F	319	F	126.8	N/A
9	E Lafayette St and Aurora St	11.8	B	16.8	B	5	N/A
10	E Lafayette St and S Airport	6.6	A	32.1	C	25.5	A to C
11	S Wilson Way and E Church	1.6	A	5.7	A	4.1	N/A
12	E Hazelton Ave and S San	8.3	A	8.7	A	0.4	N/A
13	E Hazelton Ave and S Sutter	4.2	A	4.5	A	0.3	N/A
14	E Hazelton Ave and	8.5	A	9.1	A	0.6	N/A
15	E Hazelton Ave and S	9.8	B	13	B	3.2	N/A
16	E Hazelton Ave and Aurora	8.7	A	9.5	A	0.8	N/A
17	E Hazelton Ave and S	8	A	17.1	B	9.1	A to B

	Intersection	EXISTING (AM) Delay (sec)	LOS	2045 NO PROJECT (AM) Delay (sec)	LOS	Delay Diff. (sec)	DIFFER-ENCE LOS Change
18	E Hazelton Ave and S	14.3	B	16.3	B	2	N/A
19	E Anderson St and S San	7.6	A	7.9	A	0.3	N/A
20	E Anderson St and S Sutter	7.5	A	7.7	A	0.2	N/A
21	E Anderson St and	3.8	A	3.9	A	0.1	N/A
22	E Anderson St and S	0.9	A	1	A	0.1	N/A
23	E Anderson St and Aurora	0.4	A	0.4	A	0	N/A
24	E Charter Way and	12.7	B	14.6	B	1.9	N/A
25	E Charter Way and S	6.5	A	29.7	C	23.2	A to C
26	E Charter Way and Aurora	1	A	1.1	A	0.1	N/A
27	E Charter Way and S Airport	21.4	C	25.2	C	3.8	N/A
28	E Charter Way and S Wilson	21.9	C	25	C	3.1	N/A

Table 5-4 below summarizes and compares the intersection LOS results in the 2045 No Project Alternative with the Existing Conditions (2019) for the PM peak hour. All intersections operate at an acceptable LOS under the 2045 No Project Alternative PM conditions, except for the following intersections:

- East Lafayette Street and North Stanislaus Street (#8) – This intersection is anticipated to operate at LOS F during PM peak hour
- East Lafayette Street and South Airport Way (#10) – This intersection is anticipated to operate at LOS F during the PM peak hour
- East Charter Way and South Stanislaus Street (#25) – This intersection is anticipated to operate at LOS F during the PM peak hour

The increase in delay at intersections #8, #10, and #25 during PM peak hour is due to the anticipated volume increase from 2019 to 2045.

As shown in **Table 5-4**, the LOS and delay for East Hazelton Avenue and Aurora Street intersection (#15) improved during the 2045 No Project condition. This is due to the City's planned improvement project to convert the existing side street stop-controlled intersection to an all way stop controlled intersection (**Table 5-1**).

Table 5-4: Existing and 2045 No Project Alternative PM Intersection LOS Comparison

	Intersection	EXISTING (PM)		2045 NO PROJECT (PM)		DIFFERENCE	
		Delay (sec)	LOS	Delay (sec)	LOS	Delay Diff. (sec)	LOS Change
1	S Stanislaus St and E Weber Ave	16.9	B	23.5	C	6.6	B to C
2	S Airport Way and E Weber Ave	14.5	B	27.8	C	13.3	B to C
3	S Stanislaus St and E Main St	8.8	A	9.2	A	0.4	N/A
4	S Airport Way and E Main St	7.8	A	10.1	B	2.3	A to B
5	S Stanislaus St and E Market St	8.3	A	8.7	A	0.4	N/A
6	S Airport Way and Market St	11.2	B	35.5	D	24.3	B to D
7	E Lafayette St and California St	18.3	B	20.7	C	2.4	B to C
8	E Lafayette St and S Stanislaus St	87.8	F	174.5	F	86.7	N/A
9	E Lafayette St and Aurora St	15.6	B	36.9	D	21.3	B to D
10	E Lafayette St and S Airport Way	>180	F	>180	F	>180	N/A
11	S Wilson Way and E Church St	2	A	15.9	B	13.9	A to B
12	E Hazelton Ave and S San Joaquin St	8.9	A	9.6	A	0.7	N/A
13	E Hazelton Ave and S Sutter St	4.5	A	5.1	A	0.6	N/A
14	E Hazelton Ave and California St	9.3	A	10.3	B	1	A to B
15	E Hazelton Ave and S Stanislaus St	62.6	E	22.8	C	-39.8	E to C
16	E Hazelton Ave and Aurora St	9.7	A	11.3	B	1.6	A to B
17	E Hazelton Ave and S Airport Way	9.8	A	20.1	C	10.3	A to C
18	E Hazelton Ave and S Wilson Way	16	B	20.6	C	4.6	B to C
19	E Anderson St and S San Joaquin St	7.9	A	8.2	A	0.3	N/A
20	E Anderson St and S Sutter St	7.6	A	7.9	A	0.3	N/A
21	E Anderson St and California St	3.3	A	3.6	A	0.3	N/A
22	E Anderson St and S Stanislaus St	1.9	A	2.5	A	0.6	N/A
23	E Anderson St and Aurora St	1.5	A	1.6	A	0.1	N/A
24	E Charter Way and California St	18.4	B	23.1	C	4.7	B to C

25	E Charter Way and S Stanislaus St	95.5	F	>180	F	110.3	N/A
26	E Charter Way and Aurora St	0.7	A	1.4	A	0.7	N/A
27	E Charter Way and S Airport Way	23.3	C	28.8	C	5.5	N/A
28	E Charter Way and S Wilson Way	24.2	C	27.4	C	3.2	N/A

[1]In Synchro, calculations of >180 seconds conditions cannot be fully represented in the simulation model and are not accurately predictable leading to unacceptable LOS.

5.5. ROADWAY CONDITIONS

Roadway segment operations were analyzed for 2045 in the No Project Alternative Conditions. As with the assessment of the 2019 Existing Condition, roadway segments were evaluated using v/c ratios to measure the roadway performance, where a v/c ratio of 1.0 or above represents failure or LOS F.

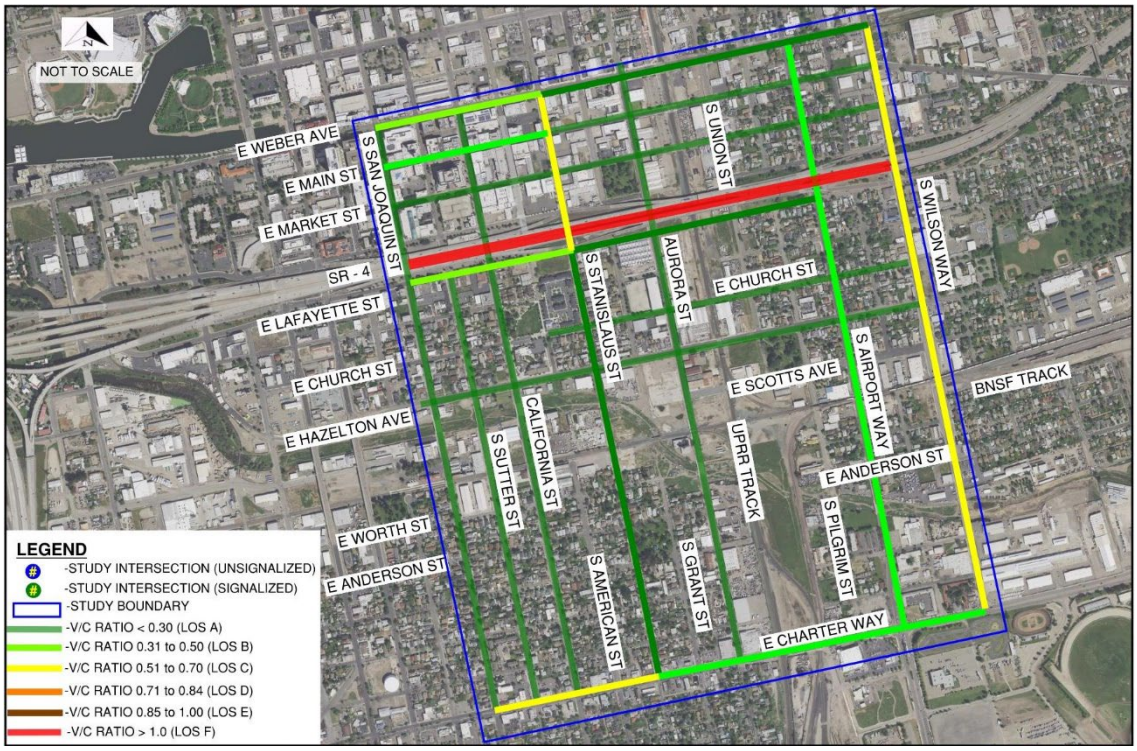
With the exception of SR 4 (Crosstown Freeway), all of the roadway levels of service in the Traffic Study Area are expected to perform at LOS E or better in the No Project Alternative condition. The resulting volume to capacity (v/c) ratios for roadways in the AM peak hour for the 2045 No Project Alternative condition are summarized in **Table 5-5** and shown in **Figure 5-5**.

Table 5-5: 2045 No Project Alternative Condition AM Peak Roadway v/c ratio and LOS

Road	Location	Roadway Classification	V/C Ratio	LOS
East Weber Ave	Between South San Joaquin Street and South Stanislaus Street	Collector	0.32	B
East Main Street	Between South San Joaquin Street and South Stanislaus Street	Arterial	0.34	B
SR 4	Between South San Joaquin Street and South Wilson Way	Freeway	1.14	F
East Lafayette Street	Between South San Joaquin Street and South Aurora Street	Local	0.47	B
East Charter Way	Between South San Joaquin Street and South Stanislaus Street	Arterial	0.59	C
East Charter Way	Between South Stanislaus Street and South Wilson Way	Arterial	0.50	B
South Stanislaus Street	North of East Lafayette Street	Collector	0.62	C
South Airport Way	Between East Weber Avenue and East Lafayette Street	Arterial	0.50	B
South Airport Way	Between East Lafayette Street and East Hazelton Avenue	Arterial	0.45	B

South Airport Way	Between East Hazelton Avenue and East Charter Way	Arterial	0.43	B
South Wilson Way	Between East Weber Avenue and East Church Street	Arterial	0.58	C
South Wilson Way	Between East Church Street and East Church Street	Arterial	0.56	C
All other Roadway Segments	-	-	<0.30	A

Figure 5-5: 2045 No Project Alternative v/c Ratio and LOS, AM Peak Hour

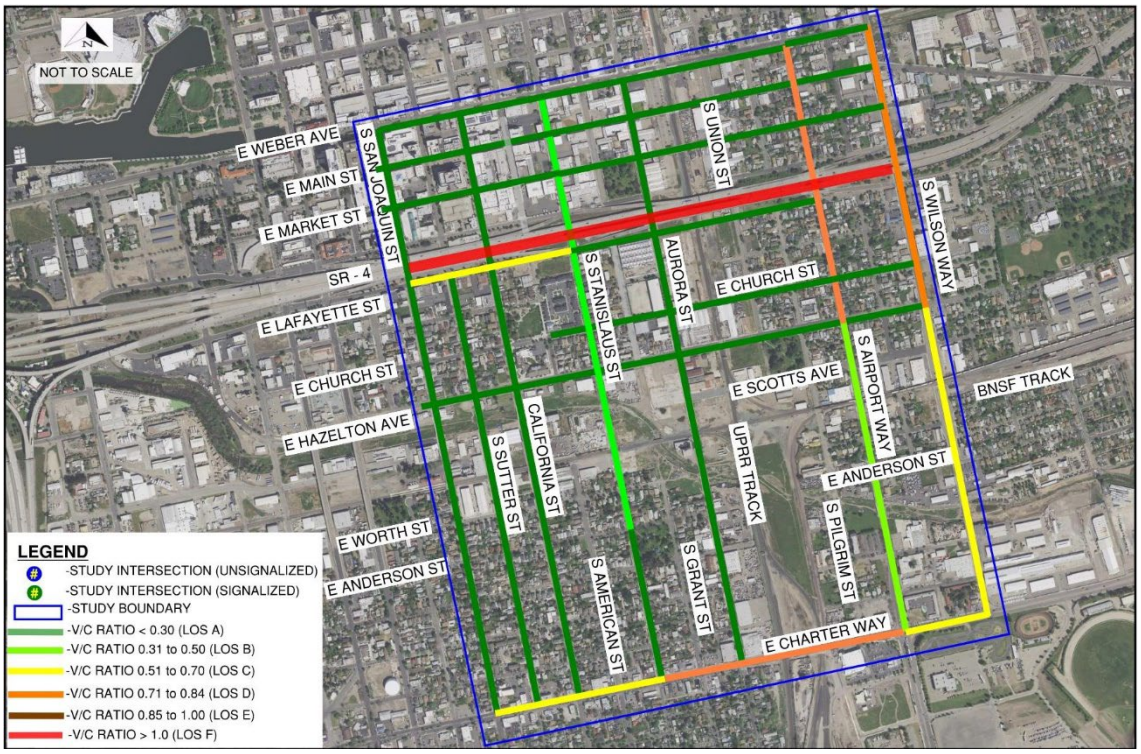


The resulting volume to capacity (v/c) ratios for roadways in the 2045 No Project Alternative condition PM peak hour are summarized in **Table 5-6** and shown in **Figure 5-6**.

Table 5-6: 2045 No Project Alternative Condition PM Peak Roadway v/c ratio and LOS

Road	Location	Roadway Classification	V/C Ratio	LOS
SR 4	Between South San Joaquin Street and South Wilson Way	Freeway	1.10	F
East Lafayette Street	Between South San Joaquin Street and South Stanislaus Street	Local	0.63	C
East Charter Way	Between South San Joaquin Street and South Aurora Street	Arterial	0.69	C
East Charter Way	Between Aurora Street and South Airport Way	Arterial	0.80	D
East Charter Way	Between South Airport Way and South Wilson Way	Arterial	0.63	C
South Stanislaus Street	North of East Hazelton Avenue	Collector	0.39	B
South Stanislaus Street	Between East Hazelton Avenue and East Anderson Street	Local	0.44	B
South Airport Way	Between East Weber Avenue and East Lafayette Street	Arterial	0.81	D
South Airport Way	Between East Lafayette Street and East Hazelton Avenue	Arterial	0.72	D
South Airport Way	Between East Hazelton Avenue and East Charter Way	Arterial	0.46	B
South Wilson Way	Between East Weber Avenue and East Hazelton Avenue	Arterial	0.81	D
South Wilson Way	Between East Hazelton Avenue and East Charter Way	Arterial	0.62	C
All other Roadways	-	-	<0.30	A

Figure 5-6: 2045 No Project Alternative v/c Ratio and LOS, PM Peak Hour



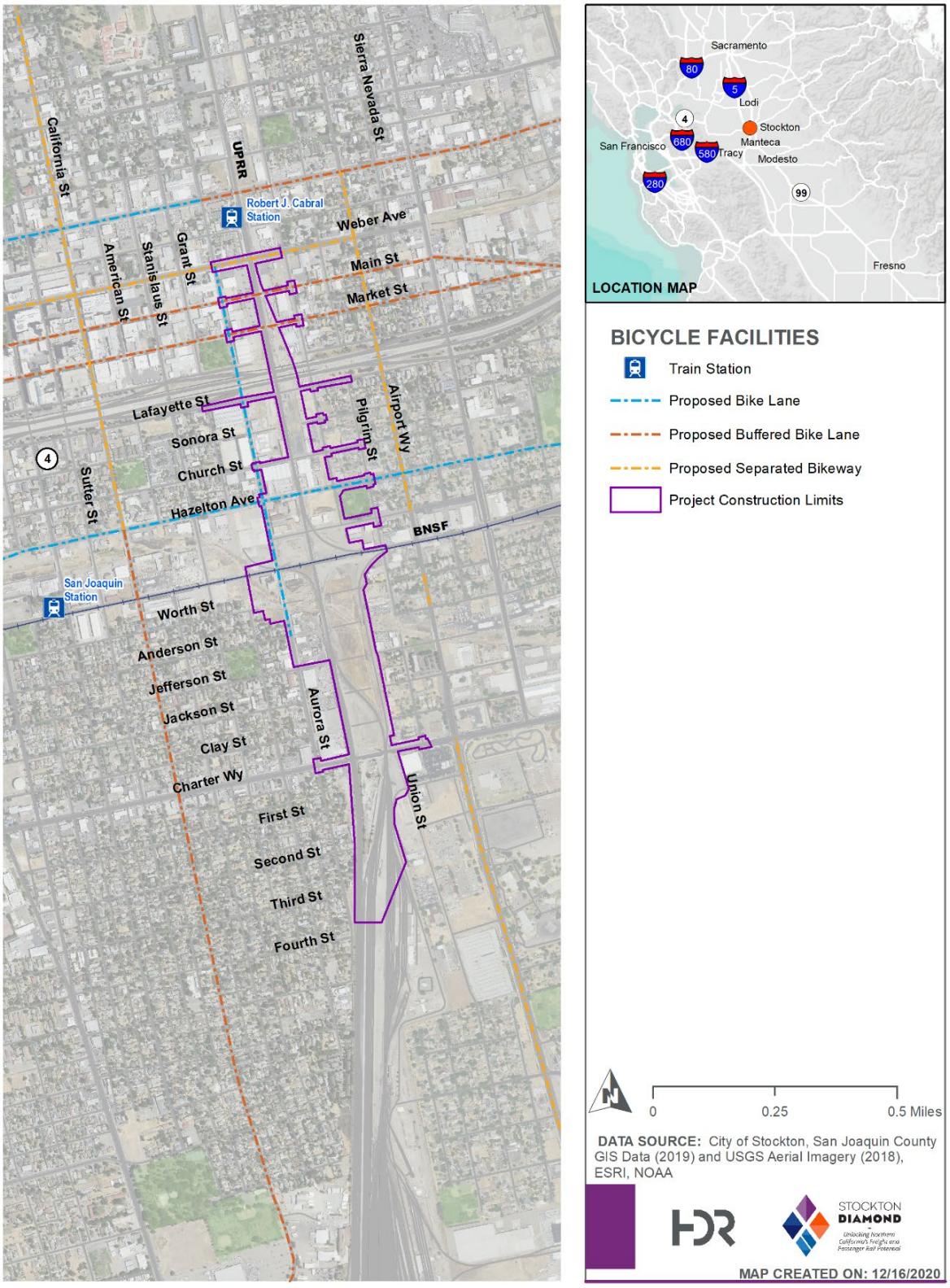
5.6. PEDESTRIAN CONDITIONS

The No Project Alternative is not anticipated to change the existing intersection geometry, land uses, and sidewalks or crosswalks in the vicinity and would have no impacts on pedestrian activity. With the exception of pedestrian improvements planned by other, independent projects, existing approaches to the at grade crossings and ADA accessibility is anticipated to remain unchanged.

5.7. BICYCLE CONDITIONS

The 2045 No Project Alternative condition are expected to include implementation of the City's proposed bicycle facilities in the Study Area, as shown in **Figure 5-7**. These future facilities are planned for East Weber Avenue, East Main Street, East Market Street, East Hazelton Avenue, California Street, South Aurora Street and South Airport Way. These planned facilities are considered part of the No Project Alternative and would add to the existing bicycle infrastructure in and around the Study Area.

Figure 5-7: Proposed No Project Alternative (2045) Bicycle Facilities in Traffic Study Area



5.8. TRANSIT CONDITIONS

Public transit services expected to operate in the Study Area by 2045 in the No Project Alternative will be similar to the services provided by the San Joaquin Regional Transit in 2019 (Section 4, Existing Transit Conditions). While the expectation is that over time (2019 to 2045) the San Joaquin Regional Transit will refine transit services (add routes, refine routes) in the Study Area, they have yet to be determined. At a minimum, the expectation is that at least the 12 transit routes currently providing service in the Study Area will be maintained into the future.

5.9. FREIGHT CONDITIONS

The 2045 No Project Alternative freight conditions are expected to consider similar levels of trucking services and activity that were identified in existing conditions (Section 4.0, Existing Freight Conditions) in the Study Area. As presented in existing conditions, the primary truck routes in the City of Stockton will remain focused primarily on the state highway system and major arterials, primarily on SR 99 and I-5 outside of the Traffic Study Area, with SR 4 crossing through the Traffic Study Area.

Truck route designations in the Traffic Study Area including STAA truck route will carry forward from existing conditions to the 2045 No Project Alternative. These will continue as designated city truck routes, county truck routes, flammable liquid-other routes, truck routes from 7 am to 10 pm and STAA truck routes. It is expected that the designated truck routes will be the same into the future, including: City Truck Routes on South Airport Way, East Hazelton Avenue, East Lafayette Street, East Market Street, East Weber Ave, Aurora Street and South Union Street; Flammable Liquid-Other Routes on East Charter Way, South Wilson Way, and South Airport Way; Truck Route–7 am to 10 pm on South Stanislaus Street; and STAA Truck Routes on East Charter Way.

6.0 Proposed Project 2045 Traffic Conditions Analysis

The following section presents the expected (2045) proposed Project traffic conditions analysis. This alternative considers the implementation and associated transportation impacts associated with all of the proposed components of the Stockton Diamond Grade Separation Project.

6.1. ANTICIPATED ROADWAY CLOSURES AND TRAFFIC REDISTRIBUTION

As a part of the proposed Project, permanent road closures are proposed for East Lafayette Street and East Church Street at the railroad crossings. These roadway closures were integrated with the proposed Project analysis. East Lafayette Street is being proposed for closure because of the multiple rail crossings with the at-grade main tracks and wye connection tracks (i.e., four proposed crossings within two blocks).

East Church Street requires closure because the proposed flyover structure would not reach its full elevation and, therefore, would not meet the required minimum vertical clearance for a vehicle crossing. The crossing would not provide the minimum 16.5 feet of vertical clearance required by

UPRR/BNSF joint guidelines for an undercrossing while still adhering to the American Association of State and Highway Transportation Officials' design criteria for change in grade for a local roadway.

East Church Street is classified as a local road with 2045 future AM peak hour volume of 38 for eastbound, and 117 for westbound. The 2045 future PM peak hour volume on East Church Street is 84 for eastbound and 62 for westbound.

Traffic on East Lafayette Street and East Church Street will use alternative routes as a result of road closures. The following assumptions were made to analyze East Lafayette traffic redistribution:

- 30 percent of traffic on East Lafayette Street (EB) will re-route to East Market Street with the remaining 70 percent re-routing to East Hazelton Avenue during both morning and afternoon peak hour
- 11 percent of the traffic on East Lafayette Street (WB) will re-route to East Main Street with the remaining 89 percent re-routing to East Hazelton Avenue during morning peak hour
- 16 percent of the traffic on East Lafayette Street (WB) will re-route to East Main Street with the remaining 84 percent re-routing to East Hazelton Avenue during afternoon peak hour

Figure 6-1 and **Figure 6-2** show the morning peak hour traffic redistribution due to East Lafayette Street closure for eastbound and westbound direction respectively in the proposed Project analysis.

Figure 6-1: Proposed Project (2045) Eastbound Traffic Distribution in AM peak hour

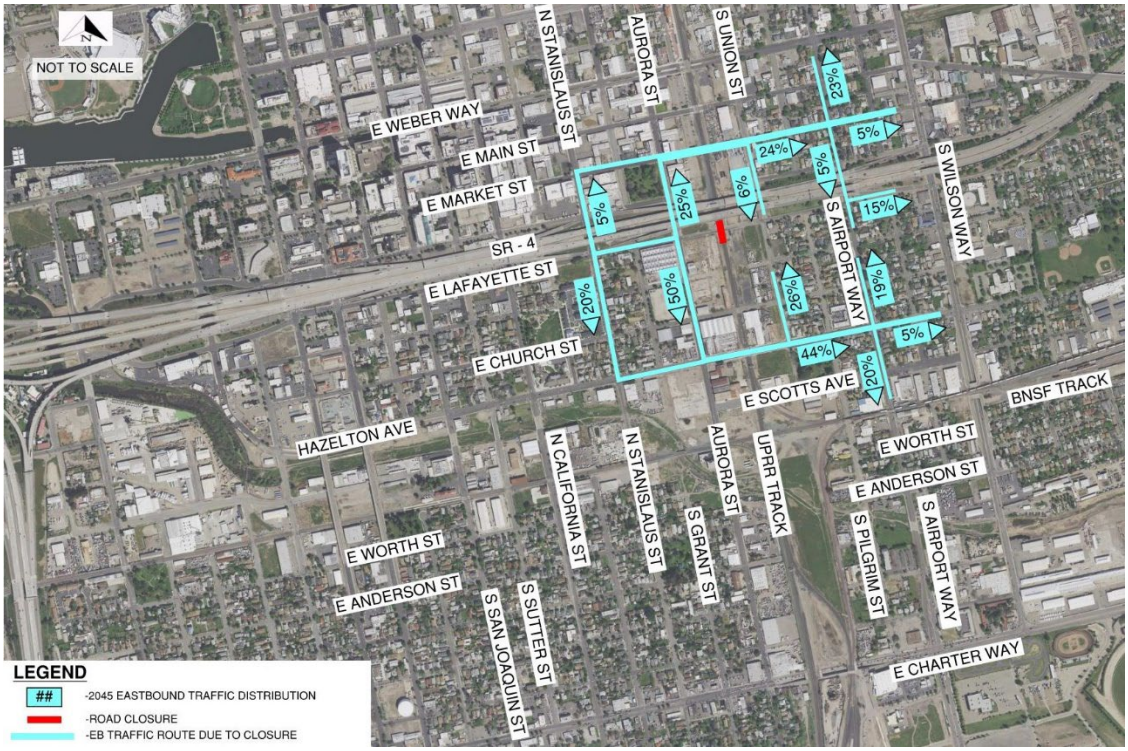


Figure 6-2: Proposed Project (2045) Westbound Traffic Distribution in AM peak hour

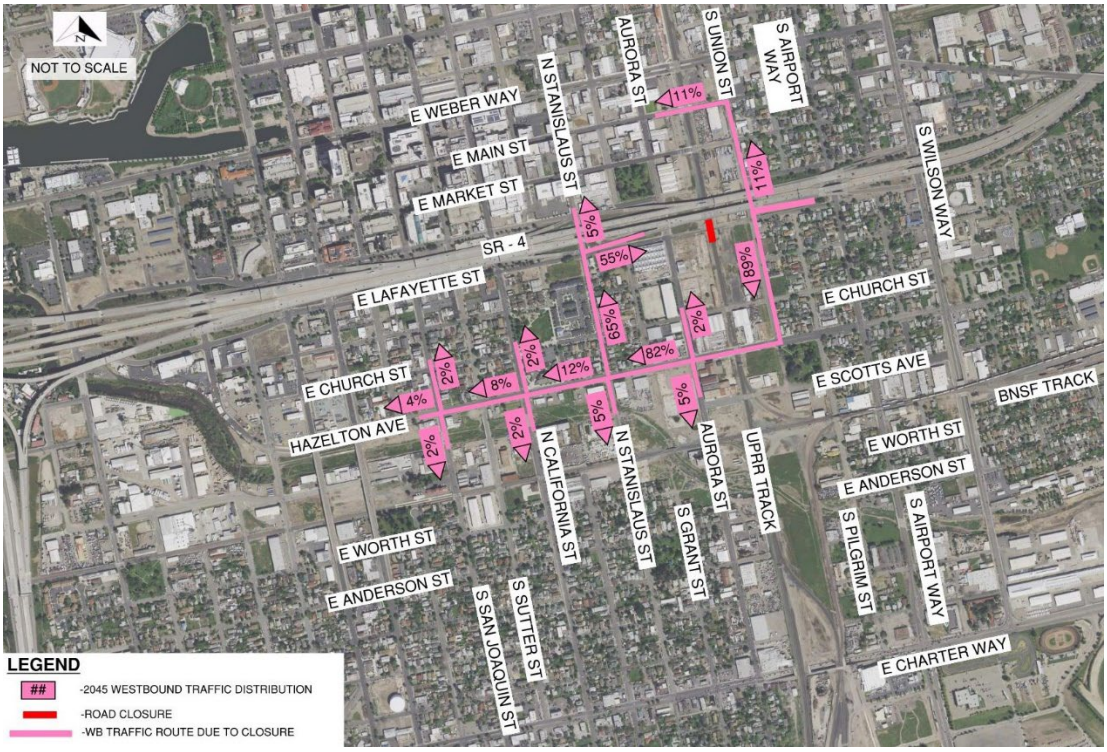


Figure 6-3 and **Figure 6-4** show the afternoon peak hour traffic redistribution due to Lafayette Street closure for eastbound and westbound direction respectively in the proposed Project analysis.

Figure 6-3: Proposed Project (2045) Eastbound Traffic Distribution in PM peak hour

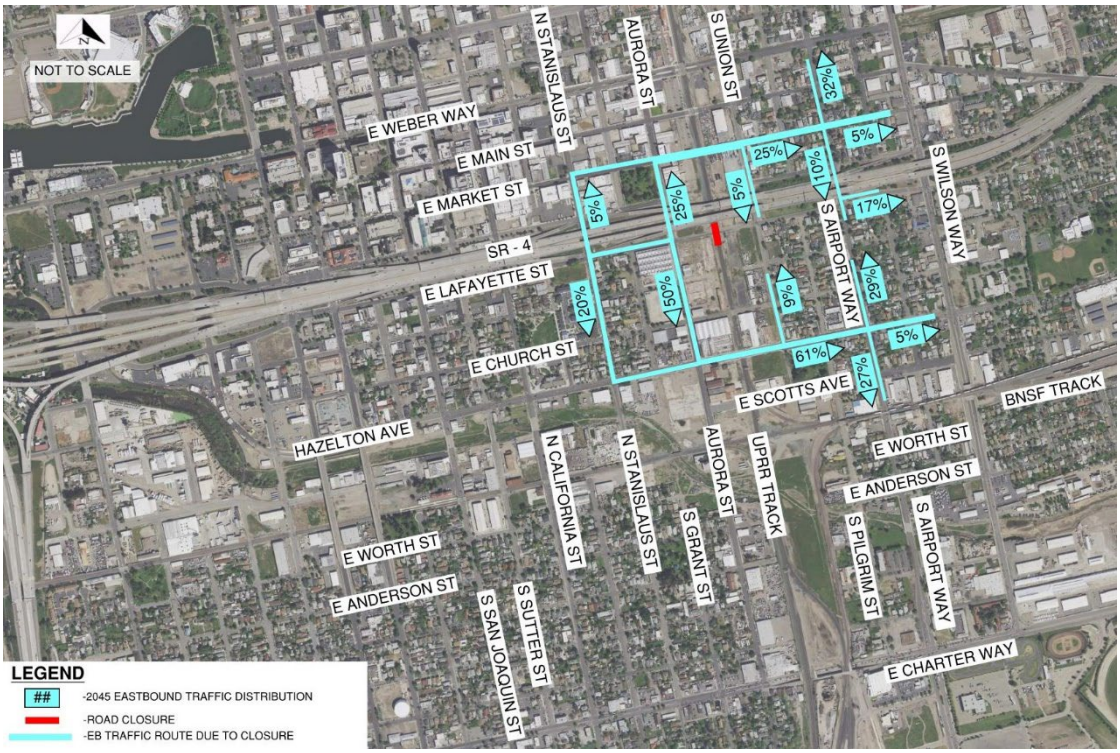
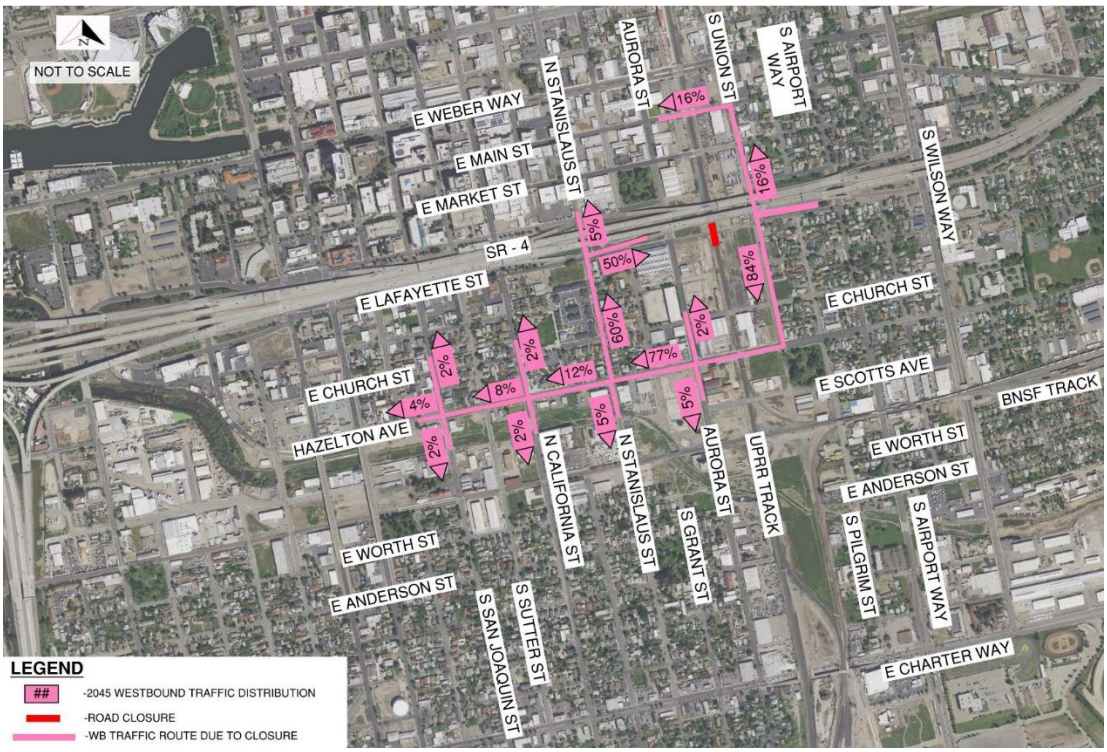


Figure 6-4: Proposed Project (2045) Westbound Traffic Distribution in PM peak hour



The following assumptions were made to analyze East Church Street traffic redistribution in the proposed Project analysis:

- 100 percent of the traffic on the East Church Street (eastbound and westbound) will re-route to East Hazelton Avenue during the proposed Project condition when East Church Street will be closed

Figure 6-5 shows the morning and afternoon peak hour traffic redistribution due to East Church Street closure for both eastbound and westbound direction in the proposed Project analysis.

Figure 6-5: Proposed Project (2045) Traffic Distribution AM and PM peak hour due to Church Street Closure

6.2. INTERSECTION OPERATIONS

The 2045 proposed Project volumes were generated by redistributing the 2045 No Project Alternative traffic for East Lafayette Street and East Church Street. **Figure 6-6** illustrate the 2045 proposed Project morning (AM) and the 2045 afternoon (PM) peak hour turning movement volumes for each of the 28 intersections. In addition, the 2045 proposed Project morning (AM) and afternoon (PM) peak hour roadway volumes, prepared from the intersection turning movement volumes, are presented in **Figure 6-7** and **Figure 6-8**.

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Figure 6-6: 2045 Proposed Project AM and PM Peak Hour Turning Movement Volumes for Study Area Intersections

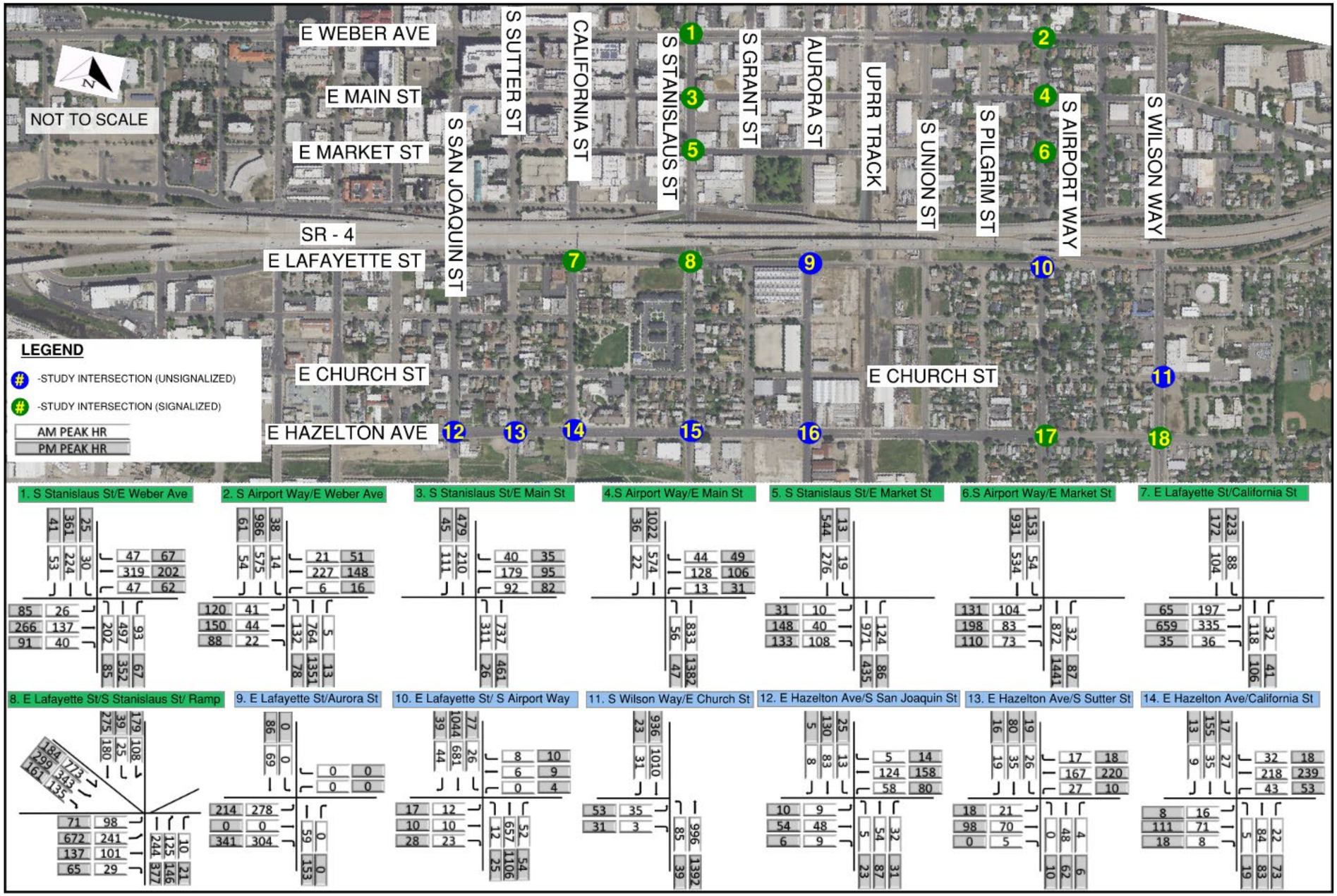


Figure 6-6. 2045 Proposed Project AM and PM Peak Hour Turning Movement Volumes for Study Area Intersections (continued)

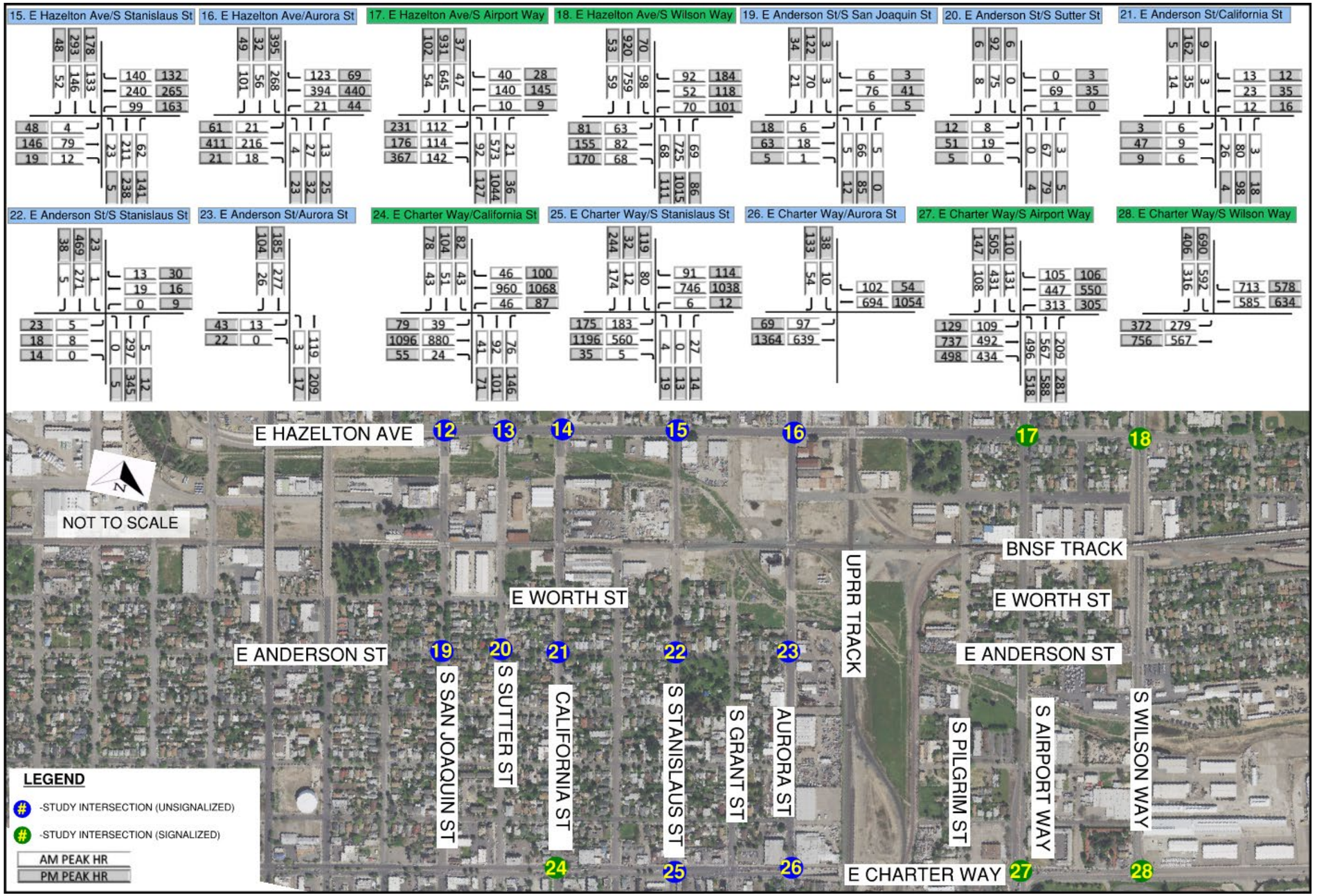


Figure 6-7: 2045 Proposed Project AM Peak Hour Roadway Volumes in the Study Area

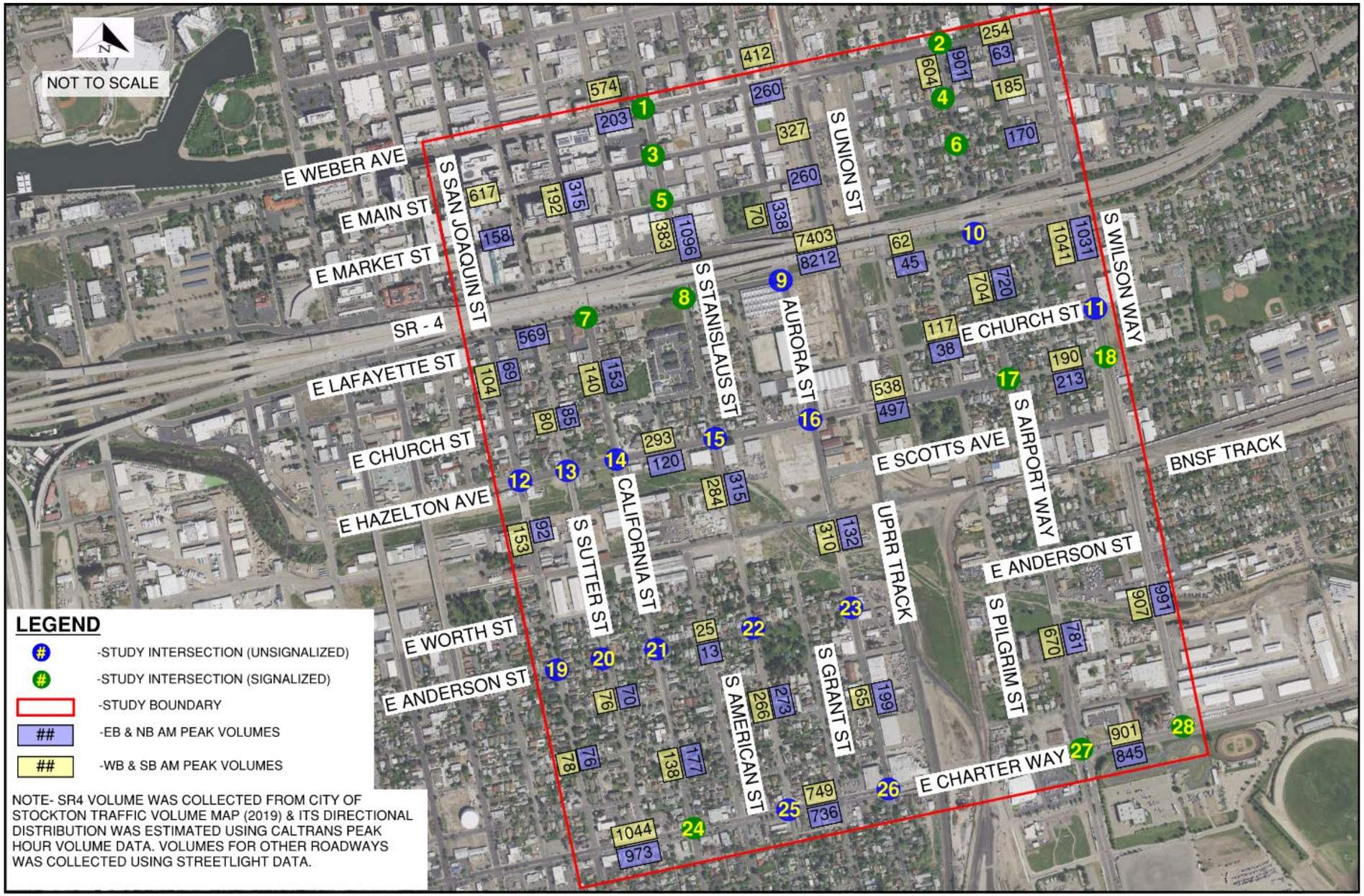
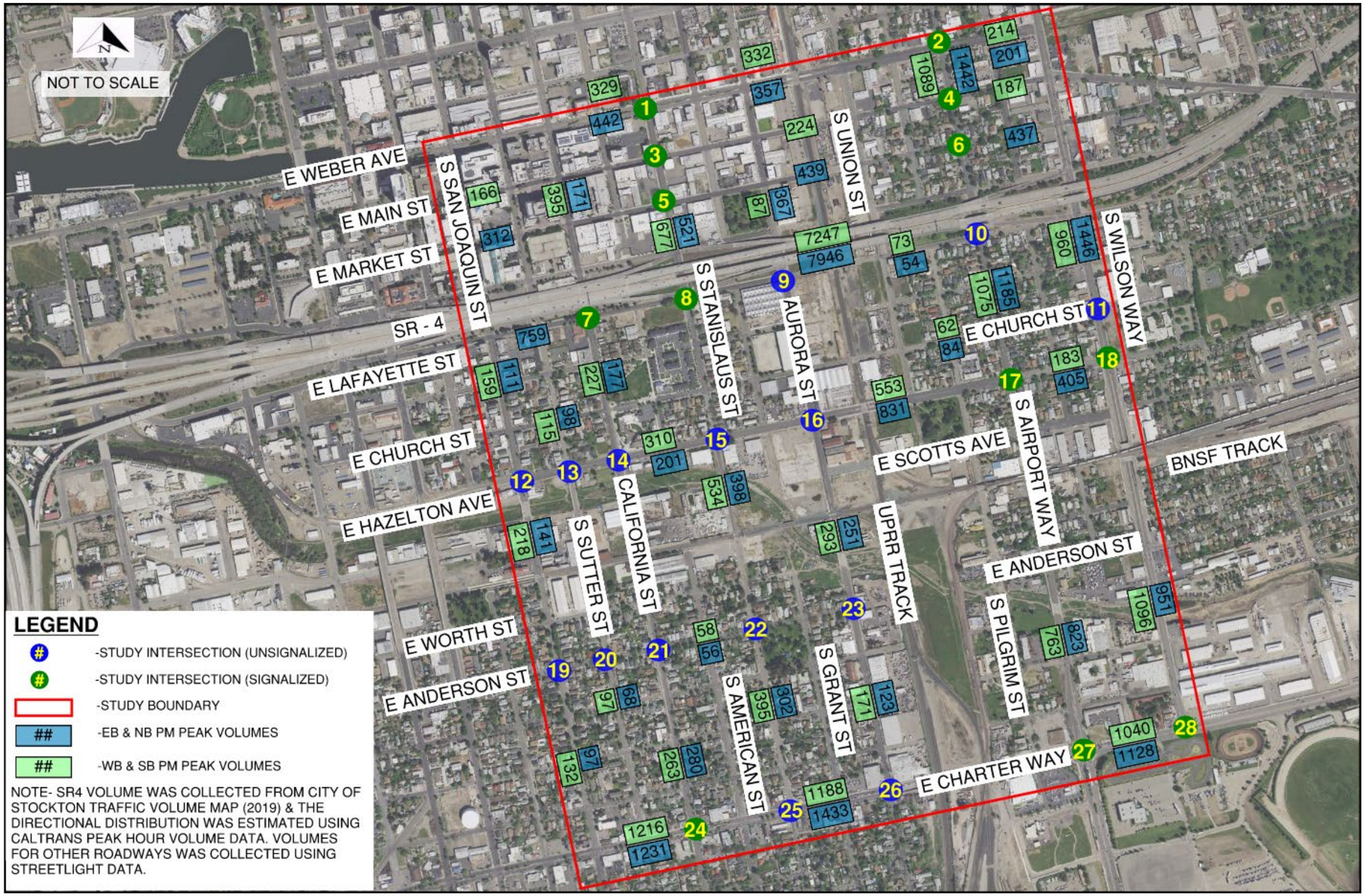


Figure 6-8: 2045 Proposed Project PM Peak Hour Roadway Volumes in the Study Area



2045 proposed Project intersection operations were analyzed for the Study Area intersections. Identical to the assessment of the 2019 Existing Conditions and 2045 No Project Alternative Conditions, intersection operations in for the proposed Project were evaluated for the AM and PM peak hours. LOS analysis was conducted according to procedures outlined in the 2010 Highway Capacity Manual using Synchro 10 traffic analysis software per City and County standards. As discussed in existing condition section (Section 4.0), LOS E or better represents the acceptable LOS in City of Stockton Downtown area and LOS D or better outside of the Downtown area (intersections along South Airport Way and South Wilson Way).

Table 6-1 and **Table 6-2** summarizes and compares the intersection LOS results in the 2045 No Project Alternative with the 2045 proposed Project for the AM and PM peak hours respectively. All intersections operate at an acceptable LOS in the 2045 proposed Project Conditions in the AM peak hours except for East Lafayette Street and North Stanislaus Street (#8). This intersection operates at LOS F (note, this intersection was LOS in both the Existing 2019 and 2045 No Project Alternative analysis).

All intersections operate at an acceptable LOS in the 2045 proposed Project Conditions in the PM peak hours except for East Lafayette Street and North Stanislaus Street (#8) and East Lafayette Street and South Airport Way (#10). East Lafayette Street and North Stanislaus Street (#8) intersection operates at LOS F (note, this intersection was LOS F in both the Existing 2019 and 2045 No Project Alternative analysis). East Lafayette Street and South Airport Way (#10) operates at LOS E (note, this intersection was LOS F in both the Existing 2019 and 2045 No Project Alternative analysis).

The intersections of East Lafayette Street and South Airport Way (#10) and East Lafayette Street and South Aurora Street (#9) are expected to improve LOS as a result of the closure of the East Lafayette Street at-grade crossing of the UP tracks.

Table 6-1: 2045 No Project Alternative and 2045 Proposed Project Intersection LOS Results Comparison, AM Peak Hour

	Intersection	2045 NO Project (AM)		2045 Proposed Project (AM)		DIFFERENCE	
		Delay (sec)	LOS	Delay (sec)	LOS	Delay Diff. (sec)	LOS Change
1	S Stanislaus St and E Weber Ave	24.2	C	24.2	C	0	N/A
2	S Airport Way and E Weber Ave	14.2	B	14.2	B	0	N/A
3	S Stanislaus St and E Main St	17.3	B	17.35	B	0.2	N/A
4	S Airport Way and E Main St	11	B	11	B	0	N/A

	Intersection	2045 NO Project (AM)		2045 Proposed Project (AM)		DIFFERENCE	
		Delay (sec)	LOS	Delay (sec)	LOS	Delay Diff. (sec)	LOS Change
5	S Stanislaus St and E Market St	13.9	B	14.3	B	0.4	N/A
6	S Airport Way and Market St	10.2	B	11.1	B	0.9	N/A
7	E Lafayette St and California St	17.8	B	17.8	B	0	N/A
8	E Lafayette St and S Stanislaus St	319	F	319.8	F	0.8	N/A
9	E Lafayette St and Aurora St	16.8	B	10.6	B	-6.2	N/A
10	E Lafayette St and S Airport Way	32.1	C	1.5	A	-30.6	C to A
11	S Wilson Way and E Church St	5.7	A	5.7	A	0	N/A
12	E Hazelton Ave and S San Joaquin St	8.7	A	8.7	A	0	N/A
13	E Hazelton Ave and S Sutter St	4.5	A	4.5	A	0	N/A
14	E Hazelton Ave and California St	9.1	A	9.1	A	0	N/A
15	E Hazelton Ave and S Stanislaus St	13	B	16.8	B	3.8	N/A
16	E Hazelton Ave and Aurora St	9.5	A	231.1	C	121.6	A to C
17	E Hazelton Ave and S Airport Way	17.1	B	18.6	B	1.5	N/A
18	E Hazelton Ave and S Wilson Way	16.3	B	16.3	B	0	N/A
19	E Anderson St and S San Joaquin St	7.9	A	7.9	A	0	N/A
20	E Anderson St and S Sutter St	7.7	A	7.7	A	0	N/A
21	E Anderson St and California St	3.9	A	3.9	A	0	N/A
22	E Anderson St and S Stanislaus St	1	A	1	A	0	N/A
23	E Anderson St and Aurora St	0.4	A	0.4	A	0	N/A
24	E Charter Way and California St	14.6	B	14.6	B	0	N/A

	Intersection	2045 NO Project (AM)		2045 Proposed Project (AM)		DIFFERENCE	
		Delay (sec)	LOS	Delay (sec)	LOS	Delay Diff. (sec)	LOS Change
25	E Charter Way and S Stanislaus St	29.7	C	29.7	C	0	N/A
26	E Charter Way and Aurora St	1.1	A	1.1	A	0	N/A
27	E Charter Way and S Airport Way	25.2	C	25.2	C	0	N/A
28	E Charter Way and S Wilson Way	25	C	25	C	0	N/A

Table 6-2: 2045 No Project Alternative and 2045 Proposed Project Intersection LOS Results Comparison, PM Peak Hour

	Intersection	2045 NO Project (PM)		2045 Proposed Project (PM)		Difference	
		Delay (sec)	LOS	Delay (sec)	LOS	Delay Diff. (sec)	LOS Change
1	N Stanislaus St and Weber St	23.5	C	23.5	C	0	N/A
2	Airport Way and Weber St	27.8	C	27.8	C	0	N/A
3	N Stanislaus St and E Main St	9.2	A	9.3	A	0.1	N/A
4	Airport Way and Main St	10.1	B	10.1	B	0	N/A
5	N Stanislaus St and E Market St	8.7	A	8.7	A	0	N/A
6	Airport Way and Market St	35.5	D	40.5	D	5	N/A
7	Lafayette Street and N California Street	20.7	C	20.7	C	0	N/A
8	Lafayette Street and N Stanislaus Street	174.5	F	178.3	F	3.8	N/A
9	Lafayette Street and Aurora Street	36.9	D	10.9	B	-26.0	D to B
10	Lafayette Street and S Airport Way	560.7	**F**	55.4	E	-505.3	F to E
11	S Wilson Way and Church Street	15.9	B	15.9	B	0	N/A

	Intersection	2045 NO Project (PM)		2045 Proposed Project (PM)		Difference	
		Delay (sec)	LOS	Delay (sec)	LOS	Delay Diff. (sec)	LOS Change
12	Hazelton Avenue and S San Joaquin Street	9.6	A	9.6	A	0	N/A
13	Hazelton Avenue and S Sutter Street	5.1	A	5.1	A	0	N/A
14	Hazelton Avenue and N California Street	10.3	B	10.3	B	0	N/A
15	Hazelton Avenue and N Stanislaus Street	22.8	C	60	E	37.2	C to E
16	Hazelton Avenue and Aurora Street	11.3	B	41.8	D	30.5	B to D
17	Hazelton Avenue and S Airport Way	20.1	C	27.8	C	7.7	N/A
18	Hazelton Avenue and S Wilson Way	20.6	C	20.6	C	0	N/A
19	E Anderson Street and S San Joaquin Street	8.2	A	8.2	A	0	N/A
20	E Anderson Street and S Sutter Street	7.9	A	7.9	A	0	N/A
21	E Anderson Street and N California Street	3.6	A	3.6	A	0	N/A
22	E Anderson Street and N Stanislaus Street	2.5	A	2.5	A	0	N/A
23	E Anderson Street and Aurora Street	1.6	A	1.6	A	0	N/A
24	E Charter Way and N California Street	23.1	C	23.1	C	0	N/A
25	E Charter Way and N Stanislaus Street	0.9	A	0.9	A	0	N/A
26	E Charter Way and Aurora Street	1.4	A	1.4	A	0	N/A
27	E Charter Way and S Airport Way	28.8	C	28.8	C	0	N/A
28	E Charter Way and S Wilson Way	27.4	C	27.4	C	0	N/A

6.3. ROADWAY CONDITIONS

With the exception of SR 4 (Crosstown Freeway), all roadway levels of service in the Traffic Study Area are expected to perform at LOS E or better. **Table 6-3** summarizes and compares the roadway v/c ratio and LOS results in the 2045 No Project Alternative with the 2045 proposed Project. The resulting v/c ratios for roadways in AM peak hour for the 2045 Proposed Project is shown in **Figure 6-9**.

Table 6-3: 2045 No Project Alternative and 2045 Proposed Project Roadway V/C and LOS Results Comparison, AM Peak Hour

Road	Location	Roadway Classification	2045 No Project (AM)		2045 Proposed Project (AM)		Difference	
			V/C Ratio	LOS	V/C Ratio	LOS	V/C Ratio	LOS
East Webber Ave	Between South San Joaquin Street and South Stanislaus Street	Collector	0.32	B	0.32	B	N/A	N/A
East Main Street	Between South San Joaquin Street and South Stanislaus Street	Arterial	0.34	B	0.34	B	N/A	N/A
SR 4	Between South San Joaquin Street and South Wilson Way	Freeway	1.14	F	1.14	F	N/A	N/A
East Lafayette Street	Between South San Joaquin Street and South Stanislaus Street	Local	0.47	B	0.47	B	N/A	N/A
East Hazelton Avenue	Between South Stanislaus Street and South Airport Way	Arterial	0.17	A	0.36	B	0.19	A to B
East Charter Way	Between South San Joaquin Street and South Stanislaus Street	Arterial	0.59	C	0.59	C	N/A	N/A
East Charter Way	Between South Stanislaus Street and South Wilson Way	Arterial	0.50	B	0.50	B	N/A	N/A
South Stanislaus Street	North of East Lafayette Street	Collector	0.62	C	0.63	C	0.01	N/A
South Airport Way	Between East Weber Avenue and East Lafayette Street	Arterial	0.50	B	0.40	B	-0.10	N/A
South Airport Way	Between East Lafayette Street and East Hazelton Avenue	Arterial	0.45	B	0.44	B	-0.01	N/A

Road	Location	Roadway Classification	2045 No Project (AM)		2045 Proposed Project (AM)		Difference	
			V/C Ratio	LOS	V/C Ratio	LOS	V/C Ratio	LOS
South Airport Way	Between East Hazelton Avenue and East Charter Way	Arterial	0.43	B	0.41	B	-0.02	N/A
South Wilson Way	Between East Weber Avenue and East Church Street	Arterial	0.58	C	0.58	C	N/A	N/A
South Wilson Way	Between East Church Street and East Church Street	Arterial	0.56	C	0.56	C	N/A	N/A
All other Roadways	-	-	<0.30	A	<0.30	A	N/A	N/A

Figure 6-9: 2045 Proposed Project v/c Ratio and LOS, AM Peak Hour

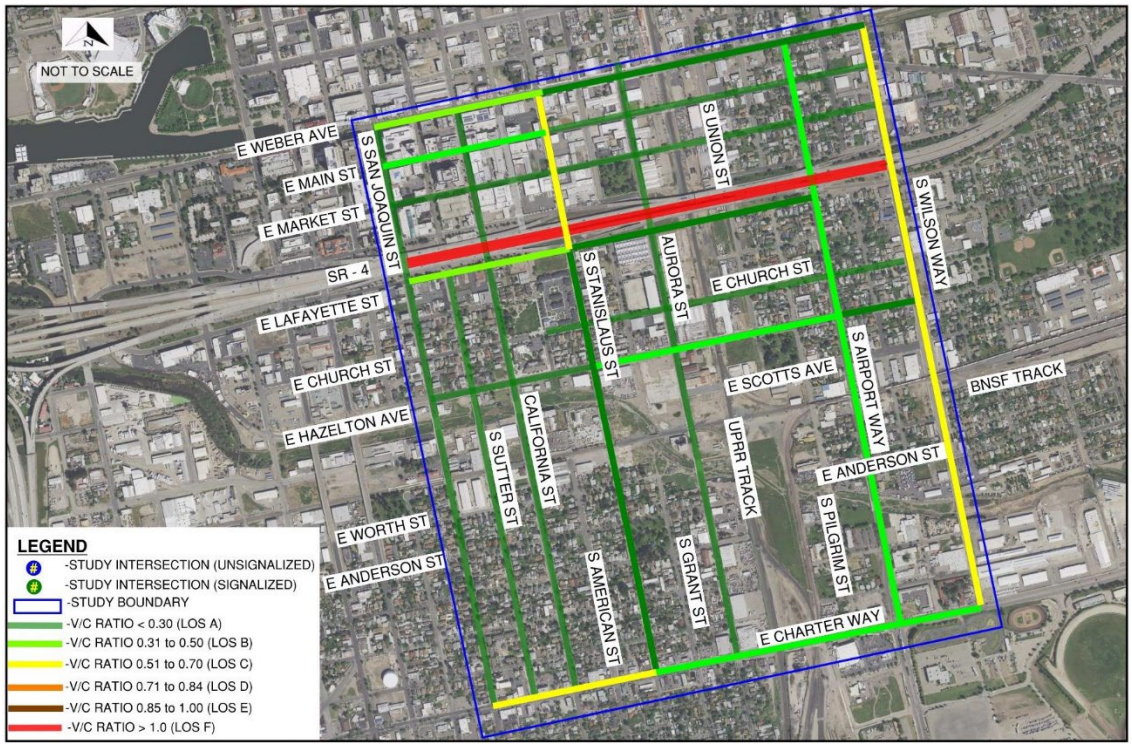


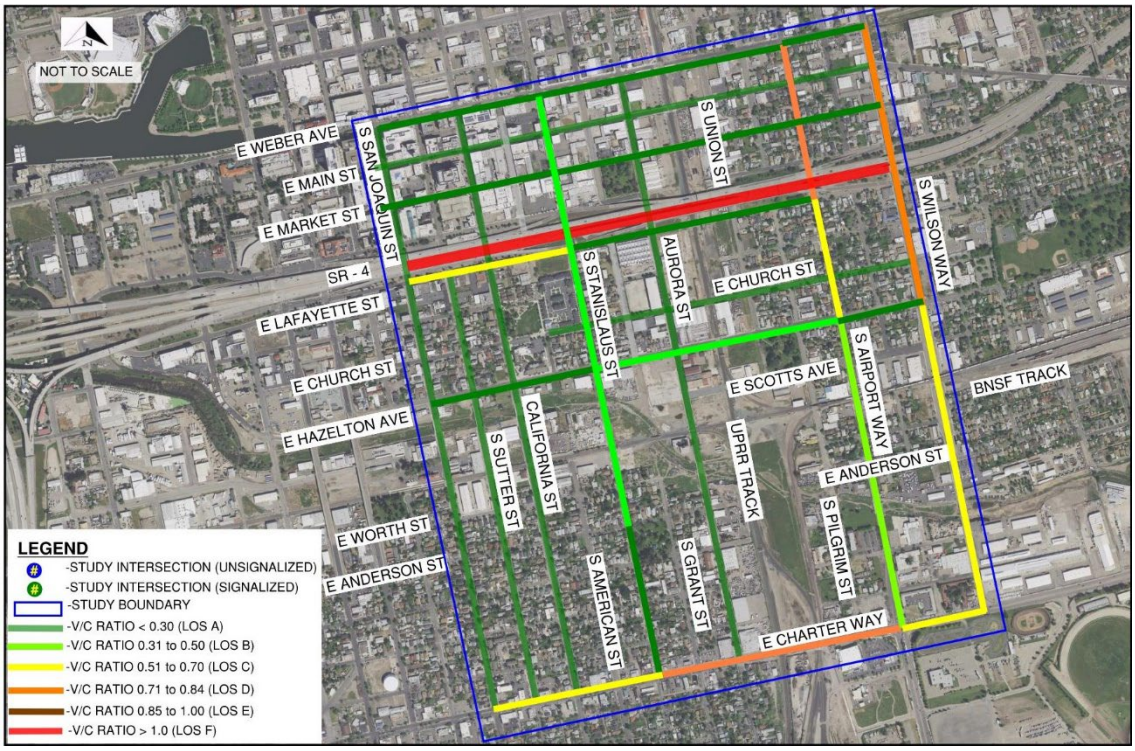
Table 6-4 summarizes and compares the roadway v/c ratio and LOS results in the 2045 No Project Alternative with the 2045 proposed Project. The resulting v/c ratios for roadways in PM peak hour for the 2045 Proposed Project is shown in **Figure 6-10**.

Table 6-4: 2045 No Project Alternative and 2045 Proposed Project Roadway V/C and LOS Results Comparison, PM Peak Hour

Road	Location	Roadway Classification	2045 No Project (PM)		2045 Proposed Project (PM)		Difference	
			V/C Ratio	LOS	V/C Ratio	LOS	V/C Ratio	LOS
SR 4	Between South San Joaquin Street and South Wilson Way	Freeway	1.10	F	1.10	F	N/A	N/A
East Lafayette Street	Between South San Joaquin Street and South Stanislaus Street	Local	0.63	C	0.63	C	N/A	N/A
East Hazelton Ave	Between South Stanislaus Street and South Airport Way	Arterial	0.24	A	0.51	B	0.27	A to B
East Charter Way	Between South San Joaquin Street and South Aurora Street	Arterial	0.69	C	0.69	C	N/A	N/A
East Charter Way	Between Aurora Street and South Airport Way	Arterial	0.80	D	0.80	D	N/A	N/A
East Charter Way	Between South Airport Way and South Wilson Way	Arterial	0.63	C	0.63	C	N/A	N/A
South Stanislaus Street	North of East Hazelton Avenue	Collector	0.39	B	0.39	B	N/A	N/A
South Stanislaus Street	Between East Hazelton Avenue and East Anderson Street	Local	0.44	B	0.44	B	N/A	N/A
South Airport Way	Between East Weber Avenue and East Lafayette Street	Arterial	0.81	D	0.81	D	N/A	N/A
South Airport Way	Between East Lafayette Street and East Hazelton Avenue	Arterial	0.72	D	0.67	C	-0.05	D to C

Road	Location	Roadway Classification	2045 No Project (PM)		2045 Proposed Project (PM)		Difference	
			V/C Ratio	LOS	V/C Ratio	LOS	V/C Ratio	LOS
South Airport Way	Between East Hazelton Avenue and East Charter Way	Arterial	0.46	B	0.46	B	N/A	N/A
South Wilson Way	Between East Weber Avenue and East Hazelton Avenue	Arterial	0.81	D	0.81	D	N/A	N/A
South Wilson Way	Between East Hazelton Avenue and East Charter Way	Arterial	0.62	C	0.62	C	N/A	N/A
All other Roadways	-	-	<0.30	A	<0.30	A	N/A	N/A

Figure 6-10: 2045 Proposed Project v/c Ratio and LOS, PM Peak Hour



6.4. PEDESTRIAN CONDITIONS

The proposed projects will make crossing and sidewalk improvements at Weber Avenue, Main Street, Market Street, Hazelton Avenue, Scotts Avenue, and Charter Way. The proposed Project would also upgrade roadway-rail at-grade crossing infrastructure, to include sidewalks and ADA ramps.

6.5. BICYCLE CONDITIONS

The 2045 proposed Project conditions are expected to include implementation of the City's proposed bicycle facilities in the Study Area (also shown above in Section 5.0, **Figure 5-7**). These future facilities are planned for East Weber Avenue, East Main Street, East Market Street, East Hazelton Avenue, and South Aurora Street funded through Measure K. According to adopted plans, these proposed bicycle facilities are anticipated to be implemented before the proposed Project and therefore, short temporary detours may be needed during construction of the proposed Project on Main Street, Market Street, Lafayette Street, and Hazelton Avenue.

6.6. TRANSIT CONDITIONS

Public transit services expected to operate in the Study Area by 2045 in the proposed Project will be similar to the services provided by the San Joaquin Regional Transit in 2019 (Section 4.0, Existing Transit Conditions). Near the 2045 proposed Project Alternative, transit routes are on San Joaquin Street (315, 510), Airport Way (44), and Charter Way (49). The 2045 proposed Project Alternative would have no impacts on existing transit routes except on Charter Way (Route 49). In the long term, Route 49 will remain on Charter Way. During construction, however, the proposed Project will include construction of two new bridges across Charter Way, with a portion of an existing bridge expected to be demolished. Temporary closures, detours, or narrowing to two lanes on Charter Way may be necessary (temporarily) during construction. Mitigation measures include preparing a traffic management plan and coordination with SJRTD and transit riders to notify them of construction implications.

6.7. FREIGHT CONDITIONS

The 2045 proposed Project freight conditions are expected to consider similar levels of trucking services and activity that were identified in existing conditions (Section 4.0, Existing Freight Conditions) in the Study Area. As presented in existing conditions, the primary truck routes in the City of Stockton will remain focused primarily on the state highway system and major arterials, primarily on SR 99 and I-5 outside of the Traffic Study Area, with SR 4 crossing through the Traffic Study Area.

Truck route designations in the Traffic Study Area will carry forward from existing conditions in the proposed Project. These will continue as designated city truck routes, county truck routes, flammable liquid-other routes, and truck routes from 7 am to 10 pm. It is expected that the designated truck routes will be the same into the future, including: City Truck Routes on South Airport Way, East Hazelton Avenue, East Lafayette Street, East Market Street, East Weber Ave,

Aurora Street and South Union Street; Flammable Liquid-Other Routes on East Charter Way, South Wilson Way, and South Airport Way; and Truck Route–7 am to 10 pm on South Stanislaus Street.

6.8. TRAFFIC DELAY DUE TO TRAINS

Train occupancies represent the total amount of time within each peak hour when the road is unavailable to automobile traffic at highway-rail grade crossings while trains pass. This includes the minimum activation time of warning devices at the crossing (i.e., bells, flashing light signals, and gates), prior warning time, and the time it takes for the grade crossing warning devices to recover after the passing of a train. Based on the train occupancy times and assumptions regarding number of trains per peak hour, average individual vehicle delays were calculated using Synchro 10 software.

The 2019 Existing Conditions included 2 freight trains and 3 passenger trains for both AM and PM peak hours, including:

- 1 Diamond Route (rail traffic going through the diamond north south) freight train for each morning and afternoon peak hours
- 1 NE connector route freight train for each morning and afternoon peak hours
- 1 ACE passenger train (Diamond Route) for each morning and afternoon peak hours
- 2 Amtrak passenger train (NE connector Route) for each morning and afternoon peak hours

The 2045 No Project Alternative and 2045 proposed Project conditions were estimated to include 3 passenger and 3 freight trains at these locations for both peak hours, including:

- 2 diamond route freight train for each morning and afternoon peak hours
- 1 NE connector route freight train for each morning and afternoon peak hours
- 1 ACE passenger train (Diamond Route) for each morning and afternoon peak hours
- 2 Amtrak passenger train (NE connector Route) for each morning and afternoon peak hours

Table 6-5 and **Table 6-6** summarize AM and PM peak hour delay per auto (in seconds) caused by trains at each of the railroad crossings for the 2019 Existing, 2045 No Project Alternative, and 2045 proposed Project conditions. The delay per auto in the 2045 No Project Alternative are expected to be higher than 2019 existing conditions due to the increase in train occupancy times (including potential number of trains and length of trains anticipated in the future) and the growth in rail traffic demand. For example, as shown below (**Table 6-5**), over the course of an hour, each auto traveling eastbound on East Weber Avenue will have approximately 18 seconds of delay in 2019 existing AM peak hour. Also shown is a comparison of the average auto delay for 2045 No Project Alternative to proposed Project analysis, including nominal increases in average auto delays at the East Main Street, and East Market locations, reduced delay at East Hazelton Avenue and East Scotts, and eliminated delay at the two locations with road closures.

Table 6-5: Morning Peak Hour Average Individual Vehicle Delay, all Conditions

Road Name/RR Crossing	Direction	2019 Existing AM Delay (sec)	2045 No Project AM Delay (sec)	2045 Proposed Project AM Delay (sec)
East Weber Avenue/UP	EB	18.2	33.4	33.4
	WB	26.5	37.8	37.8
East Main/UPStreet/UP	WB	18.1	29.6	29.8
East Market/UPStreet/UP	EB	16.3	28.4	29.4
East Lafayette Street/UP	EB	20.0	34.9	-
	WB	16.8	29.3	-
East Church Street/UP	EB	24.8	40.4	-
	WB	25.8	42.1	-
East Hazelton Avenue/UP	EB	25.7	41.8	34.6
	WB	27.8	43.3	34.7
East Scotts Avenue/UP	EB	24.9	40.7	30.5
	WB	26.3	43.0	32.2

Similar, 2045 No Project Alternative to proposed Project analysis are shown for the PM peak hour (**Table 6-6**), including nominal increases in average auto delays at the East Main Street, and East Market Street locations, reduced delay at East Hazelton Avenue and East Scotts Avenue, and eliminated delay at the two locations with road closures.

Table 6-6: Afternoon Peak Hour Average Individual Vehicle Delay, all Conditions

Road Name/RR Crossing	Direction	2019 Existing PM Delay (sec)	2045 No Project PM Delay (sec)	2045 Proposed Project PM Delay (sec)
East Weber Avenue/UP	EB	20.8	36.3	36.3
	WB	24.5	35.3	35.3
East Main Street/UP	WB	16.5	28.9	29.0
East Market	EB	16.9	29.5	31.0
East Lafayette Street/UP	EB	21.9	38.3	-
	WB	16.3	28.5	-
East Church Street/UP	EB	25.4	41.4	-
	WB	25.1	40.9	-
East Hazelton Avenue/UP	EB	27.4	44.6	38.9
	WB	29.7	44.7	38.1
East Scotts Avenue/UP	EB	25.8	42.0	31.5
	WB	25.4	41.4	31.0

For both AM and PM peak hour conditions, the nominal increase in auto delays (averaging 1-2 seconds) at the East Main Street and East Market locations is because of traffic re-routing due to road closures at the East Lafayette Street and East Church Street locations. No auto delays are expected on East Lafayette Street and East Church Street crossing locations due to road closures. The reduced auto delays on East Hazelton Avenue and East Scotts Avenue are due to reduction in train volumes (with the Build, combined grade separation and at-grade configuration).