RM 620 Corridor Improvement Study

US 183 North to SH 71 West in Travis and Williamson Counties

February 2017

Executive Summary

Background

Ranch-to-Market 620 from State Highway 71 to United States Highway 183 is typically a four-lane roadway with a two-way center left-turn lane. It provides regional mobility and connects major roadways, including SH 71, Bee Cave Parkway, RM 2222, Anderson Mill Road, SH 45N, and US 183. RM 620 serves motorists traveling between the cities of Bee Cave, Lakeway, central and northwest Austin, and Cedar Park, providing access to retail, office, housing developments, and recreational destinations around Lake Travis. RM 620 experiences high levels of congestion and delay during the morning and afternoon peak periods, and the daily traffic volumes far exceed the level at which the roadway provides safe and efficient operations.

Purpose of the Study

To address existing and increased future traffic congestion, the Texas Department of Transportation initiated a feasibility study in spring 2015 to analyze these transportation issues and develop short-, mid-, and long-term mobility and safety improvements.

Study Area

The study area for the RM 620 feasibility analysis is 18.8 miles in length and extends from SH 71 to US 183. The study area crosses several municipal boundaries, including portions of Bee Cave, Lakeway, Austin, and Cedar Park. The majority of the study area is located within Travis County with a small portion located in Williamson County. RM 620 connects to a limited number of roads that allows motorists to travel into north, central, and south Austin (i.e. SH 71, RM 2222, Anderson Mill Road, and US 183).

Public Involvement Plan

A public involvement plan was developed for the RM 620 feasibility study in order to engage stakeholders and solicit input on proposed improvements. Several methods for public outreach, including the use of an online survey tool, e-mail blasts, and face-to-face meetings with stakeholder groups, were implemented for the study. Stakeholders groups included neighborhood association representatives, city representatives, elected officials, school districts, and interested citizens. The roadway corridor was divided into six sections for public engagement purposes.

The online survey was developed to identify issues or concerns on existing roadways from the individuals who use the roadway on a regular basis. The online survey closed April 1, 2016. More than 3,000 surveys were received from more than 84 distinct zip codes, including 12 zip codes from outside of Texas. Input was received from various interest groups within the corridor that will be taken into consideration in later stages of project development.

Data Collection, Traffic Modeling, and Design Concepts

The RM 620 feasibility study was developed to address transportation issues and identify short-term, mid-term, and long-term mobility and safety improvements. In order to understand the existing and future conditions along RM 620, a variety of data was collected and analyzed to aid in the development of proposed roadway improvements.

To address existing and increased future traffic congestion, existing AM and PM peak hour traffic conditions (year 2015) along RM 620 were modeled using the traffic macroscopic analysis software Synchro 9 (Trafficware LLC 2015). This analysis allowed us to provide short-, mid-, and long-term conditions.

Findings

To ensure RM 620 continues to serve as an effective link in the regional roadway network system and provide regional connectivity, it is necessary to investigate proposed roadway improvements to accommodate existing congestion and expected growth.

Short-Term Options

The proposed short-term projects or current planned improvements would improve traffic conditions. These mostly consist of intersection improvements; however, these projects would not address the capacity constraints along the corridor. As a result, some intersections would continue to operate at level of service E or F. These low cost improvements range in construction costs of $400,000 to $1.5 million.

Mid-Term Options

Recommended mid-term improvements include the construction of a raised median with turn lanes along the entire length of RM 620 and widening from four lanes to six lanes from SH 71 to Lakeway Boulevard, as well as from Quinlan Park Road to US 183. The total construction costs for all of the improvements are approximately $176 million plus approximately $26 million in right-of-way costs.

The mid-term option would result in decreased congestion. In addition, any improvements would comply with the Edwards Aquifer rules, and would result in improved mobility. It would also require additional right-of-way to address the widened pavement and drainage features.

Conversion of the center two-way left-turn lane into a raised median with raised curbs and controlled openings for access points would provide a safe haven for turning vehicles to wait for openings between vehicles, thereby decreasing collisions.

Long-Term Options

Since short and mid-term improvements do not adequately address all traffic congestion problems through 2035, the following long-term improvements are proposed:

- Add a four-lane limited-access roadway connecting US 183/SH 45N with RM 620 and RM 2222. Incorporated flyovers into this design at the US 183/SH 45N interchange and at RM 2222.
- Extend the six-lane section with a raised median north from Lakeway Boulevard to Hudson Bend Road.
- Consider extending the RM 620 to RR 2222 flyovers to pass over River Place Boulevard.

As part of analyzing the placement of the four additional lanes from US 183 to RR 2222, five options were evaluated. The addition of four limited access lanes to the proposed six-lane divided roadway raises several important issues that would be addressed in future studies. First, is it more effective to acquire a significant amount of right of way for an "at grade" or ground level roadway? If so, should this right of way be acquired from one or both sides or, if not, should the roadway be elevated above the existing right of way? Second, seeing that these lanes would be limited-access, should they be general purpose or managed lanes? Managed lanes are lanes that are designed to more efficiently handle traffic by using tolls or other regulations based on the number of occupants per vehicle or time of day.

While general purpose lanes could handle greater volumes of traffic, managed lanes could provide more predictable levels of service[1]. In either case, these additional lanes would effectively extend SH 45N further southwest and enhance regional connectivity between US 183 and RR 2222. Although at a construction cost of approximately $620 million, the elevated option is expensive with a construction time estimated at three years, if constructed all at once. Since this would be a very disruptive construction option, it is likely that construction would occur in phases and take longer.

Conclusion

Proposed short-term, mid-term and long-term improvements all have substantial benefits in reducing delay along the corridor compared to no-build conditions. The short-term improvements, which are low-cost and easily implementable, do reduce delay; however, they do not fully address current capacity constraints, let alone those of 2035.

Since traffic volumes are anticipated to substantially increase between 2015 and 2035, peak period traffic congestion is also anticipated to worsen substantially. The mid-term improvements would improve the level of service for most intersections. Adding raised

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[1] Although managed lanes appear at this point to be the most effective solution, a final determination as to whether the additional four lanes are managed or general purpose will be made in later phases of development.

medians with turn lanes and widening the roadway to a six-lane divided roadway for much of the corridor would also reduce delays and address congestion and safety concerns. However, to properly address long-term problems, substantial long-term improvements are needed to provide relief from congestion and properly address future traffic volumes.

The economic impacts of these improvements are positive, providing benefits of approximately $90 million for mid-term and $120 million for long-term solutions for the single analysis year (2035) alone. This economic benefit does not factor in costs due to crashes, which is another corridor problem that the proposed raised median would address by reducing conflict points.

Next Steps

TxDOT will continue with intersection improvements including the design and construction of the RM 620/RR 2222 bypass. Meanwhile, the environmental clearance for constructing the center median on RM 620 from SH 71 to the Colorado River and adding a lane in each direction from SH 71 to Lakeway Boulevard will proceed as rapidly as possible. The implementation of other mid- and long-term improvements await further analysis and future funding availability.

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Chapter 1: Introduction

Purpose of Study
Study Area

Purpose of Study

The Texas Department of Transportation initiated a feasibility study in the spring of 2015 to analyze transportation issues along Ranch-to-Market 620, from State Highway 71 to United States Highway 183. RM 620 is a high-speed four-lane principal arterial roadway with a two-way center left-turn lane. It provides regional mobility, connecting highways (SH 45N, US 183) and major arterials (SH 71, Bee Cave Parkway, RM 2222, Anderson Mill Road), and provides access to many retail, office, and housing developments located along the corridor. It, along with RM 2222, serves as a major thoroughfare for commuters traveling between Bee Cave, Lakeway, central and northwest Austin, and Cedar Park, providing regional mobility and access to recreational spots around Lake Travis. There are currently no viable alternate routes, and daily traffic volumes far exceed the level at which a two-way center left-turn lane provides safe and efficient operations.

RM 620 is traveled by a variety of users, including area residents, commuters, commercial drivers, pedestrians, and bicyclists. As a result, a substantial portion of the area roadway network, especially in the vicinity of the Bee Cave Parkway, Lohmans Crossing Road, RM 2222, and Anderson Mill Road intersections, experiences high levels of congestion and delay during the morning and afternoon peak periods. Due to this variety of users, the study involved stakeholders and community leaders throughout the corridor to identify needs and gather feedback and ideas on proposed short-, mid- and long-term mobility and safety improvements.

To address existing and increased future traffic congestion, existing AM and PM peak-hour traffic conditions (year 2015) along RM 620 were modeled using the traffic macroscopic analysis software Synchro 9 (Trafficware LLC 2015) to provide base conditions. Based upon the existing conditions base models, the following scenarios were then modeled in Synchro 9:

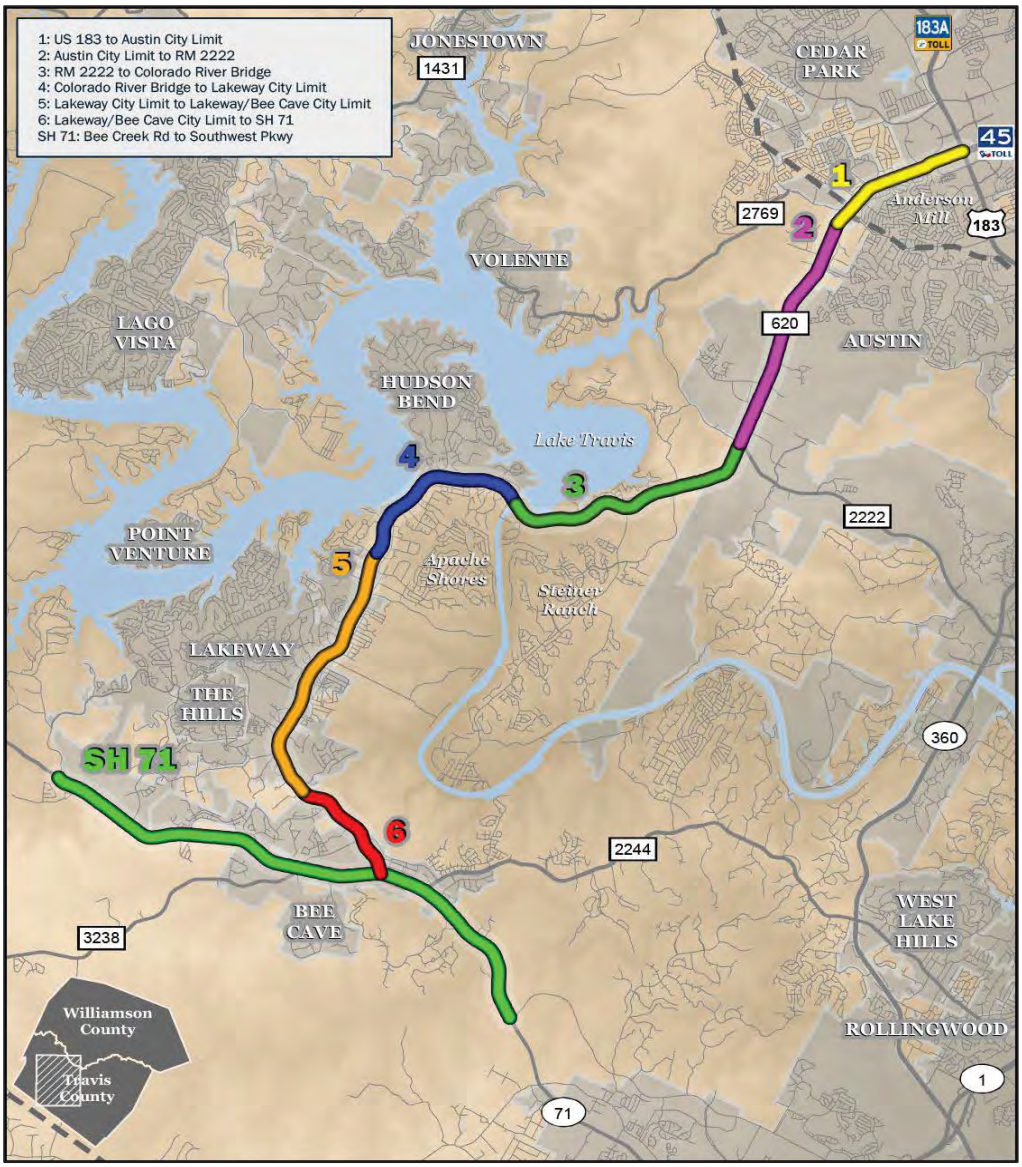
- Short-term conditions (2020)
  - No-build
  - Build (with short-term improvements)
- Mid-term conditions (2035)
  - No-build
  - Build (with mid-term improvements)
- Long-term conditions (2035)
  - Build option with possible elevated managed lanes and other long-term improvements

The results of the analysis were (and will continue to be) used by TxDOT to engage and inform stakeholders (e.g., area residents, road users, and business owners) as part of the public involvement process of the feasibility study.

Study Area

The RM 620 feasibility study area is 18.8 miles in length and extends from SH 71 to US 183. The study area crosses several municipal boundaries, including portions of Bee Cave, Lakeway, Austin, and Cedar Park. The majority of the study area is located within Travis County; however, a small portion is located in Williamson County. RM 620 connects to a limited number of roads that allows motorist to travel into north, central, and south Austin (i.e. SH 71, RM 2222, Anderson Mill Road, and US 183). It includes 33 signalized intersections—including two that were added during the course of this study—and many private driveway access points.

The RM 620 corridor was divided into six sections for public engagement purposes, as shown in **Figure 1.1**.



Source: Blanton & Associates, Inc

Figure 1.1: The six sections of the RM 620 feasibility study area.

The limits of each section along with its signalized intersections are:

Section 1 (US 183 to Austin City Limit)

- US 183
- Pecan Park Boulevard
- Deerbrook Trail
- Great Valley Drive/Lake Creek Parkway
- Hatch Road
- El Salido Parkway
- Anderson Mill Road (RM 2769)

Section 2 (Austin City Limit to Bullick Hollow Road/RM 2222)

- H-E-B driveway/Plaza Volente
- Buckner Road/Boulder Lane (north)
- Versante Circle/Boulder Lane (south)
- Concordia University Drive
- Wilson Parke Avenue/Rock Harbour Drive
- Four Points Drive

Section 3 (Bullick Hollow Road/RM 2222 to Colorado River Bridge)

- Bullick Hollow Road/RM 2222
- Comanche Trail
- Quinlan Park Road
- Marshall Ford Road

Section 4 (Colorado River Bridge to Lakeway Northern City Limit)

- Hudson Bend Road
- General Williamson Drive

Section 5 (Lakeway City Limits)

- Debba Drive
- Kollmeyer Drive
- Clara Van Street
- Lakeway Boulevard

- Main Street/Glen Heather Drive
- Lohmans Crossing Road/Ameno Drive
- Lohmans Spur Road
- Flint Rock Road
- Spillman Loop/Honey Creek Court
- Cavalier Drive/Aria Drive

Section 6 (Lakeway Southern City Limit to SH 71)

- Falcon Head Boulevard
- Ladera Boulevard
- Bee Cave Parkway
- SH 71

SH 71

- Bee Creek Road
- Pedernales Summit Parkway
- Serene Hills Drive
- Vail Divide
- Hamilton Pool Road/Bee Cave Parkway
- RM 620
- Cross Town Parkway
- Bee Cave Road
- Spanish Oaks Club Boulevard
- Southwest Parkway

Chapter 2: Public Involvement

Development of Public Involvement Plan
Community Involvement
Online Survey
Stakeholder Meetings

Development of Public Involvement Plan

A public involvement plan was developed for the RM 620 feasibility study in order to engage stakeholders and solicit input on proposed improvements to the RM 620 corridor. To accomplish this, an extensive public involvement plan was created to engage with the public throughout the entire feasibility study. The public involvement plan identified several methods for public outreach, including the use of a web-based survey tool, e-mail blasts, and face-to-face meetings with stakeholder groups. Stakeholders groups included neighborhood association representatives, city representatives, elected officials, school districts, roadway users, and interested citizens. A copy of the public involvement plan is included in **Appendix A.**

The public involvement plan will follow a four step process as seen in **Figure 2.1:**

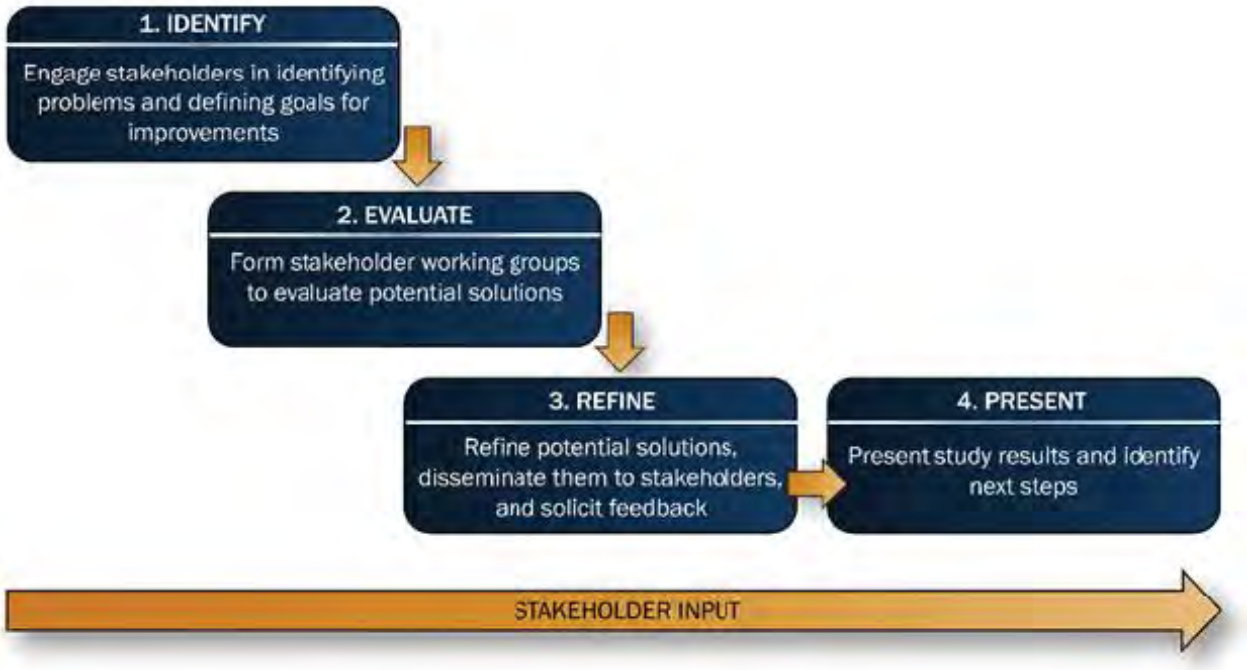


Figure 2.1: *Public Involvement Plan Process for RM 620 feasibility study.*

Step 1: Identify

This was the first step taken to engage stakeholders on the project. The intent of this step was to gather the public's experiences with traveling along the corridor and to identify what problems should be evaluated. Small section working groups comprised of 12 to 15 members were created. These groups were instrumental for identifying problems and potential solutions along the corridor. During Step 1, gathering of existing background data, the development of a stakeholder database, and the organization of key stakeholders into section working groups occurred.

Step 2: Evaluate

Step 2 involved the evaluation of environmental constraints, crash data, and information gathered from stakeholders, traffic engineers, and traffic designers. Step 2 included meetings with stakeholders, identifying options for solving short-term problems, discussing limitations of these options, and introducing long-term solutions.

Step 3: Refine

Step 3 included the distribution of information gathered during the study and included further discussion with stakeholders. Step 3 refined short- and long-term options and worked towards possible effective solutions and presenting them to stakeholders.

Step 4: Present

Step 4 reports the results of the study and provides a list of short- and long-term proposed solutions. Step 4 includes summarizing findings and describing feasible options and is documented in this draft report.

Community Involvement

One of the most efficient methods of determining issues or concerns on existing roadways is seeking input from the individuals who use the roadway on a regular basis. Their insight is essential for pin-pointing problems, as well as developing proposed solutions. Furthermore, citizens who live in the local community along the RM 620 corridor would be most affected by any construction and improvements, and therefore need to be involved in any proposed changes. Two outreach efforts were used to gather information from the local community regarding their experience with RM 620: (1) online survey and (2) meetings with stakeholders within the local communities.

Online Survey

In order to systematically gather input, an online survey tool, SurveyMonkey, was used. SurveyMonkey allows users to create and publish their own online survey for others to complete. The survey was created specifically for users of the roadway, such as private citizens, as well as specific groups within the community that frequently rely on RM 620 for various activities. This online survey began on May 1, 2015 and was effective in gathering the opinions and concerns of those who frequently use RM 620. The online survey closed April 1, 2016. More than 3,000 surveys were received from more than 84 distinct zip codes, including 12 zip codes from outside of Texas.

Approximately 70% of the survey respondents indicated they lived along the corridor, as seen in **Figure 2.2**. The individuals that participated in the survey were hailed from 84 different zip codes (see **Figure 2.3**).

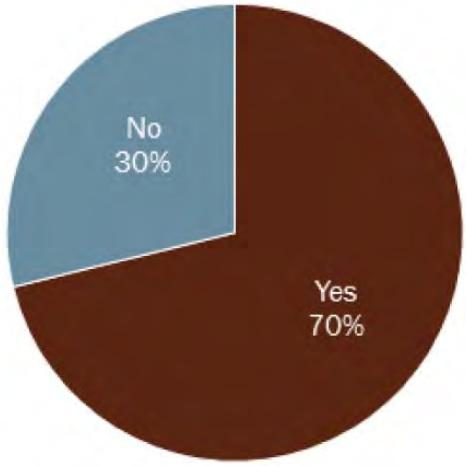


Figure 2.2: *Survey Question 15 Results, "Do you live along the RM 620 corridor?"*

All questions were related to the participant's experience with RM 620, including their daily use of RM 620, as well as how they personally believed RM 620 needed to be improved. The overall goals of these questions were to:

- Determine perceived problems on RM 620
- Assess the greatest perceived problems on RM 620
- Determine the most perceived problematic intersections
- Determine methods of transportation
- Receive input/suggestions for proposed improvements

A full list of questions can be seen in the Online Survey Results in **Appendix B**.

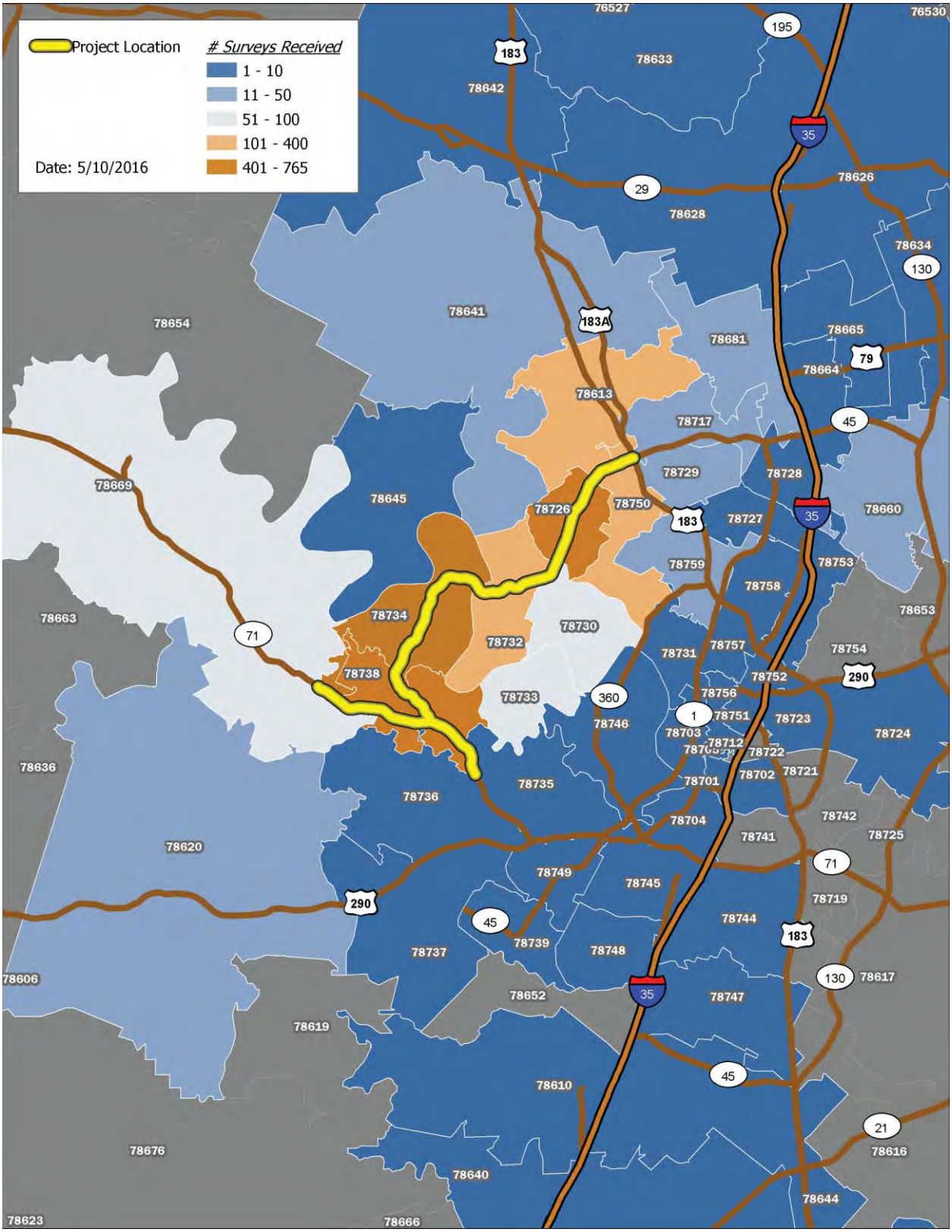


Figure 2.3: Zip Code Distribution of Respondents

As illustrated below, one question asked whether or not participants perceived a problem with traffic congestion along RM 620. Approximately 98% of participants agreed that there was a problem with traffic congestion, as seen in **Figure 2.4**.

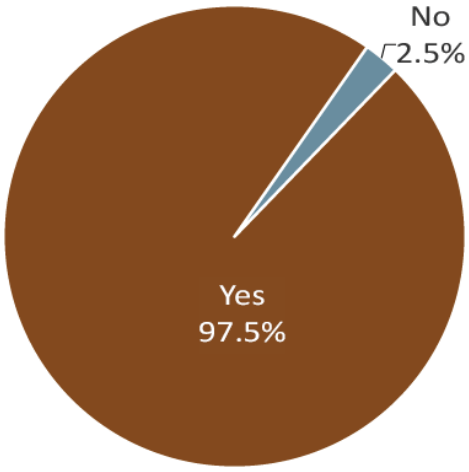


Figure 2.4: *Survey Question 7 Results, "Do you perceive a problem with RM 620 traffic congestion?"*

Participants were asked to state what transportation modes they utilized when using RM 620. Their responses can be seen in **Figure 2.5**. The vast majority of participants indicated that they drive alone when utilizing the corridor, while carpooling was a distant second.

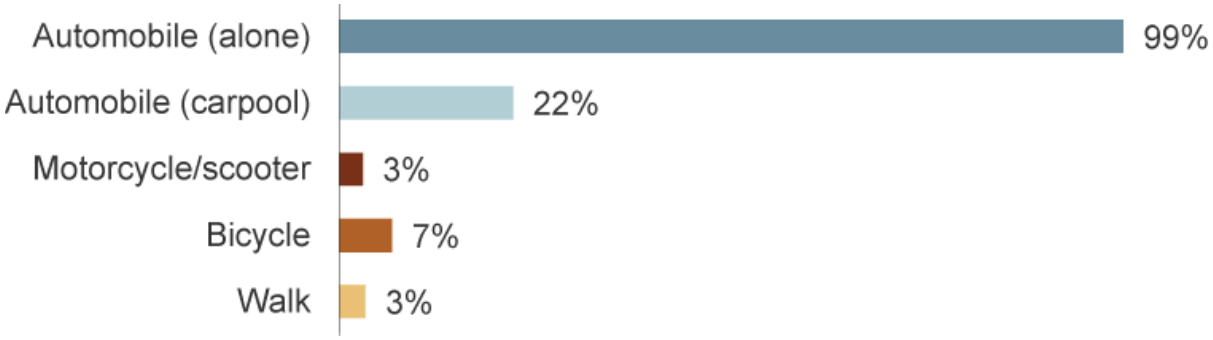


Figure 2.5*: Survey Question 2 Results, "What transportation modes do you use to travel along or across RM 620?"*

Participants were asked how often they travel along RM 620. Their responses can be seen in **Figure 2.6**. The majority of participants stated that they used RM 620 several times a day, while approximately 29% of participants stated they used RM 620 daily. Only about 11% of respondents used RM 620 on a weekly basis.

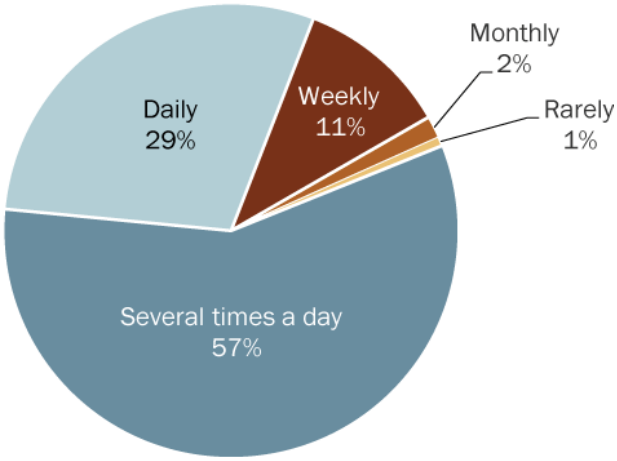


***Figure 2.6**: Survey Question 3 Results, "On average, how often do you travel on RM 620?"*

Participants were asked to list the different purposes they use RM 620. Their responses can be seen in **Figure 2.7**. Participants indicated they mainly use RM 620 while running errands, shopping, as well as visiting family and friends. Participants also indicated that RM 620 is frequently used to gain access to other roadways and for access to recreational activities.

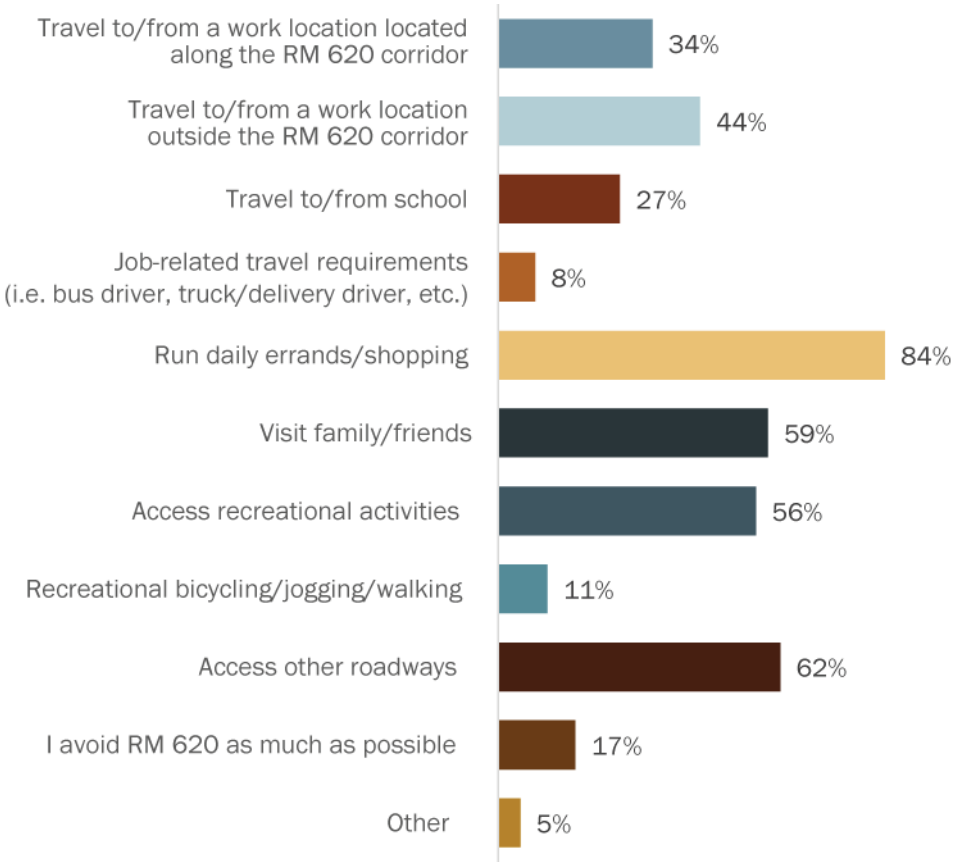


***Figure 2.7**: Survey Question 4 Results, "For what purpose do you use RM 620?"*

Participants were asked how much time they spend in traffic during the peak-hours of the day. Their responses can be seen in **Figure 2.8**. About 25% of people indicated that they spend 20 to 30 minutes waiting in traffic, while 22% spend 30 to 45 minutes waiting in traffic.

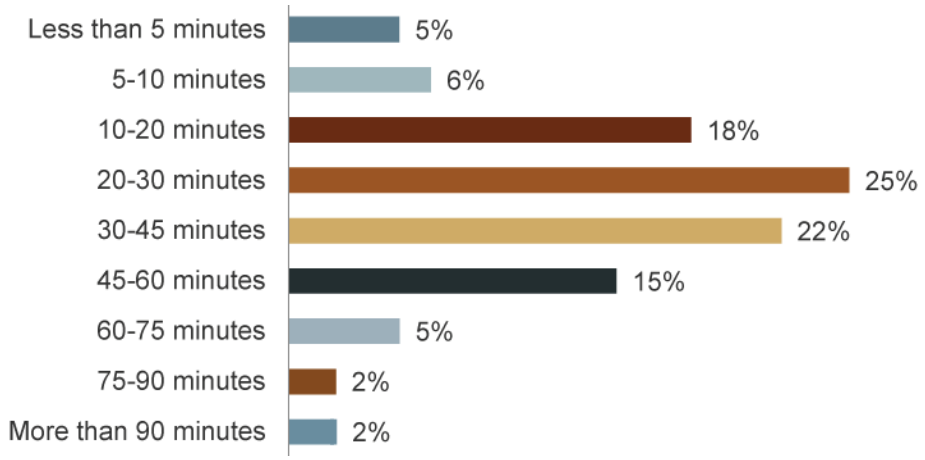


Figure 2.8: *Survey Question 5 Results, "On average, how much time do you spend on RM 620 during peak-hours of the day (i.e. morning/evening 'rush hour')?"*

Accompanying the previous question, participants were asked how many miles they travel along RM 620 during peak hours. Their responses can be seen in **Figure 2.9**. The majority of participants indicated they travel between 1-10 miles during peak hours. Only about 10% of participants traveled between 15-25 miles.

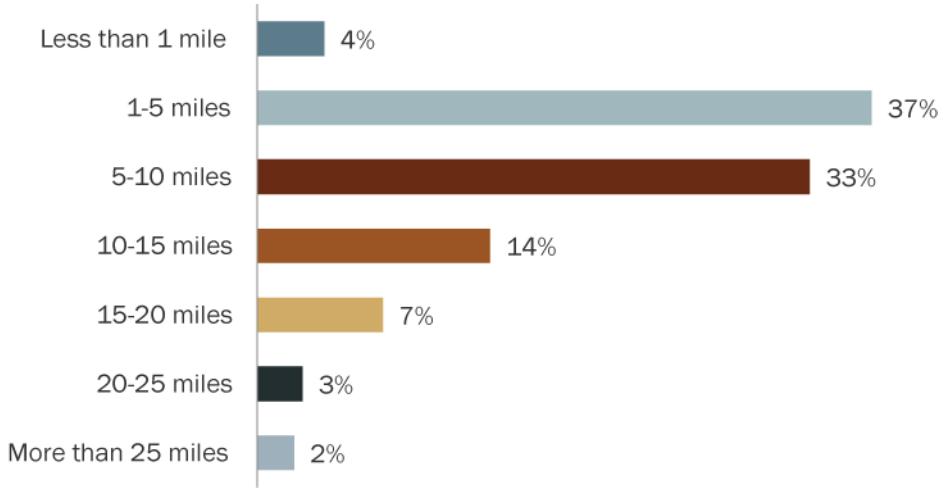


Figure 2.9: *Survey Question 6 Results, "How many miles do you travel along RM 620 during this time (average amount of time spent on RM 620 during rush hour)?"*

Participants were asked to rank problems with RM 620 from the most to the least significant (i.e. greater problems to focus on improving) to the least significant. The lower the score, the more important the issue is to the participants. Their responses can be seen in **Figure 2.10**.

According to participants, the biggest problem was the overall traffic congestion along RM 620, as well as traffic backups at specific intersections along RM 620. Traffic crashes were also identified as a significant issue. Many participants commented that law enforcement responding to a crash often causes an increase in congestion. Along with crashes, overall safety was identified as a concern. Other concerns included difficulties turning at intersections and merging, as well as traffic congestion at schools and churches.

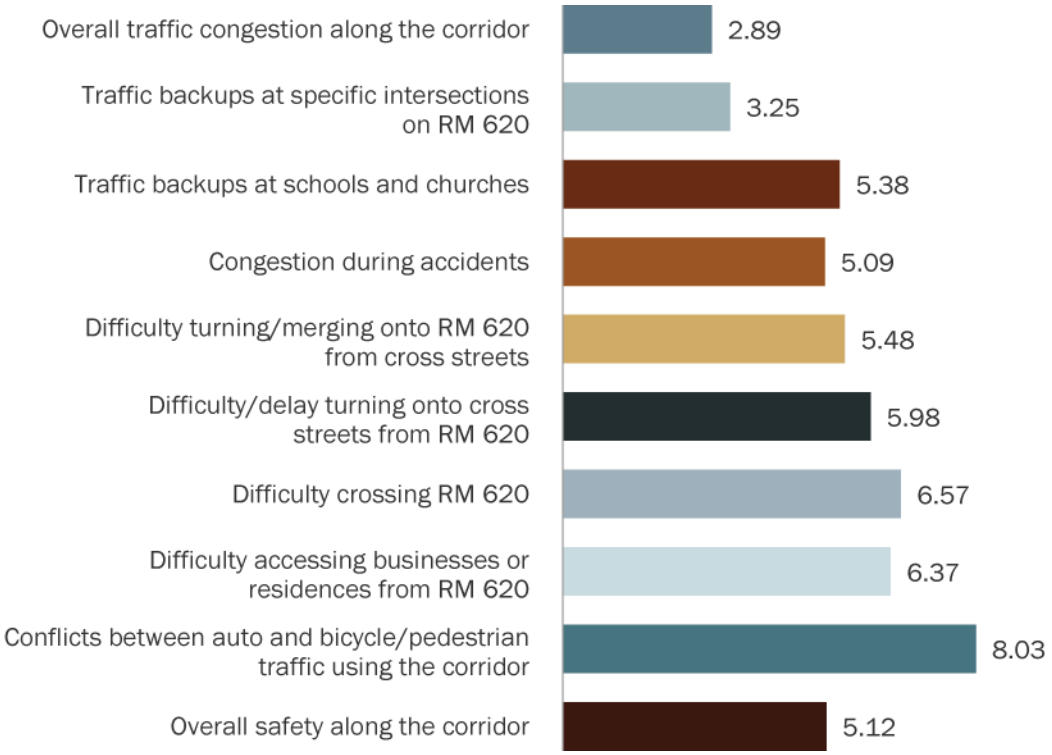


Figure 2.10: *Survey Question 8 Results, "Rank the order of each problem listed from 1 (most significant problem) to 10 (least significant problem)?"*

Participants were asked to indicate what time of day and days of the week they experienced the most significant levels of traffic congestion along RM 620. Their responses can be seen in **Figure 2.11**.

The majority of participants indicated that weekday mornings and evenings had the highest level of traffic congestion problems on RM 620. About half of participants also stated a high level of unpredictability of traffic issues when traveling on the corridor.

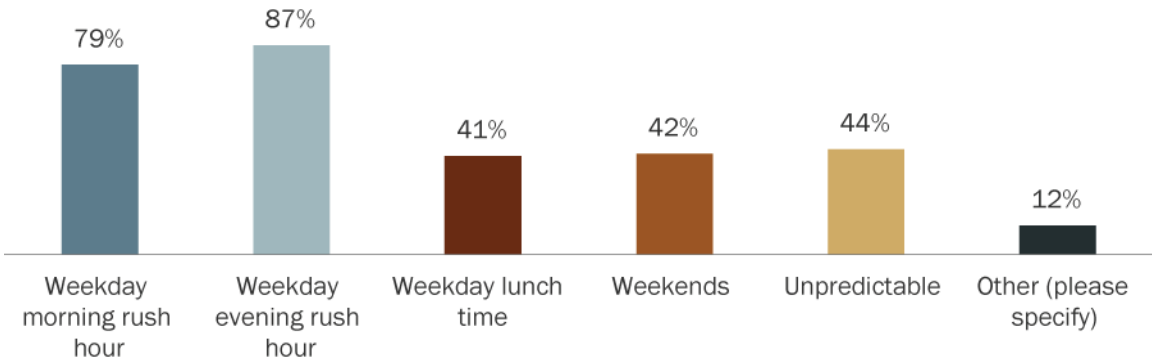


***Figure 2.11**: Survey Question 9 Results, "When do you experience significant traffic congestion problems on RM 620?"*

Participants were asked to identify at which intersections they experience the most significant mobility problems. See **Figure 2.12** for a list of the ranked intersections. The highest ranked intersections (meaning they contained the most significant traffic problems) were Bullick Hollow Road/RM 2222, Anderson Mill Road, Lohmans Crossing Road/Ameno Drive, and Bee Cave Parkway.

Participants were asked to identify which stretch of RM 620 they experience the most mobility problems. As seen in **Figure 2.13** respondents indicated that they experience the most mobility problems between SH 71 and Main Street and between RM 2222 and Anderson Mill Road. The highest mobility concerns were identified at Anderson Mill Road and RM 2222.

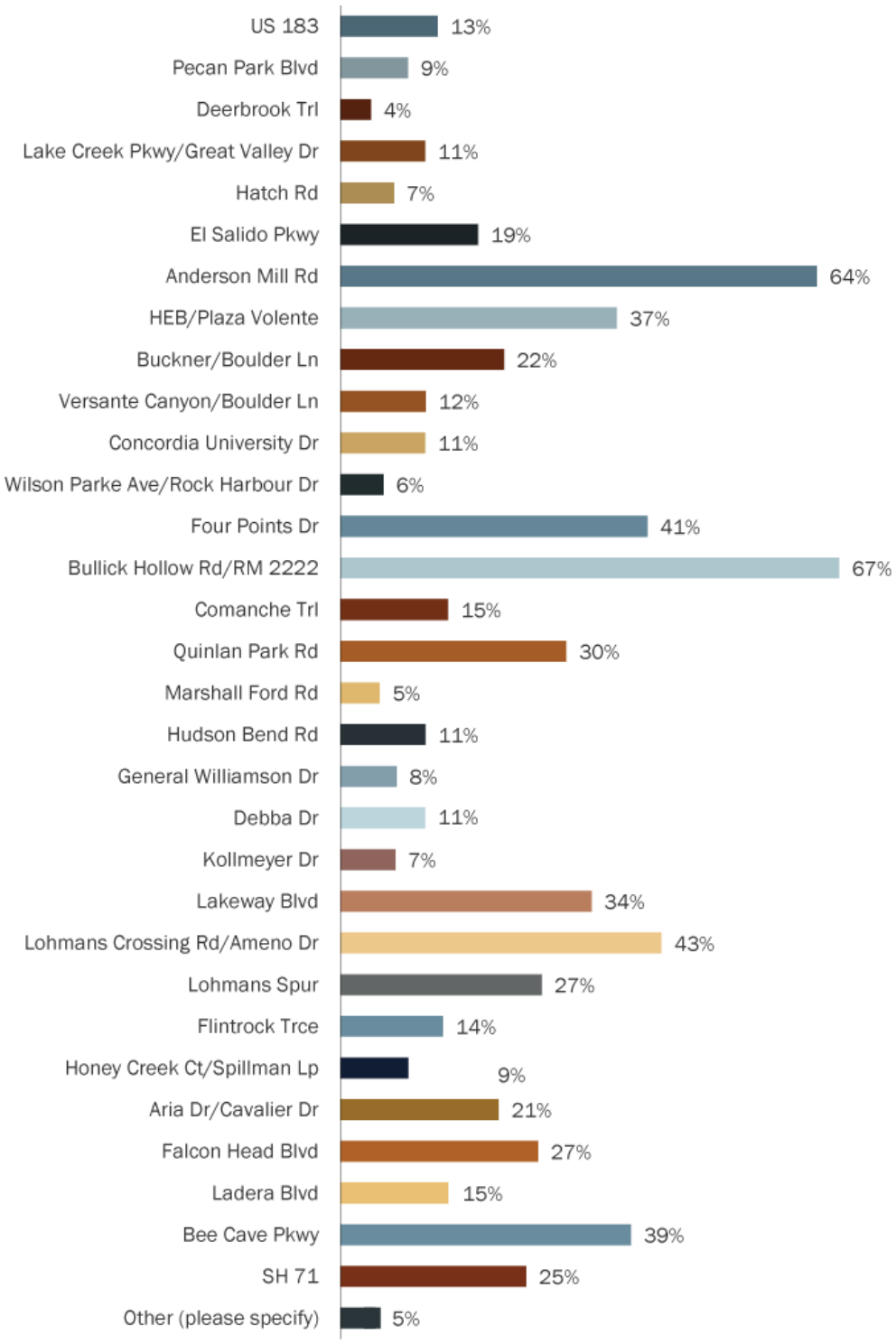


Figure 2.12: *Survey Question 10 Results, "At which intersections along RM 620 (listed from north to south) do you experience the most significant mobility problems?"*

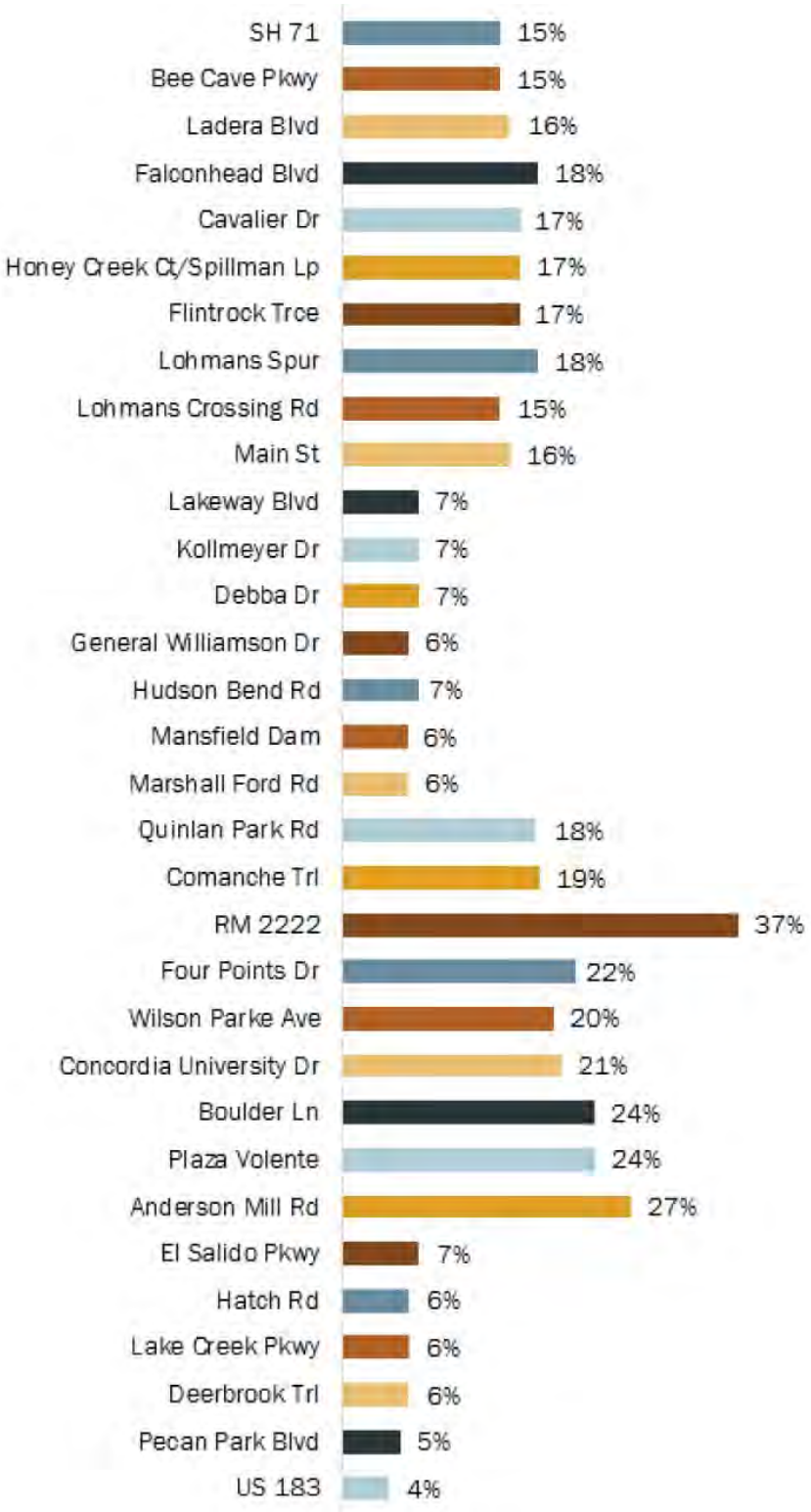


Figure 2.13: *Survey Question 11 Results, "On which stretch of RM 620 do you experience the most significant mobility problems (i.e. Anderson Mill Road to RM 2222)?"*

Participants were asked to rank the effectiveness of the proposed solutions listed for improving safety and mobility on RM 620. Their responses are seen in **Figure 2.14**. The majority of responses were evenly split between three solutions: (1) eliminating traffic signals on through-traffic by building over/underpasses at intersections, (2) adding more lanes to RM 620, and (3) improving intersections along RM 620 to reduce travel time.

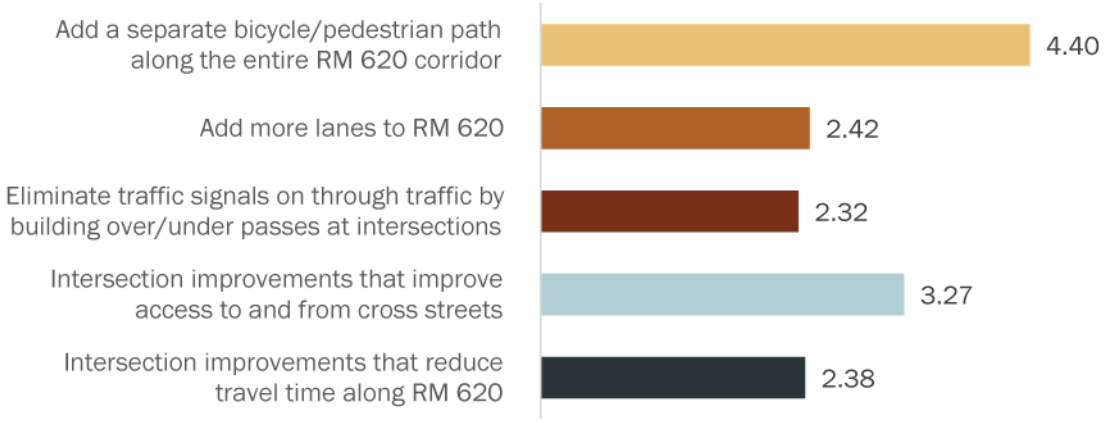


Figure 2.14: *Survey Question 12 Average Results, "Rank the effectiveness of these options for improving RM 620 safety and mobility from 1 (most effective) to 5 (least effective)."*

Participants were asked to rank (on a scale of 1 to 7) what issues they deemed most important. Their responses can be seen in **Figure 2.15**. The lower the score, the more important the issue is to the participants. The two most important issues that participants chose were related to movement and access along the corridor. The most important issue identified was providing faster, more reliable travel along the corridor area. Participants also wanted more effective methods of providing convenient access to and from locations along the corridor. Other issues that participants indicated as important were maintaining the property values, as well as the visual characteristics that make the area unique. Participants did not rank an increase in economic development, reduction of air quality, or improving safety and connectivity for bicyclists and pedestrians as top priorities for improvements.

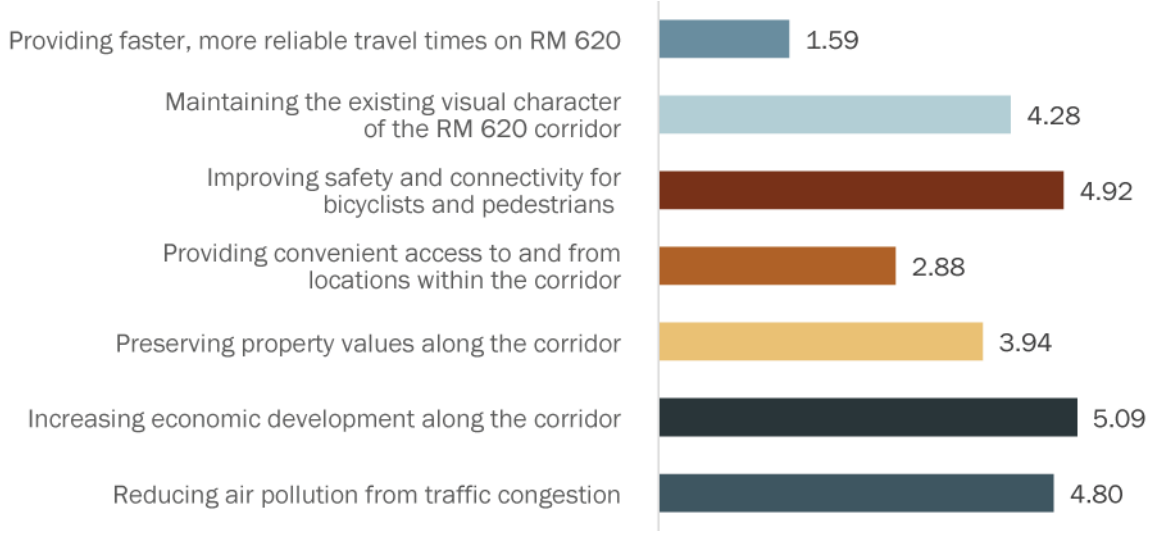


Figure 2.15: *Survey Question 13 Average Results, "Rank the importance of the following factors from 1 (most important) to 7 (least important)."*

The next question asked whether or not the participants have ever been involved in a traffic crash along the corridor. Their responses can be seen in **Figure 2.16**. Significantly, 19% of respondents claimed to have been involved in a traffic crash, frequently citing Bullick Hollow Road/RM 2222, Anderson Mill Road, and Lohmans Crossing Road/Ameno Drive as areas where the traffic crash occurred.

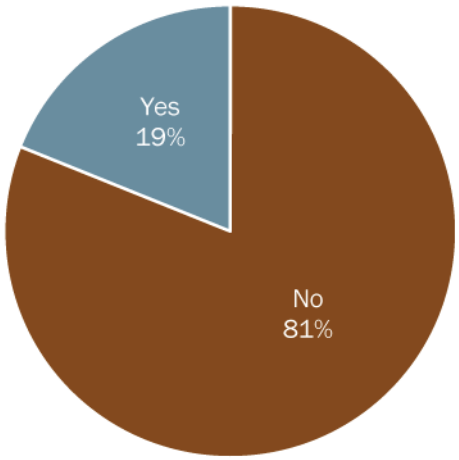


Figure 2.16: *Survey Question 14 Results, "Have you ever been involved in a traffic accident on RM 620?"*

Participants were asked to state where they live. About 30% of participants indicated that they lived outside the corridor area, while 70% of participants lived within the corridor area. Approximately 20% of participants lived in Lakeway, as seen below in **Figure 2.17**.

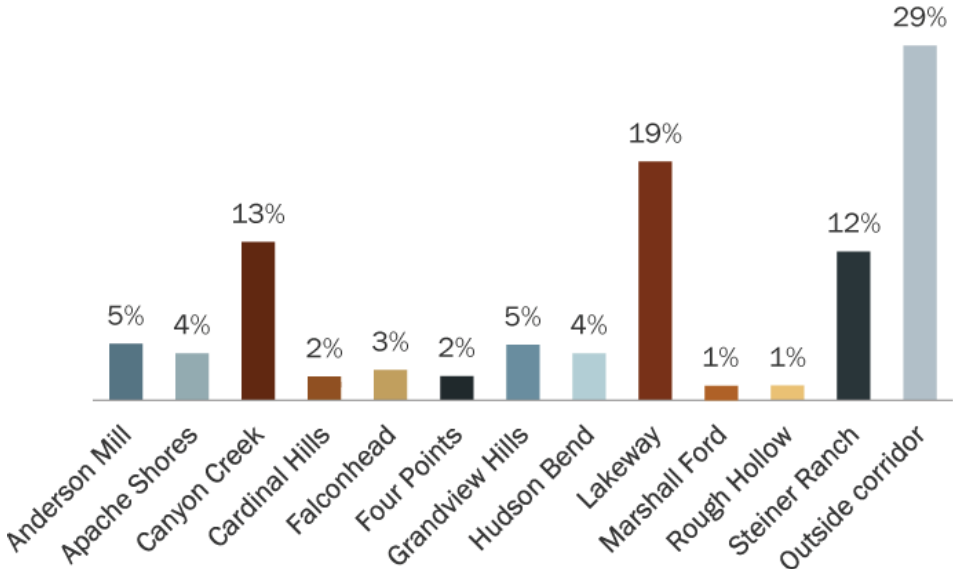


Figure 2.17: *Survey Question 16 Results, "In which neighborhood do you live?"*

Participants were asked to indicate the ways traffic along RM 620 directly impacts them. The majority of participants indicated that the traffic along RM 620 resulted in longer travel times. As seen in **Figure 2.18**, approximately 68% of the participants stated that traffic from RM 620 made it more difficult to enter and exit their community. Furthermore, participants indicated difficulties crossing RM 620 in order to get to other areas in the community, such as local businesses and schools.

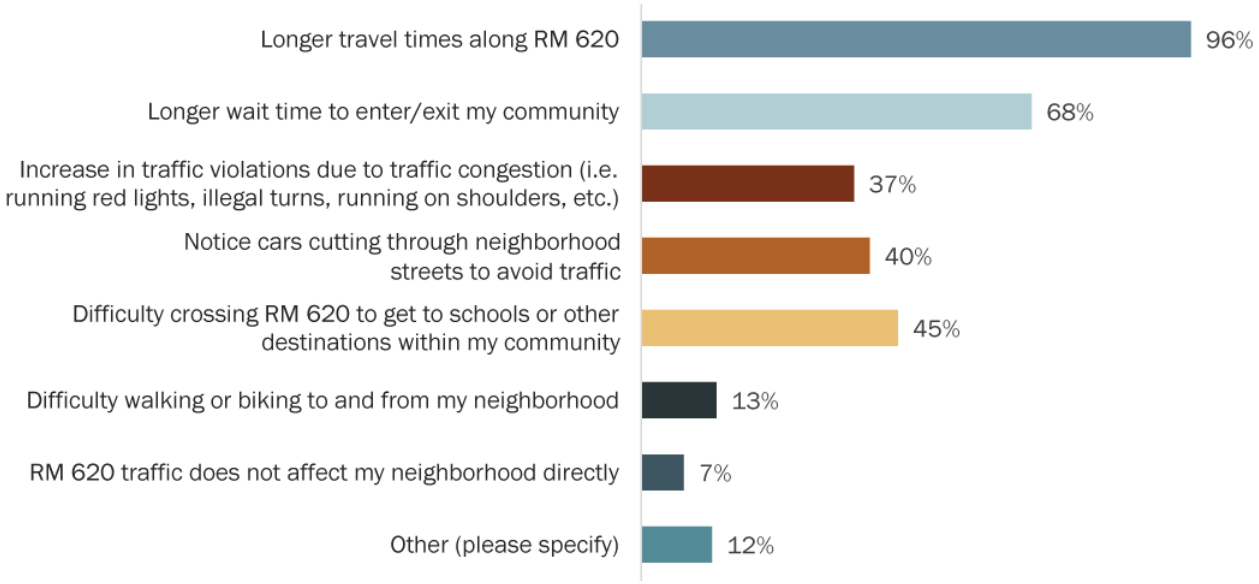


Figure 2.18: *Survey Question 17 Results, "How does the traffic on RM 620 impact you?"*

Participants were asked to provide feedback for improvements to RM 620. Their open-ended responses can be seen in **Figure 2.19**. Responses were grouped into themes. Percentages were calculated by dividing the number of responses per theme by the total number of responses.

The most preferred suggestion was synchronizing traffic signals.

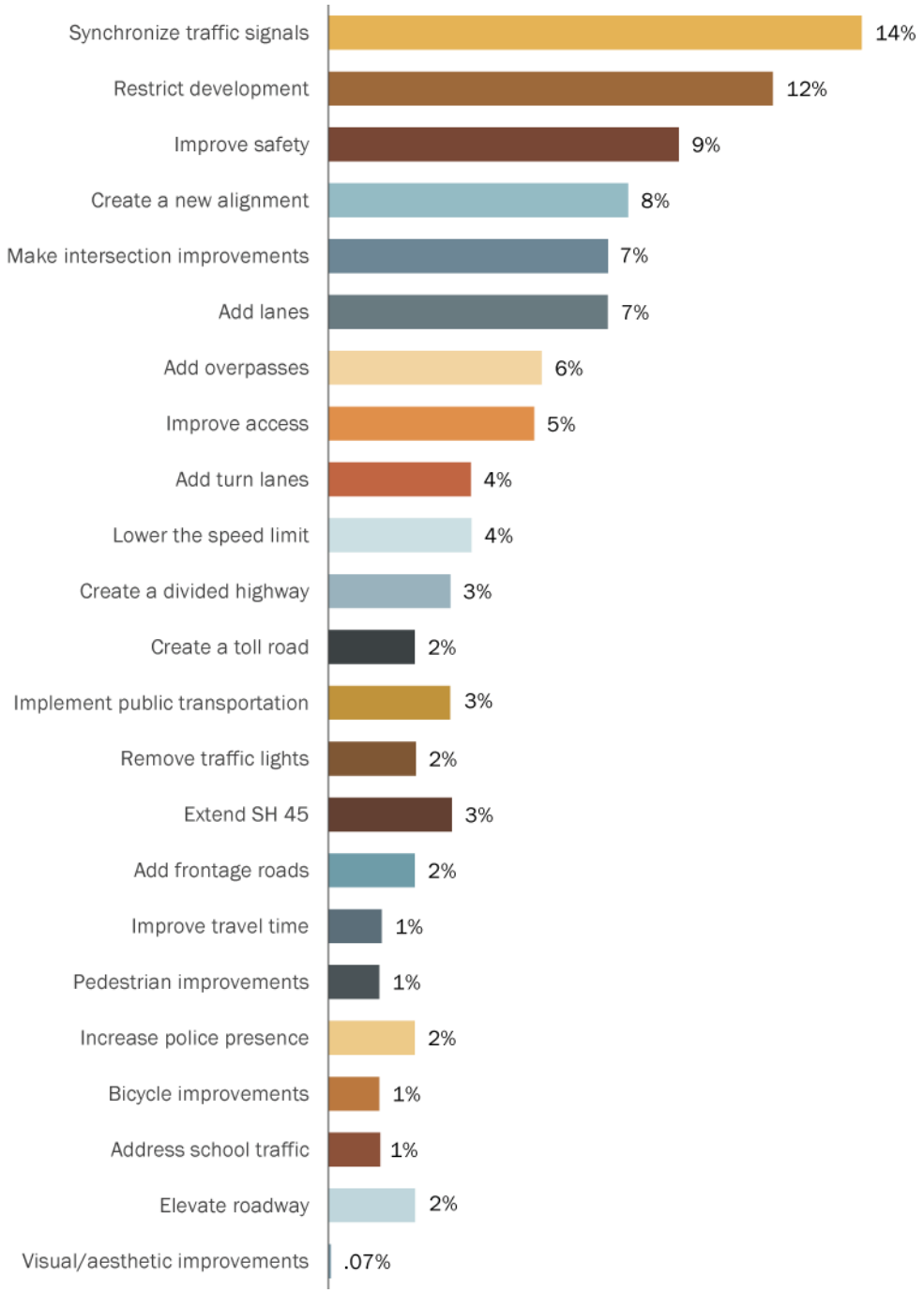


Figure 2.19: *Survey Question 19 Results, "What other feedback do you have regarding improving RM 620?"*

Stakeholder Meetings

While the online survey was effective in gathering opinions and concerns about the potential problems regarding the RM 620 study area, it was just as important to make sure the public was involved in the process. In an effort to involve and inform citizens, numerous meetings with stakeholders were held during the study. Stakeholders included neighborhood association representatives, city representatives, elected officials, business owners, school districts, and interested citizens. The job of a stakeholder was to attend specific meetings with TxDOT and speak for the constituents they represent, as well as distribute information back to their constituents. This method was used for several reasons. For one, there are many different neighborhoods that abut the project corridor. Utilizing stakeholder working groups allows each participant to pass on information to neighborhoods using methods already put in place, such as Homeowner's Association websites, meetings, etc. A preliminary list of stakeholders was identified using SurveyMonkey responses, as well as contacts with community leaders and neighborhood associations. This list was then refined.

The stakeholder meetings were organized based on geographic location within the project sections. **Table 2.1** provides the dates of the meetings, the subjects discussed, as well as the number of attendees. Meeting notes for each meeting are on file at the TxDOT Austin District office.

Table 2.1: List of Stakeholder Meetings

Date	Group	Subject	No. of Attendees
March 6, 2015	Section 6/Bee Cave	Introduction to study	14
March 24, 2015	Section 5/Lakeway	Introduction to study	15
April 10, 2015	Section 6/Bee Cave	Traffic study results and engineering details	14
April 19, 2015	Estates of Brentwood HOA	Introduction to study	36
May 26, 2015	Section 5/Lakeway	Traffic study results and engineering details	16
July 28, 2015	Section 5/Lakeway	Proposed intersection improvements and cross sections	17
August 5, 2015	City of Cedar Park	Introduction to study	7
August 14, 2015	Section 6/Bee Cave	Proposed intersection improvements and cross sections	11
August 27, 2015	Lake Travis Chamber of Commerce	Overview of project	12
September 14, 2015	RECA	Overview of project	20

Date	Group	Subject	No. of Attendees
September 22, 2015	Section 5/Lakeway	Revisiting proposed intersection improvements and cross sections	17
September 28, 2015	Section 2	Introduction to study	15
September 30, 2015	Section 3/ Steiner Ranch	Introduction to study	10
October 15, 2015	Sections 3 & 4/ Steiner Ranch, Hudson Bend, & Apache Shores	Introduction to study	11
October 16, 2015	Sections 5 & 6/ Lakeway & Bee Cave	Joint meeting to discuss proposed improvements and next steps	23
October 31, 2015	Town Hall Meeting w/ Councilmember Zimmermann	Introduction to study	30
November 4, 2015	Loop 360/RM 620 Joint Bicycle Working Group	Introduction to study and discussion on bicycle issues	14
November 12, 2015	Loop 360/RM 620 Joint Environmental Working Group	Introduction to study and discussion on environmental issues	14
November 19, 2015	Lake Travis Chamber of Commerce	Overview of project	10
December 2, 2015	Environmental Groups	Overview of project	15
December 15, 2015	Bicycle Advisory Committee	Overview of project	30
January 11, 2016	Hudson Bend	Overview of project and entry and exit discussion to Hudson Bend community	12
January 14, 2016	Leander ISD	Overview of project Feasibility Study and discussion on proposed improvements and adequate room for bus turning movements	6
January 19, 2016	Lakeway City Council	Overview of project	60
January 21, 2016	Lake Travis Chamber of Commerce	Overview of project	75

Date	Group	Subject	No. of Attendees
January 26, 2016	Bee Cave City Council	Overview of project	35
February 25, 2016	City of Austin Bike Advisory Committee	Overview of project	39
February 27, 2016	Parke HOA	Overview of project	35
March 10, 2016	Canyon Creek	Overview of project	44
April 7, 2016	Steiner Ranch Neighborhood Association	Overview of project	15
April 14, 2016	Anderson Mill Limited District	US 183 Direct Connector discussion	12
April 28, 2016	SouthStar Bank	Overview of proposed project improvements	14
May 10, 2016	Long Canyon HOA	Overview of project	45
August 17, 2016	Canyon Creek HOA	Overview of project	30

During meetings, stakeholders expressed a number of concerns, as well as potential solutions within the corridor. The most prevalent are noted below:

- Difficulty accessing the corridor from their community, or even crossing RM 620 to travel to the other side.
- Reduce the speed limit along the corridor.
- Traffic signals be more efficiently synchronized.
- Need protected turning movements at specific intersections.

These stakeholder meetings generated, input from diverse interest groups that will be taken into consideration in later stages of project development.

Chapter 3: Existing Conditions

Regional Connectivity
Land Use/Environmental Constraints
Roadway Characteristics
Railroads
Intersections
Traffic Data
Crashes
Access Management Practices
Transit
Pedestrian and Bicycle Facilities
Signage
Utilities

Regional Connectivity

RM 620 extends from SH 71 in Travis County to I-35 in Williamson County. The roadway is classified as an urban arterial roadway and provides an important link in the regional roadway network. The roadway intersects several major regional routes such as RM 2222, US 183, and SH 45N, all of which provide access into the greater Austin area. A map showing the RM 620 corridor in relation to the surrounding roadway network is shown in **Figure 3.1**. Over time, much of the RM 620 corridor has transformed from vacant ranch land to high density residential, commercial, institutional, and recreational land uses. With development, traffic volumes continue to increase, leading to declining levels of service. The rugged topography and numerous nature preserves limit the development of major mobility corridors in this part of central Texas. The limiting factor for regional connectivity is evident by the small number of roadway connections that lead into greater Austin and beyond Travis and Williamson counties. In order to ensure RM 620 continues to serve as a vital link in the regional roadway network, it is necessary to look at ways to maximize mobility along this critical corridor.

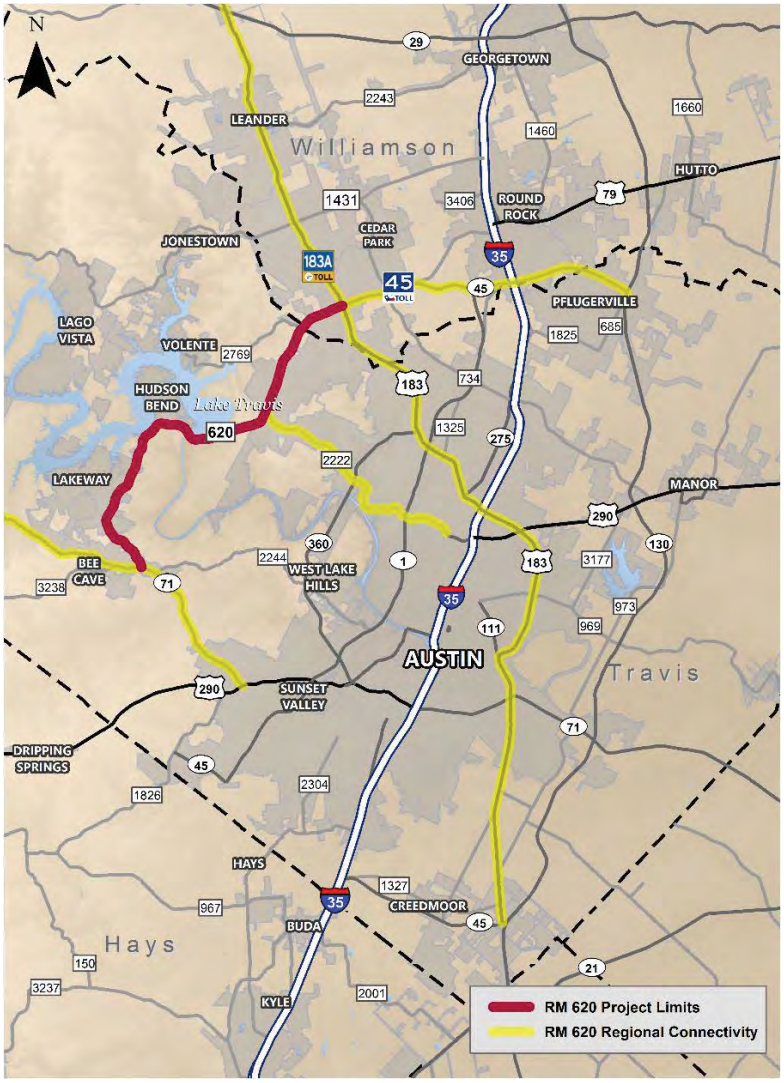


Figure 3.1: RM 620 Regional Connectivity

Land Use/Environmental Constraints

As seen in **Appendix C**, a variety of land uses exist along the RM 620 corridor. The northern and southern portions of the study area are anchored by shopping malls. Lakeline Mall is located within the northwest quadrant of the US 183/RM 620 interchange, and the Hill Country Galleria is located at the SH 71/RM 620 intersection. The majority of the study area is developed and consists of land uses ranging from single- and multi-family residential, commercial, institutional lands, and recreational properties. There are also some scattered undeveloped properties within the study area abutting the corridor. A few of the predominant landmarks within the corridor include St. Thomas More Catholic Church, Concordia University, the City of Austin Water Treatment Plant #4, Saint Luke's on the Lake, Quinlan Crossing, Lake Travis, Mansfield Dam, the Colorado River, preserve lands, parks, Hudson Bend Middle School, Lake Travis Elementary School, the Oaks at Lakeway, Lakeway Regional Medical Center, and Lake Travis High School. Adjacent land use developments within the study corridor are subject to development requirements as promulgated by local entities.

Several environmental constraints exist along and adjacent to the RM 620 corridor. These include parkland (see **Appendix D** for the locations and names of parks), Balcones Canyonlands Preserve Property, Edwards Aquifer contributing and recharge zones, and karst zones 1 and 3. In addition, RM 620 crosses several waters of the U.S., including the upper reaches of Lake Austin (Colorado River).

Publicly owned parks, recreational areas, wildlife and waterfowl refuges, and public and private historic sites are protected under Section 4(f) of the Department of Transportation Act of 1966. As such, any proposed improvements that would require the use of parkland or any other 4(f) properties would require an evaluation to determine there is no feasible and prudent avoidance alternative to the use of the property. There are no listed National Register of Historic Places properties, State Archeological Landmarks, or Registered Texas Historic Landmarks adjacent to RM 620 in the project area. There are several cemeteries located in the study area; however, only two of these are adjacent to the project corridor. For cemetery names and locations, see the RM 620 Plates located in **Appendix C**.

The project study area traverses small portions of the contributing and recharge zones of the Edwards Aquifer. Any additional impervious cover added to the facility would be assessed, and a determination would be made as to the applicability of any proposed actions as subject to the Edwards Aquifer Rules. Each of these constraints would be evaluated further if any proposed improvements are advanced.

Sections 1, 2, and 3 are located within karst zone 1, which is known to contain endangered species, specifically karst invertebrates. Any improvements in these sections would include the appropriate biological investigations to ensure compliance with the Endangered Species

Act. In addition, the surrounding area includes some areas mapped as karst zone 3, which are defined as those areas with low probability of containing endangered karst invertebrates.

If projects advanced under TxDOT's direction and oversight, those projects would be subject to National Environmental Policy Act compliance, as well as TxDOT's environmental rules and regulations.

Environmental constraints maps are included in **Appendix D**.

Roadway Characteristics

The RM 620 feasibility study extends 18.8 miles, between SH 71 and US 183. The existing typical roadway configuration generally consists of two lanes, approximately 12 feet in width in each direction with 10-foot paved shoulders. Directions of travel are separated by a center left-turn lane that is 14 feet in width. **Figure 3.2** shows the typical configuration of the existing roadway.

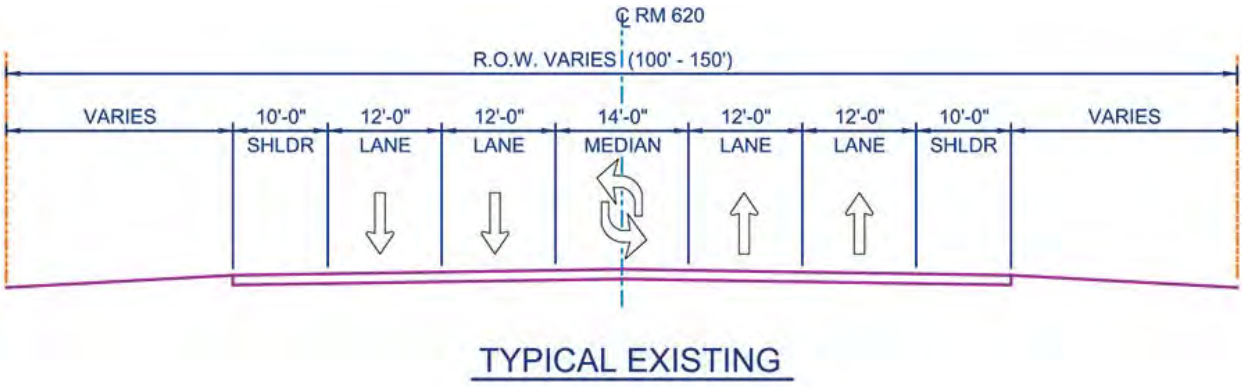


Figure 3.2: Existing Usual Typical Roadway Configuration

Within the study limits, major intersections include SH 71, Bee Cave Parkway, RM 2222, Anderson Mill Road, and US 183. There are 33 total signalized intersections along the corridor.

Railroads

No railroads are present within or adjacent to the RM 620 study area.

Intersections

Proper functioning of intersections is essential for maintaining fluid traffic movement. Intersection effectiveness depends on two factors: the lane configuration of the roadway leading up to the intersection, and signalization. Signalization can substantially determine the traffic speed on a roadway, and alteration of signal timing may sometimes be warranted if the timing is detrimental to the traffic conditions. There are 33 signalized intersections along the

corridor, as well as numerous unsignalized intersections. A full list of signalized intersections can be seen in **Table 3.2**.

Table 3.2: Signalized Intersections (South to North)

Intersections	
RM 620/SH 71	RM 620/Quinlan Park Road
RM 620/Bee Cave Parkway	RM 620/Comanche Trail
RM 620/Ladera Boulevard	RM 620/RM 2222
RM 620/Falcon Head Boulevard	RM 620/Four Points Drive
RM 620/Cavalier Drive/Aria Drive	RM 620/Wilson Parke Avenue/Rock Harbour Drive
RM 620/Spillman Ranch Loop	RM 620/Concordia University Drive
RM 620/Flintrock Trace	RM 620/Versante Circle/Boulder Lane (south)
RM 620/Lohmans Spur Road	RM 620/Buckner Road/Boulder Lane (north)
RM 620/Lohmans Crossing Road/ Ameno Drive	RM 620/H-E-B Driveway/Plaza Volente
RM 620/Main Street/ Glen Heather Drive	RM 620/Anderson Mill Road (RM 2769)
RM 620/Lakeway Boulevard	RM 620/El Salido Parkway
RM 620/Clara Van Street	RM 620/Hatch Road
RM 620/Kollmeyer Drive	RM 620/Lake Creek Parkway
RM 620/Debba Drive	RM 620/Deerbrook Trail
RM 620/General Williamson Drive	RM 620/Pecan Park Boulevard
RM620/Hudson Bend Road	RM 620/US 183
RM 620/Marshall Ford Road	

Traffic Data

Data Collection

Twenty-four-hour traffic counts were collected in March 2015 at several points along RM 620 and major cross streets (e.g., Anderson Mill Road, RM 2222). The AM peak (6:00 a.m. – 9:00 a.m.) and the PM peak (4:00 p.m. – 7:00 p.m.) period turning movement counts were conducted concurrently at the major corridor intersections (e.g., Anderson Mill Road, RM 2222, Lohmans Crossing Road/Ameno Drive). Turning movement counts collected as part of previous studies were used for the remaining signalized intersections along the corridor. In all, these counts served as the basis of the existing AM and PM peak-hour conditions traffic models.

Corridor origin-destination data was also collected over a three-weekday period in March 2015 using Bluetooth technology. The data provided information about the corridor's use

and functionality as a major regional arterial and access route to/from housing and retail developments and local businesses.

The city of Austin and TxDOT provided signal timing data for the study area intersections. TxDOT also provided crash data along the corridor for the past five years (2010 – 2015). Right-of-way information was obtained by the project team.

Information about current planned improvements to study area roadways was obtained from TxDOT and municipal sources. Capital Area Metropolitan Planning Organization's 2040 Regional Transportation Plan (CAMPO 2015) also served as a guide to proposed study area improvements.

TxDOT's average annual daily traffic volumes for years 2007 through 2013 (TxDOT 2015) were obtained at several locations in the study network. Further, CAMPO's daily traffic volume forecasts for years 2015 and 2035 (CAMPO 2010) provided projected daily traffic volume growth rate data.

Traffic Volumes

Daily traffic counts collected in the study area are shown in **Figure 3.3**. Daily vehicular traffic is highest near Anderson Mill Road and Bee Cave Parkway, but is substantial throughout the entire corridor.

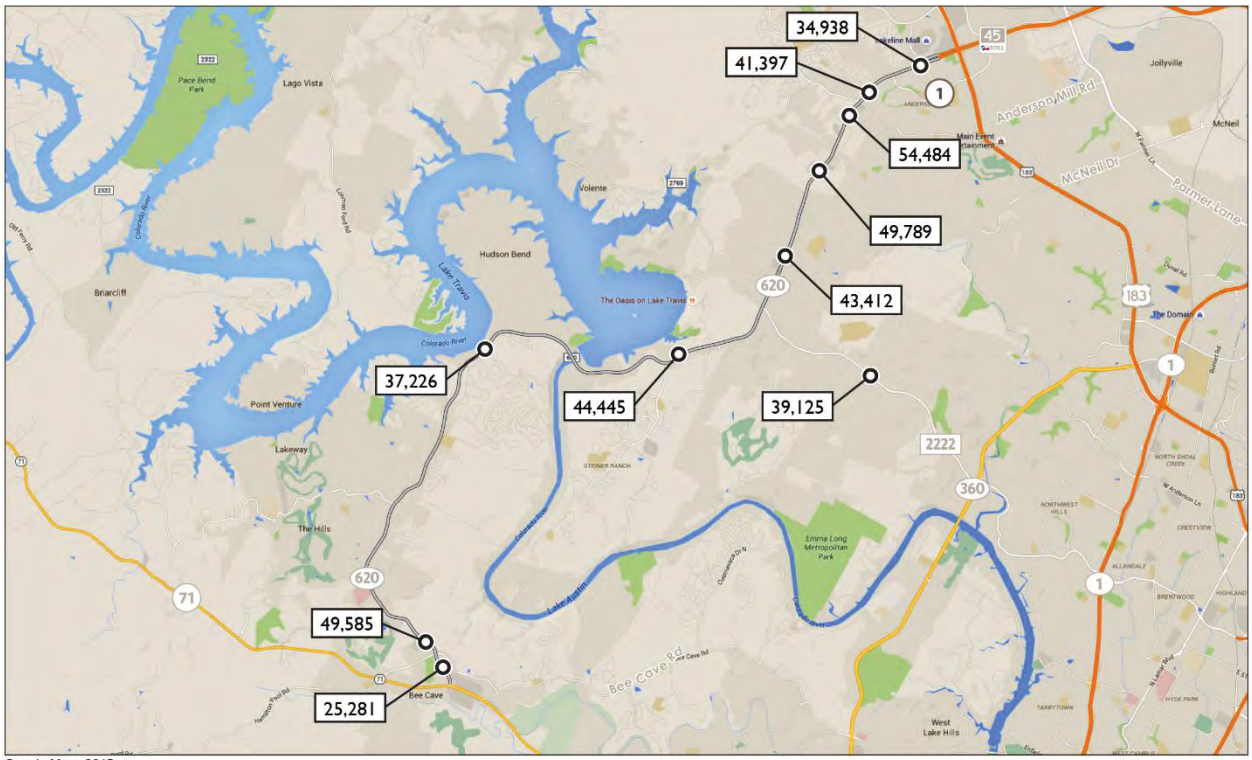


Figure 3.3: Existing daily traffic volumes collected in March 2015.

Synchro

The study area intersections were analyzed using the traffic macroscopic analysis and signal timing optimization software, Synchro. In Synchro, the collected roadway geometry, speed limit, traffic volume, and signal timing data were all incorporated to compile existing condition AM and PM peak-hour models. These models were then calibrated based on field reviews and travel times obtained from the origin-destination Bluetooth data.

Origin-Destination

Origin-destination data provided information regarding the way in which the corridor is used for daily travel. **Table 3.3** shows the origin-destination pairs for some noteworthy locations along the corridor.

Table 3.3: Origin-Destination Results

Origins	Destinations									
	RM 620, north. of Ridgeline Boulevard	Anderson Mill Road (to west)	Anderson Mill Road (to east)	RM 2222	Lakeway Boulevard	Lohmans Crossing Road	SH 71 (west of Bee Cave Parkway)	SH 71 (north of Southwest Parkway)	RM 2244 (northeast of Bee Cave Parkway)	Other
RM 620, north of Ridgeline Boulevard	-	13%	13%	3%	6%	2%	2%	1%	1%	59%
Anderson Mill Road, west of RM 620	23%	-	46%	5%	2%	0%	0%	1%	0%	23%
Anderson Mill Road, east of RM 620	12%	27%	-	2%	3%	0%	0%	1%	0%	55%
RM 2222	5%	3%	3%	-	7%	2%	1%	1%	1%	77%
SH 71, west of Bee Cave Parkway	3%	0%	0%	1%	3%	1%	-	55%	19%	28%
SH 71, south of Southwest Parkway	1%	0%	0%	0%	4%	4%	29%	-	9%	53%

Intersection Level of Service

Level of service (LOS) is a qualitative measure of operating conditions at an intersection and is directly related to vehicle delay at intersections, as shown in **Table 3.4**. LOS is given a letter designation ranging from A to F (free flow to heavily congested), with LOS D generally being the limit of acceptable operation. For example, LOS can be related to the grading scale of a report card: A = excellent, B = good, C = average, D = below average, E = needs improvement, and F = not performing. Utilizing the intersection vehicle delays reported by Synchro, LOS was determined for intersections within the study area network.

Table 3.4: Level of Service Definitions for Intersections

LOS	Control Delay (sec/veh)	Description (Signalized)
A	≤ 10.0	Very low vehicle delays, short cycle length/exceptionally favorable signal progression
B	10.1 to 20.0	Low vehicle delays, short cycle length/highly favorable signal progression, more vehicular stops than LOS A
C	20.1 to 35.0	Favorable signal progression/moderate cycle length, potential cycle failures, significant number of vehicular stops
D	35.1 to 55.0	Ineffective signal progression, long cycle length, many vehicular stops, noticeable cycle failures
E	55.1 to 80.0	Ineffective signal progression, long cycle length, frequent cycle failures
F	>80.0	Poor signal progression, long cycle length, cycle failures during most cycles

Source: Highway Capacity Manual 2010, *Transportation Research Board, 2010*

Table 3.5 provides the existing conditions (2015) AM and PM peak-hour average vehicular delay at the signalized intersections along the RM 620 corridor, and at several adjacent signalized intersections along RM 2222. The LOS associated with each amount of delay is also provided.

Table 3.5: Existing Conditions AM and PM Peak-Hour Signalized Intersection Performance

RM 620 Intersection	2015 AM Peak		2015 PM Peak	
	Delay/Vehicle (sec)	LOS	Delay/Vehicle (sec)	LOS
Section 1				
Pecan Park Boulevard (westbound)	20.4	C	25.1	C
Pecan Park Boulevard (eastbond)	16.0	B	29.2	C
Deerbrook Trail	8.8	A	8.8	A
Great Valley Drive/ Lake Creek Parkway	29.8	C	36.4	D
Hatch Road	18.1	B	10.5	B
El Salido Parkway	50.2	D	45.1	D
Anderson Road Mill (RM 2769)	92.6	F	94.4	F
Section 2				
H-E-B Driveway/Plaza Volente	18.3	B	55.9	E
Buckner Road/Boulder Lane (north)	41.3	D	69.4	E
Versante Circle/ Boulder Lane (south)	21.8	C	51.6	D
Concordia University Drive	10.5	B	38.1	D
Wilson Parke Avenue/ Rock Harbour Drive	24.7	C	17.3	B
Four Points Drive	10.0	A	32.3	C
Section 3				
Bullick Hollow Road/ RM 2222	165.2	F	182.0	F
River Place Drive (RM 2222)	109.4	F	48.3	D
Sitio Del Rio Boulevard (RM 2222)	61.1	E	5.7	A
McNeil Drive (RM 2222)	33.0	C	32.1	C
Comanche Trail	74.4	E	37.4	D
Quinlan Park Road	25.8	C	40.7	D
Marshall Ford Road	12.8	B	15.9	B
Section 4				

RM 620 Intersection	2015 AM Peak		2015 PM Peak	
	Delay/Vehicle (sec)	LOS	Delay/Vehicle (sec)	LOS
Hudson Bend Road	22.5	C	39.2	D
General Williamson Drive	15.7	B	13.7	B
Section 5				
Debba Drive	107.3	F	62.0	E
Kollmeyer Drive	16.9	B	10.7	B
Lakeway Boulevard	25.5	C	30.1	C
Lohmans Crossing Road/ Ameno Drive	58.5	E	93.3	F
Lohmans Spur Road	19.6	B	18.5	B
Flint Rock Road	18.7	B	18.1	B
Spillman Loop/Honey Creek Court	35.2	D	9.5	A
CavalierDrive/Aria Drive	91.4	F	30.5	C
Section 6				
Falcon Head Boulevard	24.0	C	24.9	C
Ladera Boulevard	15.9	B	23.5	C
Bee Cave Parkway	71.3	E	60.3	E
SH 71	31.2	C	43.4	D

Field Observations

During the AM peak period, traffic congestion reflects the predominant travel pattern toward central Austin. RM 620 experiences heavy traffic congestion in both directions of travel at RM 2222. To the north, the Anderson Mill Road intersection serves as a chokepoint. In the south section in Lakeway and Bee Cave, the Lohmans Crossing Road/Ameno Drive and Bee Cave Parkway intersections experience substantial vehicle queuing, and Lake Travis High School-related traffic contributes to congestion near Cavalier Drive/Aria Drive.

During the PM peak period, traffic congestion reflects the predominant travel pattern away from central Austin. Queuing along northbound RM 620 extends a substantial distance from Anderson Mill Road. At RM 2222, northbound RM 620 and westbound RM 2222 are both heavy movements. To the south, northbound RM 620 is slow through Bee Cave and Lakeway, and westbound Bee Cave Parkway experiences long queues as it approaches RM 620.

Crashes

Crash data provided by TxDOT was summarized for the period between January 2010 and March 2015. Of more than 1,900 crashes along RM 620 during that time period, six crashes involved fatalities. **Table 3.6** through **Table 3.8** summarize the crashes by RM 620 section, year, and type.

Table 3.6: Crashes by Section (January 2010 – March 2015)

Section	Total Crashes (number)
1	305
2	398
3	285
4	173
5	556
6	191

Table 3.7: Crashes by Year (January 2010 – March 2015)

Year	Total Crashes (number)
2010	346
2011	316
2012	361
2013	408
2014	361
2015 (partial)	116

Table 3.8: Crashes by Type (January 2010 – March 2015)

Type	Total Crashes (number)
Angle	659
Head-on	46
Single vehicle	272
Backing	7
Sideswipe	112
Rear-end	812

Figure 3.4 shows the crashes at the major intersections along the corridor.

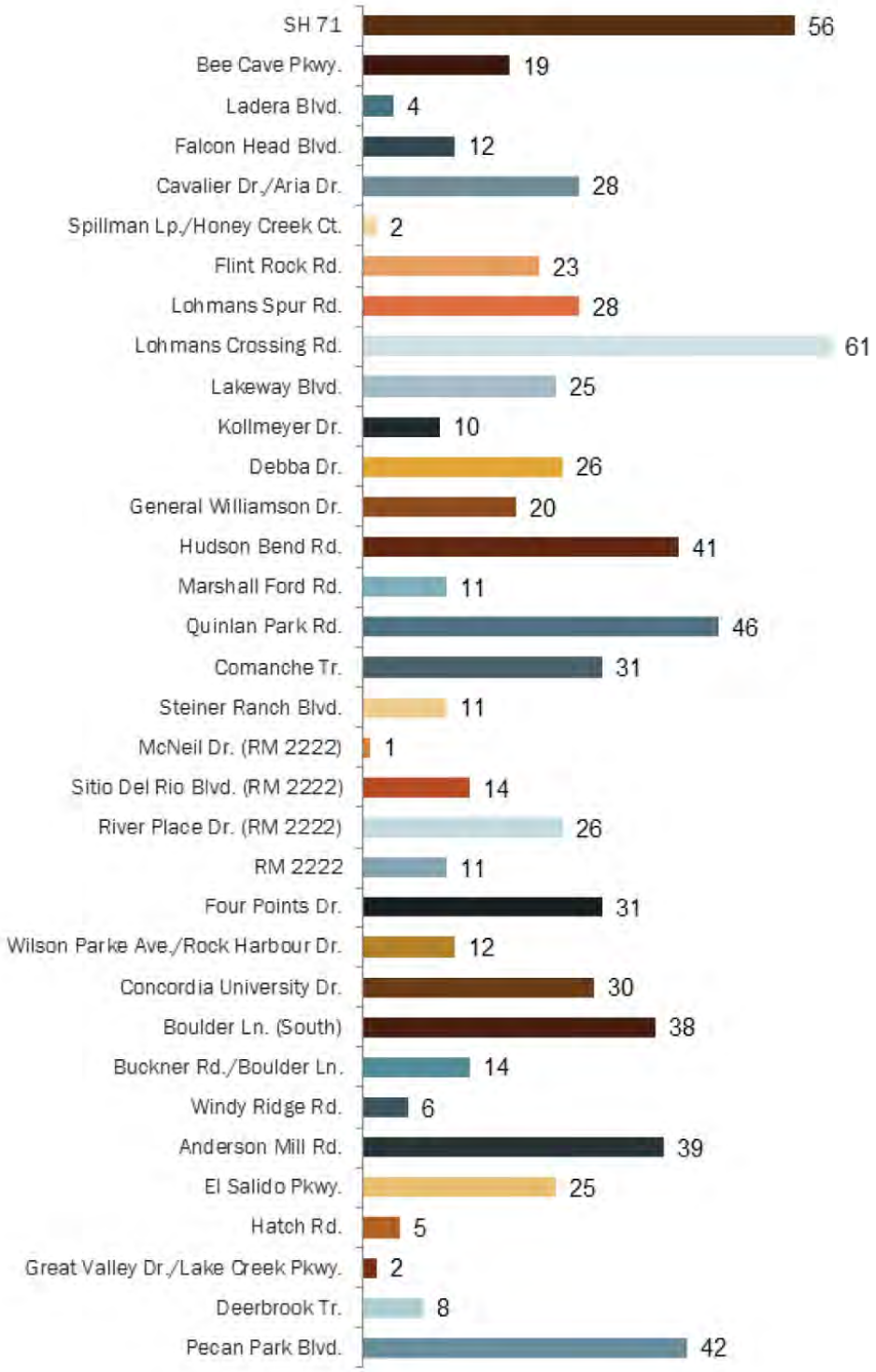


Figure 3.4: Crashes by intersection (January 2010 - March 2015).

Access Management Practices

TxDOT requires specific spacing between roadway connections in metropolitan areas that is dependent on the speed limit of the highway. On RM 620, along which the speed limit is greater than or equal to 50 miles per hour throughout the study area, TxDOT requires the minimum spacing to be 425 feet between connections. Throughout the corridor, there are numerous driveways and cross streets that intersect RM 620, many spaced significantly closer than the required minimum of 425 feet. Some of these driveways are designed with center islands to allow only right-turn movements to enter and exit, but many are full-purpose. Even those driveways designated as right in/out are frequently ignored by drivers who make illegal left turns in and out of driveways causing a serious safety problem. The existing continuous left-turn lane runs down the center of the entire RM 620 corridor. It is heavily used, but provides little opportunity for turning movements. It also used as an acceleration/deceleration lane, which frequently leads to conflicting uses and a growing number of crashes.

Transit

Alternative forms of transportation are important for a number of reasons, including the reduction of vehicle traffic along the roadways. Therefore, public transit services are important factors to consider when examining methods of improving the roadway and decreasing traffic congestion. Currently there are two proposed projects in the CAMPO 2040 Metropolitan Transportation Plan. One includes implementing express bus service along RM 2222 from RM 620 to Martin Luther King Boulevard, and the other includes constructing a transit center or a park and ride center near the RM 2222 and RM 620 intersection.

Pedestrian and Bicycle Facilities

It is TxDOT's policy to proactively plan, design, and construct roadways to safely accommodate bicyclists and pedestrians. Currently, pedestrians are accommodated through use of existing shoulders and crosswalks, or on separate sidewalks or bike paths/lanes outside of the existing right-of-way. There are five locations where bicycle lanes have been designated on the existing roadway. The locations are listed below:

- South of Boulder Lane and extends south to just past Rock Harbour Drive
- Just north of Clara Van Street and extends north to Nightingale Lane
- Lohmans Spur south to Spillman Lane
- South of Spillman Lane south to Cavalier Drive/Aria Drive
- Just north and just south of Bee Cave Parkway

With the exception of a few designated pedestrian crossings and bicycle lanes, shoulders along RM 620 are the only places available for bicyclists and pedestrians to use. Existing shoulder widths on RM 620 vary from four to eight feet in certain locations, but are usually 10 feet throughout the length of the study area. Based on the *Texas Transportation Institute*

Pedestrian and Bicycle Accommodation State Roadways in Bee Cave and Lakeway Existing Conditions and Recommendations 2010 report, "the wide shoulders on RM 2244 and RM 620 are adequate for more experienced bicyclists to ride."

Furthermore, 71% of locals who participated in the 2010 study stated that they do not feel safe using the existing bicycle and pedestrian accommodations along RM 620, with 63% claiming they actively avoid walking and cycling because of their safety concerns. However, in the recent survey conducted by TxDOT in 2015, approximately 9% of participants travel along RM 620 by bicycle and/or by walking. When asked to rank the problems regarding RM 620, participants rated "conflicts between auto and bicycle/pedestrian traffic using the corridor" the lowest, meaning that it was rated as the lowest priority. Pedestrians also use these roadways. There are several local schools located within the project limits, such as Lake Travis High School. People often walk along the shoulder of RM 620, especially right after school and during sporting events. All future improvements to RM 620 that are programmed and funded would adhere to TxDOT's bicycle and pedestrian accommodation policy.

Signage

Signage is used to assist motorists while they drive along roadways. For example, signage can be used to guide drivers to local areas of interest, direct traffic to major highways, designate jurisdictional boundaries, display speed limits, and reinforce driving laws (i.e. "left lane for passing only"). Because of the significance that different signs have for helping drivers safely navigate, it is important that these signs be consistent, as well as non-conflicting. Signage along RM 620 is consistent and includes street signs at intersections, as well as signs indicating the upcoming street at the next intersection.

Utilities

It is common practice for utility companies to place their utility lines underground along or across the right-of-way of existing roadways. Utility lines, including electrical distribution, transmission pipelines, water lines, gas lines, telephone lines, fiber optic lines, and wastewater, are often present near roadways. The presence of utility lines along the RM 620 right-of-way is an important factor that must be taken into consideration during the planning phase of any improvements to RM 620 due to the potential costs associated with relocating these types of utilities.

Chapter 4: Future Conditions

Methodology
Existing Conditions
No-Build
Short-Term Conditions - No-Build
Short-Term Conditions - Build
Mid-Term Conditions - No-Build
Mid-Term Conditions - Build
Long-Term Conditions -(2035) - Build

Methodology

As part of the feasibility study, the following scenarios were analyzed using Synchro 9, a traffic analysis software based on the methodologies contained in the Highway Capacity Manual, for both AM and PM peak-hour time periods:

- Existing conditions (2015)
- Short-term conditions (2020)
  - No-build
  - Build (with short-term improvements)
- Mid-term conditions (2035)
  - No-build
  - Build (with mid-term improvements)
- Long-term conditions (2035)
  - Build Option A (possible elevated lanes) and other long-term improvements

Traffic Volume Forecasting

Peak-hour traffic forecasts for the RM 620 corridor were developed by applying growth rates to the existing AM and PM peak-hour intersection turning movement counts. The growth rates were based on previously developed year 2020 traffic volume projections and daily traffic volume forecasts from TxDOT and CAMPO. Daily traffic volume projections developed by TxDOT and CAMPO show average annual growth rates that vary from 2.1 percent near Anderson Mill Road to 1.8 percent north of Bee Cave Parkway through 2035. For comparison, CAMPO projects average annual daily traffic volume growth rates of 1.4 percent along SH 71, west of RM 620, and of 1.3 percent along US 183, south of RM 620, through 2035.

Based on the CAMPO and TxDOT projections, along with previous year daily traffic comparisons, a two percent annual growth rate was projected between 2015 and both project analysis years (2020 and 2035) for most of the corridor. This results in an overall growth of 10 percent between 2015 and 2020 and an overall 49 percent growth between 2015 and 2035.

For the portion of the corridor in the vicinity of RM 2222 (between Wilson Parke Avenue/Rock Harbour Drive and Marshall Ford Road), an area peak-hour annual growth rate of two percent between 2015 and 2020 was previously developed. This level of peak-hour traffic growth is forecasted to continue through 2025. Between 2025 and 2035, a leveling-off effect due to capacity constraints along RM 620 and RM 2222 was also projected. As a result, peak-hour traffic volumes are projected to increase at an annual rate of one percent between 2025 and 2035. Between 2015 and 2035, this results in a 35 percent overall

growth in peak-hour traffic volume. In this scenario, peak-hour traffic volumes continue to spread earlier/later in time such that the "peak-hour" extends for several hours each during the morning and afternoon.

Existing Conditions

Year 2020 traffic volume forecasts were incorporated for the no-build conditions (2020) analysis.

General Characteristics

The no-build option leaves the existing number of mainlanes and turning lanes at intersections at the current configuration. Development in the area will add new residential and commercial driveways and intersections along the corridor.

Construction Cost

The construction cost would be zero dollars. Therefore, the least expensive option is the no-build option.

Construction Time

The construction time would be zero years for the no-build option.

Construction Disruption

There would be no construction disruption for the no-build option.

Community Impacts

The no-build option could have negative community impacts due to time lost traveling to and from all work and personal activities, and increased frustration with TxDOT and local municipalities to resolve their concerns with congestion, high crash rates, and difficult access to properties.

Environmental Impacts

There would be minimal negative environmental impacts for the no-build option. Increased traffic congestion would be anticipated.

Drainage Impacts

With no construction for the no-build option, the drainage patterns would remain the same along RM 620. Therefore, there would be no drainage impacts.

Right-of-way Impacts

With no construction for the no-build option, the right-of-way would remain the same along RM 620. Therefore, there would be no right-of-way impacts.

Mobility Benefits

The no-build option would not allow for any mobility benefits. Roadway users would experience increased travel time to and from all work and personal activities. Accessing properties would be increasingly difficult.

Safety Benefits

The no-build option would not allow for any safety benefits. The center two-way left-turn lane has already begun to show signs of exceeding its usefulness with increased head-on collisions. Roadway users could potentially be involved in more crashes that involve access to and from properties due to fewer acceptable gaps in the opposing traffic stream, resulting in some drivers taking unnecessary chances.

Short-Term Conditions – No-Build

For the short-term conditions (2020) analysis, year 2020 traffic volume forecasts and projected roadway geometric improvements by TxDOT and others were used. The signal timing parameters (cycle lengths, splits, offsets, etc.) were optimized using Synchro. **Table 4.1** provides the list of roadway improvements assumed to be in place by 2020 along with the AM and PM peak-hour intersection delays and LOS.

Table 4.1: Short-Term No-Build Conditions (2020) Roadway Improvements and Intersection Delays/LOS

Intersection	Proposed Improvements	2020 AM Peak-Hour		2020 PM Peak-Hour	
		Delay/ Veh (sec)	LOS	Delay/ Veh (sec)	LOS
Section 1					
Pecan Park Boulevard (westbound)		19.8	B	32.7	C
Pecan Park Boulevard (eastbound)		12.3	B	23.6	C
Deerbrook Trail		12.3	B	5.8	A
Great Valley Drive/ Lake Creek Parkway		17.7	B	29.7	C
Hatch Road		12.2	B	17.0	B
El Salido Parkway		49.6	D	45.5	D
Anderson Mill Road (RM 2769)		114.5	F	119.9	F
H-E-B Driveway		16.0	B	45.1	D
Section 2					
Buckner Road/		50.3	D	57.8	E

Intersection	Proposed Improvements	2020 AM Peak-Hour		2020 PM Peak-Hour	
		Delay/ Veh (sec)	LOS	Delay/ Veh (sec)	LOS
Boulder Lane					
Boulder Lane (south)		31.5	C	49.9	D
Concordia University Drive		7.9	A	38.0	D
Wilson Parke Avenue/ Rock Harbour Drive		18.6	B	19.7	B
Four Points Drive		9.7	A	26.4	C
Section 3	• Construct connector road to bypass RM 620 and RM 2222 intersection • Widen RM 2222 to six lanes between proposed connector road and McNeil Drive				
Bullick Hollow Road/ RM 2222	• Re-stripe Bullick Hollow Road/RM 2222 approaches and convert from split-phasing to protected left-turn phasing	68.6	E	101.3	F
River Place Drive (RM 2222)		32.9	C	32.4	C
Sitio Del Rio Boulevard (RM 2222)		12.9	B	7.3	A
McNeil Drive (RM 2222)	• Construct dual eastbound left-turn (RM 620) bays • Re-stripe southbound (McNeil Drive) approach to add left-turn/right-turn lane	31.6	C	15.8	B
Comanche Trail		21.7	C	29.2	C
Quinlan Park Road		31.9	C	39.2	D
Marshall Ford Road		10.6	B	10.6	B
Section 4					
Hudson Bend Road		22.0	C	31.8	C

Intersection	Proposed Improvements	2020 AM Peak-Hour		2020 PM Peak-Hour	
		Delay/ Veh (sec)	LOS	Delay/ Veh (sec)	LOS
General Williamson Drive		16.8	B	5.1	A
Section 5	• Construct southbound (RM 620) auxiliary lane between Lohmans Crossing Road and Spillman Loop				
Debba Drive		55.5	E	21.7	C
Kollmeyer Drive		14.3	B	6.9	A
Lakeway Boulevard		29.4	C	28.2	C
Lohmans Crossing Road/ Ameno Drive		30.5	C	67.4	E
Lohmans Spur Road		9.5	A	9.7	A
Flint Rock Road		25.0	C	17.1	B
Spillman Loop/ Honey Creek Ct.		23.4	C	3.5	A
Cavalier Drive/Aria Drive		85.2	F	28.9	C
Section 6					
Falcon Head Boulevard	• Construct dual northbound left-turn (RM 620) bays • Construct dual eastbound left-turn (Falcon Head Boulevard) bays • Construct southbound right-turn (RM 620) bay	12.9	B	16.3	B
Ladera Boulevard	• Construct dual eastbound left-turn (Ladera Boulevard) bays • Stripe southbound right-turn (RM 620) bay	4.5	A	11.8	B

Intersection	Proposed Improvements	2020 AM Peak-Hour		2020 PM Peak-Hour	
		Delay/ Veh (sec)	LOS	Delay/ Veh (sec)	LOS
Bee Cave Parkway	• Construct exclusive dual westbound right-turn (Bee Cave Parkway) lanes	60.9	E	40.6	D
SH 71	• Re-stripe southbound (RM 620) through lane to left-turn/ through to create triple left-turn lane configuration	35.8	D	45.6	D

Short-Term Conditions – Build

During the AM peak period, the intersections at Anderson Mill Road, Bullick Hollow Road/RM 2222, Debba Drive, Cavalier Drive/Aria Drive, and Bee Cave Parkway remain congested. The planned RM 620/RM 2222 bypass road reduces delay at the RM 620/Bullick Hollow Road/RM 2222 intersection and the adjacent intersections along RM 620 and RM 2222. The proposed southbound RM 620 auxiliary lane between Lohmans Crossing Road and Spillman Loop also reduces overall congestion in that section of RM 620. Debba Drive is improved (though still LOS E) via signal timing optimization.

During the PM peak period, RM 620 in the vicinity of Anderson Mill Road remains very congested. The intersection of RM 620 and Bullick Hollow Road/RM 2222 maintains LOS F, but the proposed bypass roadway decreases delay at the intersection and the adjacent intersections along RM 620 and RM 2222. The proposed southbound RM 620 auxiliary lane reduces overall delay in the section between Lohmans Crossing Road and Spillman Loop, though the Lohmans Crossing Road/Ameno Drive intersection would be LOS E. The proposed dual westbound right-turn lanes at Bee Cave Parkway help to reduce overall delay at its intersection with RM 620, and signal timing optimization would reduce delay and queuing at the intersection at Debba Drive.

Low-cost, easily implementable improvements for the short-term build conditions scenario were developed and further signal timing optimizations performed using Synchro. **Table 4.2** provides a list of the recommended short-term improvements along with AM and PM peak-hour intersection delays and LOS.

During both peak periods, the proposed short-term improvements improve traffic conditions at the El Salido Parkway intersection, which improves from LOS D to LOS C. The improvements in the Lakeway area also provide relief — the Debba Drive intersection begins to operate at acceptable LOS (LOS A through LOS D), and delays decrease at many of the intersections to the south. However, by their nature as low-cost and easily implementable, these improvements do not address the capacity constraints along the corridor, and thus, some intersections continue to operate at LOS E or LOS F.

Table 4.2: Short-Term Build Conditions (2020) Roadway Improvements and Intersection Delays/LOS

Intersection	Proposed Planned Improvements	2020 AM Peak-Hour		2020 PM Peak-Hour	
		Delay/ Veh (sec)	LOS	Delay/ Veh (sec)	LOS
Section 1					
Pecan Park Boulevard (westbound)		19.8	B	32.7	C
Pecan Park Boulevard (eastbound)		12.6	B	23.4	C
Deerbrook Trail		12.3	B	6.1	A
Great Valley Drive/ Lake Creek Parkway		17.9	B	29.1	C
Hatch Road		12.7	B	17.0	B
El Salido Parkway	• Remove eastbound/ westbound El Salido Parkway split-phasing and convert to permissive left-turns	28.0	C	30.5	C
Anderson Mill Road (RM 2769)		116.6	F	120.1	F
H-E-B driveway		16.0	B	45.1	D
Section 2					
Buckner Road/ Boulder Lane		50.3	D	57.8	E
Boulder Lane (South)		28.9	C	49.9	D
Concordia		9.6	A	38.0	D

Intersection	Proposed Planned Improvements	2020 AM Peak-Hour		2020 PM Peak-Hour	
		Delay/ Veh (sec)	LOS	Delay/ Veh (sec)	LOS
University Drive					
Wilson Parke Avenue/ Rock Harbour Drive		18.6	B	19.7	B
Four Points Drive		9.7	A	26.4	C
Section 3					
Bullick Hollow Road/ RM 2222		68.6	E	101.3	F
River Place Drive (RM 2222)		32.9	C	32.4	C
Sitio Del Rio Boulevard (RM 2222)		12.9	B	7.3	A
McNeil Drive (RM 2222)		31.6	C	15.8	B
Comanche Trail		21.7	C	29.2	C
Quinlan Park Road		31.9	C	39.2	D
Marshall Ford Road		10.6	B	10.6	B
Section 4					
Hudson Bend Road		22.0	C	31.8	C
General Williamson Drive		16.8	B	13.9	B
Section 5					
Debba Drive	• Re-stripe shoulder to provide right-turn bay along northbound RM 620 • Remove Debba Drive eastbound/ westbound split-phasing and convert to permissive left-turns	42.9	D	17.2	B
Kollmeyer Drive		14.1	B	6.0	A

Intersection	Proposed Planned Improvements	2020 AM Peak-Hour		2020 PM Peak-Hour	
		Delay/ Veh (sec)	LOS	Delay/ Veh (sec)	LOS
Lakeway Boulevard	• Extend left-turn striping at northbound RM 620 approach	29.4	C	29.6	C
Lohmans Crossing Road/Ameno Drive	• Extend left-turn striping at northbound RM 620 approach • Re-stripe shoulder to provide right-turn bays along northbound and southbound RM 620	24.6	C	56.0	E
Lohmans Spur Road	• Remove Lohmans Spur Road eastbound/westbound split-phasing and convert to permissive left-turns	9.5	A	10.7	B
Flint Rock Road	• Remove Flint Rock Road eastbound/ westbound protected left-turn phasing and convert to split-phasing	10.6	B	14.6	B
Spillman Loop/ Honey Creek Court		24.5	C	3.3	A
Cavalier Drive/Aria Drive	• Extend left-turn striping at northbound RM 620 approach	84.6	F	31.2	C
Section 6					
Falcon Head Boulevard		13.2	B	12.9	B

Intersection	Proposed Planned Improvements	2020 AM Peak-Hour		2020 PM Peak-Hour	
		Delay/ Veh (sec)	LOS	Delay/ Veh (sec)	LOS
Ladera Boulevard		4.6	A	11.9	B
Bee Cave Parkway		60.9	E	40.2	D
SH 71		35.8	D	44.9	D

General Characteristics

The short-term option is composed of intersection improvements that add additional turn lanes, signal timing/phasing changes, and lane restriping. This added capacity at the intersections allows more traffic to flow through the intersection, thereby reducing travel times on both RM 620 and the secondary roadways. The additional capacity also allows for easier and safer access to and from RM 620. Development in the area will add new residential and commercial driveways and intersections along the corridor.

Construction Cost

The construction cost for the short-term option would be minimal and therefore a fairly inexpensive option. The typical cost for each of the improvements can range from $400,000 to $1.5 million.

Construction Time

The construction time for the short-term option would average around six months per project. Due to the need to improve each of the intersections varying over time, the users of RM 620 should expect multiple projects spanning multiple years.

Construction Disruption

The construction disruption would be minimal for the short-term option. Users along RM 620 would endure small impacts while the side street users could experience longer times to access RM 620, due to limited lanes and staged construction.

Community Impacts

The short-term option would have both positive and negative community impacts. The positive impacts of less time to access RM 620 and less congestion along RM 620 would be temporary. Eventually, the volume of traffic demand along RM 620 would reach a point that the completed intersection improvements would no longer control the delays. The negative community impacts include decreased property values due to congested access, decreased quality of life due to time lost traveling to and from all work and personal activities, and

increased frustration with TxDOT and local municipalities to resolve their concerns with congestion, high crash rates, and difficult access to properties.

Environmental Impacts

There would be minimal environmental impacts for the short-term option. Temporary improvements to traffic congestion would be expected as a result of the short-term option.

Drainage Impacts

With minimal construction for the short-term option, the drainage patterns would remain essentially the same along RM 620, so there would be no drainage impacts. Most likely, culverts would remain the same size and only be extended as needed. Driveway pipes near the intersection may need to be relocated if the ditch needs to be adjusted.

Right-of-way Impacts

With minimal construction for the short-term option, the right-of-way would be adjusted, as needed, to allow for corner clips at intersections. These clips would be necessary to maintain the sight distances for vehicle accessing RM 620.

Mobility Benefits

The short-term option would allow for temporary mobility benefits due to operational improvements at the RM 620 intersections. Eventually, roadway users would experience more time lost traveling to and from all work and personal activities and increasing difficulty accessing properties.

Safety Benefits

The short-term option would allow for minimal safety benefits. Increasing the number of lanes at the intersections would provide safer turning movements to and from RM 620. This would be temporary as the traffic demand increases due to population growth and development. The intersection improvements do not address safety issues along RM 620. The center two-way left-turn lane has already begun to show signs of exceeding its usefulness with increased collisions. Motorists could potentially be involved in more crashes that involve access to and from properties due to their windows of open space becoming smaller and fewer.

Mid-Term Conditions – No-Build

For the mid-term conditions (2035) analysis, year 2035 traffic volume forecasts were incorporated into the mid-term conditions models. Table 4.3 shows the intersection delays and corresponding level of service (LOS) along the corridor.

Due to the substantial increase in traffic volumes between 2015 and 2035 — 35 percent in the vicinity of RM 2222 and 49 percent elsewhere — both AM peak and PM peak period traffic congestion worsens substantially. Most intersections operate at LOS E or LOS F, despite the assumed no-build condition improvements (e.g., RM 620 southbound auxiliary lane in Lakeway, RM 620/RM 2222 bypass roadway) and signal timing optimization.

Table 4.3: Mid-Term No-Build Conditions (2035) Intersection Delay/LOS

Intersection	2035 AM Peak		2035 PM Peak	
	Delay/ Veh (sec)	LOS	Delay/ Veh (sec)	LOS
Section 1				
Pecan Park Boulevard (westbound)	42.4	D	61.2	E
Pecan Park Boulevard (eastbound)	26.9	C	22.8	C
Deerbrook Trail	32.3	C	14.7	B
Great Valley Drive/Lake Creek Parkway	83.8	F	86.3	F
Hatch Road	79.3	E	34.6	C
El Salido Parkway	143.0	F	145.3	F
Anderson Mill Road (RM 2769)	257.0	F	271.9	F
H-E-B driveway	128.2	F	193.0	F
Section 2				
Buckner Road/Boulder Lane	187.1	F	207.6	F
Boulder Lane (South)	139.5	F	169.0	F
Concordia University Drive	89.5	F	150.4	F
Wilson Parke Avenue/Rock Harbour Drive	80.9	F	52.2	D
Four Points Drive	41.6	D	59.9	E
Section 3				
Bullick Hollow Road/RM 2222	117.0	F	159.0	F
River Place Drive (RM 2222)	97.0	F	33.5	C
Sitio Del Rio Boulevard (RM 2222)	68.4	E	6.6	A
McNeil Drive (RM 2222)	90.4	F	22.8	C
Comanche Trail	85.9	F	69.3	E
Quinlan Park Road	49.4	D	68.6	E
Marshall Ford Road	15.9	B	15.2	B
Section 4				
Hudson Bend Road	52.1	D	98.8	F
General Williamson Drive	41.6	D	53.7	D
Section 5				
Debba Drive	198.5	F	137.3	F
Kollmeyer Drive	63.4	E	56.8	E

Intersection	2035 AM Peak		2035 PM Peak	
	Delay/ Veh (sec)	LOS	Delay/ Veh (sec)	LOS
Lakeway Boulevard	72.0	E	88.4	F
Lohmans Crossing Road/Ameno Drive	112.3	F	181.9	F
Lohmans Spur Road	53.7	D	60.7	E
Flint Rock Road	112.6	F	112.3	F
Spillman Loop/Honey Creek Court	111.0	F	56.9	E
Cavalier Drive/Aria Drive	241.0	F	135.0	F
Section 6				
Falcon Head Boulevard	46.4	D	55.9	E
Ladera Boulevard	39.0	D	88.6	F
Bee Cave Parkway	163.4	F	121.8	F
SH 71	44.4	D	100.2	F

Mid-Term Conditions - Build

To alleviate this forecasted future traffic congestion, improvements in addition to the short-term improvements were proposed and incorporated into the analysis. The main improvement — constructing a raised median along the entire length of RM 620 and widening from four lanes to six lanes from SH 71 to Lakeway Boulevard and Quinlan Park Road to US 183 — would substantially reduce delay and improve safety by reducing conflict points along the corridor. **Figure 4.1** and **Figure 4.2** provide illustrations of the proposed cross section along RM 620. **Table 4.4** shows the intersection delays and corresponding levelo of service (LOS) along the corridor.

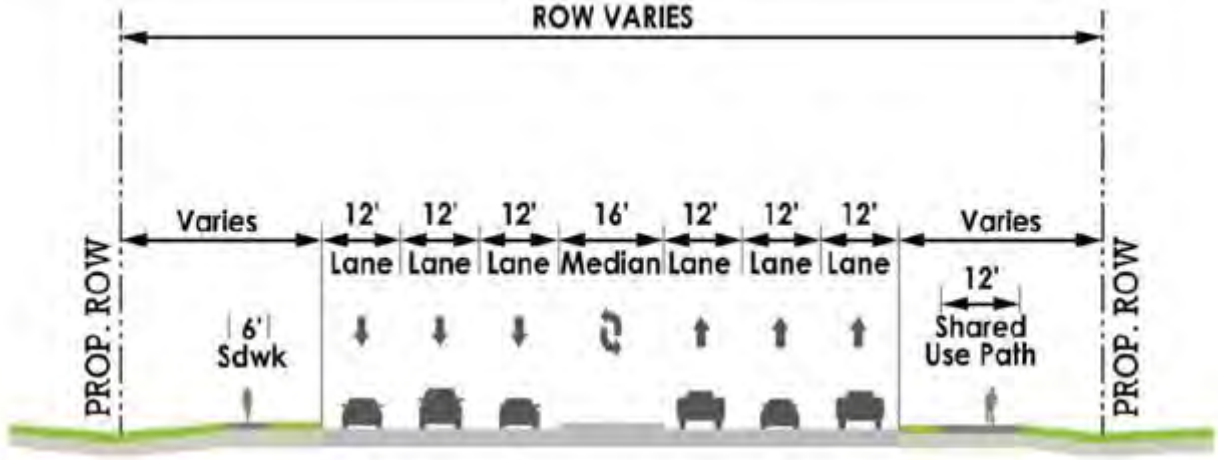


Figure 4.1: Proposed six-lane divided RM 620 roadway configuration.

Figure 4.2: Proposed six-lane divided RM 620 roadway configuration.

Table 4.4: Mid-Term Build Conditions (2035) Roadway Improvements and Intersection Delays/Level of Service

Intersection	Proposed Improvements	2035 AM Peak-Hour		2035 PM Peak-Hour	
		Delay/ Veh (sec)	LOS	Delay/ Veh (sec)	LOS
Section 1	• Widen to six-lane divided section along RM 620.				
Pecan Park Boulevard (westbound)		27.0	C	36.7	D
Pecan Park Boulevard (eastbound)		23.0	C	21.3	C
Deerbrook Trail		12.2	B	5.0	A
Great Valley Drive/ Lake Creek Parkway		19.5	B	40.7	D
Hatch Road		13.9	B	14.1	B
El Salido Parkway		39.4	D	54.9	D
Anderson Mill Road (RM 2769)	• Construct dual left-turn bays at all approaches • Construct free northbound RM 620 right-turn with acceleration lane	125.4	F	99.2	F

Intersection	Proposed Improvements	2035 AM Peak-Hour		2035 PM Peak-Hour	
		Delay/ Veh (sec)	LOS	Delay/ Veh (sec)	LOS
H-E-B driveway		13.1	B	32.8	C
Section 2	• Widen to six-lane divided section along RM 620.				
Buckner Road/ Boulder Lane	• Construct additional left-turn bay at Boulder Lane approach	40.9	D	42.3	D
Boulder Lane (South)		44.7	D	38.1	D
Concordia University Drive		12.4	B	42.2	D
Wilson Parke Avenue/ Rock Harbour Drive		20.6	C	19.1	B
Four Points Drive		12.1	B	28.8	C
Section 3	• Widen to six-lane divided section along RM 620 between RM 2222 and Quinlan Park Road • Construct raised median with select openings on existing RM 620 four-lane section between Quinlan Park Road and Colorado River bridge				
Bullick Hollow Road/ RM 2222	• Construct dual right-turn bays at westbound RM 2222 approach	70.8	E	77.1	E
River Place Drive (RM 2222)		77.9	E	33.5	C
Sitio Del Rio Boulevard (RM 2222)		53.8	D	6.6	A
McNeil Drive (RM 2222)		88.3	F	22.8	C
Comanche Trail		11.5	B	22.4	C
Quinlan Park Road		27.8	C	31.6	C
Marshall Ford Road		15.1	B	15.0	B

Intersection	Proposed Improvements	2035 AM Peak-Hour		2035 PM Peak-Hour	
		Delay/ Veh (sec)	LOS	Delay/ Veh (sec)	LOS
Section 4	• Construct raised median with select openings on existing RM 620 four-lane section				
Hudson Bend Road	• Convert southbound (Hudson Bend Road) approach to dual left-turn/through/right-turn configuration • Construct right-turn Lane at westbound RM 620 approach	25.2	C	61.7	E
General Williamson Drive		48.4	D	52.3	D
Section 5	• Construct raised median with select openings on existing RM 620 four-lane section north of Lakeway Boulevard • Widen RM 620 to six-lane divided section south of Lakeway Boulevard				
Debba Drive	• Construct right-turn bay at westbound Debba Drive approach	96.3	F	48.5	D
Kollmeyer Drive		55.6	E	56.5	E
Lakeway Boulevard	• Construct additional LT bay at northbound RM 620 approach (to create dual northbound left-turn configuration)	31.2	C	34.5	C

Intersection	Proposed Improvements	2035 AM Peak-Hour		2035 PM Peak-Hour	
		Delay/ Veh (sec)	LOS	Delay/ Veh (sec)	LOS
Lohmans Crossing Road/Ameno Drive	• Construct additional Lohmans Crossing Road eastbound right-turn and RM 620 northbound left-turn bays (to create dual turn configurations at both locations) • Construct right-turn lanes at northbound and southbound RM 620 approaches	34.8	C	54.8	D
Lohmans Spur Road		12.1	B	17.6	B
Flint Rock Road		19.6	B	16.3	B
Spillman Loop/ Honey Creek Ct.	• Construct free RM 620 southbound right-turn movement	33.7	C	3.6	A
Cavalier Drive/Aria Drive	• Construct additional Cavalier Drive eastbound right-turn and RM 620 southbound left-turn bays (to create dual turn configurations in both directions) • Convert Aria Drive westbound approach to dual left-turn/Through-Through/right-turn lane configuration • Construct RM 620 northbound right-turn lane	66.9	E	22.3	C
Section 6	• Widen to six-lane divided section along RM 620				
Falcon Head Boulevard		12.0	B	15.1	B
Ladera Boulevard		4.2	A	13.0	B

Intersection	Proposed Improvements	2035 AM Peak-Hour		2035 PM Peak-Hour	
		Delay/ Veh (sec)	LOS	Delay/ Veh (sec)	LOS
Bee Cave Parkway	• Construct additional Bee Cave Parkway eastbound left-turn (to create a dual left-turn configuration)	100.3	F	66.5	E
SH 71		45.7	D	100.8	F

The proposed improvements, especially the six-lane cross section along RM 620, reduce delay substantially during both the AM and PM peak periods. While some of the larger intersections remain at LOS E or LOS F, the improvements cut their delays in half (e.g., the Anderson Mill Road intersection). Most of the smaller intersections improve from LOS E/F to LOS A/B/C/D.

General Characteristics

The mid-term option assumes that the short-term options have been constructed and additional measures are needed. The first measure is converting the two-way continuous left-turn lane into a divided median with raised curbs and controlled openings for access points. The second measure is adding a lane of capacity in each direction along RM 620 from US 183 to Quinlan Park Road and Lakeway Boulevard to SH 71. Development in the area will continue to add new residential and commercial driveways and intersections along the corridor.

Construction Cost

For the mid-term option, the total construction cost for all improvements is approximately $176 million.

Construction Time

For the mid-term option, the construction time would be three years if the entire project were constructed at one time. Most likely, the option would be two projects—split at the Colorado River Bridge—and take four years of total construction time.

Construction Disruption

Mid-term construction will cause significant disruption due to the addition of a pair of lanes and the building of a raised median in the center of RM 620. With construction occurring right next to travel lanes and roadway accesses being reconstructed, traffic would move slower resulting in increased delay.

Community Impacts

The mid-term option would substantially improve mobility throughout the corridor. Adding sidewalks and shared-use paths along RM 620 would allow for other modes of transportation. Bicyclists, especially novice riders, can be separated from vehicular traffic to allow safer movement for both groups. Drivers will need time to adjust to a new way of accessing properties by performing a U-turn at defined cross-over locations.

Environmental Impacts

There would be several anticipated environmental impacts for the mid-term option. Some positive impacts would be less congestion and the addition of shared-use paths. A portion of Section 1 is located within the Edwards Aquifer recharge zone, and a portion of Section 5 and all of Section 6 are located within the Edwards Aquifer contributing zone. Compliance with Edwards Aquifer Rules would be required in these areas. Compliance with these rules would mitigate any potential construction impacts to the Edwards Aquifer. Due to the increase in impervious cover, water quality impacts to the Edwards Aquifer may need to be mitigated. In Sections 3, 4, and 5, new right-of-way would be needed to address the widened pavement, adjusted side slopes, shared-use paths, and relocated ditches. However, this would be minimal widths of 10 feet at most locations.

Portions of the RM 620 corridor are located in karst zones 1 and 3. Compliance with TxDOT's Karst Decision Flowchart would be required for these areas and any project that is proposed in these areas may require consultation with the U.S. Fish and Wildlife Service, depending on the results of karst surveys.

Portions of the Balcones Canyonlands Conservation Plan preserve system are located adjacent to the corridor in Sections 2, 3, 5 and 6. All efforts would be taken to avoid acquiring any additional right-of-way from these properties. If it is determined that additional right-of-way would be needed in these areas, a Section 4(f) analysis would be required.

There are several parks located in the vicinity of the RM 620 corridor. All efforts would be taken to avoid acquiring any additional right-of-way from these parks. If it is determined that additional right-of-way would be needed in these areas, a Section 4(f) analysis would be required. Recreational areas, wildlife and waterfowl refuges, and public and private historic sites are protected under Section 4(f) of the Department of Transportation Act of 1966 as well. As such, any proposed improvements that would require the use of these properties would require an evaluation to determine there is no feasible and prudent avoidance alternative to the use of the property. A map showing names and locations of parks is included in **Appendix D**. There are no listed National Register of Historic Places properties, State Archeological Landmarks, or Registered Texas Historic Landmarks adjacent to RM 620 in the project area. There are several cemeteries located in the study area; however, only two of these are adjacent to the project corridor. For cemetery names and locations, see the RM 620 Plates located in **Appendix C**.

The RM 620 corridor crosses numerous streams, creeks, and one river. If it is determined that permanent fill is required below the ordinary high water mark of any jurisdictional waterways, the appropriate permit from the U.S. Army Corps of Engineers (USACE) would be obtained prior to any construction. Also, it is possible that wetlands may be associated with these crossings. If it is determined that any roadway improvements would impact wetlands, coordination with the USACE would also be required.

Visual impacts to the landscape may occur as a result of any improvements through removal of vegetation. All areas disturbed by construction would be revegetated according to TxDOT's standard practices.

Any construction project that adds an additional through lane or moves an existing travel lane more than the width of an existing travel lane closer to a receiver would require a traffic noise analysis that would be developed under TxDOT's federally approved Noise Guidelines. Noise associated with the construction of the project is difficult to predict. Heavy machinery, the major source of noise in construction, is constantly moving in unpredictable patterns. However, construction normally occurs during daylight hours when occasional loud noises are more tolerable.

Any construction project would be subject to Section 106 of the National Historic Preservation Act. As such, historical and archaeological surveys of the project corridor would be conducted, and coordination with the Texas Historical Commission would be completed prior to any construction.

Drainage Impacts

The drainage patterns would remain mostly the same along RM 620 under the mid-term option. Ditches would need to be relocated due the widened pavement. Drainage structures would most likely need to be extended to move the end treatments outside the clear zone or receive some sort of safety-end treatment. With an increase in impervious cover, an analysis would be needed to determine impacts, the capacity of the existing drainage structures and the need for additional drainage capacity. A hydrologic analysis of the water quality would need to be conducted to determine the need, type, and size of the drainage features to mitigate impacts to the Edwards Aquifer.

Right-of-way Impacts

For the mid-term option, approximately 54.5 acres of additional right-of-way would be needed along RM 620 due to the widened pavement, adjusted side slopes, shared-use paths, and relocated ditches, but this should be minimal widths of 10 feet at most locations. TxDOT would perform a cost comparison evaluation of costs and time to purchase right-of-way versus cost and maintenance of building retaining walls to avoid right-of-way purchase. Additional right-of-way will most likely be needed to provide drainage features to mitigate water quality impacts to the Edwards Aquifer.

Mobility Benefits

The mid-term option would allow for many mobility benefits. Once the construction of the additional lane is complete, users traveling the RM 620 corridor would experience improved travel times. Adding the sidewalk and shared-use path provides connectivity between residential and commercial properties, as well as recreational areas.

Safety Benefits

The mid-term option allows for many safety benefits. Conversion of the center two-way left-turn lane into a divided median with raised curbs and controlled openings for access points would provide a safe haven for turning vehicles to wait for openings in traffic and would also decrease head-on collisions. Raised medians generally result in an overall crash reduction of approximately 35 percent as compared to undivided roadways (U.S. Department of Transportation, 2010). Drainage structures would be widened outside the clear zone or receive safety end treatments. If there are any obsolete roadway elements along the roadway, such as insufficient height on a metal beam guard fence, these items could be upgraded. Separating the bicyclists from the RM 620 vehicular traffic makes travel safer for both groups.

Long-Term Conditions (2035) – Build

Proposed long-term improvements were developed and evaluated. The long-term improvements include:

- Construct a four-lane limited-access roadway connecting US 183/SH 45N with RM 620 and RM 2222. Flyovers would be incorporated into this design concept at the US 183/SH 45N interchange, and at RM 2222. (See Figures 4.3 – 4.6)
- Extend the six-lane section with a raised median north from Lakeway Boulevard to Hudson Bend Road.

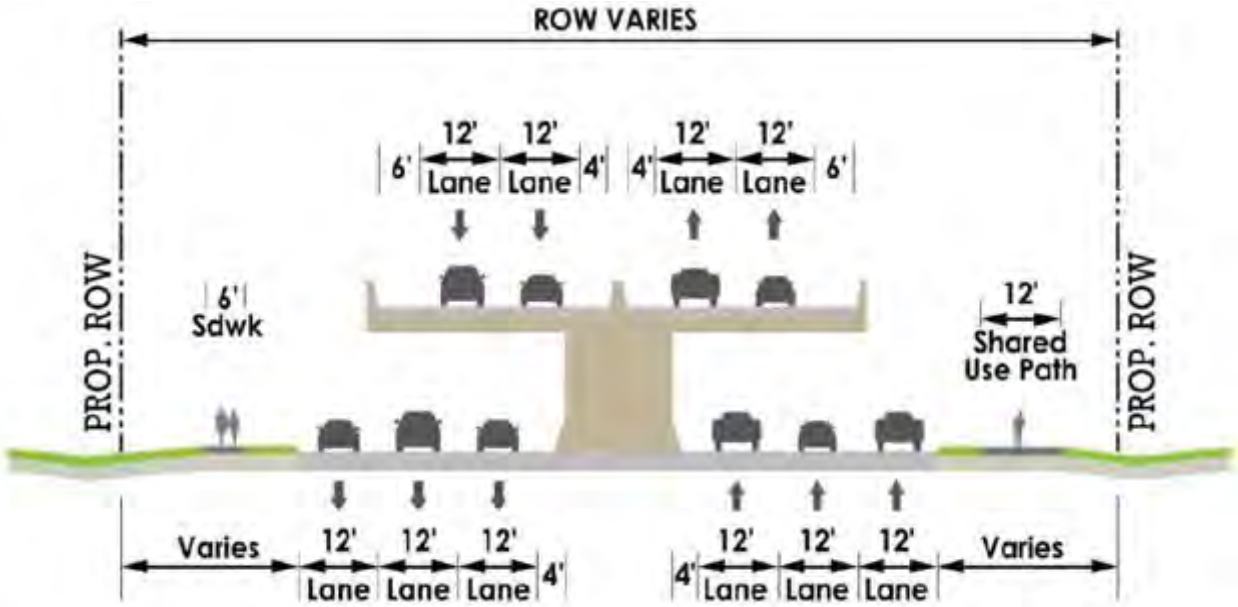


Figure 4.3: Option A: Proposed six-lane divided RM 620 roadway configuration with elevated lanes.

Additional Lanes from US 183 to RM 2222

Five options were evaluated for additional capacity between US 183 and RM 2222. Although the final design might incorporate a combination of the following options, the five options were viewed as distinct options for comparison purposes.

Option A was to construct an elevated bridge structure down the middle of a raised median along RM 620 between US 183 and RM 2222. Further analysis was performed on the elevated lanes to evaluate the delay and level of service at the intersections. To account for the elevated section, a 50 percent diversion was assumed for the westbound Anderson Mill Road (RM 2769) left-turn traffic to the southbound RM 620 through movement at its intersection. This accounts for the current travel patterns in which drivers use Anderson Mill Road instead of the US 183 northbound frontage road. Through-traffic along RM 620 was reduced by 40 percent to account for the diversion from the at-grade or ground level arterial lanes to the elevated lanes. At the RM 620 and Bullick Hollow Road/RM 2222 intersection, the through movements along RM 620 and the turning movements between north RM 620 and RM 2222 were also reduced by 40 percent to account for the proposed flyovers.

Option B was to construct the lanes within an existing utility easement. The easement is located west of RM 620 from RM 2222 to Anderson Mill Road. See **Figure 4.4**. The 100' utility easement is occupied by concrete power poles with overhead transmission lines situated in the center of the easement. These concrete poles are approximately 105' tall.

Figure 4.4: *Existing utility easement from RM 2222 to Anderson Mill Road.*

This alternative consisted of a mixture of at-grade and elevated lanes with the existing power poles located between the opposing lanes. See **Figure 4.5**. Flyovers at RM 2222 and Anderson Mill Road would provide access to RM 620 lanes.

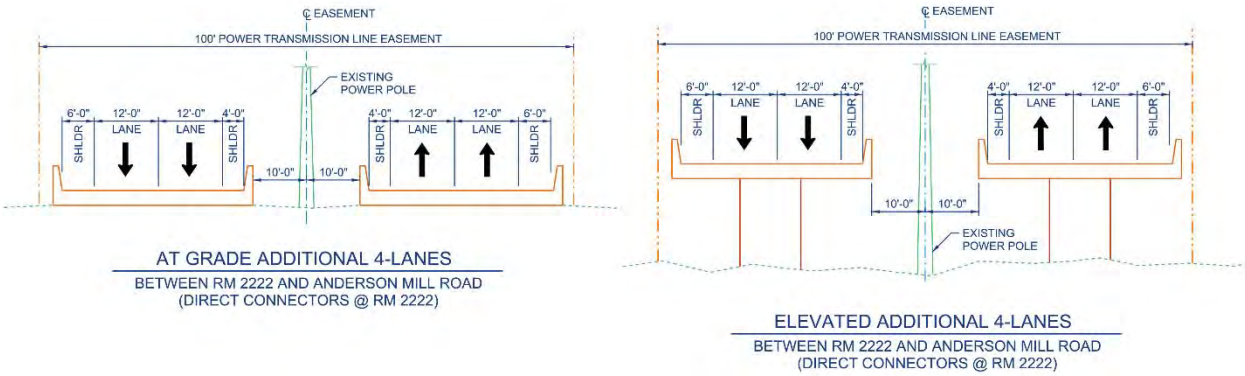


Figure 4.5: *At-grade four additional lanes with existing power poles located between opposing lanes.*

This alternative was eliminated from consideration due the conflicts during construction with the power poles and the transmission lines, uneven terrain and proximity of preserve land, and the likelihood of extreme environmental and compatibility problems.

Options C and **D** evaluated the existing RM 620 right-of-way with various right-of-way widening options to construct the additional lanes along the existing alignment (See **Figure 4.6**). Three possible widening options for acquiring the additional right-of-way were evaluated. **Option C** would acquire all the needed right-of-way on the north side of the existing right-of-way, and **Option D** would acquire the needed right-of-way on the south side of the existing right-of-way. These options would substantially impact adjacent properties and would require significant relocation of the owners. Therefore, these two options are not desirable. **Option E** was to acquire the additional right-of-way equally from both sides.

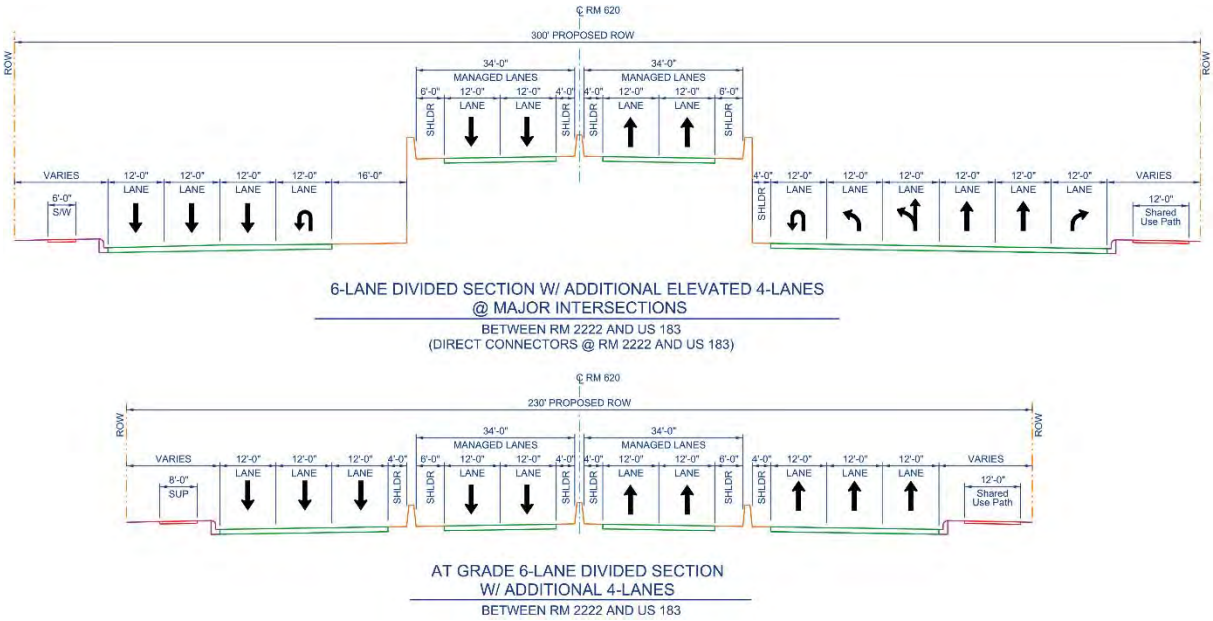


Figure 4.6: Additional lanes along the existing alignment.

Ultimately, **Option A**, the elevated lanes along RM 620, seemed most likely and was modeled at this phase subject to review in later phases when a more detailed comparison of options can be made.

Table 4.5 provides the signalized intersection vehicular delay and corresponding level of service for long-term conditions (2035). All scenarios assumed signal timing optimization, which was performed using Synchro 9.

Table 4.5: Long-Term Conditions (2035) Intersection Delay/LOS

Intersection	2035 AM Peak		2035 PM Peak	
	Delay/ Veh (sec)	LOS	Delay/ Veh (sec)	LOS
Section 1				
Pecan Park Boulevard (westbound)	19.0	B	28.1	C
Pecan Park Boulevard (eastbound)	10.8	B	20.9	C
Deerbrook Trail	6.9	A	7.4	A
Great Valley Drive/Lake Creek Parkway	22.9	C	23.7	C
Hatch Road	9.8	A	9.0	A
El Salido Parkway	16.0	B	26.7	C
Anderson Mill Road (RM 2769)	63.9	E	46.7	D
H-E-B driveway	2.9	A	8.4	A
Section 2				
Buckner Road/Boulder Lane	17.7	B	19.8	B
Boulder Lane (South)	26.9	C	11.0	B
Concordia University Drive	9.9	A	18.0	B
Wilson Parke Avenue/Rock Harbour Drive	12.6	B	8.4	A
Four Points Drive	4.0	A	18.4	B
Section 3				
Bullick Hollow Road/RM 2222	40.9	D	68.6	E
River Place Drive (RM 2222)	9.7	A	6.5	A
Sitio Del Rio Boulevard (RM 2222)	52.9	D	8.2	A
McNeil Drive (RM 2222)	27.1	C	27.0	C
Comanche Trail	11.5	B	22.4	C
Quinlan Park Road	27.8	C	31.6	C
Marshall Ford Road	15.1	B	15.0	B
Section 4				
Hudson Bend Road	19.1	B	30.6	C
General Williamson Drive	23.6	C	16.1	B
Section 5				
Debba Drive	34.5	C	17.0	B
Kollmeyer Drive	10.1	B	9.0	A
Lakeway Boulevard	32.4	C	34.0	C
Lohmans Crossing Road/Ameno Drive	34.6	C	54.4	D

Intersection	2035 AM Peak		2035 PM Peak	
	Delay/ Veh (sec)	LOS	Delay/ Veh (sec)	LOS
Lohmans Spur Road	12.3	B	17.1	B
Flint Rock Road	19.6	B	15.7	B
Spillman Loop/Honey Creek Ct.	33.7	C	3.6	A
Cavalier Drive/Aria Drive	66.9	E	21.6	C
Section 6				
Falcon Head Boulevard	12.0	B	14.6	B
Ladera Boulevard	4.2	A	12.6	B
Bee Cave Parkway	100.3	F	66.4	E
SH 71	45.7	D	101.0	F

General Characteristics

The long-term option assumes that the short-term and mid-term options were constructed and additional measures are needed. The first measure is adding one lane of capacity in each direction along RM 620, from Lakeway Boulevard to Hudson Bend Road, to extend the corridor upgrade to a six-lane section. The second measure is adding four limited-access lanes (two in each direction) between US 183 and RM 2222 due to the high traffic volumes expected for this area.

Five options for the location of the additional lanes were analyzed:

Option A: Possible elevated bridge structure down the middle of the raised median
Option B: Possible elevated bridge structure down the middle of the raised median until Anderson Mill Road then follow the overhead transmission line easement
Option C: At-grade lanes – holding existing south right-of-way and acquiring new right-of-way on the north side
Option D: At-grade lanes – holding existing north right-of-way and acquiring new right-of-way on the south side
Option E: At-grade lanes – acquiring new right-of-way equally on both sides

Of the five options, only **Option B** was eliminated. A final determination as to how much of the four lanes could be at-grade or ground level awaits further study in the schematic/ environmental phase. Since **Option A** is the most likely alternative, it was used for comparative analysis.
The design for the long-term condition needed to consider how the possible elevated section would transition at the RM 2222 intersection from elevated to ground level on both RM 620 and RM 2222. One lane of RM 620 in each direction would be carried over the RM 2222

intersection to merge with the at-grade section to the south. Due to the high traffic counts for vehicles traveling between RM 620 and RM 2222, flyovers would take the remaining lane of traffic to the east along RM 2222. Several options to merge the flyovers into the at-grade section along RM 2222 were considered. The final design will take much further study but would likely continue with the elevated section all the way to the east of River Place Boulevard. This option provided better connection options with the proposed connector (bypass) and River Place Boulevard intersections

Construction Cost

For the long-term option, **Option A**, the total construction cost for the improvements is approximately $620 million and would be subject to future funding. Construction options for **Option A** would be limited to segmented bridges (which are more expensive) or precast bents due to the narrow median and existing traffic not allowing for the placement of formwork without substantial lane closures or detours.

Construction Time

The construction time for the long-term option, **Option A**, is estimated to be three years, if the entire project is constructed at one time. Construction options would be limited to segmented bridges or precast bents and beams. For **Options B - E**, substantial utility relocations would be needed. This could add 18 months to the time of project completion.

Construction Disruption

The long-term option would be a very disruptive construction option. This would be due to several factors. First, widening the existing pavement to add a lane for capacity would impact all the traffic along RM 620 from Lakeway Boulevard to Hudson Bend Road. With construction occurring right next to a travel lane, all traffic would naturally move slower. All access points along the section of RM 620 would mostly likely need to be reconstructed in stages, reducing lanes at intersections. This would add time to everyone's commute. The next factor would be the conversion of the median. Construction would occur next to a travel lane, thereby slowing down traffic. To construct the possible elevated bridge section in **Option A**, there would need to be nighttime and weekend closures along RM 620 to place bents and beams. For **Options B - E**, there would be disruption to traffic patterns due to the multiple stages needed to construct the proposed additional lanes at-grade on new right-of-way.

Community Impacts

The long-term option would substantially improve mobility throughout the corridor. Adding sidewalks and shared-use paths along RM 620 would allow for other modes of transportation. Bicyclists, especially novice riders, would be separated from vehicular traffic to allow safer movement for both groups. By constructing the additional controlled-access lanes, commuter travel times and corridor delays could decrease between US 183 and

RM 2222. People would need time to adjust to a new way of accessing properties by performing a U-turn at defined cross-over locations.

As previously mentioned, Option B was eliminated; since there would be a negative impact to an elementary school, residential areas and a major apartment complex adjacent to the utility easement. **Options C, D, and E** would require new right-of-way of substantial width causing significant negative impacts. The impacts would be to the adjacent residential and commercial parcels of land. In some locations there would be impacts to a second row of residential parcels. These options would have an impact on the local communities' tax revenues.

Environmental Impacts

There would be several environmental impacts for the long-term option. Some positive impacts would be less congestion and the addition of shared-use paths. A portion of Section 1 is located within the Edwards Aquifer recharge zone, a portion of Section 5, and all of Section 6 are located within the Edwards Aquifer contributing zone. Compliance with Edwards Aquifer Rules would be required in these areas. Compliance with these rules would mitigate any potential construction impacts to the Edwards Aquifer. Due to the increase in impervious cover, water quality impacts to the Edwards Aquifer may need to be mitigated. In Sections 3, 4, and 5, new right-of-way would be needed to address the widened pavement, adjusted side slopes, shared-use paths, and relocated ditches. However, this would be minimal widths of 10 feet at most locations. **Options B - E** would need to address the relocation of residential and commercial properties.

Portions of the RM 620 corridor are located in karst zones 1 and 3. Compliance with TxDOT's Karst Decision Flowchart would be required for these areas, and any project that is proposed in these areas may require consultation with the U.S. Fish and Wildlife Service, depending on the results of karst surveys.

Portions of the Balcones Canyonlands Conservation Plan preserve system are located adjacent to the corridor in Sections 2, 3, 5 and 6. In Section 2, the long-term option may require new right-of-way from a portion of the Balcones Canyonlands Conservation Plan. All efforts would be taken to avoid acquiring any additional right-of-way from these properties. If it is determined that additional right-of-way would be needed in these areas, a Section 4(f) analysis would be required.

There are several parks located in the vicinity of the RM 620 corridor. All efforts would be taken to avoid acquiring any additional right-of-way from these parks. If it is determined that additional right-of-way would be needed in these areas, a Section 4(f) analysis would be required. Recreational areas, wildlife and waterfowl refuges, and public and private historic sites are protected under Section 4(f) of the Department of Transportation Act of 1966 as well. As such, any proposed improvements that would require the use of these properties

would require an evaluation to determine there is no feasible and prudent avoidance alternative to the use of the property. A map showing names and locations of parks is included in **Appendix D**. There are no listed National Register of Historic Places properties, State Archeological Landmarks, or Registered Texas Historic Landmarks adjacent to RM 620 in the project area. There are several cemeteries located in the study area; however, only two of these are adjacent to the project corridor. For cemetery names and locations, see the RM 620 Plates located in **Appendix C**.

The RM 620 corridor crosses numerous streams, creeks, and one river. If it is determined that any permanent fill is required below the ordinary high water mark of any jurisdictional waterways, the appropriate permit from the U.S. Army Corps of Engineers (USACE) would be obtained prior to any construction. Also, it is possible that wetlands may be associated with these crossings. If it is determined that any roadway improvements would impact wetlands, coordination with USACE would also be required.

Visual impacts to the landscape may occur as a result of any improvements through removal of vegetation. All areas disturbed by construction would be revegetated according to TxDOT's standard practices.

Any construction project that adds an additional through-lane or moves an existing travel lane more than the width of an existing travel lane closer to a receiver would require a traffic noise analysis that would be developed under TxDOT's federally approved Noise Guidelines. Noise associated with the construction of the project is difficult to predict. Heavy machinery, the major source of noise in construction, is constantly moving in unpredictable patterns. However, construction normally occurs during daylight hours when occasional loud noises are more tolerable.

Any construction project would be subject to Section 106 of the National Historic Preservation Act. As such, historical and archaeological surveys of the project corridor would be conducted and coordination with the Texas Historical Commission would be completed prior to any construction.

Drainage Impacts

The drainage patterns would remain mostly the same along RM 620 under the long-term option. Ditches would need to be relocated due to the widened pavement. Drainage structures would most likely need to be extended to move the end treatments outside the clear zone or receive some sort of safety end treatment. Since the amount of impervious cover would increase, the capacity of the existing drainage structures would need to be analyzed to determine impacts and the need for additional capacity. A hydrologic analysis of the water quality would need to be conducted to determine the need, type, and size of the drainage features to mitigate impacts to Edwards Aquifer. **Options B - E** would require additional design to handle the new drainage structures and create new ditches.

Right-of-way Impacts

Even with Option A, additional right-of-way would be needed along RM 620 due to the widened pavement, adjusted side slopes, shared-use paths, and relocated ditches. This would be minimal widths of 10 feet at most locations. TxDOT would perform a cost comparison evaluation of costs and time to purchase right-of-way versus cost and maintenance of building retaining walls to avoid right-of-way purchase. Additional right-of-way would most likely be needed to provide drainage features to mitigate water quality impacts to the Edwards Aquifer in accordance with the Edwards Aquifer Rules.

Mobility Benefits

The long-term option would allow for many mobility benefits. If the construction of the additional, limited-access lanes is complete, users traveling the RM 620 corridor would experience improved travel. Adding the sidewalk and shared-use path would provide connectivity between residential and commercial properties, as well as recreational areas.

Safety Benefits

The long-term option allows for many safety benefits. Converting the center two-way left-turn lane into a divided median with raised curbs and controlled openings for access points would provide a safe haven for turning vehicles to wait for openings and would also decrease head-on collisions. Raised medians generally result in an overall crash reduction of approximately 35 percent as compared to undivided roadways. Drainage structures would be widened outside the clear zone or receive safety end treatments. If there are any obsolete roadway elements along the roadway, such as an insufficient height on a metal beam guard fence, these items could be upgraded. Separating the bicyclists from the RM 620 vehicular traffic would make travel safer for both groups. Additional controlled-access lanes remove commuter and longer destination traffic from the local traffic, thereby reducing crashes from traffic accessing RM 620.

Additional Lanes Benefit Analysis

The intersection delay results were converted to annual delay to provide a comparison between scenarios that combine the AM and PM peak period results. The annual delay savings were calculated based on the following assumptions:

- AM peak period delay savings realized over three hours (6:00 – 9:00 a.m.)
- PM peak period delay savings realized over three hours (4:00 – 7:00 p.m.)
- 250 travel days per year

The above assumptions are conservative, as off-peak period delay savings were not included.

In order to quantify the impact, a benefit analysis was performed based on the comparison of future year (2020, 2035) delay savings for each scenario. The delay savings for each

scenario were based on the annual delay calculations and a value of time of $17.67 per hour, used in the Texas Transportation Institute's 2015 Urban Mobility Scorecard (Shrank et al. 2015). **Table 4.6** shows the costs of vehicular delays along the corridor by scenario.

Table 4.6: Economic Impacts by Scenario

Year	Scenario	Cost of Traffic Delays (Y2014 $)		
		AM Peak	PM Peak	Total
2020	Short-term no-build	$18,689,891	$20,423,675	$39,113,566
	Short-term build	$17,911,882	$19,961,866	$37,873,748
	Savings (over no-build)	$778,009	$461,809	$1,239,818
2035	Mid-term no-build	$75,779,793	$79,155,134	$154,934,927
	Mid-term build	$32,949,185	$30,967,842	$63,917,027
	Savings (over no-build)	$42,830,608	$48,187,292	$91,017,900
	Long-term build	$16,991,235	$15,220,158	$32,211,393
	Savings (over no-build)	$58,788,558	$63,934,976	$122,723,534

Chapter 5: Recommended Improvements

Findings

Findings

All proposed improvements would reduce delay along the corridor compared to no-build conditions. Although the short-term improvements, which are low-cost and easily implementable, do reduce delay, they do not address the capacity constraints anticipated to occur in the design year of 2035.

Since traffic volumes substantially increase between 2015 and 2035, peak period traffic congestion worsens substantially. The mid-term improvement, which provides for a raised median with limited openings, would improve the level of service for most intersections and greatly increase safety. Additionally, widening the roadway to a six-lane section for most of the corridor would also reduce delays and address congestion.

For the long-term condition, improvements are still needed to provide relief from congestion that would allow the corridor to handle expected future growth in traffic volume. It is anticipated that through-traffic along RM 620 would be reduced by 40 percent with the addition of two pair of limited-access, travel lanes. It is also anticipated that at the RM 620 and Bullick Hollow Road/RM 2222 intersection, the through movements along RM 620 and the turning movements between north RM 620 and RM 2222 would also be reduced by 40 percent due to the proposed flyovers. Based on the analysis, it was determined that Option A was desirable because it would require very minimal additional right-of-way. Appendix E shows the possible final configuration of Option A. However, considering the added cost of a fully elevated roadway, further analysis should be conducted to determine if some portions might be at-grade or ground level.

The additional travel lanes would improve regional connectivity, effectively extending SH 45N further southwest connecting SH 45N/US 183 with RM 2222. The Section 1 portion of the additional lanes is in areas of limited right-of-way and would be the most likely to be elevated. The Section 2 portion would require additional analysis to evaluate the cost benefit of ground level construction requiring significant right-of-way acquisition.

The economic impacts of the mid- and long-term improvements are positive, providing economic benefits of approximately $90 million and $120 million, resepctively, in the single analysis year (2035) alone. This economic benefit does not factor in costs due to crashes, another corridor problem that the proposed raised median would address by reducing conflict points. Overall, the proposed improvements could provide significant relief from congestion and would allow the corridor to accommodate expected future growth in traffic volume.

References

Capital Area Metropolitan Planning Organization (CAMPO). 2010. *2005 Planning Model*, Capital Area Metropolitan Planning Organization, Austin, Texas, September 2010.

Schrank, D., B. Eisele, T. Lomax, and J. Bak. 2015. *2015 Urban Mobility Scorecard*, Texas Transportation Institute, College Station, Texas, August 2015.

Texas Department of Transportation (TxDOT). 2015. Statewide Planning Map. Texas Department of Transportation, Austin, Texas, txdot.gov/apps/statewide_mapping/StatewidePlanningMap.html, accessed March 2015.

Trafficware LLC. 2015. *Synchro plus Sim Traffic 9.* Trafficware LLC, Sugar Land, Texas, 2015.

_____. 2015. *CAMPO 2040 Regional Transportation Plan*, Capital Area Metropolitan Planning Organization, Austin, Texas, adopted May 11, 2015.

U.S. Department of Transportation Federal Highway Administration Office of Safety. 2010. FHWA-SA-10-002, *Technical Summary - FHWA Access Management in the Vicinity of Intersections*, February 2010.