

Calexico West Port of Entry

TRAFFIC CIRCULATION PLAN

Prepared for:



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EXECUTIVE SUMMARY

BACKGROUND

In 2018 the existing West Port of Entry (POE) located in downtown Calexico ceased processing vehicle crossings. A new POE was opened immediately west of the existing site. The new site entrances no longer connect to Imperial Avenue (SR 111) resulting in changing travel patterns. As the POE relocation is being completed in phases, this report describes recommended traffic circulation changes for each phase.

This project was completed as a joint effort by the following agencies:

- Imperial County Transportation Commission (ICTC),
- City of Calexico, California Caltrans.
- Southern California Association of Governments (SCAG)
- Imperial County – a partner agency on the project
- U.S. General Services Administration
- U.S. Customs & Border Protection

The movement of operations from the old POE to the new POE was completed in phases. Temporary traffic circulation plans were prepared for the interim phases and for the final construction phase. The traffic scenarios completed included:

Scenario 1A - southbound traffic; was moved to the new POE for the period between July 10, 2018 to September 1, 2018.

Scenario 1B - both southbound and northbound traffic accommodated by the new POE, but with Cesar Chavez Boulevard providing limited traffic access while under construction from approximately September 1, 2018 into June, 2019.

Scenario 2 – Cesar Chavez Boulevard construction completed and available for full traffic use.

STUDY AREA

At the former POE location, both northbound and southbound traffic access was provided by SR-111 which directly connected to border crossing operations. The new POE directly lines up with Cesar Chavez Boulevard, a local street under jurisdiction of the City of Calexico. SR-111,

Cesar Chavez Boulevard and connections between these two routes (SR-98, 2nd Street and Grant Avenue) were analyzed in this Traffic Control Plan (TCP).

PROJECT GOALS

A portfolio of strategies were developed and analyzed to address the following goals:

- Provide efficient mobility at the U.S. – Mexico border to the new West Calexico POE
- Reduce traffic delay for this travel
- Reduce City staff demands for traffic control
- Reduce traffic delay impacts to businesses located in the central area of Calexico
- Provide traffic circulation strategies as the new West POE is implemented in Phases

EXISTING CONDITIONS

An initial task completed was to assess the traffic conditions occurring at West Calexico POE prior to moving to the new location. This analysis provides a baseline in which the future conditions can be compared.

- Described the existing transportation network
- Collected traffic counts on roadways and at intersections
- Analyzed traffic operations
- Evaluated traffic flows and traffic queues to and from the POE

TRAFFIC OPERATION SCENARIOS (1A AND 1B)

Traffic flow for the anticipated traffic changes with the phased implementation of new West Calexico POE operation were estimated. Two temporary traffic circulation plans were prepared and implemented to guide travel access as first southbound traffic then northbound traffic were moved into the new West Calexico POE. For each scenario, a number of traffic circulation alternatives were considered. The project team evaluated the alternatives based on delays, access, and other project goals. A preferred traffic control plan for each scenario was determined and was presented to the public at public meetings. The traffic control plans were then implemented.

TRAFFIC OPERATION SCENARIO 2

Scenario 2 describes the final scenario accommodating both northbound and southbound traffic to the new POE with the completion of Cesar Chavez Boulevard widening project. Traffic counts

were re-taken in order to capture any change in travel patterns from the existing conditions. Again, a number of traffic circulation alternatives were considered for access to-and-from the new West Calexico POE when Cesar Chavez Boulevard construction is complete. One alternative is to allow traffic to access the POE from Cesar Chavez Boulevard and from SR-111 – 2nd Street. A second alternative is to channel all southbound POE traffic to Cesar Chavez Boulevard and restrict entrance from other directions.

TRAFFIC MANAGEMENT STRATEGIES

Traffic management strategies and operational approaches were identified for the recommended Scenario 2 Alternative that would be needed improve traffic flows on roadways within the project area, address projected future traffic growth, make better use of existing capacity, and improve traffic throughput. Needed revisions to lane markings and signage were also indicated.

ITS strategies are being investigated by Caltrans to provide information to motorists regarding travel speed and travel time on highways accessing both the East and West Calexico Port of Entries. These strategies include Radio Frequency Identification (RFID) technologies to measure real-time traffic volumes and speeds, Wi-Fi technologies to provide traveler information regarding delays, changeable message signs to indicate the traveler information to the public, and coordinated signals to change traffic signal timings to optimize traffic flow. The project recommendations provide an initial determination of needed traffic control. The City and Caltrans may implement additional changes once Cesar Chavez widening is completed and observed traffic conditions are identified.

RECOMMENDATIONS

The project team evaluated the two alternatives based on delays, access, and other project goals. Traffic Operation Scenario 2, that channeled southbound access to Cesar Chavez Boulevard, was preferred by the project team as it was considered to best address the goals of reducing City staff demands for traffic control and improving access to businesses located in the central area of Calexico by reducing travel delays on SR-111. Recommendations include:

1. Provide signage to route POE traffic to Cesar Chavez Boulevard
2. Modify SR-98 / SR- 111 intersection to provide two southbound right turns
3. Adjust signal timings at major intersections to support traffic flow to the POE using Cesar Chavez Boulevard.
4. Focus manual traffic control support at Cesar Chavez Boulevard and 2nd Street
5. Implement the Caltrans ITS projects

The preferred traffic circulation plan is shown in Figure ES.1.

FIGURE ES.1: RECOMMENDED TRAFFIC CIRCULATION



1.0 INTRODUCTION

1.1 BACKGROUND

This report presents a traffic control plan for access to the new Calexico West Port of Entry (POE). The new Calexico POE is being relocated immediately west of the current site, resulting in changing travel patterns. As the POE relocation is being completed in phases, this report describes recommended traffic circulation changes for each phase.

The existing POE connects the downtown areas of the Cities of Calexico and Mexicali. The port processes up to 10,000 northbound vehicles and up to 20,000 northbound pedestrians on a typical day. In order to improve border crossing efficiency and reduce wait times, the General Services Administration (GSA) began construction of the expansion and reconfiguration of the Calexico West Port of Entry (POE) in April 2015.



SR 111 in downtown Calexico

POE construction is being completed in phases during 2018. While the expansion is anticipated to reduce delay associated with border crossings, the traffic access and circulation patterns serving the POE will significantly change. In order to maintain traffic flow during POE construction, a Traffic Circulation Plan (TCP) was initiated to develop plans to determine how best to provide access to-and-from the Calexico West POE for each phase. Additionally, the TCP will address traffic impacts during the construction of Cesar Chavez Boulevard, the primary route that will connect with the new POE.

This project is a joint effort of a number of agencies. A Technical Advisory Committee comprised of the following agencies met throughout the project and provided technical input through the development of the traffic circulation plan, and included:

- Imperial County Transportation Commission (ICTC), - the regional transportation planning and funding agency for Imperial County
- City of Calexico, California – the city where the POE is located and has jurisdiction over local streets.
- Caltrans – has jurisdiction over state highways.
- Southern California Association of Governments (SCAG) the designated Metropolitan Planning Organization for southern California, including Imperial County.
- Imperial County – a partner agency on the project

In addition to the above agencies, the following additional agencies participated in the stakeholder meetings:

- U.S. General Services Administration – the owner of the POE and responsible for construction.
- U.S. Customs & Border Protection – operator of the POE and responsible for inspection services.

1.2 STUDY AREA

Current traffic control measures require both northbound and southbound traffic to use only SR-111 to cross through the existing Calexico West POE. Based on the new location of the POE expansion, SR-111/2nd Street and California State Route (SR-98)/Cesar Chavez Blvd. will also be available to provide direct access to the POE. These roadways will be analyzed in this TCP. Grant Avenue will also be analyzed as it provides a connection between SR-111 and Cesar Chavez Boulevard. The study area is shown in **Figure 1.1**.

FIGURE 1.1: PROJECT VICINITY



1.3 STUDY PURPOSE

Vehicle processing involves northbound and southbound vehicles queuing to approach primary inspection, with some diverted to secondary inspection or denied access to cross the border. Border inspection by Mexico results in southbound travel delays in Calexico and by the U.S. Customs results in travel delays in Mexicali. Border inspection during peak crossing periods results in poor circulation and long queues that extend from the POE on to city streets and state highways. This often results in increased congestion, traffic delays, and negative consequences for the local and regional economy, and impacts travel mobility for residents. These problems could become more acute during the reconfiguration and construction of new POE facilities.

Vehicle queues and delays associated with border crossing impact the City of Calexico's budget and staff resources. During the afternoon peak, the City employs up to 12 traffic control staff in the field which assist with managing traffic at intersections along SR-111 during the southbound afternoon peak commute period. During this time period, traffic can back-up more than two miles north of the existing POE.



Right Turn Prohibition to be placed at Seventh Street



Left turn lane closure during peak hours on SR-98 at SR-111

This report describes access routes and supporting traffic operations to the newly expanded Calexico West POE. The TCP addresses current roadways, those under construction, and analyze which routes will provide for direct, less congested, safe, and timely POE crossings. A portfolio of strategies will be developed to address the impacts of the reconfiguration and expansion of the Calexico West POE on travelers, regional residents and businesses. The study also informs those travelling into and from Imperial County for work, shopping, school, business or leisure of these new connections which will minimize delays, congestion, loss of time and negative impacts to air quality in the study area.

2.0 EXISTING CONDITIONS

Existing conditions represent the current conditions of the study area prior to changes in POE access. This analysis provides a baseline in which the future conditions can be compared.

2.1 TRANSPORTATION NETWORK

Roadways

The principal roadways in the project study area are described below. The description includes the physical characteristics, adjacent land uses, and traffic control devices along these roadways. The existing intersection roadway geometry and control conditions are shown in **Figures 2.1**. The street and highway functional classification is shown in **Figure 2.2**. **Table 2.1** summarizes the existing physical characteristics of the study roadways as collected via field and aerial reviews, including the number of lanes, functional classification, type of median, posted speed, presence of bicycle facility, on-street parking restrictions, and sidewalk presence.

State Route 111/Imperial Avenue

SR-111 is the primary north-south arterial route and commercial corridor in the City of Calexico. SR-111 has been constructed as a four-lane limited access expressway facility from I-8 to SR-98. From SR-98 to 2nd Street, SR-111 is an urban arterial with signals at 2nd Street, 5th Street, 7th Street, Grant Street, and SR-98. A raised median has been constructed between 2nd Street and Fifth Street in order to eliminate cross traffic at Third and Fourth Streets. Traffic control personnel place signs or cones indicating restricted turns during the p.m. peak period.

State Route 98/Birch Street

SR-98 is a primary east-west arterial. Caltrans recently complete capacity improvements to SR-98 that widened the highway and added turn bay storage at the Cesar Chavez Boulevard intersection. SR-98 has four through travel lanes from the east edge of Calexico to Cesar Chavez Boulevard. SR-98 provides a connection to SR-7 and the east Calexico border crossing, with this route used by truck traffic. This intersection with SR-111 is signalized. During the p.m. peak hour, turns from westbound SR-98 to southbound SR- 111 are prohibited.

2nd Street/Anza Road

2nd Street, which becomes Anza Road east and west of the City, is one of the east/west arterials near the southern edge of the City, parallel to the International Border. In the section west of SR-111, there are two lanes in each direction to the Outlet Mall, and one lane in each direction from that point to the west. East of SR- 111, the street narrows to one lane each way with angular parking provided. As the cross-street located closest to the U. S. / Mexico border, 2nd Street is impacted most when vehicle queues form waiting to be processed at the border.

Cesar Chavez Boulevard

Cesar Chavez Boulevard is a four-lane roadway that parallels the Union Pacific Railroad tracks running northwest from 2nd Street to SR-98. Cesar Chavez Boulevard is located directly opposite the vehicle entry point at the new POE. Roadway widening design plans have been completed and with construction to occur in mid-2018 through early 2019 that would widen Cesar Chavez Boulevard to five lanes (three southbound/two northbound) between 2nd Street and Grant Street and four-lanes from Grant Street to SR-98.

Grant Street

Grant Street is a two lane street classified in the General Plan as a secondary street. Grant Street provides one of the few connections between Cesar Chavez Boulevard and SR-111. The intersection of Grant Street and Cesar Chavez Boulevard is four-way stop controlled. This intersection will be signalized when the improvement project is completed. There is a guarded train crossing on Grant Street immediately east of Cesar Chavez Boulevard. The intersection of Grant Street and SR-111 is signalized.

FIGURE 2.1: INTERSECTION GEOMETRY

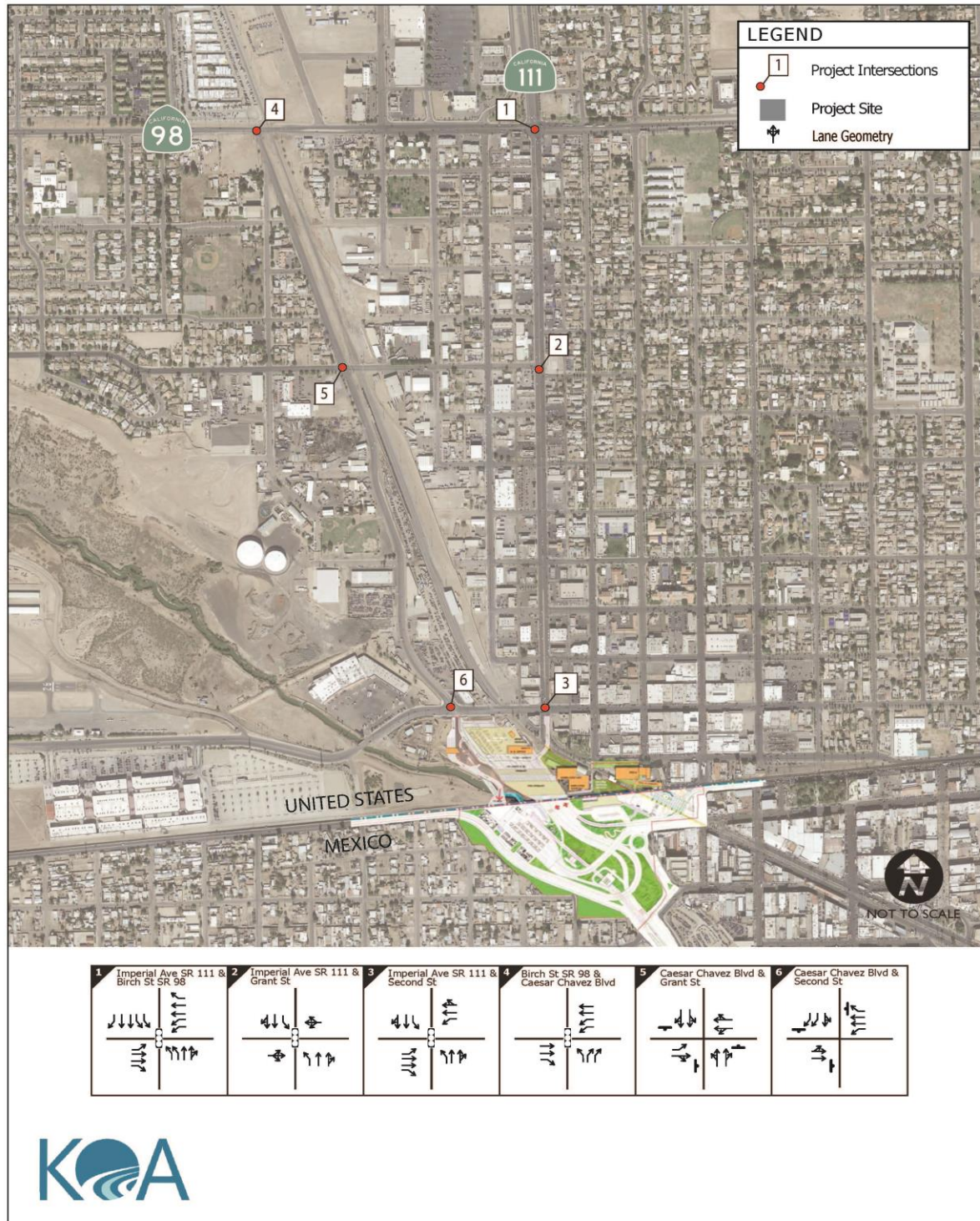


FIGURE 2.2: FUNCTIONAL



Source: Existing General Plan, City of Calexico, California

TABLE 2.1: EXISTING ROADWAY CHARACTERISTICS

Name	From	To	# of Lanes	Median	Functional Class	Post Speed	Side-walk	On-Street Park	Bicycle Lane
SR 111	Jasper Rd.	Cole Rd.	4	Yes	Expressway	65	No	No	Shoulder
	Cole	SR 98	4	Yes	Expressway	65/35	No	No	Shoulder
	SR 98	10th St.	4	Turn lanes	Primary Arterial	35	Yes	No	No
	10th St.	Grant St.	4	TWLTL	Primary Arterial	30	Yes	Yes	No
	Grant St.	4th St.	4	TWLTL	Primary Arterial	30	Yes	Yes	No
	4th St.	2nd St.	4	Median	Primary Arterial	30	Yes	No	No
Cesar Chavez Blvd.	SR 98	Grant St.	4	None	Arterial	30	West side	West side	No
	Grant St.	2nd St.	4	None	Arterial	30	No	No	No
SR 98	SR 111	Ollie Ave.	4	Yes	Arterial	30	Yes	North side	No
	Ollie Ave.	Chavez Blvd.	4	Painted	Arterial	30	Yes	No	Shoulder
Grant St.	SR 111	Chavez Blvd.	2	None	Secondary	30	Yes	Yes	No
2nd St.	SR 111	Chavez Blvd.	4	Painted	Arterial	30	Yes	No	No

Transit

Transit vehicles do not cross the border at this port, instead using the Calexico East/Mexicali II POE facility. Imperial Valley Transit operates a fixed route transit system connecting Calexico with other communities in Imperial County (such as IVT bus routes 1, 21, 31, and 32). There are plans to replace or upgrade the transit transfer center is located in downtown Calexico. This new Intermodal Transportation Center is recommended to be located on the south side of Third Street between Rockwood and Heffernan Avenue. Upon completion, the transit center will accommodate Imperial Valley Transit and Greyhound bus facilities, drop off and pick up zones, amenities such as restrooms and bicycle storage, and bus bays for public and private buses.

In addition to Imperial County Transit service, other travel modes include: taxi, transit, privately operated shuttles, intercity and tour buses, contracted labor transportation, friends or relatives picking them up in private automobiles, and on foot and by bicycle. These activities are

unorganized and dispersed across downtown Calexico. It is estimated that approximately 25 transportation service providers operating, at least in part, in Calexico: taxi companies; transit or shuttle operators; tour bus operators; and farm labor bus operators.¹

Pedestrian/Bicycle/Other

There are no existing bicycle facilities near this port in the U.S. or Mexico. There is a supportive pedestrian environment in the vicinity of the existing U.S. Customs building where pedestrian border access takes place. Pedestrian amenities include Border Park and sidewalks on local streets.

2.2 TRAFFIC VOLUMES

Daily Count Volumes

Daily traffic counts were taken at two locations on SR-111 in April, 2018, in order to understand traffic levels that occur throughout the day. Average daily traffic volumes were obtained through machine data collection. Two locations were counted:

- SR-111 north of SR-98
- SR-111 south of 2nd Street

The hourly traffic volume distribution of the traffic counts taken are shown in **Figure 2.3** and **Figure 2.4**. The traffic count south of 2nd Street provides an indication of the level of traffic flow through the border inspection stations. As shown in **Figure 2.4**, the number of vehicles moving southbound to the Mexican border increased throughout the day and peaked at 1,461 for the hour between 6 p.m. and 7 p.m. This provides an indication of the capacity for southbound vehicle inspections. The northbound movement remains relatively constant reaching a peak of just over 500 vehicles per hour between 7:00 a.m. and 8:00 a.m. The daily traffic counts are provided in **Appendix A**.

¹ Calexico Border Intermodal Transportation Center Feasibility Study, 2014, p. 5.

FIGURE 2.3: DAILY TRAFFIC COUNT SR-111 AND SR-98

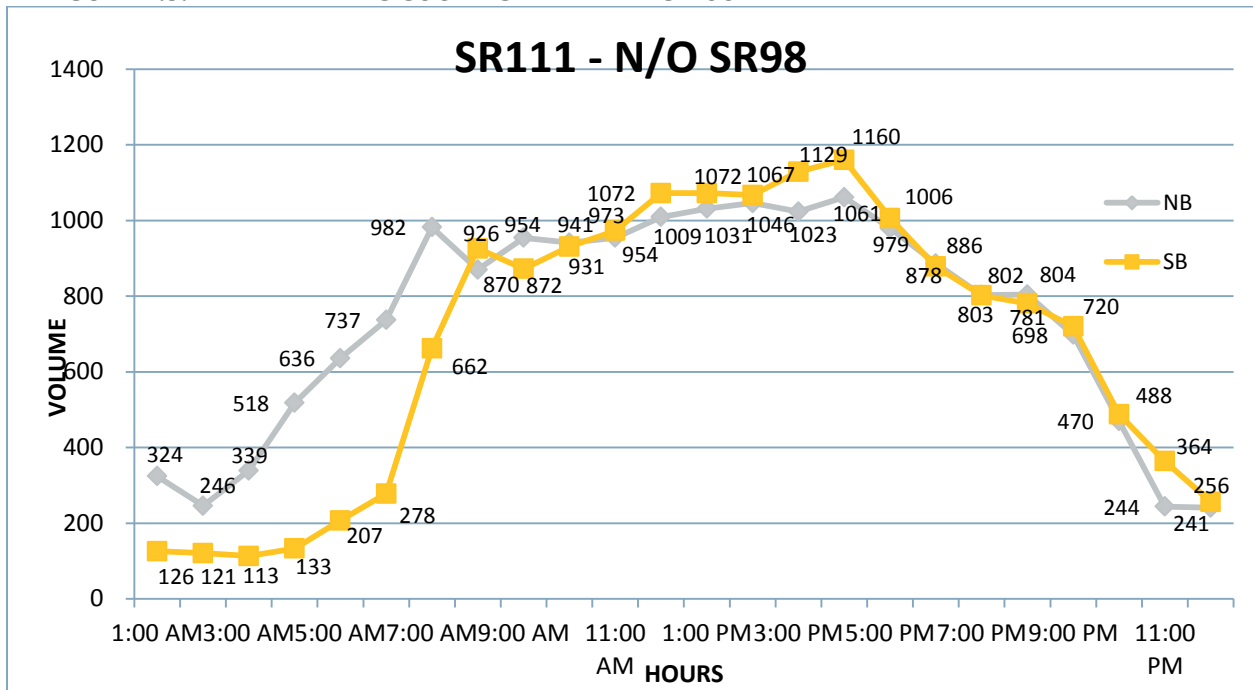
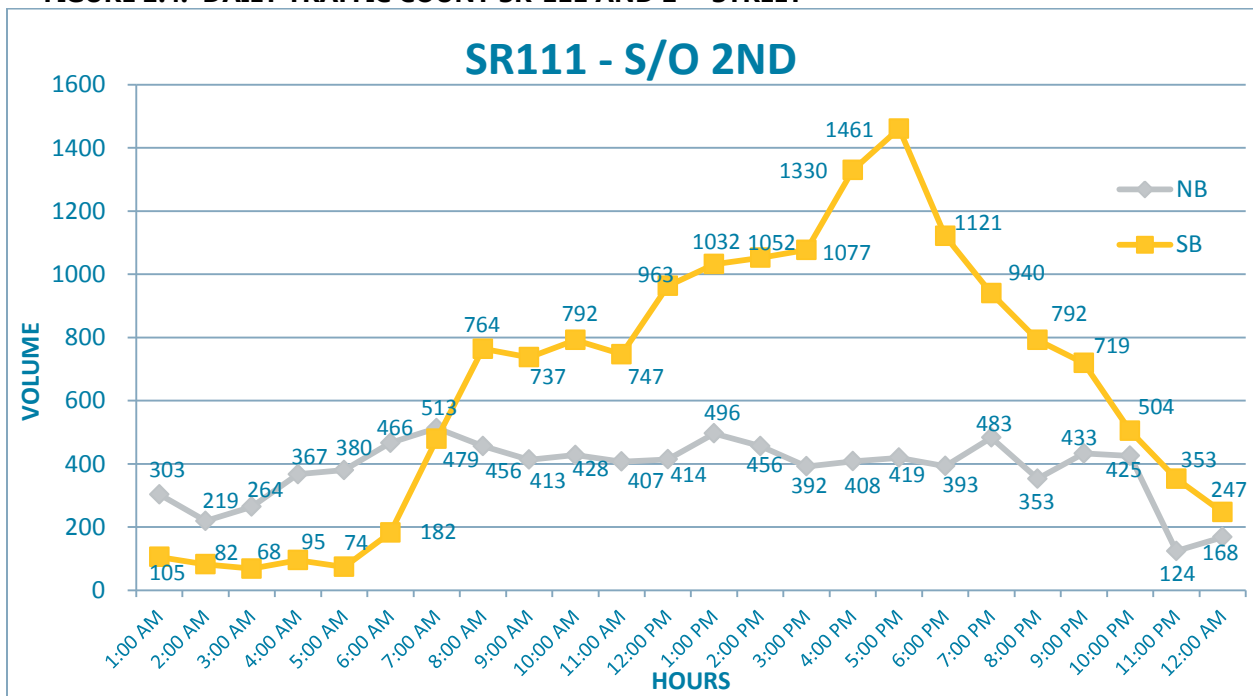


FIGURE 2.4: DAILY TRAFFIC COUNT SR-111 AND 2ND STREET



Peak Hour Count Volumes

The intersection turning movement counts were conducted during the weekday evening peak from 3:00 PM to 6:00 PM on Wednesday April 25, 2018 for the following intersections:

Intersections

1. SR 111 at SR 98
2. SR 111 at Grant Street
3. SR 111 at 2nd Street
4. Cesar Chavez at SR 98
5. Cesar Chavez at Grant Street
6. Cesar Chavez at 2nd Street

The resultant existing weekday morning and evening peak hour intersection volumes are shown in **Figure 2-5. Appendix B** contains peak hour count data.

Traffic Queue

The length of queues was recorded on Thursday May 17, 2018 between 3:00 p.m. and 6:00 p.m. The growth of the queue over this time period is shown in **Figure 2.6**.

FIGURE 2.5: EXISTING TURNING MOVEMENT COUNTS

EXISTING TURNING MOVEMENT COUNTS

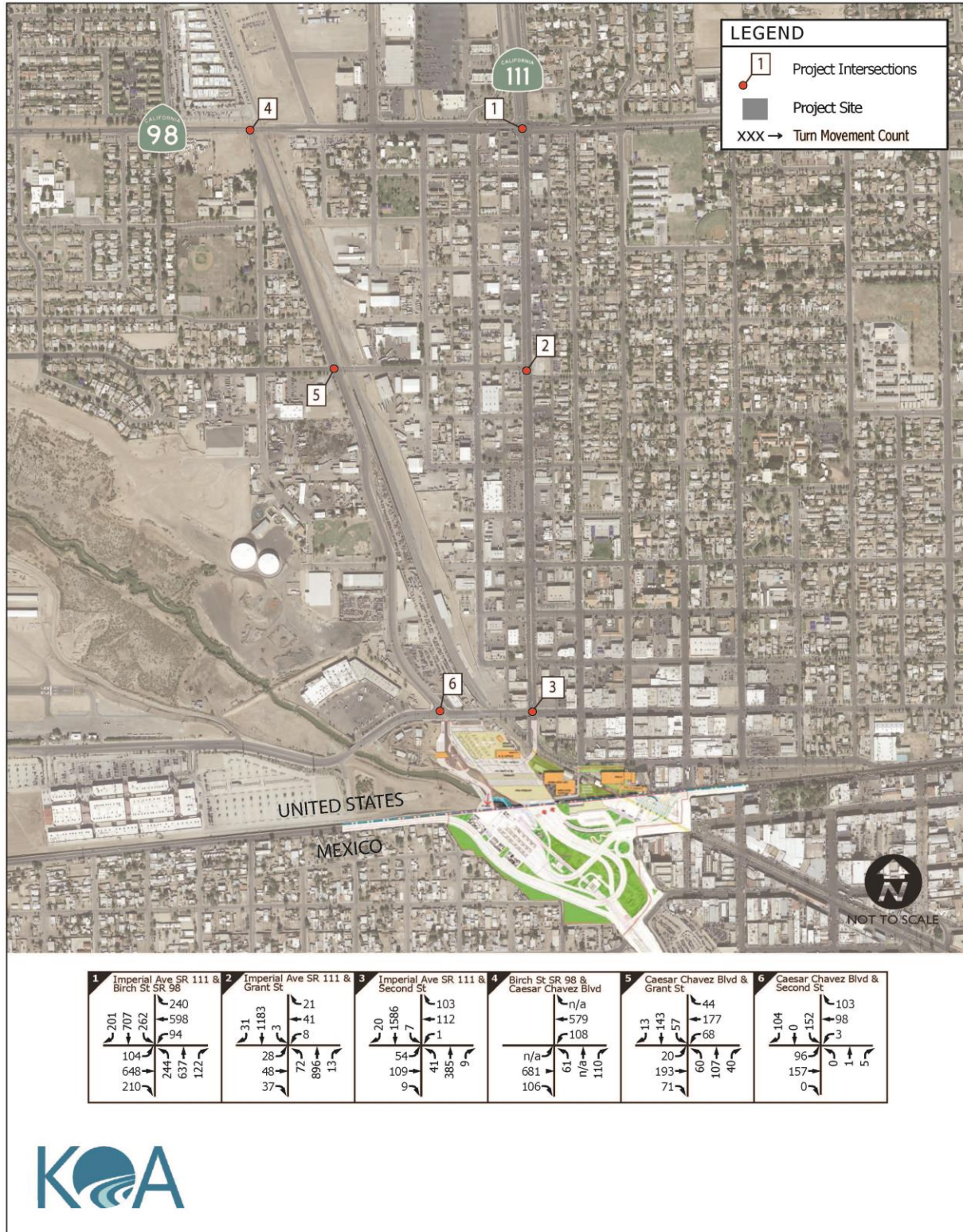


FIGURE 2.6: VEHICLE QUEUES, 3:00 P.M. TO 6:00 P.M.



INTERSECTION LEVEL OF SERVICE

Table 2.2 summarizes the level of service analysis results for the study area intersections using the intersection evaluation methodology described in the 2010 Highway Capacity Manual. Intersection level of service detail and worksheets are provided in **Appendix C**. While overall intersection level-of-service is shown to be satisfactory, individual traffic movements can be impacted. The primary cause of traffic delays are queues related to border crossing creating long queue lengths that impede travel movement restricting traffic counts at intersections. This analysis only partially reflects actual delays resulting from border queuing.

TABLE 2.2: INTERSECTION LEVEL OF SERVICE

No.	Intersection	Traffic Control	PM Peak Period		
			Avg Delay (secs.)	LOS	Southbound Queue (ft.)
1	SR-111 and SR-98	Signal	42.3	D	394
2	SR-111 and Grant	Signal	32.7	C	717
3	SR-111 and 2nd Street	Signal	20.1	C	1220
4	Cesar Chavez and SR-98	Signal	27.9	C	32 (WBL)
5	Cesar Chavez and Grant	Stop		A	n/a
6	Cesar Chavez and 2nd Street	Stop		A	n/a

The southbound queue lengths estimated by Synchro provide an estimate of the queue length from that intersection without downstream back-ups. The queues reported in Synchro while substantial, were still shorter than those observed and illustrated in **Figure 2.3**. While the calculated level-of-service and queue length are show better than observed level-of-service, they still provide a measure of comparison between alternatives and can be used for evaluating signal timing and phasing.

PORT OF ENTRY FACILITIES

Existing

The existing POE facilities are shown in **Figure 2.7**. The existing facility provides 10 vehicle lanes for northbound traffic entering the U.S. and six southbound vehicle inspection lanes for southbound traffic entering Mexico. Current operations in each country tend to support the operation of between four to six vehicle inspection lanes. Representatives of SAT, the agency in Mexico responsible for border operations, has stated a goal of achieving an average vehicle inspection rate of less than 60 seconds per vehicle. Typically for southbound travel, there are four vehicle inspection lanes open except during peak times when six vehicle inspection lanes may be open. For northbound travel, the U.S. Customs typically provides six open vehicle inspection lanes. During peak travel times, the number of lanes may increase. The time for vehicle inspection by U.S. Customs may exceed 60 seconds per vehicle, which can limit the volume of the northbound vehicle movement.

FIGURE 2.7: EXISTING PORT OF ENTRY (MAY, 2018)



Planned

On the U.S. side, the POE's existing structures will be replaced by three new buildings. The project will be implemented in two phases. The first phase has been funded, and is the phase analyzed in this TCP. The first phase will include a headhouse, ten of the project's ultimate 16 northbound POV inspection lanes, five southbound POV inspection lanes with temporary asphalt paving, and a bridge across the New River for southbound traffic. The POE improvements will change the access point on the U.S. from SR 111 (Imperial Avenue) to Cesar Chavez Boulevard. These plans are shown in **Figure 2.8**.

FIGURE 2.8: CALEXICO WEST POE EXPANSION PLANS



Source: GSA

Mexico is also constructing a new POE that will include 10 inspection lanes. The layout for POE improvements for both the U.S. and Mexico are shown in **Figure 2.9**. While vehicle lane capacity will increase, the number of inspection lanes open will depend on operational funding from both countries. Modernization plans have also been made on the Mexican side of the border. The Mexicali expansion project will consist of a new administration building and expansion and reconfiguration of personal vehicle crossing lanes on both sides of the New River, to the east of the current processing facilities. Four southbound vehicle lanes expanding into 17 inspection booths will be created east of the river, along with reconfiguration of northbound roadways west of the railroad tracks.

Pedestrian movements will continue to be accommodated at the existing POE facilities. Phase 2 of the POE improvement project will include pedestrian improvements, including a new pedestrian processing facility. The addition of a pedestrian plaza east of the current facility is also planned during the modernization project. Additional pedestrian and bicycle facility improvements are planned in for both sides of the border which will improve pedestrian access.²

² Pedestrian and Bicycle Transportation Access Study, ICTC, 2015

FIGURE 2.9: MEXICALLI POE EXPANSION PLANS



Source: Gobierno del Estado de Baja California

A combined graphic of the POE improvements is shown below in **Figure 2.10**.

FIGURE 2.10: COMBINED POE PLANS



Source:

ICTC

SUMMARY

This section describes existing traffic conditions prior to the shift of traffic from the downtown Calexico POE to the new POE to the west. It describes the existing street system, traffic volumes, queue length, and intersection level of service. This information will provide a baseline comparison for traffic conditions following circulation changes associated with the new POE.

3.0 TRAFFIC OPERATION SCENARIOS (1A AND 1B)

This memorandum describes the traffic circulation alternatives developed to accommodate traffic during the initial traffic scenarios related to the phased opening of a new Port of Entry (POE) facility in downtown Calexico, California. The phased opening will require development of two temporary traffic circulation plans.

Scenario 1A - a temporary traffic during construction scenario to accommodate southbound traffic; to the new POE that would be in place, from approximately July 10, 2018 to September 1, 2018.

Scenario 1B - a temporary traffic during construction scenario; to accommodate both southbound and northbound traffic to the new POE, that would be in place from approximately September 1, 2018 into February, 2019.

This memorandum presents traffic circulation alternatives for these two scenarios.

3.1 SCENARIO 1A

This is a temporary traffic during construction scenario that will be in place from July 10, 2018 to approximately September 1, 2018. Cesar Chavez Boulevard will be under construction during this time, so POE traffic will be directed to use SR-111 to 2nd Street for southbound border access (see **Figure 3.1**). The estimated traffic volumes associated with this traffic shift are shown in **Figure 3.2**. Southbound volumes were adjusted to reflect variation in flow to the POE and to represent observed traffic demand.

The traffic circulation alternatives involve modifications to lane geometry and signal timings at SR-111/2nd Street and at Cesar Chavez Boulevard/2nd Street, and the road segment between these two intersections. For each alternative, a description of the lane geometry and permitted movements has been provided along with a summary of benefits and impacts and the results of a capacity analysis. The conceptual drawings for each alternative are shown in the appendix.

3.2 TRAFFIC CONTROL ALTERNATIVE 1: MAXIMIZE SOUTHBOUND VEHICLE THROUGHPUT

Alternative 1a

This alternative will provide alternatives that would seek to maximize the movement of southbound vehicles to the southbound inspection booths entering Mexico, but would impact other travel movements. Four westbound lanes would be provided on 2nd Street between SR-111 and Cesar Chavez Boulevard that would accommodate three left turn lanes into the three entrance lanes into the customs area, and a fourth lane which would provide for westbound through and right turn traffic at Cesar Chavez Boulevard. A fixed barrier protecting the left turn movement into the POE could be provided at 2nd Street and Cesar Chavez Boulevard, eliminating the need for city personnel to direct traffic. One eastbound lane would be provided between 2nd Street and Cesar Chavez Boulevard that would essentially serve construction related traffic coming out of the new POE. The remaining traffic movements would only allow turns between the north and west legs of the 2nd Street and Cesar Chavez intersection.

The intersection of SR-111 and 2nd Street would be modified to provide triple right turn lanes to facilitate the movement to the POE. Southbound left turns would not be permitted. All eastbound traffic movements would be provided from one lane. The intersection level-of service is shown in **Table 3.1**.

FIGURE 3.1: CIRCULATION PATTERN WITH SOUTHBOUND TRAFFIC SHIFT

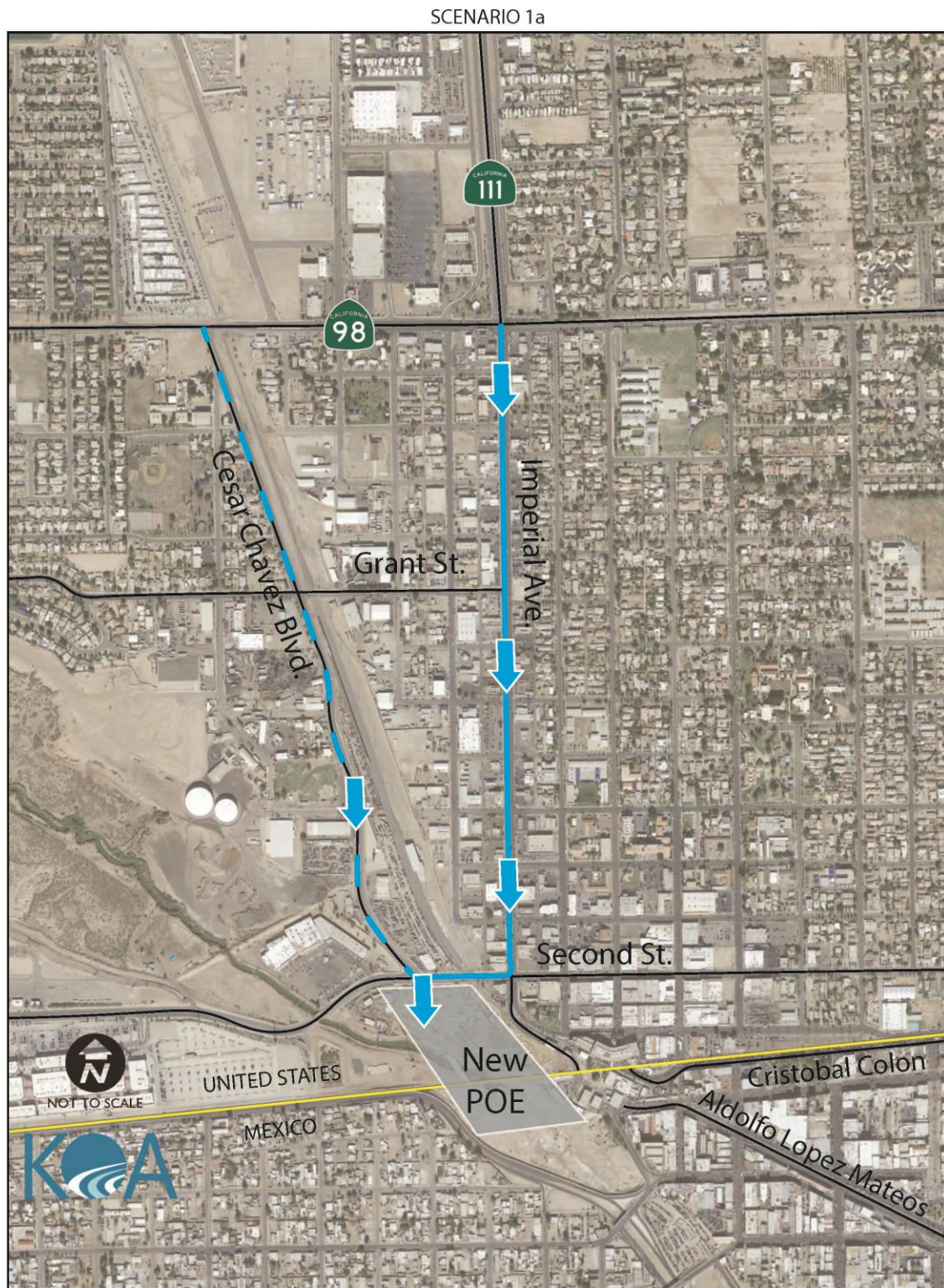
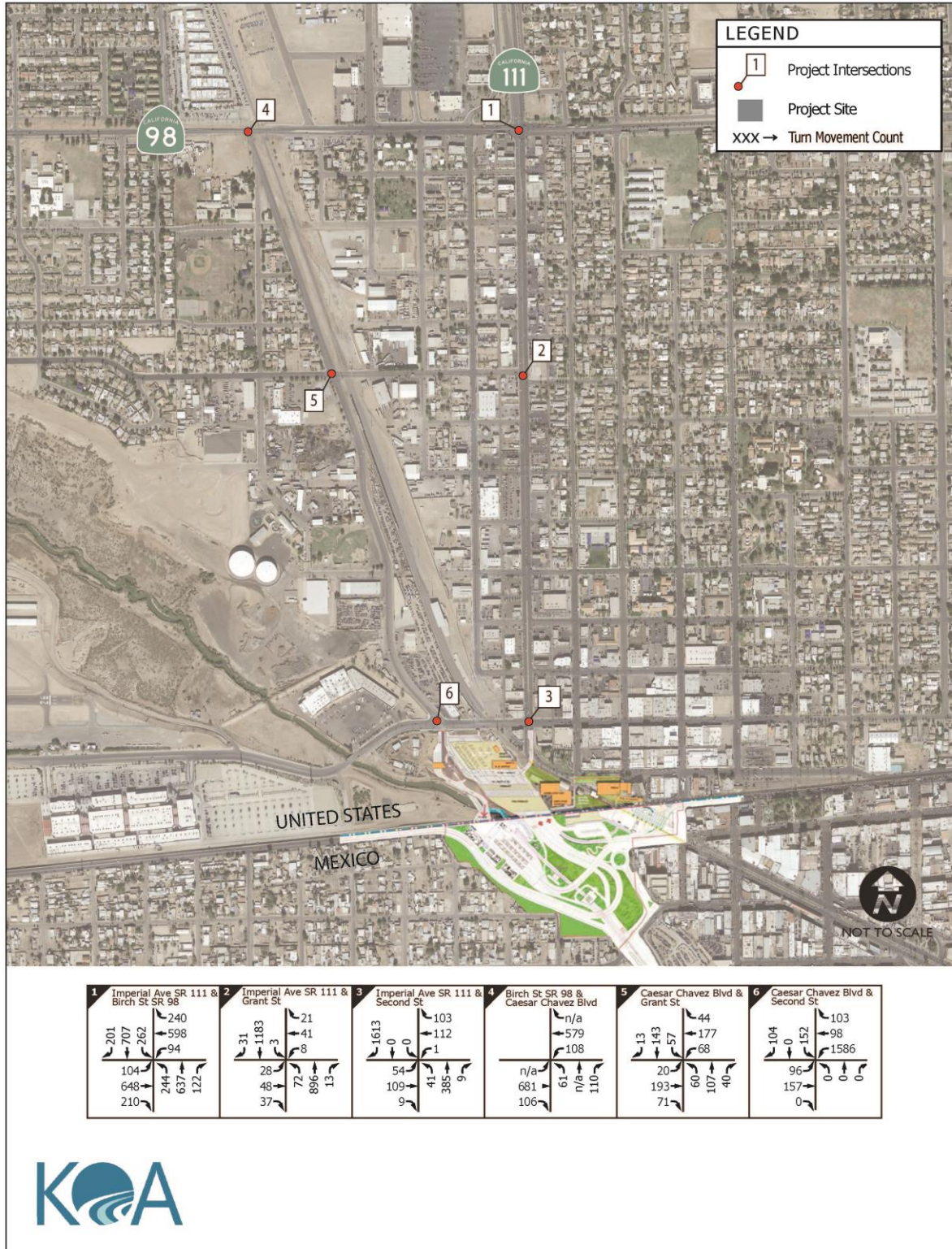


FIGURE 3.2: 1A – TURNING MOVEMENT COUNTS

1A - TURNING MOVEMENT COUNTS



Benefits

- Three lanes of vehicle capacity and queue storage on westbound 2nd Street
- Reduced need of Calexico City personnel to assist traffic at 2nd Street and Cesar Chavez Boulevard
- Westbound access provided to outlet mall / airport

Impacts

- Limited traffic movement at 2nd Street and Cesar Chavez Blvd.
- Eastbound traffic from outlet mall / airport must use Cesar Chavez Boulevard, which will be under construction but remain open
- No southbound left turn movement provided at SR-111 and 2nd Street.

TABLE 3.1: TRAFFIC LEVEL OF SERVICE – 1a

SCENARIOS	LANE GROUPS		Intersection LOS	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
1A-1a	Cesar Chavez & 2nd St	Total Delay	7.6	27.5			6.1	7.9							0.6
		LOS	A	C			A	A							A
	Imperial & 2nd St	Total Delay	8.5		36.1		16	18.7		5.1	5.1				5.9
		LOS	A		D		B	B		A	A				A

Alternative 1b

This alternative differs from Alternative 1a in that both eastbound and westbound lanes would be provided through the Cesar Chavez Boulevard intersection at 2nd Street. The alternative will provide a similar movement of southbound vehicles to the southbound inspection booths entering Mexico from three westbound left turn lanes. No fixed barrier would be provided at 2nd Street and Cesar Chavez Boulevard, so that traffic could be signal controlled or controlled by on-site personnel. One eastbound and westbound lane would be provided. Only a right turn is provided for southbound traffic on Cesar Chavez. The intersection of SR-111 and 2nd Street would be modified to provide triple right turn lanes, with the center left turn lane providing for all three movements, to facilitate the movement to the POE. Southbound right turns would be permitted at Cesar Chavez. The intersection level-of service is shown in **Table 3.2**.

Benefits

- Three lanes of vehicle capacity and queue storage on westbound 2nd Street
- Westbound access provided to outlet mall / airport
- Eastbound access provided from the outlet mall/airport

Impacts

- Limited southbound traffic movement at 2nd Street and Cesar Chavez Blvd.
- No southbound left turn movement provided at SR-111 and 2nd Street.
- Calexico City personnel may be needed to assist traffic at 2nd Street and Cesar Chavez Boulevard
- Less capacity at CCB/2nd Street

TABLE 3.2: TRAFFIC LEVEL OF SERVICE – 1b

SCENARIOS	LANE GROUPS		Intersection LOS	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
1A-1b	Cesar Chavez & 2nd St	Total Delay	23.8	35.7	32.9		27.4	3.2							0.6
		LOS	C	D	C		C	A							A
	Imperial & 2nd St	Total Delay	10.3		70.8		20	24.8		4.9	4.8				4.8
		LOS	B		E		B	C		A	A				A

Alternative 1c

This alternative differs from Alternative 1a in that both eastbound and westbound lanes would be provided through the Cesar Chavez Boulevard intersection at 2nd Street **and** a southbound left turn on Cesar Chavez would be added. This alternative will provide a similar movement of southbound vehicles to the southbound inspection booths entering Mexico from three westbound left turn lanes and a third westbound lane which would provide for westbound through and right turn traffic at Cesar Chavez Boulevard. No fixed barrier would be provided at 2nd Street and Cesar Chavez Boulevard, so that traffic could be signal controlled or controlled by on-site personnel. One eastbound and westbound lane would be provided. Traffic patterns at 2nd Street and SR-111 would remain the same as in Alternative 1b. Southbound right and left turns would be permitted at Cesar Chavez. The intersection level-of service is shown in **Table 3.3**.

Benefits

- Three lanes of vehicle capacity and queue storage on westbound 2nd Street
- Westbound access provided to outlet mall / airport
- Eastbound access provided from the outlet mall/airport

Impacts

- No southbound left turn movement provided at SR-111 and 2nd Street
- Calexico City personnel may be needed to assist traffic at 2nd Street and Cesar Chavez Boulevard
- Less capacity at CCB/2nd Street

TABLE 3.3: TRAFFIC LEVEL OF SERVICE – 1c

SCENARIOS	LANE GROUPS		Intersection LOS	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
1A-1c	Cesar Chavez & 2nd St	Total Delay	38.5	84.7	82.8		35.3	12.0						40.4	
		LOS	D	F	F		D	B						D	
	Imperial & 2nd St	Total Delay	14.3		119.8		29	38.4		5.1	5.0				4.8
		LOS	B		F		C	D		A	A				A

Alternative 1d

This alternative differs from Alternative 1a in that both eastbound and westbound lanes would be provided through the Cesar Chavez Boulevard intersection at 2nd Street **and** one southbound through lane is provide to access the new POE during construction of Cesar Chavez. This alternative will provide a similar movement of southbound vehicles to the southbound inspection booths entering Mexico from three westbound left turn lanes and a third westbound lane which would provide for westbound through and right turn traffic at Cesar Chavez Boulevard. No fixed barrier would be provided at 2nd Street and Cesar Chavez Boulevard, so that traffic could be signal controlled or controlled by on-site personnel. One eastbound and westbound lane would be provided. Southbound right and left turns and through movement to the POE would be permitted at Cesar Chavez. The intersection level-of service is shown in **Table 3.4**.

Benefits

- Three lanes of vehicle capacity and queue storage on westbound 2nd Street
- Westbound access provided to outlet mall / airport
- Eastbound access provided from the outlet mall/airport
- Southbound access to new POE provided at Cesar Chavez

Impacts

- No southbound left turn movement provided at SR-111 and 2nd Street
- Calexico City personnel may be needed to assist traffic at 2nd Street and Cesar Chavez Boulevard
- Less capacity at CCB/2nd Street

TABLE 3.4: TRAFFIC LEVEL OF SERVICE – 1d

SCENARIOS	LANE GROUPS		Intersection LOS	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
1A-1d	Cesar Chavez & 2nd St	Total Delay	52.8	84.8	92.8		49.7	21.9						57.1	
		LOS	D	F	F		D	C						C	
	Imperial & 2nd St	Total Delay	10.9		87.0		22.0	27.1		4.9	4.8				2.8
		LOS	B		F		C	C		A	A				A

3.3 TRAFFIC CONTROL ALTERNATIVE 2: BALANCED EAST-WEST TRAFFIC

Alternative 2a

This alternative provides two westbound left turn lanes on 2nd Street at Cesar Chavez Boulevard to provide access to the inspection booths entering Mexico. The two westbound left turn lanes would be accommodated by the three entrance lanes into the customs area. For this alternative, a fixed barrier protecting the left turn movement into the POE could be provided at 2nd Street and Cesar Chavez Boulevard, eliminating the need for city personnel to direct traffic. One eastbound lane would be provided between 2nd Street and Cesar Chavez Boulevard, that would essentially serve construction related traffic coming out of the new POE. The remaining traffic movements would only allow turns between the north and west legs of the 2nd Street and Cesar Chavez intersection. The intersection of SR-111 and 2nd Street would be modified to provide two right turn lanes to facilitate the movement to the POE. Southbound right turns would be permitted. The intersection level-of service is shown in **Table 3.5**.

Benefits

- Two lanes of vehicle capacity and queue storage on westbound 2nd Street
- Reduced need of Calexico City personnel to assist traffic at 2nd Street and Cesar Chavez Boulevard
- Westbound access provided to outlet mall / airport
- Left turn provided for southbound SR-111 to 2nd Street

- Less change required moving into Scenario 2

Impacts

- Limited traffic movement at 2nd Street and Cesar Chavez Blvd.
- Eastbound traffic from outlet mall / airport must use Cesar Chavez Boulevard, which will be under construction but remain open
- Less capacity and storage provided as compared to Traffic Control Alternative 1

TABLE 3.5: TRAFFIC LEVEL OF SERVICE – 2a

SCENARIOS	LANE GROUPS		Intersection LOS	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
1A-2a	Cesar Chavez & 2nd St	Total Delay	7.1	60.9			1.8	1.9							0.8
		LOS	A	E			A	A							A
	Imperial & 2nd St	Total Delay	27.4		117.4		40	48.1		19.9	4.9		4.3	22.4	22.2
		LOS	C		F		D	D		B	A		A	C	C

Alternative 2b

This alternative differs from Alternative 2a in that both eastbound and westbound lanes would be provided through the Cesar Chavez Boulevard intersection at 2nd Street. This alternative provides two westbound left turn lanes on 2nd Street at Cesar Chavez Boulevard to provide access to the inspection booths entering Mexico, and one westbound through and right turn lane. No fixed barrier would be provided at 2nd Street and Cesar Chavez Boulevard, so all eastbound traffic movements will be permitted through the intersection. Only a right turn is provided for southbound traffic on Cesar Chavez at 2nd Street. The intersection of SR-111 and 2nd Street would be modified to provide two southbound right turn lanes to facilitate the movement to the POE. Southbound right turns would be permitted at Cesar Chavez. The intersection level-of service is shown in **Table 3.6**.

Benefits

- Two lanes of vehicle capacity and queue storage on westbound 2nd Street
- Westbound access provided to outlet mall / airport
- Left turn provided for southbound SR-111 to 2nd Street
- Less change required moving into Scenario 2.
- Eastbound access provided from the outlet mall/airport

Impacts

- Limited traffic movement at 2nd Street and Cesar Chavez Blvd.
- Calexico City personnel may be needed to assist traffic at 2nd Street and Cesar Chavez Boulevard
- Less capacity at CCB/2nd Street than with Alternative 2a

TABLE 3.6: TRAFFIC LEVEL OF SERVICE – 2b

SCENARIOS	LANE GROUPS		Intersection LOS	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
1A-2b	Cesar Chavez & 2nd St	Total Delay	20.8	9.0	57.3		20.2	30.5							0.7
		LOS	C	A	E		C	A							A
	Imperial & 2nd St	Total Delay	26.2	178.4	94.3		42.0	66.9		8.7	3.6		3.4	19.0	18.9
		LOS	C	F	F		D	E		A	A		A	B	B

Alternative 2c

This alternative differs from Alternative 2a in that both eastbound and westbound lanes would be provided through the Cesar Chavez Boulevard intersection at 2nd Street **and** a southbound left turn on Cesar Chavez would be permitted as well as the southbound right turn. This alternative provides two westbound left turn lanes on 2nd Street to provide access to the inspection booths entering Mexico and one westbound through and right turn lane. No fixed barrier would be provided at 2nd Street and Cesar Chavez Boulevard, so all eastbound traffic movements will be permitted through the intersection. The intersection of SR-111 and 2nd Street would be modified to provide two southbound right turn lanes to facilitate the movement to the POE. Southbound right and left turns would be permitted at Cesar Chavez. The intersection level-of service is shown in **Table 3.7**.

Benefits

- Two lanes of vehicle capacity and queue storage on westbound 2nd Street
- Westbound access provided to outlet mall / airport
- Left turn provided for southbound SR-111 to 2nd Street
- Left turn lane provided for southbound CCB to 2nd Street
- Less change required moving into Scenario 2.
- Eastbound access provided from the outlet mall/airport

Impacts

- Limited traffic movement at 2nd Street and Cesar Chavez Blvd.
- Calexico City personnel may be needed to assist traffic at 2nd Street and Cesar Chavez Boulevard
- Less capacity at CCB/2nd Street than with Alternative 2a or 2b

TABLE 3.7: TRAFFIC LEVEL OF SERVICE – 2c

SCENARIO S	LANE GROUPS		Intersection LOS	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
1A-2c	Cesar Chavez & 2nd St	Total Delay	45.9	84.8	73.6		44.4	3.7							59.9
		LOS	D	F	E		D	A							E
	Imperial & 2nd St	Total Delay	65.0	173.6	87.2		54.0	78.6		168.2	91.7			52.0	52.0
		LOS	E	F	F		D	E		F	F			D	D

Alternative 2d

This alternative differs from Alternative 2a in that both eastbound and westbound lanes would be provided through the Cesar Chavez Boulevard intersection at 2nd Street **and** one southbound through lane is provide to access the new POE during construction of Cesar Chavez. This alternative provides two westbound left turn lanes on 2nd Street to provide access to the inspection booths entering Mexico and one westbound through and right turn lane. No fixed barrier would be provided at 2nd Street and Cesar Chavez Boulevard, so all eastbound traffic movements will be permitted through the intersection. The intersection of SR-111 and 2nd Street would be modified to provide two southbound right turn lanes to facilitate the movement to the POE. Southbound right and left turns and through movement to the POE would be permitted at Cesar Chavez. The intersection level-of service is shown in **Table 3.8**.

Benefits

- Two lanes of vehicle capacity and queue storage on westbound 2nd Street
- Westbound access provided to outlet mall / airport
- Left turn provided for southbound SR-111 to 2nd Street
- Southbound access to new POE provided at Cesar Chavez
- Less change required moving into Scenario 2.
- Eastbound access provided from the outlet mall/airport

Impacts

- Limited traffic movement at 2nd Street and Cesar Chavez Blvd.
- Calexico City personnel needed to assist traffic at 2nd Street and Cesar Chavez Boulevard
- Less capacity at CCB/2nd Street than with Alternative 2a, 2b or 2c

TABLE 3.8: TRAFFIC LEVEL OF SERVICE

SCENARIOS	LANE GROUPS		Intersection LOS	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
1A-2d	Cesar Chavez & 2nd St	Total Delay	93.8	84.8	73.6		107.9	16.8						83.6	
		LOS	F	F	E		F	B						F	
	Imperial & 2nd St	Total Delay	25.2	40.3	30.8		23.0	31.2		47.5	38.7			19.9	19.9
		LOS	C	D	C		C	C		D	D			B	B

SELECTED ALTERNATIVE

The eight alternatives were reviewed by the Technical Stakeholder Committee. Following review of eight alternatives, the committee reached a consensus on Alternative 2c. The alternatives considered and primary considerations are compared in **Table 3.9**. A primary reason for selecting Alternative 2 was that benefit that Alternative 2 would minimize the change needed when the northbound traffic moved to the new POE. The level of access provided by sub-alternatives d, c, b, was then discussed. The consensus was to not allow access from Cesar Chavez Boulevard directly into the POE while it was under construction. Methods to block the southbound access was discussed including paint delineation, use of a porkchop median and use of personnel.

TABLE 3.9: ALTERNATIVE COMPARISON AND SELECTION

Scenario 1A	SB Access to POE	Access to Outlet Mall	Access to Downtown	Impacts to CC Construction	Consistency between 1A and 1B
Alternative 1 - Maximize Southbound Vehicle Throughput					
a. Restrict SB CC and EB	Very	Poor	Very Poor	Good	Poor

2nd	Good				
b. Restrict SB CC to RT	Fair	Fair	Poor	Fair	Poor
c. Restrict SB CC to RT/LT	Fair	Fair	Fair	Fair	Poor
d. SB CC all movements	Fair	Fair	Fair	Poor	Poor
Alternative 2 - Balanced East-West flow on 2nd St.					
a. Restrict SB CC and EB 2nd	Good	Poor	Very Poor	Good	Good
b. Restrict SB CC to RT	Fair	Fair	Poor	Fair	Good
c. Restrict SB CC to RT/LT	Fair	Fair	Good	Fair	Good
d. SB CC all movements	Poor	Fair	Fair	Poor	Good

 Selected Alternative

3.4: SCENARIO 1B

This is a temporary traffic during construction scenario that would be in place from approximately September 1, 2018 into February, 2019. . Cesar Chavez Boulevard will be under construction during this time, so POE traffic will be directed to use SR-111 to 2nd Street for northbound and southbound border access (see **Figure 3.3**).

The traffic circulation alternatives involve modifications to lane geometry and signal timings at SR-111/2nd Street and at Cesar Chavez Boulevard/2nd Street, and the road segment between these two intersections. The traffic control alternative is a modified Alternative 2c that was also selected for construction Scenario 1A, as essentially the same lane geometry can be used for both Scenario 1A and 1B. For the analysis of Scenario 1B, the northbound POE traffic has been added. The estimated traffic volumes associated with these alternatives are shown in **Figure 3.4**. The traffic level-of service has been calculated.

The traffic circulation alternatives involve modifications to lane geometry and signal timings at SR-111/2nd Street and at Cesar Chavez Boulevard/2nd Street, and the road segment between these two intersections. For each alternative, a description of the lane geometry and permitted movements has been provided along with a summary of benefits and impacts and the results of a capacity analysis. The conceptual drawings for each alternative are shown in the appendix.

FIGURE 3.3: CIRCULATION PATTERN WITH SOUTHBOUND/NORTHBOUND TRAFFIC SHIFT

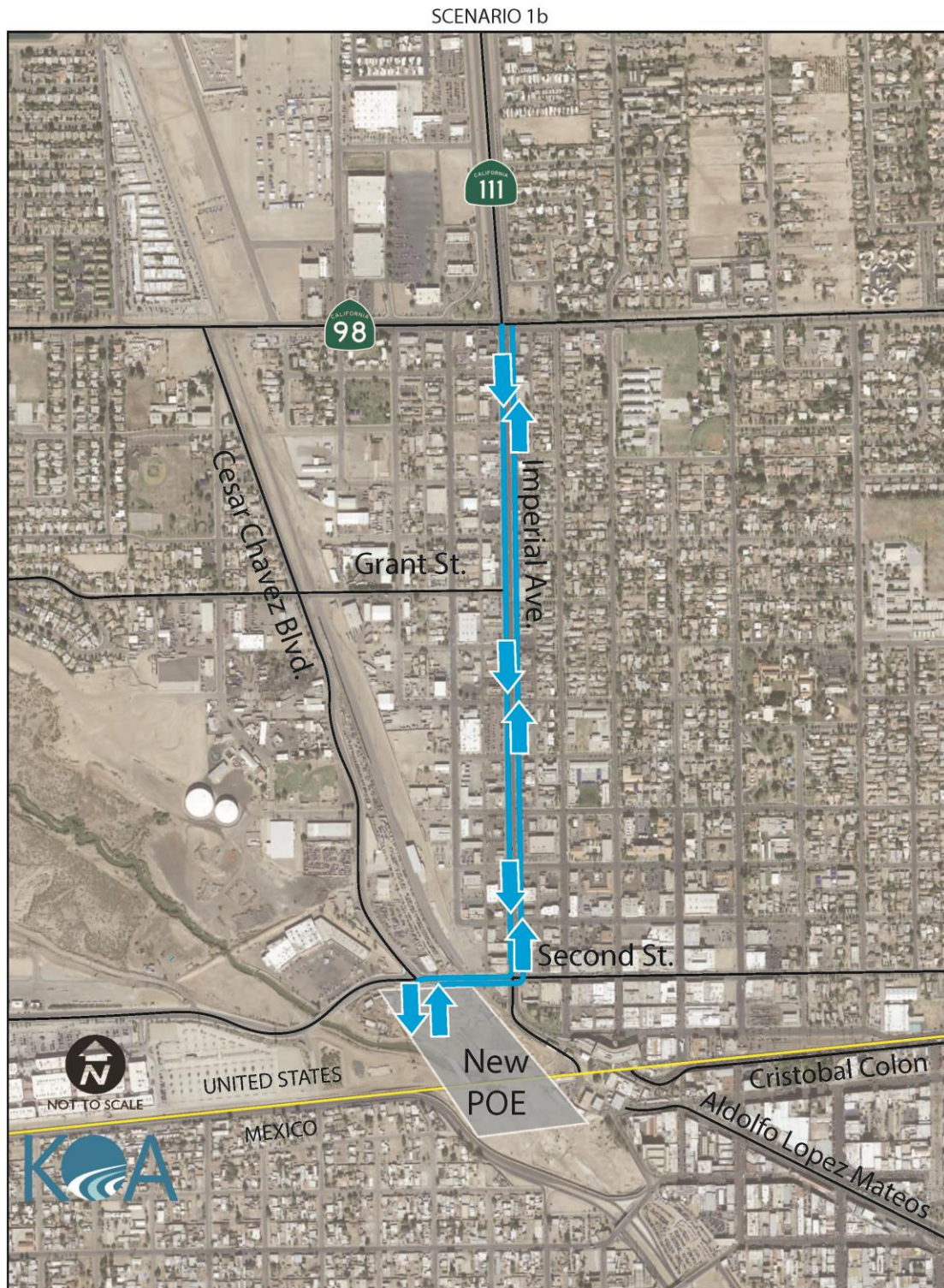
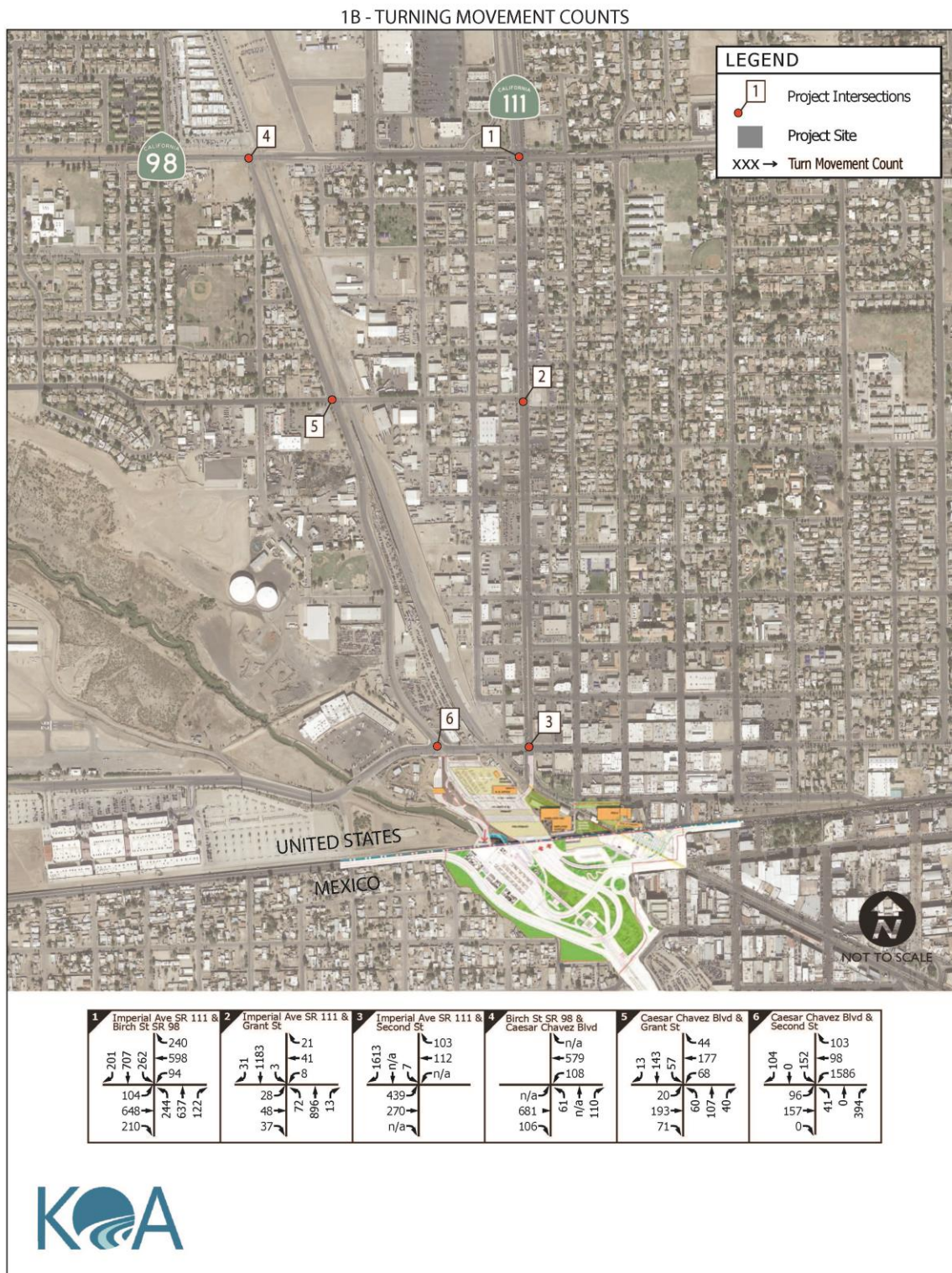


FIGURE 3.4: ESTIMATED SCENARIO 1B TRAFFIC VOLUMES



Traffic Control Alternative 2c

The conceptual layout for Traffic Control Alternative 2c is shown below. The level of service results shown below reflects those geometrics. The intersection level-of service is shown in **Table 3.9**.

TABLE 3.9: TRAFFIC LEVEL OF SERVICE – 2c

SCENARIOS	LANE GROUPS		Intersection LOS	EBL	EBT/R		WBL	WBT/R	WBT/R	NBL	NBT	NBR	SBL	SBT	SBR
1B-2C	Cesar Chavez & 2nd St	Total Delay	32.9	78.4	68.3		35.1	4.6		52.3		2.3	63.1		12.6
		LOS	C	E	E		D	A		D		A	E		B
		Queue		155	117		595	27		76		35	225		59
	Imperial & 2nd St	Total Delay	25.2	23.1	17.8				51.3				54.3		70.7
		LOS	C	C	B				D				D		E
		Queue		263	219				264				17		571

3.4 SUMMARY

This report section describes the information used to develop traffic circulation plans for initial traffic scenarios related to the phased opening of a new Port of Entry (POE) facility in downtown Calexico, California. Two circulation plans and traffic control plans were developed for:

Scenario 1A - to accommodate southbound traffic to the new POE that would be in place from approximately July 10, 2018 to September 1, 2018.

Scenario 1B - to accommodate both southbound and northbound traffic to the new POE that would be in place from approximately September 1, 2018 into February, 2019.

The intersection capacity results are summarized in **Table 3.10**. The high volume of traffic and length of queues between the POE and nearby intersections results in varying results. For Scenario 1B, the traffic impacts of both northbound and southbound travel impacts the SR-111 and 2nd Street intersection which in turn impacts the 2nd Street and Cesar Chavez intersection. The delays and queue at Cesar Chavez will depend on how well the SR-111 and 2nd Street intersections operate.

TABLE 3.10 SCENARIO 1A AND 1B LEVEL OF SERVICE SUMMARY

No.	Intersection	Traffic Control	PM Peak Period		
			Avg Delay (secs.)	LOS	Southbound Queue (ft.)
Scearnio 1A					
3	SR-111 and 2nd Street	Signal	31.6	C	#766
6	Cesar Chavez and 2nd Street	Personnel	45.8	D	#1265
Scearnio 1B					
3	SR-111 and 2nd Street	Signal	57.2	E	#571
6	Cesar Chavez and 2nd Street	Personnel	32.9	C	m597

- intersection queue may be longer than calculated

m - intersection queue impacted by flow at adjacent intersection

4.0 TRAFFIC OPERATION SCENARIO 2

This memorandum describes the traffic circulation alternatives developed to accommodate traffic following the opening of a new Port of Entry (POE) facility in downtown Calexico, California. This memorandum describes the estimated traffic impacts for the widening of Cesar Chavez Boulevard based upon the previously completed design plans.

Scenario 2 describes the final scenario accommodating both northbound and southbound traffic to the new POE with the completion of Cesar Chavez Boulevard widening project. When constructed, Cesar Chavez Boulevard will have three southbound and two northbound lanes between Grant Avenue and 2nd Street. The roadway will have two lanes in each direction between Grant Avenue and SR-98. The intersections of Cesar Chavez at 2nd Street and Grant Avenue will be signalized. The completion of this project is anticipated for March, 2019.

The purpose of this analysis is to evaluate the potential traffic flow associated with the completion of Scenario 2 in order to identify projects and traffic management strategies that may be needed to support efficient traffic flow. Two traffic flow options are evaluated:

- 1) Provide signal timings and traffic control to encourage a balance of traffic flow along a network of routes to access the new POE; and
- 2) Provide signal timings, lane geometric changes and traffic control to guide southbound POE traffic from SR-111 to SR-98 to Cesar Chavez Boulevard to access the new POE.

4.1 TRAFFIC COUNT VOLUMES

Daily traffic counts were updated to reflect traffic flows following the opening of the new POE. The traffic counts were taken in November, 2018 at the same locations conducted in April, 2018 prior to the POE opening. At the time of November, 2018 counts, Cesar Chavez Boulevard was under construction, and the route was used by a limited amount of traffic. The November, 2018 traffic counts show POE-bound traffic primarily using SR-111 to 2nd Street for southbound border access.

Daily Traffic Counts

Average daily traffic volumes were obtained through machine data collection. Two locations were counted:

- SR-111 north of SR-98
- SR-111 south of 2nd Street

Peak Hour Count Volumes

The intersection turning movement counts were conducted during the weekday evening peak from 4:00 PM to 7:00 PM on Wednesday November 7, 2018 for the following intersections:

Intersections

7. SR 111 at SR 98
8. SR 111 at Grant Street
9. SR 111 at 2nd Street
10. Cesar Chavez at SR 98
11. Cesar Chávez at Grant Street
12. Cesar Chavez at 2nd Street

The evening peak hour intersection count worksheets are shown in **Appendix A**.

4.2 TRAFFIC ANALYSIS

There will be two options for POE traffic access when Cesar Chavez Boulevard construction is complete. One alternative is to allow traffic to access the POE from Cesar Chavez Boulevard and from SR-111 – 2nd Street. A second alternative is to channel all southbound POE traffic to Cesar Chavez Boulevard and restrict entrance from other directions. Each of these alternatives is described below.

Alternative 2A – Balanced Traffic Flow to POE

This traffic analysis reflects the use of the street network to access the new POE. The analysis reflects the proposed roadway geometrics for the widening of Cesar Chavez Boulevard. Following the design plans, the primary access route is Cesar Chavez Boulevard; with secondary access routes available include SR-111, 2nd Street and Grant Street.

The roadway network vehicle capacity will affect travel times and should lead to the traffic flow finding a balance that equalizes travel times between the two routes. Southbound SR-111 traffic utilizing Cesar Chavez Boulevard will make a right turn at SR-98 and a left turn at Cesar Chavez Boulevard. Three lanes will be available from Cesar Chavez Boulevard to enter into the POE.

SR-111 traffic utilizing Cesar Chavez Boulevard will continue through the intersection of SR-98. Traffic will then turn right at 2nd Street and left into the POE at the intersection of Cesar Chavez Boulevard. A single right turn will be provided at 2nd Street and a single left turn provided at Cesar Chavez.

The volumes that will use each route to access the POE have been estimated based on the available capacity for the turn movements described above. The results in a traffic distribution where between 60 to 65% of POE traffic would use Cesar Chavez and between 35 to 40% traffic would use SR-111/2nd Street. The traffic forecasts at each of the six study area intersections are shown in **Figure 4.1**.

The Synchro traffic model of the area was used to analyze the traffic operation of this alternative. **Table 4.1** summarizes the level of service analysis results for the study area intersections using the intersection evaluation methodology described in the 2010 Highway Capacity Manual. The capacity analysis shows that with Alternative 2A, no geometric changes would be needed at any of the study area intersections, or to the lane geometry as planned for Cesar Chavez Boulevard. The lane geometry from the design of the Cesar Chavez and 2nd Street intersection was shown to accommodate traffic volumes from this alternative. The intersection level of service worksheets are provided in **Appendix B**.

FIGURE 4.1: ALTERNATIVE 2A TRAFFIC FORECAST

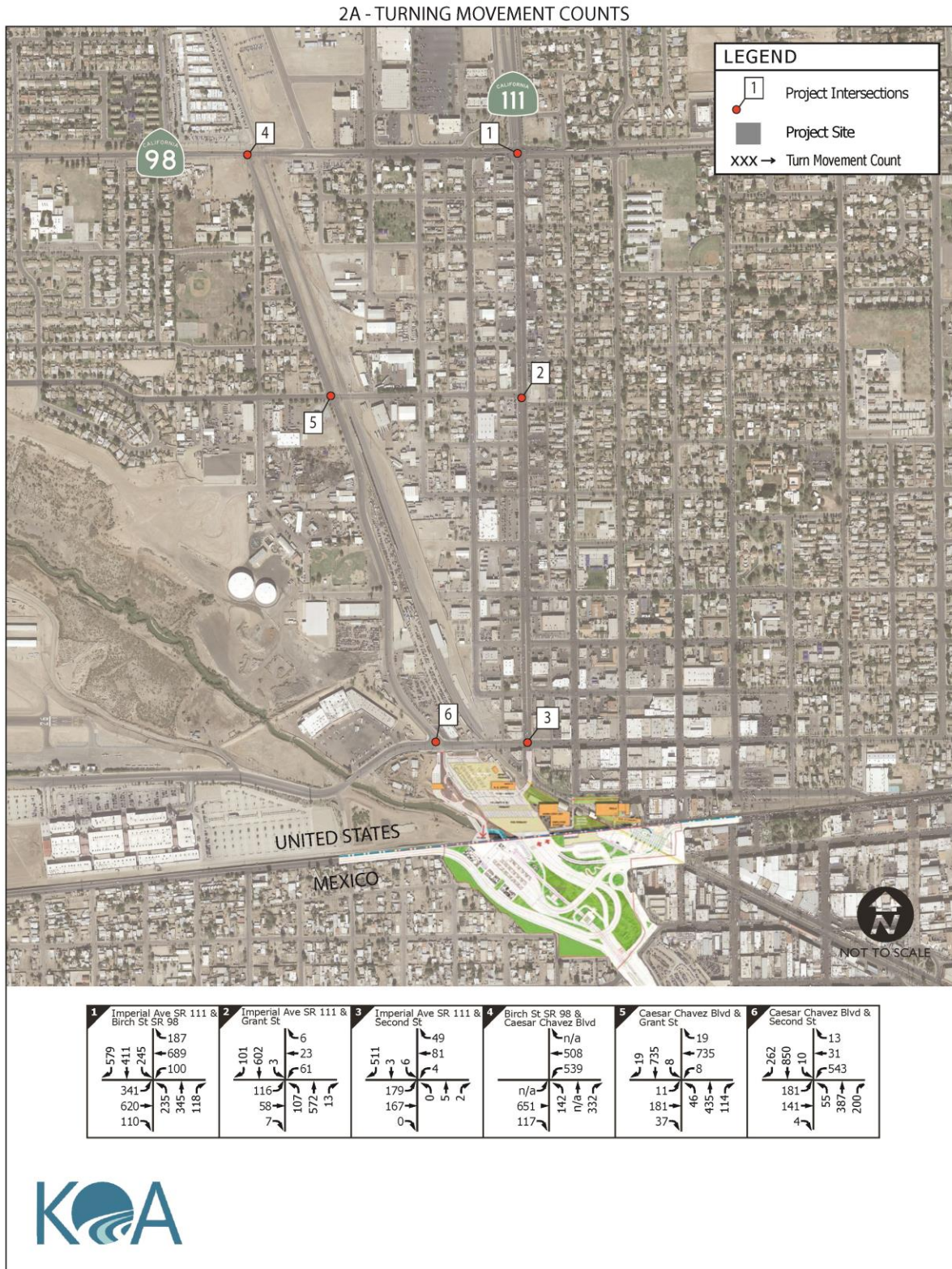


TABLE 4.1: SCENARIO 2A – BALANCED POE TRAFFIC FLOW LEVEL-OF-SERVICE

No.	Intersection	Traffic Control	PM Peak Period		
			Ave. Delay (secs.)	LOS	POE-bound Queue (ft.)
1	SR-111 and SR-98	Signal	50.3	D	222
2	SR-111 and Grant	Signal	35.5	D	424
3	SR-111 and 2nd Street	Signal	29.0	C	124
4	Cesar Chavez and SR-98	Signal	33.7	C	327
5	Cesar Chavez and Grant	Signal	18.5	B	141
6	Cesar Chavez and 2nd Street	Signal	46.2	D	347

Findings

This approach allows traffic to use a number of routes to and from the new POE. By spreading out the travel, the level of service is level-of-service D or better. The traffic flow that would use each route to access the new POE is governed by the intersection of Cesar Chavez and 2nd Street, and in particular the capacity of the westbound 2nd Street turn bay. With the final design plan, this left turn bay will change from two-lanes to one lane, with a shorter storage length. If more than 35-40% of POE-bound traffic uses this route, traffic will back up on 2nd Street. In this case, traffic should shift to Cesar Chavez Boulevard which will provide more vehicle capacity and less travel delay.

- SR-111 and SR-98 – a large portion of POE traffic travels through this intersection. With a balanced flow, the intersection of SR-111 and SR-98 is shown to work satisfactory. While a number of lane configurations were studied, the existing lane configuration provided the best level-of-service.
- SR 111 and Grant - Traffic operational delay is shown to be satisfactory. The Synchro model results show a queue developing at Grant Street but can move through the intersection in one cycle.
- SR-111 and 2nd Street – this intersection becomes less congested.

- SR-98 and Cesar Chavez Boulevard – the overall intersection operation is satisfactory. The westbound left turn lane queue length is long, and could result in a back- up of traffic from the turn bay into a through lane during peak times.
- Cesar Chavez Boulevard and Grant – this intersection is uncongested.
- Cesar Chavez Boulevard and 2nd Street – all of the POE traffic moves through this intersection. With balanced flow, the intersection operates at LOS D.

Alternative 2B - POE Traffic to Cesar Chavez Boulevard

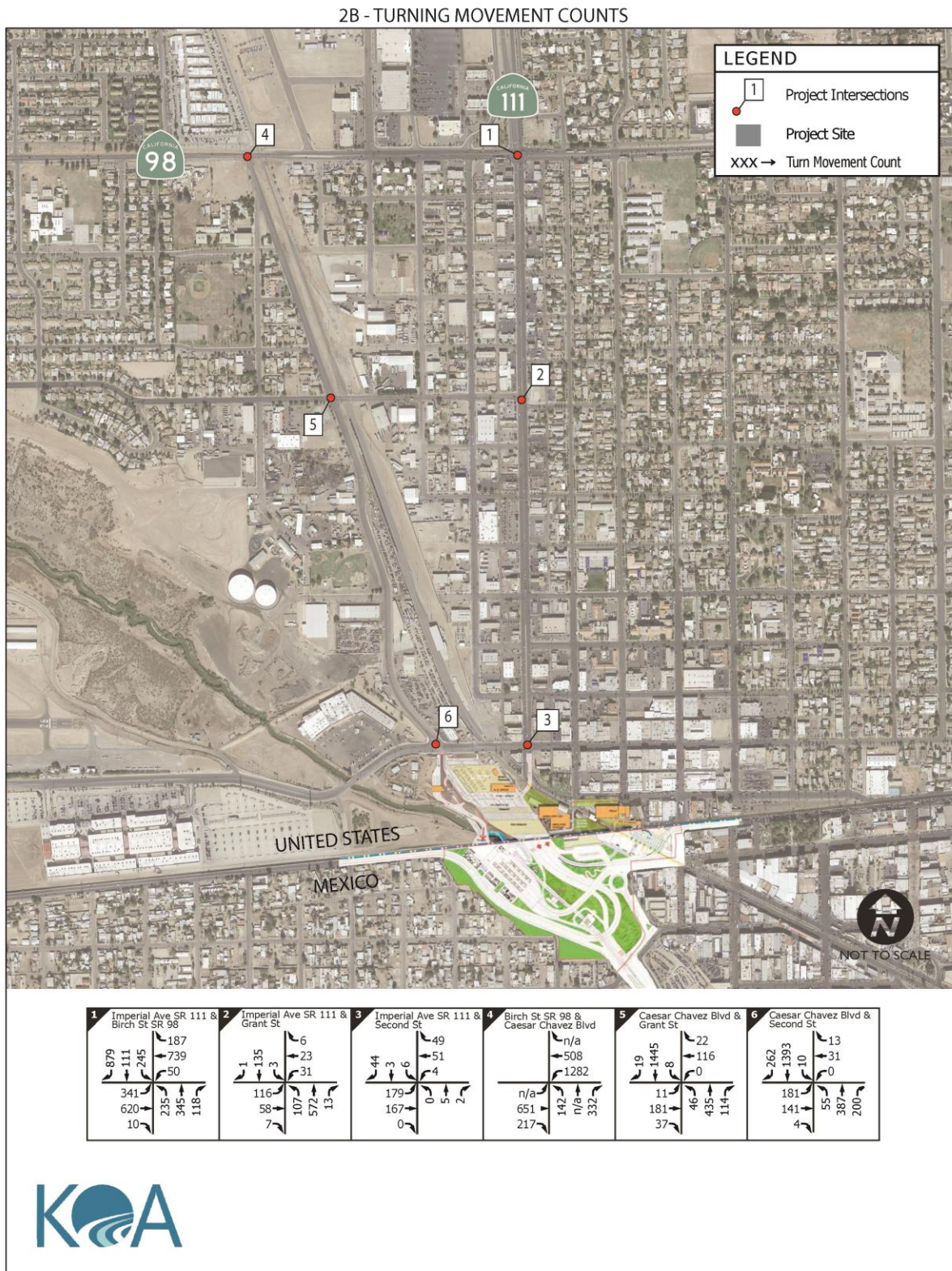
This traffic analysis reflects the full shift of southbound traffic access to the new POE to Cesar Chavez Boulevard. This alternative assumed required signage will be provided to inform motorists that access to the new POE is only provided from Cesar Chavez Boulevard during the peak travel period. Additionally, other access would be prohibited by restricting westbound left turns from Grant Street to Cesar Chavez and westbound left turns from Second Street. **Table 4.2** summarizes the level of service analysis results for the study area intersections. The anticipated volumes associated with this traffic scenario and the intersection level of service worksheets are provided in **Appendix C**.

TABLE 4.2: SCENARIO 2B – POE TRAFFIC TO CESAR CHAVEZ LEVEL-OF-SERVICE

No.	Intersection	Traffic Control	PM Peak Period		
			Avg Delay (secs.)	LOS	POE-bound Queue (ft.)
1	SR-111 and SR-98 Modified	Signal	49.6	D	589
2	SR-111 and Grant	Signal	21.5	C	51
3	SR-111 and 2nd Street	Signal	34.9	C	6
4	Cesar Chavez and SR-98	Signal	38.5	D	737
5	Cesar Chavez and Grant	Signal	15.1	B	201
6	Cesar Chavez and 2nd Street	Signal	10.1	B	191

The intersection operations analysis shows longer queue lengths for the southbound right turn on SR-111 at SR-98 and the westbound left turn on SR-98 at Cesar Chavez Boulevard. Traffic operation on SR-111 would be improved. With the elimination of left turns from 2nd Street into the POE, traffic operations at the intersection of Cesar Chavez would be simplified and would result in less delay as compared to Alternative 2A.

FIGURE 4.2: ALTERNATIVE 2B TRAFFIC FORECAST



Findings

This alternative presents the traffic impact of one route to the new POE, although in for this analysis, the small number of right-turns into the POE from 2nd Street were permitted. Two constraints impact traffic flow - the southbound right turn volumes at SR-111 and SR-98, and the left turn volumes at SR-98 and Cesar Chavez. This alternative reduces traffic on SR-111, but creates two longer traffic queues at those locations.

- SR-111 and SR-98 – this alternative results in a higher right turn volume that needs a second right turn lane to accommodate the volume. With this change, the estimated vehicle queue length is estimated to be 589 feet.
- SR 111 and Grant – with reduced traffic on SR-111, the level of service and queue lengths are reduced.
- SR-111 and 2nd Street – with reduced traffic on SR-111, the level of service and queue lengths are reduced.
- SR-98 and Cesar Chavez Boulevard – the intersection operation is satisfactory. However, the westbound left turn lane queue length is estimated at nearly 740 feet.
- Cesar Chavez Boulevard and Grant – with westbound left turns prohibited, this intersection is uncongested.
- Cesar Chavez Boulevard and 2nd Street – with westbound left turns prohibited, this intersection is uncongested.

5.0 DEVELOPMENT OF TRAFFIC MANAGEMENT STRATEGIES

The purpose of this task is to present the traffic management strategy for the access to the new West Calexico Port of Entry (POE) with the completion of the Cesar Chavez Boulevard widening. Traffic management strategies and operational approaches are identified that will improve traffic flows on roadways within the project area, address projected future traffic growth, make better use of existing capacity, and improve traffic throughput. Needed revisions to lane markings and signage are indicated.

5.1 INTELLIGENT TRANSPORTATION SYSTEM (ITS) TECHNOLOGIES

ITS strategies are being investigated by Caltrans to provide information to motorists regarding travel speed and travel time on highways accessing both the East and West Calexico Port of Entries. The types of ITS technologies planned for implementation in the border area include:

- Radio Frequency Identification (RFID) technologies – this involves the use of electromagnetic fields to identify and track tags attached to objects. RFID has been used primarily with commercial vehicles.
- Wi-Fi technologies – readers are installed along the roadway that read a vehicles Wi-Fi signal at a specific point. Algorithms are developed that take these readings to compute travel times and travel speeds.
- Coordinated signals – signal timings can be used to manage and direct the movement of vehicles. Real-time traveler information can be used not only for traveler information, but also to adjust signal timing to move vehicles based upon real-time conditions.
- Changeable message signs (permanent & movable) – these signs display travel time information collected from RFID and Wi-Fi readers.

5.2 EXISTING/ PLANNED INTELLIGENT TRANSPORTATION SYSTEMS

Caltrans is currently designing ITS infrastructure that would be placed within and along-side highways. This ITS system will provide real-time traveler information to motorists traveling on SR-111, SR-98 and SR-7 leading to the East Calexico POE and the new West Calexico POE. The planned ITS infrastructure includes using Wi-Fi, RFID and changeable message signs to collect and provide traveler information. Initial locations for Wi-Fi and RFID readers and changeable message signs have been identified, but may be modified to reflect travel patterns as the project is completed.

The initial Vehicle time detection locations include:

- SR-111 and Heber Road
- SR-111 and Jasper Road
- SR-111 and Cole Road
- SR-111 / SR-98
- 2nd Street and Cesar Chavez Boulevard
- SR-98 and Cesar Chavez Boulevard
- SR-98 and Cole Road
- SR-7 / SR-98
- SR-7 and Maggio Road
- SR-7 and Heber Road

The location of the portable changeable message signs are being defined but may include:

- SR-98 west of Dogwood Road
- SR-98 west of SR-7
- SR-98 east of SR-7
- Locations on I-8

5.3 TRAFFIC CONTROL PLAN

Based upon the forecast of traffic flow and traffic operation for the opening of Cesar Chavez Boulevard, the two traffic control plan alternatives have been developed. The traffic control plans are based upon the traffic forecasts and operations analysis described in Section 6. The potential to reduce staff traffic control has also been reviewed including the need and role of law enforcement strategies. While specific traffic management strategies are identified, the following recommendations provide a framework for the City of Calexico and Caltrans to manage border travel to the expanded Calexico West POE. The City and Caltrans may implement additional changes once Cesar Chavez widening is completed and observed traffic conditions are identified.

Alternative 2A – Balanced Traffic Flow to POE

Alternative 2a reflects the use of the street network to access the new POE using a number of routes. The analysis reflects the proposed roadway geometrics for the widening of Cesar Chavez Boulevard. The needed traffic control is shown with the primary access route of Cesar Chavez Boulevard, but also with secondary access routes available include SR-111, 2nd Street and Grant Street. The traffic control plan for Alternative 2A is shown in Figure 5.1.

POE Access Routes

Southbound POE access routes include SR-111, SR-98 and Cesar Chavez Boulevard. The access routes also include continuing on SR-111 to 2nd Street. Grant Street also provides a connection between SR-111 and Cesar Chavez Boulevard.

Signal Timing

Signal timing will be used to provide capacity to utilize all of the routes identified above. The intersection of 2nd Street and Cesar Chavez will be used to control the POE access capacity provided to Cesar Chavez Boulevard and also to the eastbound left turn movement at 2nd Street and Cesar Chavez Boulevard.

Manual Staff Traffic Control

Manual staff control is anticipated at the intersection of Cesar Chavez and 2nd Street. The manual staff control should maintain the primary access from Cesar Chavez and secondary access from 2nd Street.

ITS Reader and Message Signs

The ITS infrastructure should be placed as previously indicated.

2nd Street

2nd Street will be converted back to the original lane configurations prior to changes associated with the temporary Scenario 1A and 1B. This change will provide a consistent connection with the new design of Cesar Chavez Boulevard at 2nd Street. The general lane striping for the final configuration of 2nd Street is shown in Figure 5.2.

Alternative 2B - POE Traffic to Cesar Chavez Boulevard during Peak Period

This traffic analysis reflects the full shift of access for southbound traffic access during the peak period to the expanded Calexico West POE from SR-111 to Cesar Chavez Boulevard. This alternative would involve use of signage to inform motorists that access to the new POE is only provided from Cesar Chavez Boulevard during the peak travel period. In this scenario, westbound left turns from Grant Street to Cesar Chavez and westbound left turns from Second Street into the new POE would be prohibited. The traffic control plan for Alternative 2B is shown in Figure 5.3.

POE Access Routes

Southbound POE access routes include SR-111, SR-98 and Cesar Chavez Boulevard. The access routes continuing on SR-111 to 2nd Street, or at Grant Street will be restricted.

Signal Timing

Signal timing will be used to provide capacity and travel time for the movement of vehicles along the primary access route during the peak period.

Manual Staff Traffic Control

Cones prohibiting left turns on to Cesar Chavez Boulevard at Grant Street and also at 2nd Street during the peak period will need to be placed manually. Manual staff control will be needed at Cesar Chavez and 2nd Street to maintain the primary access from Cesar Chavez and to restrict for westbound traffic on 2nd Street. Access for eastbound traffic is proposed to remain open, but this travel movement should be monitored by City staff.

ITS Reader and Message Signs

The ITS infrastructure should be placed as previously indicated.

Intersection of SR-111 and SR-98

The lane geometry for this intersection should be modified as shown in Figure 5.4. Because of the higher southbound right turn volumes associated with this alternative, the southbound approach lanes are modified by adding a second right turn lane by reducing one left turn lane. The eastbound approach lanes have also been shifted by designating a second left turn lane. The outside lane will now accommodate both through and right turn traffic.

2nd Street

2nd Street will be converted back to the original lane configurations prior to changes associated with the temporary Scenario 1A and 1B. This change will provide a consistent connection with the new design of Cesar Chavez Boulevard at 2nd Street. The general lane striping for the final configuration of 2nd Street is shown in Figure 5.2.

Existing Signs and Pavement Markings to Modify

The following signs and pavement markings will need to be modified as part of the access changes described in Scenarios 2A and 2B.



Only show one arrow. With Alternative 2B, an electronic arrow will need to be provided to only show access during the non-peak travel times.



Modify to only one right turn arrow



Remove delineators, restripe.
Only single left turn to be
provided



Modify sign north
of SR-98



SR-111 north of
Third Street.
Can keep sign for
Alternative 2A



SR-111 north of Second Street.
Can keep sign for Alternative 2A

Signage Change Summary

- Revise signs on SR-111 north of SR-98 (2)
- Border directional signs on SR-98 (3)
- Add border directional sign on Cesar Chavez north of 2nd Street
- Add border lane indication sign on westbound 2nd Street
- Add border lane indication sign on eastbound 2nd Street.

5.3 RECOMMENDATIONS

The project team evaluated the two alternatives based on delays, access, and other project goals. Traffic Operation Scenario 2, that channeled southbound access to Cesar Chavez Boulevard, was preferred by the project team as it was considered to best address the goals of reducing City staff demands for traffic control and improving access to businesses located in the central area of Calexico by reducing travel delays on SR-111. Recommendations include:

1. Provide signage to route POE traffic to Cesar Chavez Boulevard
2. Modify SR-98 / SR- 111 intersection to provide two southbound right turns
3. Adjust signal timings at major intersections to support traffic flow to the POE using Cesar Chavez Boulevard.
4. Focus manual traffic control support at Cesar Chavez Boulevard and 2nd Street
5. Implement the Caltrans ITS projects

The preferred traffic circulation plan is shown in Figure 5.5.

Figure 5.1 Traffic Control Plan – Scenario 2A



Figure 5.2 Lane Geometric Changes – Alternative 2A and 2B



Figure 5.3 Traffic Control Plan – Scenario 2B

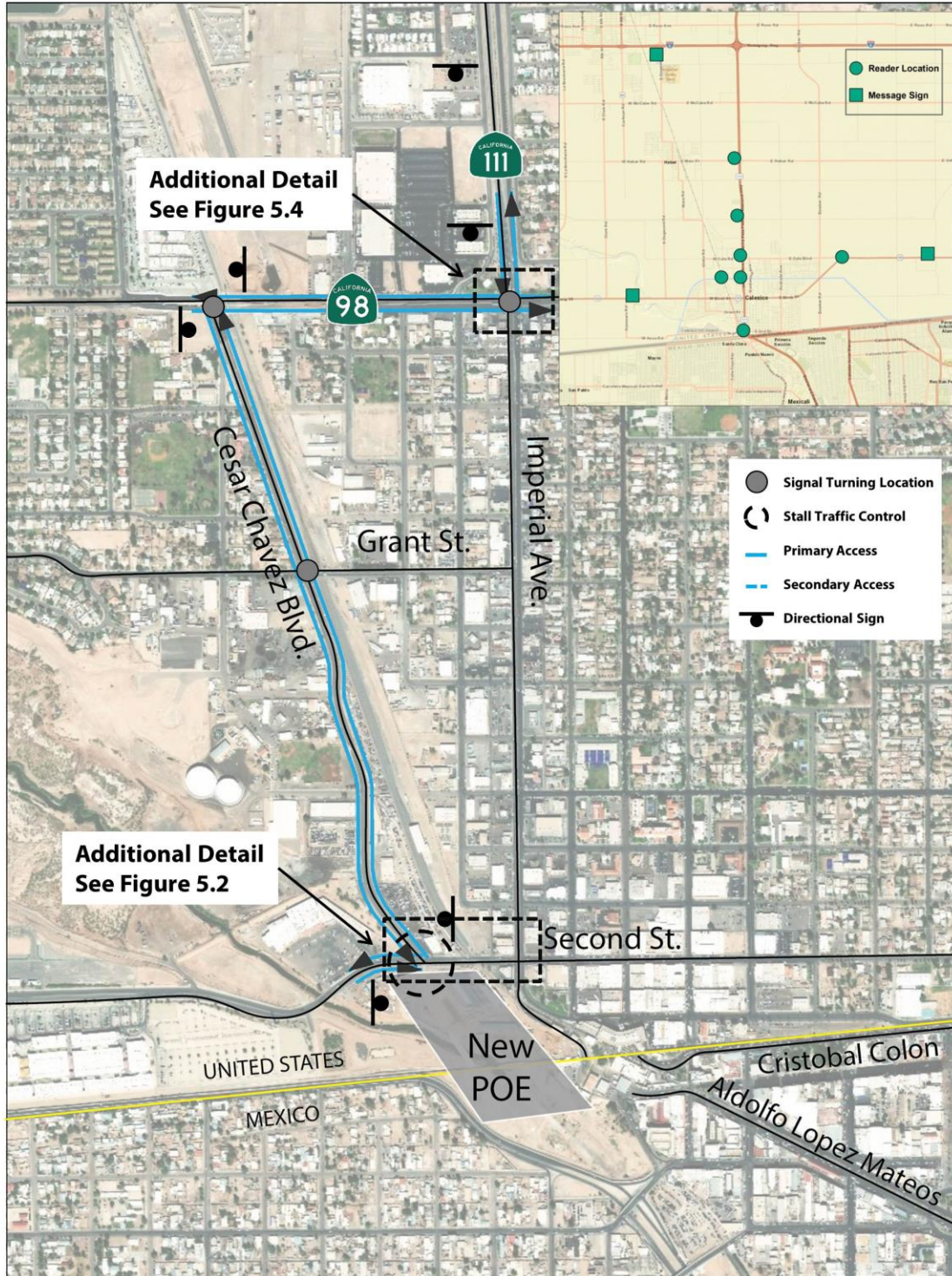


Figure 5.4 Lane Geometric Changes – Alternative 2B

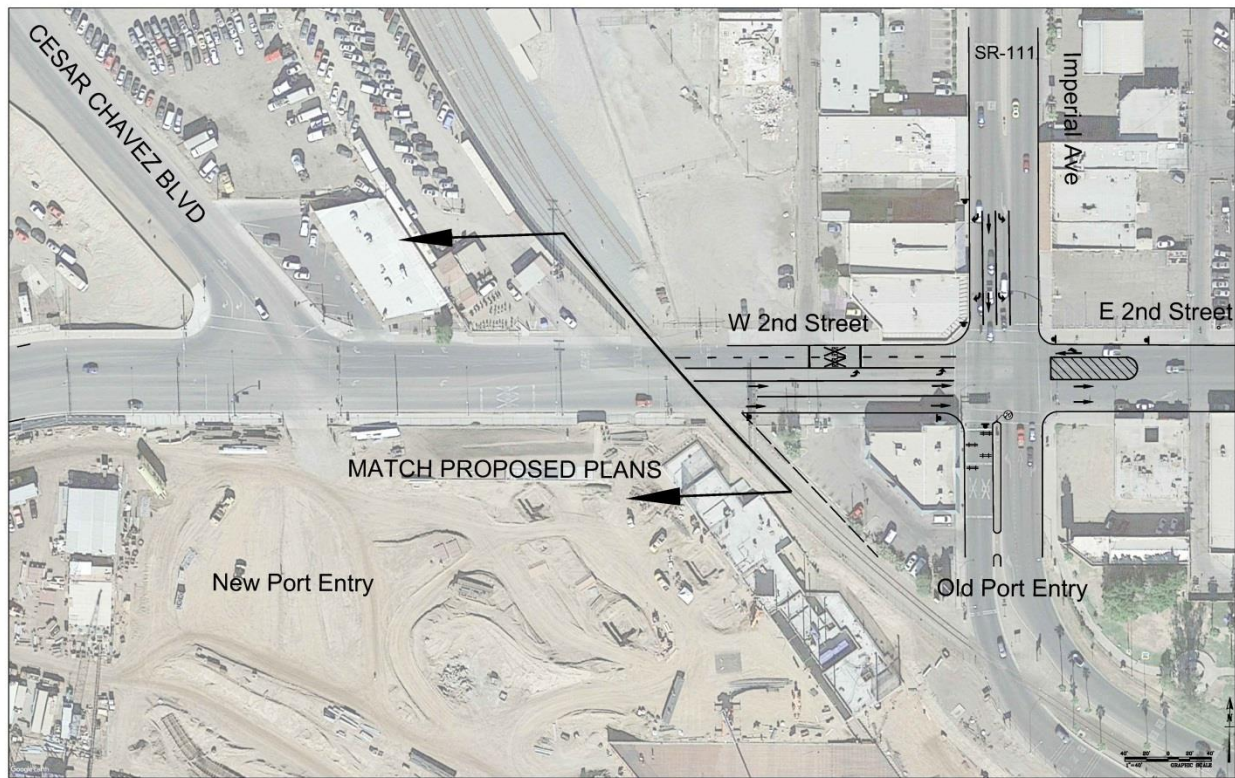


Figure 5.5 Recommended Traffic Circulation

