

# Rainey Mobility Study

**TECHNICAL MEMORANDUM**

**City of Austin Transportation Department & Planning and Zoning Department**

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Prepared for:

City of Austin Transportation Department (ATD) & Planning and Zoning Department (PAZ)



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# TABLE OF CONTENTS

Executive Summary.....	i
Introduction.....	i
Scenarios.....	ii
Conclusions.....	iv
1. Background.....	1
2. Approach.....	3
3. Vehicular Analysis.....	4
3.1 Scenarios.....	4
3.2 Trip Generation for Future Developments.....	11
3.4 Existing Conditions.....	16
3.5 Potential Improvements.....	16
3.6 PM Peak Vehicular Modeling.....	17
4. Red River Extension.....	24
4.1 Horizontal Alignment.....	24
4.2 Vertical Alignment.....	24
5. Pedestrian Facilities.....	26
6. Bicycle and Scooter Facilities.....	28
7. Business Input.....	29
8. Emergency Vehicles.....	37
9. Conclusion and Next Steps.....	38

# Appendices

Appendix I: 72-hr Multimodal Counts at Rainey Street and Davis Street

Appendix II: 2-hr Saturday Counts

Appendix III: Camden Rainey Street Vehicle Counts

Appendix IV: PM Peak Trip Distribution

Appendix V: Weekend Peak Trip Distribution

Appendix VI: PM Peak No Reductions

Appendix VII: PM Peak 60/40 Mode Split

Appendix VIII: Weekend Peak No Reductions

Appendix IX: Weekend Peak 60/40 Mode Split

Appendix X: Business Input

# Executive Summary

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## Introduction

The City of Austin commissioned the Rainey Mobility Study to conduct an analysis that evaluates ways to improve circulation in the Rainey Neighborhood, which currently features multiple mobility challenges. This technical memorandum does not contain final recommendations but reviews the feasibility of different transportation network scenarios.

The Rainey neighborhood is located on the southeastern edge of Downtown Austin. Interstate Highway 35 (IH-35), Lady Bird Lake, Waller Creek, and Cesar Chavez Street geographically bound the study area. Originally composed of small single-family homes mostly built in the 1920s, by the 1990s the Rainey area grew to incorporate various small businesses, warehouses, and a low-density condominium complex. In 2004, the City of Austin changed the neighborhood's zoning to Central Business District (CBD), which increased the allowable density to match the rest of Downtown Austin. Since then, the neighborhood has rapidly developed from a primarily residential use to include a thriving entertainment district.

The popularity of the Rainey Street entertainment district has led to mobility challenges and concerns over interactions between pedestrians, bicyclists, scooters, and vehicles, with residents expressing frustration at increasing congestion. Developments under construction and planned developments add to mobility challenges in the area.

To help evaluate these mobility concerns the Austin Transportation Department commissioned AECOM to analyze different mobility circulation scenarios. The goal of this study was to analyze the impact of future traffic in the Study Area and to determine the difference in vehicular circulation induced by road network changes. The vehicular study consisted of an analysis of 11 different network configurations. Each alternative was analyzed with anticipated traffic volumes in the year 2025 and included trips generated by 13 proposed or recently completed developments. Traffic operations were measured in terms of intersection delay per vehicle and level of service. The study also assessed the pedestrian and micromobility systems, access to emergency services, and operations of local businesses in the area.

The Rainey Mobility Study will inform the next steps for the Rainey Shared Streets Pilot and the Austin Core Transportation (ACT) Plan. The Rainey Shared Streets Pilot Resolution No. 20190619-186, adopted on June 19, 2019 by Austin City Council, directed the City Manager to launch a pilot program to reduce conflicts between vehicles and other modes on Rainey Street. The ACT Plan is an update to the 2002 Downtown Austin Mobility Plan and 2011 Downtown Austin Plan's Transportation Framework Plan. This update will guide transportation planning, project development, operations, and transportation demand management. The ACT Plan process will include the improvements identified in the Rainey Mobility Study in order to receive public feedback and further project development.

## Scenarios

Eleven network configurations were analyzed for vehicular circulation under four different sets of traffic conditions: PM peak, PM peak with 60/40 mode split of trips generated by new developments, Weekend peak, and Weekend peak with 60/40 mode split of trips generated by new development. In the 60/40 scenarios, 60% of the trips are assumed to be drive-alone, while 40% of trips are taken by other modes. Extending Rainey Street to Cesar Chavez Street, as identified in the Austin Strategic Mobility Plan, was assumed in all scenarios.

**Differences in Network Characteristics Across Scenarios**

Scenario	Characteristics						
	Traffic Circle at the Red River Street/Davis Street Intersection	Rainey Street connects to Cesar Chavez Street	Traffic Signal Installed at River and Rainey Streets	Red River Alley includes Alley Vacation South of 70 Rainey	Red River Extension as Two-Way Vehicular N-S Connection	Red River Extension as One-Way Vehicular N-S Connection	Rainey Street Closed to Vehicular Traffic
Existing	-	-	-	-	-	-	-
1a	-	X	-	-	-	-	-
1b	X	X	X	-	-	-	-
1c	X	X	-	X	-	-	-
1d	X	X	-	X	X	-	-
2a	X	X	-	X	-	-	X
2b	X	X	-	-	-	-	X
3a	X	X	-	X	-	X	X
3b	X	X	-	-	-	X	X
4a	X	X	-	X	X	-	X
4b	X	X	-	-	X	-	X
4c	X	X	-	X	X	-	X

## Analysis Results

**A 60/40 MODE SPLIT FOR PROPOSED DEVELOPMENTS REDUCES AVERAGE INTERSECTION DELAY BY 50% TO 70%**

The following table presents the average change in delay at all intersections relative to Scenario 1a. The Table does not indicate absolute delay per scenario. PM average reductions are more substantial than weekend reductions because the relationship between delay and volume is non-linear, therefore the trip reductions will have a larger relative impact on the PM than Weekend suite of models. The report details the delay per vehicle in all intersections for all scenarios. The analysis section also includes a summary of the differences in intersection delay as a result of the 60/40 mode split across PM and Weekend Scenarios. A 60/40 mode split for proposed developments reduces the average intersection delay by 50% to 70%.

**Change in Delay Across Scenarios**

Scenario	Average Change in Delay from Scenario 1a (sec/veh/intersection)			
	PM Peak	PM Peak with 60/40 mode split	Weekend PM Peak	Weekend PM Peak 60/40 mode split
1b	0	2	0	0
1c	-128	-12	10	-18
1d	-128	-31	-150	-39
2a	53	184	-102	4
2b	51	185	-109	-1
3a	89	204	-98	7
3b	101	204	-105	3
4a	-369	-44	-178	-41
4b	-369	-44	-183	-43
4c	-23	85	-110	-2

The network configuration that reduced the overall delay on all the analyzed sets of traffic conditions the most was scenario 4b, which featured the following network changes from the current state:

- Rainey Street closed to vehicular traffic except for emergency vehicles,
- Red River Street Extension to connect to River Street,
- No alley vacation south of 70 Rainey,
- Rainey Street extension connecting to Cesar Chavez Street (per the Austin Strategic Mobility Plan),
- All-way stop control at the Red River Street/Driskill Street intersection and River Street/East Avenue intersections,
- Traffic circle at the Red River Street/Davis Street intersection.

Pedestrian, bicycle, and scooter circulation were also analyzed. This included collecting counts of each mode on Rainey Street just south of the intersection with Davis Street from June 20, 2019 to June 22, 2019. The peak hour counts by mode are:



## Conclusions

The evaluation of the network configurations identified the following modifications:

- Adding a traffic circle at the intersection of Red River Street/Davis Street
- Converting the East Avenue/River Street intersection from two-way stop control to all-way stop control in order to reduce future delay.
- Converting the Red River Street/Driskill Street intersection from two-way stop control to all-way stop control in order to reduce future delay.
- Creating an additional north-south vehicular connection via the Red River Extension. In order to consider closing Rainey Street to non-emergency vehicular traffic, Red River Street must be extended .

This report also discusses in detail other network modifications and how they impact the multimodal circulation such as:

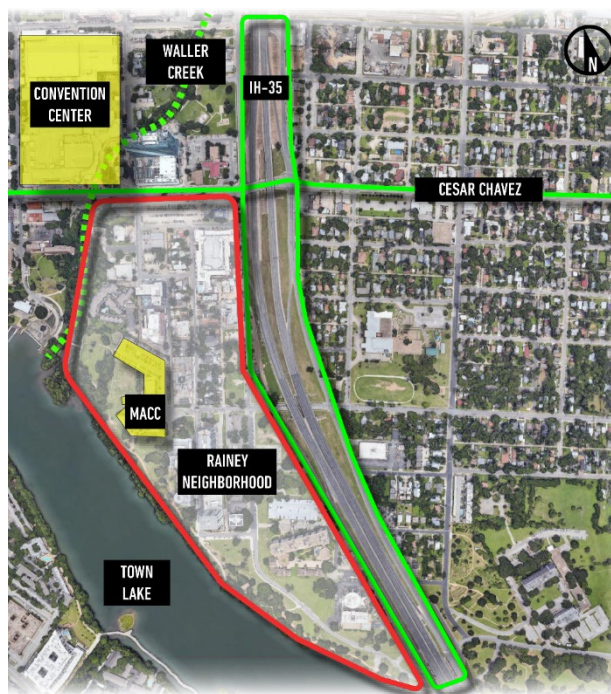
- Rainey Street closure to non-emergency vehicles,
- Rainey Street/River Street traffic circle versus a traffic signal, and
- Red River alley vacation.



# 1. Background

The City of Austin commissioned the Rainey Mobility Study to conduct an analysis that evaluates ways to improve circulation in the Rainey neighborhood, which currently features multiple mobility challenges. This technical memorandum does not contain final recommendations but reviews the feasibility of different transportation network scenarios.

Interstate Highway 35 (IH-35), Lady Bird Lake, Waller Creek, and Cesar Chavez Street geographically isolate the Rainey neighborhood on the southeastern edge of Downtown Austin (see Figure 1). Originally composed of small, single-family homes mostly built in the 1920's, by the 1990's the Rainey area grew to incorporate various small businesses, warehouses, and a low-density condominium complex. In 2004, the City of Austin changed the neighborhood's zoning to Central Business District (CBD) which increased the allowable density to match the rest of Downtown Austin. Since then the neighborhood has developed rapidly. Developers have constructed five multifamily projects, two hotels, and the City of Austin has built the Emma S. Barrientos Mexican American Cultural Facility (ESB-MACC). Business owners have converted all but one of the single-family homes to bars and/or restaurants, and on evenings and weekends Rainey Street has become a thriving entertainment destination that sees high volumes of pedestrian and micromobility (bicycle, scooter, and other small vehicle) traffic.



**Figure 1:** Rainey Neighborhood

In recent years the pace of new construction has greatly increased; 13 additional developments were under construction or in the permitting system as of June 2019. Although the new developments align with the Imagine Austin and Downtown Austin Plans' visions to promote both residential and non-residential growth within growth centers and corridors, mobility challenges due to growth and construction in the Rainey neighborhood remain. In addition, the popularity of the Rainey Street entertainment district has led to concerns over interactions between pedestrians and vehicles, with residents expressing frustration about increased congestion.

Because of these concerns, different future network configurations were tested. Some of the modeled network configurations include scenarios where Rainey Street is closed to vehicle traffic. Emergency vehicle access was maintained in all the scenarios where Rainey Street is otherwise closed to vehicles. To achieve enough clearance to safely operate their equipment, emergency vehicles can use the shared space within the closure. Section 8 of this report includes further detail about emergency vehicle access, and Section 9 of this report presents a conceptual image of the shared street.

Another consideration is the future vacation of a section of the Red River alley, an alley that runs north-south, parallel to, and in between Rainey Street and Red River Street. At the time of development, the 70 Rainey condominiums developer proposed closing a segment of the existing Red River alley from south of 70 Rainey Street to River Street and building a new east-west alley segment that joins the alley to Rainey Street. The ESB-MACC Master Plan reflects this proposal by connecting the lot at the corner of Rainey and River streets and the vacated alley as a gateway (“Gran Entrada”) into the ESB-MACC. Although the 70 Rainey condominiums developer has constructed the new connection, the Austin City Council has not yet officially vacated the north-south alley segment. Neighborhood residents have expressed concern about the effects on mobility introduced by this vacation.

To address these mobility concerns the Austin Transportation Department (ATD) commissioned AECOM to analyze different mobility circulation scenarios. Eleven scenarios, each with a different roadway network, were developed. These scenarios were analyzed and compared network performance in order to understand the impacts the changes will have on the rest of the vehicle circulation. In response to concerns over the high pedestrian volumes and micromobility traffic, seven of the analyzed scenarios consider closing Rainey Street to vehicular traffic.

This study will at times refer to the Rainey Neighborhood Mobility Study & Plan (RNMSP), a study completed in May 2017 by Big Red Dog Engineering. The RNMSP was privately commissioned by several Rainey neighborhood groups. The RNMSP assessed existing mobility conditions, what the neighborhood might look like with future redevelopment, and made recommendations for future improvements. The Austin Transportation Department conveyed to Rainey stakeholders that while the City of Austin could not be bound by a privately commissioned plan, ATD would be happy to review the RNMSP and incorporate the recommendations when feasible. Accordingly, this study did look at the RNMSP’s data and findings. However, the intent of this study is not to provide a comprehensive plan for the Rainey area, but to provide a technical analysis of different mobility alternatives to help guide future conversations and planning for the Rainey area.

## 2. Approach

The study area extends between Red River Street and the IH-35 Southbound Frontage Road (SBFR)/East Avenue and between Cesar Chavez Street and River Street (see Figure 2). The Rainey neighborhood encompasses a bigger area, but the study was limited to this area because the entertainment district is concentrated on Rainey Street north of River Street, resulting in most of the modal conflicts and circulation challenges. In addition, the possible network changes that were modeled are all within the study area; there are no proposed network changes south of River Street.



**Figure 2:** Study Area

The streets within the study area were designed as neighborhood streets and are narrower than standard downtown streets. Driskill Street and Davis Street are both 30 feet wide, Red River Street and River Street are 40 feet wide, and Rainey Street is 38 feet wide. The Red River alley is a paved alley that runs north-south, parallel to, and in between Rainey and Red River Streets. The Rainey alley runs north-south, parallel to, and in between East Avenue and Rainey Street and is currently unpaved. Both alleys are used by vehicles for loading/unloading of passengers and deliveries, as well as for trash pick-up. The north boundary street, Cesar Chavez Street, is a five-lane arterial that provides direct access to IH-35 from downtown. East Avenue is an existing southbound one-way road. This road is also referred to as the IH-35 Southbound Frontage Road (IH-35 SBFR) until it splits with East Avenue just north of River St.

Multiple modes of transportation including cars and trucks, pedestrians, and micromobility options, including bicycles, were analyzed. Other important considerations for the Rainey area are the need for freight delivery, emergency services access, and trash pick-up for the local businesses, hotels, and residences. The goals of the recently adopted Austin Strategic Mobility Plan (ASMP) were also considered; the ASMP proposes a citywide mode split of 50% drive-alone/50% other transportation modes by 2039.

## 3. Vehicular Analysis

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This section of the study summarizes the analysis of the impact of the different scenarios on vehicular mobility.

### 3.1 Scenarios

Eleven alternate street network configurations were analyzed for circulation. Figures 3 to 14 define the existing street network and all 11 alternatives.

The existing network conditions for the year 2019 was the first analysis. The roadway network matches existing traffic circulation, and it does not include any proposed developments.

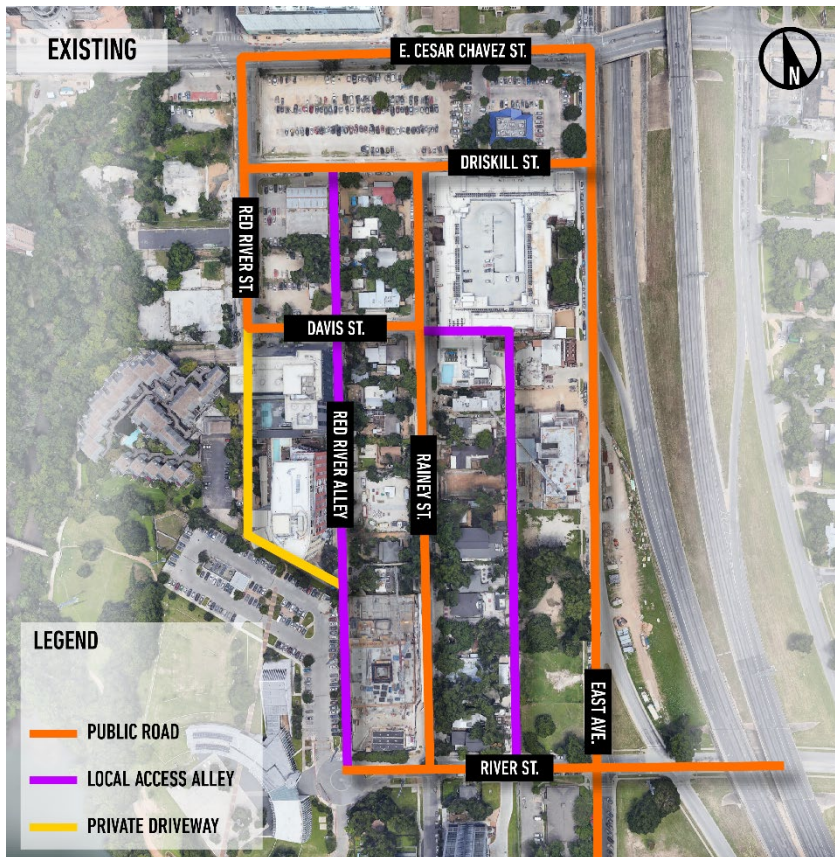
The ASMP shows a future extension of Rainey Street from Driskill Street to Cesar Chavez Street. Excluding the existing conditions scenario, all future scenarios include this Rainey Street extension to Cesar Chavez Street. The intersection with Cesar Chavez Street was modeled as a right-in right-out intersection because of its proximity to the already-signalized intersections at Red River Street/Cesar Chavez Street and IH-35 SBFR/Cesar Chavez Street, however, development and demand may warrant a signalized intersection in the future.

This study refers to two primary network changes. First, the proposed “Red River Extension” is the north-south extension of Red River Street from Davis Street to River Street, located on the west side of the Kimpton Hotel Van Zandt and The Shores Condominium. Second, the “alley vacation” refers to vacating the north-south Red River alley (sometimes known as Bierce Lane) south of 70 Rainey and utilizing a proposed east-west alley connecting Rainey Street to the Red River alley. This would allow travel to continue north-south within the neighborhood, as well as align with future development proposed in the MACC Master Plan.

When the alleys were used solely for local access and were not used to accommodate future generated traffic, this study refers to them as “local access alleys.” In all cases where Rainey is closed to vehicles and traffic is rerouted through the alley, this study refers to them as, “alleys.”

Micromobility refers to bicycles, scooters, and other small vehicles designated for personal mobility. These devices are often electric and can be either privately owned or part of a shared micromobility service.





**Figure 3: Existing Conditions**

Rainey Street open to vehicular traffic with two local access alleys (Red River Alley and Rainey Alley) closed to through traffic.

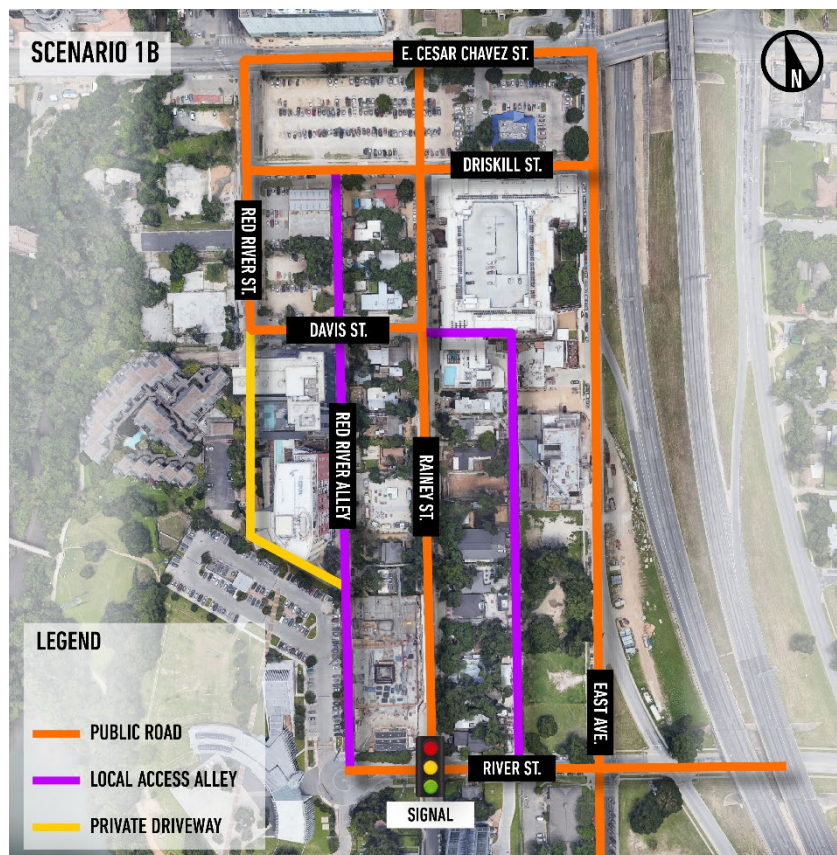
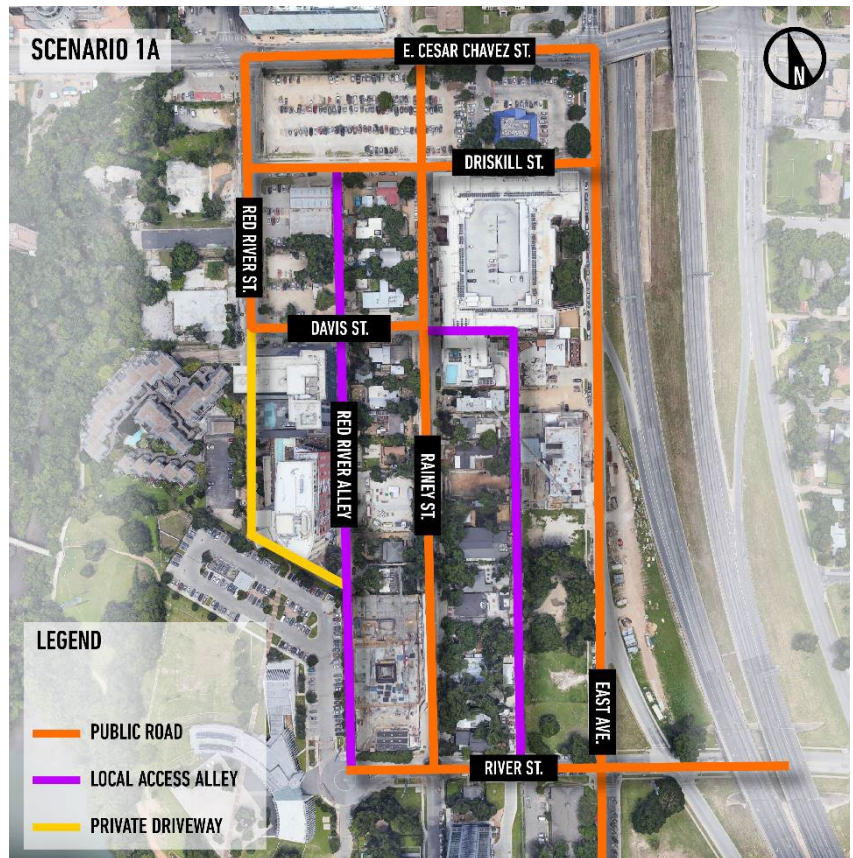
Red River Street becomes a private drive at the intersection of Red River Street/Davis Street.



**Figure 4: Scenario 1A**

Roadway network matches existing conditions with Rainey Street extension to connect to Cesar Chavez Street and future (2025) vehicular volumes.

This scenario will help compare the vehicular circulation without network changes against all other scenarios.



**Figure 5: Scenario 1B**

Roadway network matches existing conditions with the Rainey Street extension to connect to Cesar Chavez Street and the River Street/Rainey Street intersection signalized.

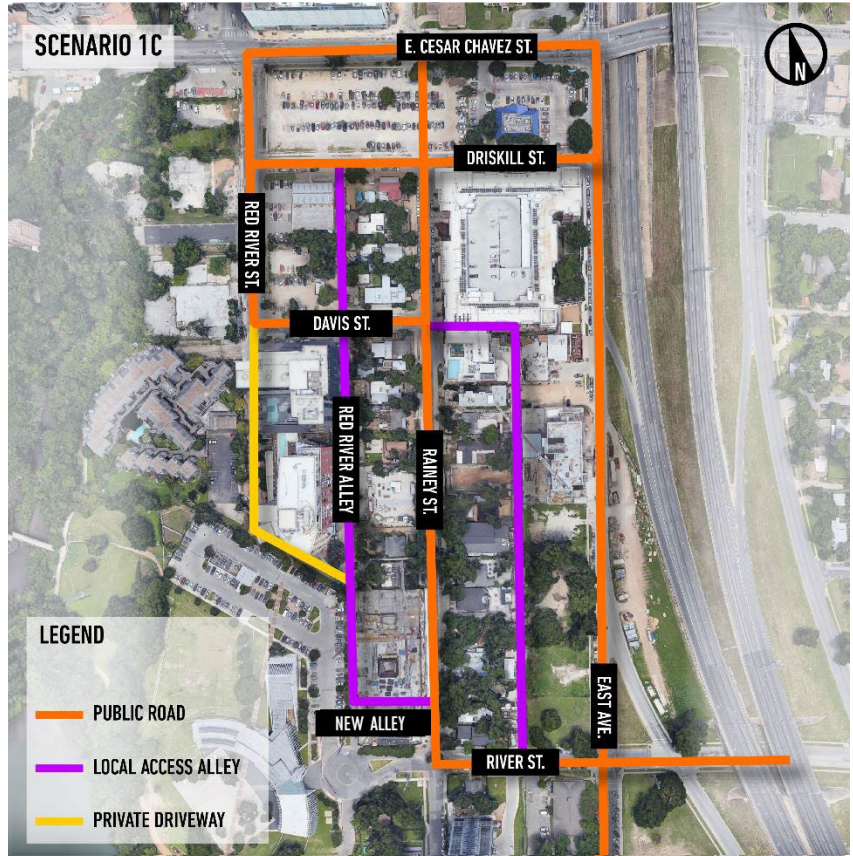
This scenario evaluates the performance of the intersection at Rainey Street/River Street with a traffic signal.



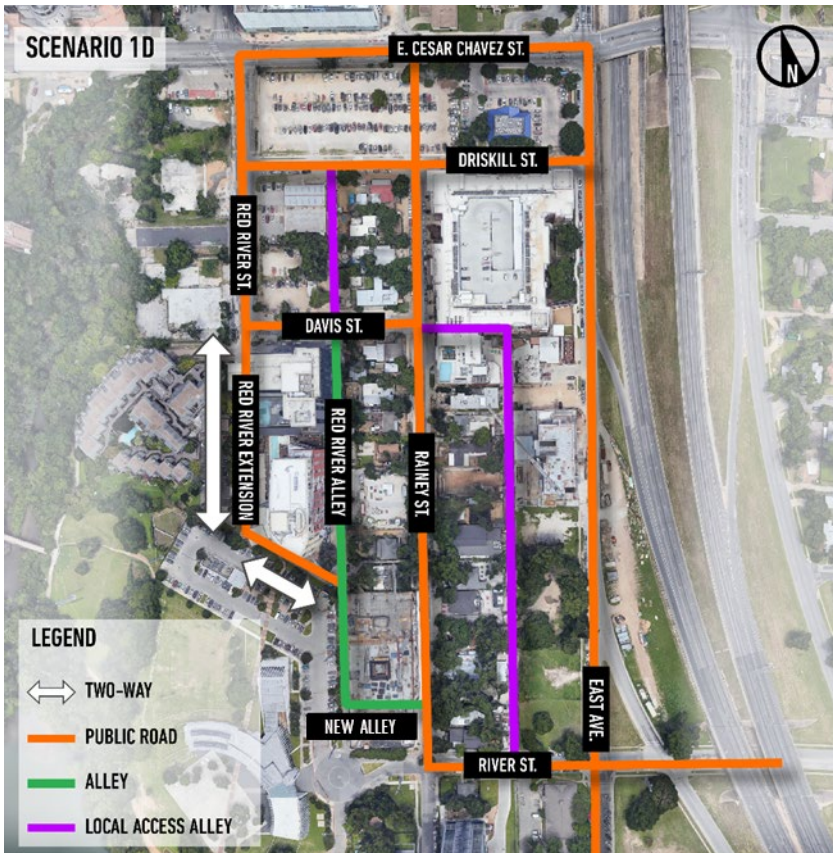
**Figure 6: Scenario 1C**

Rainey Street open to vehicular traffic with the Red River alley reconfigured to include the new east-west alley south of 70 Rainey Street. This scenario assumes no other changes to the Red River alley operations.

This scenario evaluates how the alley vacation would impact the vehicular circulation assuming no other changes to the existing vehicular network.



**Scenario 1D**



**Figure 7: Scenario 1D**

Rainey Street open to vehicular traffic with a two-way Red River Extension that connects to the Red River alley. This scenario reconfigured the extension to include the new east-west alley south of 70 Rainey Street.

This scenario evaluates the vehicular circulation of the study area with the addition of the Red River Extension as a vehicular north-south connection.

The Red River Extension layout is yet to be determined, and the model merges the Red River Extension to the existing Red River alley as shown. The Red River alley is assumed to be widened and open to two-way traffic.

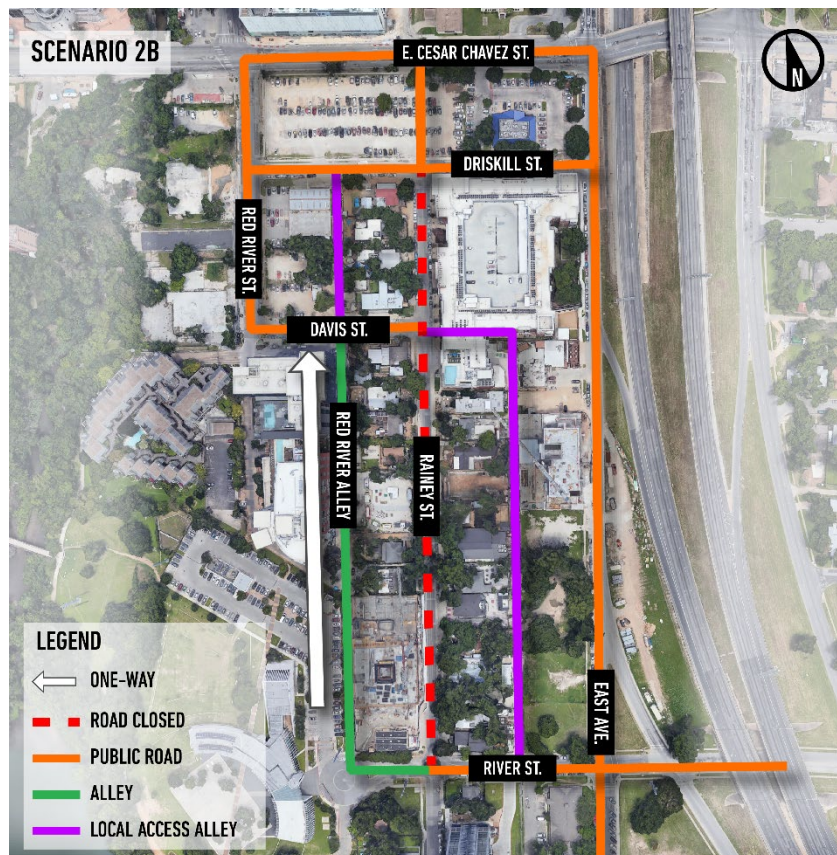
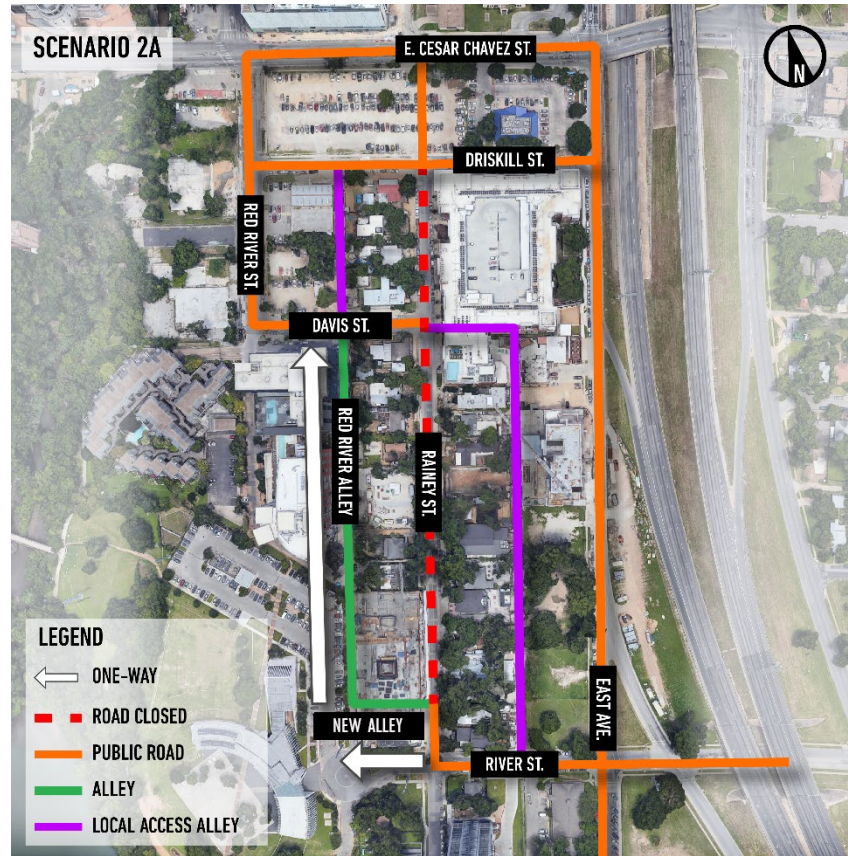


**Figure 8: Scenario 2A**

Rainey Street closed to vehicular traffic except for emergency vehicles, with a one-way northbound Red River alley reconfigured to reflect the new east-west alley south of 70 Rainey Street and maintaining one-way southbound East Avenue north of River Street.

This scenario presents the possibility to add pedestrian, bicycle, and micromobility facilities on Rainey Street while maintaining a north-south vehicular connection via the Red River alley.

Based on the existing Red River alley width, the vehicular circulation was modeled as a one-way northbound connection.



**Figure 9: Scenario 2B**

Rainey Street closed to vehicular traffic except for emergency vehicles with a one-way northbound Red River alley and maintaining one-way southbound East Avenue north of River Street.

This scenario presents the possibility to add pedestrian, bicycle, and micromobility facilities on Rainey Street while maintaining a north-south vehicular connection via the Red River alley.

Based on the existing Red River alley width, the vehicular circulation was modeled as a one-way northbound connection.

This analysis evaluates the alley vacation’s impact on circulation.

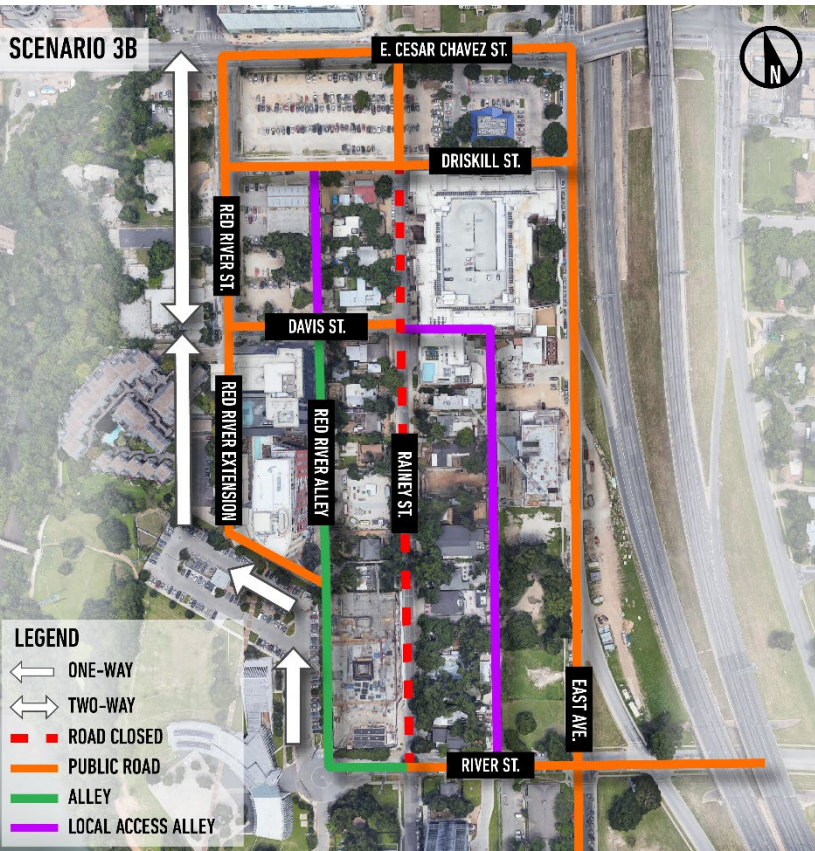
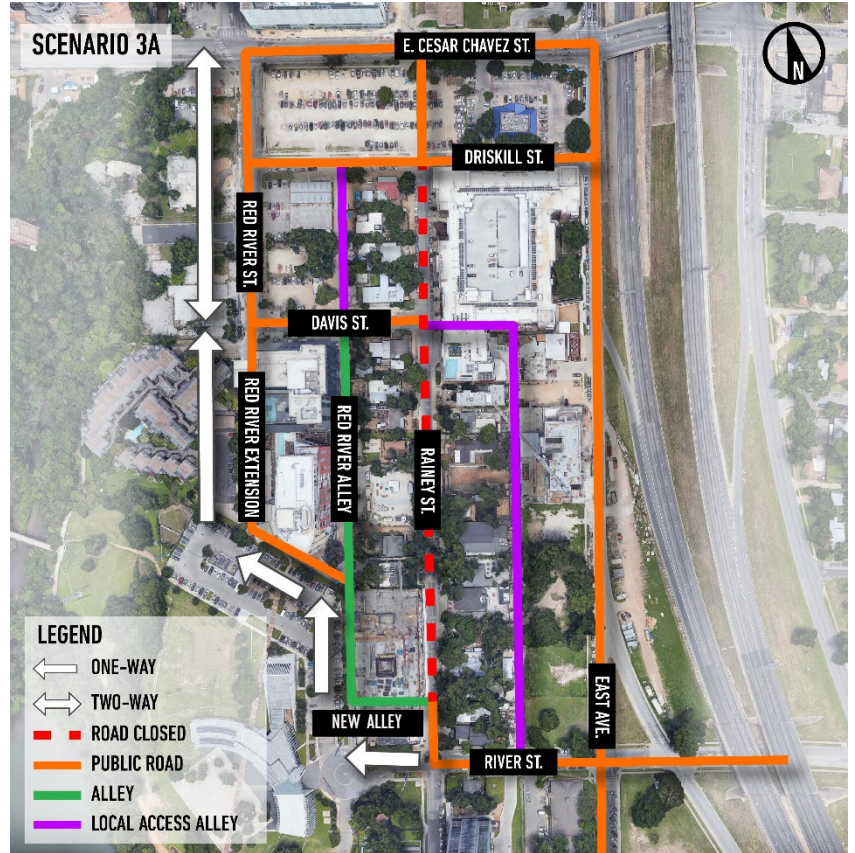


**Figure 10: Scenario 3A**

Rainey Street closed to vehicular traffic except for emergency vehicles, with one-way northbound Red River Extension to include the new east-west alley south of 70 Rainey and maintaining one-way southbound East Avenue north of River Street.

This scenario presents the possibility to add pedestrian, bicycle, and micromobility facilities on Rainey Street while maintaining a north-south vehicular connection via the Red River Extension.

The Red River Extension layout is yet to be determined. The model merges the Red River Extension to the existing Red River alley as shown. The scenario maintains the existing width of the Red River alley, changes its circulation to be one-way northbound, and establishes the Red River Extension to be one-way northbound.



**Figure 11: Scenario 3B**

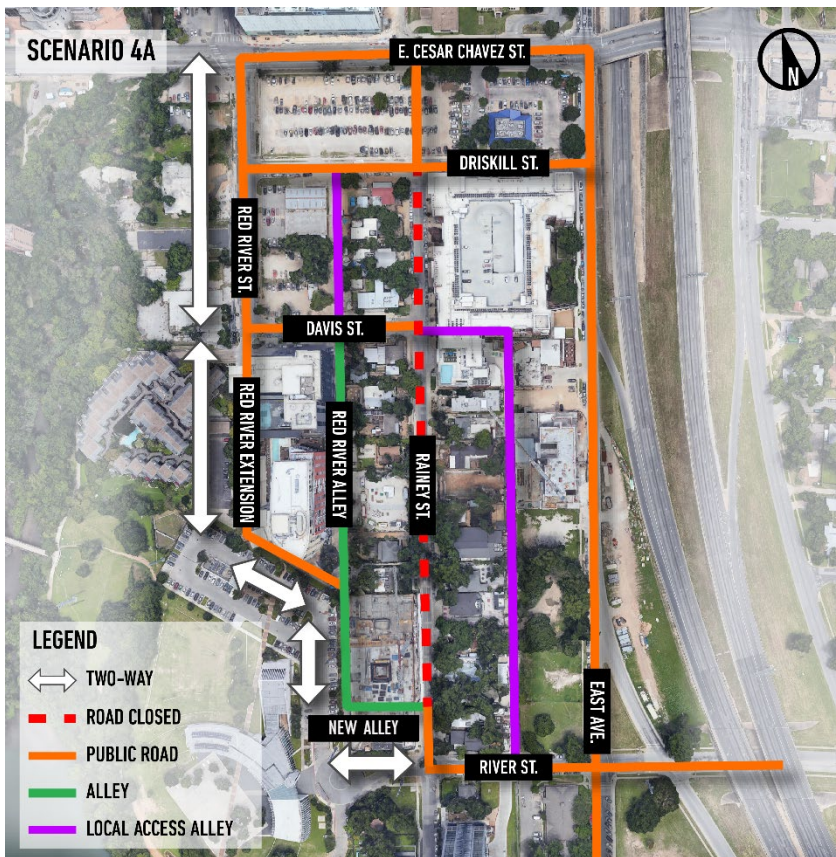
Rainey Street closed to vehicular traffic except for emergency vehicles, with one-way northbound Red River Extension and maintaining one-way southbound East Avenue north of River Street.

This scenario presents the possibility to add pedestrian, bicycle, and micromobility facilities on Rainey Street while maintaining a north-south vehicular connection via the Red River Extension.

The Red River Extension layout is yet to be determined. The model merges the Red River Extension to the existing Red River alley as shown. The scenario maintains the existing width of the Red River alley, changes its circulation to be one-way northbound, and establishes the Red River Extension to be one-way northbound.

This analysis evaluates the alley vacation’s impact on circulation.





**Figure 12: Scenario 4A**  
 Rainey Street closed to vehicular traffic except for emergency vehicles, with a two-way Red River Extension to include the new east-west alley south of 70 Rainey.

This scenario presents the possibility to add pedestrian, bicycle, and micromobility facilities on Rainey Street while maintaining a north-south vehicular connection via the Red River Extension.

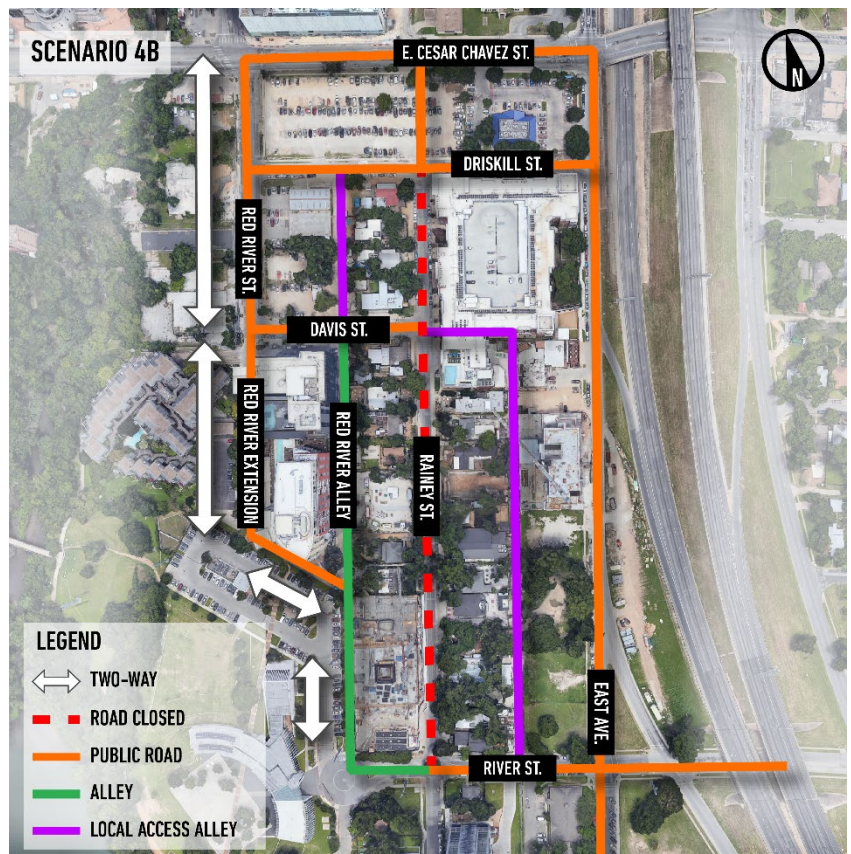
The Red River Extension layout is yet to be determined. The model merges the Red River Extension to the existing Red River alley as shown. The Red River alley is assumed to be widened to be two-way and establishes the Red River Extension to be two-way, as well.

**Figure 13: Scenario 4B**  
 Rainey Street closed to vehicular traffic except for emergency vehicles, with a two-way Red River Extension.

This scenario presents the possibility to add pedestrian, bicycle, and micromobility facilities on Rainey Street while maintaining a north-south vehicular connection via the Red River Extension.

The Red River Extension layout is yet to be determined. The model merges the Red River Extension to the existing Red River alley as shown. The Red River alley is assumed to be widened to a two-way and establishes the Red River Extension to be two-way, as well.

This analysis evaluates the alley vacation’s impact on circulation.



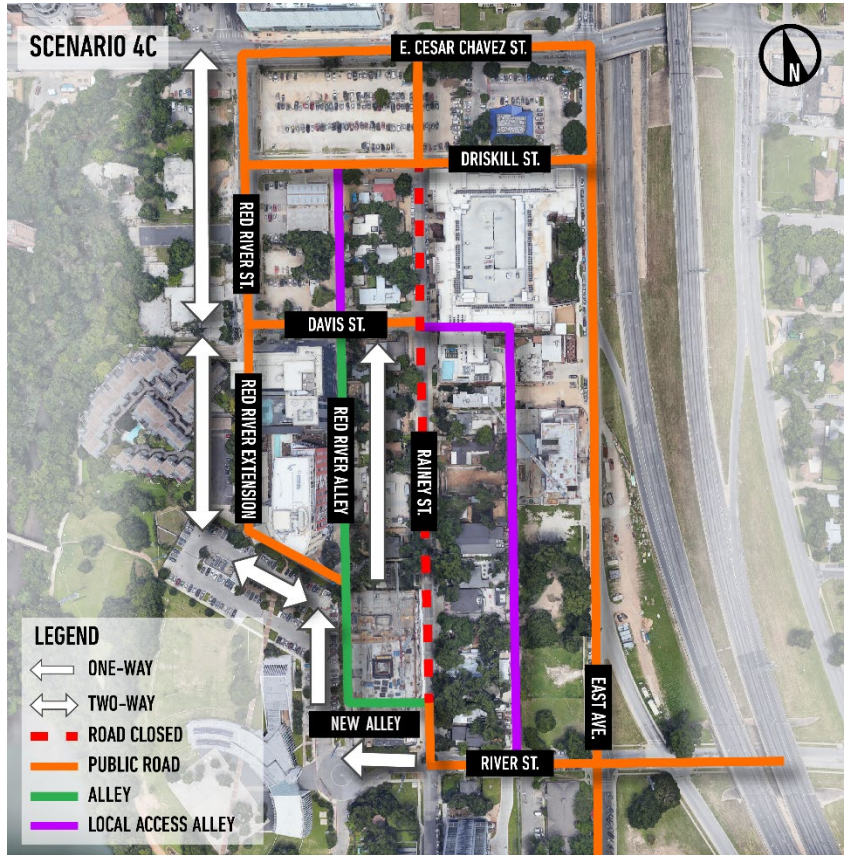


**Figure 14: Scenario 4C**

Rainey Street closed to vehicular traffic except for emergency vehicles, with a two-way Red River Extension merging into the one-way Red River Street alley, and including the new east-west alley south of 70 Rainey. East Avenue is maintained as one-way southbound north of River Street.

This scenario presents the possibility to add pedestrian, bicycle, and micromobility facilities on Rainey Street while maintaining a north-south vehicular connection via the Red River Extension.

The Red River Extension layout is yet to be determined. The model merges the Red River Extension to the existing Red River alley, maintains the existing width of the Red River alley, changes the circulation to be one-way northbound, and establishes the Red River Extension to be two-way.



### 3.2 Trip Generation for Future Developments

Each model includes the trips generated by the 13 proposed developments previously identified. These developments are either under review or have been approved, but construction is complete only on 70 Rainey as of December 2019.

The 10<sup>th</sup> edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual was used to calculate the proposed new development trips. The City of Austin provided the land use types and intensities.

The RNMSF took counts at three developments and compared them to projected trip rates from the 9<sup>th</sup> edition ITE Trip Generation Manual. The RNMSF found that the actual daily trip rates generate at most 70% of the ITE Trip Generation rates.

In addition to an analysis of all scenarios without vehicle trip reductions, this study used a 60% drive-alone/40% other-mode split. This split was derived from combination of the 50/50 ASMP mode split goal and RNMSF's 70/30 observed trip rates. It is important to note that the future mode split will vary depending on the Transportation Demand Management (TDM) measures developments provide. All scenarios were modeled for PM weekday peaks (4 PM to 6 PM) and weekend peaks (Saturday 7 PM to 8 PM). Section 3.3 discusses the peak periods further. Both peaks were modeled with the 10<sup>th</sup> edition ITE rates without vehicle trip reductions, and then with 60% drive-alone/40% other modes split.

Figures 15a and 15b show an overview of the locations of the current and proposed developments referenced in the study area.



**Figure 15a:** Proposed Development Locations



**Figure 15b:** Existing Development Locations

ITE’s Trip Generation data does not include enough case studies to provide trip generation rates for the weekend peak. Because of this the weekend peaks were calculated for existing and proposed developments using the following assumptions:

- Multifamily: traffic counts collected on the driveway for Camden Rainey Street Apartments at Driskill Street were used to calculate a trip generation rate. Appendix III includes the counts collected in a previous study on April 25, 2019. This study assumed the counts collected from 7 PM to 8 PM on a weekday would produce the same trip generation on the weekend. The calculated trip generation for the weekend is 30% of ITE’s PM peak for a weekday.
- Offices: Trip generation used 5% of the weekday PM peak for the Weekend peak trips.
- Restaurant: the weekday PM peak would be the same as the Weekend peak trips.
- Apparel Store: Trip Generation used 10% of the weekday PM peak for the Weekend peak trips, assuming most retail closes before 7 PM.
- Cocktail: the weekday PM peak would be the same as the Weekend peak trips.
- Hotel: the weekday PM peak would be the same as the Weekend peak trips.

Table 1 presents the trip generation for proposed developments.

Projected trip rates were based on land use codes in the 10<sup>th</sup> Edition of the ITE Trip Generation Manual according to the character of the neighborhood. For consistency, the following ITE Codes were used:

- 222 for multifamily,
- 310 for hotel,
- 710 for office,
- 876 for retail stores,
- 925 for cocktail, and
- 931 for restaurants.



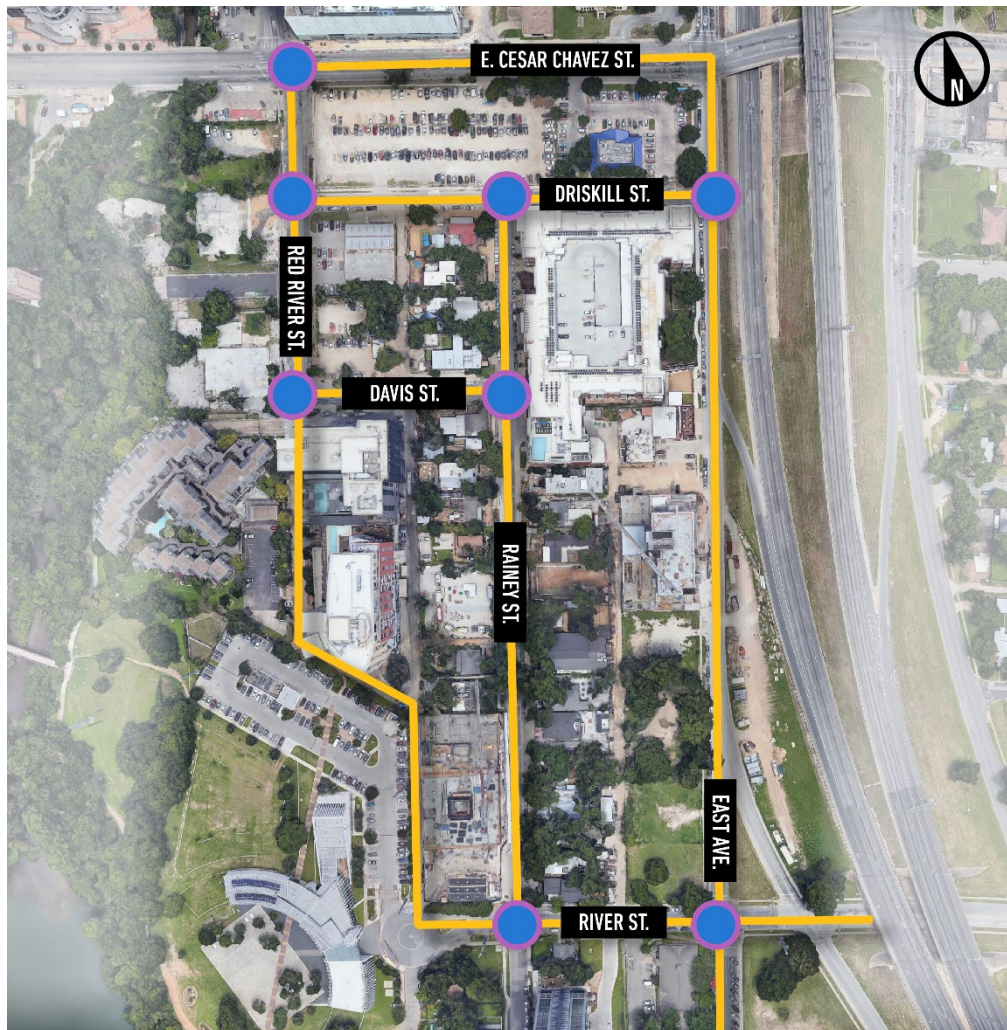
**Table 1: Development Trip Generation**

Letter name	Site Name	Reference File Name	Type	Size	Units	ITE Code	Daily Traffic	PM Peak	PM Peak 40% Reduction	Weekend Peak	Weekend Peak 40% Reduction
A	The Travis	SP-2018-0159C	Multifamily	422	DU	222	1878	165	99	51	30
			Multifamily	217	DU	222	966	85	51	26	16
B	Endeavor/ 91 Red River	SP-2018-0111C	Office	80	KSF	710	779	114	68	6	6
			Restaurant	11	KSF	931	944	93	56	93	56
			Multifamily	328	DU	222	1460	128	77	39	24
C	78-84 Rainey	SP-2017-0445C	Office	50	KSF	710	487	71	43	4	4
			Apparel Store	23	KSF	876	-	97	58	10	10
D	70 Rainey	SP-2013-0101C	Multifamily	173	DU	222	770	67	40	21	12
			Apparel Store	5	KSF	876	-	20	12	2	2
			Cocktail	7	KSF	925	-	109	65	109	65
E	44 East	SP-2018-0472C	Multifamily	322	DU	222	1433	126	75	39	23
			Apparel Store	4	KSF	876	232	15	9	1	1
F	48 East	SP-2016-0391C	Multifamily	240	DU	222	1068	94	56	29	17
G	Lady Bird Hotel	SP-2018-0500C	Hotel	24	Rooms	310	201	15	9	15	9
H	Fairfield	SP-2018-0295C	Hotel	107	Rooms	310	895	65	39	65	39
I	82-84 East Ave	--	Office	250	KSF	710	2435	355	213	18	18
			Apparel Store	6	KSF	876	-	41	25	4	4
J	Waller Park Place	SP-2013-0449C	Hotel	233	Rooms	310	1948	142	85	142	85
			Office	319	KSF	710	3106	453	272	23	23
			Multifamily	445	units	222	1980	174	104	53	32
			Restaurant	19	KSF	931	1580	156	94	156	94
			Apparel Store	20	KSF	876	-	83	50	8	8
K	90 Rainey	SP-2019-0093C	Multifamily	360	DU	222	1602	140	84	43	26
			Hotel	300	DU	310	2508	183	110	183	110
L	60 East & 61-69 Rainey	--	Multifamily	204	KSF	222	908	80	48	24	15
			Hotel	229	Rooms	310	1914	140	84	140	84
			Restaurant	12	KSF	931	989	98	59	98	59
			Apparel Store	9	KSF	876	574	36	22	4	4
M	Cambria Hotel	SP-2019-0011C	Hotel	225	Rooms	310	1881	137	82	137	82

\*DU - Dwelling Units, KSF - Square Feet (in thousands).

### 3.3 Modeling

All modeled scenarios have a proposed year of 2025 and a growth factor of 2% as established by the City of Austin. An existing conditions model was created in order to establish a baseline, which analyzed every intersection for the year 2019. The analysis used some traffic counts collected before 2019. In these cases, a 2% cumulative annual growth rate was applied for every year until 2019. In order to model year 2025, a 2% cumulative annual growth rate was applied to the volumes of every intersection to reach volumes for the year 2025. In each model the projected volumes are balanced. As all scenarios are more than five years in the future, timings for signalized intersections were optimized. The study utilized Synchro 10 to model and analyze the vehicular circulation of the 11 scenarios. Figure 16 shows the intersections analyzed for vehicular performance.



**Figure 16:** Intersections Analyzed

Level of service (LOS) is a term used to quantitatively describe the operating conditions of an intersection. Different letters designate the level of service of a facility from A (free flow traffic conditions with little to no delay) to F (traffic exceeds design capacity, resulting in long queues and delay). The 6<sup>th</sup> Edition of the Highway Capacity Manual (HCM) defines these classifications. This report presents delay and LOS for the analyzed intersections to compare the alternative network configurations.

**Table 2: Level of Service by Delay**

LOS	Average Control Delay for Intersections	
	Signalized (s/veh)	Unsignalized / Stop-Controlled (s/veh)
A	≤ 10	≤ 10
B	> 10 and ≤ 20	> 10 and ≤ 15
C	> 20 and ≤ 35	> 15 and ≤ 25
D	> 35 and ≤ 55	> 25 and ≤ 35
E	> 55 and ≤ 80	> 35 and ≤ 50
F	> 80	> 50

To determine the vehicular peaks, data was collected during a 72-hour count on Rainey Street just south of Davis Street from Thursday, June 20, 2019 to Sunday, June 23, 2019. This data is included in Appendix I. The PM peak was from 4 PM to 6 PM and the AM peak was spread out throughout the morning. In order to measure the vehicular performance when demand is at its highest, it was decided not to model the AM peak, but to instead model the weekend vehicular peak from 7 PM to 8 PM on a Saturday.

The City of Austin provided traffic counts for the PM peak (4 PM to 6 PM). Traffic counts internal to the Rainey Neighborhood were provided by previously approved Traffic Impact Analyses (TIAs) that were used for 78-84 Rainey Street, Endeavor/91 Red River, and 44 East. Previous studies collected these counts during a typical fall evening, and most of the intersection data were collected in 2017. Traffic counts external to the Rainey neighborhood were collected from the City of Austin data tracker website.

Intersection traffic counts were collected for the weekend vehicular peak (Saturday 7 PM to 8 PM) on Saturday July 17, 2019. Appendix II contains the collected traffic counts.

Added trips generated by the developments specified in Section 3.2 were distributed on the transportation network based on percentages used in previously submitted TIAs, demographics, land use, and assumptions about the nature of trips conducted by vehicle travelers that would be attracted to or generated by the developments. Appendices IV and V present the development trips distributed at each intersection in every scenario.

In each scenario with roadway network modifications, underlying and development traffic volumes were re-routed on the shortest paths for each origin-destination (OD) pair, assuming the same trip distributions. For example;

- When network configurations close Rainey Street to vehicles:
  - Scenarios 2a and 2b – these scenarios redistributed the development trips to take the northbound Red River alley instead of Rainey Street.
  - Scenarios 3a, 3b, 4a, 4b and 4c – these scenarios redistributed the development trips to take the northbound Red River Extension instead of Rainey Street.
  - Scenarios 2a, 2b, 3a, 3b and 4c – these scenarios redistributed the development trips to take the IH-35 SBFR/ East Avenue instead of Rainey Street.
  - Scenarios 4a and 4b – these scenarios redistributed the development trips to take the southbound Red River Extension instead of Rainey Street.

- Scenarios with the alley vacation:
  - Scenario 1c – this scenario redistributed 6% of the northbound trips to take the Red River alley instead of Rainey Street. It also redistributed 16% of the southbound trips to take the Red River alley instead of Rainey Street. Section 3.6.7 further discusses the reasoning for this assumption.
  - For all other scenarios, the trip redistribution caused by this network change is minimal.

Synchro 10, which uses the Highway Capacity Manual 6<sup>th</sup> Edition, was used as the analysis platform for this study. The analysis includes results in each scenario for:

- PM peak without vehicular reductions,
- PM peak with 60/40 mode split,
- Weekend peak without vehicular reductions, and
- Weekend peak with 60/40 mode split.

For the 60/40 mode split, a reduction of 40% was applied to only new vehicular trips generated by the proposed developments. Because of this, the existing conditions remain the same for both PM peaks and for both weekend peaks.

### 3.4 Existing Conditions

The roads surrounding the study area experience congested conditions during the PM peak. Drivers trying to get on the IH-35 southbound ramp queue and spill back to the Cesar Chavez Street/Lavaca Street intersection and Guadalupe Street intersection. During site visits it was determined that the congestion extends on Cesar Chavez Street from Guadalupe Street to Waller Street and on Red River Street from Cesar Chavez Street to 5<sup>th</sup> Street. The RNMSM made the same observation that the capacity constraints at Cesar Chavez are due to congestion from the adjacent highway and not due to geometric constraints.

This analysis accounted for congested conditions in Synchro using two tactics: reducing the capacity of the intersections as much as possible and increasing vehicle volumes until conditions were like the ones observed in the field. These approaches failed to produce vehicle metrics that would provide an input to the road performance. In some cases, calculating the metrics was outside the capacities of Synchro.

Because of the previously mentioned reasons, and in order to understand the subtle performance changes to the streets internal to the study area, congested vehicular metrics were not used. The Texas Department of Transportation is currently leading the Mobility 35 improvement program. Although still in the planning phase, these improvements are expected to bring significant changes to vehicular circulation in the study area. Given that this study does not analyze travel conditions on, or improvements to, IH-35, analysis of the study area was completed without congested conditions to understand the effects the changes to the road network will have on the surrounding streets. The scenarios evaluated in this study utilized existing traffic counts on Cesar Chavez Street without unserved demand from IH-35, referred to as “non-congested conditions”. This helped to uncover how the Rainey Neighborhood network behaves independent to the possible improvements IH-35 undergoes.

### 3.5 Potential Improvements

Scenario 1a was modeled to determine the baseline conditions for year 2025. Based on analysis for the non-congested conditions during the PM peak, converting the Red River Street/Driskill Street and East Avenue/River Street intersections from two-way stop control (TWSC) to all-way stop control (AWSC) would facilitate circulation.



The analysis for scenario 1a without mitigation for the Red River Street/Driskill Street intersection presents delay of over one hour and 30 minutes per vehicle. This is in part because the heavy Red River Street volumes limit the gaps for left/right turns out of Driskill Street. By converting this intersection to AWSC, the westbound approach will be able to turn into Red River Street, reducing the intersection delay to 5.6 minutes per vehicle. For scenario 1a, the queue for the westbound approach reduces from 709 feet with TWSC to 257 feet with AWSC. The distance between Red River Street and Rainey Street is 300 feet. The southbound queue changes from 32 feet when the intersection is TWSC to 653 feet with AWSC. The distance between Cesar Chavez Street and Driskill Street is 200 feet. Even if the queue for the southbound approach after mitigation is longer than the existing storage, it is less critical to have spill back on Cesar Chavez Street than to have a queue on the IH-35 SBFR.

For the East Avenue/River Street intersection, the analysis of Scenario 1a resulted in an intersection delay of 20 minutes per vehicle without mitigation and 4 minutes per vehicle with mitigation. By converting this intersection to AWSC, the southbound queue changed from 729 feet with TWSC to 375 feet with AWSC; the existing distance from River Street to the IH-35 SBFR and East Avenue split is approximately 250 feet. For Scenario 1a, the queue for the westbound approach changed from 4 feet with TWSC to 362 feet with AWSC. The existing distance from East Avenue to IH-35 SBFR is 70 feet. The queues for the northbound and eastbound approaches after mitigation are less than the existing storage length. After mitigation this intersection presents a westbound queue length longer than the existing storage length. Like before, having a queue on River Street was less critical than spill back on the IH-35 SBFR.

Additionally, the intersection of Red River Street/Davis Street is currently stop-controlled in all directions. In lieu of an all-way stop controlled intersection, the intersection could be controlled with a traffic circle. Section 4 discusses this in further detail.

Table 3 presents a comparison of these intersections before and after mitigation under the PM peak traffic conditions in Scenario 1a. With the mitigation, the overall delay for the alternatives decreased. Other intersections performed at a level of exceedingly high delay but are not currently candidates for changing control type due to geometric constraints (e.g. proximity to IH-35).

**Table 3:** Before-and-After Comparison of Mitigated Intersections

Intersection Name	Existing Control Type	Proposed Control Type	Average Delay Before Mitigation (s/veh)	Average Delay After Mitigation (s/veh)
Red River Street & Driskill Street	TWSC	AWSC	6,255	336
East Avenue & River Street	TWSC	AWSC	1,207	241
Red River Street & Davis Street	AWSC	Traffic Circle	216	7

### 3.6 PM Peak Vehicular Modeling

All the models discussed in this section include the previously discussed improvements in section 3.5.

Table 4 shows the results of the PM peak and PM peak with 60/40 mode split models. Appendices VI and VII include the Synchro generated reports for PM peaks without vehicular reductions and with a 60/40 mode split.

Table 4 - 2025 PM Peak Synchro Results															
Scenario	Intersection Name	Control Type*	PM Peak						PM Peak with 40% Reduction						
			Approach Delay (seconds/vehicle)				Intersection Delay (s/veh)	Intersection LOS	Approach Delay (seconds/vehicle)				Intersection Delay (s/veh)	Intersection LOS	
			EB	WB	NB	SB			EB	WB	NB	SB			
Existing	Red River St/Cesar Chavez St	Pre	14.4	17.7	54.3	73.9	29.1	C	14.4	17.7	54.3	73.9	29.1	C	
	Red River St/Driskill St	TWSC	0.0	11.2	0.0	4.2	11.2	B	0.0	11.2	0.0	4.2	11.2	B	
	Red River St/Davis St	AWSC	--	8.4	8.6	9.4	9.4	A	--	8.4	8.6	9.4	9.4	A	
	Rainey St/Driskill St	TWSC	0.0	3.2	10.7	0.0	10.7	B	0.0	3.2	10.7	0.0	10.7	B	
	Rainey St/Davis St	TWSC	9.7	2.3	--	0.0	9.7	A	9.7	2.3	--	0.0	9.7	A	
	Red River Alley/Davis St	TWSC	0.0	0.0	0.0	--	0.0	A	0.0	0.0	0.0	--	0.0	A	
	Rainey St/River St	Rdbt	3.7	4.1	3.4	4.3	4.3	A	3.7	4.1	3.4	4.3	4.3	A	
	East Ave/River St	TWSC	0.0	1.0	12.5	10.9	12.5	B	0.0	1.0	12.5	10.9	12.5	B	
	I-35 SBFR/River St	Act	25.4	204.1	--	24.0	110.8	F	25.4	204.1	--	24.0	110.8	F	
	I-35 SBFR/Driskill St	TWSC	35.3	--	--	0.0	35.3	E	35.3	--	--	0.0	35.3	E	
1a	Red River St/Cesar Chavez St	Pre	352.7	38.0	309.1	265.4	278.2	F	147.0	9.6	173.2	101.6	118.4	F	
	Red River St/Driskill St	AWSC	--	105.7	87.0	336.2	336.2	F	--	20.8	20.3	75.4	75.4	F	
	Red River St/Davis St	Rdbt	5.0	7.2	7.3	4.6	7.3	A	4.1	5.3	6.0	4.1	6.0	A	
	Rainey St/Driskill St	TWSC	1.4	3.2	3555.3	--	3555.3	F	1.1	3.0	440.8	67.1	440.8	F	
	Rainey St/Davis St	TWSC	80.3	--	2.4	0.0	80.3	F	17.6	--	2.2	0.0	17.6	C	
	Red River Alley/Davis St	TWSC	0.0	0.0	0.0	0.0	0.0	A	0.0	0.0	0.0	--	0.0	A	
	Rainey St/River St	Rdbt	4.8	9.1	4.1	5.4	9.1	A	4.3	6.7	3.9	5.1	6.7	A	
	East Ave/River St	AWSC	138.7	241.1	38.9	236.6	241.1	F	43.5	63.5	18.8	45.0	63.5	F	
	I-35 SBFR/River St	Act	278.8	548.2	--	53.0	295.4	F	140.2	446.3	--	36.3	226.2	F	
	I-35 SBFR/Driskill St	TWSC	2084.9	--	--	0.0	2084.9	F	940.1	--	--	0.0	940.1	F	
1b	Red River St/Cesar Chavez St	Pre	345.3	30.7	322.1	269.7	277.2	F	150.9	10.2	131.4	219.3	133.5	F	
	Red River St/Driskill St	AWSC	--	105.7	87.0	336.2	336.2	F	--	20.8	20.3	75.4	75.4	F	
	Red River St/Davis St	Rdbt	5.0	7.2	7.3	4.6	7.3	A	4.1	5.3	6.0	4.1	6.0	A	
	Rainey St/Driskill St	TWSC	1.4	3.2	3555.3	--	3555.3	F	1.1	3.0	440.8	67.1	440.8	F	
	Rainey St/Davis St	TWSC	80.3	--	2.4	0.0	80.3	F	17.6	--	2.2	0.0	17.6	C	
	Red River Alley/Davis St	TWSC	0.0	0.0	0.0	0.0	0.0	A	0.0	0.0	0.0	--	0.0	A	
	Rainey St/River St	Pre	10.4	10.7	8.3	20.9	13.4	B	10.3	6.1	8.1	17.5	10.2	B	
	East Ave/River St	AWSC	138.7	241.1	38.9	236.6	241.1	F	43.5	63.5	18.8	45.0	63.5	F	
	I-35 SBFR/River St	Act	288.5	543.8	--	50.2	294.6	F	140.2	446.3	--	36.1	226.2	F	
	I-35 SBFR/Driskill St	TWSC	2084.9	--	--	0.0	2084.9	F	940.1	--	--	0.0	940.1	F	
1c	Red River St/Cesar Chavez St	Pre	363.1	37.7	296.3	258.4	278.8	F	150.6	18.3	168.1	104.0	121.1	F	
	Red River St/Driskill St	AWSC	--	104.8	94.6	254.5	254.5	F	--	20.1	19.9	48.9	48.9	E	
	Red River St/Davis St	Rdbt	5.7	7.3	7.7	4.8	7.7	A	4.4	5.3	6.2	4.2	6.2	A	
	Rainey St/Driskill St	TWSC	1.7	3.1	2385.9	--	2385.9	F	1.2	3.0	336.3	162.0	336.3	F	
	Rainey St/Davis St	TWSC	35.2	--	2.0	0.0	35.2	E	14.7	--	1.6	0.0	14.7	B	
	Red River Alley/Davis St	TWSC	0.0	0.0	13.3	--	13.3	B	0.0	0.0	11.6	--	11.6	B	
	Rainey St/River St	Rdbt	4.5	9.1	4.1	5.7	9.1	A	4.2	6.7	3.9	5.2	6.7	A	
	East Ave/River St	AWSC	138.7	241.1	38.9	236.6	241.1	F	43.5	63.5	18.8	45.0	63.5	F	
	I-35 SBFR/River St	Act	278.8	548.2	--	53.0	295.4	F	152.9	426.5	--	37.9	221.2	F	
	I-35 SBFR/Driskill St	TWSC	2084.9	--	--	0.0	2084.9	F	940.1	--	--	0.0	940.1	F	

\*Pre - Pretimed, Act - Actuated-Coordinated, Rdbt - Roundabout, TWSC - Two-way Stop Controlled, AWSC - All-Way Stop Controlled

1d	Red River St/Cesar Chavez St	Pre	377.8	38.4	279.7	317.5	291.4	F	151.1	18.3	128.5	273.0	143.7	F
	Red River St/Driskill St	AWSC	--	147.0	119.2	251.6	251.6	F	--	23.7	24.8	55.7	55.7	F
	Red River St/Davis St	Rdbt	5.6	7.0	6.9	5.2	7.0	A	4.3	5.0	5.8	4.2	5.8	A
	Rainey St/Driskill St	TWSC	0.0	3.1	1217.8	2393.6	2393.6	F	0.0	2.9	132.6	64.1	132.6	F
	Rainey St/Davis St	TWSC	27.4	--	1.9	0.0	27.4	D	13.5	--	1.6	0.0	13.5	B
	Red River Alley/Davis St	TWSC	0.0	0.0	0.0	--	0.0	A	0.0	0.0	0.0	--	0.0	A
	Rainey St/River St	Rdbt	--	0.0	4.0	5.5	5.5	A	0.0	3.8	5.1	0.0	5.1	A
	East Ave/River St	AWSC	--	147.0	119.2	251.6	251.6	F	43.5	63.5	18.8	45.0	63.5	F
	I-35 SBFR/River St	Act	278.8	548.2	--	53.0	295.4	F	152.9	426.5	--	37.9	221.2	F
	I-35 SBFR/Driskill St	TWSC	2084.9	--	--	0.0	2084.9	F	940.1	--	--	0.0	940.1	F
2a	Red River St/Cesar Chavez St	Pre	380.8	41.0	279.0	312.4	292.1	F	152.7	14.9	122.0	305.7	148.1	F
	Red River St/Driskill St	AWSC	--	30.2	674.9	259.2	674.9	F	--	15.4	291.4	58.1	291.4	F
	Red River St/Davis St	Rdbt	4.6	115.8	5.7	4.2	115.8	F	3.6	19.7	4.7	3.4	19.7	C
	Rainey St/Driskill St	TWSC	0.8	0.0	--	853.2	853.2	F	0.5	0.0	--	54.9	54.9	F
	Rainey St/Davis St	TWSC	--	--	--	--	--	--	--	--	--	--	--	--
	Red River Alley/Davis St	TWSC	0.0	0.0	48.2	--	48.2	E	0.0	0.0	19.0	--	19.0	C
	Rainey St/River St	Rdbt	3.0	14.7	4.0	0.0	14.7	B	3.0	9.3	4.0	0.0	9.3	A
	East Ave/River St	AWSC	66.5	230.6	45.3	833.9	833.9	F	34.5	68.3	22.1	459.2	459.2	F
	I-35 SBFR/River St	Act	298.7	572.5	--	100.0	318.4	F	218.4	444.2	--	41.7	236.3	F
	I-35 SBFR/Driskill St	TWSC	4129.8	--	--	0.0	4129.8	F	2293.7	--	--	0.0	2293.7	F
2b	Red River St/Cesar Chavez St	Pre	427.8	53.5	243.5	217.1	291.2	F	320.9	22.6	47.5	43.7	170.7	F
	Red River St/Driskill St	AWSC	--	30.2	674.9	259.2	674.9	F	--	15.4	291.4	58.1	291.4	F
	Red River St/Davis St	Rdbt	4.6	115.8	5.7	4.2	115.8	F	3.6	19.7	4.7	3.4	19.7	C
	Rainey St/Driskill St	TWSC	0.8	0.0	--	853.2	853.2	F	0.5	0.0	--	54.9	54.9	F
	Rainey St/Davis St	TWSC	--	--	--	--	--	--	--	--	--	--	--	--
	Red River Alley/Davis St	TWSC	0.0	0.0	48.2	--	48.2	E	0.0	0.0	19.0	--	19.0	C
	Rainey St/River St	Rdbt	3.0	14.8	3.9	--	14.8	B	3.0	9.3	3.9	--	9.3	A
	East Ave/River St	AWSC	66.5	230.6	45.3	833.9	833.9	F	34.5	68.3	22.1	459.2	459.2	F
	I-35 SBFR/River St	Act	330.6	515.0	--	106.2	306.5	F	208.8	417.2	--	50.0	227.0	F
	I-35 SBFR/Driskill St	TWSC	4129.8	--	--	0.0	4129.8	F	2293.7	--	--	0.0	2293.7	F
3a	Red River St/Cesar Chavez St	Pre	394.7	48.8	165.4	338.7	278.2	F	137.4	13.2	117.4	106.7	106.1	F
	Red River St/Driskill St	AWSC	--	34.7	719.6	217.6	719.6	F	--	16.2	298.4	44.1	298.4	F
	Red River St/Davis St	Rdbt	4.2	26.9	28.5	3.9	28.5	D	3.5	11.5	11.8	3.3	11.8	B
	Rainey St/Driskill St	TWSC	0.0	0.0	--	856.7	856.7	F	0.0	0.0	--	88.6	88.6	F
	Rainey St/Davis St	TWSC	--	--	--	--	--	--	--	--	--	--	--	--
	Red River Alley/Davis St	TWSC	0.0	0.0	9.6	--	9.6	A	0.0	0.0	9.3	--	9.3	A
	Rainey St/River St	Rdbt	3.1	16.3	4.0	0.0	16.3	C	3.1	9.7	4.0	--	9.7	A
	East Ave/River St	AWSC	--	34.7	719.6	217.6	719.6	F	34.9	72.1	22.4	464.2	464.2	F
	I-35 SBFR/River St	Act	328.9	508.5	--	103.9	302.0	F	221.6	428.7	--	43.8	231.3	F
	I-35 SBFR/Driskill St	TWSC	4679.6	--	--	0.0	4679.6	F	2492.7	--	--	0.0	2492.7	F

\*Pre - Pretimed, Act - Actuated-Coordinated, Rdbt - Roundabout, TWSC - Two-way Stop Controlled, AWSC - All-Way Stop Controlled

3b	Red River St/Cesar Chavez St	Pre	394.6	48.8	165.4	338.7	278.2	F	137.4	13.2	117.4	106.7	106.1	F
	Red River St/Driskill St	AWSC	--	34.7	719.6	217.6	719.6	F	--	16.2	298.4	44.1	298.4	F
	Red River St/Davis St	Rdbt	4.2	26.9	28.5	3.9	28.5	D	3.5	11.5	11.8	3.3	11.8	B
	Rainey St/Driskill St	TWSC	0.0	0.0	--	856.7	856.7	F	0.0	0.0	--	88.6	88.6	F
	Rainey St/Davis St	TWSC	--	--	--	--	--	--	--	--	--	--	--	--
	Red River Alley/Davis St	TWSC	0.0	0.0	9.6	--	9.6	A	0.0	0.0	9.3	--	9.3	A
	Rainey St/River St	Rdbt	3.1	5.4	3.9	--	5.4	A	3.1	9.4	3.9	--	9.4	A
	East Ave/River St	AWSC	67.3	249.1	46.0	840.4	840.4	F	34.9	72.1	22.4	464.2	464.2	F
	I-35 SBFR/River St	Act	328.9	508.5	--	103.9	302.0	F	221.6	428.7	--	43.8	231.3	F
	I-35 SBFR/Driskill St	TWSC	4679.6	--	--	0.0	4679.6	F	2492.7	--	--	0.0	2492.7	F
4a	Red River St/Cesar Chavez St	Pre	392.5	45.8	194.0	313.1	271.5	F	203.1	13.0	71.7	140.4	131.6	F
	Red River St/Driskill St	AWSC	--	160.6	458.8	395.7	458.8	F	--	30.0	164.3	130.8	164.3	F
	Red River St/Davis St	Rdbt	7.9	11.4	10.1	8.7	11.4	B	5.3	7.3	7.3	6.0	7.3	A
	Rainey St/Driskill St	TWSC	1.8	0.0	--	186.4	186.4	F	1.4	0.0	--	21.0	21.0	C
	Rainey St/Davis St	TWSC	--	--	--	--	--	--	--	--	--	--	--	--
	Red River Alley/Davis St	TWSC	0.0	0.0	9.4	--	9.4	A	0.0	0.0	9.2	--	9.2	A
	Rainey St/River St	Rdbt	--	5.3	5.6	5.9	5.9	A	--	4.9	4.6	5.3	5.3	A
	East Ave/River St	AWSC	133.5	83.4	24.1	64.4	133.5	F	23.4	21.1	12.9	17.2	23.4	C
	I-35 SBFR/River St	Act	328.0	464.8	--	106.2	278.4	F	211.7	381.3	--	47.4	206.8	F
	I-35 SBFR/Driskill St	TWSC	2129.4	--	--	0.0	2129.4	F	909.0	--	--	0.0	909.0	F
4b	Red River St/Cesar Chavez St	Pre	392.5	45.8	194.0	313.1	271.5	F	203.1	13.0	71.7	140.4	131.6	F
	Red River St/Driskill St	AWSC	--	160.6	458.8	395.7	458.8	F	--	30.0	164.3	130.8	164.3	F
	Red River St/Davis St	Rdbt	7.9	11.4	10.1	8.7	11.4	B	5.3	7.3	7.3	6.0	7.3	A
	Rainey St/Driskill St	TWSC	1.8	0.0	--	186.4	186.4	F	1.4	0.0	--	21.0	21.0	C
	Rainey St/Davis St	TWSC	--	--	--	--	--	--	--	--	--	--	--	--
	Red River Alley/Davis St	TWSC	0.0	0.0	9.4	--	9.4	A	0.0	0.0	9.2	--	9.2	A
	Rainey St/River St	Rdbt	4.6	--	4.4	3.4	4.6	A	5.3	4.9	4.6	--	5.3	A
	East Ave/River St	AWSC	133.5	83.4	24.1	64.4	133.5	F	23.4	21.1	12.9	17.2	23.4	C
	I-35 SBFR/River St	Act	328.0	464.8	--	106.2	278.4	F	211.7	381.3	--	47.4	206.8	F
	I-35 SBFR/Driskill St	TWSC	2129.4	--	--	0.0	2129.4	F	909.0	--	--	0.0	909.0	F
4c	Red River St/Cesar Chavez St	Pre	297.1	76.4	311.8	435.1	280.0	F	95.4	31.8	170.8	537.6	168.2	F
	Red River St/Driskill St	AWSC	--	114.7	532.3	266.8	532.3	F	--	24.5	183.4	71.3	183.4	F
	Red River St/Davis St	Rdbt	4.8	11.0	10.0	4.7	11.0	B	3.6	6.9	7.1	3.9	7.1	A
	Rainey St/Driskill St	TWSC	1.3	0.0	--	1449.3	1449.3	F	0.9	0.0	--	138.3	138.3	F
	Rainey St/Davis St	TWSC	--	--	--	--	--	--	--	--	--	--	--	--
	Red River Alley/Davis St	TWSC	0.0	0.0	9.1	--	9.1	A	0.0	0.0	8.9	--	8.9	A
	Rainey St/River St	Rdbt	--	7.4	4.6	0.0	7.4	A	--	6.9	3.9	0.0	6.9	A
	East Ave/River St	AWSC	18.2	47.8	17.6	172.2	172.2	F	12.3	20.4	11.8	27.3	27.3	D
	I-35 SBFR/River St	Act	143.1	446.5	--	142.6	246.1	F	120.3	323.7	--	63.6	168.0	F
	I-35 SBFR/Driskill St	TWSC	3893.6	--	--	0.0	3893.6	F	1929.9	--	--	0.0	1929.9	F

\*Pre - Pretimed, Act - Actuated-Coordinated, Rdbt - Roundabout, TWSC - Two-way Stop Controlled, AWSC - All-Way Stop Controlled

### **3.6.1 Existing Conditions**

The results of the analysis in this study show that the vehicular circulation of the study area operates with LOS C or better during the PM peak. The RNMSF had a similar finding. Site visits have indicated that conflicts between modes contribute to much of the vehicular delay. Sections 5 and 6 discuss this in detail.

### **3.6.2 Red River Street/Davis Street**

The delay per vehicle at the Red River Street/Davis Street intersection increases in Scenarios 2a and 2b in comparison to all other scenarios. Scenarios 2a and 2b evaluate Rainey Street closed to vehicular traffic with a northbound Red River alley vehicular connection. Vehicles traveling north caused the increase in delay; originally, they had the option to make a northbound left turn from the Red River alley/Davis Street intersection or at the Red River alley/Driskill Street intersection. With Rainey Street closed to vehicles, all vehicles traveling north are rerouted to take the Red River alley, consequently increasing the number of vehicles making a northbound left turn from the Red River alley onto Davis Street or at the Red River alley/Driskill Street intersection. These vehicles then must make a westbound right turn onto Red River Street at their respective intersection.

It is important to note that the worse an intersection operates, the delay per vehicle reported in Synchro increases exponentially. This explains why the delay per vehicle changes from approximately 7 seconds on most scenarios to approximately 100 seconds in Scenarios 2a and 2b when the intersection operates at a LOS F (without vehicular reductions). However, when the intersection performs at a LOS C (with vehicular reduction), the delay per vehicle changes from approximately 6 seconds on most scenarios to approximately 19 seconds in Scenarios 2a and 2b.

### **3.6.3 Red River Street/Driskill Street**

When network configurations prohibit vehicular traffic on Rainey Street, the delay per vehicle at the Red River Street/Driskill Street intersection increases considerably. This is because some vehicles traveling southbound originally take a southbound left at the Red River Street/Davis Street intersection to go to Rainey Street. In Scenarios 2a, 2b, 3a, 3b, and 4c, all vehicles traveling south now make a southbound left turn at the Red River Street/Driskill Street intersection to get to the IH-35 SBFR. The increase in southbound left turns increases delay. For Scenarios 4a and 4b the increase in vehicles traveling northbound through is what cause an increase in delay.

While the intersection still performs at an unacceptable LOS in all scenarios with a vehicle reduction, the 60/40 mode split reduces delay per vehicle by more than half.

### **3.6.4 Rainey Street/Driskill Street**

In all scenarios where Rainey Street prohibits vehicular traffic, closing the south leg of the Rainey Street/Driskill Street intersection results in a substantial reduction in delay per vehicles. Scenario 1d also has a reduction in delay per vehicle because the trips traveling northbound on Rainey Street would be able to use the Red River Extension and the Red River alley, decreasing the volume using Rainey Street.

### **3.6.5 East Avenue/River Street**

The delay per vehicle at the East Avenue/River Street intersection increases considerably in Scenarios 2a, 2b, 3a, and 3b. In these scenarios there is no other southbound connection besides the IH-35 SBFR/East Avenue. Because of this, vehicles traveling south on Rainey Street will be rerouted to take the IH-35 SBFR/East Avenue and make a southbound right turn at this intersection. While the intersection still performs to a LOS F in these scenarios after vehicular reductions, the 60/40 mode split substantially reduced delay. Scenarios 4a, 4b, and 4c, with the 60/40 mode split, perform at a LOS D or better.

### **3.6.6 IH-35 SBFR/Driskill Street**

The IH-35 SBFR/Driskill Street intersection also experiences a substantial increase in delay per vehicle in all scenarios where there is no other southbound connection besides IH-35 SBFR/East Avenue. The reason for this



is the same as other intersections; vehicles traveling south will be rerouted to take IH-35 SBFR/East Avenue. At this intersection there is an increase of vehicles making eastbound right turns.

The Red River Street/Cesar Chavez Street intersection and the IH-35 SBFR/Driskill Street intersections experience congestion today due to unmet demand from IH-35 outside of the study area. While this set of models do not account for such conditions, the 60/40 mode split shows a decrease of delay per vehicle by half or more for all scenarios.

### **3.6.7 Alley Vacation**

Scenario 1c was created to compare the vehicular circulation with and without the alley vacation south of 70 Rainey Street. This model assumes that with an alley vacation 6% of northbound traffic and 16% of southbound traffic originally using Rainey Street would instead use the Red River alley to skip the multimodal conflicts on Rainey Street during the PM peak and the weekend peak. By having a connection from the alley to Rainey Street the Red River alley will be more appealing for vehicles to use as an alternative for Rainey Street.

The metrics presented the following changes from Scenario 1a (without alley vacation) to 1c (with alley vacation):

- Red River Street/Driskill Street intersection – reduction in delay per vehicle. Rerouting vehicles from using Rainey Street to using the Red River alley, more vehicles will travel through southbound instead of making a southbound left turn at this intersection.
- Rainey Street/Driskill Street intersection – reduction in delay per vehicle. Fewer vehicles will take Rainey Street to travel northbound.
- Rainey Street/Davis Street intersection – reduction in delay per vehicle. Fewer vehicles will take Rainey Street to travel northbound.

It is important to note that the existing Red River alley is not wide enough to be two-way. If no other upgrades to the alley occur with the alley vacation, conflicts could arise if a high number of vehicles use the Red River alley in both directions. Even though this scenario re-routed some traffic to use the Red River alley, the existing width cannot accommodate traffic traveling in both directions without conflicts.

## **3.7 Weekend Peak Vehicular Modeling**

All the models discussed in this section include the previously discussed improvements in section 3.5.

Table 5 shows the results of the Weekend peak and Weekend peak with 60/40 mode split models. Appendices VIII and IX include the Synchro generated reports for weekend peaks without vehicular reductions and with a 60/40 mode split.

Table 5 - 2025 Weekend Peak Synchro Results

Scenario	Intersection Name	Control Type*	Weekend PM Peak						Weekend PM Peak with 40% Reduction					
			Approach Delay (seconds/vehicle)				Intersection Delay (s/veh)	Intersection LOS	Approach Delay (seconds/vehicle)				Intersection Delay (s/veh)	Intersection LOS
			EB	WB	NB	SB			EB	WB	NB	SB		
Existing	Red River St/Cesar Chavez St	Pre	17.5	17.8	50.6	25.2	22.4	C	17.5	17.8	50.6	25.2	22.4	C
	Red River St/Driskill St	TWSC	--	12.0	0.0	3.2	12.0	B	--	12.0	0.0	3.2	12.0	B
	Red River St/Davis St	AWSC	--	0.0	5.0	5.0	5.0	A	--	0.0	5.0	5.0	5.0	A
	Rainey St/Driskill St	TWSC	0.3	4.1	15.9	12.6	15.9	C	0.3	4.1	15.9	12.6	15.9	C
	Rainey St/Davis St	TWSC	11.8	--	2.5	0.0	11.8	B	11.8	--	2.5	0.0	11.8	B
	Red River Alley/Davis St	TWSC	0.0	0.0	0.0	--	0.0	A	0.0	0.0	0.0	--	0.0	A
	Rainey St/River St	Rdbt	4.2	5.2	4.1	4.6	5.2	A	4.2	5.2	4.1	4.6	5.2	A
	East Ave/River St	TWSC	15.5	17.6	3.9	0.3	17.6	C	15.5	17.6	3.9	0.3	17.6	C
	I-35 SBFR/River St	Act	17.1	8.0	--	55.0	20.5	C	17.1	8.0	--	55.0	20.5	C
	I-35 SBFR/Driskill St	TWSC	14.6	--	--	0.0	14.6	B	14.6	--	--	0.0	14.6	B
1a	Red River St/Cesar Chavez St	Pre	19.6	20.1	55.3	26.2	25.2	C	19.6	19.8	55.3	26.2	24.9	C
	Red River St/Driskill St	TWSC	--	24.2	17.1	77.3	77.3	F	--	16.4	13.5	29.6	29.6	D
	Red River St/Davis St	AWSC	4.4	6.0	5.3	4.6	6.0	A	4.0	5.1	4.9	4.2	5.1	A
	Rainey St/Driskill St	TWSC	1.7	3.3	1575.6	1486.9	1575.6	F	1.4	3.5	402.3	140.6	402.3	F
	Rainey St/Davis St	TWSC	20.8	--	2.6	0.0	20.8	C	16.8	--	2.5	0.0	16.8	C
	Red River Alley/Davis St	TWSC	0.0	0.0	0.0	--	0.0	A	0.0	0.0	0.0	--	0.0	A
	Rainey St/River St	Rdbt	4.6	7.6	4.7	5.2	7.6	A	4.5	6.9	4.5	5.1	6.9	A
	East Ave/River St	TWSC	62.4	70.3	17.5	73.6	73.6	F	26.7	26.1	13.1	24.8	26.7	D
	I-35 SBFR/River St	Act	25.0	39.0	--	59.0	39.0	D	22.1	22.9	--	58.4	30.6	C
	I-35 SBFR/Driskill St	TWSC	165.3	--	--	0.0	165.3	F	46.8	--	--	0.0	46.8	E
1b	Red River St/Cesar Chavez St	Pre	19.6	20.1	55.3	26.2	25.2	C	19.6	19.8	55.3	26.2	24.9	C
	Red River St/Driskill St	TWSC	--	24.2	17.1	77.3	77.3	F	--	16.4	13.5	29.6	29.6	D
	Red River St/Davis St	AWSC	4.4	6.0	5.3	4.6	6.0	A	4.0	5.1	4.9	4.2	5.1	A
	Rainey St/Driskill St	TWSC	1.7	3.3	1575.6	1486.9	1575.6	F	1.4	3.5	402.3	140.6	402.3	F
	Rainey St/Davis St	TWSC	17.6	--	2.3	0.0	17.6	C	15.0	--	2.2	0.0	15.0	C
	Red River Alley/Davis St	TWSC	0.0	0.0	0.0	--	0.0	A	0.0	0.0	0.0	--	0.0	A
	Rainey St/River St	Pre	10.4	11.8	6.9	15.4	11.8	B	10.4	10.5	6.7	14.8	11.0	B
	East Ave/River St	TWSC	62.4	70.3	17.5	73.6	73.6	F	26.7	26.1	13.1	24.8	26.7	D
	I-35 SBFR/River St	Act	25.0	39.0	--	59.0	39.0	D	22.1	22.9	--	58.4	30.6	C
	I-35 SBFR/Driskill St	TWSC	165.3	--	--	0.0	165.3	F	46.8	--	--	0.0	46.8	E
1c	Red River St/Cesar Chavez St	Pre	21.1	20.7	46.7	23.6	24.8	C	21.1	20.3	46.7	23.6	24.6	C
	Red River St/Driskill St	TWSC	--	24.1	17.1	54.8	54.8	F	--	15.8	13.3	24.1	24.1	C
	Red River St/Davis St	AWSC	4.9	6.1	5.6	4.8	6.1	A	4.2	5.2	5.0	4.3	5.2	A
	Rainey St/Driskill St	TWSC	2.1	3.2	782.5	1699.6	1699.6	F	1.7	3.4	265.6	233.0	265.6	F
	Rainey St/Davis St	TWSC	17.6	--	2.1	0.0	17.6	C	15.0	--	2.0	0.0	15.0	C
	Red River Alley/Davis St	TWSC	0.0	0.0	11.0	--	11.0	B	0.0	0.0	10.7	--	10.7	B
	Rainey St/River St	Rdbt	--	0.0	4.3	4.9	4.9	A	--	0.0	4.3	4.7	4.7	A
	East Ave/River St	TWSC	62.4	70.3	17.5	73.6	73.6	F	26.7	26.1	13.1	24.8	26.7	D
	I-35 SBFR/River St	Act	22.8	28.9	--	53.5	32.9	C	20.0	18.5	--	52.8	27.5	C
	I-35 SBFR/Driskill St	TWSC	165.3	--	--	0.0	165.3	F	46.8	--	--	0.0	46.8	E

\*Pre - Pretimed, Act - Actuated-Coordinated, Rdbt - Roundabout, TWSC - Two-way Stop Controlled, AWSC - All-Way Stop Controlled

1d	Red River St/Cesar Chavez St	Pre	25.2	23.5	31.6	25.7	25.6	C	25.2	23.2	32.2	25.7	25.5	C
	Red River St/Driskill St	TWSC	--	17.6	15.7	29.0	29.0	D	--	12.9	12.8	17.6	17.6	C
	Red River St/Davis St	AWSC	3.8	4.7	4.8	3.7	4.8	A	3.5	4.4	4.6	3.5	4.6	A
	Rainey St/Driskill St	TWSC	0.2	3.2	60.7	58.3	60.7	F	0.2	3.4	25.3	22.6	25.3	D
	Rainey St/Davis St	TWSC	12.1	--	1.9	0.0	12.1	B	11.1	--	1.8	0.0	11.1	B
	Red River Alley/Davis St	TWSC	0.0	0.0	10.5	--	10.5	B	0.0	0.0	10.2	--	10.2	B
	Rainey St/River St	Rdbt	--	0.0	4.3	4.9	4.9	A	--	0.0	4.3	4.7	4.7	A
	East Ave/River St	TWSC	73.5	43.6	16.8	73.4	73.5	F	31.9	21.5	13.0	26.7	31.9	D
	I-35 SBFR/River St	Act	170.6	236.2	--	21.0	157.5	F	20.0	16.4	--	52.8	26.7	C
	I-35 SBFR/Driskill St	TWSC	115.9	--	--	0.0	115.9	F	37.4	--	--	0.0	37.4	E
2a	Red River St/Cesar Chavez St	Pre	25.0	22.7	29.7	22.8	24.9	C	25.0	22.3	29.4	22.8	24.7	C
	Red River St/Driskill St	TWSC	--	14.5	79.2	40.2	79.2	F	--	11.8	31.7	20.7	31.7	D
	Red River St/Davis St	AWSC	3.1	8.6	3.6	3.0	8.6	A	2.8	7.5	3.5	2.8	7.5	A
	Rainey St/Driskill St	TWSC	0.7	0.0	29.7	--	29.7	D	0.6	0.0	--	18.8	18.8	C
	Rainey St/Davis St	TWSC	--	--	--	--	--	--	--	--	--	--	--	--
	Red River Alley/Davis St	TWSC	0.0	0.0	12.8	--	12.8	B	0.0	0.0	12.0	0.0	12.0	B
	Rainey St/River St	Rdbt	--	9.5	3.3	0.0	9.5	A	--	8.4	3.3	0.0	8.4	A
	East Ave/River St	TWSC	24.0	34.7	16.0	342.7	342.7	F	19.0	23.8	13.3	199.2	199.2	F
	I-35 SBFR/River St	Act	16.8	12.1	--	50.6	25.5	C	14.0	10.0	--	48.1	22.8	C
	I-35 SBFR/Driskill St	TWSC	522.8	--	--	0.0	522.8	F	279.7	--	--	0.0	279.7	F
2b	Red River St/Cesar Chavez St	Pre	24.4	21.7	31.1	22.8	24.6	C	24.4	21.4	30.2	22.8	24.2	C
	Red River St/Driskill St	TWSC	--	15.1	87.4	41.7	87.4	F	--	12.1	33.7	21.3	33.7	D
	Red River St/Davis St	AWSC	3.0	11.3	3.3	--	11.3	B	2.8	7.6	4.1	2.8	7.6	A
	Rainey St/Driskill St	TWSC	0.5	0.0	--	22.2	22.2	C	0.5	0.0	--	16.8	16.8	C
	Rainey St/Davis St	TWSC	--	--	--	--	--	--	--	--	--	--	--	--
	Red River Alley/Davis St	TWSC	0.0	0.0	11.1	--	11.1	B	0.0	0.0	11.1	--	11.1	B
	Rainey St/River St	Rdbt	3.0	11.3	3.3	--	11.3	B	3.0	9.7	3.3	--	9.7	A
	East Ave/River St	TWSC	18.0	31.4	14.5	291.6	291.6	F	15.0	21.9	12.4	167.0	167.0	F
	I-35 SBFR/River St	Act	29.9	23.0	--	64.3	37.4	D	23.3	13.5	--	64.9	31.1	C
	I-35 SBFR/Driskill St	TWSC	495.1	--	--	0.0	495.1	F	266.9	--	--	0.0	266.9	F
3a	Red River St/Cesar Chavez St	Pre	28.3	21.8	30.5	22.8	26.3	C	28.3	21.4	29.1	22.8	25.9	C
	Red River St/Driskill St	TWSC	--	14.6	104.2	26.9	104.2	F	--	11.9	40.7	18.5	40.7	E
	Red River St/Davis St	AWSC	3.0	6.7	9.2	2.9	9.2	A	2.8	6.0	8.1	2.8	8.1	A
	Rainey St/Driskill St	TWSC	0.5	0.0	--	35.8	35.8	E	0.5	0.0	--	21.0	21.0	C
	Rainey St/Davis St	TWSC	--	--	--	--	--	--	--	--	--	--	--	--
	Red River Alley/Davis St	TWSC	0.0	0.0	8.6	--	8.6	A	0.0	0.0	8.6	--	8.6	A
	Rainey St/River St	Rdbt	3.7	15.2	3.7	0.0	15.2	C	3.7	12.6	3.7	0.0	12.6	B
	East Ave/River St	TWSC	24.2	36.2	16.1	346.7	346.7	F	19.0	24.2	13.4	200.9	200.9	F
	I-35 SBFR/River St	Act	18.7	17.0	--	48.2	27.3	C	13.5	12.0	--	47.5	23.4	C
	I-35 SBFR/Driskill St	TWSC	516.9	--	--	0.0	516.9	F	294.8	--	--	0.0	294.8	F

\*Pre - Pretimed, Act - Actuated-Coordinated, Rdbt - Roundabout, TWSC - Two-way Stop Controlled, AWSC - All-Way Stop Controlled

3b	Red River St/Cesar Chavez St	Pre	21.9	22.6	31.6	22.8	23.7	C	21.9	22.2	30.3	22.8	23.3	C
	Red River St/Driskill St	TWSC	--	14.6	104.2	26.9	104.2	F	--	11.9	40.7	18.5	40.7	E
	Red River St/Davis St	AWSC	3.0	6.7	9.2	2.9	9.2	A	2.8	6.0	8.1	2.8	8.1	A
	Rainey St/Driskill St	TWSC	0.5	0.0	--	36.3	36.3	E	0.5	0.0	--	21.7	21.7	C
	Rainey St/Davis St	TWSC	--	--	--	--	--	--	--	--	--	--	--	--
	Red River Alley/Davis St	TWSC	0.0	0.0	8.6	--	8.6	A	0.0	0.0	8.6	--	8.6	A
	Rainey St/River St	Rdbt	3.6	7.7	3.6	--	7.7	A	3.6	7.7	3.6	--	7.7	A
	East Ave/River St	TWSC	18.0	31.4	14.5	293.4	293.4	F	15.0	21.9	12.4	169.1	169.1	F
	I-35 SBFR/River St	Act	18.8	12.8	--	50.6	25.8	C	15.5	10.4	--	48.1	22.8	C
	I-35 SBFR/Driskill St	TWSC	516.9	--	--	0.0	516.9	F	294.8	--	--	0.0	294.8	F
4a	Red River St/Cesar Chavez St	Pre	29.2	20.1	31.1	22.8	26.1	C	29.2	20.3	31.5	22.8	26.2	C
	Red River St/Driskill St	TWSC	--	26.7	91.1	80.0	91.1	F	--	17.8	43.8	31.1	43.8	E
	Red River St/Davis St	AWSC	4.8	5.7	7.5	6.0	7.5	A	4.2	5.4	6.9	5.4	6.9	A
	Rainey St/Driskill St	TWSC	2.0	0.0	--	21.5	21.5	C	1.8	0.0	--	15.1	15.1	C
	Rainey St/Davis St	TWSC	--	--	--	--	--	--	--	--	--	--	--	--
	Red River Alley/Davis St	TWSC	0.0	0.0	8.9	--	8.9	A	0.0	0.0	8.9	--	8.9	A
	Rainey St/River St	Rdbt	--	7.3	6.4	6.6	7.3	A	--	7.0	5.8	6.3	7.0	A
	East Ave/River St	TWSC	52.4	25.2	14.1	33.3	52.4	F	26.6	17.2	11.8	19.4	26.6	D
	I-35 SBFR/River St	Act	27.9	37.7	--	48.2	36.7	D	22.8	22.2	--	47.9	29.2	C
	I-35 SBFR/Driskill St	TWSC	116.4	--	--	0.0	116.4	F	39.7	--	--	0.0	39.7	E
4b	Red River St/Cesar Chavez St	Pre	21.5	20.3	35.3	25.6	23.2	C	21.5	20.4	35.8	25.6	23.2	C
	Red River St/Driskill St	TWSC	--	26.6	81.5	79.5	81.5	F	--	17.6	39.2	30.5	39.2	E
	Red River St/Davis St	AWSC	4.7	5.5	7.0	5.8	7.0	A	4.1	5.1	6.6	5.3	6.6	A
	Rainey St/Driskill St	TWSC	1.9	0.0	--	17.8	17.8	C	1.7	0.0	--	13.4	13.4	B
	Rainey St/Davis St	TWSC	--	--	--	--	--	--	--	--	--	--	--	--
	Red River Alley/Davis St	TWSC	0.0	0.0	8.9	--	8.9	A	0.0	0.0	8.9	--	8.9	A
	Rainey St/River St	Rdbt	5.3	6.4	4.5	--	6.4	A	5.3	6.4	4.5	--	6.4	A
	East Ave/River St	TWSC	52.4	25.2	14.1	33.3	52.4	F	26.6	17.2	11.8	19.4	26.6	D
	I-35 SBFR/River St	Act	24.0	29.2	--	53.4	33.7	C	19.7	17.5	--	53.5	27.8	C
	I-35 SBFR/Driskill St	TWSC	89.6	--	--	0.0	89.6	F	34.1	--	--	0.0	34.1	D
4c	Red River St/Cesar Chavez St	Pre	30.0	22.7	26.3	22.8	26.7	C	30.0	22.9	26.7	22.8	26.9	C
	Red River St/Driskill St	TWSC	--	14.7	57.1	25.7	57.1	F	--	11.9	27.5	16.8	27.5	D
	Red River St/Davis St	AWSC	3.2	6.6	6.4	3.2	6.6	A	2.9	6.0	5.9	3.0	6.0	A
	Rainey St/Driskill St	TWSC	1.3	0.0	--	52.0	52.0	F	1.1	0.0	--	21.4	21.4	C
	Rainey St/Davis St	TWSC	--	--	--	--	--	--	--	--	--	--	--	--
	Red River Alley/Davis St	TWSC	0.0	0.0	9.0	--	9.0	A	0.0	0.0	9.0	--	9.0	A
	Rainey St/River St	Rdbt	0.0	10.7	4.3	0.0	10.7	B	--	9.6	3.9	0.0	9.6	A
	East Ave/River St	TWSC	17.4	23.9	13.2	226.7	226.7	F	14.7	18.9	11.7	126.2	126.2	F
	I-35 SBFR/River St	Act	16.9	10.7	--	52.7	26.6	C	14.5	9.1	--	49.2	23.6	C
	I-35 SBFR/Driskill St	TWSC	567.0	--	--	0.0	567.0	F	304.5	--	--	0.0	304.5	F

\*Pre - Pretimed, Act - Actuated-Coordinated, Rdbt - Roundabout, TWSC - Two-way Stop Controlled, AWSC - All-Way Stop Controlled

### 3.7.1 Existing Conditions

During the Weekend peak the vehicular analysis for existing conditions present a LOS of C or better in all analyzed intersections. Site visits and existing multimodal counts on Rainey Street demonstrate that the pedestrians, bicycles, and scooters are present at most of the conflicts. The increase of multimodal volumes during the weekend peak indicated that these conflicts are more prevalent during these times. These findings confirm those reported on the RNMSP.

### 3.7.2 Red River Street/Davis Street

The Red River Street/Davis Street intersection presents similar delay per vehicle trends as PM peak with a 60/40 mode split. Because the intersection operates at a LOS A the variations of delay are only of a few seconds.

### 3.7.3 Red River Street/Driskill Street

The Red River Street/Driskill Street intersection presents similar delay per vehicle trends as PM peak with a 60/40 mode split.

While the intersection still performs at LOS F in all scenarios, the 60/40 mode split reduced delay per vehicle by more than half.

### 3.7.4 Rainey Street/Driskill Street

In all scenarios closing Rainey street to vehicles, removing the south leg of the Rainey Street/Driskill Street intersection results in a large reduction in delay per vehicles. Scenario 1d also has a reduction in delay per vehicle because the trips traveling northbound on Rainey Street are now also using Red River Street and the Red River alley.

### 3.7.5 East Avenue/River Street

The delay per vehicle at the East Avenue/River Street intersection increases considerably in Scenarios 2a, 2b, 3a, and 3b. Vehicles traveling south on Rainey Street will now take IH-35 SBFR/East Avenue and make a southbound right turn at this intersection. While the intersection still performs at a LOS F in Scenarios 2a, 2b, 3a, 3b, and 4c the delay reduces with the 60/40 mode split. Scenarios 4a and 4b with a 60/40 mode split perform at a LOS D.

### 3.7.6 IH-35 SBFR/Driskill Street

The IH-35 SBFR/Driskill Street intersection experiences an increase in delay per vehicle in all scenarios where there is no other southbound connection besides IH-35 SBFR/East Avenue. Vehicles traveling southbound on Rainey Street are rerouted to take IH-35 SBFR/East Avenue and take a southbound right turn at this intersection.

### 3.7.7 Red River Street/Cesar Chavez Street

The Red River Street/Cesar Chavez Street intersection does not have considerable changes throughout the different scenarios because vehicular trips were not rerouted through this intersection.

## 3.8 Rainey Street/River Street

This report compared the vehicular performance of the existing traffic circle versus a proposed traffic signal at the Rainey Street/River Street intersection. The RNMSP also mentions that public comments regarding the existing traffic circle disagreed about whether it should be kept or replaced. Table 6 includes an analysis of the intersection under existing conditions with 2019 traffic volumes and two projected year 2025 scenario:; Scenario 1a with a traffic circle and Scenario 1b with a pretimed signal.

**Table 6:** Rainey Street/River Street Intersection Comparison

Scenario	Control Type	Intersection Delay (s/veh)	LOS
----------	--------------	----------------------------	-----



Existing	Traffic Circle	4.3	A
1a	Traffic Circle	9.1	A
1b	Pretimed Signal	13.4	B

A pretimed signal does not introduce a detrimental level of delay at the intersection of Rainey Street/River Street. However, the optimal control type is a traffic circle based on the HCM 6<sup>th</sup> edition analysis of the delay.

### 3.9 Vehicular Analysis Summary

Table 7 presents the average change in delay at all intersections from Scenario 1a. The table represents the average change in delay in all analyzed intersections relative to scenario 1a; it does not indicate absolute delay per scenario. These values show the broad differences in delay resulting from network changes under different time periods and trip generation assumptions. Differences are relative only to scenario 1a of its column's respective time periods and trip generation assumptions. A negative result in the table indicates a reduced delay for a vehicle on the network.

**Table 7:** Rainey Street/River Street Intersection Comparison

Change in Delay Across Scenarios				
Scenario	Average Change in Delay from Scenario 1a (sec/veh/intersection)			
	PM Peak	PM Peak with 60/40 mode split	Weekend PM Peak	Weekend PM Peak 60/40 mode split
1b	0	2	0	0
1c	-128	-12	10	-18
1d	-128	-31	-150	-39
2a	53	184	-102	4
2b	51	185	-109	-1
3a	89	204	-98	7
3b	101	204	-105	3
4a	-369	-44	-178	-41
4b	-369	-44	-183	-43
4c	-23	85	-110	-2

The network configuration that reduced the overall delay on all the analyzed sets of traffic conditions the most was Scenario 4b which featured the following network changes from the current state:

- Rainey Street closed to vehicular traffic except for emergency vehicles,
- Red River Extension to connect to River Street,
- No alley vacation south of 70 Rainey,
- Rainey Street extension connecting to Cesar Chavez,
- All-way stop control at the Red River Street/Driskill Street and River Street/East Avenue intersections,
- Traffic circle at the Red River Street/Davis Street intersection.

Table 8 shows a summary of the relative average changes between the scenarios with and without a 60/40 mode split vehicle reduction. The table presents the average changes in intersection delay across all scenarios. PM average reductions are more substantial than Weekend reductions because the relationship between delay

and volume is non-linear, therefore the trip reductions will have a larger relative impact on the PM than weekend suite of models. As expected, reducing the number of trips from developments reduces delay.

**Table 8:** Average Change in Intersection Delay Resulting From 60/40 Mode Split

<b>Scenario</b>	<b>Average PM Change in Intersection Delay Resulting from 60/40 Mode Split (min/veh.)</b>	<b>Average Weekend Change in Intersection Delay Resulting from 60/40 Mode Split (min/veh.)</b>
1a	-8.3	-2.3
1b	-8.3	-2.3
1c	-6.4	-2.7
1d	-6.7	-0.5
2a	-6.9	-0.8
2b	-6.9	-0.8
3a	-7.2	-0.8
3b	-7.4	-0.8
4a	-3.7	-0.3
4b	-3.7	-0.2
4c	-7.3	-0.8

These statistics represent average decreases in intersection delay from 50% to 70% from scenarios without any trip reduction. Based on this analysis, implementing Travel Demand Management (TDM) measures that align with the Austin Strategic Mobility Plan (ASMP) are important to reduce delay in the study area.

## 4. Red River Extension

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Some of the analyzed scenarios include a Red River Extension that extends Red River Street south of Davis Street. South of Davis Street is currently a private driveway for The Shore Condominium and the Kimpton Hotel Van Zandt. This study assumed that the extension would be a conversion of the existing private driveway and Red River alley, and did not include any new, additional capacity that could result from the creation of a new street in a new alignment.

A traffic circle is recommended at the Red River Street/Davis Street intersection for all future scenarios. The intersection presents horizontal alignment issues discussed in section 4.1 Horizontal Alignment. Because of these, neither a signal nor the existing all-way stop control is recommended at this intersection. As part of the study, a conceptual schematic design for the Red River Street/Davis Street intersection was also created.

### 4.1 Horizontal Alignment

During the schematic design process, the north and south approaches of the Red River Street/Davis Street intersection were aligned. The existing Shore Condominium/Kimpton Hotel Van Zandt driveway and the proposed Red River Extension/The Travis driveway would be parallel to each other resulting in a five-legged intersection. This layout would not provide drivers exiting the intersection with a clear southbound approach. There would also be a visibility problem for the east and west legs. Proposing an intersection layout without correcting the misalignment would require a five-legged traffic signal, increasing the cycle length compared to a standard four-legged signal. To fix these issues the northbound lane would need to be on the Shore Condominium/Kimpton Hotel Van Zandt driveway and the southbound lane would need to run on The Travis driveway.

The intersection of Red River Street/Davis Street and the proposed driveways for The Travis and Waller Park Place do not currently align because of property constraints. The driveways of The Travis and Waller Park Place properties should merge their adjacent driveways to align with Davis Street. Without this merger, the intersection may experience the same issues discussed for the misaligned north-south approach. Waller Park Place is planning on filing a site plan extension as of November 2019.

Using a traffic circle would help control this intersection due to the existing north-south and east-west offsets. Unless the offsets are aligned, a traffic signal at this intersection would have cycle lengths considerably longer than a four-leg intersection. With offsets, not only would this intersection be five-legged, but left turns would need to operate on separate phases.

### 4.2 Vertical Alignment

This report verified the proposed vertical alignment for the north and southbound lanes of the Red River Extension. This alignment would require the northbound lane to run on the existing Shore Condominium/Kimpton Hotel Van Zandt driveway and the southbound lane to run on the proposed driveway of The Travis.

The Travis' most current site plan, submitted November 2019, shows a grade difference of up to 11 feet between the proposed driveway and the existing Shore Condominium/Kimpton Hotel Van Zandt driveway. The Travis Driveway will align vertically with the Shore Condominium/Kimpton Hotel Van Zandt driveway at the north end, as well as at the south end.



The proposed Travis driveway has a grade of 12% at its steepest, and the plans present the slope going down to the south. The existing Shore Condominium/Kimpton Hotel Van Zandt driveway has a grade of 11% at its steepest. These grade changes are greater than what the City of Austin typically recommends for public roads. The design of the extension will have to take this into consideration.

## 5. Pedestrian Facilities

Pedestrian usage in the study area begins increasing on Thursday afternoons, and from Thursday around 8 PM through Sunday the percentage of pedestrians compared to total traffic (vehicles, scooters, bicycles, and pedestrians) increases dramatically. The highest percentage of pedestrians can reach up to 80% of total traffic on Saturday at 11 PM, which agrees with the RNMSA's findings. The identified peak hour for the pedestrians is Saturday from 11 PM to 12 AM, with 1,799 pedestrians on Rainey Street just south of Davis Street. The counts were collected using MioVision from Thursday, June 20, 2019 to Sunday, June 23, 2019.

Rainey Street's existing pedestrian infrastructure presents some non-ideal conditions for its users. Figure 17 illustrates the existing pedestrian facilities throughout the study area. The existing constraints observed are: substandard sidewalks, scooters parked on the sidewalk, queues to enter venues spilling into the sidewalk, sidewalks that go up or down long ramps or stairs, and pedestrian spaces on the road separated by delineators. During site visits pedestrians were observed walking in the street to avoid such obstacles. Pedestrians blocking the travel lanes add to the congestion in the area.

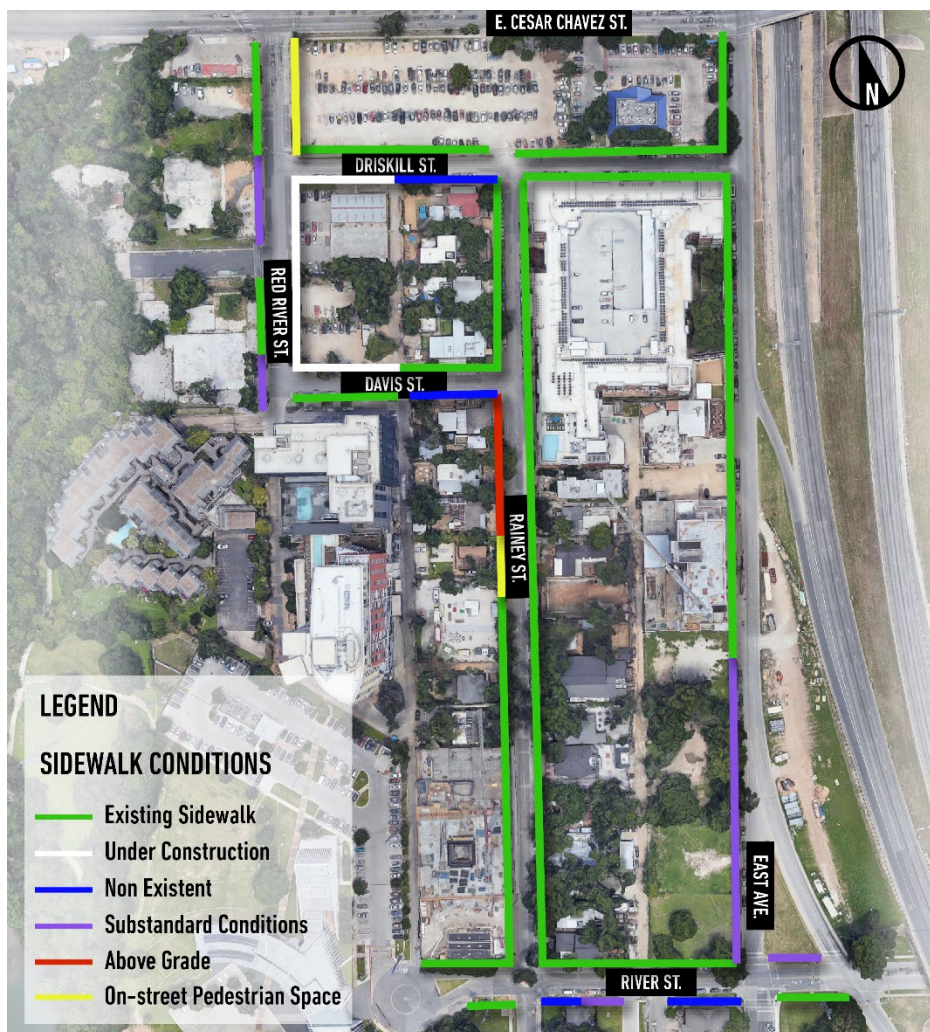


Figure 17: Sidewalk Infrastructure

The existing pedestrian infrastructure makes accommodating the high volume of pedestrians difficult. One option to accommodate pedestrians along this section of Rainey Street would be closing the street to vehicular traffic. This would create a much larger and safer pedestrian realm, generate an improved pedestrian atmosphere, and eliminate the conflicts observed between pedestrians and vehicles. This study also explored the idea of extending the sidewalk into the street and how this might impact vehicular circulation. Because of the physical difficulties of extending the sidewalk behind the existing curb, the sidewalk would expand into the street and replace on-street parking.

This study evaluated how eliminating the vehicular traffic on Rainey Street north of River Street would impact its multimodal users. The RNMSD discusses that stakeholders did not broadly support this use, noting that there would be no other continuous northbound access through the neighborhood between River Street and Davis Street. With the possibility of adding a new north-south connection, removing vehicles from Rainey Street becomes a more feasible option.



## 6. Bicycle and Scooter Facilities

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Bicycle and scooter counts were collected on Rainey Street just south of the Rainey Street/Davis Street intersection from Thursday, June 20, 2019 to Sunday, June 22, 2019. Appendix I includes the collected volumes.

For the collected period, the total scooter volume is almost double the total bicycle volume. Both modes start having an increase in users around 7 AM on Thursday and Friday. Scooters maintain a relatively steady number of users until the late hours of the night, with a peak of 89 scooters on Friday at 9 PM and 87 scooters on Saturday at 6 PM. Bicycles had a less steady volume throughout the day, with a peak volume of 45 bicycles on Thursday at 8 PM. The peak-hour for both bicycles and scooters happens earlier than the pedestrian peak-hour during the week and weekend.

The study area does not have existing bicycle lanes. Bicyclists and scooter riders share the travel lanes with motor vehicles. As mentioned before, pedestrians blocking the travel lanes can be a contributing factor to congestion in the area. Increased bicycle and scooter usage also increases the potential for conflicts between modes.

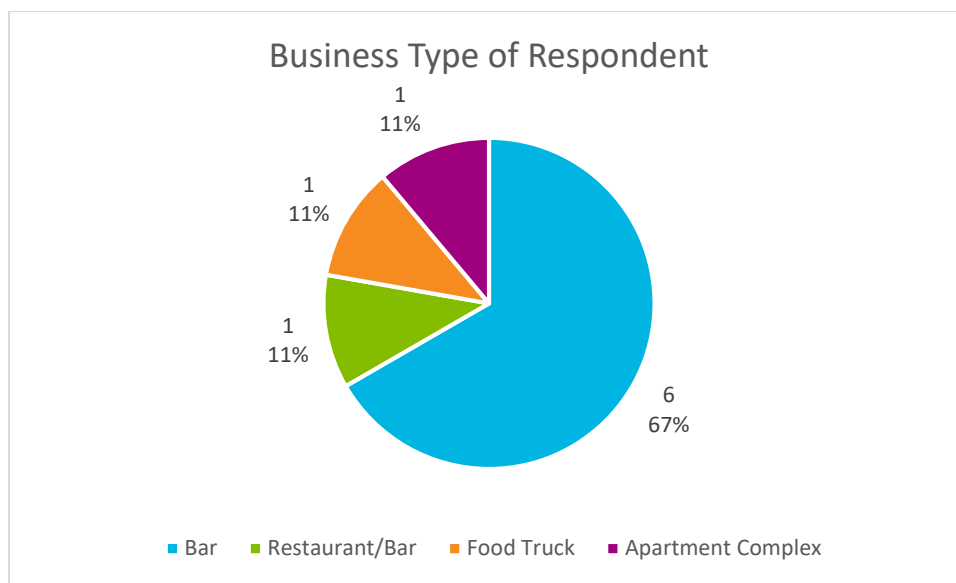
The 2014 City of Austin Bicycle Plan proposes protected bicycle lanes on Rainey Street, Davis Street, and River Street, and the RNMSMP proposes adding sharrows in addition to traffic calming measures in the study area.

Removing vehicles from Rainey Street would create a protected environment for bicycles and micromobility options. Adding bicycle lanes on other streets in the neighborhood would require removing existing on-street parking.

## 7. Business Input

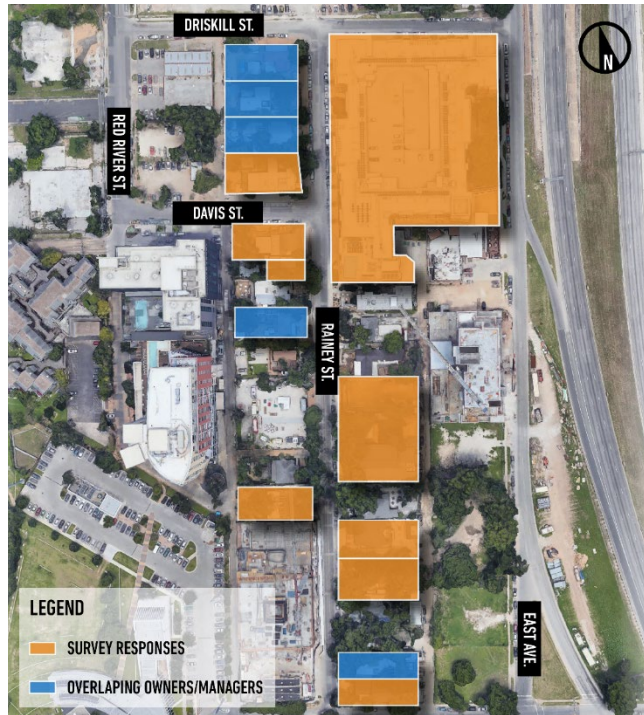
A survey was sent to businesses that would be directly affected by a street closure to vehicular traffic. The results of this survey help to explain how a closure of Rainey Street to vehicles could impact daily business operations, customers, and employees. The businesses contacted are located on Rainey Street between River Street and Driskill Street. A public meeting open to the businesses was held at the ESB-MACC on August 12, 2019 to provide more information about the study and to encourage businesses to complete the survey.

The survey closed on August 15, 2019, and it received nine complete responses. Of these responses, four were from business owners, and five were managers of the businesses. Figure 18 presents business types of survey respondents.



**Figure 18:** Business Type of Respondents

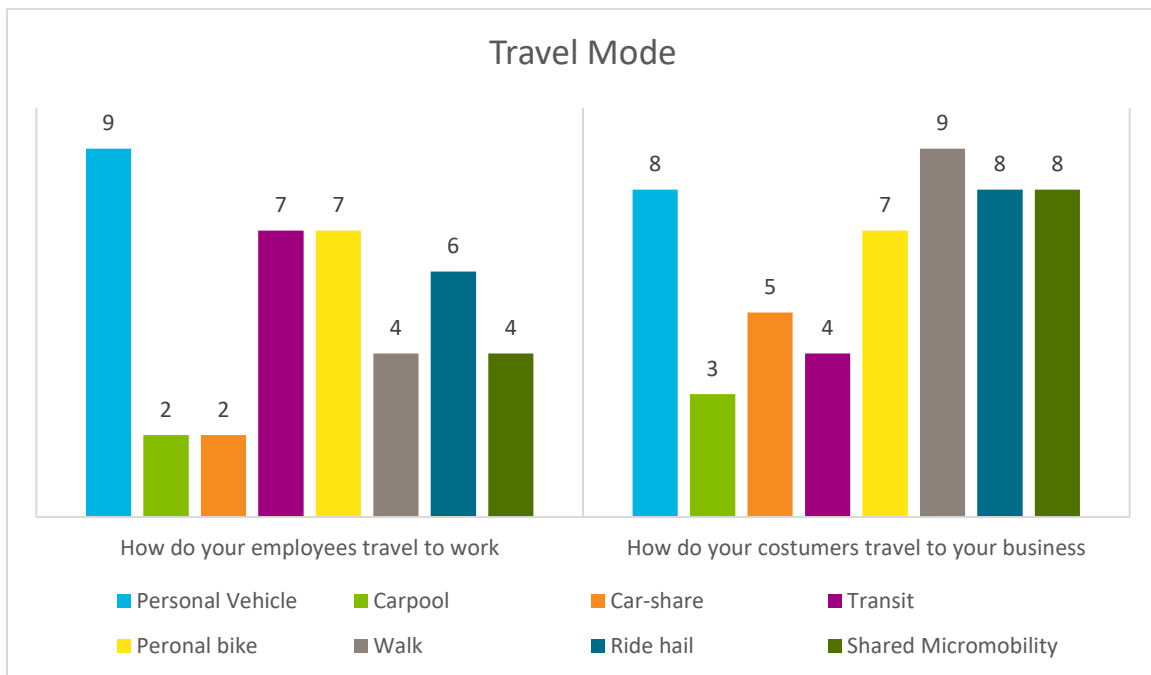
The results of this survey should not be considered representative of all interests on Rainey Street, as they do not include the opinions of all the businesses. Of the 25 businesses targeted, there are 15 different owners or managers. It is important to note that some of the responses might represent the opinion of more than one business being that they are owners or managers of more than one establishment. Figure 19 presents the locations of the businesses that provided responses. In this figure, orange indicates the bar first identified by the respondent, even though they may manage multiple places. The manager for Clive Bar operates additional businesses including the Container Bar, Bungalow, Lustre Pearl, and Bar 96 (shown in blue). The manager for Craft Pride also manages Javelinas (shown in blue). This suggests that some of the responders represent the opinion of more than one business.



**Figure 19: Business Respondents Map**

This section will summarize and discuss the questions in the survey, Appendix X contains all questions and responses for the survey.

Most employees travel to work using a car, bicycle, or public transportation, while it is believed that most of the customers walk, use shared micromobility, their personal vehicles, or ridehailing services (see Figure 20). Vehicular transportation is currently the main form of transportation for the area.



**Figure 20: Travel Mode to Rainey Businesses**

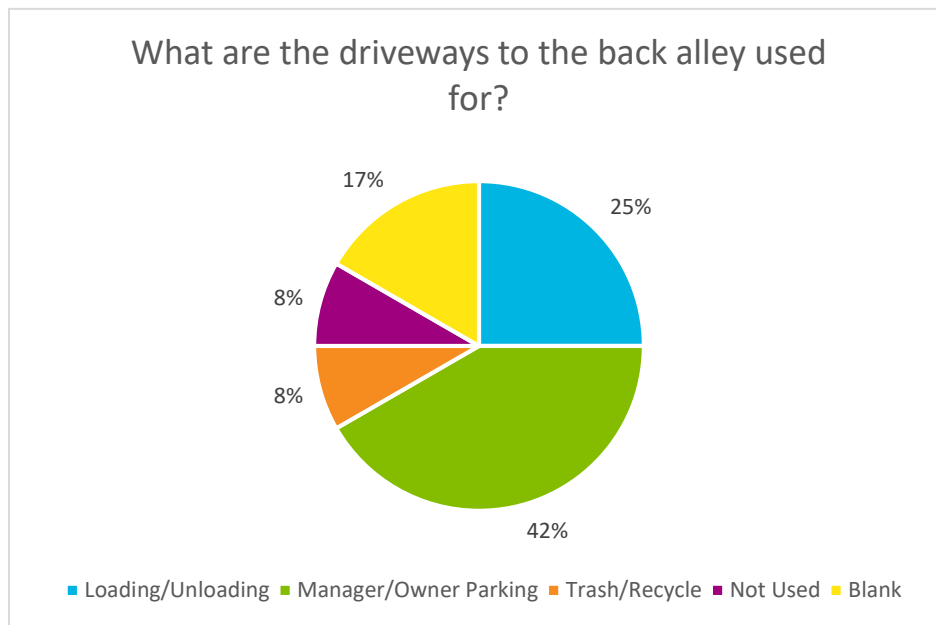


In order to understand if vehicles could use the Rainey alley and the Red River alley as an alternate north-south connection, the survey contained a series of questions about the businesses’ use of the alley.

The survey indicated that most of the responders have a driveway to their back alley (see Figure 21), and that they mostly use the driveways as parking and loading/unloading areas (see Figure 22). Parking does not greatly affect the potential flow of vehicles using the alleys. However, loading/unloading services could create conflicts. To reduce the conflicts between trucks loading/unloading and vehicles traveling on the alleys, the City could designate a loading/unloading lane on Rainey Street.

		Yes	No	Blank
Does the business have driveways to the back alley?	Clive Bar	✗		
	Big Fat Greek Gyros	✗		
	Craft Pride	✗		
	Unbarlievable		✗	
	Drafting Room	✗		
	Half Step		✗	
	Container Bar			✗
	Camden Rainey Street	✗		
	Bangers	✗		

**Figure 21: Alley Driveways**



**Figure 22: Alley Driveways Use**

Although most of the respondents have a driveway to their back alley, most businesses indicated they do not have a driveway directly on Rainey Street (see Figure 23). The businesses that do have a driveway on Rainey Street use them in diverse ways and throughout the day (see Table 9 and Table 10). A solution for businesses to keep access to their establishments if vehicles cannot access Rainey Street is to keep access for certain types of vehicles during an established schedule, and to provide loading/unloading zones on Davis Street and Driskill Street for moving/delivery trucks.

		Yes	No	Blank
Does the business have driveways to Rainey St?	Clive Bar		X	
	Big Fat Greek Gyros	X		
	Craft Pride		X	
	Unbarlievable	X		
	Drafting Room		X	
	Half Step		X	
	Container Bar			X
	Camden Rainey Street	X		
	Bangers		X	

**Figure 23:** Rainey Street Driveways

**Table 9:** Rainey Street Driveway Use

What are the driveways to Rainey Street used for?	
Big Fat Greek Gyros	In and out of food trucks
Unbarlievable	Not Used
Camden Rainey Street	Large Moving Trucks, Delivery Trucks, Maintenance Parking, Vendor Parking

**Table 10:** Rainey Street Driveway Use Schedule

When are the driveways to Rainey Street used?	
Big Fat Greek Gyros	9 AM - 12 PM & 5 PM – 8 PM
Camden Rainey Street	All day/night

Some businesses do not have driveways to their back alleys but receive their deliveries at that location (see Figure 24). Most delivery trucks park on the street while delivering to businesses and the amount of time they are parked varies widely (see Figure 25). Businesses noted that sometimes trucks park in one location and distribute to multiple businesses without moving, extending the parking time to a few hours. Most businesses report receiving deliveries before 5 PM (see Table 11).

In order to help alleviate some of the possible road obstructions caused by deliveries, on-street parking could be removed from one side of Rainey Street and this space can be designated as a loading/unloading only lane.

	Alley	Rainey St	River St	N.A.	Blank
Where does your business receive deliveries?					
Clive Bar	X				
Big Fat Greek Gyros				X	
Craft Pride			X		
Unbarlievable					X
Drafting Room	X	X			
Half Step	X	X			
Container Bar		X			
Camden Rainey Street		X			
Bangers		X			

Figure 24: Delivery Locations

	5 min	10 to 20 min	30 min	30 min to 4 hrs	N.A.	Blank
How long are the delivery trucks parked at this location?						
Clive Bar				X		
Big Fat Greek Gyros					X	
Craft Pride	X					
Unbarlievable		X				
Drafting Room					X	
Half Step			X			
Container Bar						X
Camden Rainey Street				X		
Bangers		X				

Figure 25: Delivery Durations

Table 11: Delivery Schedules

During what days and times does your business receive deliveries?	
Clive Bar	11 AM to 4 PM
Big Fat Greek Gyros	N.A.
Craft Pride	Tuesday, Wednesday & Friday 12 PM - 5 PM
Unbarlievable	Yes
Drafting Room	Tuesday to Friday afternoons
Half Step	12 PM – 4 PM ideally, but very often they come later
Container Bar	Blank
Camden Rainey Street	7 days a week 8 AM to 7 PM
Bangers Sausage and Beer Garden	Monday to Friday 9 AM to 3 PM

The last questions concerning business operations regarded dumpster location and pickup schedules. Most of the dumpsters are in the alleys behind the business (see Figure 26). The schedules for the pickups vary widely by days and times, and it may be possible to reduce conflicts between trash trucks and vehicles using the alleys by scheduling the trash pickup times for the early morning hours on weekdays (see Table 12).



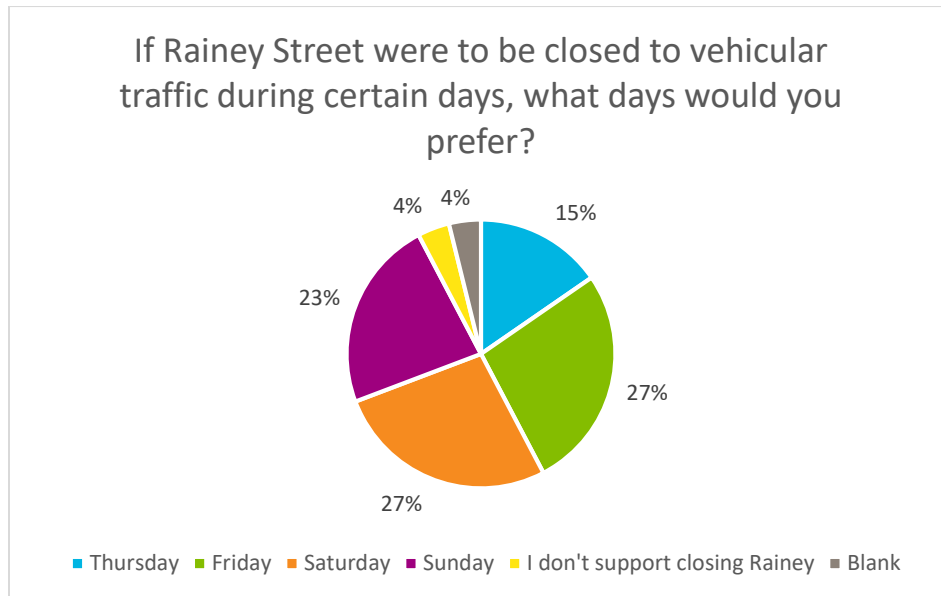
Where are the dumpsters used by your business located?		Alley	No Dumpsters	Off Rainey St	Property Parking	Blank
	Clive Bar				✗	
	Big Fat Greek Gyros	✗				
	Craft Pride	✗				
	Unbarlievable	✗				
	Drafting Room		✗			
	Half Step	✗				
	Container Bar					✗
	Camden Rainey Street			✗		
Bangers	✗					

**Figure 26:** Dumpster Locations

**Table 12:** Trash Schedules

During which days and times is trash picked up?	
Clive Bar	5 AM overnight, five days a week for recycling and two days a week (Sunday morning and Thursday morning)
Big Fat Greek Gyros	Wednesday & Saturday
Craft Pride	Monday, Tuesday, Thursday & Friday
Unbarlievable	Friday
Drafting Room	Friday morning
Half Step	Monday, Wednesday and Saturday from 4 AM to 7 AM
Container Bar	Blank
Camden Rainey Street	7 days a week
Bangers Sausage and Beer Garden	Unknown

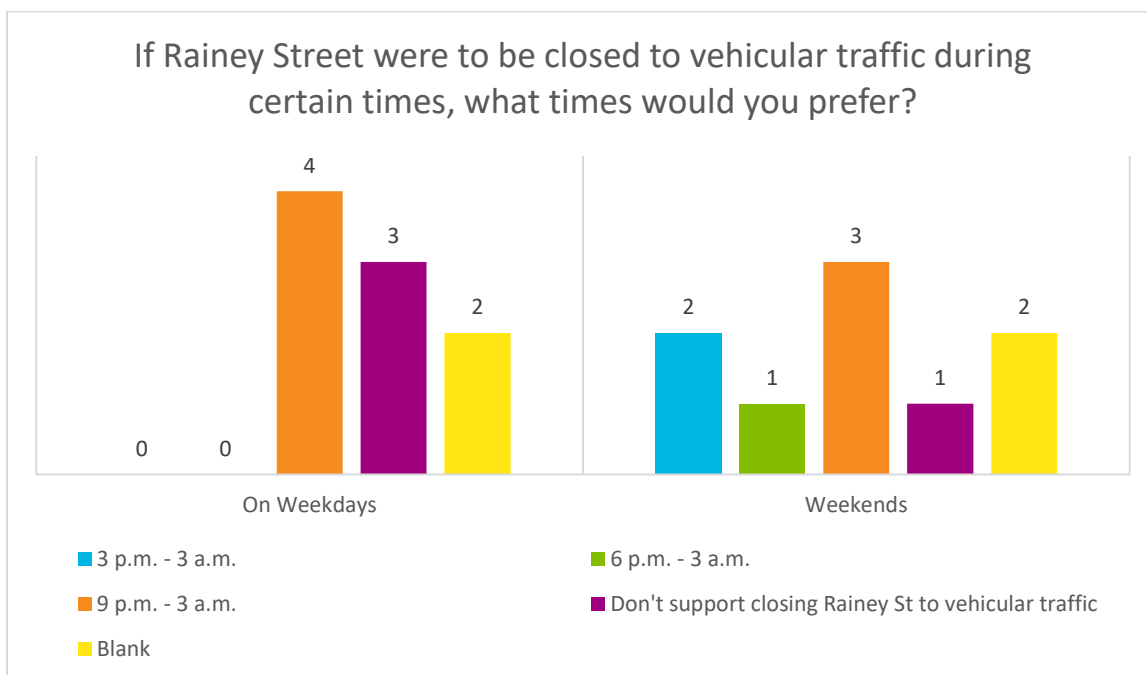
None of the businesses that supported closing Rainey Street to vehicular traffic supported doing so Monday, Tuesday, or Wednesday (see Figure 27). The explanation from several respondents is because “it is not busy enough” to warrant the closure. With one response not supporting the closure to vehicles on any day. That reason was noted as: “We will not be able to provide parking for moving companies for our residents. We will not be able to provide parking for delivery trucks.”



**Figure 27: Rainey Street Vehicular Closure Preferred Days**

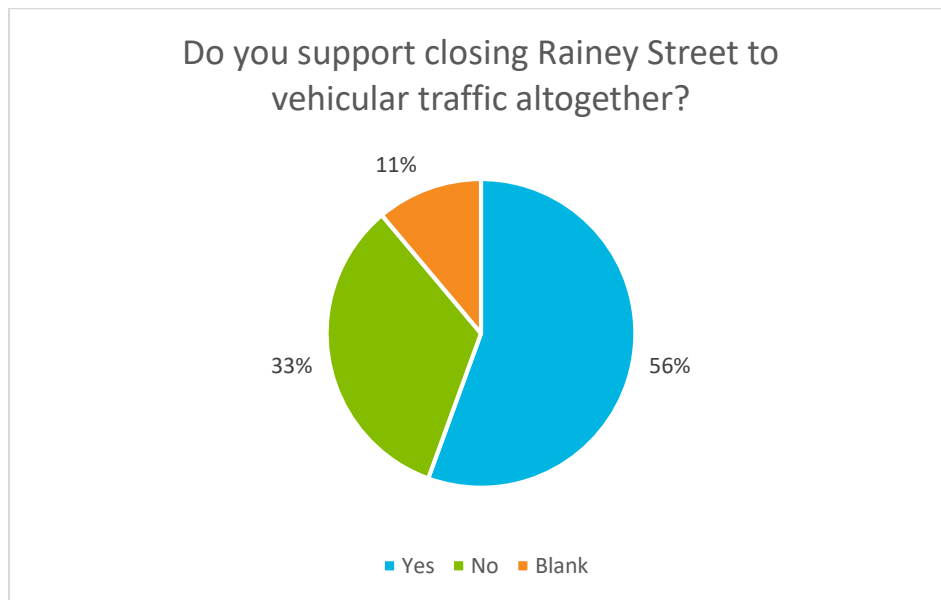
When asked which specific hours for vehicular closure they would prefer, one respondent specified that they would support the closure if they can receive deliveries before 6 PM. Another respondent specified that they would like to see closures on Saturday and Sunday starting early in the day for spring and fall seasons (see Figure 28).

This question clustered the weekdays and weekends as two groups. This might have presented problems as one response suggested for the closure to be on Friday and Saturday night but only on Sunday afternoons. Surveyors previously noted that they do not see the need for the closure to happen on certain days during the week. The Austin Core Transportation (ACT) Plan could ask this question again for individual days to obtain more detailed answers.



**Figure 28: Rainey Street Vehicular Closure Preferred Schedule**

A few respondents mentioned that as long as deliveries and managers/owners can access their venue, they support making Rainey Street non-vehicular. One of the “no” answers mentions that there is no need for the vehicular closure to happen during the day time, and another specifies that the closure will affect their business because there is no alternative parking for moving and delivery trucks.



**Figure 29:** Rainey Street Vehicular Closure Support

Additional public outreach should inform the decision to close Rainey Street to vehicles; engagement for the upcoming ACT Plan and outreach in support of the Rainey Shared Streets Pilot offer opportunities to receive more public input.

The survey to businesses provided valuable information to inform the Rainey Street Shared Street Pilot vehicular closure. Taking the input from the businesses into consideration, the following should be considered if Rainey Street is closed to vehicular traffic long-term:

- Establish trash pickup to happen on the back alleys during the early hours of the morning on weekdays only.
- Designate a loading/unloading only lane on Rainey Street to operate while Rainey Street is car-free and limit the schedule of deliveries to happen before 5 PM so that other modes can use the space after hours.
- If a loading/unloading only lane on Rainey Street cannot operate while Rainey is car-free, the City should close Rainey Street to vehicles after 5 PM to accommodate for deliveries.



## 8. Emergency Vehicles

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The Rainey Neighborhood stakeholders have expressed concern about the ability for emergency vehicles to access the buildings on and surrounding Rainey Street if Rainey Street is closed to vehicular traffic.

When studying the feasibility of the Rainey Street closure to vehicles, this study determined that the City could close the street to vehicles while maintaining access for emergency vehicles in case of emergencies. This will ensure that emergency responders can access all buildings on Rainey Street even if there are congested conditions on other roads in the study area. Emergency vehicles will maintain access to Rainey Street by being allowed to access the space that is closed to other motor vehicles. Any bicycle or micromobility facilities installed within the closure would maintain sufficient clearance for emergency vehicles and allow first responders to safely operate their equipment. The Austin Fire Department and the Austin Police Department have agreed with this assessment.

## 9. Conclusion and Next Steps

This study evaluated ways to improve mobility in the Rainey Neighborhood. It reviewed the feasibility of different network changes but did not make final recommendations about a preferred scenario. Eleven scenarios were modeled, each with a different road network. The study analyzed and compared their performance in order to understand the impacts the network changes would have on the rest of the network.

The scenario that resulted in the greatest reduction of overall delay for the study area included the following improvements:

- Adding a traffic circle at the intersection of Red River Street/Davis Street
- Converting the East Avenue/River Street intersection from two-way stop control to all-way stop control in order to reduce future delay.
- Converting the Red River Street/Driskill Street intersection from two-way stop control to all-way stop control in order to reduce future delay.
- Creating an additional north-south vehicular connection via the Red River Extension.

Some of the scenarios evaluated the effects of closing Rainey Street to vehicles, while others kept Rainey Street open to vehicles. Closing Rainey Street to vehicles would improve the space for pedestrians, bicycles and micromobility, however, vehicular circulation would need to be maintained via other routes within the study area, including the Red River Extension. If Rainey Street was closed to vehicles, emergency vehicles could continue to access Rainey Street through the closure; the space would provide enough clearance to operate safety equipment. Figure 31 provides a representation of what Rainey Street could look like if reconstructed as a “shared street,” which can operate with or without vehicular traffic. Figure 32 depicts a reconstructed Rainey Street that keeps vehicle access but provides more physical space for pedestrians and other modes than the street does today.



**Figure 31:** Rainey Street as a Shared Street



**Figure 32:** Rainey Street with Vehicle Access

There are additional considerations to take into account when considering the future of the transportation network in the Rainey neighborhood. The use of additional curb management techniques in the area can increase the efficiency of the streets. For example, one side of Rainey Street could be designated as a loading/unloading area while the other side of the street is used as additional space for pedestrians. Another option is alternating the designated loading/unloading areas and additional sidewalk space along Rainey Street, which would act as a traffic calming technique. Both options ensure loading/unloading space is available to businesses. These changes would narrow the curb-to-curb distance to create a better pedestrian environment and would improve vehicular circulation by providing designated loading/unloading areas.

A district-wide parking strategy would also increase the efficiency of the neighborhood's streets. Parking options currently vary, from numerous private garages and private lots to public on-street parking, as well as the ESB-MACC parking lot. The ESB-MACC Master Plan calls for the construction of a new underground garage, which would almost double the amount of parking spaces currently available at the ESB-MACC.

Finally, Capital Metro's Project Connect could have a substantial impact on the neighborhood. Project Connect is considering routing the Blue Line from East Riverside Drive across the river to connect the south end of Trinity Street. This would allow the neighborhood to access high-capacity transit. If the final route configuration includes the crossing near Trinity Street, a new bridge would be constructed to the west of the neighborhood.

Based on the modeling and analysis included in this study, there are several next steps that can be taken to improve mobility in the Rainey neighborhood. These include:

- Communicating the findings of this report to stakeholders
- Completing the Rainey Shared Streets Pilot and reporting on the Pilot's results
- Furthering project development for the Red River Extension, including coordination with the ESB-MACC on Phase II of their development plan, project design, and right of way acquisition
- Working with developers on the extension of Rainey Street to Cesar Chavez Street
- Constructing short-term multimodal infrastructure improvements funded through development mitigation
- Completing the ACT Plan, which will update the 2002 Downtown Austin Mobility Plan and 2011 Downtown Austin Plan's Transportation Framework. This update will guide transportation planning, project development, operations, and transportation demand management, and will include the improvements identified in this study.

As the neighborhood grows, developments are completed, and operational changes take place it is likely that there will be an increase in demand volumes along Rainey Street. The importance of maintaining and improving mobility in the Rainey neighborhood will increase, as well. This report evaluates different scenarios of what the transportation network in the Rainey neighborhood could look like, and how this would affect traffic flow. However, the ultimate configuration and design of Rainey area improvements should be informed by community input and the ASMP mode split goals.