Pressler Street Extension Traffic Study

May 2015

Prepared For:

City of Austin Transportation Department

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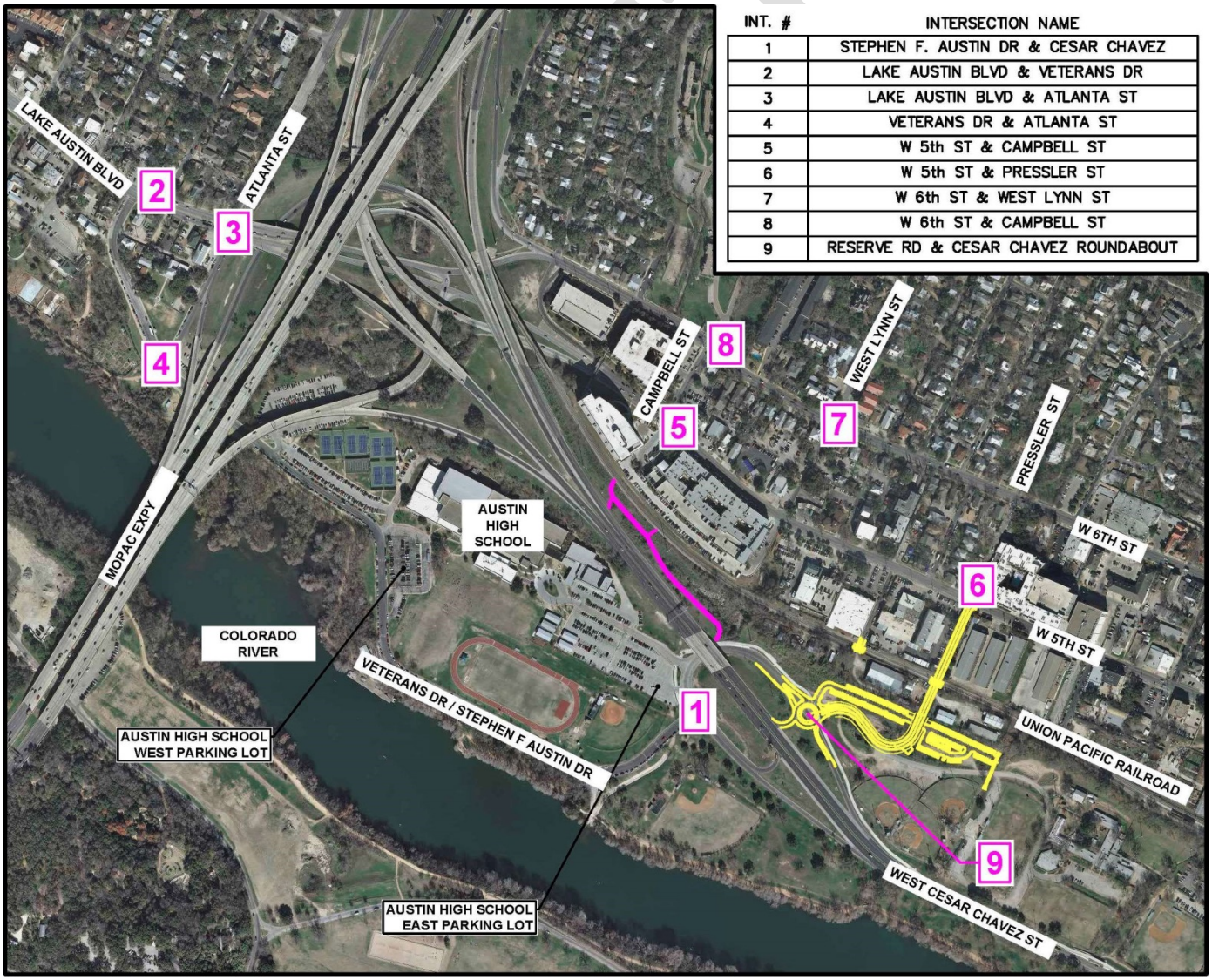
Executive Summary

The City of Austin has retained Jacobs Engineering Group Inc. (Jacobs) to perform a traffic study for the proposed connection of Pressler Street. The City of Austin is preparing the design for connecting Pressler Street from its current terminus south of the Union Pacific Railroad tracks to Reserve Road/Cesar Chavez Street. Jacobs collected traffic data and parking information, analyzed parking management strategies, developed traffic projections, performed traffic simulation, and analyzed the Pressler Street connection and the roadways around Austin High School in Austin, Texas.

The overall study area for the project was bounded by 9th Street to the north, Hearn Street on the west, Lady Bird Lake to the south, and Lamar Boulevard to the east. Based on the analysis and results within the report, we offer the following findings and recommendations for each location within the study area. These recommendations are illustrated in the Exhibit A.



INT. #	INTERSECTION NAME
1	STEPHEN F. AUSTIN DR & CESAR CHAVEZ
2	LAKE AUSTIN BLVD & VETERANS DR
3	LAKE AUSTIN BLVD & ATLANTA ST
4	VETERANS DR & ATLANTA ST
5	W 5th ST & CAMPBELL ST
6	W 5th ST & PRESSLER ST
7	W 6th ST & WEST LYNN ST
8	W 6th ST & CAMPBELL ST
9	RESERVE RD & CESAR CHAVEZ ROUNDABOUT

Exhibit A – Pressler Street Extension Recommenations

Overall Findings

- The addition of the Pressler Street Connection does not adversely impact the overall Level of Service (LOS) of the study area.
- The PM traffic peak hour (defined as 5:00 PM to 6:00 PM) shows a delay savings of 4 minutes per vehicle, or 768 hours of cumulative travel time savings for the 12,111 vehicles within the study area during that hour.
- The proposed improvements create a 17 second delay for the Stephen F. Austin & Cesar Chavez intersection during the school peak hour (defined as 4:00 PM to 5:00 PM) and no change during the PM traffic peak hour. The delay is a result of the additional school and commuter traffic that is expected to take advantage of the new Pressler Street Connection between 5th / 6th Streets and Austin High School / Cesar Chavez Street.
- The addition of the Pressler Street Connection has no impact to intersection delays during the AM peak hour (defined as 7:00 AM to 8:00 AM).
- The addition of the Pressler Street Connection reduces the intersection delays along westbound 6th Street between Pressler Street and Veterans Drive by a total of 4.5 minutes per vehicle during the PM school peak and a total of 3.5 minutes per vehicle during PM traffic peak.

Pressler Street Improvements

- Jacobs concludes that the Pressler Street Connection improves the connectivity and relieves existing congestion along routes within the study area during the peak hours. This connection provides an alternate north/south route between MoPac and Lamar Boulevard, connecting 5th Street, 6th Street, Cesar Chavez Street, and Stephen F. Austin Drive. This alternate route will allow drivers to vary their route as traffic patterns/congestion forms throughout the system.
- Jacobs recommends Pressler Street be converted from one-way northbound to one-way southbound between 5th and 6th Streets to facilitate traffic flow from westbound 6th Street to Austin High School and Cesar Chavez Street.
- Jacobs finds that while the at-grade train crossing between 5th Street and Cesar Chavez Street will result in delays when a train is present, the vehicular queues associated with that train event will have minimal effect on adjacent intersections along the proposed Pressler Street.
- The roundabout included in the Pressler Street Connection will operate at an acceptable LOS for the year 2020 during the PM school peak hour (LOS C) and the PM traffic peak hour (LOS B). These LOS scores equate to an average of 21 seconds of delay per vehicle and 13 second of delay per vehicle, respectively.
- During the PM school peak hour, the travel time from the student parking lot to westbound Cesar Chavez Street just east of the MoPac northbound/southbound split is expected to increase from 54 seconds in 2015 to 72 seconds in 2020, an increase of 18 seconds under the No-Build conditions. That same route will take 98 seconds in 2020 if the Pressler Street Connection is constructed. This results in an additional delay of 26 seconds. The reason that the travel time is longer for the Build condition than the No-Build condition is due to the shift of traffic from 6th Street to Cesar Chavez Street using the Pressler Street Connection during the PM school peak hour.

Pressler Street Improvements - Continued

- During the PM traffic peak hour, the travel time from the teacher parking lot to westbound Cesar Chavez Street just east of the MoPac northbound/southbound split is expected to remain the same 34 second delay in the 2020 No-Build conditions as it is in 2015. That 34 second delay is expected to increase to 56 seconds increase in 2020 if the Pressler Street Connection is constructed. The reason that the travel time is longer for the Build condition than the No-Build condition is due to the shift of traffic from 6th Street to Cesar Chavez Street using the Pressler Street Connection during the PM traffic peak hour.
- The planned improvements of the MoPac South Managed Lanes project are expected to alleviate some of the traffic congestion on westbound Cesar Chavez Street with this additional roadway capacity. These improvements include but are not limited to two managed lanes in each direction, access points to the managed lanes, and entrance and exit ramp changes.
- While the pedestrian traffic count at the UPRR track is minimal, the Pressler Street Connection project is anticipated to include fences along the UPRR tracks encouraging students to use the safer crossing at Pressler Street. The City of Austin is also working with UPRR to include both vehicular gates and pedestrian gates at the Pressler Street Connection across the UPRR tracks.

MoPac Southbound Improvements

- The traffic congestion on southbound MoPac near the Lake Austin Boulevard / 6th Street entrance ramp impacts the ability for traffic to turn southbound from 6th Street / Lake Austin Boulevard. The delay creates a queue that extends to the edge of the study boundary.
- The southbound queue is anticipated to eventually impact the MoPac northbound exit lanes, to the point that traffic destined for eastbound Cesar Chavez Street and westbound Lake Austin Boulevard attempts to merge up to a mile south of the river, with last-minute merges affecting all lanes on northbound MoPac.
- This merging activity restricts the ability for northbound traffic to proceed past the Cesar Chavez Street / 5th Street exit.
- Additional southbound MoPac capacity should be added to alleviate the congestion along both southbound and northbound MoPac, Lake Austin Boulevard, Cesar Chavez Street, and 6th Street. This improvement would also help the traffic accessing MoPac from 6th Street and Lake Austin Boulevard.

MoPac Northbound Improvements

- The proposed Managed Lane allows traffic to utilize the Cesar Chavez Street ramp to travel north.
- Southbound MoPac causes delays on northbound MoPac due to the queue on Lake Austin Boulevard/6th Street. West bound traffic on 6th Street is prevented from turning south bound onto MoPac south. This delay causes a queue which blocks northbound traffic exiting MoPac at the Cesar Chavez/5th Street exit. This queue affects all four northbound main lanes of MoPac. Based on our observations, it is possible that some of the traffic may look for alternative routes (e.g. exit MoPac at Bee Caves Road, Spy Glass Drive, use Barton Springs Road, etc.).

Cesar Chavez Street Improvements

- Coordination with TxDOT should be made to restripe the westbound exit lane from Cesar Chavez Street to MoPac, increasing the weaving distance.
- Coordination with TxDOT should be made to re-stripe the turn-around area under the main lanes of Cesar Chavez Street to allow parking/waiting near Austin High School.

Veterans Avenue/Stephen F. Austin Improvements

- No parking zones should be designated for 150 feet on both the eastbound and westbound approach to the Cesar Chavez Loop intersection.
- A dedicated right-turn lane should be designated at the intersection with Cesar Chavez Loop.
- No parking or waiting zone should be designated for northbound Stephen F. Austin Drive between the entrance and exit driveways at the west faculty parking lot.
- A dedicated left-turn lane should be designated between the entrance and exit driveways at the west faculty parking lot for southbound Stephen F. Austin Drive turning into the student drop-off/pick-up area.
- No parking or waiting zone should be designated for northbound Stephen F. Austin Drive between the closed driveway and entrance driveway at the west faculty parking lot.
- A dedicated right-turn lane should be designated at the west faculty parking lot for northbound Stephen F. Austin Drive turning into the student drop-off/pick-up area.
- The left-turn and right turn lanes at the entrance to the west faculty parking lot will allow vehicles to proceed through on Stephen F. Austin Drive during the PM school peak hour.
- Veterans Drive contains defined parking spots on both sides from Lake Austin Boulevard to the west faculty parking lot. We recommend adding defined parking spots on both sides of Stephen F. Austin Drive with the exception of the No Parking Zones mentioned above to reduce inconsistent parking along the street.
- Signal timing at Lake Austin Boulevard should be modified to account for the reduced traffic on westbound 6th Street/Lake Austin Boulevard and allow additional time for Atlanta Street traffic to proceed through the intersection.

Austin High School East Parking Lot Improvements

- Reconfigure the student lot to define the circulation path, islands, and driving aisles. Direct vehicles using islands to the right to the north aisle upon entering the parking lot from the Cesar Chavez Loop driveway. Direct vehicles using islands in the middle aisle to either back to the north aisle or to the exit. Direct vehicles in the south aisle to the exit.
- Reconfigure the parking to have perpendicular parking spots on the north aisle closet to the school, head-in parking on the middle aisle, and back-in parking on the south aisle by the softball field.

Austin High School West Faculty Parking Lot Improvements

- Restripe the waiting zones on the driveway loop to better define where vehicles need to wait to pick-up students during the school dismissal period.
- Add No Parking or Waiting areas in the curve radius leading into the waiting zones.
- Reconfigure the approach to the exit driveway to two lanes on the inside and a Bus waiting area along the outside curb section. To complete the reconfiguration, widen the pavement marking hatched area to redirect vehicles.
- Reconfigure the exit driveway to 24 feet in width (left turn lane and right turn lane) by adding a hatched painted island or rebuilding the curb and gutter.

Background

The City of Austin has retained Jacobs Engineering Group Inc. (Jacobs) to perform a traffic study for the proposed connection of Pressler Street. The City of Austin is preparing the design for connecting Pressler Street from its current terminus south of the Union Pacific Railroad lines to Reserve Road/Cesar Chavez Street. Jacobs collected traffic data and parking information, analyzed parking management strategies, performed traffic simulation, and analyzed the Pressler Street connection and the roadways around Austin High School in Austin, Texas. The location of the project within Austin is shown in Figure 1.

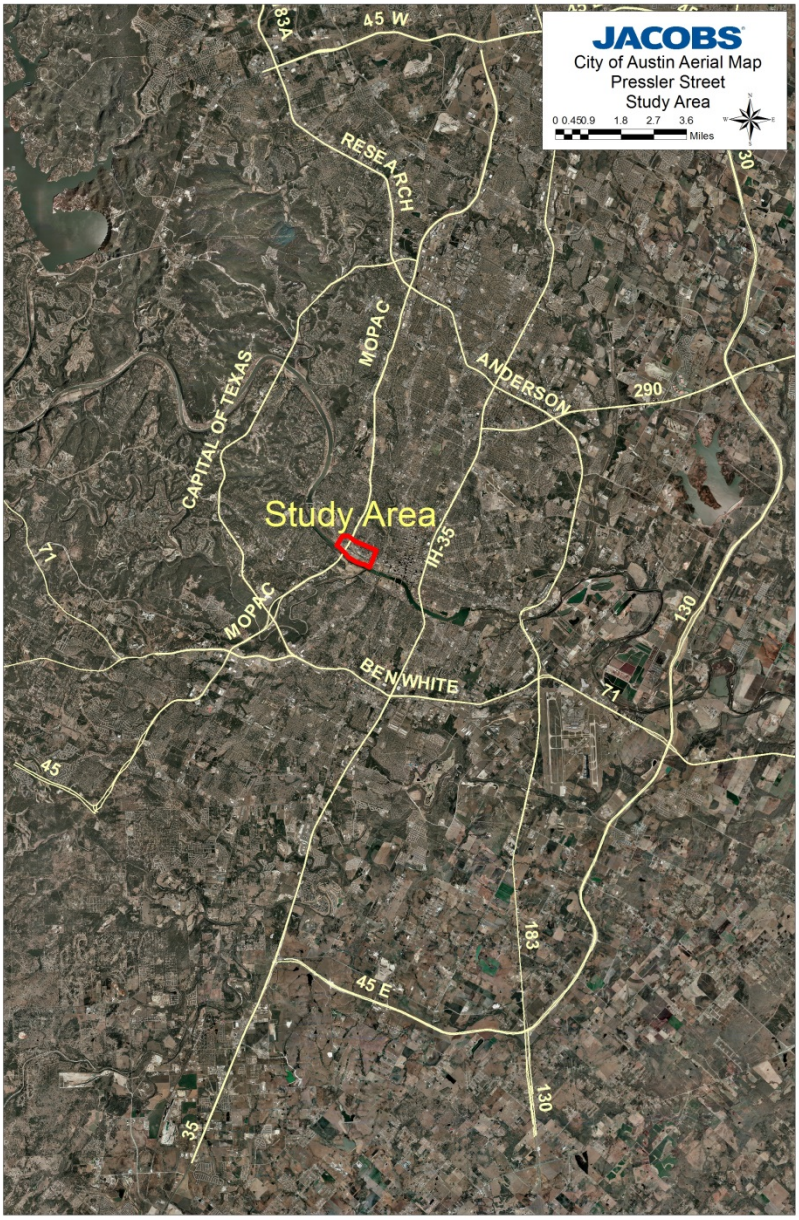


Figure 1 – Pressler Street Connection Study Area

FIELD DATA COLLECTION

In September 2014, GRAM Traffic Counting collected 24-hour bi-directional traffic counts at the locations shown in Figure 2 within the study area. The 24-hour traffic counts are found in Appendix A.

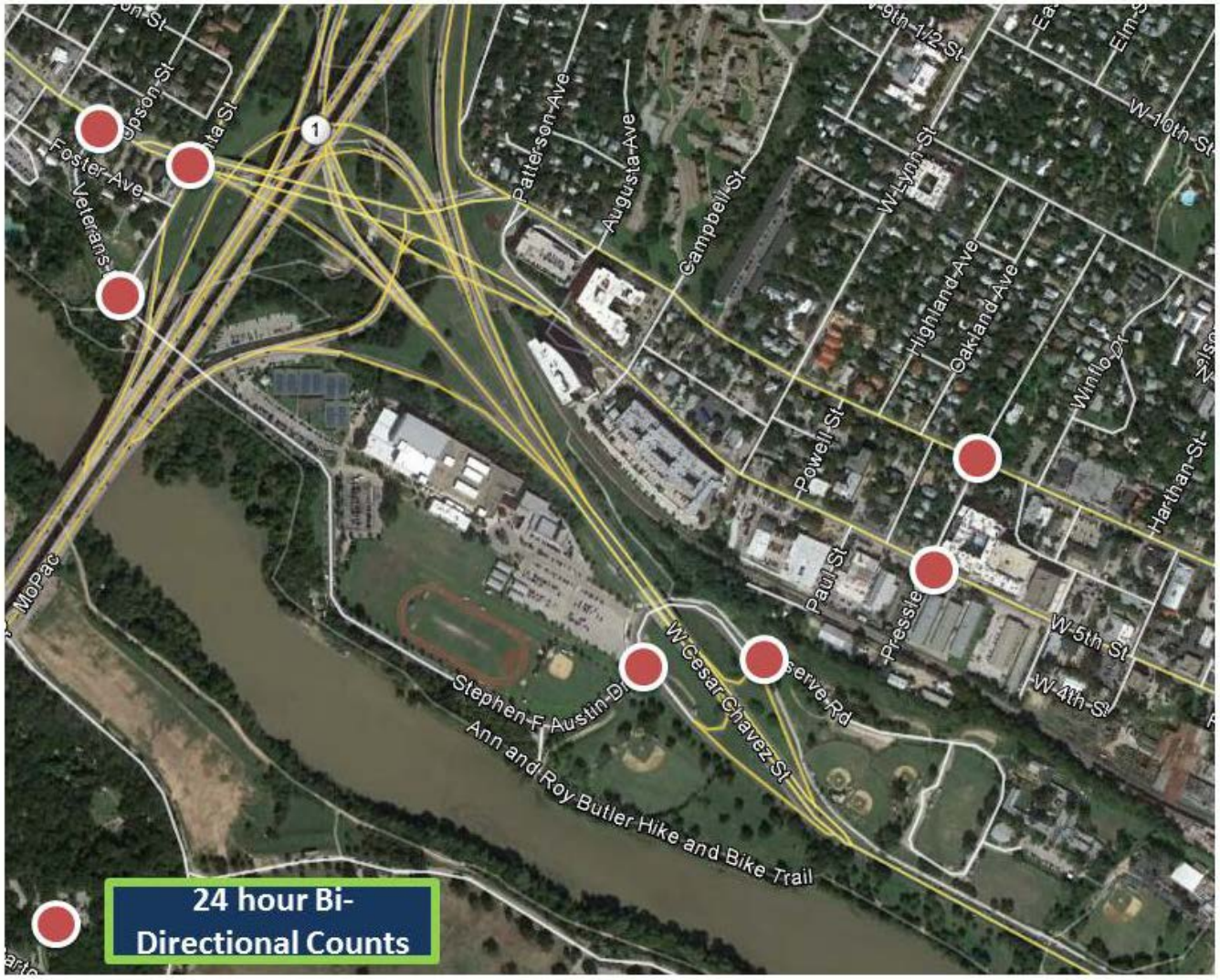


Figure 2 – 24 Hour Count Locations

In March 2015, GRAM Traffic Counting collected turning movement counts in the AM and PM peak periods at the locations shown in Figure 3 within the study area. The turning movement counts are found in Appendix A.

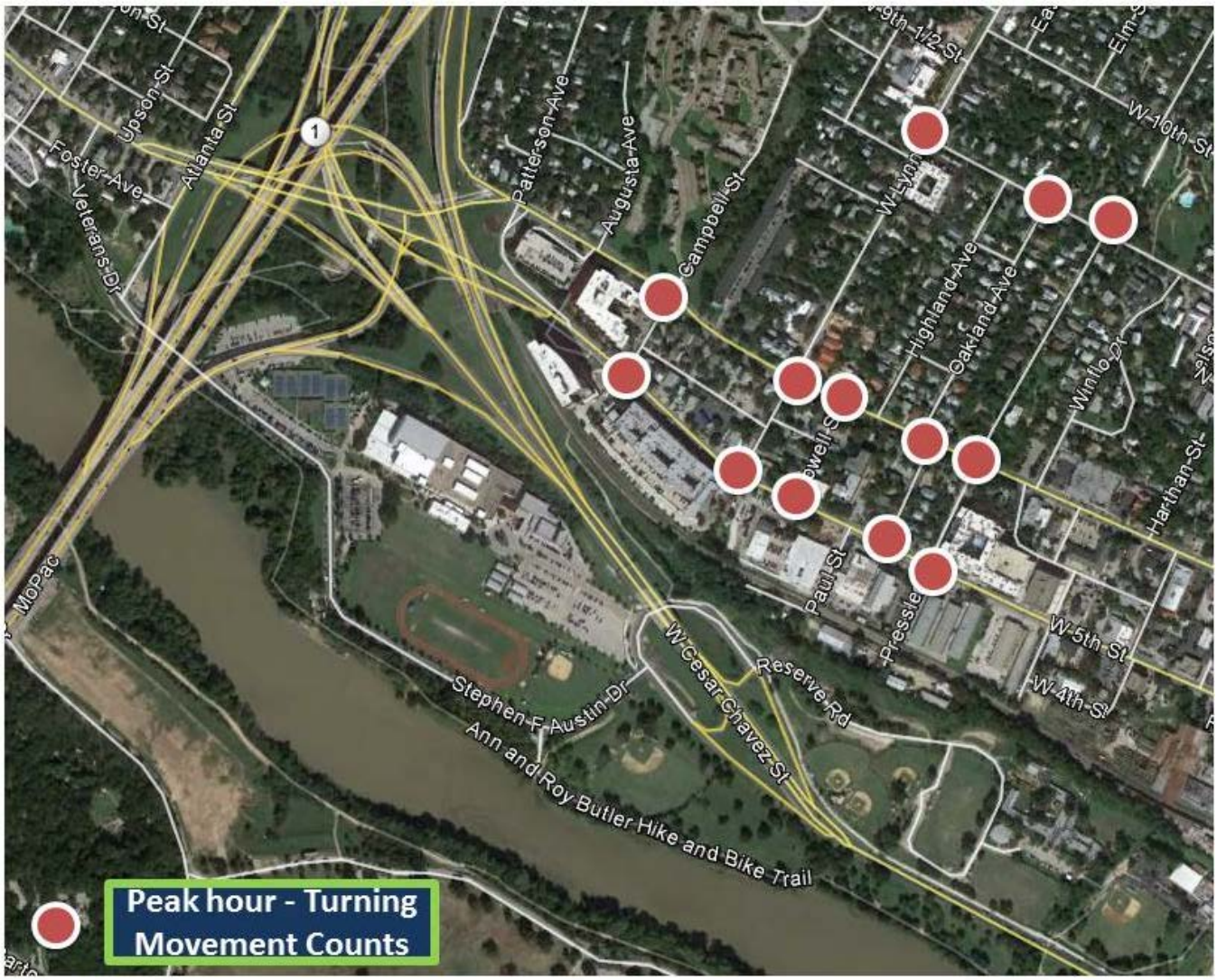


Figure 3 – AM and PM Peak Hour Turning Movement Count Locations

In October 2014, the City of Austin placed two game cameras along north side of the Union Pacific Railroad (UPRR) tracks to observe the number of pedestrians crossing the railroad tracks during a 24 hour period. The pedestrian counts and time of the crossing are shown in Table 1.

Table 1 – Camera Pedestrian Count

West Camera		East Camera	
Time	Count	Time	Count
10/16/2014		10/16/2014	
12:51	1	16:38	2
13:27	1	16:39	2
13:28	1	16:43	1
15:14	1	10/17/2014	
16:31	1	0:27	1
19:08	2	6:54	1
10/17/2017		10:52	1
8:18	1	11:13	2
8:33	1	11:16	2
9:45	1	11:37	1

Jacobs performed travel time runs along MoPac, 5th Street, 6th Street, Lake Austin Boulevard, Cesar Chavez Street, and Veterans/Stephen F. Austin Drive in October 2014. The paths of the travel time runs are shown in Figure 4. The travel time results are found in Appendix E.

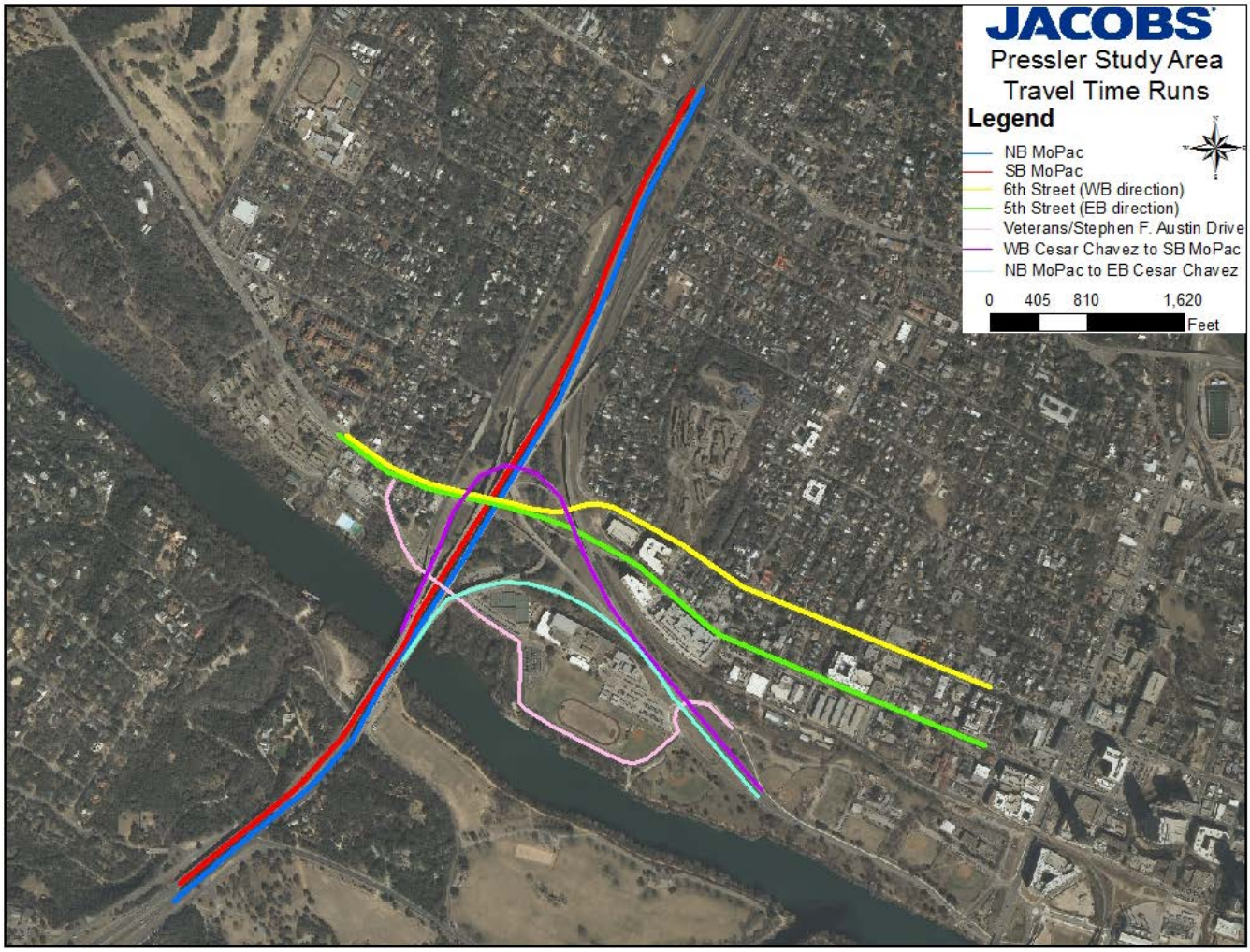


Figure 4 – Travel Time Run Paths

As part of the data collection, we took videos of the traffic operations at several locations within the study area. The first video we took on November 10, 2014 while driving from Reserve Road to Stephen F. Austin Drive along the Cesar Chavez loop in front of Austin High School to show how the student pick-up and student dismissal operate. The second video was taken on March 25, 2015 to demonstrate the traffic operations at the driveways along the Cesar Chavez loop and Stephen F. Austin Drive.

We watched and counted the vehicles arriving and departing the driveways at Austin High School on September 30, 2014 during the school dismissal period.

ADJACENT PROJECT COORDINATION

Another project is being designed and analyzed within the Pressler Street Extension study area. The project is the MoPac South Managed Lanes being completed by the Central Texas Regional Mobility Authority (CTRMA). The entrance and exit ramp counts on MoPac and some turning movement counts at MoPac and Lake Austin Boulevard were gathered from a consultant working for CTRMA on the MoPac South Managed Lanes project. We used this data to supplement the field counts mentioned above for the traffic projections. However, the data is not included within this report.

EXISTING ROADWAY CONFIGURATION

The roadways within the study area have various configurations; some are three-lane one-way roads, while others are controlled access freeways, and others are two-way two-lane roads with parking on both sides. The existing roadway configuration is shown in Figure 5.

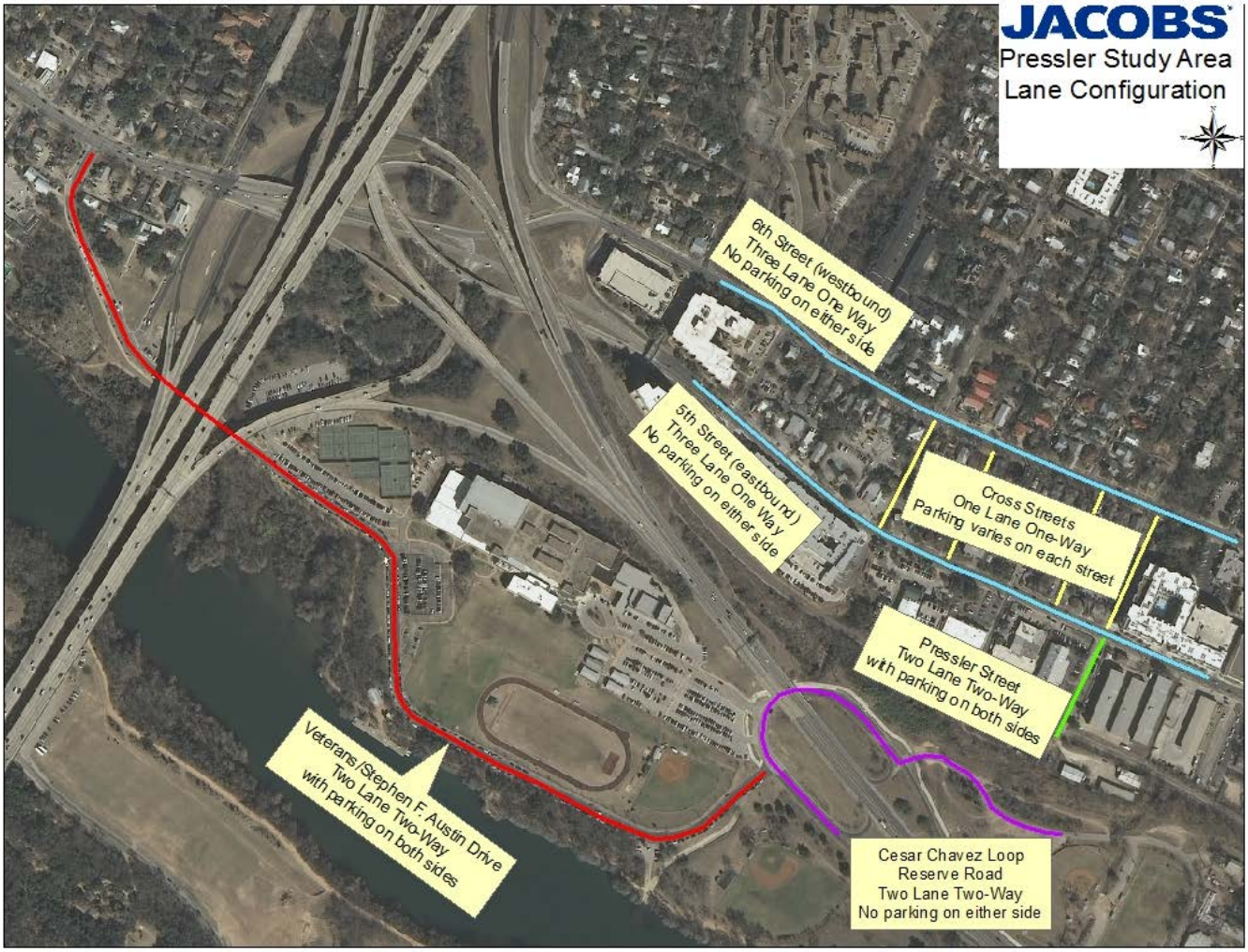


Figure 5 – Existing Roadway Configuration

FUTURE ROADWAY CONFIGURATION

There is only one major difference between the existing and future roadway configurations for this study. The change is the addition of the Pressler Street extension and the associated changes to the interchange of Cesar Chavez Street and Reserve Road. Figure 6 shows a possible configuration; the design of the proposed improvements is underway by the City of Austin.

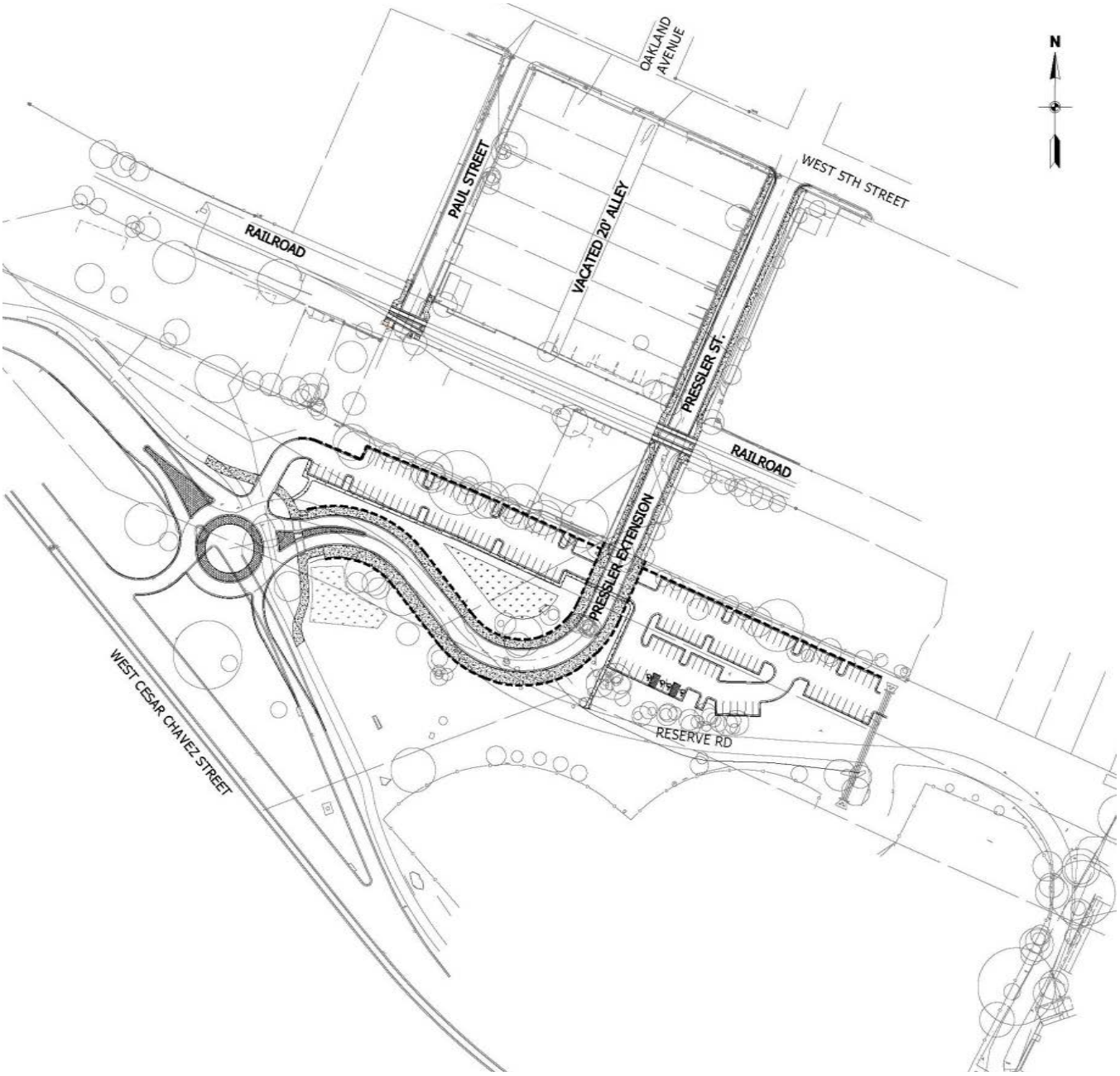


Figure 6 – Conceptual Roundabout Configuration

Public Involvement

Intentionally omitted from the report, to be inserted after the final public meeting.

Parking Management Methodology

EXISTING CONFIGURATION

Austin High Area Parking

In addition to the parking lots on the Austin High School property, there are two parking lots under the MoPac mainlanes, entrance ramps, and exit ramps and on-street parking along both sides of Veterans/Stephen F. Austin Drive. The larger Austin High School parking lots identified in Figure 7 are discussed in the following sections. The paved parking lot under northbound MoPac has 190 parking spaces just north of the Austin High School tennis courts. The gravel parking lot under the southbound MoPac mainlanes has about 60 parking spaces. Along Veterans Drive, there are approximately 45 identified parking spaces total on both sides to the west of MoPac and about 46 identified parking spaces on both sides from northbound MoPac to the Austin High School west faculty parking lot driveway. This driveway is also approximately where the street names switch between Veterans Drive and Stephen F. Austin Drive. Along Stephen F. Austin Drive, there are approximately 96 unidentified parking spaces on the south side (purple line in Figure 7) and approximately 83 unidentified parking spaces on the north side (yellow line in Figure 7).

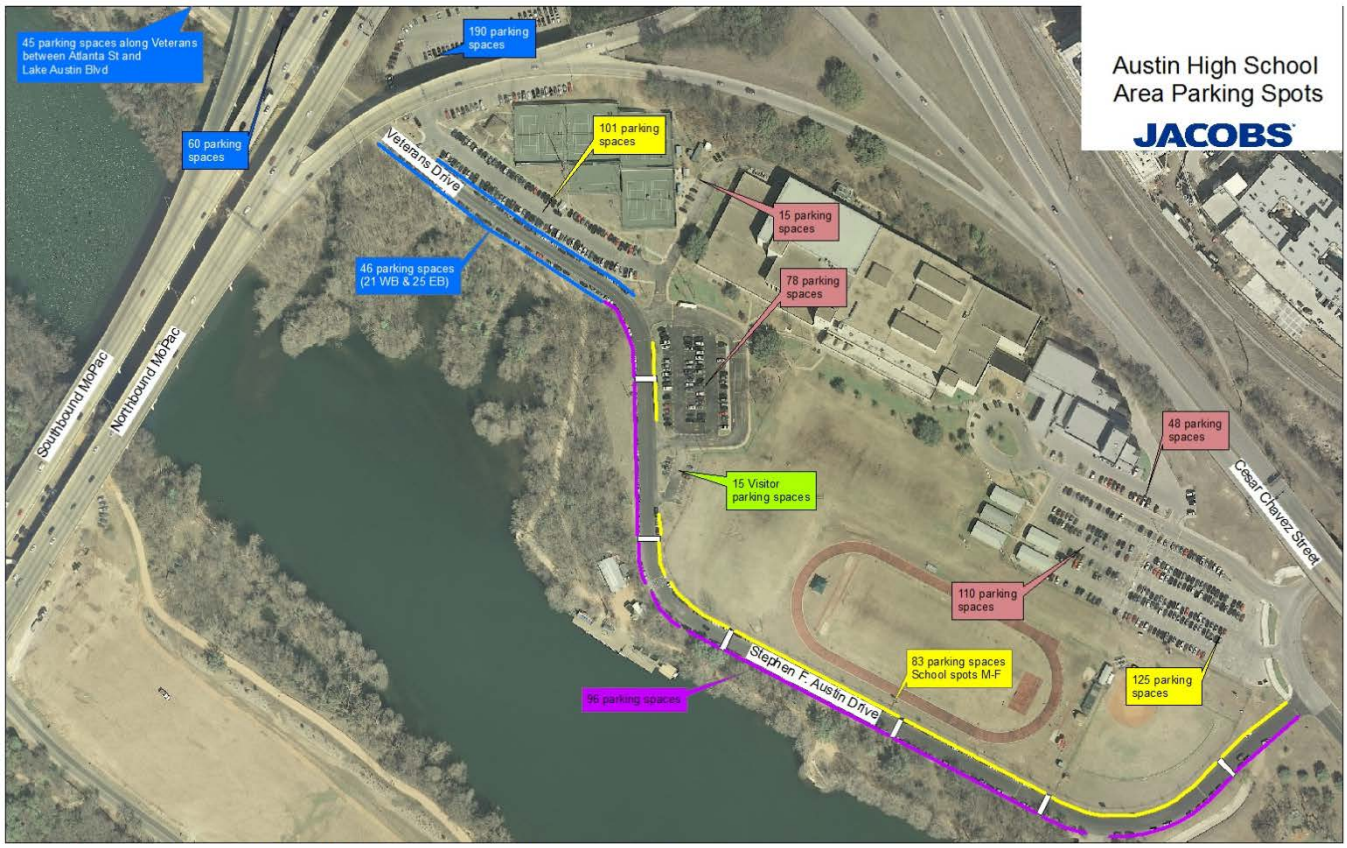


Figure 7 – Austin High Area Parking
(Full size in Appendix C)

Austin High East Parking Lot

The parking lot located on the east side of Austin High School consists of a 120 yard by 33 yard wide parking lot which has been divided roughly into halves by barricades. The east parking lot is shown in Figure 8. There are approximately 110 parking spaces in the western half for teacher parking and approximately 125 parking spaces in the eastern half for student parking. Access to the parking lot is from the east via Cesar Chavez Loop and from the north via the main driveway to the front of the high school. The main driveway is also utilized as a bus queueing area for the afternoon school dismissal. Parking and access is restricted during pick-up and drop-off periods. Parking is available on either side of Stephen F. Austin Drive immediately east of the parking lot. Cesar Chavez Loop is a two-lane street.

Figure 8 – East Parking Lot

Austin High West Faculty Parking Lot

The parking lot located on the west side of Austin High School shown in Figure 9 consists of a teacher parking lot and a visitor parking lot. The teacher parking lot has 78 parking spaces and the visitor lot has 15 parking spaces. Access to the parking lots is via the driveway between the teacher and visitor parking lots along Stephen F. Austin Drive. The driveway is utilized as a student drop-off for the morning school arrival and a student pick-up for the afternoon school dismissal.

Figure 9 – West Faculty Parking Lot

Austin High West Student Parking Lot

The parking lot shown in Figure 10, located on the west side of Austin High School, consists of 110 student parking spaces south of the tennis courts. Access to the parking lot is via the driveway on the west along Veterans Drive. Students also park in the parking lot on the north side of the tennis courts, but those spots are not part of the Austin High School parking lot system.

Figure 10 – West Student Parking Lot

TRAFFIC CIRCULATION

Existing East Parking Lot Traffic Flow Patterns

During the school dismissal period, vehicles begin arriving 10-15 minutes prior to and 10-15 minutes after school dismissal. Vehicles idle within the Student parking lot and along Cesar Chavez Loop in both directions to wait for students. The travel patterns within this parking lot create four distinct points of conflict. These conflict points are:

- The intersection of Stephen F. Austin Drive and Cesar Chavez Loop – Vehicles parked and idling along Cesar Chavez Loop block the view of vehicles attempting to turn in either direction onto Cesar Chavez Loop from Stephen F. Austin Drive.

Vehicles attempting to turn from westbound Cesar Chavez Loop to southbound Stephen F. Austin have to yield and wait for passing traffic before they are able to cross the eastbound Cesar Chavez Loop traffic. While not required to pause, vehicles traveling eastbound on Cesar Chavez Loop proceed very cautiously through the intersection due to the limited visibility caused by the parked and idling vehicles along Cesar Chavez Loop.

- Inside the parking lot near the Cesar Chavez Loop entrance – During the school dismissal period, vehicles enter and exit the parking lot simultaneously. Vehicles do not follow any of the lane markings in the parking lot and proceed to the parking lot exit from up to four different directions. This confusion, combined with vehicles entering the parking lot during the same period, results in travel delays of approximately four to five minutes. This area is a safety concern due to a lack of traffic management markings.
- Outside the parking lot on Cesar Chavez Loop – Vehicles parked and idling along Cesar Chavez Loop block the view of vehicles attempting to turn in either direction onto Cesar Chavez Loop from the parking lot. Vehicles attempting to turn from WESTBOUND Cesar Chavez Loop into the parking lot have to yield to and wait for passing traffic before they are able to cross the eastbound Cesar Chavez Loop traffic.
- At the intersection of the main entrance and Cesar Chavez Loop – Vehicles parked and idling along Cesar Chavez Loop block the view of vehicles attempting to turn in either direction onto Cesar Chavez Loop from the main entrance drive. Vehicles attempting to turn from northbound Cesar Chavez Loop into the entrance have to yield to and wait for passing traffic before they are able to cross the southbound Cesar Chavez Loop traffic. Vehicles generally yield the right-of-way to the school buses as they depart the main entrance approximately 12 to 15 minutes after the school dismissal.

Existing West Teacher Parking Lot Traffic Flow Patterns

During the school dismissal period, vehicles begin arriving 10-15 minutes prior to and 10-15 minutes after school dismissal. Vehicles idle along both sides of the driveway loop around the faculty parking lot and on Stephen F. Austin Drive waiting to turn in to the driveway loop.

- The driveway loop – The driveway loop has enough space for three lanes from the driveway exit on the north to the curve between the faculty and visitor parking lots. When the vehicles begin to arrive, they turn into the driveway and proceed up the left and right sides of the driveway loop until the crosswalk from the school to the faculty parking lot. When the vehicles stop, there are one row of vehicles on the left, a middle driving lane, and one row of vehicles on the right. The left row can hold about seven vehicles and the right row holds about ten vehicles before the curve. Once the left and right rows are full, the vehicles stack behind them from the curve to Stephen F. Austin Drive.
- At the intersection of the driveway loop and Stephen F Austin – Vehicles idle along Stephen F. Austin Drive attempting to turn into the driveway loop. When the driveway loop is full of idling vehicles, vehicles turning right into the driveway turn on to the right half of the driveway and vehicles turning left into the driveway

turn on to the left half of the driveway. Vehicles turning into the driveway loop generally block through traffic from proceeding on Stephen F. Austin Drive.

Existing West Student Parking Lot Traffic Flow Patterns

Contrasting the other two parking areas on Austin High School, the west student parking lot does not have buses, student drop-off, or student pickup maneuvers and therefore operates as a parking lot. During the school dismissal period, the students walk to their vehicle and leave the parking lot by making left and right turns at the driveway with Veterans Drive. There is no significant inconsistent traffic flow pattern at this driveway.

PARKING MANAGEMENT

The parking around Austin High School is used by many people throughout each day. The majority of the students, faculty, and visitors within the area park in the parking lots on Austin High School property. However, the on-street parking along Veterans/Stephen F. Austin Drive and parking lots under MoPac are used by the Austin High School students as well. There are other visitors, which are there to use the park facilities, that park in the on-street parking along Veterans/Stephen F. Austin Drive and parking lots under MoPac. The following sections discuss recommended modifications to the parking facilities within the area. We developed Exhibits 1, 4, 5, and 6 showing the proposed modifications. These exhibits can be found in Appendix C.

On-Street Area Parking

During the field data collection and observations, we noticed several locations around Austin High School that could benefit from some operational improvement, such as dedicated turn lanes and dedicated parking spots. These dedicated turn lanes will allow vehicles to operate more efficiently on Stephen F. Austin Drive during the PM school peak hour. The following are the recommended changes to the parking along Veterans/Stephen F. Austin Drive and the Cesar Chavez Loop:

- To accommodate a northbound dedicated right-turn lane on Stephen F. Austin Drive at Cesar Chavez Loop, a 150 feet No Parking zone needs to be established on both sides of Stephen F. Austin Drive for the approach to the Cesar Chavez Loop intersection.
- With a dedicated left-turn lane between the entrance and exit driveways at the west faculty parking lot for southbound turning into the student drop-off/pick-up area, a No Parking or Waiting zone should be designated for northbound between the entrance and exit driveways at the west faculty parking lot.
- In addition to the left-turn lane, a dedicated right-turn lane should be created at the west faculty parking lot for northbound turning into the student drop-off/pick-up area. The existing No Parking or Waiting zone should be repainted and enforced for northbound Stephen F. Austin Drive between the closed driveway and entrance driveway at the west faculty parking lot.
- Veterans Drive contains defined parking spots on both sides from Lake Austin Boulevard to the west faculty parking lot. We recommend adding defined parking spots on both sides of Stephen F. Austin Drive with the exception of the No Parking Zones mentioned above to reduce inconsistent parking along the street.

- The turn-around roadway under the main lanes of Cesar Chavez Street should be re-striped to allow parking/waiting near Austin High School for school drop-off and pick-up.

Austin High East Parking Lot

As mentioned above in the traffic circulation section, some safety concerns within the student section of the parking lot were noticed during the field observations. The parking changes considered within the Austin High School east parking lot are as follows:

- Reconfigure the student lot to define the circulation path, islands, and driving aisles. Direct vehicles using islands to the right to the north aisle upon entering the parking lot from the Cesar Chavez driveway. Direct vehicles using islands in the middle aisle to either back to the north aisle or to the exit. Direct vehicles in the south aisle to the exit.
- Reconfigure the parking to have perpendicular parking spots on the north aisle closest to the school, head-in parking on the middle aisle, and back-in parking on the south aisle by the softball field.

Austin High West Faculty Parking Lot

The examination of the Austin High west faculty parking lot did not show the need for any modifications to the parking area. However, the traffic circulation of the driveway loop could be improved. The driveway loop modifications are as follows:

- Restripe the waiting zones on the driveway loop to better define where vehicles need to wait to pick-up students during the school dismissal period.
- Add No Parking or Waiting areas in the curve radius leading into the waiting zones.
- Reconfigure the approach to the exit driveway to two lanes on the inside and a Bus waiting area along the outside curb section. To complete the reconfiguration, widen the pavement marking hatched area to redirect vehicles.
- Reconfigure the exit driveway to 24 feet in width (left turn lane and right turn lane) by adding a hatched painted island or rebuilding the curb and gutter.

Austin High West Student Parking Lot

No changes were identified for the Austin High School student parking lot south of the tennis courts.

Traffic Projections

The traffic projections to the Pressler Street Extension Traffic Study went through two iterations. The two iterations were the Initial Traffic Projections and the Final Traffic Projections. These iterations are discussed in the following sections.

With the MoPac South Managed Lanes project still being designed, we were provided daily and peak hour traffic model run volumes from the CTRMA consultant that we used to refine and balance the traffic projections we developed. The Pressler Street Extension Traffic Study did not use any lane configurations from the MoPac South

Managed Lanes project in the analysis. Therefore, the Pressler Street Extension Traffic Study is an independent analysis of the study area.

INITIAL TRAFFIC PROJECTIONS:

Existing Traffic

As mentioned in the Data Collection Section above, the 24-hr tube counts were collected in September 2014 along Lake Austin Boulevard, 5th Street, 6th Street, Pressler Street, Veterans/Stephen F. Austin Drive, Reserve Road, and Cesar Chavez Street. We also collected the traffic activity to and from the driveways and parking lots at Austin High School including bus and parking numbers in October 2014. The entrance and exit ramp counts on MoPac within the study area and some turning movement counts at MoPac and Lake Austin Boulevard were obtained from a consultant working for CTRMA on the MoPac South Managed Lanes project.

Based on the traffic counts, we estimated the turning movements for both AM and PM peak periods along Lake Austin Boulevard, Veterans/Stephen F. Austin Drive, 5th Street, 6th Street, Pressler Street, and Cesar Chavez Street within the study area. The existing traffic we developed for the PM peak hour is shown in Figure 11 and can be found in Appendix D. The existing AM peak hour traffic is also in Appendix D.

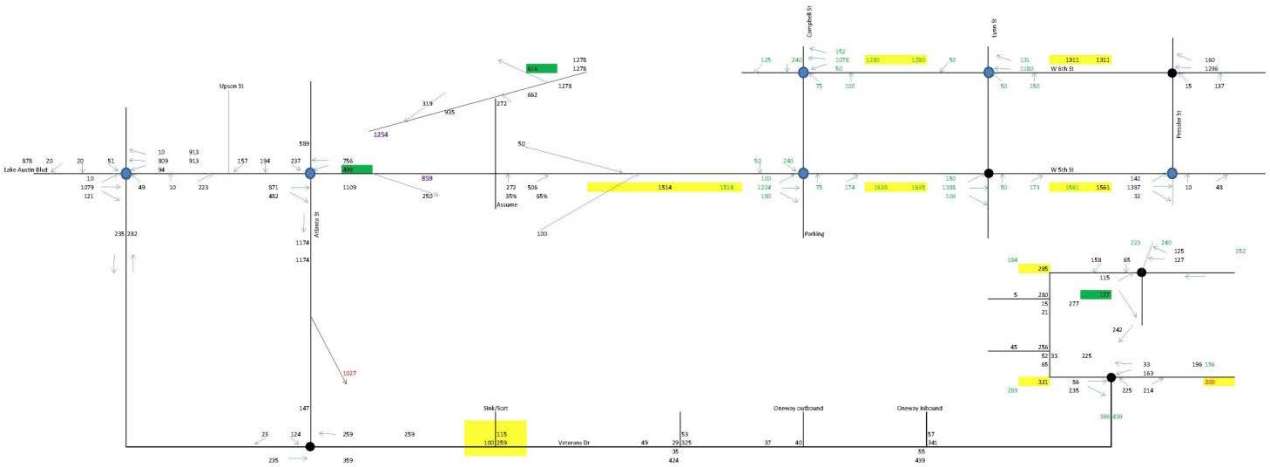


Figure 11 – Existing PM Traffic Intersection Turning Movements (Full size in Appendix D)

Future Traffic

Traffic growth on roadways is a function of the development both within the immediate area and the surrounding region. Therefore, we obtained historical traffic data from TxDOT and projected data from the CAMPO 2035 Mobility Plan travel demand model. These two sources were used to develop a growth rate for the Pressler Street Extension Traffic Study. We determined a growth rate of two percent per year (2%/year) should be used within the study area. Hence, the growth rate of two percent per year (2%/year) was applied to the existing traffic volumes to estimate the future 2020 volumes. The future traffic we developed for the PM peak hour is shown in Figure 12 and can be found in Appendix D. The future AM peak hour traffic is also in Appendix D.

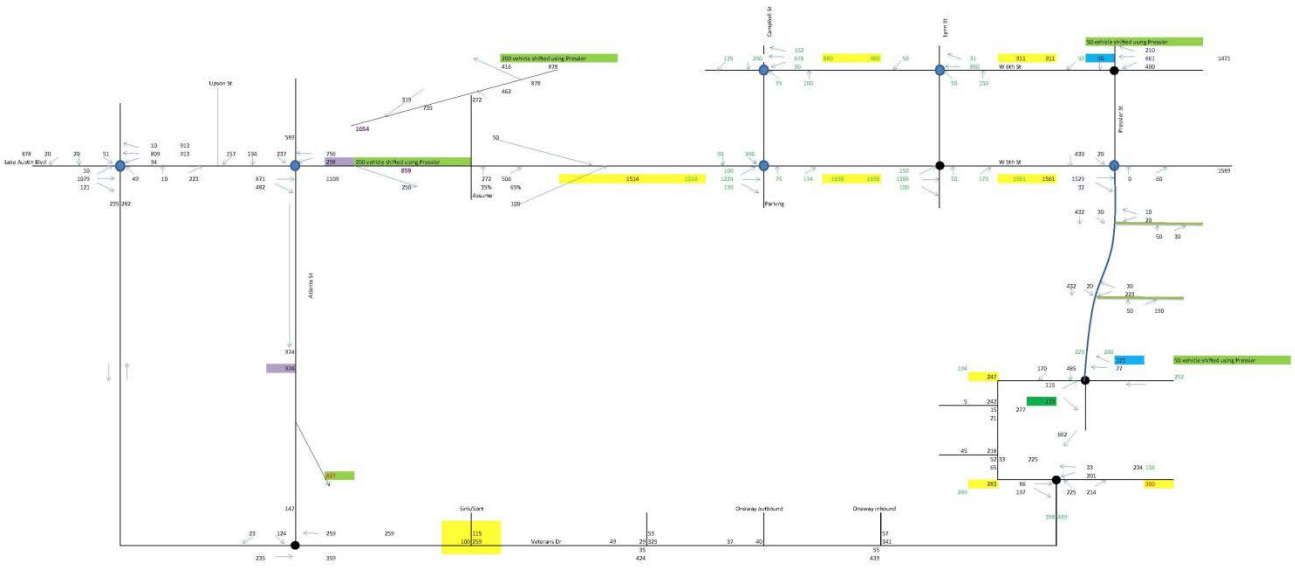


Figure 12 – Future PM Traffic Intersection Turning Movements (Full size in Appendix D)

Pressler Connection

The major element of the study is that Pressler Street does not connect to Cesar Chavez Street. Therefore, we developed future traffic numbers for vehicles expected to use this connection. Along with the new Pressler Street connection between 5th Street and Cesar Chavez Street, we assumed that the segment of Pressler Street between 5th Street and 6th Street would be converted from a northbound one-way street to a southbound one-way street. We used the CAMPO 2035 Mobility Plan travel demand model to estimate the traffic patterns with the new Pressler Street Connection. On the south end, Pressler Street will tie into Cesar Chavez Street at a roundabout which provides access to Austin High School and the Cesar Chavez Street westbound main lanes. Figure 6 shows a possible design configuration for the proposed improvements underway by the City of Austin.

Using the existing traffic patterns, the conversion of Pressler Street, the anticipated growth rate, and engineering judgement, we have adjusted the peak hour traffic volumes as follows:

AM Peak Hour

- Adjusted the volumes on Pressler Street between 5th and 6th Streets, due to the conversion from northbound to southbound;
- Shifted 30 vehicles from 6th Street to use Pressler Street for access to MoPac;
- Shifted 100 vehicles from the westbound Cesar Chavez Street exit ramp to use Pressler Street for access to the school; and
- Adjusted and balanced the traffic volumes within the study area.

PM Peak Hour

- Adjusted the volumes on Pressler Street between 5th and 6th Streets, due to the conversion from northbound to southbound;
- Shifted 400 vehicles from 6th Street to use Pressler Street for access to MoPac (200 to southbound MoPac and 200 to northbound MoPac Managed Lanes);
- Shifted 50 vehicles from the westbound Cesar Chavez Street exit ramp to use Pressler Street for access to the school; and
- Adjusted and balanced the traffic volumes within the study area.

FINAL TRAFFIC PROJECTIONS:

Existing Traffic

In February 2015, we gathered turning movement counts (TMCs) along 5th Street and 6th Street at Pressler Street, Oakland Avenue, West Lynn Street, and Campbell Street. In March 2015, the CTRMA consultant on the MoPac South Managed Lanes project provided daily and peak hour traffic model run volumes on various corridors within the study area for 2015, 2020, and 2035. With this new data, we refined and balanced the turning movements that we developed during the initial traffic projections.

Future Traffic

Based on the previous sections above, we revised the future traffic volumes and we applied the growth rate (2%/year) to the February 2015 count data to estimate the model year (2020) traffic count. Finally, we compared them to the MoPac South Managed Lanes travel demand model run data for the 2020 future peak hour (PM Peak link volume).

The overall traffic entering or exiting the area bounded by 5th Street on the south, 6th Street on the north, Pressler Street on the east, and MoPac on the west are very close (See Table 2). Even though some of the individual links exceeded these percent differences, the difference in overall link volume is less than the capacity of one lane. Therefore, the volume differences are unlikely to produce a significant difference in the analysis outcome. For example, West 6th Street between Pressler Street and West Lynn Street differs by 36% or 558 vehicles, which is less than the 1,900 vehicle lane capacity.

Table 2 – Traffic Count and Model Comparison

Source	Inbound (veh/hr)	Outbound (veh/hr)	Total (veh/hr)
Counts (grown to Year 2020)	2,908	2,897	5,805
Model (Year 2020)	3,200	3,100	6,300
Difference	**292 (10%)**	**203 (7%)**	**495 (8%)**

Given that the two sets of traffic projections are fairly close, we proceeded with the development of traffic projections based on the 2014/2015 counts, using a two percent (2%) annual growth rate out to the year 2020. The traffic volumes were adjusted and balanced and were then put in to the Traffic Simulation Models (VISSIM) developed for the No-Build and Build models. The future traffic we developed can be found in Figure 13 and Appendix D.

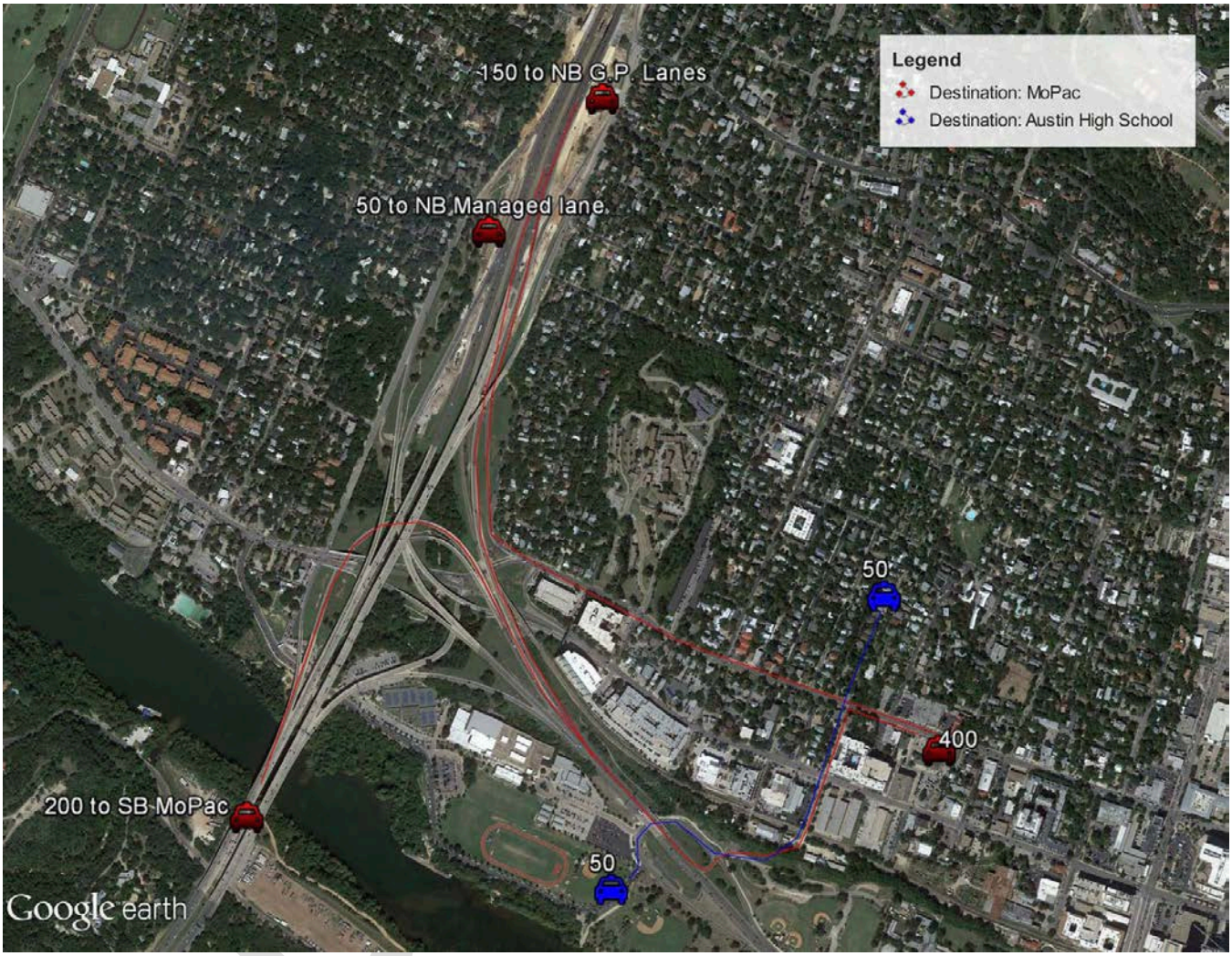


Figure 13 – Proposed Pressler Street Extension Traffic Flows

Pressler Connection

As discussed above, we initially developed the projections based on a proposed conversion of Pressler Street from a northbound one-way street to a southbound one-way street between 5th Street and 6th Street. In the final traffic projections, we have reviewed two other scenarios that could impact the traffic demand on the streets within the study area. These include (1) how traffic patterns would change if Pressler Street were to remain as northbound only between 5th Street and 6th Street, and (2) traffic shifting away from Cesar Chavez Street as Managed Lane-destined traffic increases on Cesar Chavez Street.

1) **Pressler Street One-Way Conversion:**

Based on public input at the first public open house, we looked at the impact of keeping the section of Pressler Street between 5th Street and 6th Street northbound instead of converting to southbound. If the segment of Pressler Street between 5th Street and 6th Street is maintained as northbound only, drivers would need to use Oakland Avenue or streets farther to the west to get from westbound 6th Street to the Pressler Street Connection. Oakland Avenue is only 200' from Pressler Street, resulting in a short and unsafe weave condition across the three lanes on 5th Street. Due to the heavy eastbound volumes on 5th Street, the unsignalized Oakland Avenue approach would fail. If drivers use the streets farther west (e.g. Powell Street, Campbell Street), the weaving distance is increased but the path between 6th Street and the Pressler Street Connection becomes much more circuitous. Most drivers do not like to drive long distances out of their way, which would result in lower use of the proposed Pressler Street Connection. The current assumption of a southbound Pressler Street between 5th Street and 6th Street works well with the Pressler Street Connection to Cesar Chavez Street, as it gives drivers an efficient and logical path to southbound MoPac and the Northbound MoPac Managed Lanes.

2) **Traffic Balancing between Cesar Chavez Street and 6th Street:**

Based on the initial traffic projections, we anticipated that some of the vehicles currently using 6th Street to access MoPac will shift to use Cesar Chavez Street once the Pressler Street Connection and the new ramps to the MoPac General Purpose and Managed Lanes north of Cesar Chavez Street are completed (approximately 400 vehicles in the PM Peak Hour). This shift in traffic resulted in higher congestion levels on Cesar Chavez Street and excess capacity on 6th Street. Therefore, due to this imbalance in volumes and capacities, we have revised the original assumptions so that the traffic destined for the northbound MoPac General Purpose Lanes (approximately 150 vehicles) will remain on 6th Street, and only the traffic destined for southbound MoPac General Purpose Lanes or the northbound MoPac Managed Lanes will use the Pressler Street Connection to shift from 6th Street to Cesar Chavez Street (approximately 250 vehicles).

Based on the above, we used the revised projected traffic volumes (Figure 13), and continue with the assumption that Pressler Street is converted to southbound only between 5th Street and 6th Street.

Based on the existing traffic patterns, the turning movement counts, the conversion of Pressler Street, the growth rate, and engineering judgement, we have adjusted the peak hour traffic volumes as follows:

AM Peak Hour

- Adjusted the volumes on Pressler Street between 5th and 6th Streets, due to the conversion from northbound to southbound;

- Adjusted the volumes on Oakland Avenue between 5th Street and 6th Streets, due to the conversion from southbound to northbound;
- Shifted 30 vehicles from 6th Street to use Pressler Street for access to MoPac;
- Shifted 100 vehicles from the westbound Cesar Chavez Street exit ramp to use Pressler Street for access to the school; and
- Adjusted and balanced the traffic volumes within the study area.

PM Peak Hour

- Adjusted the volumes on Pressler Street between 5th and 6th Streets, due to the conversion from northbound to southbound;
- Adjusted the volumes on Oakland Avenue between 5th Street and 6th Streets, due to the conversion from southbound to northbound;
- Shifted 250 vehicles from 6th Street to use Pressler Street for access to MoPac (200 to southbound MoPac and 50 to the northbound MoPac Managed Lanes);
- Shifted 50 vehicles from the westbound Cesar Chavez Street exit ramp to use Pressler Street for access to the school; and
- Adjusted and balanced the traffic volumes within the study area.

Traffic Analysis Methodology

The traffic analysis was performed for connecting Pressler Street from its current terminus south of the Union Pacific Railroad lines to Reserve Road/ Cesar Chavez Street. The analysis was performed for existing year (2014) and build-out year (2020). The overall study area was bounded by 9th Street to the north, Hearn Street on the west, Lady Bird Lake to the south, and Lamar Boulevard to the east. The corridors and associated intersections within study area included:

- Pressler Street
- 5th Street
- 6th Street
- Campbell Street
- West Lynn Street
- Powell Street
- Paul Street
- Oakland Avenue
- Cesar Chavez Street
- Veterans Drive
- Lake Austin Boulevard
- MoPac Expressway

In addition to the above corridors, roadways surrounding the Austin High School (Stephen F Austin Drive and Cesar Chavez Loop) were also considered in the traffic analysis. The analysis focused on both AM and PM peak hours on the adjacent streets. The AM and PM peak hour volumes were checked for reasonableness based on field observations of users and stakeholders in the vicinity of the study area. We analyzed the traffic counts and determined that the AM peak hour is from 7:00 AM to 8:00 AM and the PM peak hour includes 2 peak hours, the school peak (4:00 PM to 5:00 PM) and the traffic peak (5:00 PM to 6:00 PM).

The traffic operational analysis was performed using VISSIM microscopic simulation software, version 7.0-07. VISSIM is a microscopic, time-step, and behavior-based simulation software developed to model urban traffic, transit, rail and pedestrian operations. VISSIM incorporates a series of constraints, such as lane configuration,

traffic composition, traffic control types, and transit stops, among others. VISSIM provides a diverse array of Measures of Effectiveness (MOEs), such as average total delay, travel times, and queue lengths. VISSIM can also be used to determine environmental MOEs, such as CO2 and NOx emissions and fuel consumption.

We have developed an AM peak hour and PM peak hour VISSIM models for the existing conditions, No Build and Build scenarios, using the following steps:

Step 1. Scale and import background aerial image of the corridor;
Step 2. Develop network geometry (number of lanes, lane widths, acceleration/deceleration lane lengths);
Step 3. Code Desired Speed Decisions;
Step 4. Code Reduced Speed Areas where appropriate;
Step 5. Code Priority Rules/ Conflict Areas;
Step 6. Code Signal Controllers and Signal Heads (signal timings);
Step 7. Code input volumes and Routing Decisions (15 minutes of preload (also called as shoulder time period) and at least the 60 min of actual peak hour);
Step 8. Calibrate the models by running the model for multiple runs (10) and extracting the output results; and
Step 9. Calibrate the models as per the GEH formula calibration targets mentioned in the Federal Highway Administration (FHWA) *Traffic Analysis Toolbox III*[1].

While performing the calibration for the existing traffic conditions, default calibration parameters were assumed on the arterial streets, whereas on the MoPac expressway the parameters have been modified to replicate the traffic operations during the peak hours before running the models to extract the MOEs. VISSIM provides a large number of options for outputs, all of which can be tailored to the needs of the project. For this project, two of the main output files were used (node evaluation and travel time).

NODE EVALUATION:

In VISSIM, nodes are equivalent to intersections. From the node evaluation output, the MOEs of throughput and delay were selected.

It is generally argued that control delay performance measures calculated by microscopic simulation models should be translated into level of service (LOS) as described by the Transportation Research Board (TRB) *Highway Capacity Manual 2010*[2] (*HCM2010*), because the calculation methodology differs substantially between both methodologies (simulation is inherently stochastic whereas HCM methods are deterministic, among other differences). Notwithstanding, a rough correlation between delay and LOS can be made using the LOS thresholds identified in *HCM2010*, with the caveat that this correlation is only for reference purposes and does not intend to provide absolute LOS results.

LOS is a qualitative measure of the operational efficiency or effectiveness of a roadway. Six LOS scores are defined and are designated by letters ranging from “A” through “F,” with LOS “A” representing the best range of operating conditions and LOS “F”

1 FHWA-HRT-04-040 Traffic Analysis Toolbox Volume III: Guidelines for Applying Traffic Microsimulation Modeling Software (June 2004)
2 TRB-ISBN 0-309-06681-6 Highway Capacity Manual 2010 (December 2010)

representing the worst. The criteria for LOS at unsignalized and signalized intersection are shown in Table 3.

Table 3 – Level of Service Criteria

Level of Service	Unsignalized Intersection (Average Control Delay (seconds/vehicle))	Signalized Intersection (Average Control Delay (seconds/vehicle))
A	≤10	≤10
B	10–15	10–20
C	15–25	20–35
D	25–35	35–55
E	35–50	55–80
F	≥50	≥80

Source: *HCM2010*

TRAVEL TIME:

In addition to throughput, travel times were also chosen as a MOE. The average travel times calculated from field data were utilized in the calibration process to compare actual travel times to those observed in the model.

Actual travel times for the study corridor were compiled for a series of travel time runs driven along the southbound and northbound directions on MoPac during the peak periods in October 2014. The data collected were used to develop average travel times. The field-collected travel time data are reported in Appendix E.

As with the other MOEs, the travel time results from VISSIM were compared with field collected data during the calibration process. The model parameters were adjusted, as necessary, through several iterations until the model travel times were within 15% (or one minute, if higher) of the observed (field collected) travel time for more than 85% of the cases.

It should be noted that ten simulation runs with different random seeds were performed, and their results averaged, before being compared to the input data, thus minimizing the chance of outliers yielded by the stochastic component of the software.

Furthermore, to prevent bias caused by an initially empty network, MOEs were always collected only after the simulation had run 15 minutes. MOEs were then aggregated during the peak hour. Whenever the comparison between the model results and the field data fell outside the acceptable ranges set by the guidelines included in FHWA's *Traffic Analysis Toolbox Volume III*, adjustments to the model parameters were made and the simulation was run again ten times to determine if the new results fell within the acceptable ranges.

CALIBRATION RESULTS:

AM Peak Hour

During the AM peak hour, the model was calibrated as per the FHWA guidelines. All the link volumes and the travel time meet the criteria specified in the *Traffic Analysis Toolbox Volume III*. The detailed volume and travel time calibration spreadsheets are included in Appendix F.

PM Peak Hour

During the PM peak hours (school and street), the model was calibrated based on the FHWA guidelines, video data, and professional judgement. As part of the calibration, the traffic operations looked more accurate from a visual perspective of the field conditions during the PM peak period (showing the traffic backups on southbound / northbound MoPac expressway, westbound Cesar Chavez Street, eastbound 5th Street (west of the Lake Austin Boulevard / Atlanta Street intersection) and westbound 6th Street (east of Lake Austin Boulevard / Atlanta Street intersection). The backup on MoPac expressway caused a backup on westbound Cesar Chavez Street, eastbound 5th Street and westbound 6th St. Some of the links and some of the travel time segments meet the criteria specified in the *Traffic Analysis Toolbox Volume III*, whereas the remaining links and travel time segments are consistent with the video data and professional judgement. The detailed volumes and travel time calibration spreadsheets are included in Appendix F.

At-Grade Railroad Crossing

The two game cameras that were placed to observe the pedestrians crossing the railroad tracks also observed data the train traffic crossing Pressler Street as noted in Table 4. There were 19 trains within the 24-hour period the cameras were in place. The times for the trains are in Table 4. The number of trains and their passing times are for this specific 24-hour period; the number and passing times of trains may be different throughout the year.

Table 4 – Railroad Train Field Data

Date	Time					
10/16/2014	12:32 pm	12:57 pm	1:45 pm	4:57 pm	5:23 pm	5:59 pm
	7:55 pm	8:39 pm	10:28 pm			
10/17/2014	12:34 am	12:55 am	2:12 am	2:55 am	5:10 am	5:30 am
	5:58 am	6:30 am	9:55 am	11:52 am		

Figure 14 – Four Quadrant Gate At-Grade Railroad Crossing

The Pressler Street Connection has been discussed for years. In prior years, one focus point has been on Austin High School student safety due to illegal crossing of the railroad tracks. Fences have been erected parallel to the UPRR tracks to discourage this movement, but the illegal flow across the UPRR tracks continues. As the pedestrian traffic count shown in Table 1 is minimal, the Pressler Street Connection project may construct more impenetrable fences along the UPRR tracks encouraging students to use the safer crossing at Pressler Street.

As part of the Pressler Street Connection project, the existing at-grade railroad crossing would be rebuilt and upgraded with new railroad planking, signs, gates and lights, which will be coordinated with UPRR. One of the safety upgrades for railroad at-grade crossings that would be added is to implement a quiet zone inclusive of this crossing. This Quiet Zone would include a four-quadrant railroad gate and light system similar to what is shown in Figure 14. Another safety concern at the at-grade crossing is the safety of the pedestrians crossing the railroad tracks. There are several ways to make the at-grade crossing safer for pedestrians. One of these methods is to place the railroad gate across the sidewalk as shown in Figure 15.

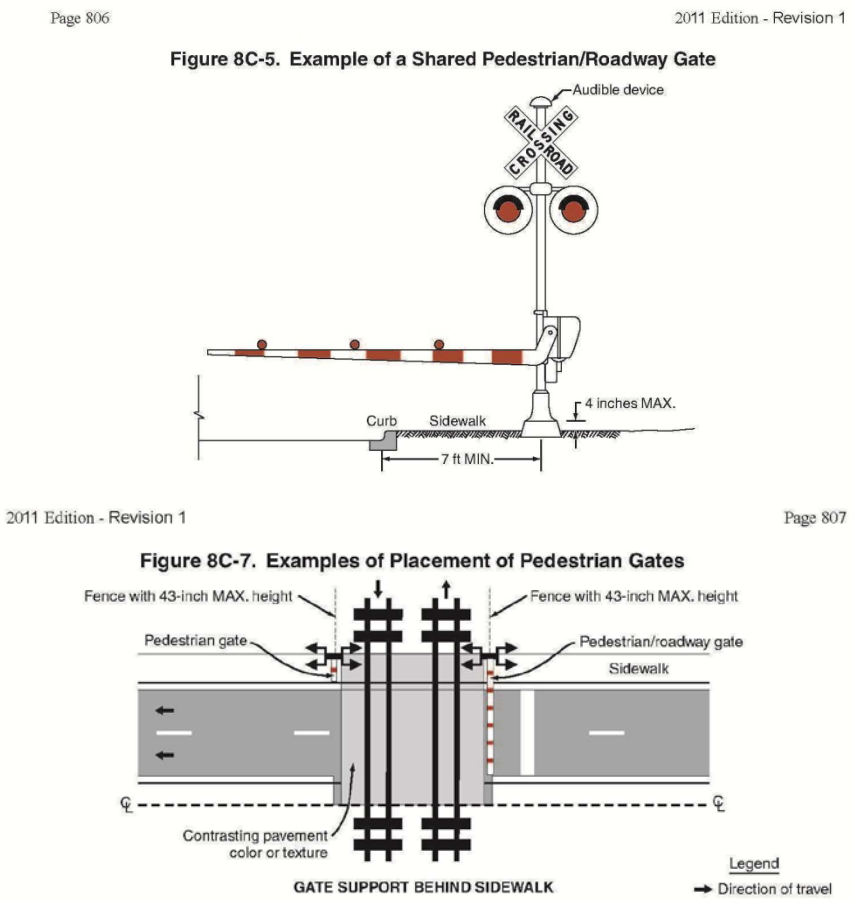


Figure 15 – Railroad Gate Crossing a Sidewalk

On the 2020 Build AM and PM peak hour operational analysis, the proposed Pressler Street extension will be at-grade with the railroad crossing that is located between Reserve Road and 5th Street. To perform the operational analysis, the following train event assumptions were considered for the analysis:

- Train Frequency = 2 Trains/Peak Hour (Approximately 17 trains per day)
- Train Length = 7,900 ft.
- Train Speed = 30 MPH

With these train assumptions, the average blockage time at the railroad crossing with the new Pressler Street Connection will be around 220 seconds (3.67 minutes).

Existing Conditions Analysis

The traffic operational existing conditions analyses includes a detailed evaluation of the traffic operations at all intersections in the study area for 2014. Figure 16 shows VISSIM roadway geometry for the existing conditions within the study area, which includes all the major intersections along Lake Austin Boulevard, 5th Street, 6th Street, Pressler Street, Veterans/Stephen F. Austin Drive, Reserve Road, Cesar Chavez Street, around the Austin High School, and on MoPac expressway.

The existing conditions operational analysis was performed on both the AM and PM peak hours. As mentioned in the Traffic Analysis Methodology section, the AM peak hour was observed to be 7:00-8:00 AM and the PM peak hours were observed from 4:00 PM-5:00 PM (school peak) and 5:00 PM-6:00 PM (traffic peak). During the school PM peak hour, the model was used to show traffic operations of the driveways and roadways around Austin High School. During the street PM peak hour, the model showed the traffic operations on the arterials and main lanes within the study area. During both the AM and PM peak hours, a heavy vehicle percentage of two percent (2%) was used for arterials and three percent (3%) was used on the MoPac expressway main lanes. The raw data of the counts collected from the field are included in Appendix A.

Figure 16 – Existing VISSIM Network

The City of Austin provided current traffic signal timing plans, which included the AM and PM peak hours. The timings from the plans were coded into Synchro and then imported into the AM and PM peak hour VISSIM models. The raw data of the signal timings from the city are included in Appendix G.

To evaluate the operational performance at all the study intersections, the node evaluation results were extracted from VISSIM and compared to the input data. This included throughput and average total delay per approach at all study intersections during the peak hours.

Total delay was calculated within VISSIM by subtracting the ideal travel time (the time it would take to travel between two points under ideal conditions) from the simulated travel time which considers such impediments as congestion, signal delay, and impacts of adjacent vehicles. Table 5, Table 6, and Table 7 summarize the average total approach delay obtained from VISSIM for each study intersection during the AM Peak hour and the two PM Peak hour (school and street). The overall average intersection delay total at each signalized intersection was then calculated using a weighted average of the approach delay, and is also shown in Table 5, Table 6, and Table 7.

The detailed intersection evaluation spreadsheet is provided in Appendix H.

Table 5 – Existing AM 2014 Approach / Intersection Delay/LOS

Intersection	Movement	Approach Delay (sec/veh)	Approach LOS	Intersection Delay (sec/veh)	Intersection LOS
Lake Austin Blvd & Veterans Dr*	SB	30	C	7	A
	WB	3	A		
	NB	30	C		
	EB	5	A		
Lake Austin Blvd & Atlanta St*	SB	29	C	22	C
	WB	27	C		
	EB	15	B		
W 5th St & Campbell St*	SB	30	C	11	B
	NB	18	B		
	EB	8	A		
W 5th St & Pressler St*	NB	10	B	6	A
	EB	6	A		
W 6th St & West Lynn St*	SB	5	A	14	B
	WB	3	A		
	NB	57	E		
W 6th St & Campbell St*	SB	52	D	23	C
	WB	3	A		
	NB	71	E		
Veterans Dr & Atlanta St	SB	12	B	-	-
	WB	0	-		
	EB	0	-		
Stephen F. Austin Dr & Cesar Chavez	WB	3	-	-	-
	NB	12	B		
	EB	0	-		
Reserve Rd & Cesar Chavez	SB	8	A	-	-
	WB	1	-		
	EB	1	-		

* Signalized Intersections

The operational performance during the AM peak hour shows that all the intersections in the study area are operating at LOS “C” or better, and all of the approaches are operating at LOS “C” or better, except the southbound approach at W 6th Street / Campbell Street, which operates at LOS “D.”

Table 6 – Existing PM 2014 Approach / Intersection Delay/LOS (School Peak)

Intersection	Movement	Approach Delay (sec/veh)	Approach LOS	Intersection Delay (sec/veh)	Intersection LOS
Lake Austin Blvd & Veterans Dr*	SB	56	E	48	D
	WB	25	C		
	NB	153	F		
	EB	36	D		
Lake Austin Blvd & Atlanta St*	SB	33	C	40	D
	WB	25	C		
	EB	57	E		
W 5th St & Campbell St*	SB	37	D	14	B
	NB	15	B		
	EB	9	A		
W 5th St & Pressler St*	NB	8	A	7	A
	EB	7	A		
W 6th St & West Lynn St*	SB	6	A	11	B
	WB	4	A		
	NB	60	E		
W 6th St & Campbell St*	SB	42	D	18	B
	WB	8	A		
	NB	43	D		
Veterans Dr & Atlanta St	SB	20	C	-	-
	WB	94	-		
	EB	0	-		
Stephen F. Austin Dr & Cesar Chavez	WB	9	-	-	-
	NB	266	F		
	EB	0	-		
Reserve Rd & Cesar Chavez	SB	32	D	-	-
	WB	7	-		
	EB	2	-		

* Signalized Intersections

The operational performance during the PM school peak hour shows that all the intersections in the study area operate at LOS “D” or better, and all of the approaches are operating at LOS “D” or better, except the southbound approach at Lake Austin Boulevard / Veterans Drive, the eastbound approach at Lake Austin Boulevard / Atlanta Street and the northbound approach at W 6th Street / West Lynn Street, which operate at LOS “E,” and the northbound approach at Lake Austin Boulevard / Veterans Drive and Stephen Austin Drive intersection with eastbound Cesar Chavez, which operates at LOS “F.”

Table 7 – Existing PM 2014 Approach / Intersection Delay/LOS (Traffic Peak)

Intersection	Movement	Approach Delay (sec/veh)	Approach LOS	Intersection Delay (sec/veh)	Intersection LOS
Lake Austin Blvd & Veterans Dr*	SB	51	D	285	F
	WB	18	B		
	NB	328	F		
	EB	578	F		
Lake Austin Blvd & Atlanta St*	SB	315	F	193	F
	WB	238	F		
	EB	87	F		
W 5th St & Campbell St*	SB	35	C	14	B
	NB	16	B		
	EB	8	A		
W 5th St & Pressler St*	NB	9	A	6	A
	EB	6	A		
W 6th St & West Lynn St*	SB	47	D	82	F
	WB	85	F		
	NB	77	E		
W 6th St & Campbell St*	SB	209	F	132	F
	WB	118	F		
	NB	65	E		
Veterans Dr & Atlanta St	SB	82	F	-	-
	WB	513	-		
	EB	0	-		
Stephen F. Austin Dr & Cesar Chavez	WB	65	-	-	-
	NB	100	F		
	EB	7	-		
Reserve Rd & Cesar Chavez	SB	27	D	-	-
	WB	36	-		
	EB	2	-		

* Signalized Intersections

The operational performance during the PM traffic peak hour shows that two of the study intersections operate at LOS "B" or better and the rest operate at LOS "F," with most of the approaches operating at LOS "E" and LOS "F." As explained in the previous section, traffic travelling from eastbound Lake Austin Boulevard to southbound MoPac expressway, westbound 6th Street to southbound MoPac expressway and from westbound Cesar Chavez Street to southbound MoPac expressway create backups on all the cross streets and Cesar Chavez Street, and cause the intersections and approaches to operate at LOS "F" during the street PM peak hour.

Future Conditions Analysis

The future conditions analysis was performed for the 2020 analysis year. This involves both a No Build conditions and a Build conditions operational analysis during the peak hours. On the No Build condition analysis, the geometry from the study area remains the same as the existing conditions except for providing a new access connection from westbound Cesar Chavez Street to northbound Managed Lanes on MoPac expressway and an eastbound right turn lane for Stephen F. Austin at Cesar Chavez Loop. Whereas, the Build conditions include the following improvements:

- Modifying the intersection of Reserve Road and westbound Cesar Chavez exit ramp to a 5-leg roundabout;
- Connecting Pressler Street to the proposed roundabout at Reserve Road and westbound Cesar Chavez exit ramp;
- Depressing Reserve Road under the Pressler Street Connection to tie into the roundabout;
- Reversing the direction of Pressler Street between W 6th Street and W 5th Street from northbound-only to southbound-only; and
- Reversing the direction of Oakland Avenue between W 6th Street and W 5th Street from southbound-only to northbound-only.

For all the future conditions analysis, all the assumptions from the existing year remain the same except the above mentioned geometry changes, traffic volumes, and signal timings. The traffic volumes for all the future conditions are based on the traffic projections, as discussed in the traffic projections section. The future signal timings were optimized using Synchro for each of the future (No-Build and Build) conditions based on the proposed improvements, and were coded into the VISSIM models.

2020 NO BUILD

For the 2020 No Build operational analysis, the AM and PM VISSIM models from the existing year were updated with the projected 2020 traffic volumes and the optimized signal timings from Sycnhro. With the exception of the two roadway geometric changes mentioned above, the roadway geometry did not change from the existing year as shown in Figure 17.

The AM and PM models were run to extract the node evaluation results, (i.e., throughput and average total delay per approach) at all seven study intersections. During the AM peak hour the model was able to process all the input volumes, whereas during the PM peak hour because of the congestion from southbound MoPac Expressway the model was not able to process all of the input volumes.

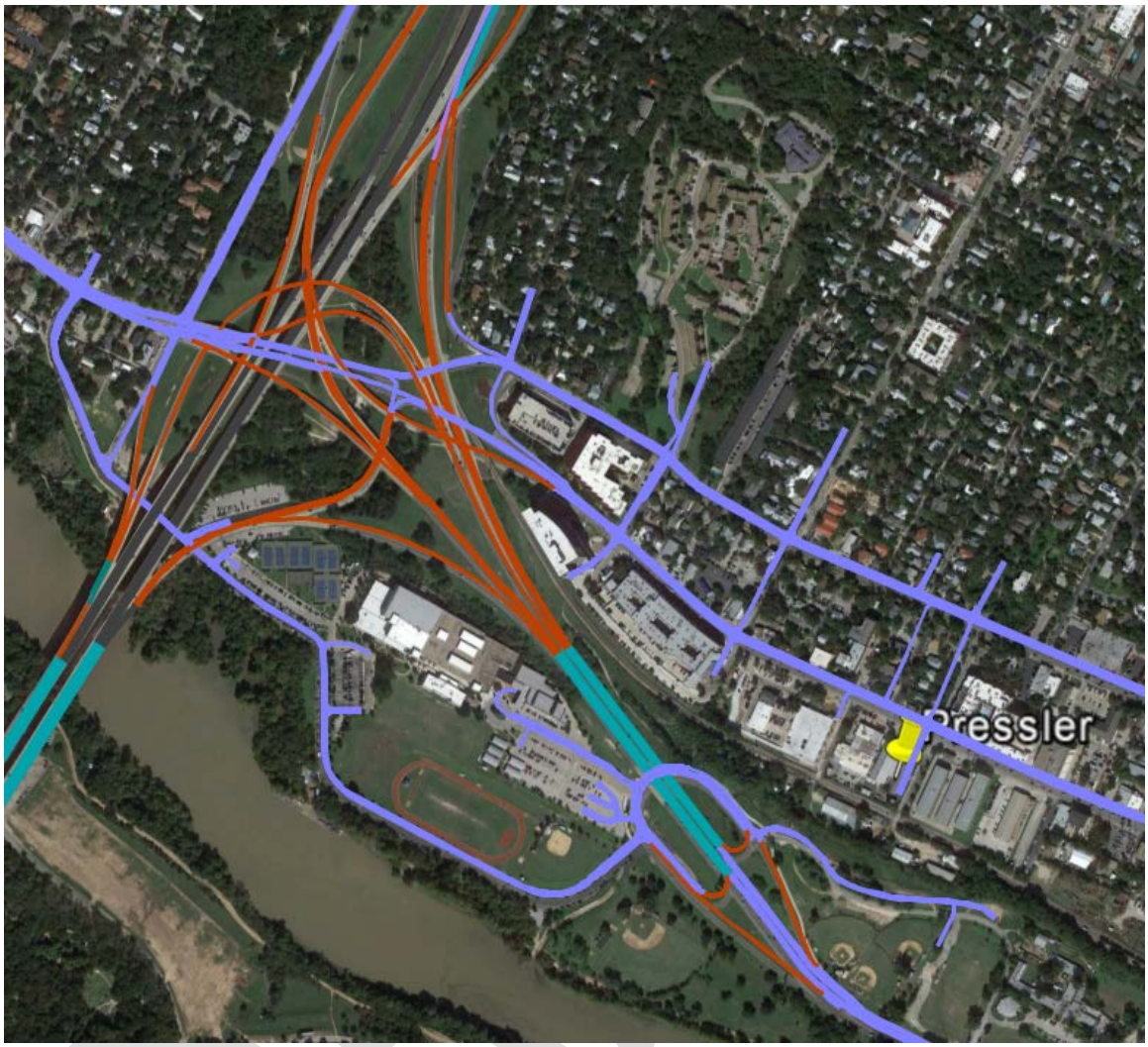


Figure 17 – 2020 No Build VISSIM Network

Table 8, Table 9, and Table 10 summarize the average total approach and intersection delay obtained from VISSIM for each intersection during all three peak hours. The detailed volume processing spreadsheet and intersection evaluation spreadsheet is provided in Appendix I.

Table 8– No Build AM 2020 Approach / Intersection Delay/LOS

Intersection	Movement	Approach Delay (sec/veh)	Approach LOS	Intersection Delay (sec/veh)	Intersection LOS
Lake Austin Blvd & Veterans Dr*	SB	30	C	7	A
	WB	3	A		
	NB	30	C		
	EB	5	A		
Lake Austin Blvd & Atlanta St*	SB	35	C	27	C
	WB	28	C		
	EB	21	C		
W 5th St & Campbell St*	SB	36	D	43	D
	NB	20	C		
	EB	45	D		
W 5th St & Pressler St*	NB	15	B	6	A
	EB	6	A		
W 6th St & West Lynn St*	SB	6	A	10	B
	WB	8	A		
	NB	21	C		
W 6th St & Campbell St*	SB	9	A	9	A
	WB	7	A		
	NB	22	C		
Veterans Dr & Atlanta St	SB	12	B	-	-
	WB	0	-		
	EB	0	-		
Stephen F. Austin Dr & Cesar Chavez	WB	4	-	-	-
	NB	8	A		
	EB	0	-		
Reserve Rd & Cesar Chavez	SB	8	A	-	-
	WB	1	-		
	EB	1	-		

* Signalized Intersections

The operational performance during the No Build AM peak hour shows that all the intersections and approaches in the study area operate at LOS “D” or better.

Table 9 – No Build PM 2020 Approach / Intersection Delay/LOS (School Peak)

Intersection	Movement	Approach Delay (sec/veh)	Approach LOS	Intersection Delay (sec/veh)	Intersection LOS
Lake Austin Blvd & Veterans Dr*	SB	35	C	103	F
	WB	15	B		
	NB	51	D		
	EB	202	F		
Lake Austin Blvd & Atlanta St*	SB	250	F	165	F
	WB	249	F		
	EB	53	D		
W 5th St & Campbell St*	SB	30	C	15	B
	NB	28	C		
	EB	13	B		
W 5th St & Pressler St*	NB	13	B	22	C
	EB	22	C		
W 6th St & West Lynn St*	SB	195	F	156	F
	WB	185	F		
	NB	40	D		
W 6th St & Campbell St*	SB	17	B	126	F
	WB	139	F		
	NB	74	E		
Veterans Dr & Atlanta St	SB	49	E	-	-
	WB	13	-		
	EB	0	-		
Stephen F. Austin Dr & Cesar Chavez	WB	26	-	-	-
	NB	27	D		
	EB	0	-		
Reserve Rd & Cesar Chavez	SB	73	F	-	-
	WB	10	-		
	EB	2	-		

* Signalized Intersections

The operational performance during the No Build PM School peak hour shows that two of the study intersection operates at LOS “C” or better and the rest operate at LOS “F”, and some of the approaches operate at LOS “F”. As explained in the previous section, traffic travelling from eastbound Lake Austin Boulevard to southbound MoPac expressway, westbound 6th Street to southbound MoPac expressway and from westbound Cesar Chavez Street to southbound MoPac expressway create backups on all the cross streets and Cesar Chavez Street, and cause the intersection and approaches to operate at LOS “F.” The reason the delay has increased at all intersections, as compared to existing conditions, is because the traffic accessing the southbound MoPac expressway starts to back up earlier and faster than the existing conditions.

Table 10 – No Build PM 2020 Approach / Intersection Delay/LOS (Traffic Peak)

Intersection	Movement	Approach Delay (sec/veh)	Approach LOS	Intersection Delay (sec/veh)	Intersection LOS
Lake Austin Blvd & Veterans Dr*	SB	37	D	301	F
	WB	10	A		
	NB	62	E		
	EB	700	F		
Lake Austin Blvd & Atlanta St*	SB	1141	F	336	F
	WB	369	F		
	EB	64	E		
W 5th St & Campbell St*	SB	31	C	26	C
	NB	60	E		
	EB	20	C		
W 5th St & Pressler St*	NB	14	B	47	D
	EB	47	D		
W 6th St & West Lynn St*	SB	599	F	435	F
	WB	564	F		
	NB	54	D		
W 6th St & Campbell St*	SB	15	B	265	F
	WB	312	F		
	NB	127	F		
Veterans Dr & Atlanta St	SB	74	F	-	-
	WB	7	-		
	EB	0	-		
Stephen F. Austin Dr & Cesar Chavez	WB	28	-	-	-
	NB	20	C		
	EB	0	-		
Reserve Rd & Cesar Chavez	SB	11	B	-	-
	WB	53	-		
	EB	2	-		

* Signalized Intersections

The operational performance during the No Build PM Traffic peak hour shows that two of the study intersections operate at LOS “D” or better and the rest operate at LOS “F”, and most of the approaches operate at LOS “E” and LOS “F”. As explained in the previous section, traffic travelling from eastbound Lake Austin Boulevard to southbound MoPac expressway, westbound 6th Street to southbound MoPac expressway and from westbound Cesar Chavez to southbound MoPac expressway creates backups on all the cross streets and Cesar Chavez and causes the intersection and approaches to operate at LOS “F”. The reason the delay has increased at all intersections comparing to existing conditions is because the arterials accessing the southbound MoPac expressway starts to back up early/ faster than the existing conditions.

2020 BUILD

For the 2020 Build operational analysis, the AM and PM VISSIM models from the No Build were updated with the 2020 traffic volumes based on the detailed Build traffic projections and the optimized signal timings from Sycnhro. As explained earlier, the roadway geometry has changed at some of the locations, as compared to existing and No Build conditions. All the geometry changes have been updated in the AM and the PM VISSIM models as shown in Figure 18.

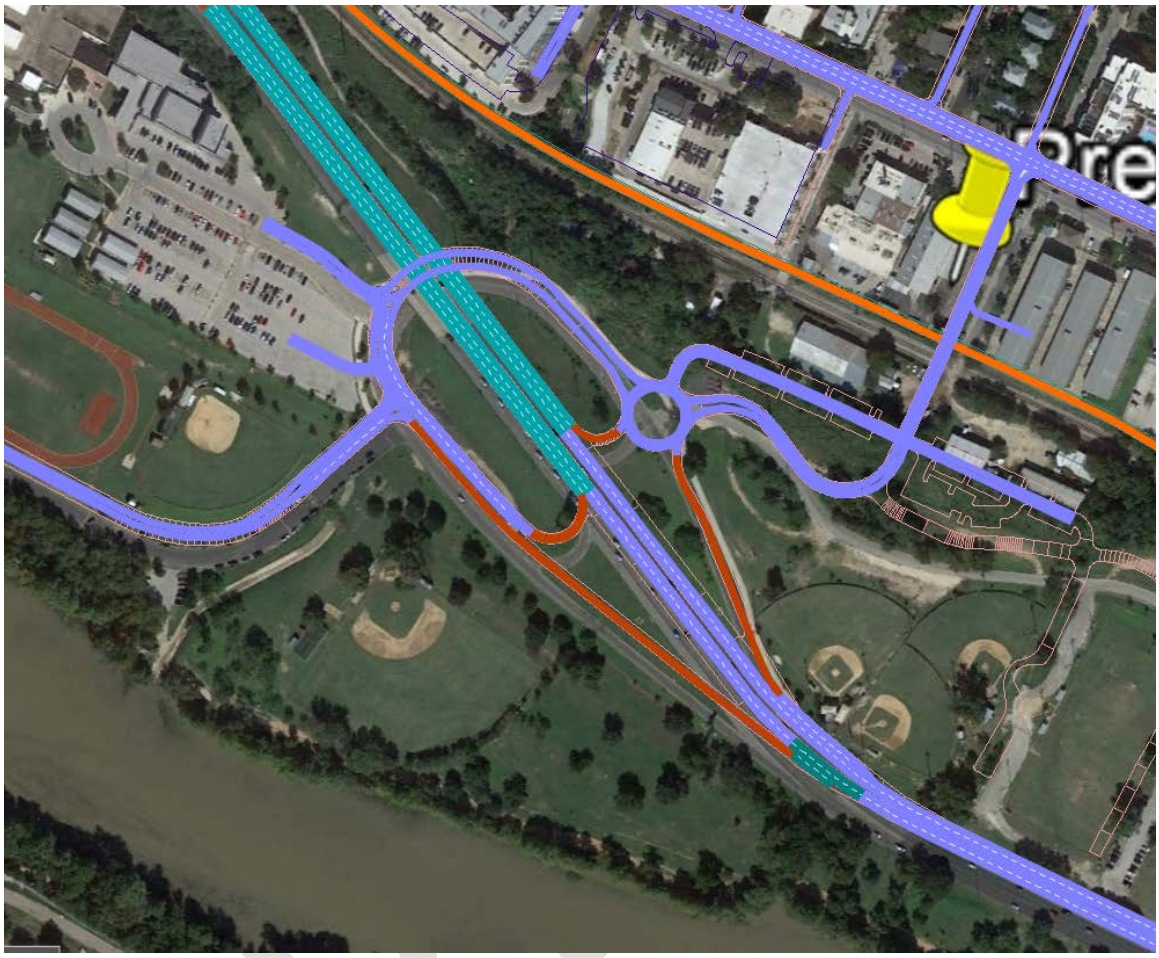


Figure 18 – 2020 Build VISSIM Network

The AM and PM models were run to extract the node evaluation results, (i.e., throughput and average total delay per approach) at all seven study intersections. During the AM peak hour, the model was able to process all the input volumes, whereas during the PM peak hour, because of the congestion from southbound MoPac expressway, the model was not able to process all of the anticipated traffic. During the PM peak hours, the Build model was able to process more traffic than the No Build PM peak hour, indicating the benefit of allowing some of the traffic to use the new Pressler Street Connection to access southbound MoPac. While able to process more traffic than the No-Build condition, the Build condition is still unable to process all of the anticipated traffic, indicating the need for additional improvements in the study area. In over saturated conditions, a higher percent of the anticipated traffic that the model is able to process is an indication of improved conditions. While the No-Build model was only able to process 58% during the PM school peak hour on 6th Street, the Build model was able to process 78%.

Table 11, Table 12, and Table 13 summarize the average total approach and intersection delay obtained from VISSIM for each intersection during all three peak hours. The detailed volume processing spreadsheet and intersection evaluation spreadsheet is provided in Appendix J.

Table 11 – Build AM 2020 Approach / Intersection Delay/LOS

Intersection	Movement	Approach Delay (sec/veh)	Approach LOS	Intersection Delay (sec/veh)	Intersection LOS
Lake Austin Blvd & Veterans Dr*	SB	29	C	7	A
	WB	3	A		
	NB	33	C		
	EB	5	A		
Lake Austin Blvd & Atlanta St*	SB	33	C	26	C
	WB	27	C		
	EB	22	C		
W 5th St & Campbell St*	SB	32	C	34	C
	NB	21	C		
	EB	35	D		
W 5th St & Pressler St*	SB	38	D	10	B
	NB	17	B		
	EB	10	A		
W 6th St & West Lynn St*	SB	6	A	10	B
	WB	9	A		
	NB	21	C		
W 6th St & Campbell St*	SB	9	A	9	A
	WB	7	A		
	NB	21	C		
Veterans Dr & Atlanta St	SB	11	B	-	-
	WB	1	-		
	EB	0	-		
Stephen F. Austin Dr & Cesar Chavez	WB	4	-	-	-
	NB	10	B		
	EB	0	-		
Reserve Rd & Cesar Chavez**	SB	2	A	6	A
	WB	15	C		
	NB	1	A		
	EB	2	A		

* Signalized Intersections
* * Roundabout Intersection

The operational performance during the Build AM peak hour shows that all intersections in the study area operates at LOS “C” or better, and all approaches are operating at LOS “C” or better, except the eastbound approach at W 5th Street / Campbell Street and southbound approach at W 5th Street / Pressler Street, which operates at LOS “D.”

Table 12 – Build PM 2020 Approach / Intersection Delay/LOS (School Peak)

Intersection	Movement	Approach Delay (sec/veh)	Approach LOS	Intersection Delay (sec/veh)	Intersection LOS
Lake Austin Blvd & Veterans Dr*	SB	33	C	70	E
	WB	13	B		
	NB	36	D		
	EB	131	F		
Lake Austin Blvd & Atlanta St*	SB	147	F	124	F
	WB	207	F		
	EB	42	D		
W 5th St & Campbell St*	SB	31	C	14	B
	NB	21	C		
	EB	11	B		
W 5th St & Pressler St*	SB	43	D	21	C
	NB	25	C		
	EB	21	C		
W 6th St & West Lynn St*	SB	32	C	41	D
	WB	48	D		
	NB	24	C		
W 6th St & Campbell St*	SB	13	B	45	D
	WB	45	D		
	NB	45	D		
Veterans Dr & Atlanta St	SB	49	E	-	-
	WB	3	-		
	EB	0	-		
Stephen F. Austin Dr & Cesar Chavez	WB	25	-	-	-
	NB	44	E		
	EB	0	-		
Reserve Rd & Cesar Chavez**	SB	33	C	20	C
	WB	25	C		
	NB	2	A		
	EB	12	B		

* Signalized Intersections
* * Roundabout Intersection

The operational performance during the Build PM School peak hour shows that all the study intersections in the study area operate at LOS “D” or better, except the intersection of Lake Austin Boulevard / Veterans Drive and Lake Austin Boulevard / Atlanta Street, which operates at LOS “F.” All of the approaches at the study intersections operates at LOS “D” or better, except the southbound approach at Veterans Drive / Atlanta Street and the northbound approach at Stephen Austin Drive / Cesar Chavez Loop eastbound exit and entrance ramp operate at LOS “E,” the eastbound approach at Lake Austin Boulevard / Veterans Drive and the southbound and westbound approaches at Lake Austin Boulevard / Atlanta Street, which operates at LOS “F.”

Table 13– Build PM 2020 Approach / Intersection Delay/LOS (Traffic Peak)

Intersection	Movement	Approach Delay (sec/veh)	Approach LOS	Intersection Delay (sec/veh)	Intersection LOS
Lake Austin Blvd & Veterans Dr*	SB	33	C	273	F
	WB	9	A		
	NB	43	D		
	EB	598	F		
Lake Austin Blvd & Atlanta St*	SB	775	F	295	F
	WB	382	F		
	EB	56	E		
W 5th St & Campbell St*	SB	29	C	13	B
	NB	28	C		
	EB	9	A		
W 5th St & Pressler St*	SB	43	D	50	D
	NB	24	C		
	EB	52	D		
W 6th St & West Lynn St*	SB	281	F	338	F
	WB	489	F		
	NB	39	D		
W 6th St & Campbell St*	SB	17	B	220	F
	WB	263	F		
	NB	82	F		
Veterans Dr & Atlanta St	SB	62	F	-	-
	WB	2	-		
	EB	0	-		
Stephan Austin Dr & Cesar Chavez	WB	29	-	-	-
	NB	16	C		
	EB	0	-		
Reserve Rd & Cesar Chavez**	SB	10	B	12	B
	WB	22	C		
	NB	2	A		
	EB	11	B		

* Signalized Intersections
* * Roundabout Intersection

The operational performance during the Build PM traffic peak hour shows that two of the study intersections operate at LOS “D” or better, and the rest operate at LOS “F.” Most of the approaches operate at LOS “E” and LOS “F.” As explained in the previous section, traffic travelling from eastbound Lake Austin Boulevard to southbound MoPac expressway, westbound 6th Street to southbound MoPac expressway and from westbound Cesar Chavez Street to southbound MoPac expressway create backups on all the cross streets and Cesar Chavez Street, and cause the intersections and approaches to operate at LOS “F.” The reason the delay has increased at all intersections, as compared to existing conditions, is because the traffic accessing southbound MoPac expressway starts to back up earlier and faster than the existing conditions.

When comparing the Build approach and intersection delay with the No Build PM school and traffic peak hour, the new Pressler Street Connection is helping the traffic along westbound 6th Street to access both northbound and southbound on MoPac expressway as well as the traffic going westbound on 6th Street, southbound on Atlanta

Street to access the school and eastbound 5th Street, and on eastbound Lake Austin Boulevard at the Veterans Drive and Atlanta Street intersections.

SIDRA

In addition to the VISSIM analysis, SIDRA analysis was performed for the proposed roundabout with the New Pressler Street Connection, relocated Reserve Road, westbound Cesar Chavez ramps and Cesar Chavez Loop from Austin High School. The analysis was performed during the street PM peak hour for both the 2015 and 2020 analysis years. Table 14 and Table 15 summarize the intersection and approach delay and LOS.

Table 14 – PM 2015 Roundabout Delay/ LOS

Approach	2015 PM Build			
	Approach Delay (sec)	Approach LOS	Intersection Delay (sec)	Intersection LOS
SB	10.0	B	9.7	A
WB	10.6	B		
NB	5.3	A		
EB	10.9	B		

Table 15 – PM 2020 Roundabout Delay/ LOS

Approach	2020 PM Build			
	Approach	Approach	Intersection	Intersection
SB	13.1	B	11.7	B
WB	12.2	B		
NB	5.5	A		
EB	13.9	B		

The SIDRA operational analysis shows that the roundabout operates at LOS “B” or better in both the analysis years with the projected volumes. The detailed SIDRA results are in Appendix K.

3DS MAX ANIMATION

The VISSIM 3DS Max integration process started with the export of the network data and vehicle positions from PTV VISSIM as a text file. The data was then imported in 3DS Max using a script provided by the PVT Group. During the import process, the script read the VISSIM files and created the animated cars in the 3DS Max scene. Initially, the script asks sequentially for the location of the 3D car models used on the animation. The time this process took varied depending on the numbers of cars in each part of the simulation. The script also asks to select the roads surface model within the scene on which the cars are going to be laid on. The next step was to review the animated cars to identify any cars that might be off path and fix their trajectory. Once this was done, the VISSIM model was ready to be integrated with the context model.

With both, the VISSIM and the context model integrated, the 3DS Max scene was ready to be rendered into video sequences.

In order to visualize the different points of interest of the study area and their traffic simulations, an interactive application was developed. The application provided the ability to see the overall study area and zoom into any of the five different points of interest. Using a series of toggles, the user is able to switch between the existing conditions, future no- build conditions, and future build conditions. With another set of toggles the user is also able to switch between two different day times. The application was developed with Adobe AIR SDK which offers multi-platform deployment and strong multimedia capabilities. Figure 19, Figure 20, Figure 21, and Figure 22 are screen shots from the application for the overall view and several intersections.

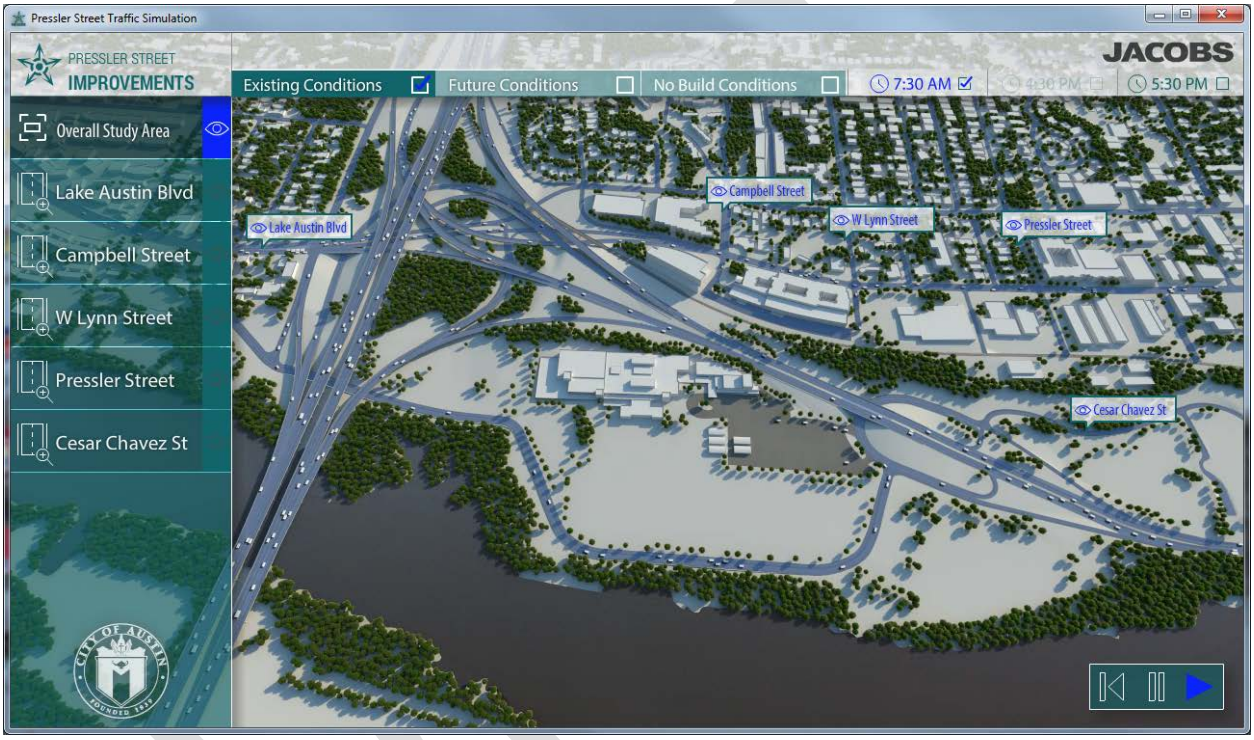


Figure 19 – Overall Application View

Figure 20 – Lake Austin Application View

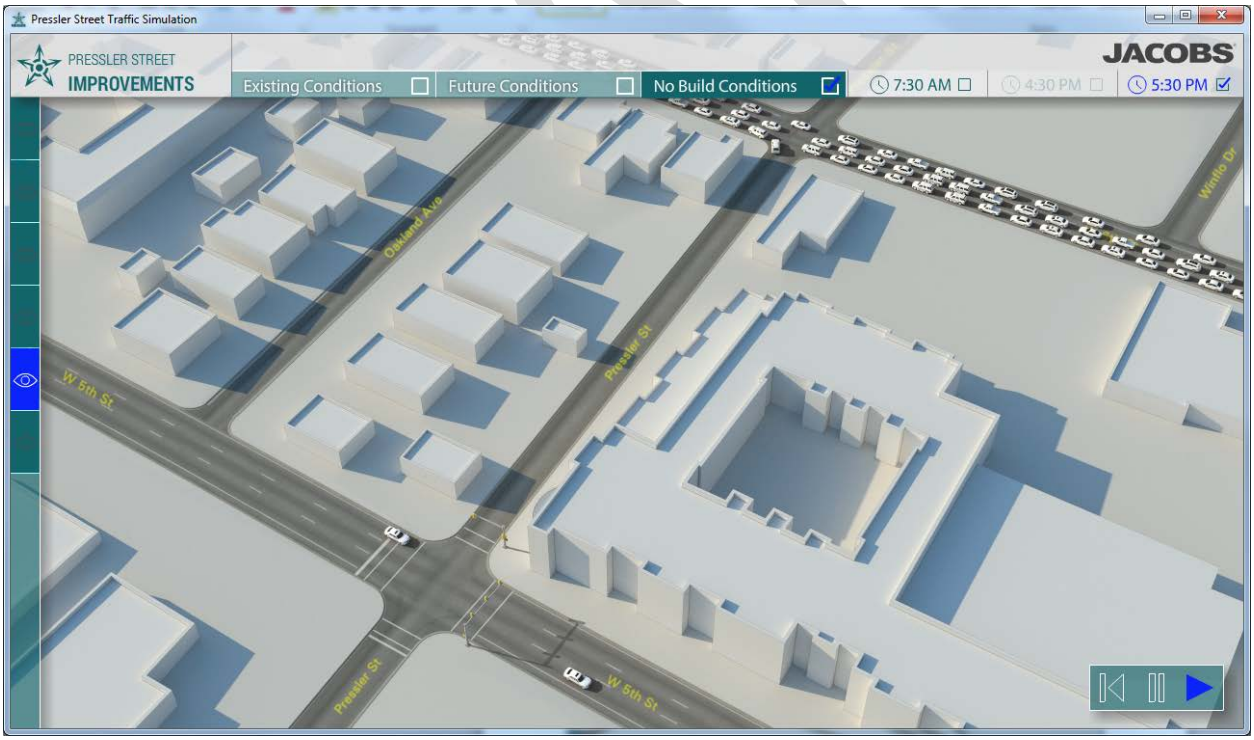


Figure 21 – Pressler Application View

Figure 22 – Cesar Chavez Application View

Findings and Recommendations

Based on the analysis and results discussed above, we offer the following findings and recommendations for each location within the study area. The findings and recommendations locations are indicated in the Figure 23.

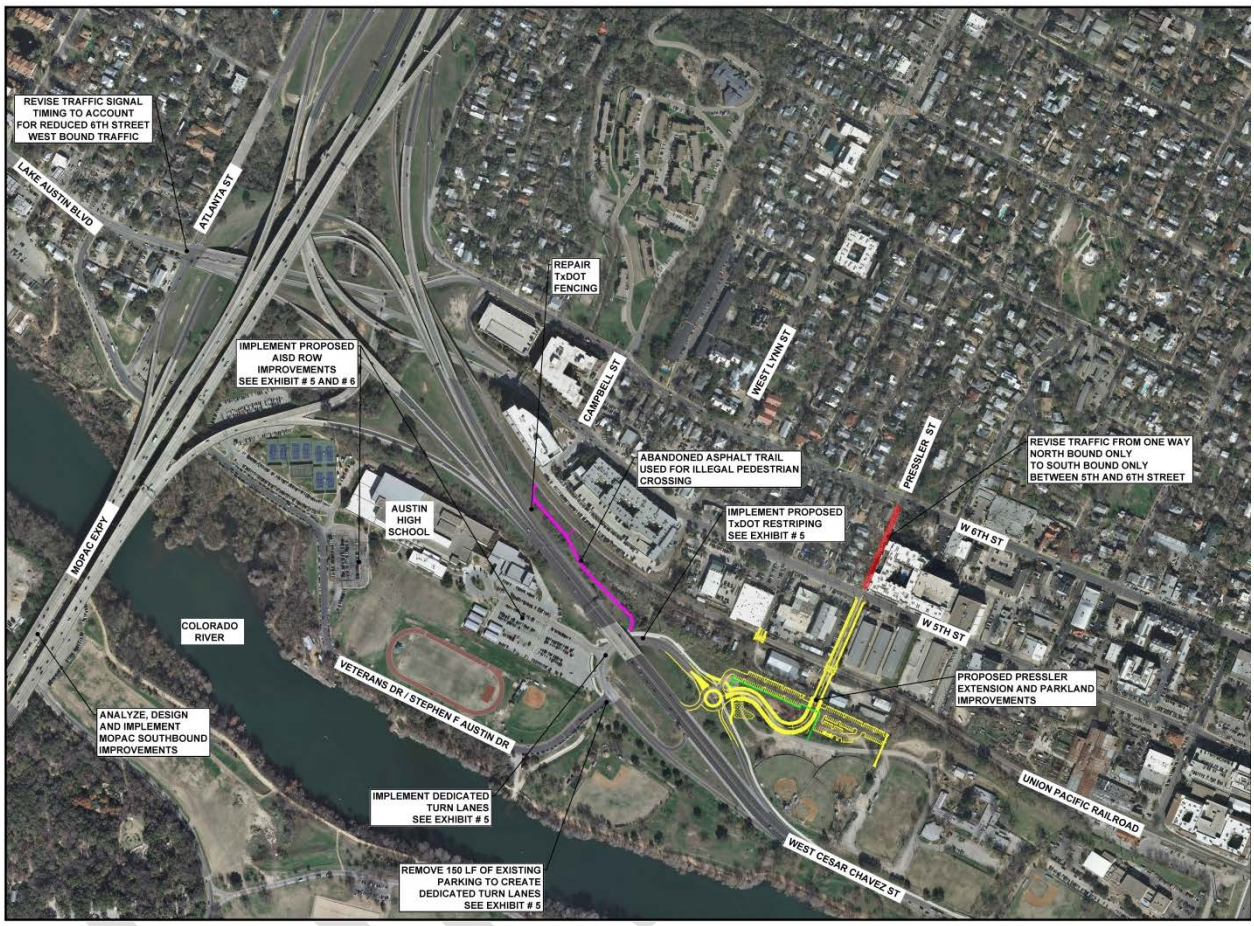


Figure 23 – Findings and Recommendations Locations

OVEREALL FINDINGS

- The addition of the Pressler Street Connection does not adversely impact the overall Level of Service (LOS) of the study area.
- A summary of the approach and intersection delays for the PM school and traffic peak hours is shown in Table 16. The PM traffic peak hour in Table 16 shows a delay savings of 3 minutes 48 seconds (approximately 4 minutes) per vehicle, or 768 hours of cumulative travel time savings for the 12,111 vehicles within the study area during that hour.
- The proposed improvements create a 17 second delay for the Stephen F. Austin & Cesar Chavez intersection during the school peak hour and no change during the PM traffic peak hour. The delay is a result of the additional school and commuter traffic that is expected to take advantage of the new Pressler Street connection between 5th / 6th Street and Austin High School / Cesar Chavez Street.

- The addition of the Pressler Street Connection has no impact to intersection delays during the AM peak period. As shown in the tables above, the AM peak hour delays are nearly identical. Hence, an AM peak summary has not been provided within the report.
- The addition of the Pressler Street Connection reduces the intersection delays along westbound 6th Street between Pressler Street and Veterans Drive by a total of 4.5 minutes per vehicle during the PM school peak and a total of 3.5 minutes per vehicle during PM traffic peak.

Table 16 – LOS PM Peak Summary

Intersection	PM PEAK (SCHOOL)						PM PEAK (TRAFFIC)					
	EXISTING		FUTURE NO BUILD		FUTURE BUILD		EXISTING		FUTURE NO BUILD		FUTURE BUILD	
	Delay (sec /veh)	LOS	Delay (sec /veh)	LOS	Delay (sec /veh)	LOS	Delay (sec /veh)	LOS	Delay (sec /veh)	LOS	Delay (sec /veh)	LOS
Lake Austin Blvd & Veterans Dr*	48	D	103	F	70	F	285	F	301	F	273	F
Lake Austin Blvd & Atlanta St*	40	D	165	F	124	F	193	F	336	F	295	F
W 5th St & Campbell St*	14	B	15	B	14	B	14	B	26	C	13	B
W 5th St & Pressler St	7	A	22	C	21	C	6	A	47	D	50	D
W 6th St & Lynn St*	11	B	156	F	41	D	82	F	435	F	339	F
W 6th St & Campbell St*	18	B	126	F	45	D	132	F	265	F	220	F
Veterans Dr & Atlanta St	20	C	49	E	49	E	82	F	74	F	62	F
Stephen F. Austin Dr & Cesar Chavez	266	F	27	D	44	E	65	F	28	C	29	C
Reserve Road & Cesar Chavez**	32	D	73	F	20	C	27	D	11	B	12	B
Total Delay (seconds/vehicle)	456		737		429		887		1522		1294	
Total Delay Delta (seconds/vehicle)					-308						-228	
Total Delay Delta (minutes/vehicle)					-5.1						-3.8	
Total Number of Vehicles (each)					15,854						12,111	
Total Delay for All Vehicles (hrs)					-1,357						-768	

* Signalized Intersections
** Roundabout Intersection

Non-highlighted delays are intersection delays.
Yellow highlighted delays are for the Southbound Approach Delay
Orange highlighted delays are for the Northbound Approach Delay

PRESSLER STREET IMPROVEMENTS

- Jacobs concludes that the Pressler Street Connection improves the connectivity and relieves existing congestion along routes within the study area during the peak hours. This connection provides an alternate north/south route between MoPac and Lamar Boulevard, connecting 5th Street, 6th Street, Cesar Chavez Street, and Stephen F. Austin Drive. This alternate route will allow drivers to vary their route as traffic patterns/congestion forms throughout the system.
- Jacobs recommends Pressler Street be converted from one-way northbound to one-way southbound between 5th and 6th Streets to facilitate traffic flow from westbound 6th Street to Austin High School and Cesar Chavez Street.
- Jacobs finds that while the at-grade train crossing between 5th Street and Cesar Chavez Street will result in delays when a train event is present, the vehicular queues associated with that train event will have minimal effect on adjacent intersections along the proposed Pressler Street Connection.
- The roundabout included in the Pressler Street Connection will operate at an acceptable LOS for the year 2020 during the PM school peak hour (LOS C) and the PM traffic peak hour (LOS B). These LOS scores equate to an average of 21 seconds of delay per vehicle and 13 seconds of delay per vehicle, respectively.
- During the PM school peak hour, the travel time from the student parking lot to westbound Cesar Chavez Street just east of the MoPac northbound/southbound split is expected to increase from 54 seconds in 2015 to 72 seconds in 2020, an increase of 18 seconds under the No-Build conditions. That same route will take 98 seconds in 2020 if the Pressler Street Connection is constructed. This results in an additional delay of 26 seconds. The reason that the travel time is longer for the Build condition than the No-Build condition is due to the shift of traffic from 6th Street to Cesar Chavez Street using the Pressler Street Connection during the PM school peak hour.
- During the PM traffic peak hour, the travel time from the teacher parking lot to westbound Cesar Chavez Street just east of the MoPac northbound/southbound split is expected to remain the same 34 second delay in the 2020 No-Build conditions as it is in 2015. That 34 second delay is expected to increase to 56 seconds increase in 2020 if the Pressler Street Connection is constructed. The reason that the travel time is longer for the Build condition than the No-Build condition is due to the shift of traffic from 6th Street to Cesar Chavez Street using the Pressler Street Connection during the PM traffic peak hour.
- The planned improvements of the MoPac South Managed Lanes project are expected to alleviate some of the traffic congestion on westbound Cesar Chavez Street with this additional roadway capacity. These improvements include but are not limited to two managed lanes in each direction, access points to the managed lanes, and entrance and exit ramp changes.
- While the pedestrian traffic count at the UPRR track is minimal, the Pressler Street Connection project is anticipated to include fences along the UPRR tracks encouraging students to use the safer crossing at Pressler Street. The City of Austin is also working with UPRR to include both vehicular gates and pedestrian gates at the Pressler Street Connection across the UPRR tracks.

MOPAC SOUTHBOUND IMPROVEMENTS

- The traffic congestion on southbound MoPac near the Lake Austin Boulevard / 6th Street entrance ramp impacts the ability for traffic to turn southbound from 6th Street / Lake Austin Boulevard. The delay creates a queue that extends to the edge of the study boundary.
- The southbound queue is anticipated to eventually impact the MoPac northbound exit lanes, to the point that traffic destined for eastbound Cesar Chavez Street and westbound Lake Austin Boulevard attempts to merge up to a mile south of the river, with last-minute merges affecting all lanes on northbound MoPac.
- This merging activity restricts the ability for northbound traffic to proceed past the Cesar Chavez Street / 5th Street exit.
- Additional southbound MoPac capacity should be added to alleviate the congestion along both southbound and northbound MoPac, Lake Austin Boulevard, Cesar Chavez Street, and 6th Street. This improvement would also help the traffic accessing MoPac from 6th Street and Lake Austin Boulevard.

MOPAC NORTHBOUND IMPROVEMENTS

- The proposed Managed Lane allows traffic to utilize the Cesar Chavez Street ramp to travel north.
- Southbound MoPac causes delays on northbound MoPac due to the queue on Lake Austin Boulevard/6th Street. West bound traffic on 6th Street is prevented from turning south bound onto MoPac south. This delay causes a queue which blocks northbound traffic exiting MoPac at the Cesar Chavez/5th Street exit. This queue affects all four northbound main lanes of MoPac. Based on our observations, it is possible that some of the traffic may look for alternative routes (e.g. exit MoPac at Bee Caves Road, Spy Glass Drive, use Barton Springs Road, etc.).

CESAR CHAVEZ STREET IMPROVEMENTS

- Coordination with TxDOT should be made to restripe the westbound exit lane from Cesar Chavez Street to MoPac, increasing the weaving distance.
- Coordination with TxDOT should be made to re-stripe the turn-around area under the main lanes of Cesar Chavez Street to allow parking/waiting near Austin High School.

VETERANS AVENUE/STEPHEN F. AUSTIN IMPROVEMENTS

- No parking zones should be designated for 150 feet on both the eastbound and westbound approach to the Cesar Chavez Loop intersection.
- A dedicated right-turn lane should be designated at the intersection with Cesar Chavez Loop.
- No parking or waiting zone should be designated for northbound Stephen F. Austin Drive between the entrance and exit driveways at the west faculty parking lot.
- A dedicated left-turn lane should be designated between the entrance and exit driveways at the west faculty parking lot for southbound Stephen F. Austin Drive turning into the student drop-off/pick-up area.

- No parking or waiting zone should be designated for northbound Stephen F. Austin Drive between the closed driveway and entrance driveway at the west faculty parking lot.
- A dedicated right-turn lane should be designated at the west faculty parking lot for northbound Stephen F. Austin Drive turning into the student drop-off/pick-up area.
- The left-turn and right turn lanes at the entrance to the west faculty parking lot will allow vehicles to proceed through on Stephen F. Austin Drive during the PM school peak hour.
- Veterans Drive contains defined parking spots on both sides from Lake Austin Boulevard to the west faculty parking lot. We recommend adding defined parking spots on both sides of Stephen F. Austin Drive with the exception of the No Parking Zones mentioned above to reduce inconsistent parking along the street.
- Signal timing at Lake Austin Boulevard should be modified to account for the reduced traffic on westbound 6th Street/Lake Austin Boulevard and allow additional time for Atlanta Street traffic to proceed through the intersection.

AUSTIN HIGH SCHOOL EAST PARKING LOT IMPROVEMENTS

- Reconfigure the student lot to define the circulation path, islands, and driving aisles. Direct vehicles using islands to the right to the north aisle upon entering the parking lot from the Cesar Chavez Loop driveway. Direct vehicles using islands in the middle aisle to either back to the north aisle or to the exit. Direct vehicles in the south aisle to the exit.
- Reconfigure the parking to have perpendicular parking spots on the north aisle closest to the school, head-in parking on the middle aisle, and back-in parking on the south aisle by the softball field.

AUSTIN HIGH SCHOOL WEST FACULTY PARKING LOT IMPROVEMENTS

- Restripe the waiting zones on the driveway loop to better define where vehicles need to wait to pick-up students during the school dismissal period.
- Add No Parking or Waiting areas in the curve radius leading into the waiting zones.
- Reconfigure the approach to the exit driveway to two lanes on the inside and a Bus waiting area along the outside curb section. To complete the reconfiguration, widen the pavement marking hatched area to redirect vehicles.
- Reconfigure the exit driveway to 24 feet in width (left turn lane and right turn lane) by adding a hatched painted island or rebuilding the curb and gutter.