CITY OF MISSOURI CITY

Mobility Master Plan

SEPTEMBER 2023

PREPARED FOR

Missouri City Texas

PREPARED BY

Kimley»Horn

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Acknowledgements

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Missouri City Fire Department
Missouri City Development Services Department
Missouri City Information Technology Department
Missouri City Management Office
Missouri City Parks and Recreation Department
Missouri City Police Department
Missouri City Public Works Department
Fort Bend County
Fort Bend ISD
Houston-Galveston Area Council (H-GAC)
Texas Department of Transportation (TxDOT)

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CITIZENS OF MISSOURI CITY

This plan was made for the community, with the help of the community. The continuous dedication of time and effort by members of the community, not only in the planning process, but in their daily interests, is what made this effort possible.

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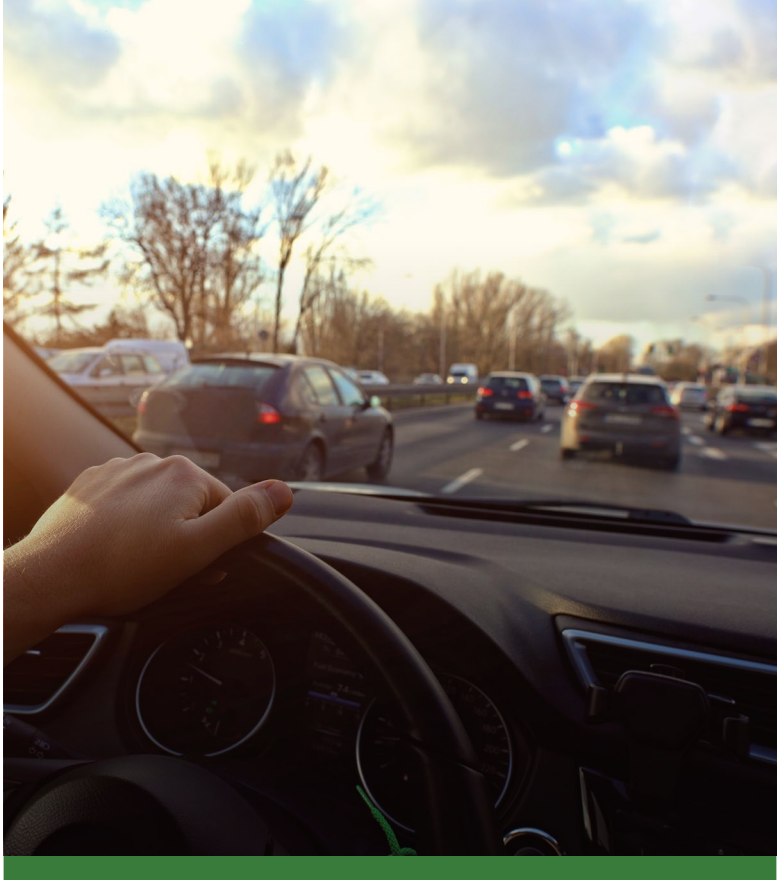

Executive Summary

Executive Summary

Mobility planning is a process that defines future improvements and guides future investments for cities that will move people and goods safely and efficiently. The City of Missouri City began the mobility study to address the mobility needs regarding existing transportation within the city and to plan for future expansion. With the recent and future growth of the city, planning is required to address the existing traffic and safety issues to establish enhanced mobility now and in the future.

A primary focus in development of the mobility study was to engage the public and develop a plan for citizen input. The planning process coordinated with and incorporated existing plans of the city. A public engagement process, an overarching vision, goals, and performance measures guided the creation of the mobility study.

0.1 VISION AND GOALS

The vision of the Missouri City Mobility Plan is "to provide a connected transportation network that is safe and efficient for all users".

TABLE 0.1A - PROJECT GOALS, OBJECTIVES, AND PERFORMANCE MEASURES

GOAL	OBJECTIVES	MEASURES
Mobility	Provide additional mobility options to serve areas with unique mobility needs and accommodate future growth	Modes, facilities
	Increase miles of bicycle, pedestrian, and trail facilities to provide a connected non-motorized network	Connectivity, gaps
Safety	Provide safety related pedestrian improvements	Pedestrian-specific crash data
	Identify improvements at intersections experiencing the City's highest crash densities	Number of conflict points, crash data
Efficiency	Improve efficiency of vehicular mobility citywide	Travel time, traffic volumes

The corresponding goals, objectives, and performance measures are used to ensure that the recommendations from this study help the city achieve the vision over time.

0.2 PLAN DEVELOPMENT

0.2.1 Community Engagement

Input from daily users of the transportation system was an important part of the planning process. To guarantee that the correct issues were being addressed, input was solicited from the community through public meetings and a project website with a survey, budgeting exercise, and online interactive commenting map.

Major themes heard throughout the community engagement process included:

- Provide more pedestrian and bicyclist facilities
- Provide new mobility options (micro-mobility)
- Expand trail systems
- Improve pedestrian safety, specifically near schools
- Improve safety and efficiency of intersections

0.2.2 Existing Conditions

Data was collected to document the existing conditions at the time that this study was conducted including population growth, current development projects, and transportation and environmental characteristics.

Similar studies have previously been completed for Missouri City. However, as the city continues to develop, traffic volumes, traffic patterns, and the roadway network itself, continue to change as well. This update is to address current issues and create a plan to continue implementation into the future.

The existing conditions data sets a baseline of understanding in order to plan for future changes.

Data that is documented in this study include:

- Existing land uses
- Zoning map
- Current developments
- Existing and previously planned bicycle and pedestrian facilities
- Existing transit facilities
- Crash data
- Environmental features
- Existing traffic volumes

0.2.3 Previous Studies

The areawide, corridor, and intersection improvements recommended in this study incorporate those recommended in some of the City's previous studies. Plans that were incorporated into the creation of the Missouri City Mobility Plan include:

- Missouri City Comprehensive Plan - 2009 (Updated 2017)
- City of Missouri City Bicycle and Pedestrian Mobility Plan - 2013
- Missouri City Strategic Plan - 2014
- Parks and Recreation Master Plan - 2021
- Sienna Parkway Mobility and Needs Assessment - 2019

0.3 PROPOSED IMPROVEMENTS

Study area improvements include recommendations for cross-section design, functional classifications, alignments, active transportation, railroad crossings, intersections, and policy. Short-term recommendations include:

- Citywide signal retiming program
- Study of priority intersections identified in this study for safety and mobility enhancements
- Install sidewalks along priority corridors identified in this study
- Use the Safe Routes to School program to improve illumination and increase number of sidewalks near schools
- Update Major Thoroughfare Plan to reflect existing conditions, align with the Public Infrastructure Design Manual, and account for potential future alignments

Refer to Appendix C for a list of specific recommendations.

0.4 EVALUATION OF IMPROVEMENTS

The goals and performance measures provided in Table 0.1a, were used as guides to evaluate the recommended improvements. Each of the goals were given a weighting and each recommendation was ranked based on those weights. Recommendations that were made based on feedback from the community were given additional weighting. While the evaluation was used to generally rank the projects, actual implementation will depend on available funding, local and regional partnership, and continued development throughout the city.

It is recommended that proposed improvements be measured regularly in the future to determine their continued effectiveness. In total, 175 recommendations were evaluated:

- Pedestrian Network (57 recommendations)
- Bicycle Network (97 recommendations)
- Intersections (19 recommendations)
- Miscellaneous (2 recommendations)

The evaluated improvements were used to develop a possible Capital Improvement Plan project list for the city. Additionally, local, state, and federal funding sources were identified to present opportunities for the city.

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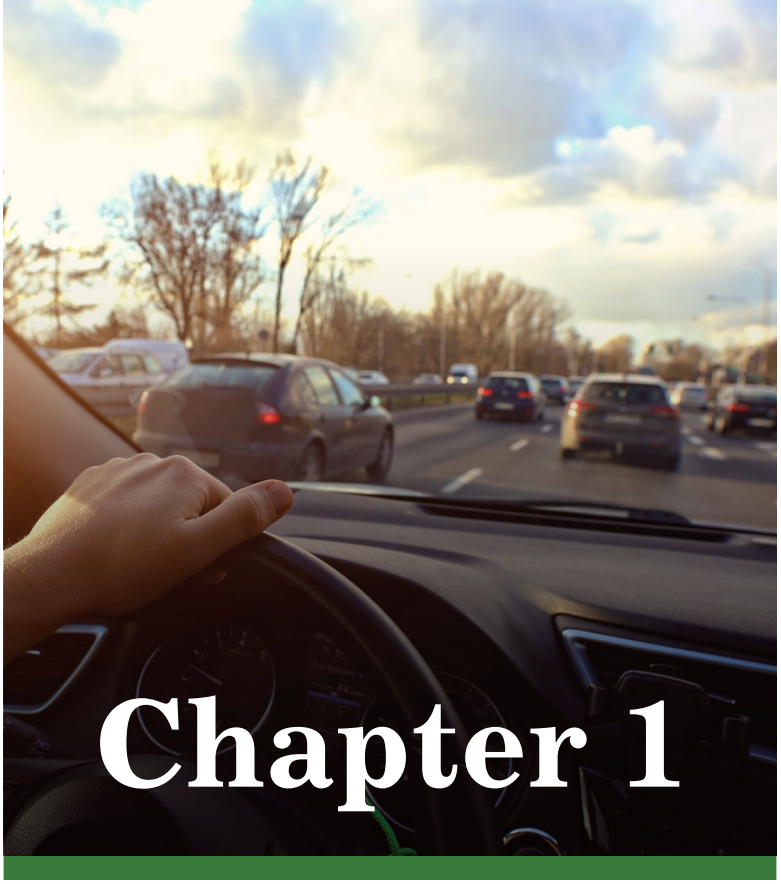


Chapter 1

Introduction

1.1 PROJECT STUDY AREA

1.2 VISION AND GOALS

1.3 PAST PLANS

1.4 REPORT ORGANIZATION

Introduction

Mobility planning is a process that defines future improvements and guides future investments for cities that will move people and goods safely and efficiently. This plan examines the existing transportation network, accounts for community input received throughout the planning process, and recommends improvements to achieve the city's mobility goals.

Missouri City has completed several plans that contain elements of mobility. The purpose of the Missouri City Mobility Plan is to consolidate the existing plans and provide the city with a roadmap to meet the mobility needs of the future. This plan is intended to be used in conjunction with the Missouri City Intelligent Transportation systems (ITS) Master Plan which focuses on addressing the city's mobility needs through upgrading the ITS infrastructure.

1.1 PROJECT STUDY AREA

The City of Missouri City is located approximately 17 miles southwest of downtown Houston; the majority of the city is located in Fort Bend County, with its northernmost portion located within Harris County. The city is bordered by Sugar Land to the west, Stafford to the north, Houston to the northeast, and Fresno and Arcola to the southeast. Several highways running through the city connect Missouri City with the Greater Houston area. Figure 1.1a displays the study area in relation to points of interest in the greater Houston area. The study area for this plan includes both the City Limits and Extraterritorial Jurisdiction (ETJ) and is displayed in Figure 1.1b.

FIGURE 1.1A - PROJECT STUDY AREA

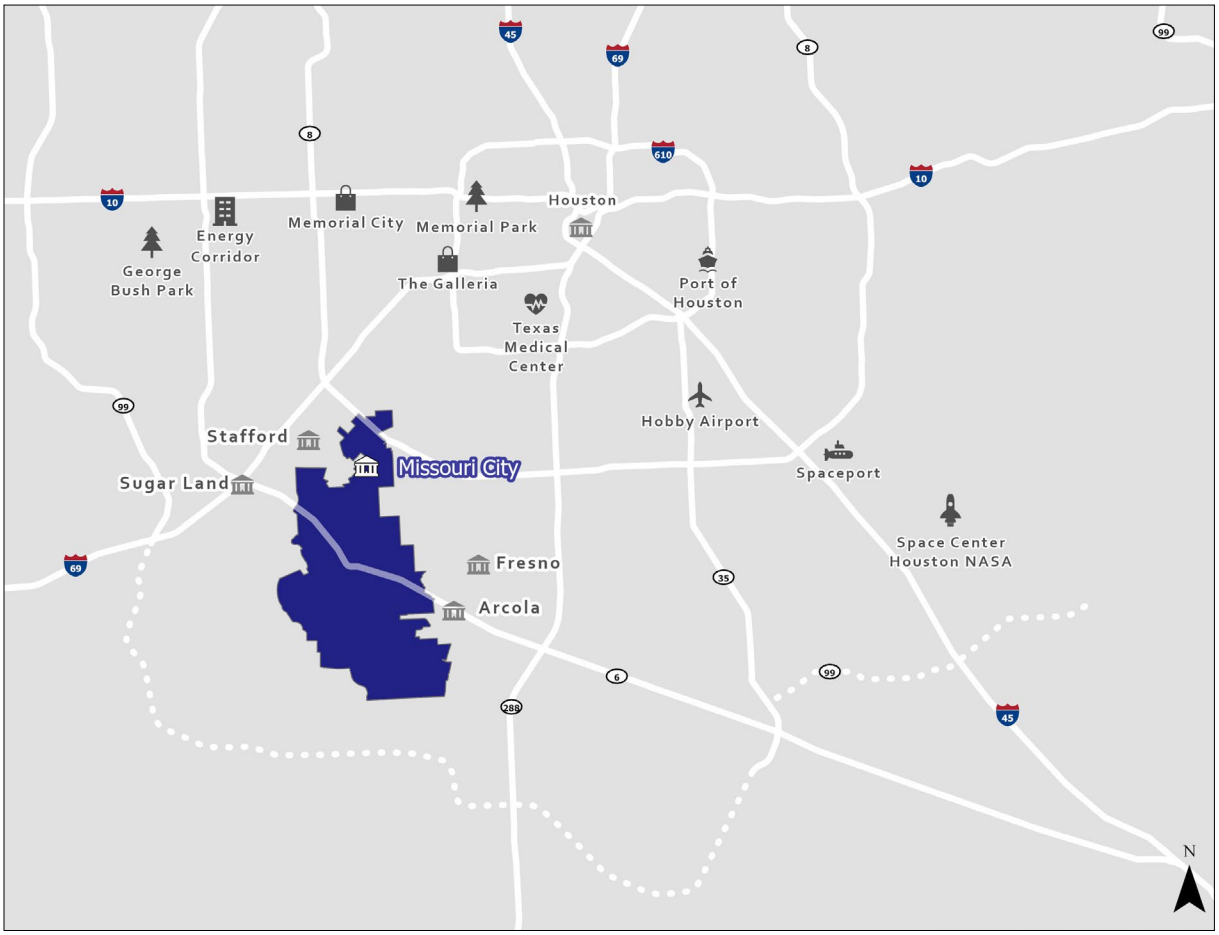
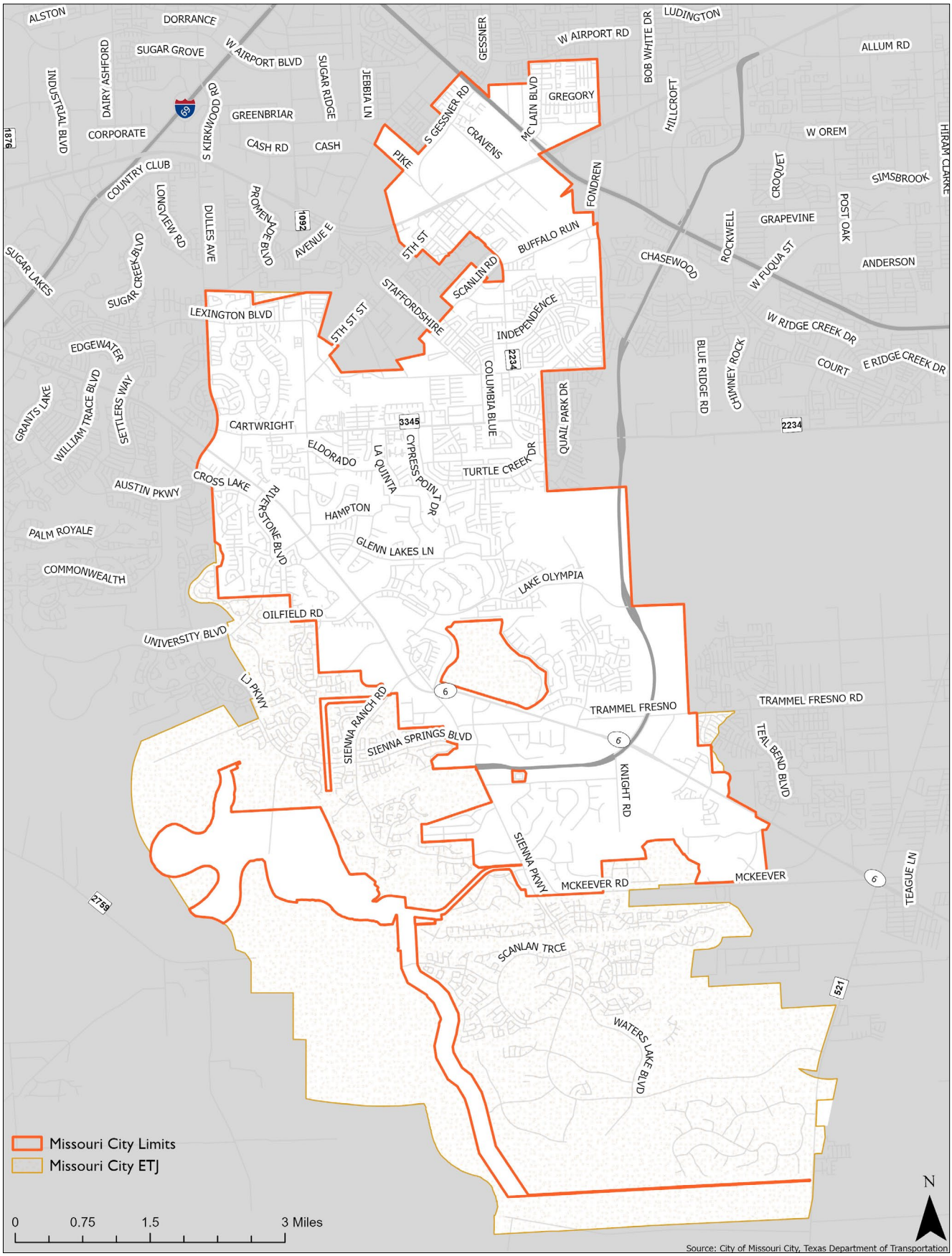


FIGURE 1.1B – STUDY AREA BOUNDARY



Source: City of Missouri City, Texas Department of Transportation

1.2 VISION AND GOALS

The purpose of the vision statement is to provide a guiding direction for the future of mobility in the city. The vision for this plan was created from feedback provided during the community engagement process and is provided below.

VISION

"To provide a connected transportation network that is safe and efficient for all users."

Once the Vision was established, it was further refined into three goals as shown in Figure 1.2a.

Each goal is supported by more specific objectives, and the fulfillment of each goal is evaluated using a set of performance measures. The combination of the goals, objectives, and performance measures were used throughout the planning process to support the overarching vision. All recommendations made in the report work toward accomplishing at least one of the goals and its corresponding objectives and performance measures. A full overview of the plan's goals, objectives and performance measures can be found in Chapter 5 – Evaluation of Recommendations and are summarized in Table 1.2a.

FIGURE 1.2A – PROJECT GOALS

TABLE 1.2A – PROJECT GOALS, OBJECTIVES, AND PERFORMANCE MEASURES

GOAL	OBJECTIVES	MEASURES
Mobility	Provide additional mobility options to serve areas with unique mobility needs and accommodate future growth	Modes, facilities
	Increase miles of bicycle, pedestrian, and trail facilities to provide a connected non-motorized network	Connectivity, gaps
Safety	Provide safety related pedestrian improvements	Pedestrian-specific crash data
	Identify improvements at intersections experiencing the City's highest crash densities	Number of conflict points, crash data
Efficiency	Improve efficiency of vehicular mobility citywide	Travel time, traffic volumes

1.3 PAST PLANS

Missouri City has not historically had a single mobility plan but rather several plans with aspects of mobility. Table 1.3a below lists the plans, the year the plans were adopted, and a brief description of the purpose of the plan. A couple of the plans were updated after the initial adoption of the plan. The year the plan was updated is shown in parenthesis.

TABLE 1.3A – PREVIOUS PLANS

PLAN	ADOPTED (UPDATED)	DESCRIPTION
Traffic Management Plan	2006 (2011)	A plan focused on addressing traffic congestion and transportation infrastructure improvements to sufficiently plan for mobility for the future.
ITS Operations Plan	2008	A plan concentrated on the use of Intelligent Transportation Systems (ITS) to address traffic congestion.
Comprehensive Plan	2009 (2017)	A plan designed as a framework for guiding development, redevelopment, and community enhancements throughout the city for the years to come.
Bicycle and Pedestrian Mobility Plan	2013	A plan developed to create a multi-modal network throughout the city to provide better connections for bicyclists and pedestrians.
Parks, Recreation & Open Space Master Plan	2021	A plan committed to enhancing the quality of life for citizens by providing parks, trails, and recreational programming opportunities.

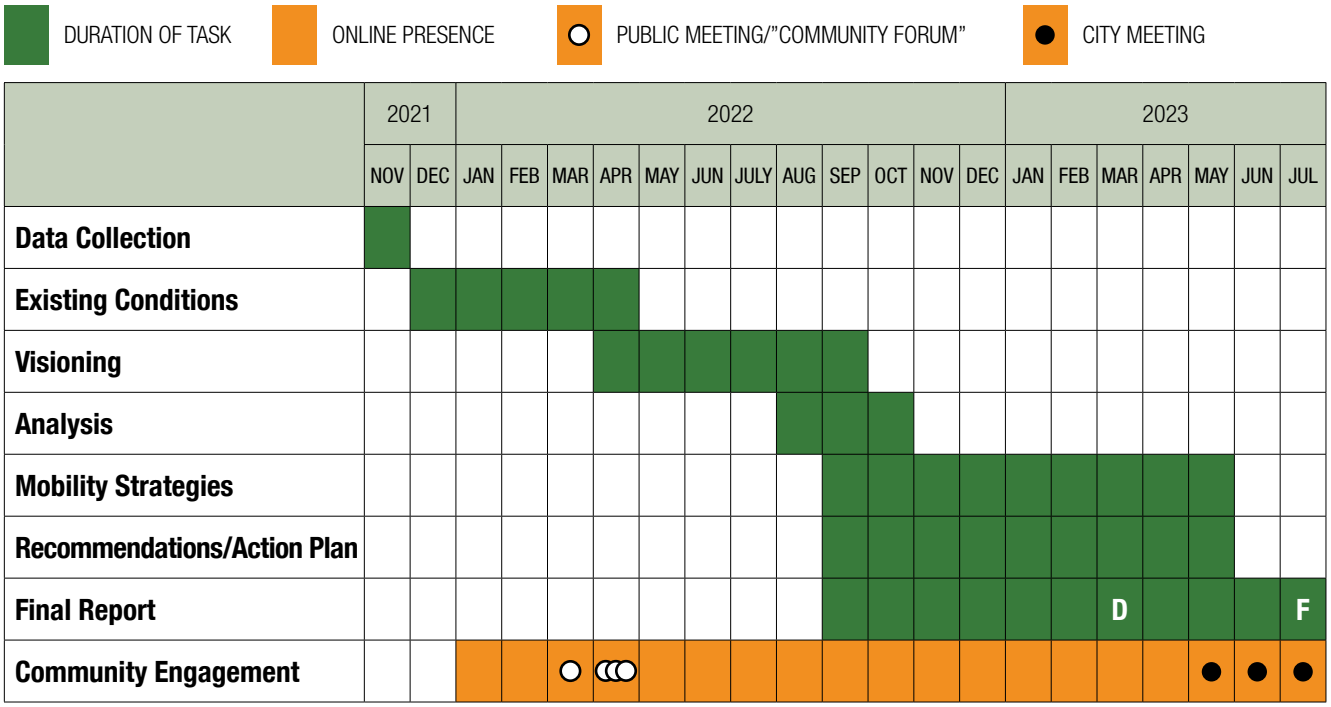
1.4 REPORT ORGANIZATION

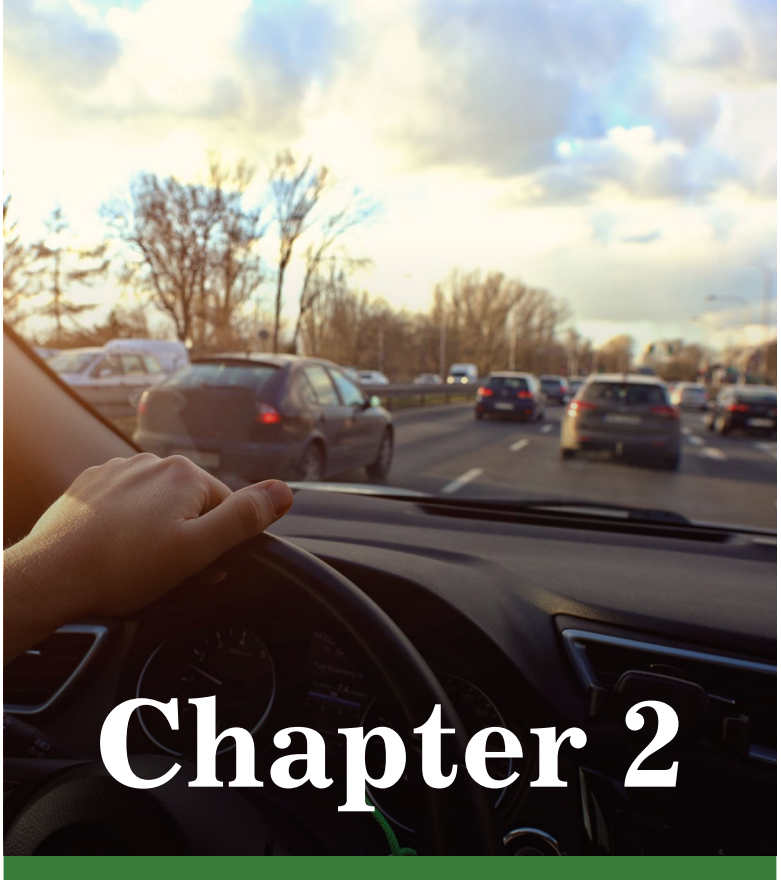
The Table of Contents is available as an overview of where specific items are located within the report. Generally, the report is organized into the following chapters:

- **Chapter 1** – Introduction
  provides a brief overview of the study area and explains the vision, goals, and objectives of the mobility plan.
- **Chapter 2** – Community Engagement
  describes how the priorities and concerns of the public are integrated into the plan and provides details on the community engagement events.
- **Chapter 3** – The City Today
  reviews the existing conditions of the city, including transportation and environmental elements.
- **Chapter 4** – Recommendations
  identifies current and future multimodal mobility needs within the city and strategies for meeting those needs.
- **Chapter 5** – Evaluation of Recommendations
  summarizes and evaluates the recommendations made in the previous chapter based on performance measures consistent with the Vision. Additionally, this chapter identifies timelines and potential funding sources.
- **Chapter 6** – Capital Improvements Program (CIP) Implementation Plan
  presents the recommended projects to be included in the CIP.

An overview of major project milestones is illustrated in Figure 1.4a.

FIGURE 1.4A – PROJECT SCHEDULE





Chapter 2

Community Engagement

2.1 COMMENT MAP RESULTS

2.2 BUDGET ACTIVITY RESULTS

2.3 SURVEY RESULTS

2.4 PUBLIC ENGAGEMENT MEETINGS

CHAPTER 2

Community Engagement

Residents, visitors, and stakeholders of Missouri City were given the opportunity to provide feedback through a project website and four public engagement meetings. The project website, created using an online engagement platform, Social Pinpoint, was live from February to May of 2022. The website hosted an interactive map that allowed users to place comments geographically within the study area, a budget activity that allowed users to distribute a finite amount of money into various transportation buckets based on desire or need, and a written survey that contained prompts on residents' mode choices and preferences. The in-person meetings took place in the spring of 2022. The same activities that were on the website were reformatted for in-person participation and were available at all four public meetings. These three activities provided important context as to where residents wanted to see mobility improvements and what barriers existed for users on the current network.

Major themes heard throughout the community engagement process included:

- Provide more pedestrian and bicyclist facilities
- Provide new mobility options (micro-mobility)
- Expand trail systems
- Improve pedestrian safety, specifically near schools
- Improve safety and efficiency of intersections

SECTION 2.1 – Results of the interactive map

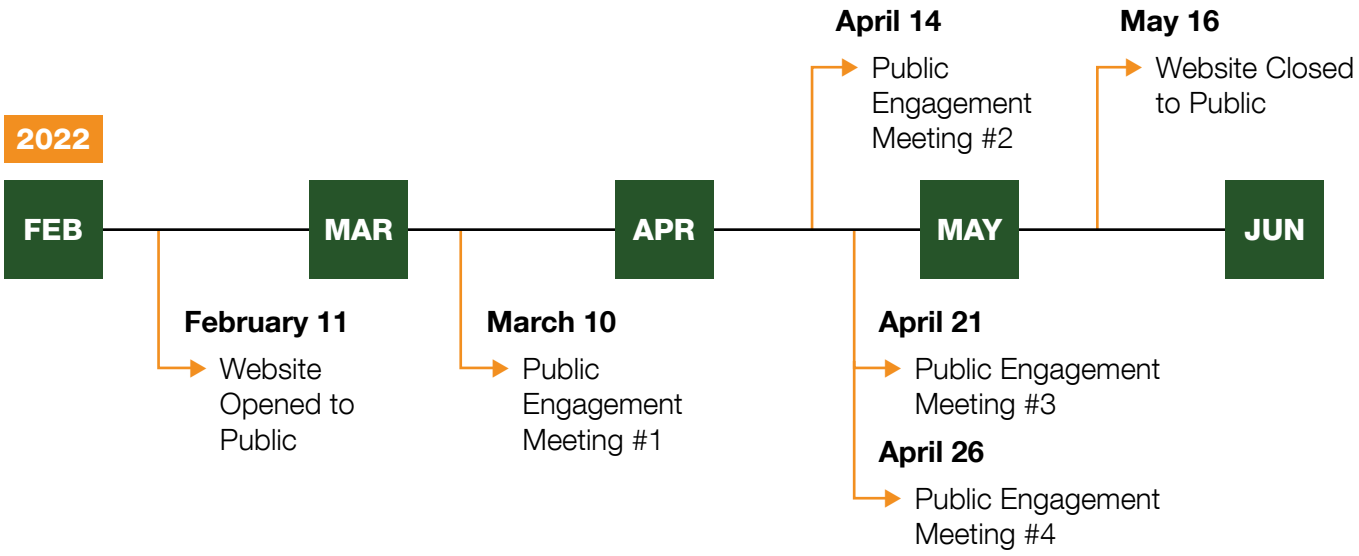
SECTION 2.2 – Results of the budget activity

SECTION 2.3 – Results of the written survey

APPENDIX A – All public engagement materials

The results of the online map survey can be found in Section 2.1 and pictures of the map comments received during the in-person meetings can be found in Appendix A; the budget activity results from the in-person meetings and the website have been combined and can be found in Section 2.2; and the written survey in Section 2.3.

FIGURE 2A - PUBLIC ENGAGEMENT TIMELINE



2.1 COMMENT MAP RESULTS

The comment map provided users the opportunity to provide comments on the state of mobility in the study area. In the online interactive version, users were asked to provide comments relating to one of the seven categories: automobile facilities, bicycle facilities, pedestrian facilities, transit facilities, micro-mobility opportunities, technology opportunities, or general if the comment did not relate to the previous categories. The comments were then separated into three general groupings; safety, efficiency, and transportation network gaps; which are shown in Figure 2.1a. A heat map for each of the three categories are displayed in Figures 2.1b through 2.1d. More detailed information on the feedback provided is shown in Figure 2.1e

The in-person comment mapping activity allowed users to place sticky notes or write comments directly on the map. Facilitators guided the users to provide comments on transportation-related topics.

FIGURE 2.1A - SOCIAL PINPOINT COMMENT MAP

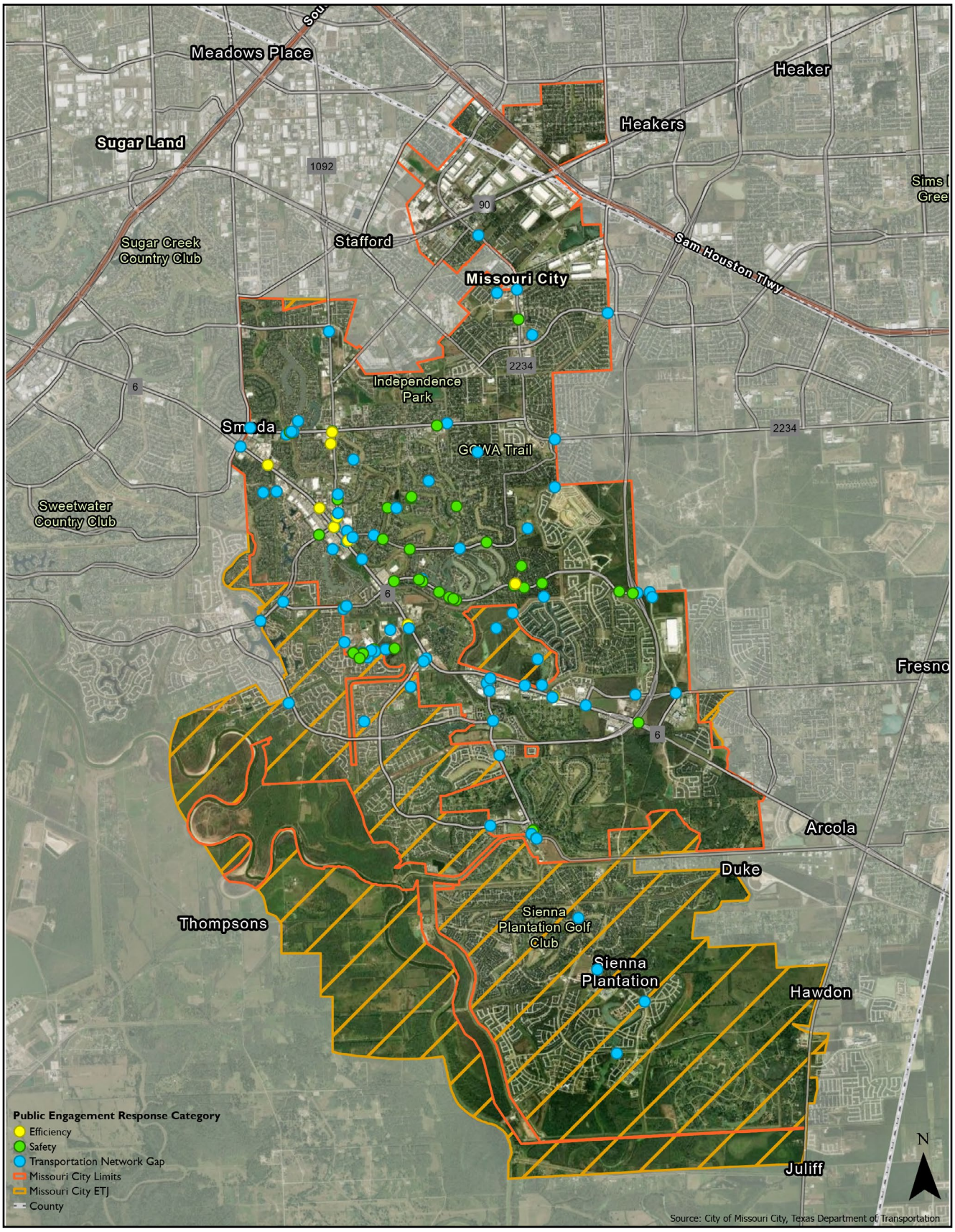


FIGURE 2.1B – EFFICIENCY COMMENTS HEAT MAP

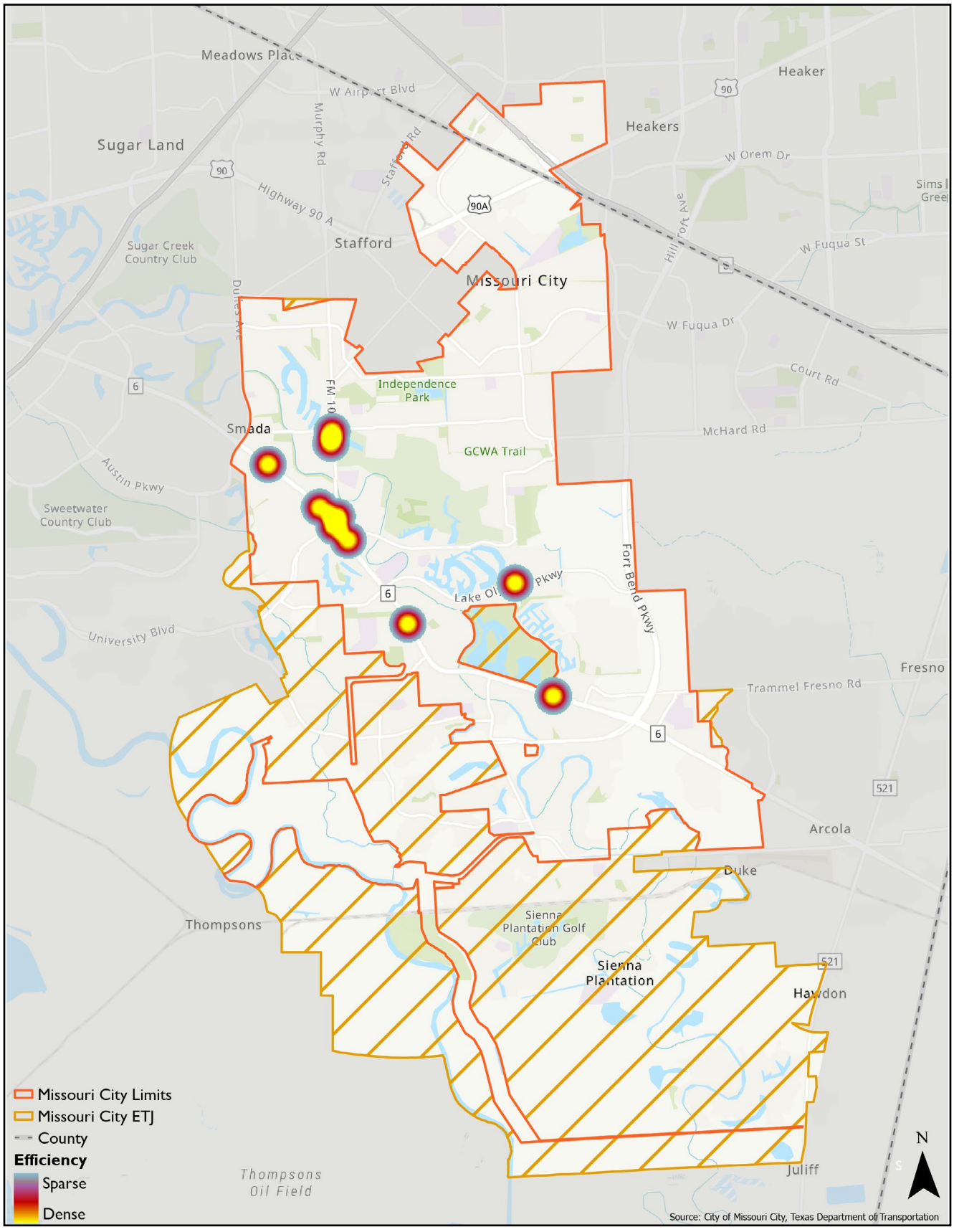


FIGURE 2.1C – SAFETY COMMENTS HEAT MAP

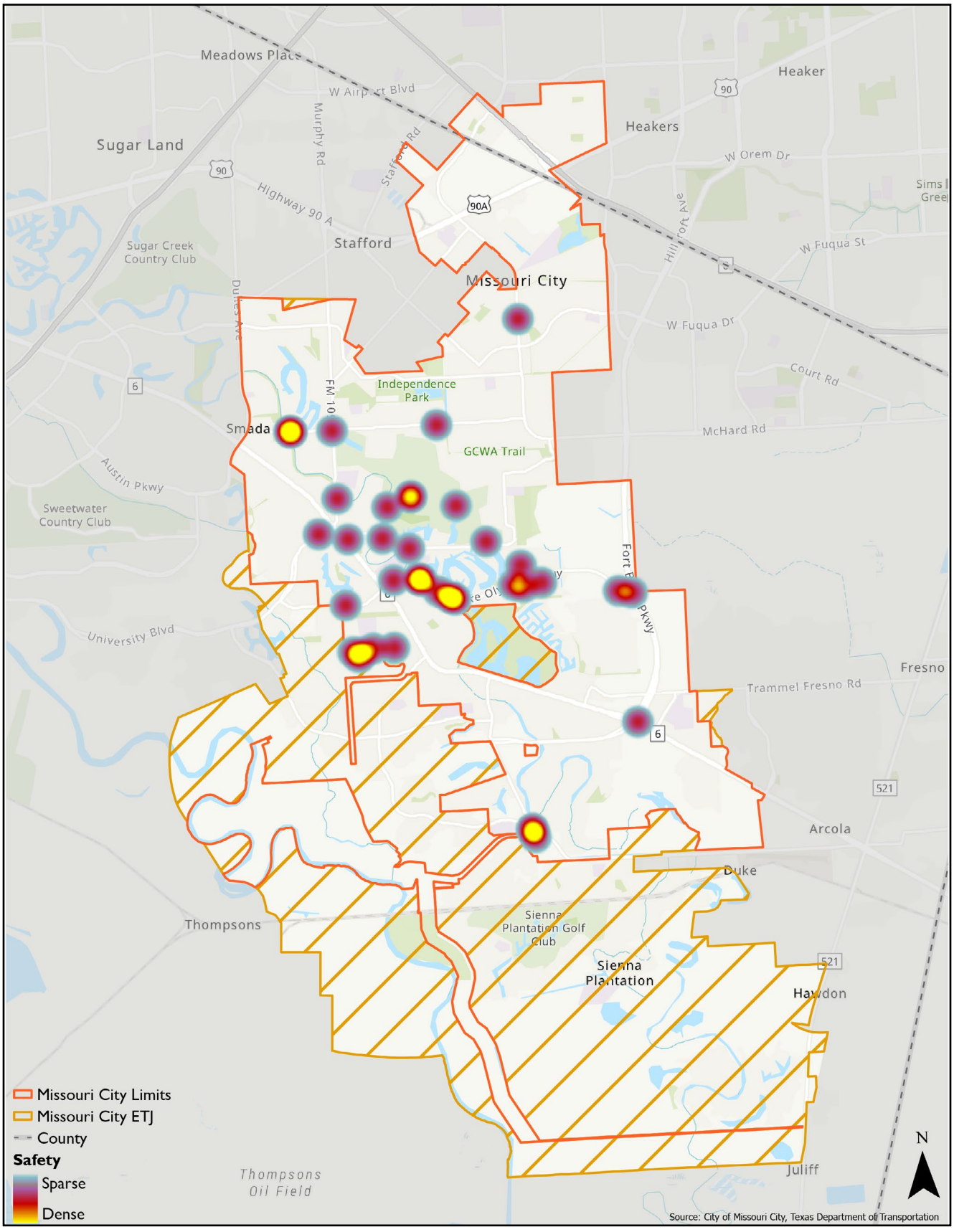


FIGURE 2.1D – TRANSPORTATION NETWORK GAP COMMENTS HEAT MAP

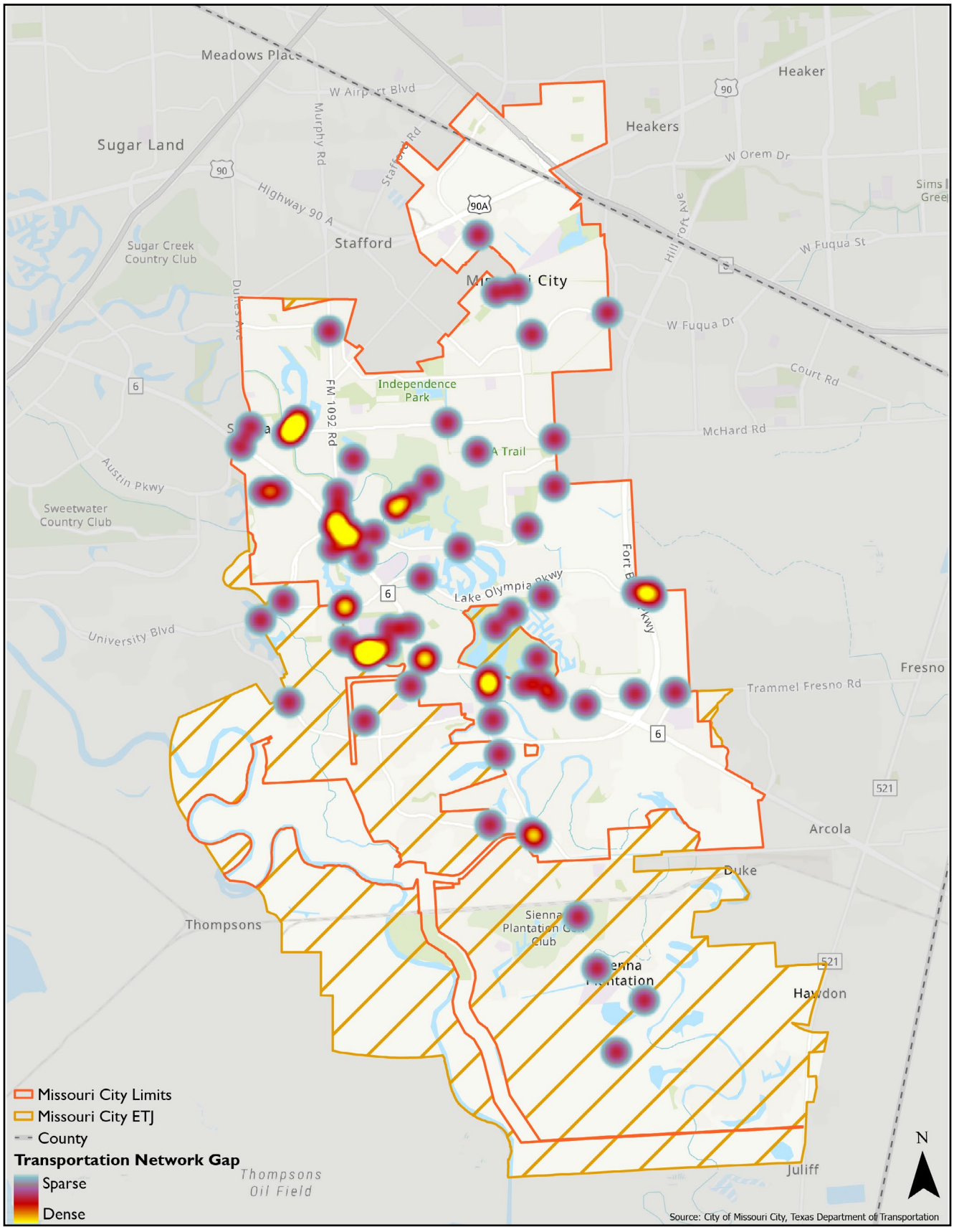


FIGURE 2.1E - SOCIAL PINPOINT COMMENT MAP CATEGORY RESULTS

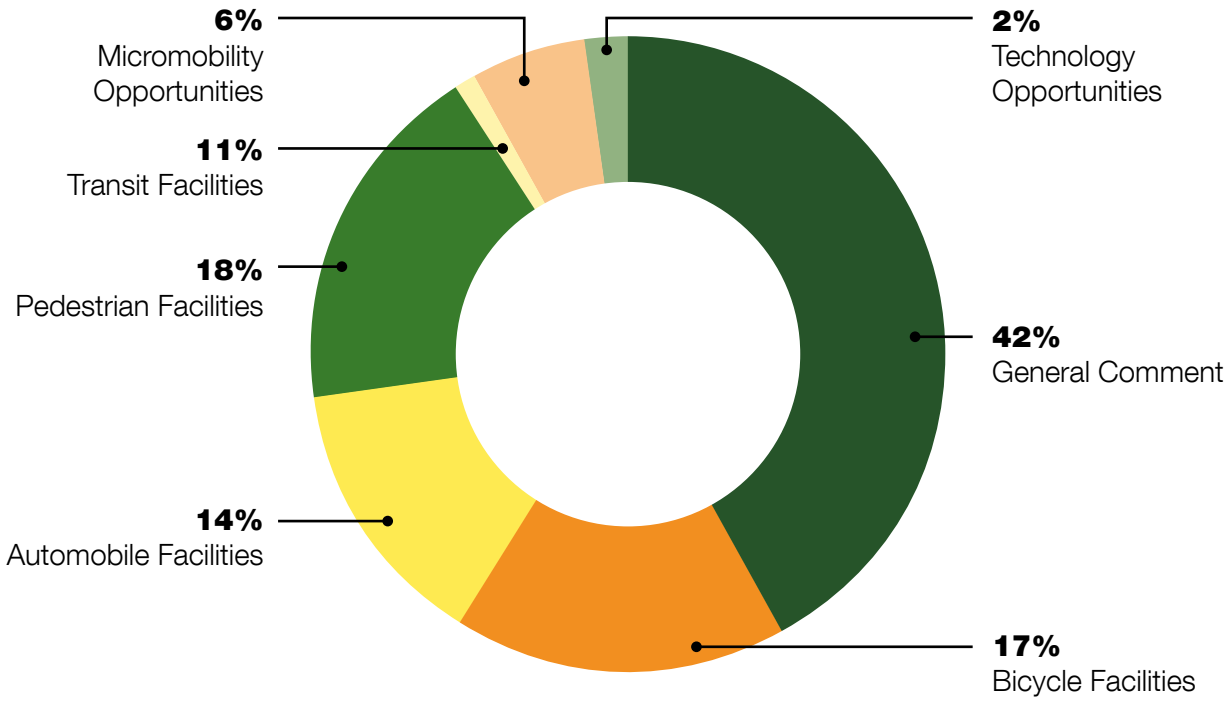


FIGURE 2.1F - COMMENTS PROVIDED DURING IN-PERSON MEETINGS

2.2 BUDGET ACTIVITY RESULTS

The budget activity provided users with coins representing a set amount of money that they could place into six transportation buckets based on need or desire: automobile facilities, bicycle facilities, micro-mobility, pedestrian facilities, transit facilities, and transportation technology. A few examples of each bucket are below.

- **Pedestrian Facilities:** sidewalks, trails, curb ramps, lighting, crosswalks, etc.
- **Automobile Facilities:** roadway widening, turn lanes, medians, etc.
- **Bicycle Facilities:** bike lanes, shared-use paths, intersection safety treatments, etc.
- **Transportation Technologies:** traffic signal timing, traveler information, traffic monitoring, etc.
- **Transit Facilities:** bus routes, bus shelters, park-and-rides, etc.
- **Micromobility:** bikeshare, scooter rentals, golf carts, etc.

The buckets that the users placed their coins into indicated how the user would prefer the City allocate its budget. Results from the website activity were combined with the results from the four public engagement meetings and the total allocation of funds per category based on the combined results are displayed in Table 2.2a.

TABLE 2.2A - BUDGET ACTIVITY RESULTS

BUDGET ITEMS	PERCENTAGE	OVERALL RANK
Automobile Facilities	25.5%	1
Pedestrian Facilities	22.8%	2
Bicycle Facilities	18.7%	3
Transportation Technologies	17.2%	4
Transit Facilities	9.8%	5
Micromobility	5.9%	6
Grand Total	**100%**	

2.3 SURVEY RESULTS

The survey acted as a companion to the comment map by providing residents with an opportunity to offer more specific feedback. The survey consisted of 12 questions focused on respondents' travel patterns, mode preferences, and project prioritization preferences. Figures 2.3a-2.3g display results for specific survey questions that helped inform final recommendations.

FIGURE 2.3A - SURVEY RESULTS:

Do you live, work, shop, or play in Missouri City?

Total Responses: 329

**Participants were able to select as many options as they wanted for this question*

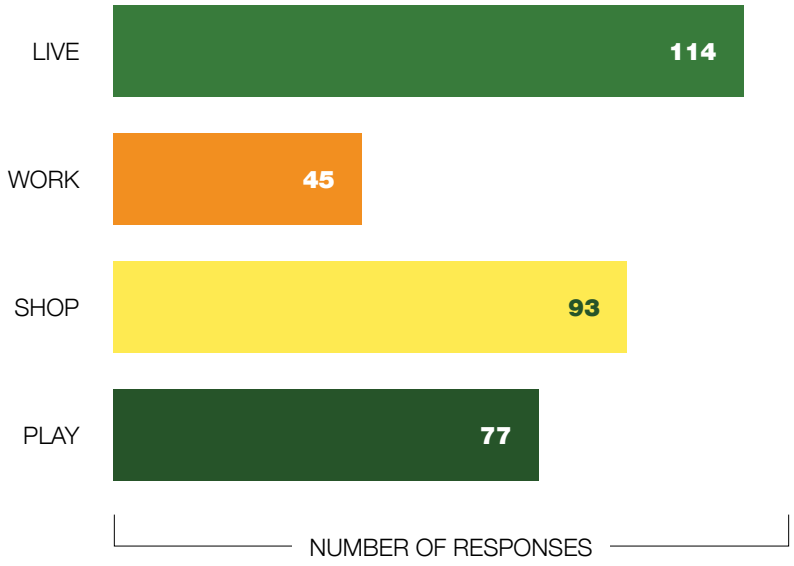


FIGURE 2.3B - SURVEY RESULTS:

How would you describe the existing pedestrian facilities and amenities (sidewalks/trails, curb ramps, lighting, benches, shade trees, crosswalks, pedestrian islands, audio-assisted crossings, push buttons, etc.)?

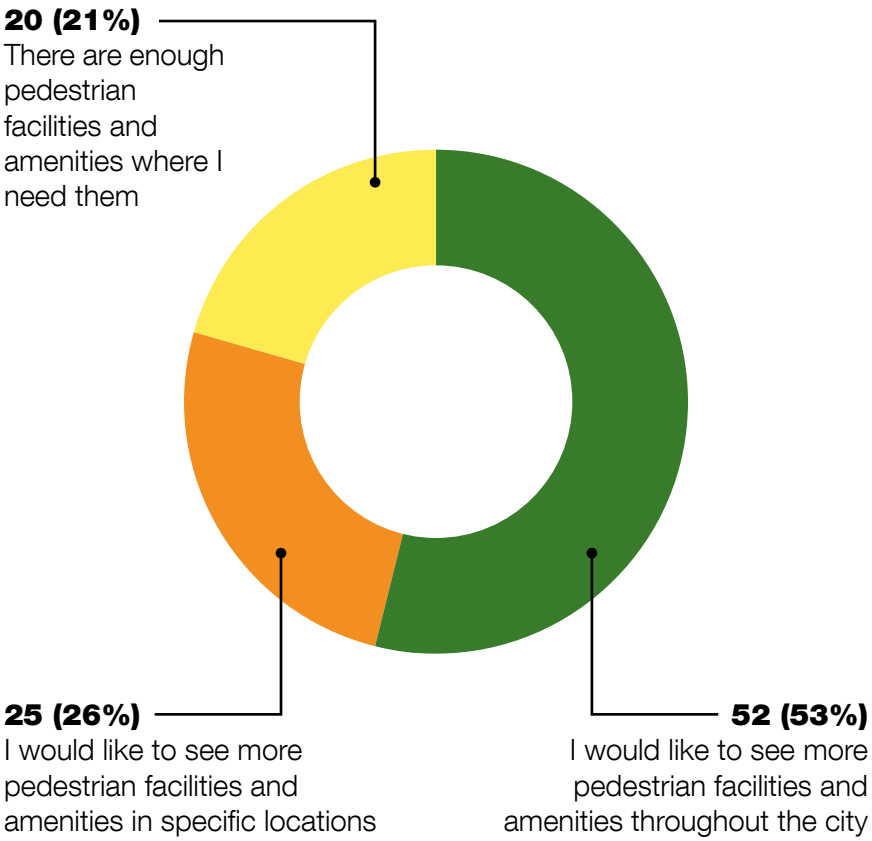


FIGURE 2.3C - SURVEY RESULTS:

How would you describe the existing bicycle facilities (bike lanes, shared use paths, safety measures, bike parking, etc.)?

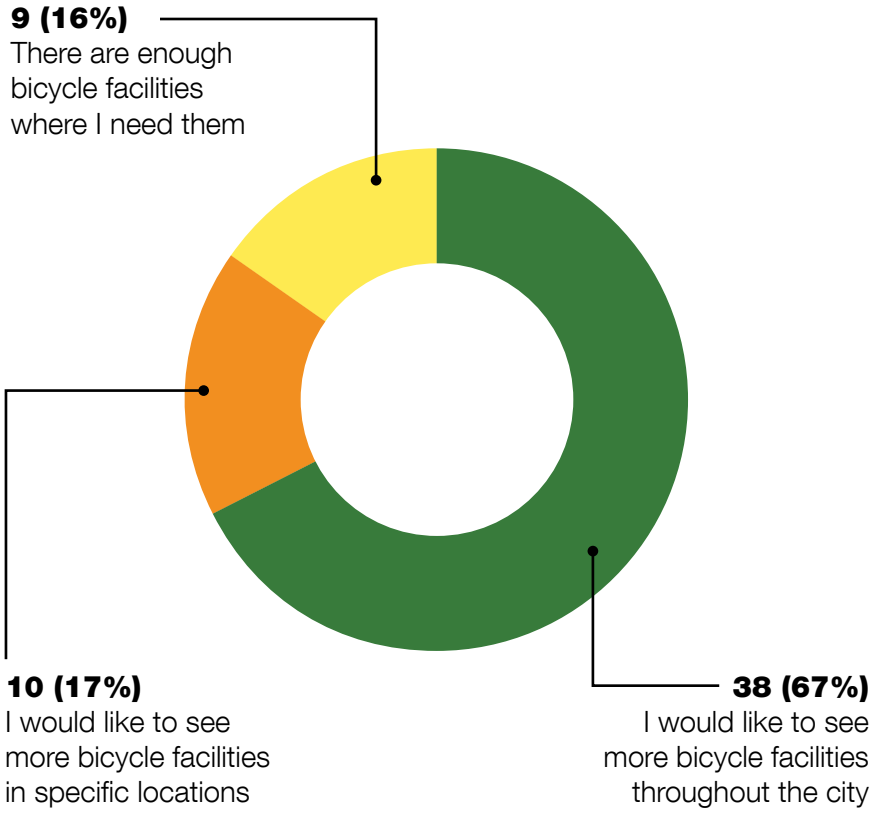


FIGURE 2.3D - SURVEY RESULTS:

Which type of community service and facilities within the City of Missouri City do you access most frequently?

Total Responses: 409

**Participants were asked to select their top five choices for this question*

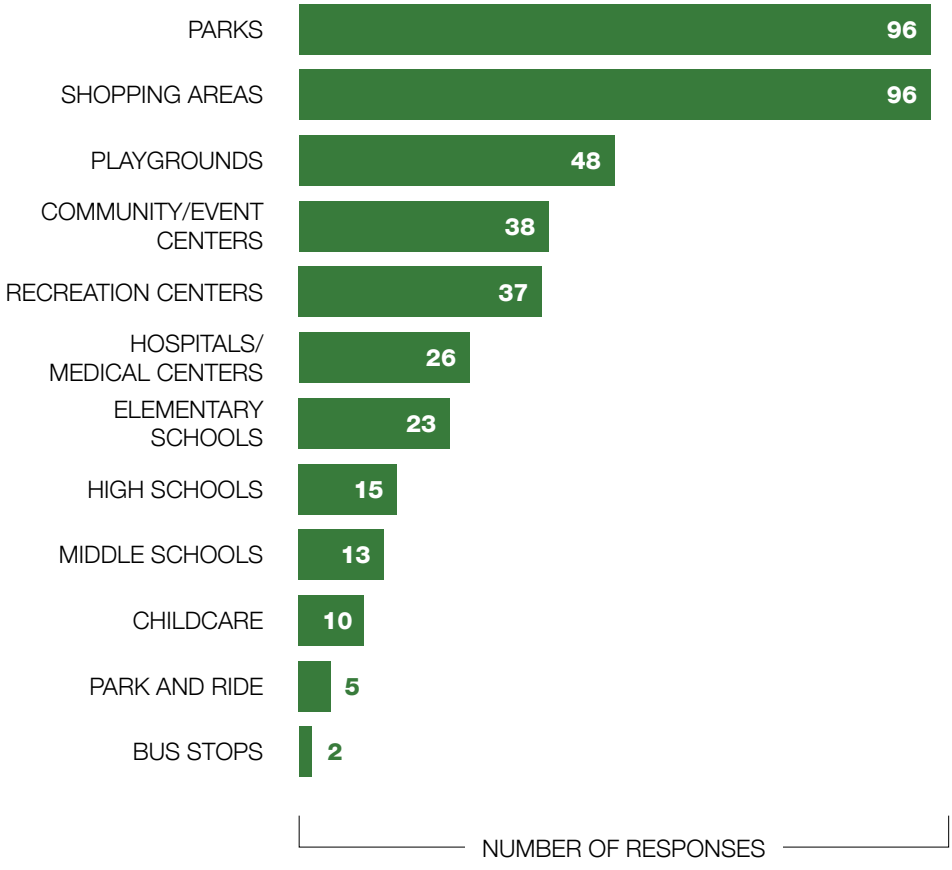


FIGURE 2.3E - SURVEY RESULTS:

If the following mocromobility options were made available in the City of Missouri City, which ones would you use?

Total Responses: 158

**Participants were able to select as many options as they wanted for this question*

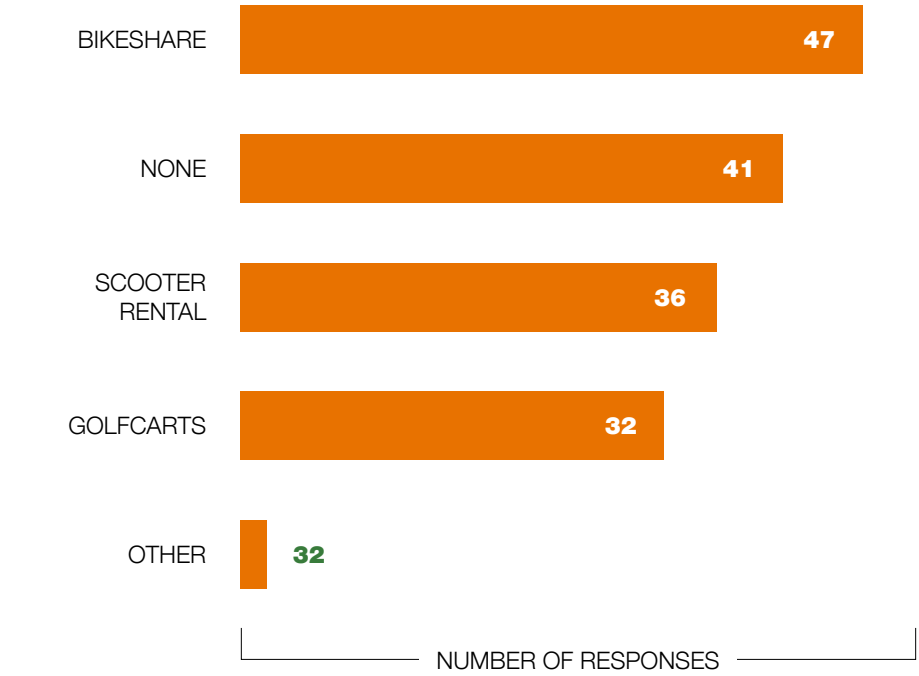


FIGURE 2.3F - WRITTEN SURVEY RESULTS:

If the following transit options were made (more) readily available in the City of Missouri City, which ones would you use?

Total Responses: 210

**Participants were able to select as many options as they wanted for this question*

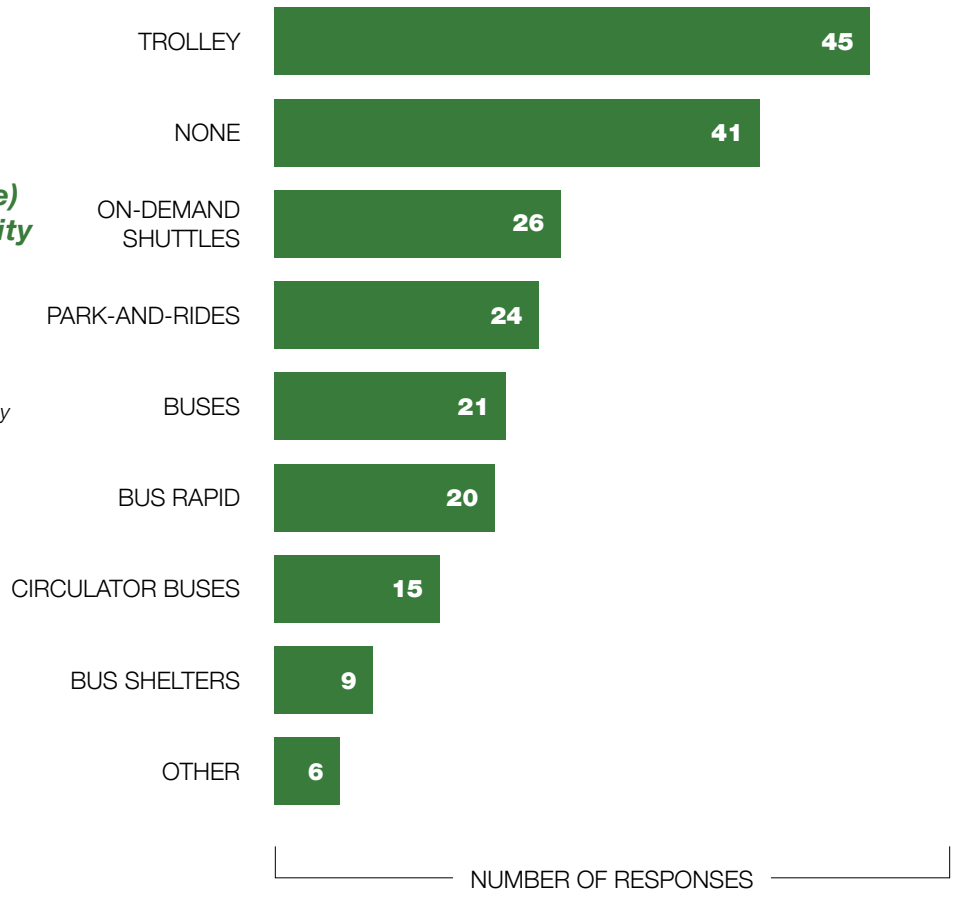
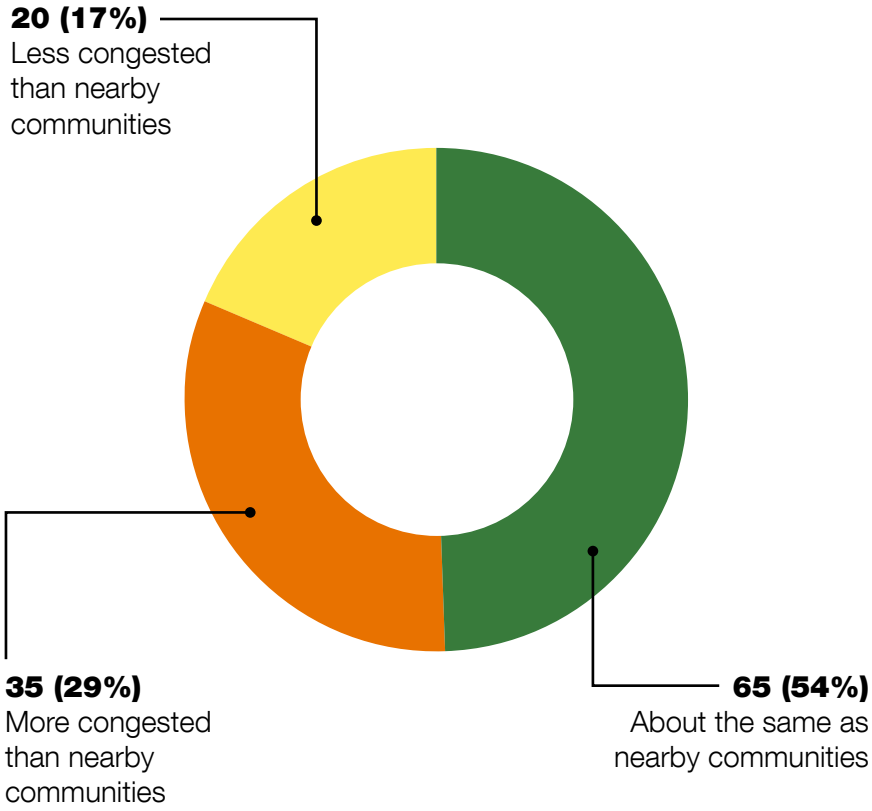


FIGURE 2-.3G - WRITTEN SURVEY RESULTS:

How would you describe the existing automobile traffic within the City of Missouri City?



In summary, the majority of individuals who participated in the survey live or shop in Missouri City. A desire was expressed for more pedestrian and bicycle facilities throughout the city. More pedestrian and bicycle facilities would assist citizens in accessing the most frequently visited community areas: parks and shopping areas. Additionally, it was noted by many that they would use bikeshare and trolleys if both options were made available. Overall, most individuals who participated in the survey described the existing automobile traffic in Missouri City as about the same as nearby communities.

2.4 PUBLIC ENGAGEMENT MEETINGS

The public engagement meetings were hosted at various locations around the city to provide residents the opportunity to choose the most convenient location for them. The purpose of the public meetings was to provide residents with information about the Mobility and Intelligent Transportation Systems Master Plan and to obtain feedback. Dates and locations for all public meetings are listed below:

1. **March 10th** – Community Center in City Hall (1522 Texas Parkway)
2. **April 14th** – Recreation and Tennis Center (2701 Cypress Point Drive)
3. **April 21st** – Missouri City Fire and Rescue Services Building (3849 Cartwright Road)
4. **April 26th** – Fort Bend County Library Sienna Branch (8411 Sienna Springs Boulevard)

Through the four public engagement meetings, 33 individuals attended the meetings, 22 surveys were received, and 91 comments were provided.

FIGURE 2.4A - PUBLIC ENGAGEMENT MEETING #1

FIGURE 2.4C - PUBLIC ENGAGEMENT MEETING #2

FIGURE 2.4B - PUBLIC ENGAGEMENT MEETING #1

FIGURE 2.4D - PUBLIC ENGAGEMENT MEETING #3

FIGURE 2.4E - PUBLIC ENGAGEMENT MEETING #4

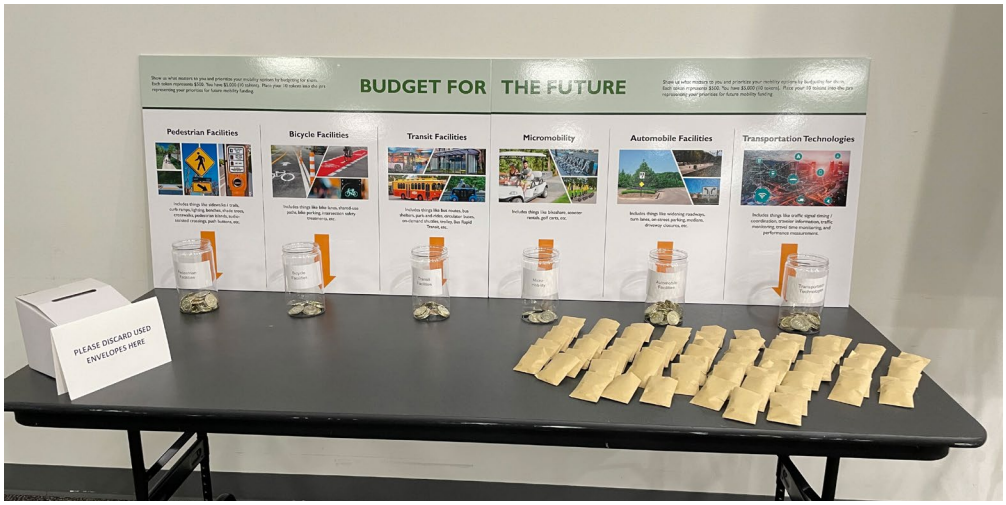


FIGURE 2.4F - PUBLIC ENGAGEMENT MEETING #4 BUDGET ACTIVITY

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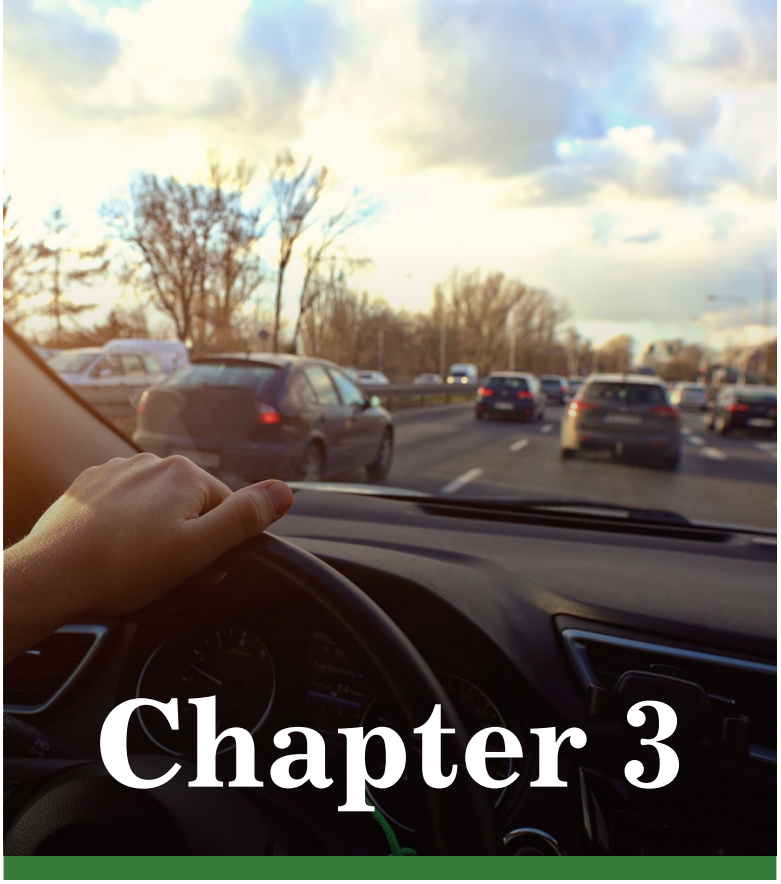


Chapter 3

The City Today

3.1 SOCIOECONOMIC

3.2 BUILT ENVIRONMENT

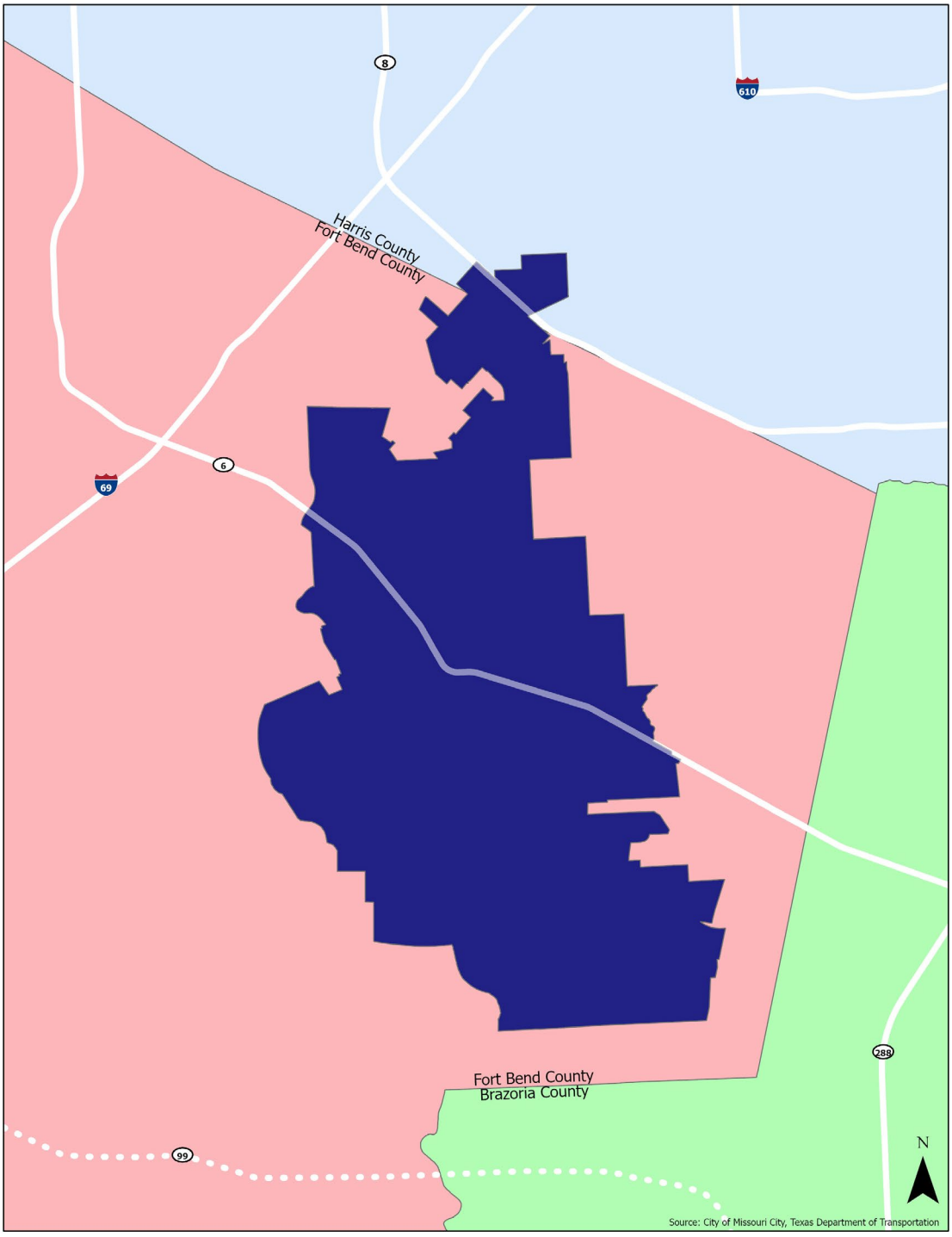
3.3 TRANSPORTATION

The City Today

This chapter includes a summary of the existing conditions of Missouri City regarding demographics, environment, and transportation. These conditions will provide a better understanding of what makes this city unique and how to best plan for its future.

The study area, which includes the City of Missouri City (30 square miles) and its ETJ (25 square miles), covers a total of 55 square miles and includes portions of both Harris County and Fort Bend County.

FIGURE 3A – PROJECT STUDY AREA



3.1 SOCIOECONOMIC

3.1.1 Population

The total population of Missouri City, not including the ETJ, has grown steadily each year for the last several decades. Refer to Table 3.1.1a for population information for the city from 2000 to 2021.

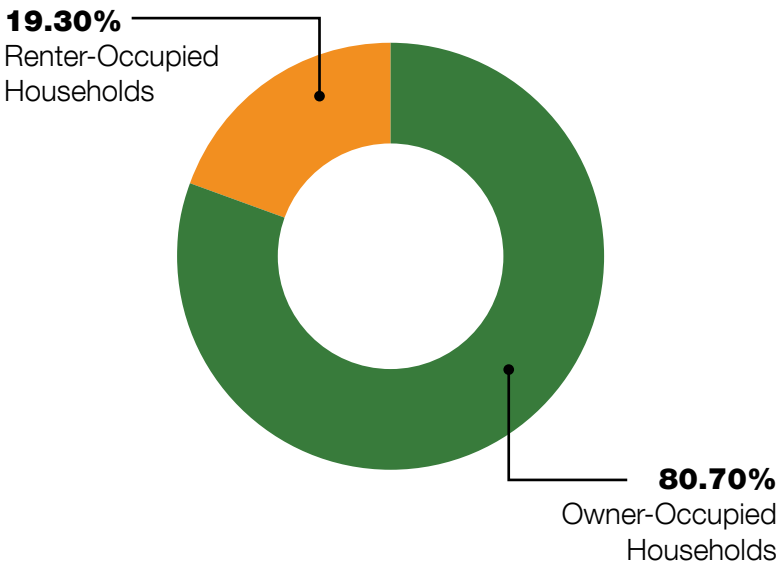
TABLE 3.1.1A – MISSOURI CITY POPULATION INFORMATION[2]

YEAR	POPULATION
2000	53,659
2010	67,020
2020	74,244
2021	74,850

As seen in the table above, the population grew by approximately 2.5% per year from 2000 to 2010 but only approximately 1.1% per year from 2010 to 2020. From 2020 to 2021 the population increased by about 0.8%. Per the regional growth forecast provided by Houston-Galveston Area Council (H-GAC), the population of Missouri City is projected to be 85,495 by the year 2045.

The total number of households in Missouri City was equal to 25,235. The majority of households in Missouri City own their homes. This data is displayed in Figure 3.1.1a below. In addition, 5.8% of the population were living below the poverty level of a median household income of $88,426.[2]

FIGURE 3.1.1A – MISSOURI CITY HOUSEHOLD INFORMATION

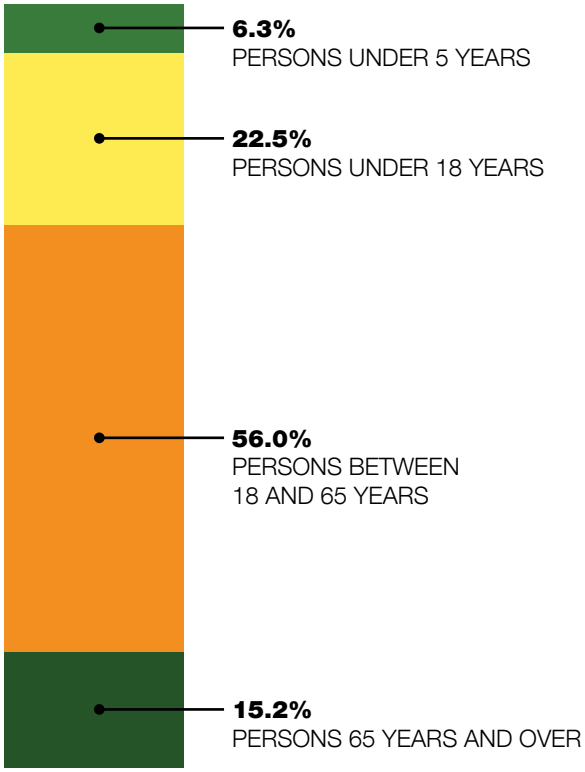


[1] *https://datacommons.org/place/geoId/4848804?utm_medium=explore&mprop=count&popt=Person&hl=en*

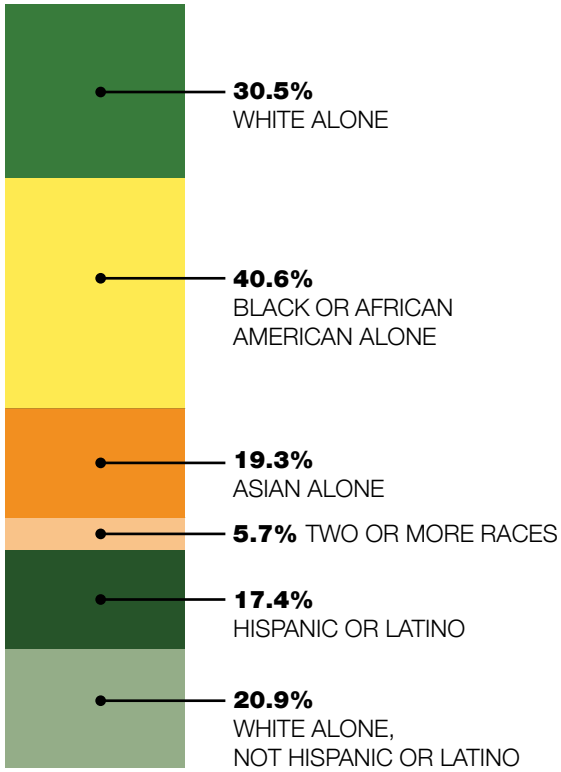
[2] *https://www.census.gov/quickfacts/fact/table/missouricitycitytexas/PST040221#PST040221*

FIGURE 3.1.1B – MISSOURI CITY DEMOGRAPHIC INFORMATION

Age and Sex



Race and Hispanic Origin



Transportation

30.6 MINUTES

MEAN TRAVEL TIME TO WORK (MINUTES),
WORKERS AGE 16 YEARS+, 2017-2021

Source: https://www.census.gov/quickfacts/missouricitycitytexas

**The information displayed in Table 3.1.1a and Figures 3.1.1a and 3.1.1b is based on data for the city and does not include information for the ETJ.*

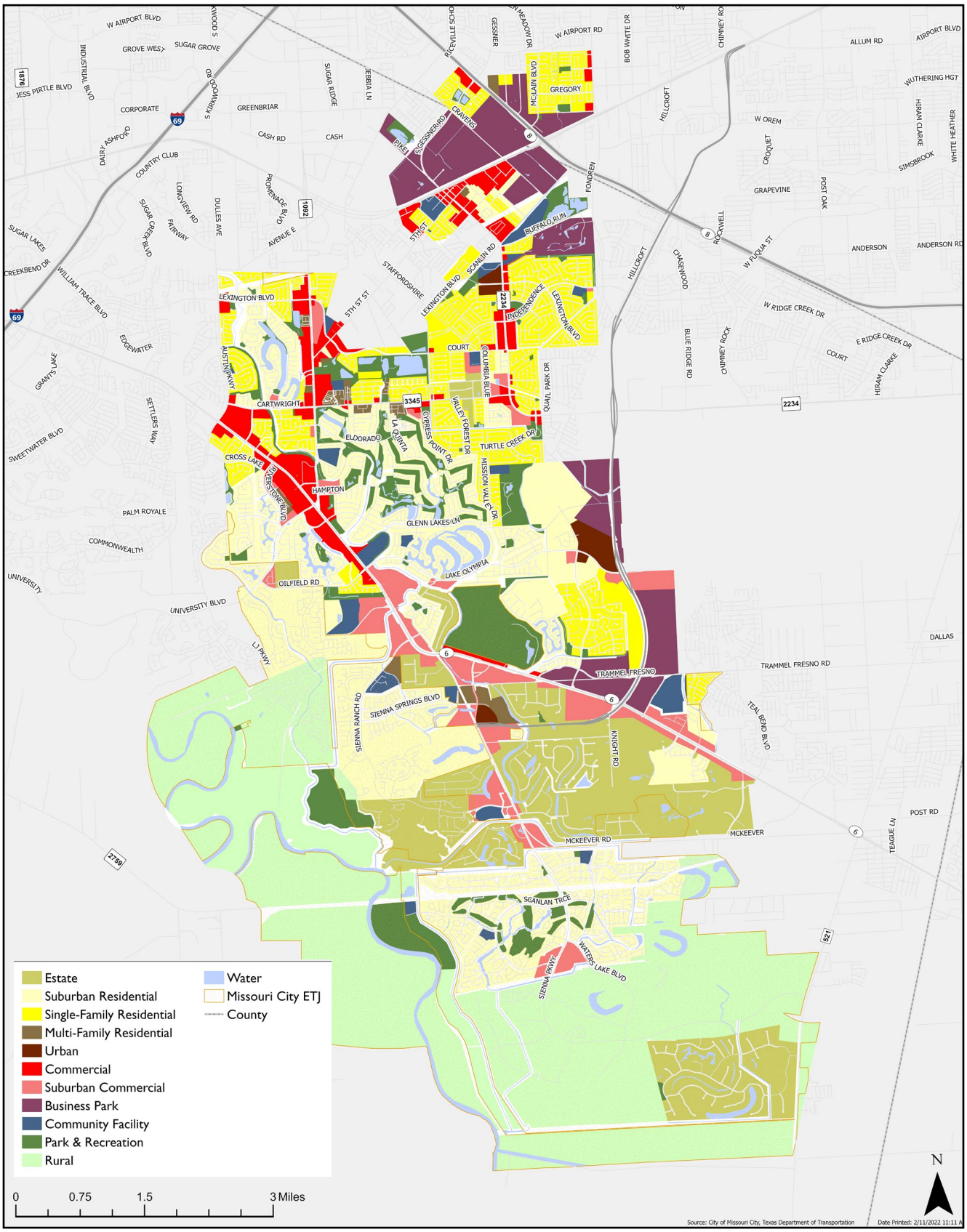
3.2 BUILT ENVIRONMENT

3.2.1 Land Use

The northernmost part of Missouri City was predominantly developed first. This area includes the land near the intersection of US 90A at Texas Parkway and north. The city's railroad history resulted in industrial land uses in this area. Development continued south with much of the land south of State Highway 6 still being developed. Sienna Ranch is a master planned community and is being constructed as predominantly residential with some supporting commercial uses, schools, and other public facilities. The remaining land south of State Highway 6 is mostly categorized as rural. The majority of the city is residential with industrial typically located on the outskirts of the city and retail and commercial along the major corridors.

The distribution of land use types is illustrated in Figure 3.2.1a.

EXHIBIT 3.2.1A – LAND USE MAP

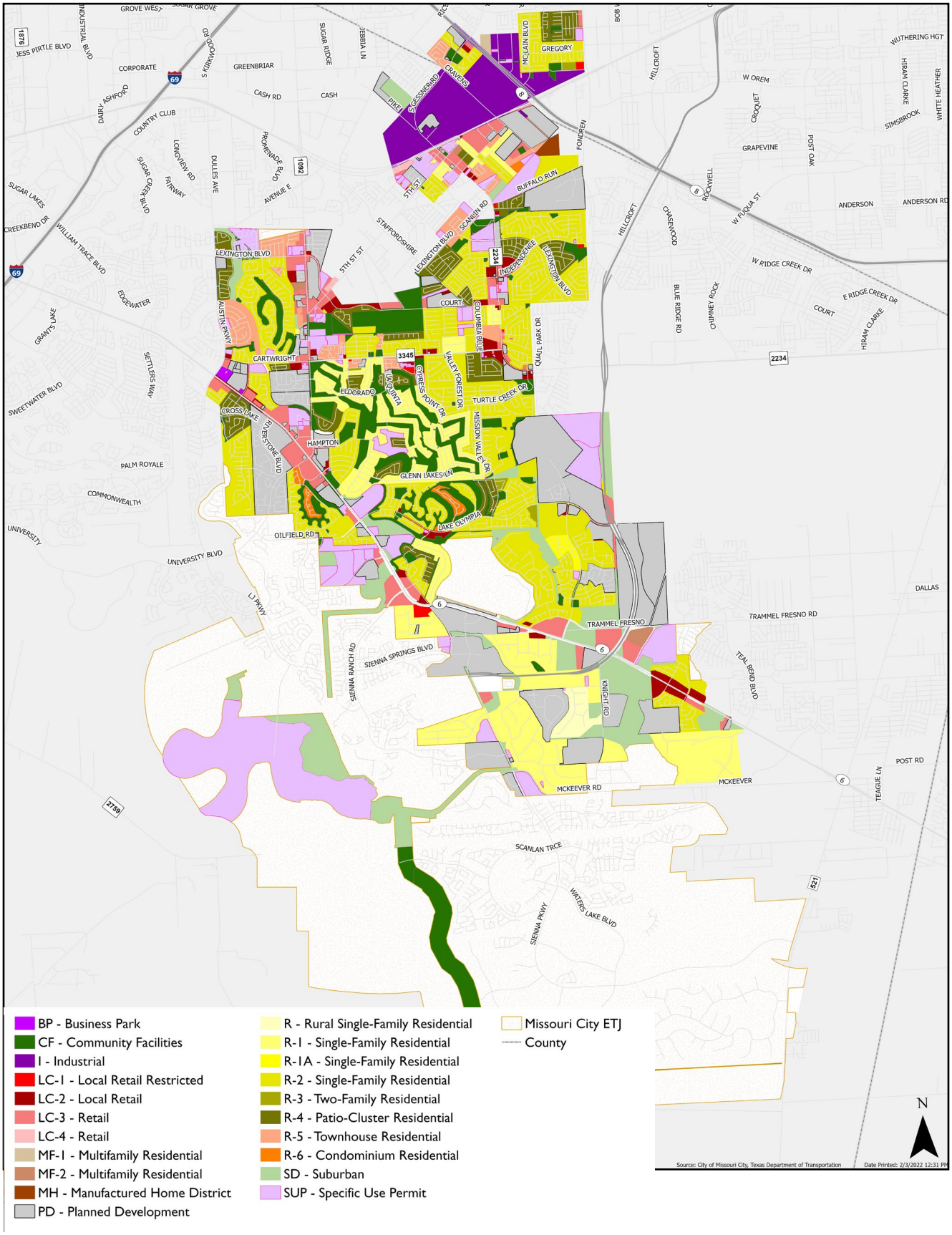


3.2.2 Zoning

Similar to the existing land use patterns, zoning in Missouri City is a mix of various residential and retail classifications, as well as business, community, industrial, and suburban. Additionally, Missouri City has several specific use permit and planned development districts.

Zoning assignment is displayed in Figure 3.2.2a.

FIGURE 3.2.2A – ZONING MAP



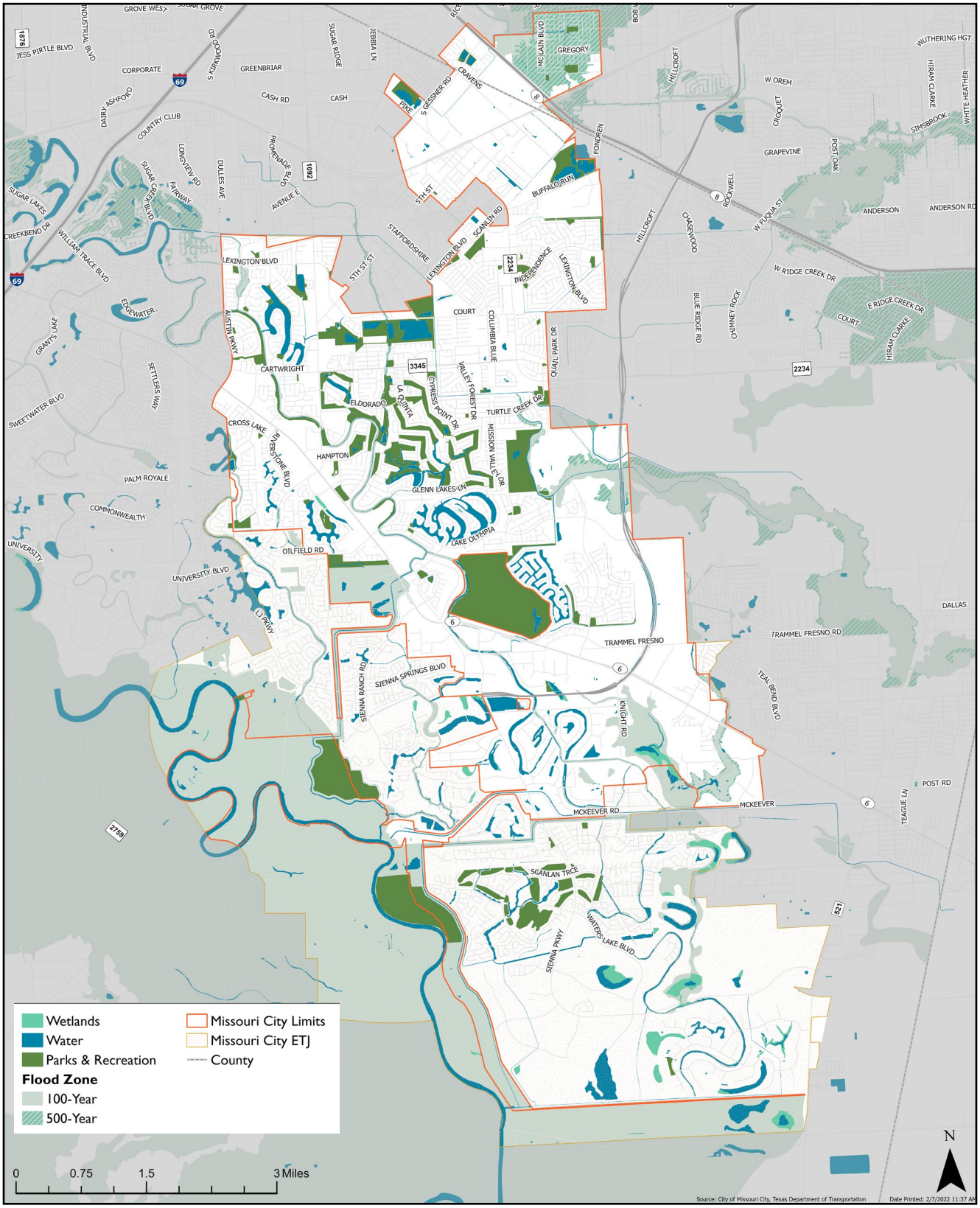
3.2.3 Environmental Features

Most of Missouri City does not fall within the flood zone. However, approximately 26% falls within the 100-year floodplain and approximately 1% falls within the 500-year floodplain. The majority of the land in the 100-year floodplain is in the ETJ and not within city limits.

Missouri City has several prominent parks including Kitty Hollow Park, Community Park, Independence Park, and Buffalo Run Park, to name a few. Parks account for approximately 6% of the total land area while being tied with shopping areas for the most frequently accessed community facility. There is over 320 acres of undeveloped parkland allowing for the potential to expand the acreage of parks throughout the city. Several undeveloped parklands are recommended for development per the city's Parks, Recreation & Open Space Master Plan.

Environmental features including wetlands, parks and recreation areas, and bodies of water are illustrated in Figure 3.2.3a.

FIGURE 3.2.3A – ENVIRONMENTAL FEATURES MAP



3.3 TRANSPORTATION

The transportation network in Missouri City consists of roadways, active transportation, freight, and transit.

3.3.1 Safety

Crash data was collected from TxDOT's CRIS system from January 1, 2018, through January 12, 2022. Figure 3.3.1a depicts the density of all crashes within the city limits.

There were 4,844 vehicular crashes in Missouri City from January 1, 2018, to January 12, 2022. Nine of these crashes resulted in a fatality.

The top five contributing factors to all crashes are as follows:

1. Failed to control speed (1315 - 27%)
2. Failed to yield right of way (742 – 15%)
3. Driver inattention (509 – 11%)
4. Changed lane when unsafe (380 – 8%)
5. Disregard stop and go signal (216 – 4%)

Many crashes were stated as having no contributing factor. However, this was not included in the development of the list above.

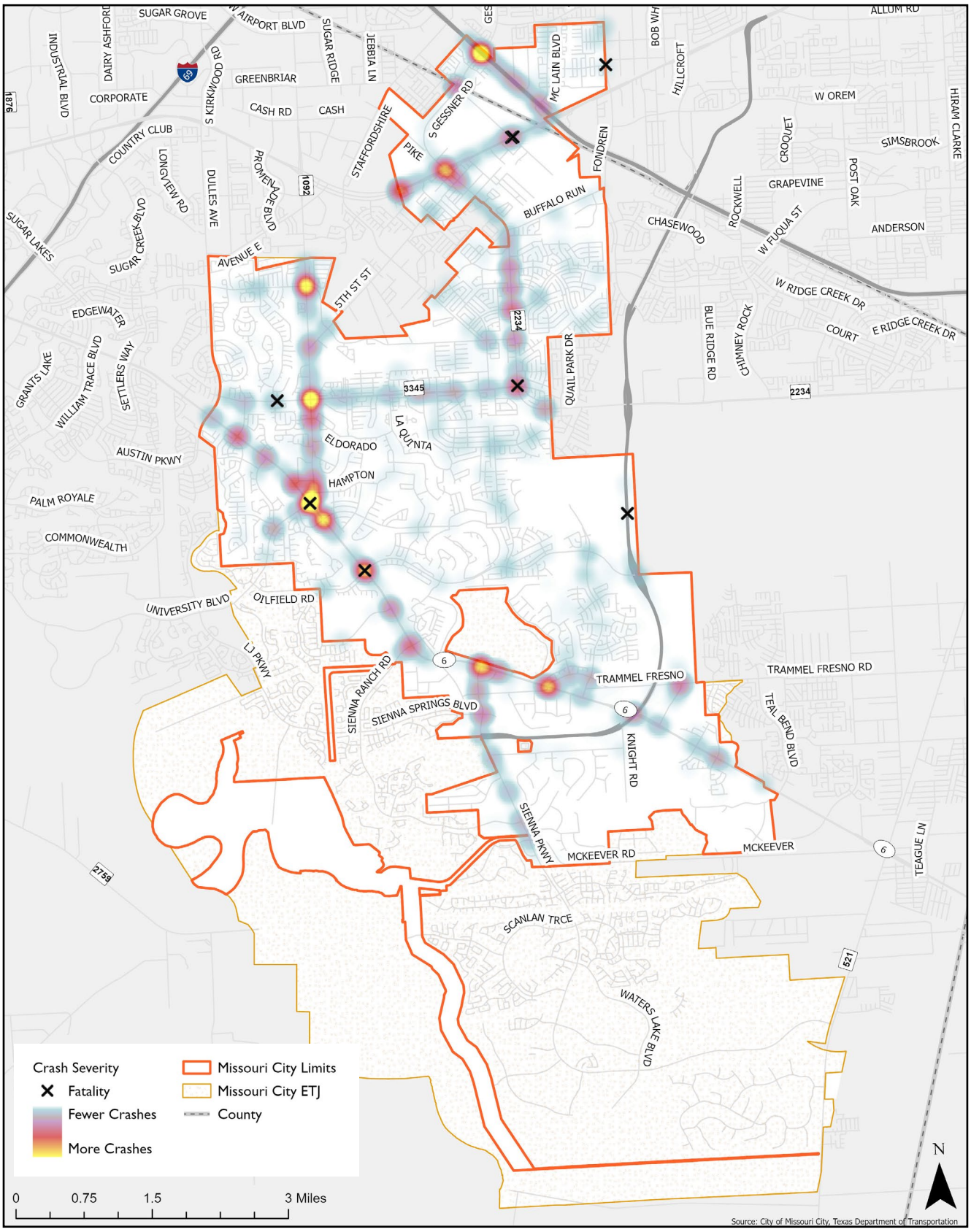
The four contributing factors to all fatal crashes were:

1. Failed to control speed (5 - 56%)
2. Other (2 – 22%)
    a. Not applicable (1)
    b. One vehicle forward from parking (1)
3. Changed lane when unsafe (1 – 11%)
4. Pedestrian failed to yield right of way to vehicle (1 – 11%)

Pedestrian and bicyclists were involved in approximately 1% of all crashes and 22% of all fatal crashes.

While crashes occur on most roadways in Missouri City, higher crash density occurs along higher capacity/speed roadways and at intersections of higher capacity/speed roadways. Major corridors in Missouri City with noticeably higher crash density include SH 6, US 90A, Sam Houston Tollway, FM 1092, Texas Parkway, Cartwright Road, and Sienna Parkway.

FIGURE 3.3.1A – CRASH DENSITY



3.3.1.1 Safety Near Schools

Circulation and safety near schools is another high priority for the residents of the city. General comments regarding safety near schools were received during the community engagement process requesting:

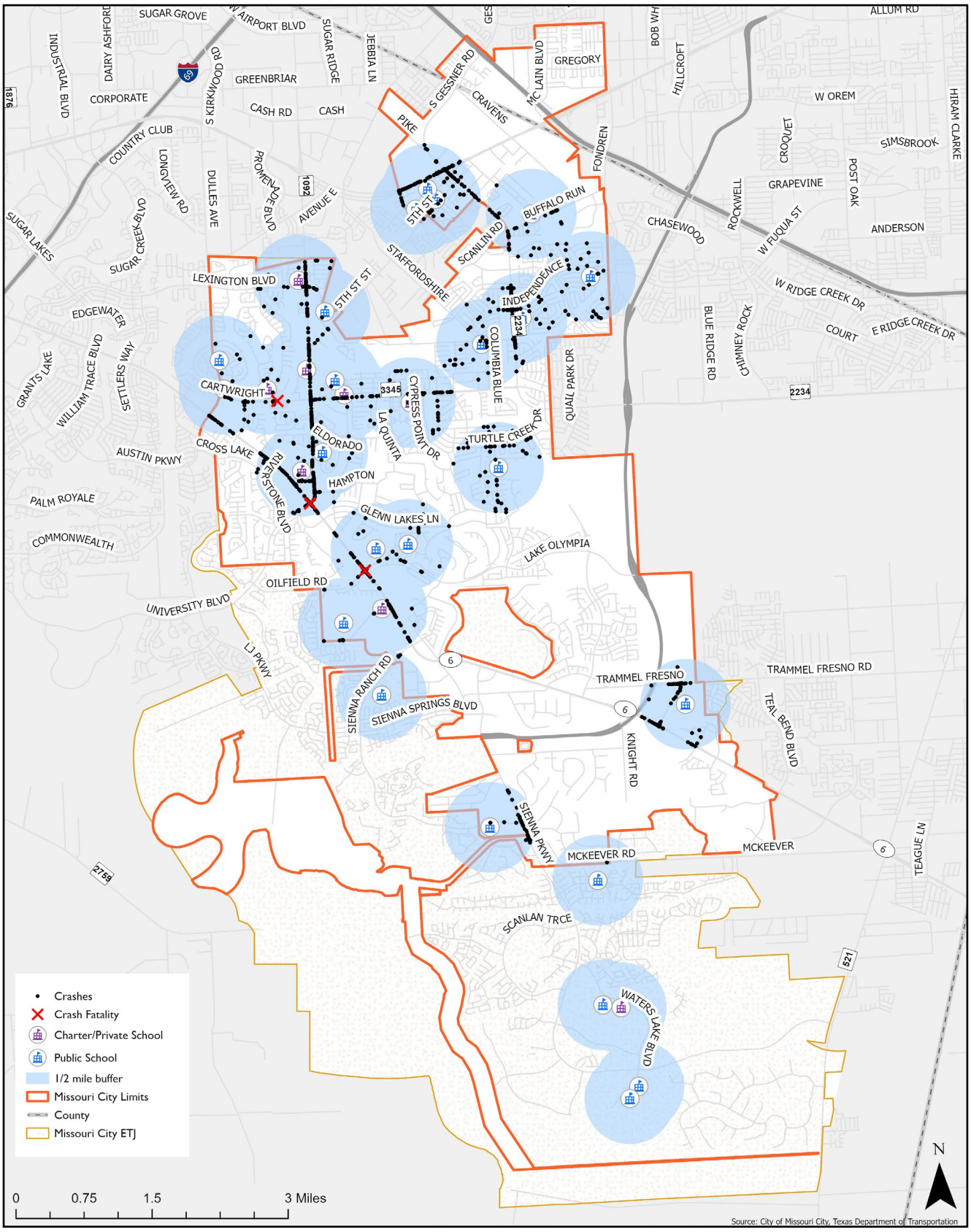
- More sidewalks along streets are desired for schoolchildren
- Increase illumination on roads near schools that are dark in the morning
- Expand roadways near heavily congested school zones

Specifically, the area near Elkins High School was mentioned by several residents. Knights Court and Thompson Ferry Road are roadways of high concern for residents. Comments were received regarding these two roadways at the community engagement meetings and on the online platform, Social Pinpoint.

It is recommended that schools have adequate lighting and pedestrian facilities to ensure student safety and improved circulation to reduce congestion at drop off and pick up times especially with the growing population of the city. Inadequate lighting and pedestrian facilities, along with excessive congestion, may create unsafe conditions and has been shown to increase the likelihood of pedestrian involved crashes.

Figure 3.3.1.1a displays the crashes that occurred within a half-mile radius of schools from January 1, 2018, to January 12, 2022. These are areas with high student pedestrian activity and should continue to be evaluated for safety concerns.

FIGURE 3.3.1.1A - CRASH DATA NEAR SCHOOLS



3.3.2 Roadway Network

The roadway network for the city is provided and maintained by various agencies, including county departments, municipal governments, state and federal agencies.

Major Thoroughfare: Major roadways that provide connectivity throughout and across communities.

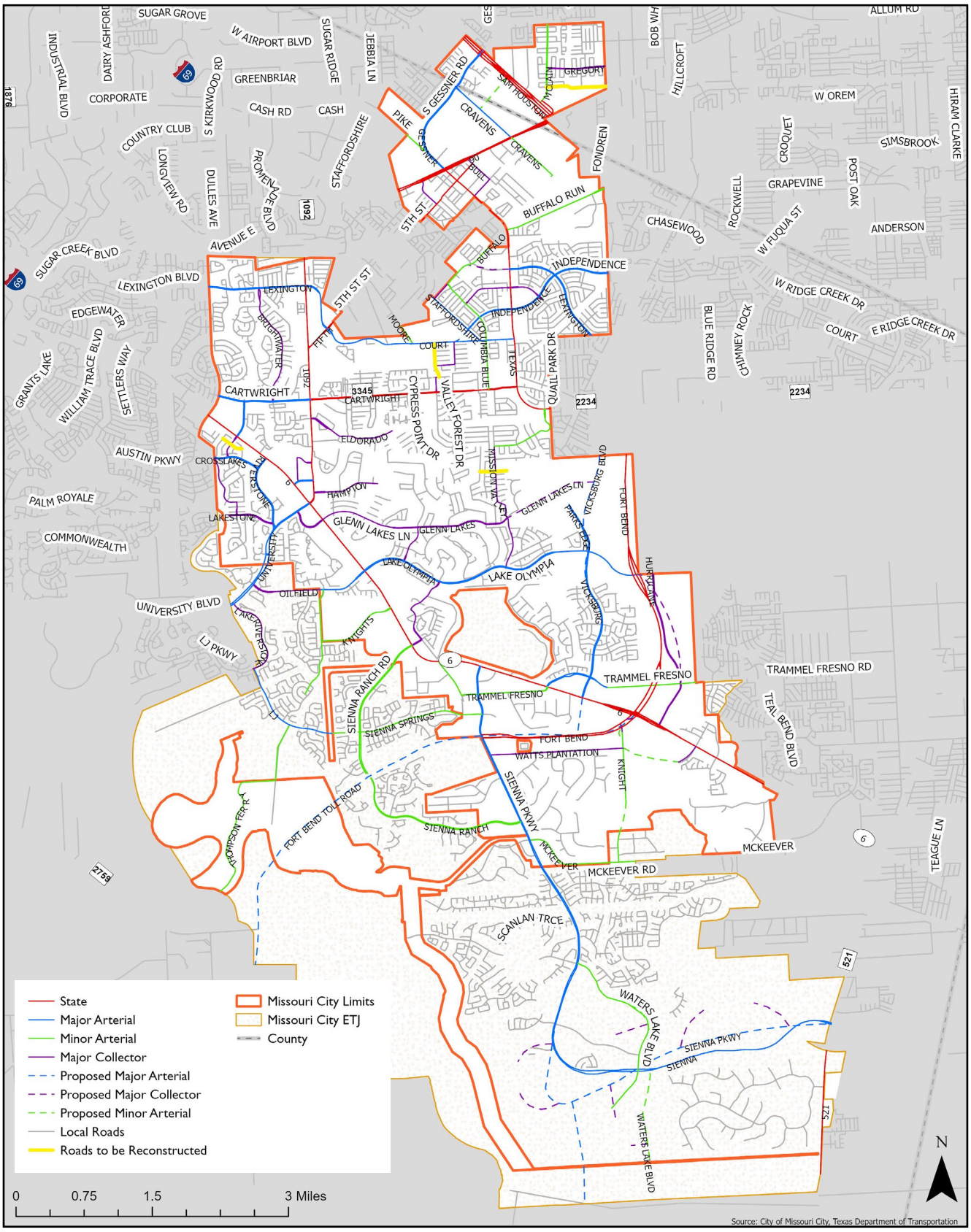
Major Collector: Major roadways that provide connectivity within communities. Typically, Major Collectors connect Minor Collectors to Major Thoroughfares.

Minor Collector: Moderate capacity roadways providing connections from local roadways to Major Collectors.

Local: Low-capacity roadways that provide access between homes and local businesses and to larger capacity roadways.

Figure 3.3.2a shows the existing roadway inventory from the city in 2017.

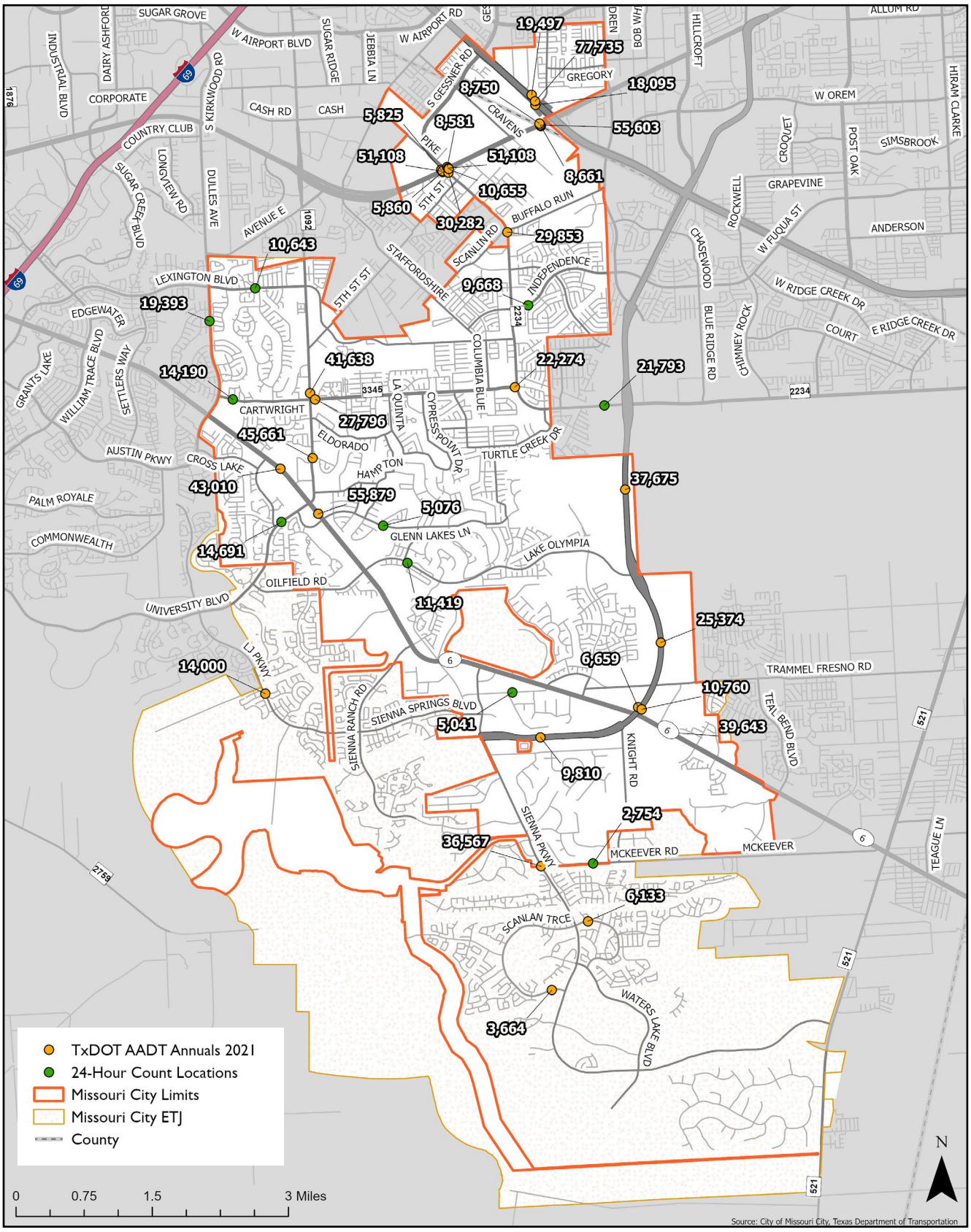
FIGURE 3.3.2A – ROADWAY CLASSIFICATIONS



**The City currently has two policy documents that define the hierarchy of their existing roadway network, the Public Infrastructure Design Manual and the Major Thoroughfare Plan. The classifications from the Major Thoroughfare Plan are shown here given the availability of data; this is used only to illustrate the general hierarchy of the roadways. However, for any design or planning requirements, reference the PIDM. Chapter 5 of this report includes a recommendation to revise the MTP to use the same classifications as the PIDM.*

To better understand the demand on the major thoroughfares in the study area, traffic volumes were considered. Using TxDOT's Statewide Planning Map, traffic volumes were pulled for roadways with available data. The locations where volume data was pulled from the Statewide Planning Map are shown in orange in Figure 3.3.2b. For highly traveled roadways where volume data was not available on the Statewide Planning Map, counts were collected. These locations, with their respective volumes, are shown in green in Figure 3.3.2b. Refer to Appendix B for volume data.

FIGURE 3.3.2B – TRAFFIC VOLUME DATA



3.3.3 Transit Network

Houston METRO provides three services to Missouri City:

- **Park & Ride**
- **Community Connector/Curb2curb**
- **MCTX Flex**

There are two Park and Ride service routes in Missouri City:

- *Route 270 – Missouri City - Fondren*
- *Route 271 – Missouri City – SH 6*

The SH 6 Park and Ride extends along Fort Bend Toll Road from SH 6 to Texas Parkway. The Missouri City Fondren Park and Ride connects to the SH 6 Park and Ride and extends to the Medical Center. These two routes combine to form the Park and Ride Route 170 that is displayed in Figures 3.3.3a and 3.3.3b. Two new Park & Ride facilities are proposed per H-GAC's 2023-2026 Transportation Improvement Program (TIP). One on the southeast corner of the intersection of SH 6 and Fort Bend Toll Road in Fort Bend Town Center III and one near the intersection of US 90A and Sam Houston Tollway. These facilities would service the two Park & Ride routes.

METRO provides one community connector route in Missouri City:

- *Route 363*

The community connector program, curb2curb, provides personalized curb to curb transportation in a designated zone in the city that connects users with METRO's larger transportation network at anchor points within the zone. This zone covers majority of the city, specifically areas near major corridors such as State Highway 6, Cartwright Road, Texas Parkway, FM 1092, and Fondren Road.

METRO previously offered one flex route in Missouri City:

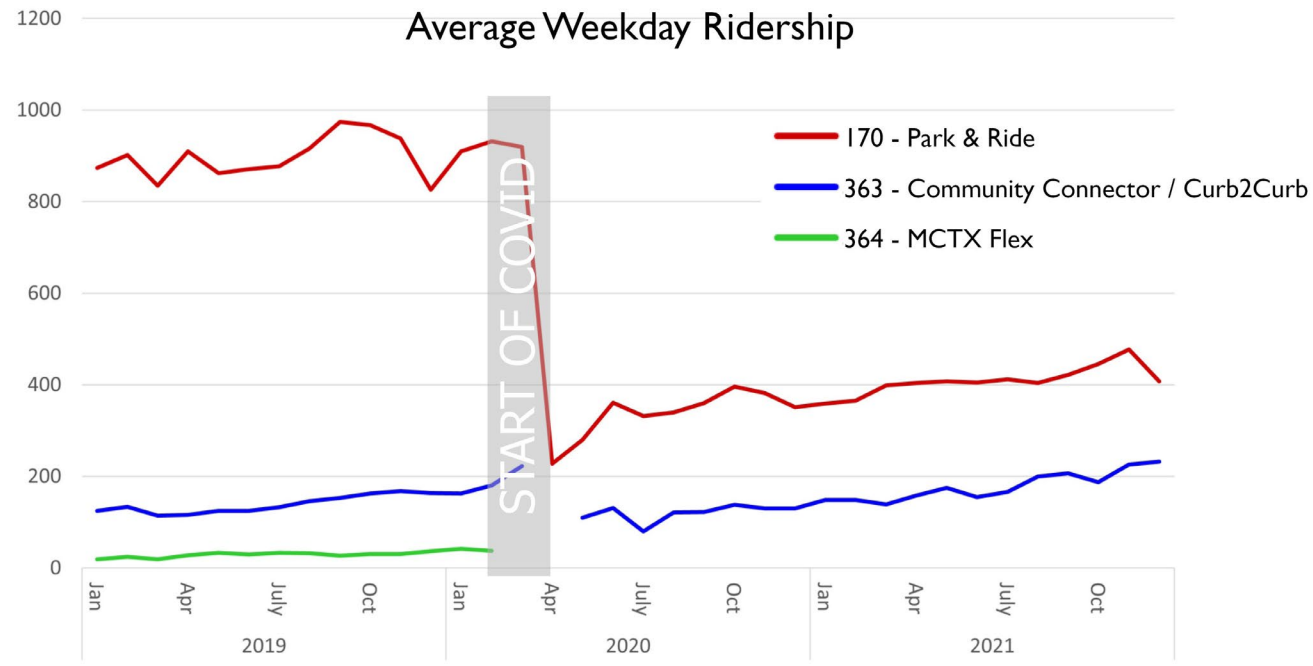
- *Route 364 – MCTX Flex*

The flex route provided hourly fixed-route service at select bus stops and a curb-to-curb bus service along State Highway 6. It connected users with popular destinations within the city. The route serviced destinations along State Highway 6, Cartwright Road, Texas Parkway, and S Gessner Road within the city. This service merged with the existing Route 363 service to better allocate METRO resources and simply the user experience.

There are no major Transit Centers within the city. The closest major transit center is Hiram Clarke, which is approximately 5 miles east of the city.

Weekly ridership of the three transit services in Missouri City from 2019 to 2021 is displayed in Figure 3.3.3a. The Park & Ride service was the most utilized in the city with an average weekday ridership of around 900 individuals. As expected, the Park & Ride experienced a significant drop in ridership during the pandemic. The community connector experienced a brief period of no ridership at the start of the pandemic but has since shown a steady increase in ridership. As displayed in the figure, the MCTX Flex route was discontinued in early 2020. Refer to Appendix B for average weekday ridership data.

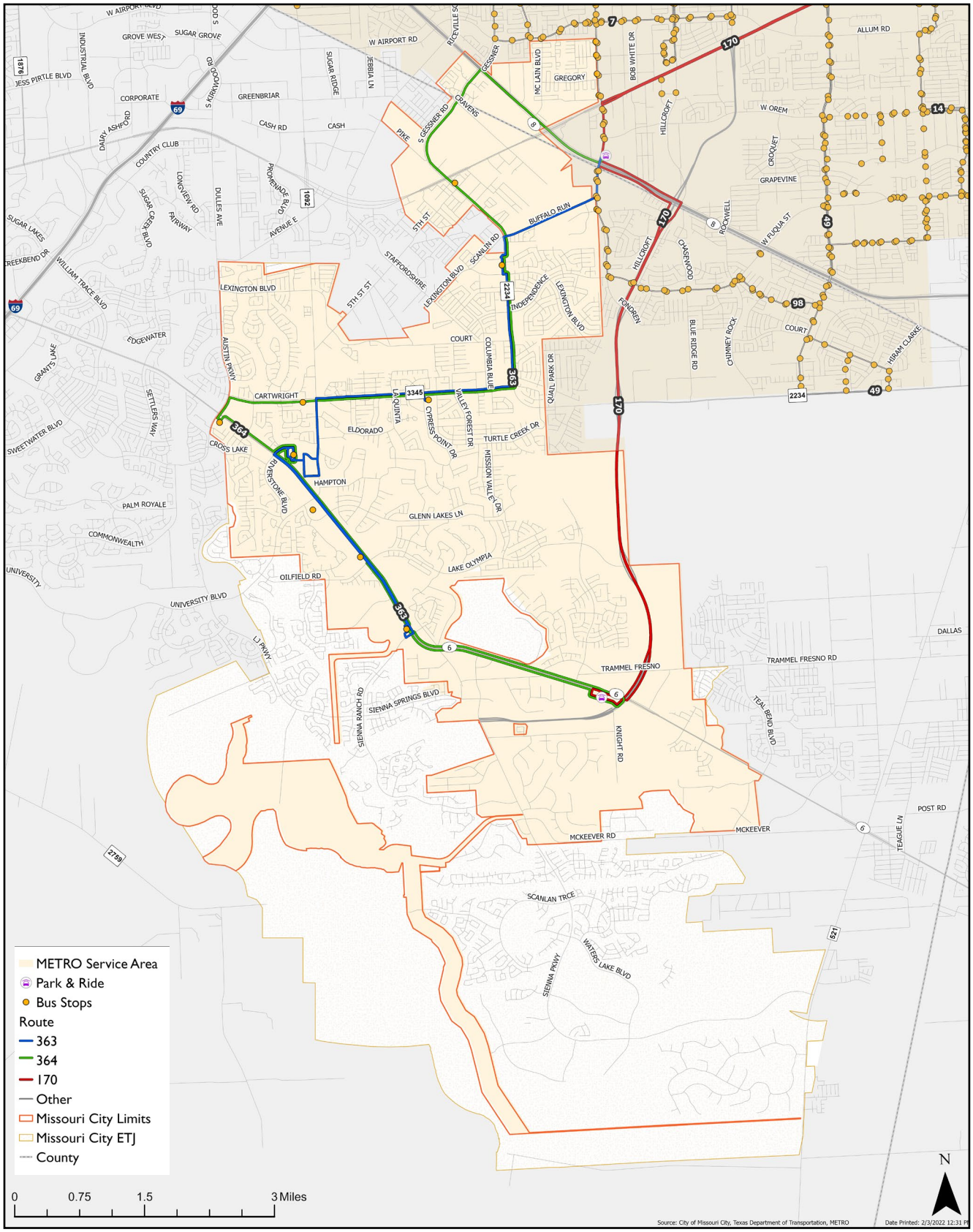
FIGURE 3.3.3A – AVERAGE RIDERSHIP



Source: METRO

Figure 3.3.3b shows the location of all transit facilities within the city.

FIGURE 3.3.3B – TRANSIT NETWORK



3.3.4 Active Transportation Network

The existing active transportation network includes bicycle and pedestrian facilities. Sidewalk data was collected from H-GAC's Open Data portal. Bicycle network data was collected from existing City data and was updated using Nearmap, the most current aerial maps available.

The existing active transportation network in Missouri City includes:

- 608 miles of sidewalks
- 12 miles of bike routes and bike lanes
- 58 miles of trails
- 31 miles of shared use paths

Figure 3.3.4a depicts the existing bicycle and pedestrian network within the study area. Figure 3.3.4b shows the existing trails in solid green. The dashed green lines indicate proposed future trails, and the blue lines depict existing sidewalks.

FIGURE 3.3.4A – ACTIVE TRANSPORTATION NETWORK

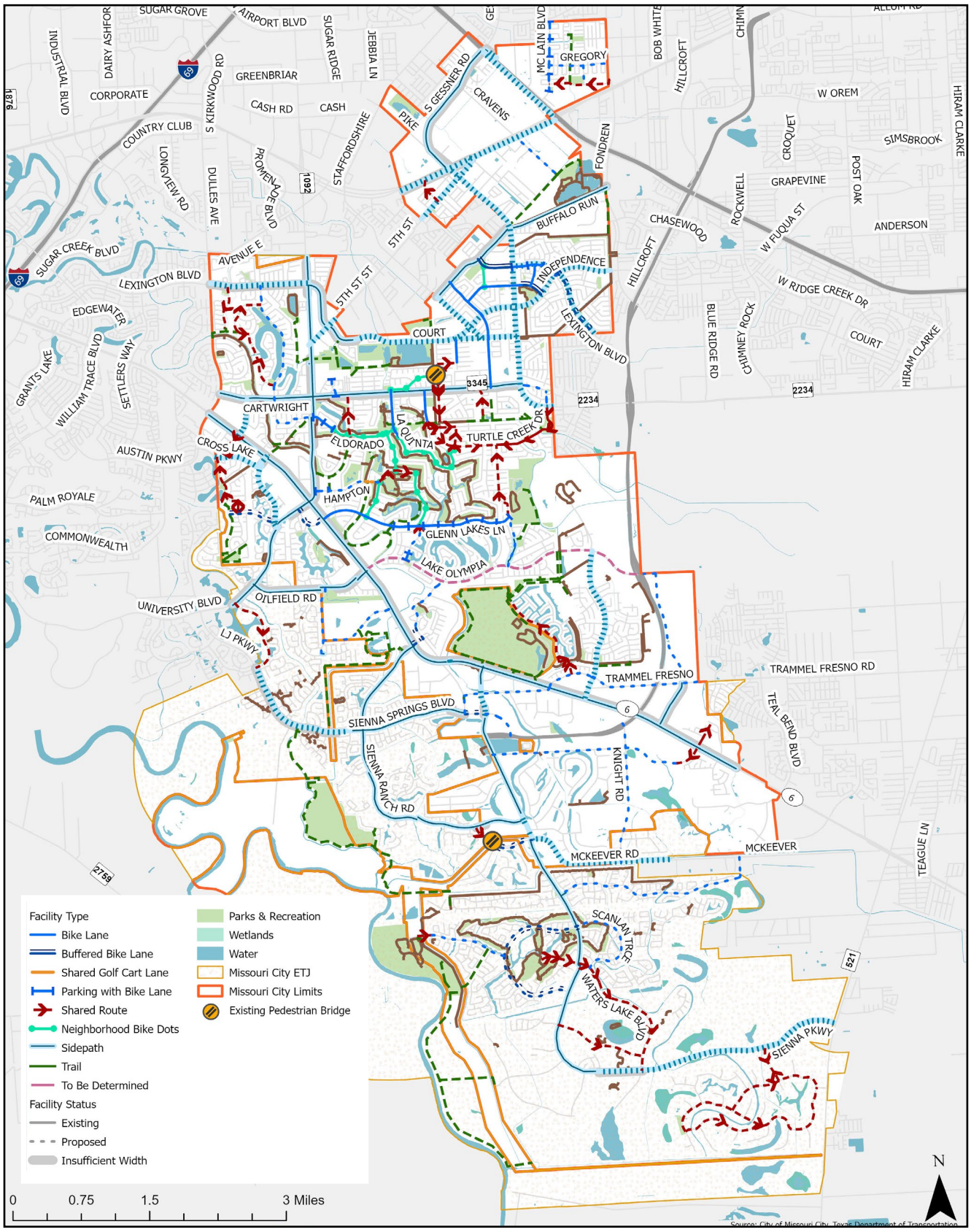
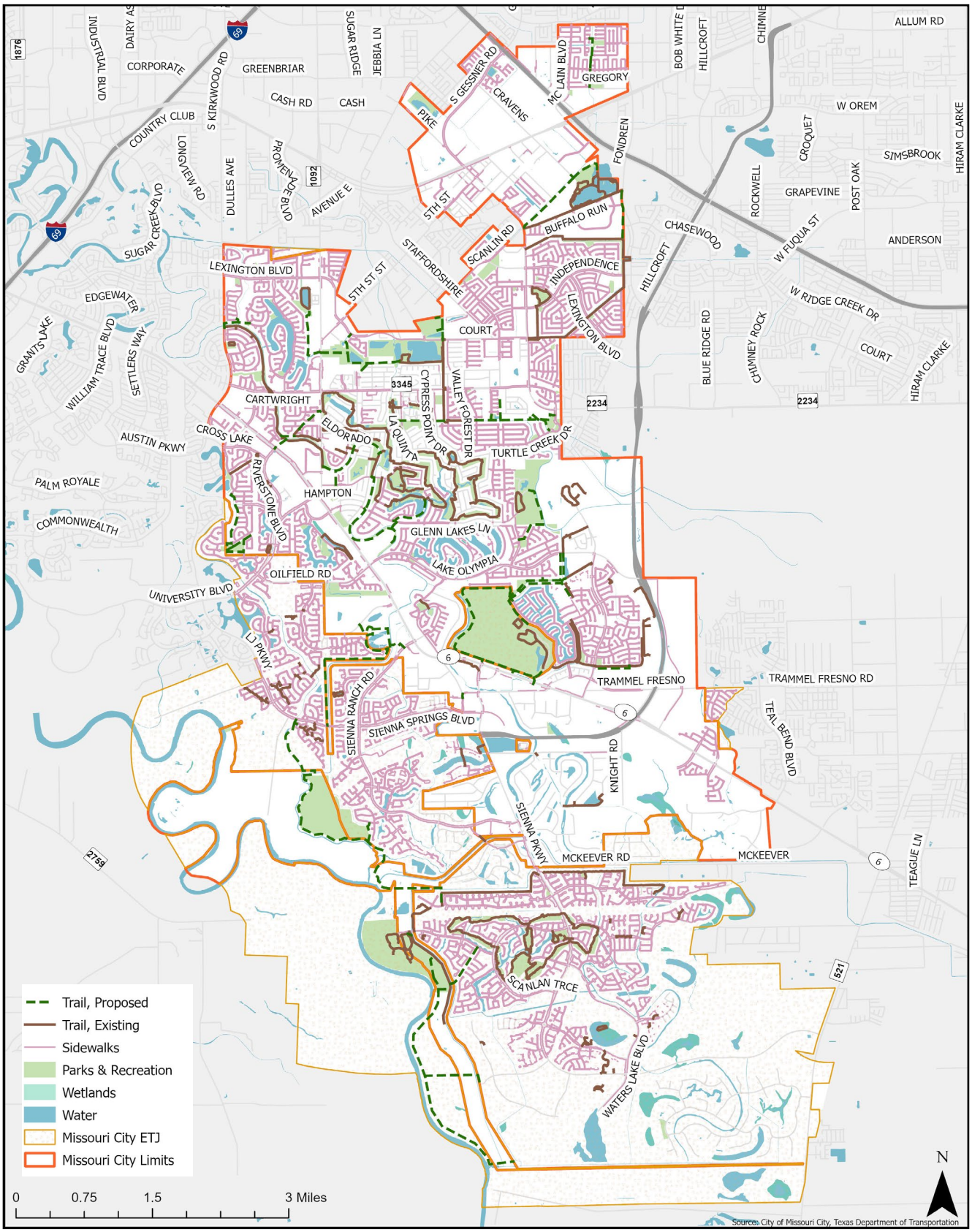


FIGURE 3.3.4B – SIDEWALK AND TRAIL NETWORK V

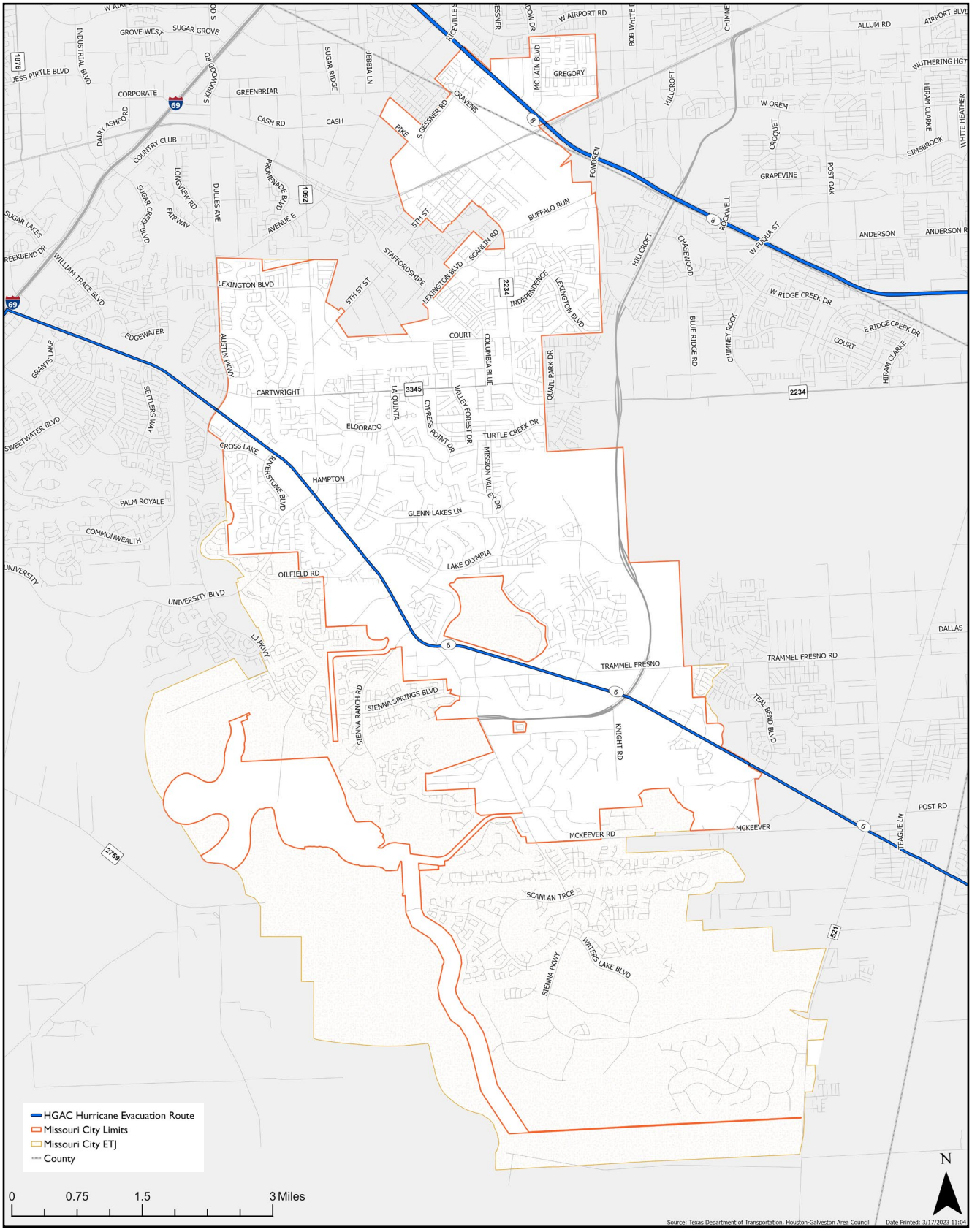


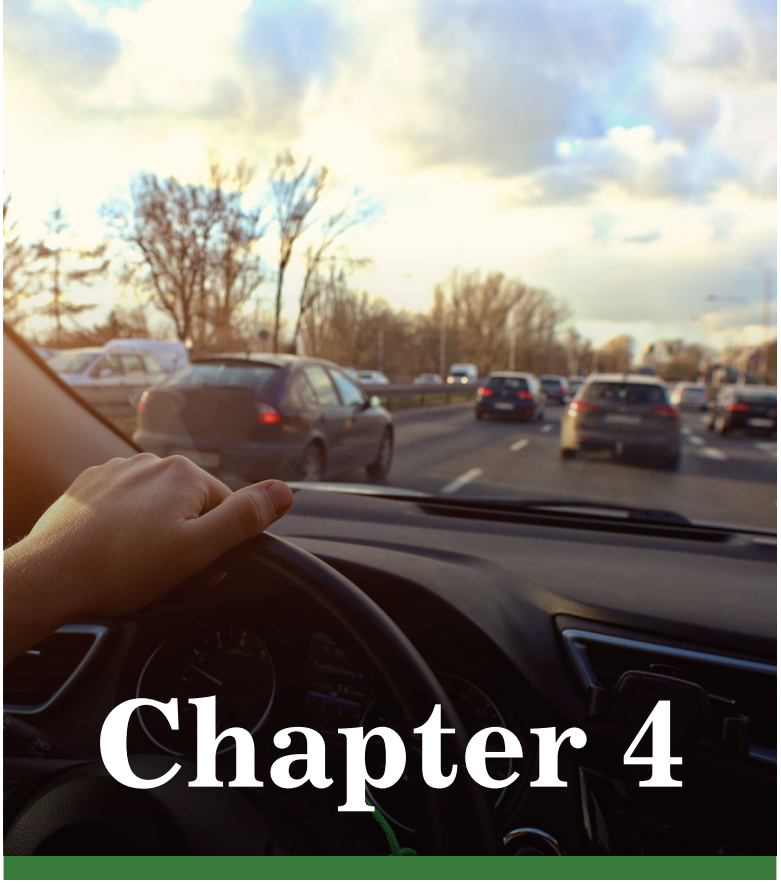
**The proposed trails displayed in the figure above consist of proposed trails from a mix of previous plans, city identified proposed trails, and currently proposed trails.*

3.3.5 Evacuation Routes

There are two evacuation routes within the Missouri City: SH 6 and Sam Houston Tollway. SH 6 is classified as a principal arterial, and Sam Houston Tollway is classified as a freeway/expressway. These roadways allow for the greatest amount of traffic to move at a faster speed in the case of an emergency evacuation.

FIGURE 3.3.5A – EVACUATION ROUTES





Chapter 4

Recommendations

4.1 CROSS-SECTION MODERNIZATION

4.2 FUNCTIONAL CLASSIFICATION EVALUATIONS

4.3 ALIGNMENT REVISION

4.4 ACTIVE TRANSPORTATION

4.5 RAILROAD CROSSING

4.6 INTERSECTION ASSESSMENT

4.7 POLICY REVIEW

Recommendations

This chapter provides an overview of recommended improvements throughout Missouri City.

This chapter includes recommendations on:

1. Cross-sections,
2. Functional classifications,
3. Alignments,
4. Active transportation, including pedestrian, cyclists, and transit,
5. Railroad crossings, and
6. Intersections

4.1 CROSS-SECTION MODERNIZATION

The Public Infrastructure Design Manual (PIDM) was used to identify the existing cross sections per functional classification. Once identified, the cross sections were evaluated to ensure adequate space for pedestrian and bicycle facilities as well as motor vehicles. The proposed cross-sections are shown on the proceeding pages. It is recommended the cross sections presented in this section be adopted into City code to ensure compliance for all new construction.

Roadway requirements, including right-of-way, are stated in the PIDM. A major thoroughfare is broken down into two categories, 6-lane divided with a right-of-way of 120 feet, or 4-lane divided with a right-of-way of 100 feet. Due to the high volumes and speeds of vehicles on 6-lane divided major thoroughfares, it is recommended to install sidepaths with a minimum width of 10 feet and a buffer of at least 5 feet from the travel lane. For a 4-lane divided major thoroughfare, a sidepath or buffered bike lane is acceptable. Refer to the bicycle implementation flow chart found in Appendix C for determining which option is preferred based on roadway conditions.

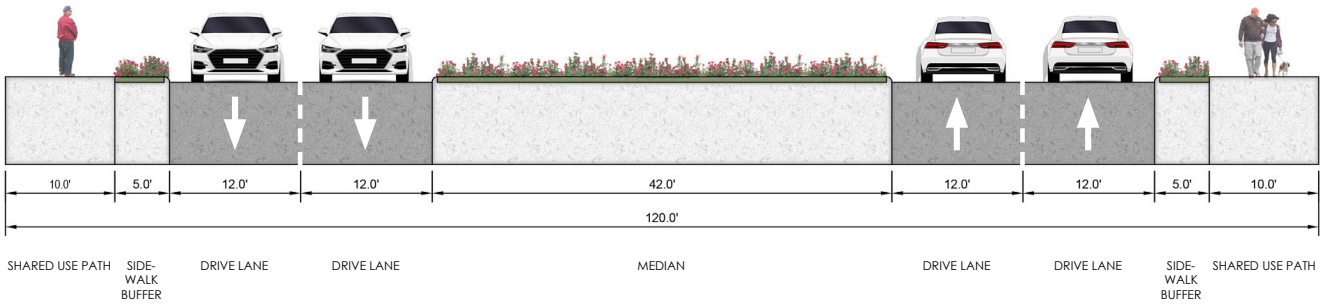
Major collectors are identified as having 70 feet of right-of-way with typically two travel lanes in the PIDM. Due to their nature, major collectors have more moderate volumes and speeds compared to major throughfares. This allows for several options for bicycle implementation as displayed in the cross sections on the following pages. It is recommended to install a bike lane with parking lane on major collectors with on-street parking. For major collectors without on-street parking, bike lanes or buffered bike lanes are recommended. Preference will be determined by existing criteria including the speed limit and lane width.

Compared to major collectors, minor collectors have lower speeds and volumes and a typical right-of-way width of 60 feet. On these roadways, bike lanes or shared lanes are acceptable.

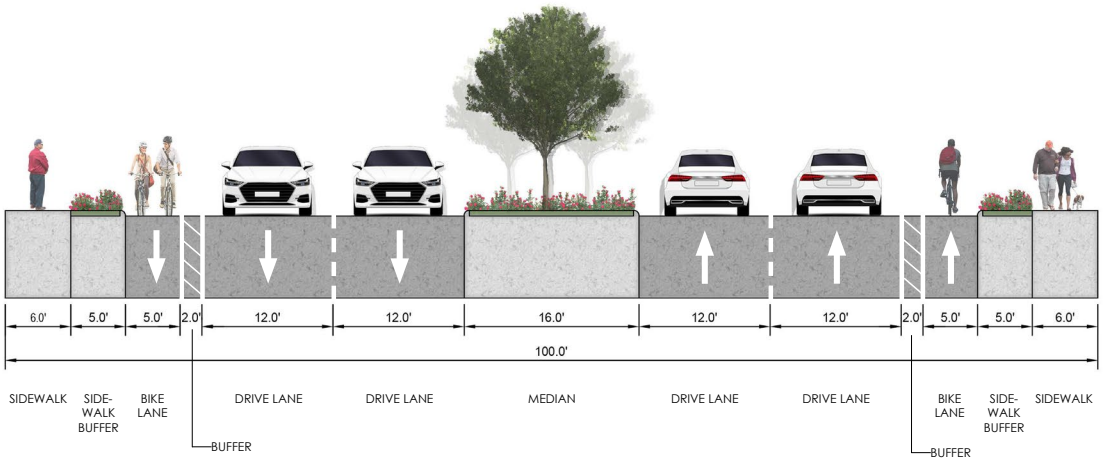
Per the PIDM, local streets are identified as having right-of-way widths of 50 feet. Local streets are typically neighborhood streets with minimal volumes and lower speeds. Shared facilities, such as shared lanes, are recommended for local streets. However, implementation should be specific to the neighborhood or area to account for unique characteristics.

Refer to Section 4.4.1 for design criteria of the active transportation facilities discussed above.

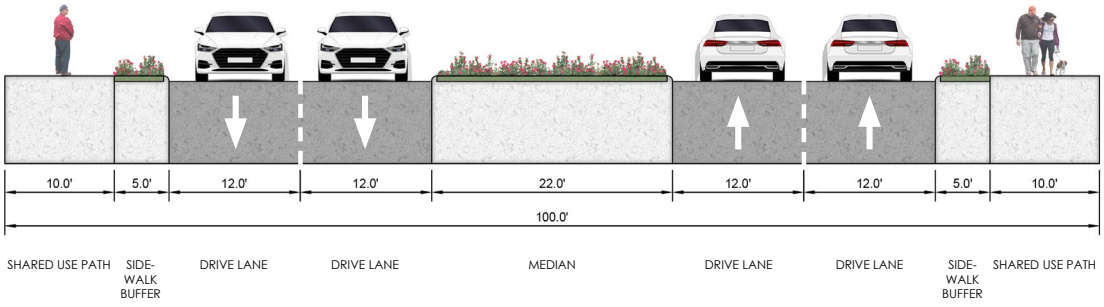
MAJOR THOROUGHFARE CROSS-SECTION (120' R.O.W.)



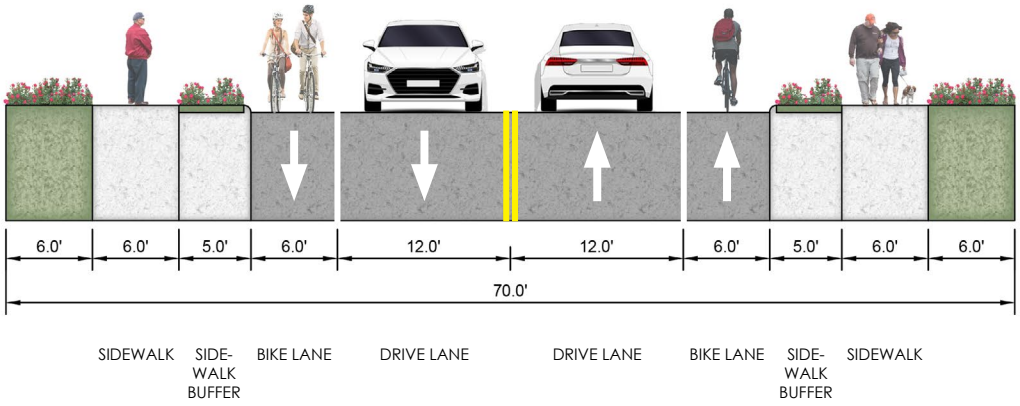
MAJOR THOROUGHFARE CROSS-SECTION OPTION 1: BUFFERED BIKE LANE (100' R.O.W.)



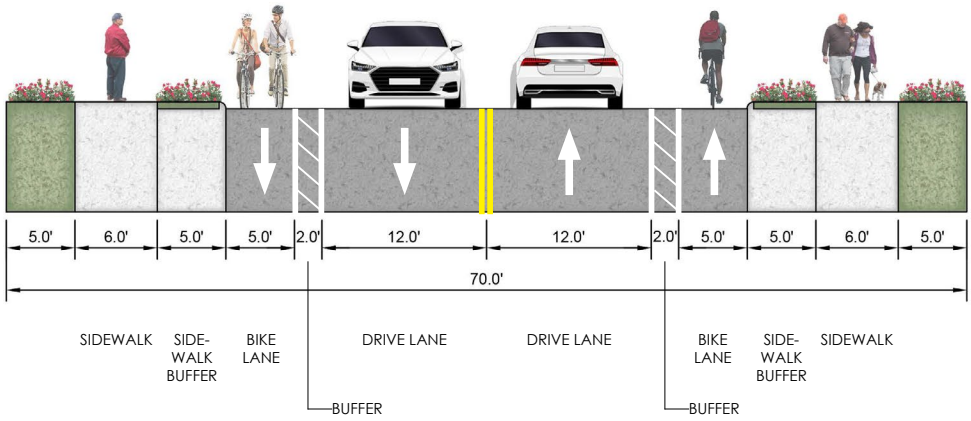
MAJOR THOROUGHFARE CROSS-SECTION OPTION 2: SIDEPATH (100' R.O.W.)



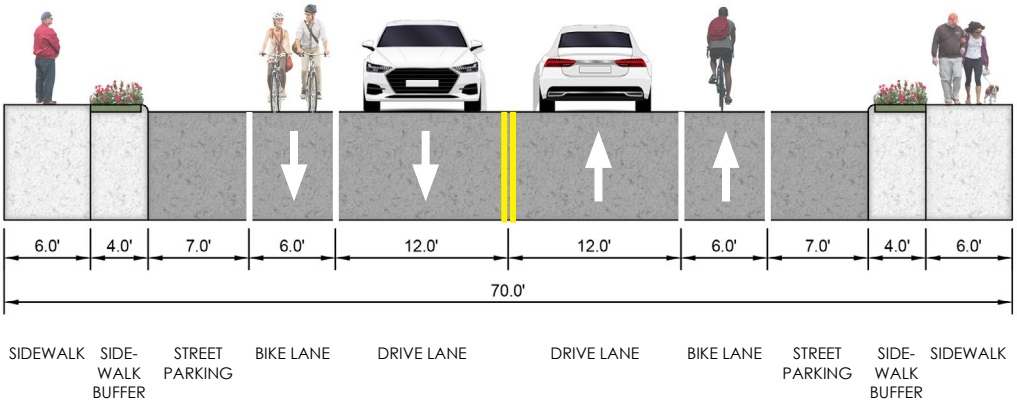
MAJOR COLLECTOR CROSS-SECTION OPTION 1: BIKE LANE (70' R.O.W.)



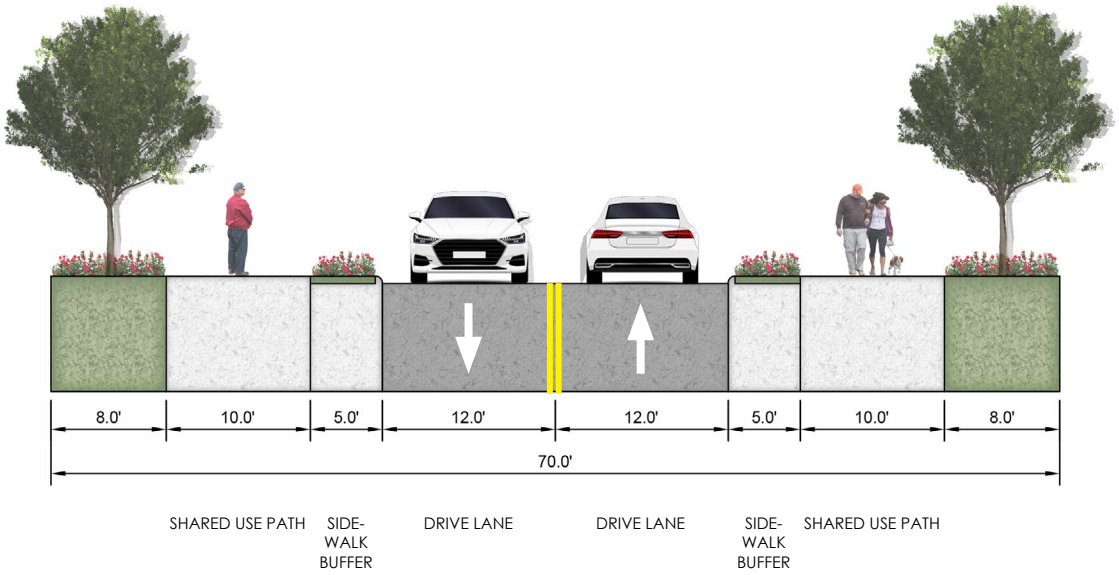
MAJOR COLLECTOR CROSS-SECTION OPTION 2: BUFFERED BIKE LANE (70' R.O.W.)



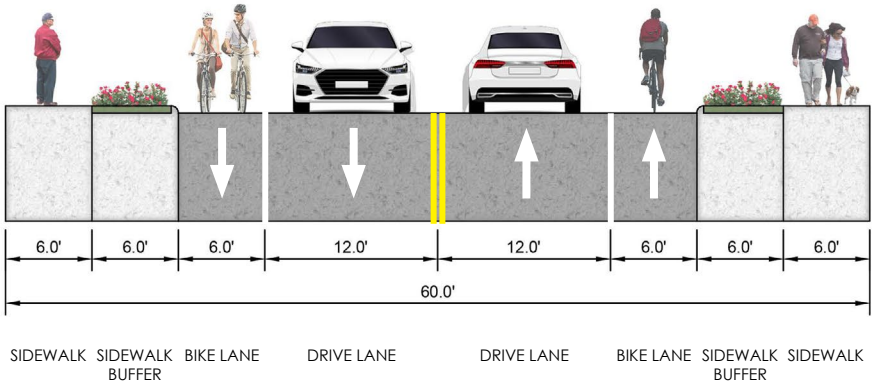
MAJOR COLLECTOR CROSS-SECTION OPTION 3: PARKING WITH BIKE LANE (70' R.O.W.)



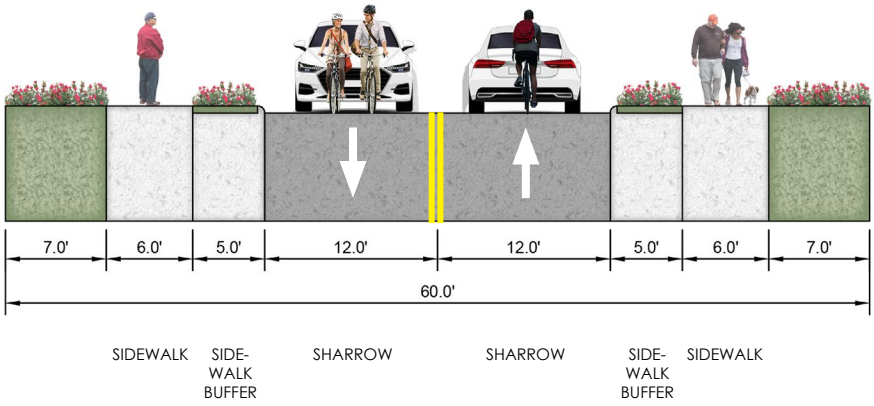
MAJOR COLLECTOR CROSS-SECTION OPTION 4: SIDEPATH (70' R.O.W.)



MINOR COLLECTOR CROSS-SECTION OPTION 1: BIKE LANE (60' R.O.W.)



MINOR COLLECTOR CROSS-SECTION OPTION 2: SHARED ROUTE (60' R.O.W.)



4.2 FUNCTIONAL CLASSIFICATION EVALUATIONS

The PIDM and MTP were reviewed to determine the functional classification of the city's roadways. Per the PIDM, the city recognizes four basic classifications of roadways: major thoroughfares, major collectors, minor collectors, and local streets. However, per the MTP, the four basic classification of roadways are as follows: state, major arterial, minor arterial, and major collector. Therefore, it is recommended that the MTP be revised to parallel the PIDM to create uniformity between the city's documents and allow for easier adherence to the city's policies.

4.2.1 Planned Roadway Projects

TxDOT has several planned projects within Missouri City that will affect residents in the coming years. A list is provided below:

- Highway improvement on FM 2234 at US 90A
- Traffic management, landscape development, and roadway restoration on US 90A
- Roadway restoration, highway improvement, and hazard elimination & safety on FM 1092
- Traffic management, roadway restoration, and landscape development on SH 6
- Widening of FM 521

Additionally, H-GAC has several projects in Missouri City as part of the 2023-2026 Transportation Improvement Program (TIP). The projects are listed below:

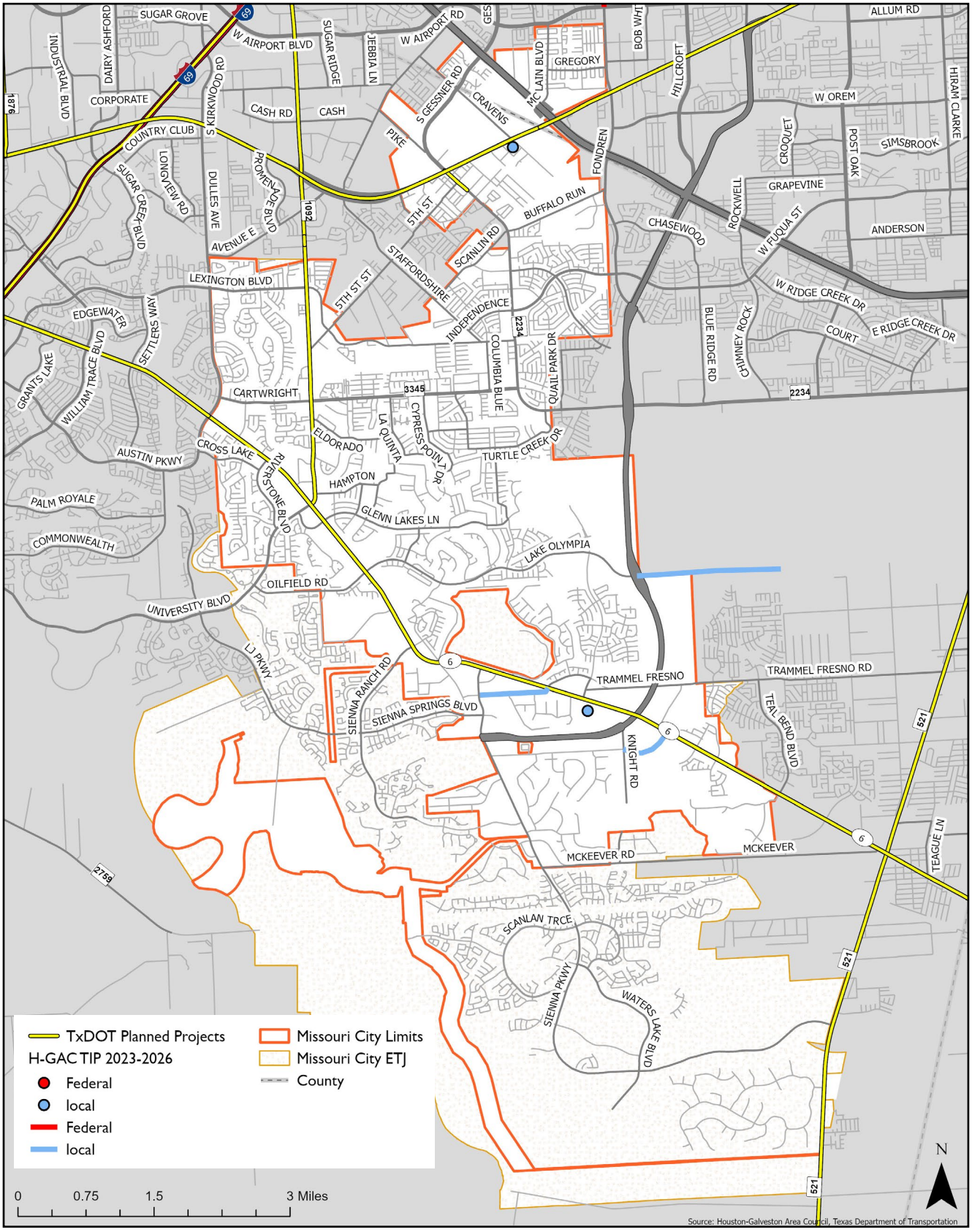
- Construct new Park & Ride facility near US 90A and Sam Houston Tollway
- Construct new Park & Ride facility near SH 6 and Fort Bend Toll Road
- Reconstruct and widen Trammel Fresno Rd from SH 6 to Sienna Parkway
- Extend Watts Plantation from Knights Road to SH 6

The future planned projects for both TxDOT and H-GAC are presented in Figure 4.2.1a.

In addition to TxDOT and H-GAC, Missouri City is aware of several roadways needing improvements where there are active projects or where future projects can be expected. The roadways are listed below:

- Knights Court
- Sienna Parkway
- McLain Boulevard
- East Hampton Road
- Valley Manor

FIGURE 4.2.1A – PLANNED ROADWAY PROJECTS



4.2.2 Agency Coordination

Due to increased development and the expectation for increased vehicular volumes, roadways near Missouri City and its ETJ will likely be impacted. While this plan addresses roadways within the boundary of the City, coordination with neighboring jurisdictions and regional agencies will be required where municipal boundaries end and overlap. Coordination with TxDOT will also be required where their roadways exist within the City Limits. It is recommended that this plan and any future plans be shared with those entities. Coordination should be ongoing.

4.3 ALIGNMENT REVISION

Currently, the Major Thoroughfare Plan (MTP) does not account for recently constructed roadways and recent developments. It is recommended to update the MTP to account for the new roadways, remove alignments no longer possible due to recent developments, and realign roadway alignments that have already been constructed, and recommend any potential additional alignments for future connectivity.

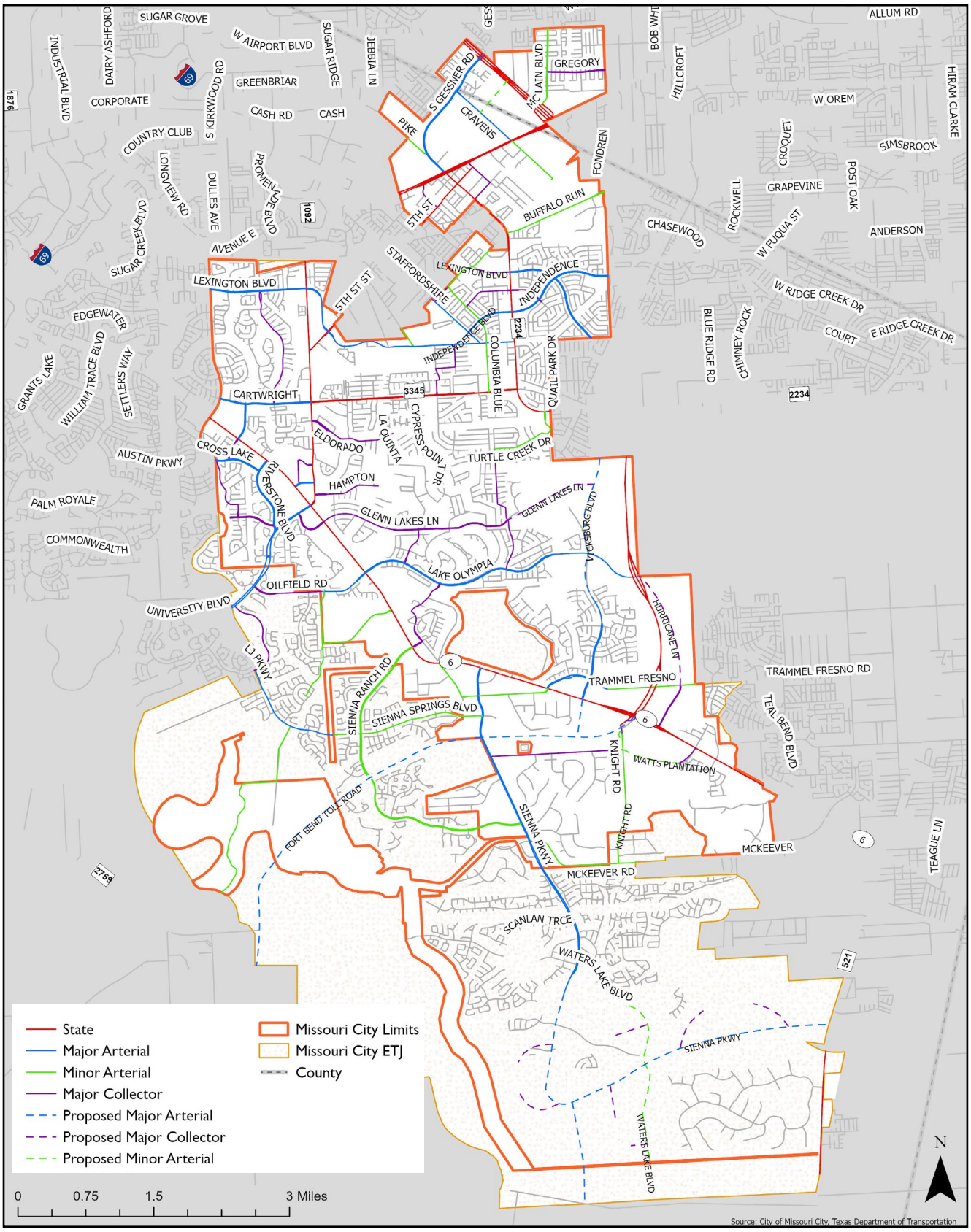
Figure 4.3a displays the existing MTP for the city. As seen in the figure, several roadways have since been constructed including the following:

- Lexington Boulevard between Texas Parkway and Scanlin Road
- Independence Boulevard between Staffordshire Road and Court Road
- Vicksburg Boulevard from Aldridge Drive to Lakes Edge Lane
- Hurricane Lane between Trammel Fresno Road and Lake Olympia Parkway
- Fort Bend Toll Road between SH 6 and Sienna Parkway
- Knights Road between Fort Bend Toll Road and McKeever Road
- Sienna Parkway from Scanlan Trace to FM 521
- Waters Lake Boulevard from Sienna Parkway to the north to the development south of Ronald Thornton Middle School

Additionally, several proposed extensions of roadways are no longer viable due to development. Examples are included in the list below:

- Glenn Lakes Lane from Mission Valley Drive to Vicksburg Boulevard
- Vicksburg Boulevard from Lake Olympia Parkway to the City Limits to the north
- Vicksburg Boulevard from SH 6 to Fort Bend Toll Road to the south

FIGURE 4.3A – CURRENT MAJOR THOROUGHFARE PLAN



An analysis was performed to gauge what areas of the city are currently served by the existing transportation network. A quarter-mile buffer was placed around existing three-leg intersections and a half-mile buffer was placed around existing four-leg intersections. The areas included in the buffers are considered connected areas. Figure 4.3b displays the connected areas within the study area. Service gaps were identified, primarily in the southern region of the study area.

This analysis also took into consideration existing barriers that may hinder the city's ability to provide transportation, including railways, floodways, and existing major transportation corridors. Figure 4.3c displays the barriers that exist in the study area today. A future MTP update should account for gaps and barriers while recommending future alignments.

FIGURE 4.3B – EXISTING SERVICE GAPS

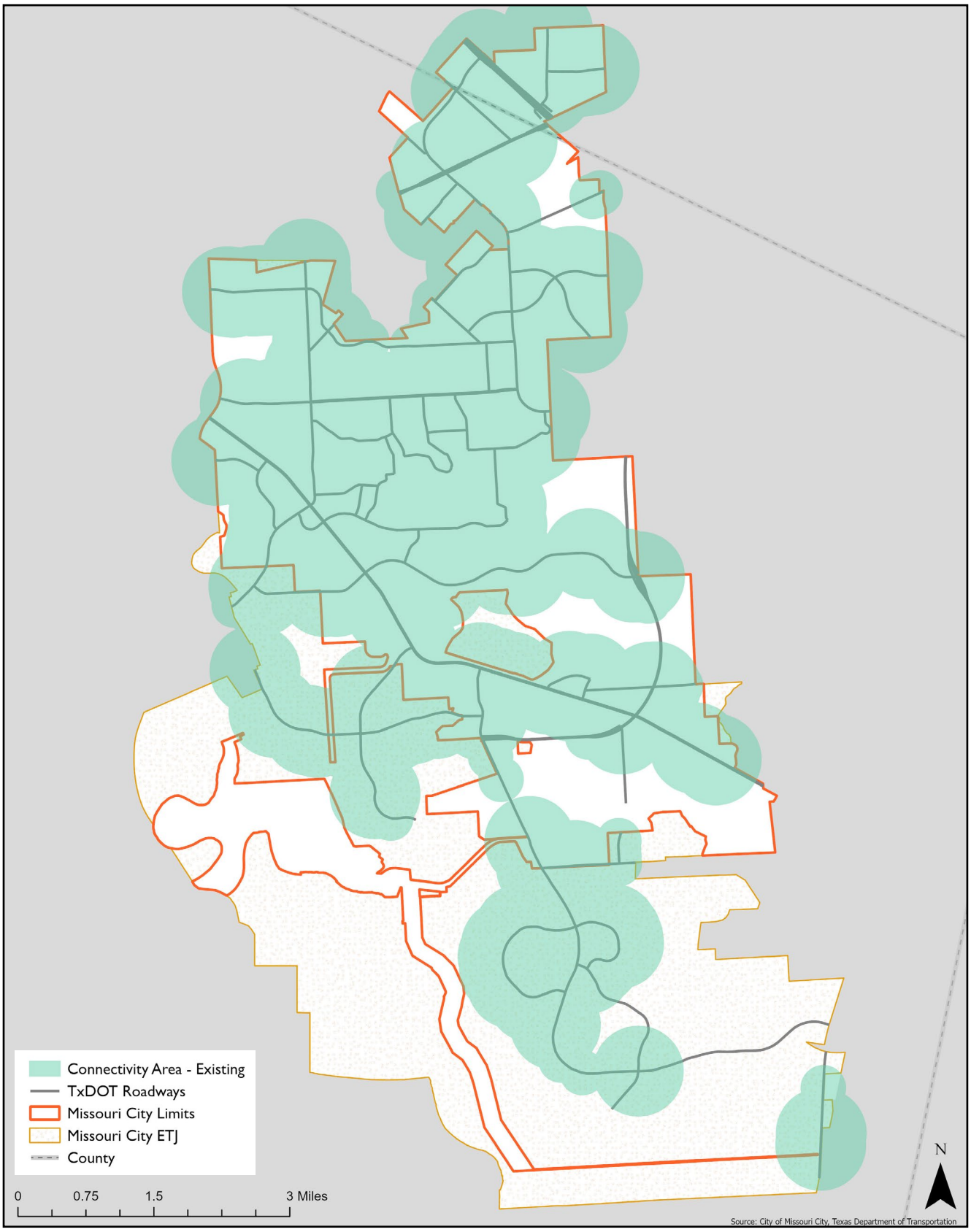
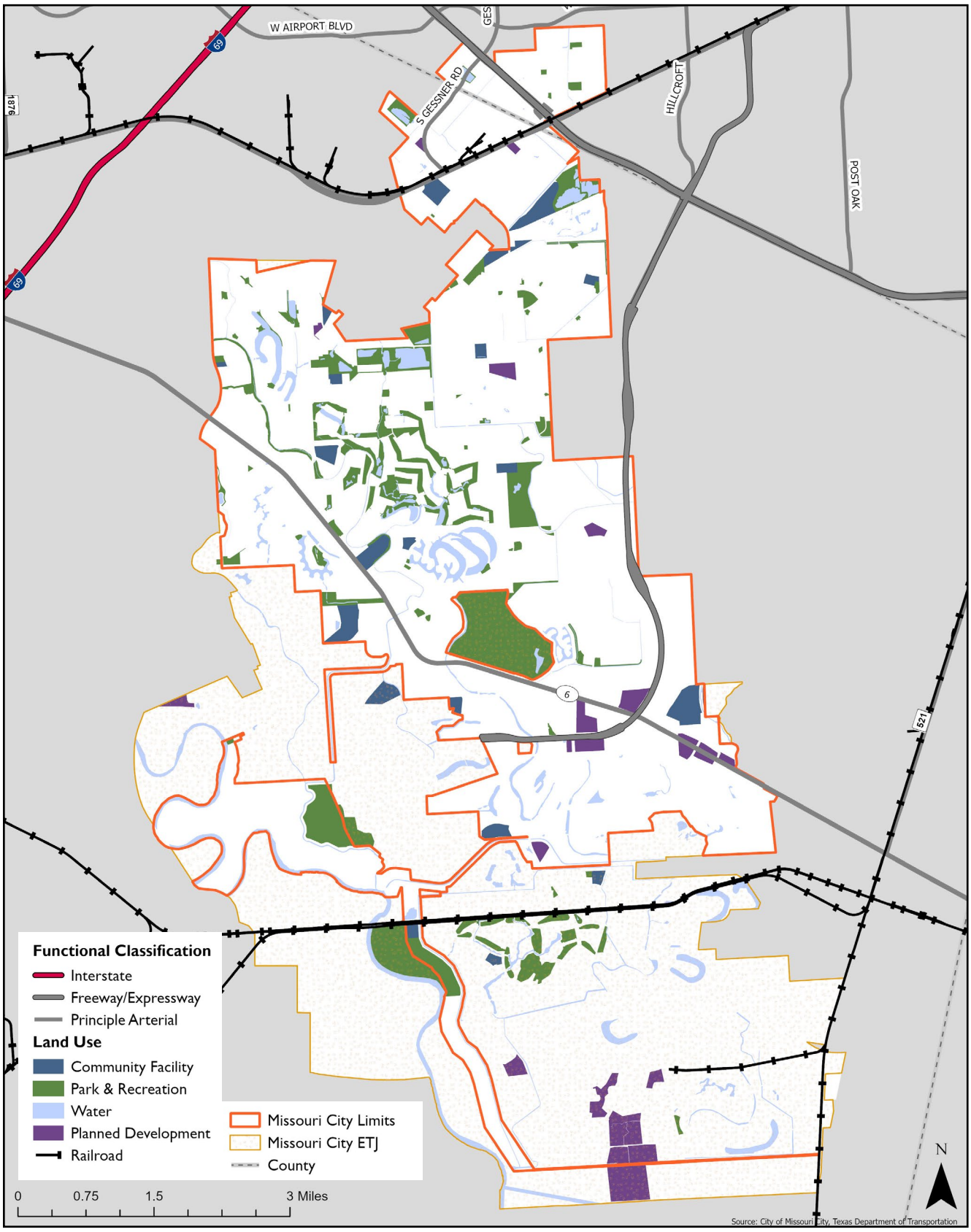


FIGURE 4.3C – EXISTING BARRIERS



4.4 ACTIVE TRANSPORTATION

One of the most apparent themes identified during the community engagement process was the need to increase the availability of pedestrian and bicyclist facilities, including trails. Gaps in sidewalks, trails and other bicycle facilities exist today in the city impacting pedestrian travel and leading to potential pedestrian safety issues.

Several gaps in the existing system were identified and led to the proposed recommendations. Sidewalk connections are recommended citywide. The calculation below for proposed sidewalk connections is specifically for the high priority areas, as shown in Figure 4.4d.

A detailed list of recommendations is included in Appendix C. The dominant mode of transportation within the City continues to be vehicular, specifically single-occupancy vehicular travel. However, there is an increased demand for multi-modal transportation, and many of the recommendations reflect the City's intent to provide additional facilities. The proposed recommendations resulted in:

- 76 miles of new proposed sidewalks
- 48 miles of new dedicated bike routes or bike lanes
- 32 miles of new trails
- 44 miles of new shared use paths

The proceeding figures are as follows:

- **Figure 4.4a** – The combined existing and proposed active transportation network
- **Figure 4.4b** – The existing trail network
- **Figure 4.4c** – The existing sidewalk network
- **Figure 4.4d** – The high priority areas

The next section outlines best practices for facility design and should be used as minimum guidelines where possible.

FIGURE 4.4A – ACTIVE TRANSPORTATION NETWORK

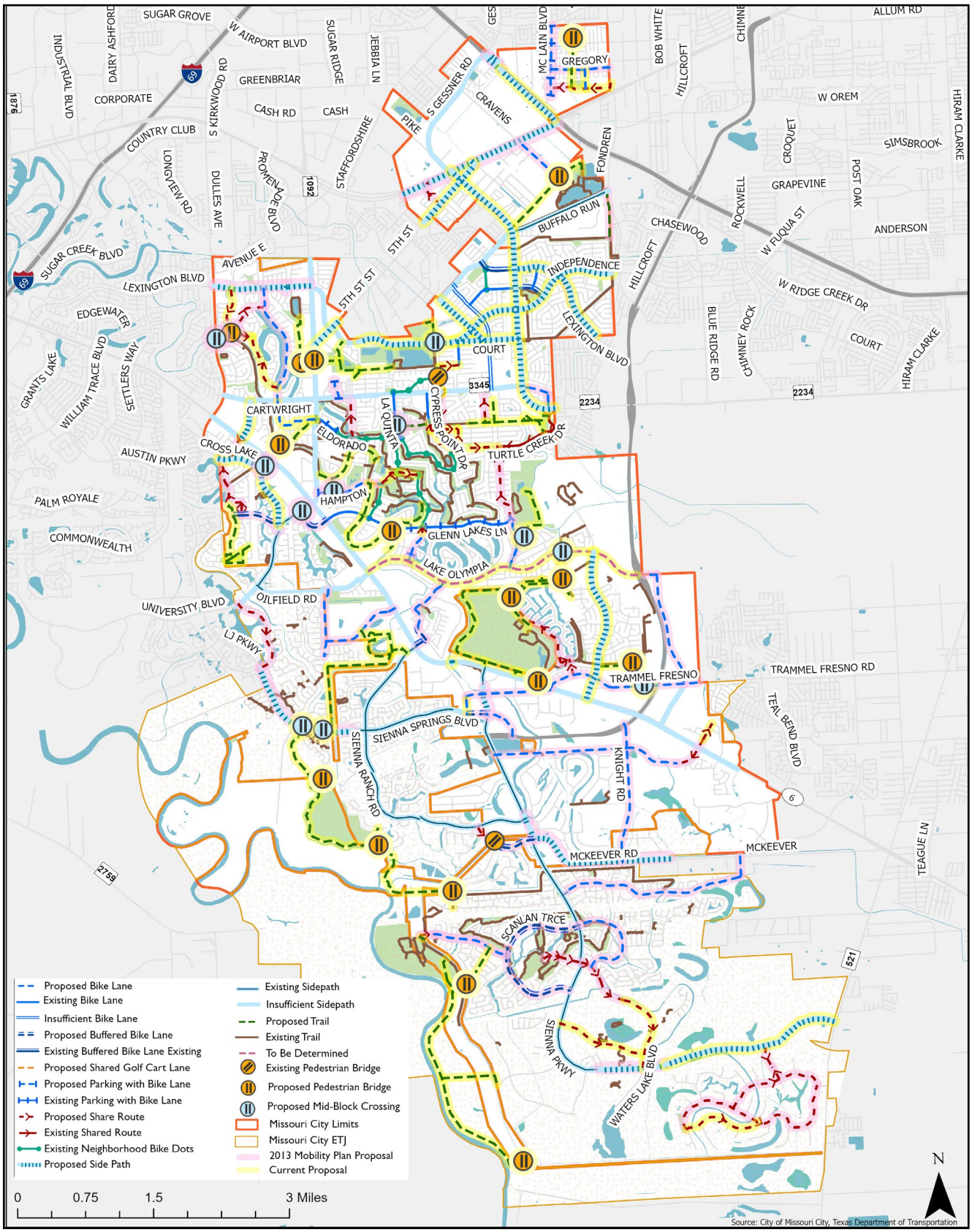


FIGURE 4.4B – EXISTING TRAIL NETWORK

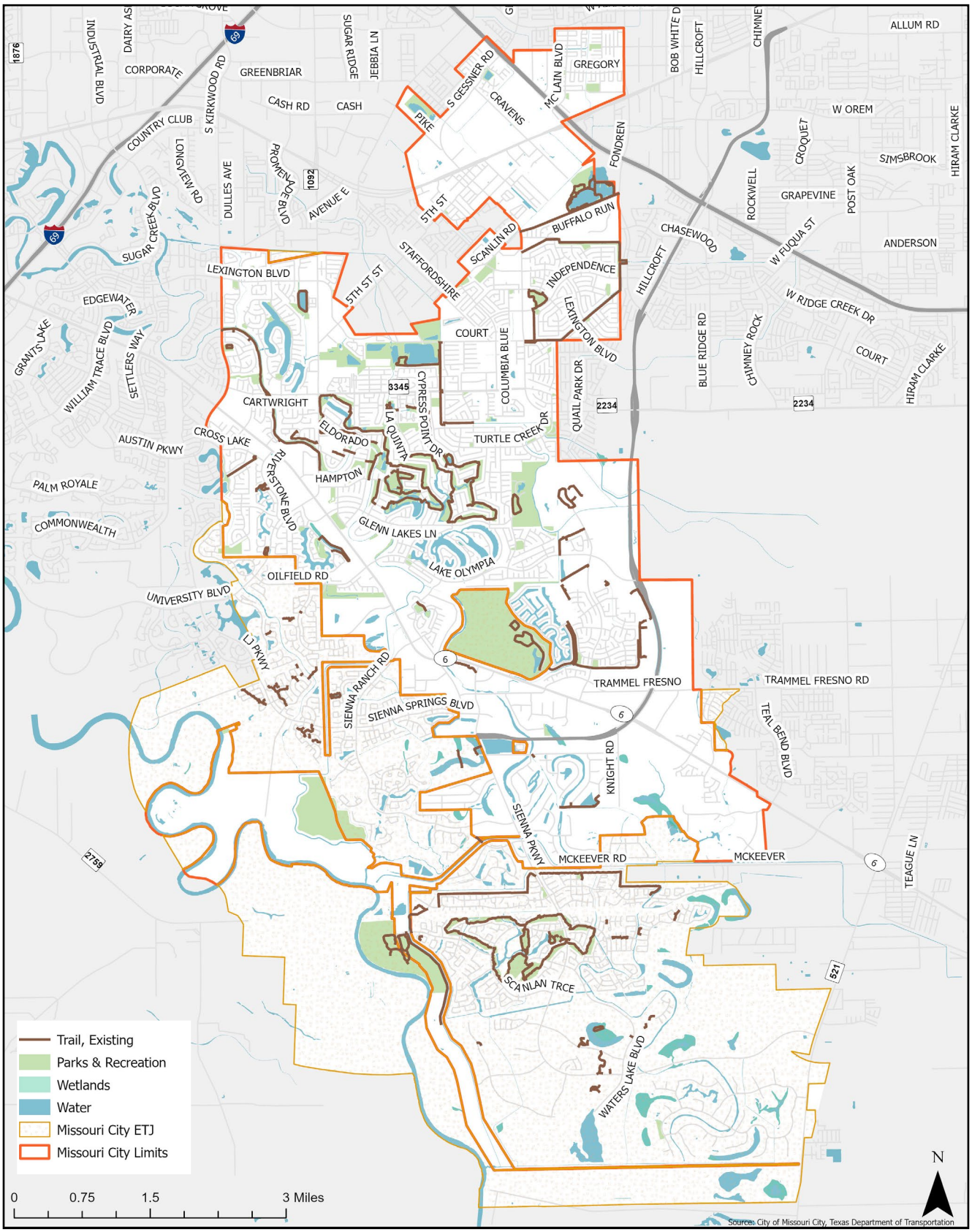


FIGURE 4.4C – EXISTING SIDEWALK NETWORK

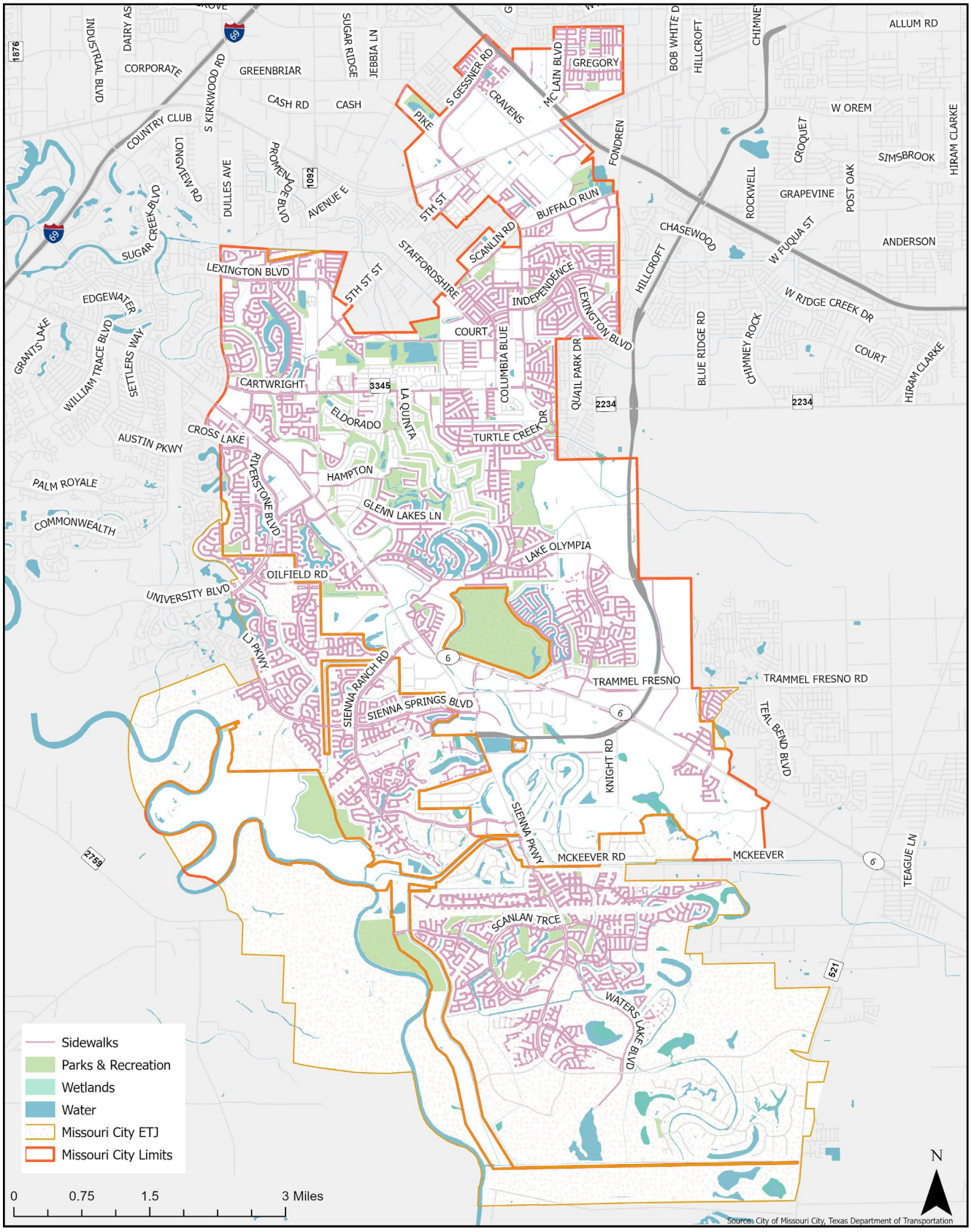
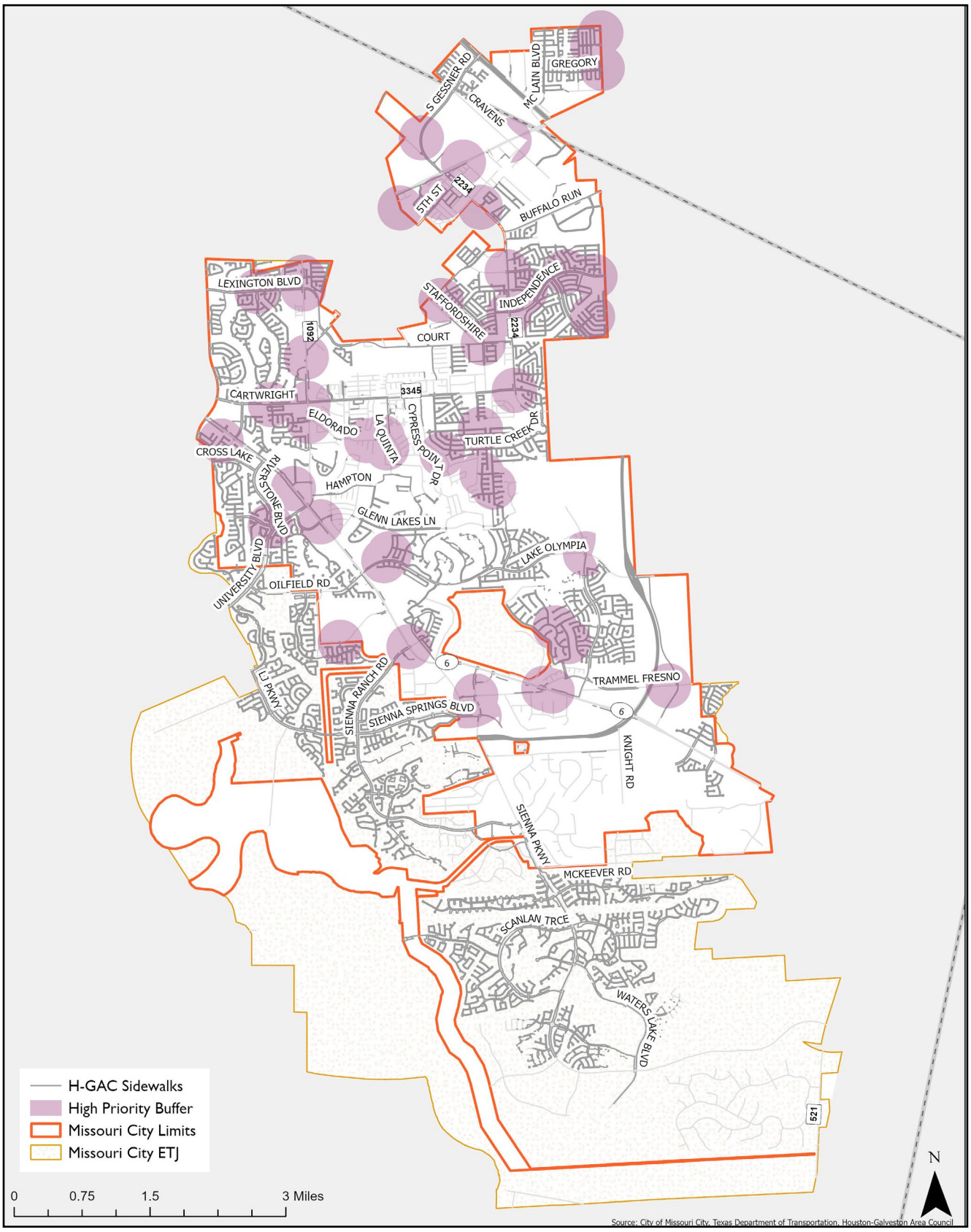


FIGURE 4.4D – HIGH PRIORITY AREAS



4.4.1 Design Guidelines

General best practices for designing active transportation facilities are outlined below. These design principles encourage more widespread use by providing higher comfort and increased safety for all users. Refer to the Bicycle Implementation Flow Chart included in Appendix C for the appropriate design based on functional classification. In addition to the information provided below, refer to the Bicycle and Pedestrian Toolbox in Appendix C for more detailed information regarding design guidelines, benefits, and considerations of various transportation facilities.

Shared Use Path/Sidepath

- The minimum paved width for a shared use path is 10 feet. In constrained low-traffic areas, a reduced width of 8 feet may be used.
- The minimum recommended distance between a shared use path and adjacent roadway edge is 5 feet on a high-speed roadway. A barrier should be provided where the separation is less than 5 feet.

Buffered Bike Lane

- A 6-foot bike lane is recommended when possible, however, a minimum width of 5 feet is acceptable.
- A physical separation buffer is recommended; buffer treatments can include vertical delineators, concrete barriers, raised pavement markers, and planter boxes. They can also serve as a tool for beautification, integrating art and place-making elements into a streetscape.
- If a striped buffer is provided with no physical separation, 2 feet is the recommended minimum for the buffer; there must be two solid white lines parallel to the bike lane, with interior diagonal cross hatching or chevron markings if the buffer is 3 feet in width or wider.
- When buffering a bike lane from a parking lane, a minimum 1.5-foot width (in addition to the travel lane side buffer) is recommended to encourage cyclists to ride outside of the door zone of parked cars.

Shared Lane/Bike Route

- Bike routes are identified with both pavement markings and signage. The marking used for this facility, also known as a “sharrow,” is a bicycle with a double arrow above it to mark the direction of travel. Signage is useful when placed at the beginning of a shared lane to alert motorists.
- Sharrows should be placed immediately after an intersection and spaced at 250-foot intervals.

Sidewalks

- A 6-foot sidewalk is recommended when possible, however, a minimum sidewalk width of 5 feet is acceptable.
- It is recommended that a buffer zone of 4-6 feet be incorporated to further separate pedestrians from the roadway. This buffer zone is often created by a landscaped or hardscaped strip next to the curb, but it can also be created by the presence of bike lanes or on-street parking.
- In cases where the sidewalk is immediately adjacent to the curb, the sidewalk should be widened an additional 2-3 feet.

Improving active transportation connectivity would enable pedestrians and bicyclists to move around the city safely and more easily and could help the city market itself to residents and visitors desiring more active mobility options.

4.4.2 Transit

In Missouri City today, there is an existing transit network that is comprised of:

- ***Two Park-n-Ride commuter bus routes***
- ***One community connector route***

Two new Park & Ride facilities are proposed per H-GAC's 2023-2026 Transportation Improvement Program (TIP). One facility is proposed to be on the southeast corner of the intersection of SH 6 and Fort Bend Toll Road in Fort Bend Town Center III, and the other facility is proposed near the intersection of US 90A and Sam Houston Tollway. These facilities would service the two Park & Ride commuter bus routes.

There are 10 existing bus stops in the study area, 90% of which do not have a bus shelter.

Refer to Figure 3.3.3b in Chapter 3 for the routes and types of existing transit facilities in the city.

As part of the public outreach process, residents expressed an interest in using trolleys if they were made available. Additionally, inconvenience was the strongest deterrent to residents utilizing transit. Upon review of the existing facilities, it was determined that several recommendations could be made.

Recommendation: Partner and coordinate with H-GAC to review and propose revisions to the current METRO facilities, increase efficiency of existing routes, specifically the 270 and 271 routes to Downtown Houston, and review potential for on-demand services.

4.4.3 Micro-Mobility

One of the themes that arose from the community engagement process was to provide new mobility options, specifically micro-mobility options. Examples of micro-mobility options include, but are not limited to, bicycle and scooter sharing. The city does not currently provide these services to the residents. Investing in a bicycle or scooter sharing program centered around major destinations would benefit the city and the residents by providing alternative transportation modes creating flexibility, convenience, and connectivity. Locations are typically determined by destinations and tourism and should tie into the City's existing trail system. It is recommended that the city further investigate a bike share program to support the increasing demand for multi-modal transportation.

When implementing micro-mobility services, the City should consider the following:

- How the services will be permitted,
- Where the services will operate,
- Who will maintain and corral the bicycles or scooters, and
- If parking geofencing will be desired.

It is recommended that the city coordinate with individual provider companies or peer cities to help address these concerns and identify best practices.

Micro-mobility options are most successful when they are deployed in areas with a lot of commercial activity and existing transit service. Initial consideration could include commercial areas near:

- Fort Bend Parkway Tollway and State Highway 6, including the future Town Center
- State Highway 6 and Sienna Parkway
- Texas Parkway between Missouri City Drive and Court Road

4.5 RAILROAD CROSSING

There are two railroad crossings in the city today, one at the intersection of Cravens Road and US 90A and one at the intersection of Gessner Road at US 90A. Both crossings require updates to the existing infrastructure to ensure safety and efficiency for vehicles. Table 4.5.a below lists the proposed recommendations for the two railroad crossings.

TABLE 4.5.A – RAILROAD CROSSING RECOMMENDATIONS

ID	LOCATION	RECOMMENDATION
R.1	Cravens at US 90A	Recommend quad crossing gates on Cravens Rd to prevent vehicles from driving around gates.
R.2	Cravens at US 90A	Evaluate crash data to determine need for safety improvements.
R.3	Gessner at US 90A	Recommend advanced railroad signage on southbound approach.
R.4	Gessner at US 90A	Recommend checking pre-emption to ensure proper operation.
R.5	Cravens and Gessner at US 90A	Recommend installing railroad monitoring system to be transmitted to Bluetooth devices, the City's website, and Transtar.

As listed in the table above, a comprehensive railroad monitoring system would be beneficial for the residents of the city as well individuals who travel to Missouri City. The railroad monitoring system would detect trains and transmit the information to devices connected via Bluetooth. Citizens would be informed of stopped trains and would be able to make an educated decision to take an alternate route, saving them time and money.

4.6 INTERSECTION ASSESSMENT

Crash data was utilized to determine the intersections with the highest crash incidence. TxDOT's CRIS system was used to collect crash data from January 1, 2018, to January 12, 2022. The crash density heat map in Section 3.3.1, as well as crash data, were used to identify five priority intersections with high crash incidence and the top contributing factors.

The five priority intersections identified are:

1. FM 1092 at SH 6 (153 crashes)
2. FM 1092 at Cartwright Road (130 crashes)
3. FM 1092 at Lexington Boulevard (109 crashes)
4. SH 6 at Sienna Parkway (100 crashes)
5. SH 6 at Lake Olympia Parkway (95 crashes)

The top five contributing factors to intersection-related crashes at the intersections above were:

1. Failed to control speed (125 – 36%)
2. Failed to yield right of way (33 – 10%)
3. Disregard stop and go signal (29 – 8%)
4. Driver inattention (29 – 8%)
5. Changed lane when unsafe (22 – 6%)

Many crashes were stated as having no contributing factor. However, this was not included in the development of the list above.

In addition to the intersections listed above, several intersections throughout the city were highlighted as needing improvements during the community engagement process. Intersection recommendations were identified and classified into groups, or categories, based on the improvement needed. The categories include timing, safety, geometry, and warrant analysis. Some intersections may have needs for more than one category such as safety and geometry.

Recommendations specific to evaluating timing at a signalized intersection were placed into the timing category. These recommendations are focused on optimizing timing, such as ensuring adequate green time is provided. Timing and efficiency are directly related; as timing improves, efficiency will increase.

The safety category includes improvements that would increase the overall safety at the intersection, such as installing lighting. Most of the recommendations in the safety category are locations with high crash incidence or where specific safety concerns were received during the community engagement process.

Recommendations for installing turn lanes or re-evaluating lane configuration were categorized into the geometry group. Geometry recommendations have an impact on safety and efficiency by increasing storage for vehicles and allowing for service of the maximum number of vehicles per phase.

The warrant analysis category has two subsequent groups, Traffic Signal Warrant Analysis (TSWA) and All-Way Stop Control (AWSC) warrant analysis. Recommendations will fall into one of these two subcategories if an intersection needs to be evaluated to determine the appropriate control. Appropriate intersection control can lead to increased safety, mobility, and efficiency.

A detailed table of the specific intersection recommendations is provided in Table 4.6a. In addition to the intersection recommendations in Table 4.6a, several more recommendations are included in another project or are already being implemented. These recommendations are listed in a separate table, Table 4.6b.

TABLE 4.6A - INTERSECTION RECOMMENDATIONS

ID	GROUP	LOCATION	RECOMMENDATION
I.1	Timing	Citywide	Evaluate timing along major corridors and implement coordination of signals
I.2	Traffic Signal Warrant Analysis	Sienna Parkway at Sienna Circle/Silver Ridge Boulevard	Perform traffic signal warrant analysis to determine need for this intersection to be signalized
I.3	Safety	Sienna Parkway at Sienna Circle/Silver Ridge Boulevard	Evaluate crash data to determine need for safety improvements
I.4	Timing	Lake Olympia Parkway at Paradise River Drive	Evaluate timing plan and safety of intersection; increase all red time due to visibility concerns of vehicles running yellow/red light
I.5	Safety	SH 6 at FM 1092	Evaluate intersection for safety and efficiency and recommend geometric and/or operational improvements
I.6	Safety	SH 6 at Fort Bend Toll Road	Recommend increased signage to prevent illegal westbound left turn from SH 6
I.7	Geometry	Sienna Parkway at Sienna Christus Drive	Evaluate westbound right turn volumes from Sienna Christus Drive to determine if lane geometry needs to be revised
I.8	Safety	Cartwright Road at FM 1092	Evaluate intersection for safety and efficiency and recommend geometric and/or operational improvements
I.9	Safety	Lexington Boulevard at FM 1092	Evaluate intersection for safety and efficiency and recommend geometric and/or operational improvements
I.10	Timing	SH 6 at Vicksburg Drive	Evaluate timing, specifically for eastbound left phase from SH 6
I.11	Safety	Glenn Lakes Lane at Lowes Driveway	Evaluate volumes and geometry to determine improvements to reduce congestion
I.12	Geometry	Hurricane Lane at Lake Olympia Parkway	Evaluate northbound turn volumes from Hurricane Lane to determine need for dual turn lanes
I.13	Timing	Knights Court at SH 6	Evaluate eastbound left turn volumes from Knights Court to determine need for increased green time
I.14	All-Way Stop Control Warrant Analysis	Robindale Lane at Hampton Drive	Perform all-way stop control warrant analysis
I.15	Traffic Signal Warrant Analysis	Lake Olympia Parkway at Dry Creek Drive	Perform traffic signal warrant analysis to determine need for this intersection to be signalized
I.16	Traffic Signal Warrant Analysis	Trammel-Fresno Road at Dry Creek Drive	Perform traffic signal warrant analysis to determine need for this intersection to be signalized

ID	GROUP	LOCATION	RECOMMENDATION
I.17	All-Way Stop Control Warrant Analysis	Knights Court at Hidden Bough Lane	Perform all-way stop control warrant analysis
I.18	Timing	Glenn Lakes Lane at SH 6	Evaluate timing, specifically for phases on Glenn Lakes Lane, to determine need for longer green time
I.19	Safety	SH 6 at Lake Olympia Parkway	Evaluate intersection for safety and efficiency and recommend geometric and/or operational improvements

TABLE 4.6B - INTERSECTION RECOMMENDATIONS IN IMPLEMENTATION STAGE

ID	GROUP	LOCATION	RECOMMENDATION
I.20	Safety/ Geometry	Sienna Parkway at Bees Passage/McKeever Road	Evaluate crash data and evaluate left turn volumes to determine need for geometric requirements
I.21	Geometry	Sienna Parkway at Bees Passage/McKeever Road	Evaluate volumes to determine need for turn lanes
I.22	Traffic Signal Warrant Analysis	Lake Olympia Parkway at Fort Bend Toll Road	Perform traffic signal warrant analysis to determine need for this intersection to be signalized
I.23	Geometry	Lake Olympia Parkway at Fort Bend Toll Road	Evaluate eastbound left turn volumes from Lake Olympia Parkway to determine need for dual left turn lanes
I.24	Traffic Signal Warrant Analysis	Lake Olympia Parkway at Crow Valley Drive	Perform traffic signal warrant analysis to determine need for this intersection to be signalized
I.25	Traffic Signal Warrant Analysis	Lake Olympia Parkway at Misty Hollow Drive	Perform traffic signal warrant analysis to determine need for this intersection to be signalized
I.26	Safety	Lake Olympia Parkway at Swan Isle Boulevard	Perform speed study to determine safety improvements
I.27	Geometry	Colonial Lakes Drive at SH 6	Evaluate southbound left turn volumes from Colonial Lakes Drive to determine need for dual left turn lanes
I.28	Geometry	Township Lane at SH 6	Evaluate southbound right turn volumes from Township Lane to determine need for exclusive right turn lane
I.29	Safety	Knights Court at Hidden Bough Lane	Recommend installation of lighting to increase student safety
I.30	Geometry	Knights Court at SH 6	Recommend eastbound left turn lane to increase capacity
I.31	Safety	Sienna Parkway at SH 6	Evaluate intersection for safety and efficiency and recommend geometric and/or operational improvements

4.7 POLICY REVIEW

The city's current mobility related policies, ordinances, and standards should consider the following transportation-related best practices. In general, the city's policies should be updated to provide regulations for new or re-development.

4.7.1 Thoroughfare Planning

The Major Thoroughfare Plan (MTP) is an important tool in long-term mobility planning. As new development comes in for platting and permitting applications, the city should refer to the MTP to ensure that the proposed development is dedicating any rights-of-way as specified by the MTP.

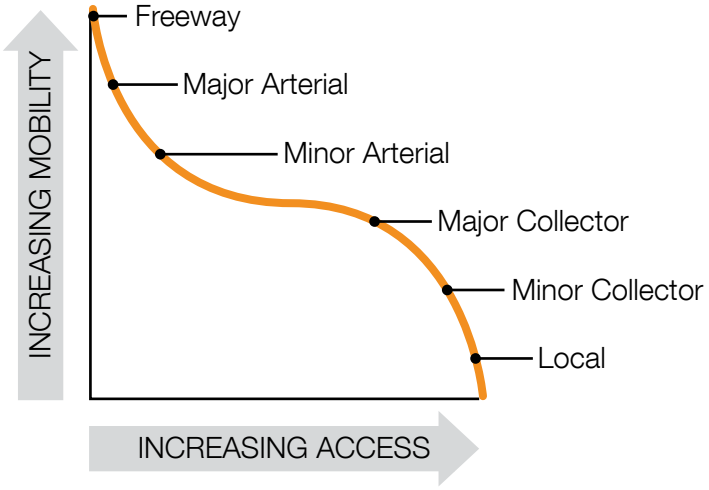
4.7.2 Access Management

As development continues, the city should evaluate their current policies for access management. This includes spacing between streets and driveways, turn lanes, and medians. Current conditions in the study area allow for safety issues as well as inefficiencies in traffic flow and travel time.

Street and Driveway Spacing

Roadways are assigned a hierarchy classification to better regulate uses and make travel safer and more efficient. Roadway hierarchy generally dictates that freeways should provide the least amount of access and local streets should have the most access, with all other facilities varying by type, as shown in Exhibit 4.7.2a. Mobility and safety improve when access decreases.

EXHIBIT 4.7.2A – MOBILITY-ACCESS RELATIONSHIP



The American Association of State Highway and Transportation Officials (AASHTO) provides some guidance on spacing of roadways. In their publication, The Green Book, they distinguish between urban and rural areas. In general, for more developed areas, freeway spacing may vary between 1 to 5 miles apart from one another, arterials are typically no more than 1 mile apart, and collectors and local streets will vary greatly and should be consistent with the community context. Each lower classification of roadway provides access to the classification above it, creating a true network of roadways.

It is typical in the study area to find that many Minor and Major Collectors have excessive driveway openings. Changes in policy should include, either in the form of ordinance requirements or incentives:

- Maximum allowance of driveways specific to each functional classification, per property by type, or by frontage distance
- Provisions for shared driveway access / connectivity between neighboring properties or strip centers
- Alley access, either allowing alleys to be constructed for parking / access, or requirement of properties abutting alleys to use them for access

An example of a policy that might address these points: "Along a Major Collector, a maximum of one driveway is allowed for every 200 feet of frontage per commercial business. If the property abuts

another property of similar use, the properties should consolidate to use one shared driveway between properties. Strip centers will be allowed one driveway for every 500 feet of frontage, or two per center, whichever is least restrictive. For properties abutting alleyways, the alleys must be used for frontage to the public street."

This is a general example and exact verbiage may be different for Missouri City. Considerations should be made for who will be burdened with cost, how to retrofit existing access points, and at what point in the development process they should be addressed. The City will need to coordinate with TxDOT for roadways that are maintained or controlled by TxDOT. TxDOT has specific standards related to access management; the City can help to enforce these rules through the platting and permitting processes.

4.7.3 Bicycle and Pedestrian Facilities

Policies should also be considered to provide bicycle and pedestrian facilities and to improve the user experience along these facilities. Policies could include:

- Design guidelines for facility types (sidewalks, bike lanes, shared use paths, etc.), to include minimum widths, barriers, striping, signing, lighting, etc.
- Requirements for safe crossings where facilities meet one another or the public right-of-way
- Requirements for connections to existing bicycle and pedestrian facilities with all new or re-developments
- Provision of amenities along new or existing sidewalks or bicycle facilities; amenities could include bicycle parking, shade trees, benches, trash cans, bicycle repair stations, etc.
- Provision of safety equipment along new or existing pedestrian or bicycle facilities, including adequate lighting and alert stations

4.7.4 Transit

While the recommendation of this study is to partner and coordinate with H-GAC to review and propose revisions to the existing METRO facilities and routes, there are policy changes that should be implemented either preemptively or in combination with the recommendation. These policies will promote the use of transit and improve the user experience.

- Provide pedestrian and bicycle facilities at each stop and station, with connections to major retail and residential nodes
- At stops and stations, provide bike parking / storage and shared mobility options (micro-transit, scootershare, bikeshare, and transportation network companies – TNCs)
- Make all stops and stations ADA-compliant with separation from the roadway
- Partner with area employers to encourage transit ridership
- Promote transit-oriented development

4.7.5 Performance Metric Schedule

Missouri City should implement a schedule that requires for a regular measurement of performance metrics to monitor how the improvements are improving traffic flow and safety in the study area. Over time, if the metrics show that the improvements are no longer sufficient for maintaining an acceptable level of service or safety standard, new improvements should be considered. This measurement schedule should be at a maximum of 5 years, or whenever new measurement methods are introduced.

The goals, performance measures, and potential data sources are illustrated in Table 4.7.5a.

TABLE 4.7.5A – PROJECT GOALS, PERFORMANCE MEASURES, AND POTENTIAL DATA SOURCES

GOAL	OBJECTIVES	MEASURES
Mobility	Connectivity, gaps	▶ Houston-Galveston Area Council and Texas Department of Transportation Open Data Portal ▶ Geographic Information System (GIS)
	Modes, facilities	▶ Geographic Information System (GIS)
Safety	Pedestrian-specific crash data	▶ Texas Department of Transportation Crash Records Information System (C.R.I.S.)
	Number of conflict points, crash data	▶ Federal Highway Administration Signalized Intersections Informational Guide ▶ Texas Department of Transportation Crash Records Information System (C.R.I.S.)
Efficiency	Travel time, traffic volumes	▶ INRIX, Texas Department of Transportation and Houston-Galveston Area Council Traffic Count Database System (TCDS)

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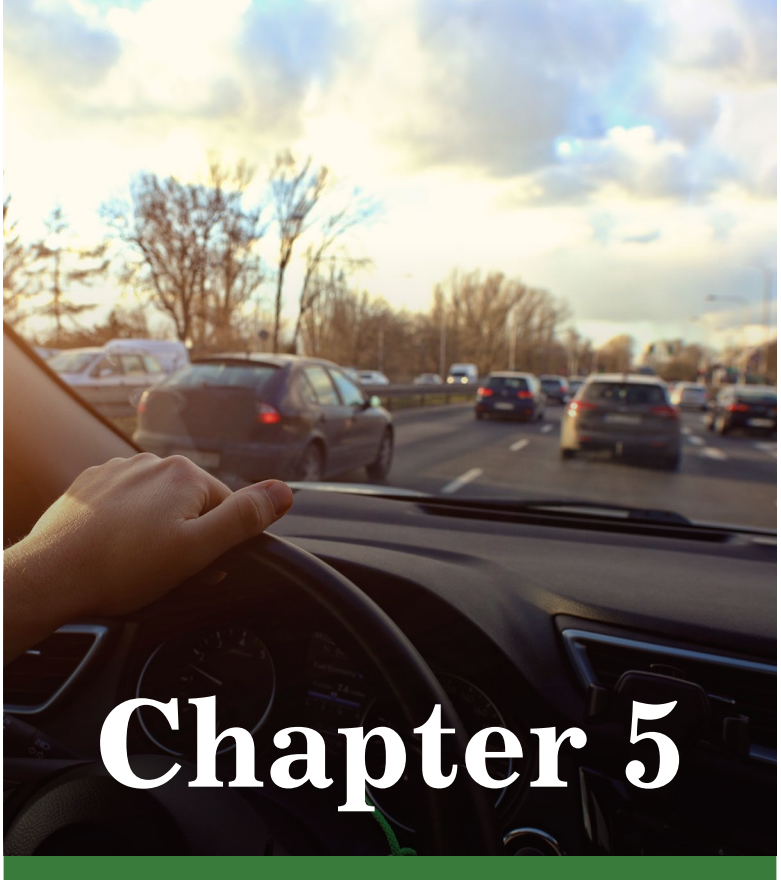


Chapter 5

Evaluation of Improvements

5.1 IMPROVEMENTS SUMMARY

5.2 VISION AND GOALS

5.3 DEMAND AND RISK ASSESSMENT

5.4 IMPROVEMENTS EVALUATION AND BENEFITS

5.5 IMPROVEMENT COSTS

5.6 POTENTIAL FUNDING OPTIONS

Evaluation of Improvements

The improvements recommended in this study were based on the vision and goals outlined in Chapter 1. Performance measures were determined based on the goals and will be used to evaluate the improvements discussed in Chapter 4. It is recommended the city measure the proposed improvements regularly in the future to determine their effectiveness.

This chapter will focus on the evaluation of recommendations related to the active transportation network and intersections. There is a focus on active transportation instead of vehicular transportation due to the existing conditions of the city. The city is limited when it comes to proposing new roadway connections, however improving facilities for pedestrian and cyclists will provide residents with safe and efficient alternative modes of travel.

Also included in this chapter is the process by which the improvements recommended in this study may be implemented in the future, including potential timelines and funding sources.

5.1 IMPROVEMENTS SUMMARY

Recommendations were made by analyzing the existing conditions and gathering information from the community engagement process. The recommendations presented in Chapter 4 focus on improving overall safety and operations.

The improvements recommended were analyzed based on the three goals: mobility, safety, and efficiency. To account for comments received during the community engagement process, a fourth category, citizen concern, was added to the evaluation process. Each category was then split into subcategories based on the performance measures in Table 5.2a and given a specific point range and weight. Recommendations were then assigned points in each category based on the specifications of that category. The highest-ranking recommendations were included in the Capital Improvement Program (CIP) list of projects. The CIP project list is included in Chapter 6. Further detail on the evaluation process is presented later in this chapter.

In total, 175 recommendations were evaluated:

- Pedestrian Network (57 recommendations)
- Bicycle Network (97 recommendations)
- Intersections (19 recommendations)
- Miscellaneous (2 recommendations)

5.2 VISION AND GOALS

As stated in Chapter 1, the Vision for the Missouri City Mobility Master Plan is as follows:

VISION

"To provide a connected transportation network that is safe and efficient for all users."

The Vision was further refined into three goals that align with the city's own goals, and each goal is supported by more specific objectives. Performance measures – measurable metrics such as connectivity, crash data, and number of conflict points – provide a guide to evaluate if and how the objectives are fulfilled. See the goals, objectives, and performance measures illustrated in Table 5.2a.

TABLE 5.2A – PROJECT GOALS, OBJECTIVES, AND PERFORMANCE MEASURES

GOAL	OBJECTIVES	MEASURES
Mobility	Provide additional mobility options to serve areas with unique mobility needs and accommodate future growth	Modes, facilities
	Increase miles of bicycle, pedestrian, and trail facilities to provide a connected non-motorized network	Connectivity, gaps
Safety	Provide safety related pedestrian improvements	Pedestrian-specific crash data
	Identify improvements at intersections experiencing the City's highest crash densities	Number of conflict points, crash data
Efficiency	Improve efficiency of vehicular mobility citywide	Travel time, traffic volumes

**Recommendations that address citizen concerns were more highly weighted in scoring.*

The performance measures provided above are evaluated on different scales as some of the measures apply to a corridor and others to an intersection. Increasing the connectivity, removing gaps, and increasing travel modes will be evaluated on a corridor basis while facilities, crash data, and crash conflict points will be evaluated on an intersection or location basis.

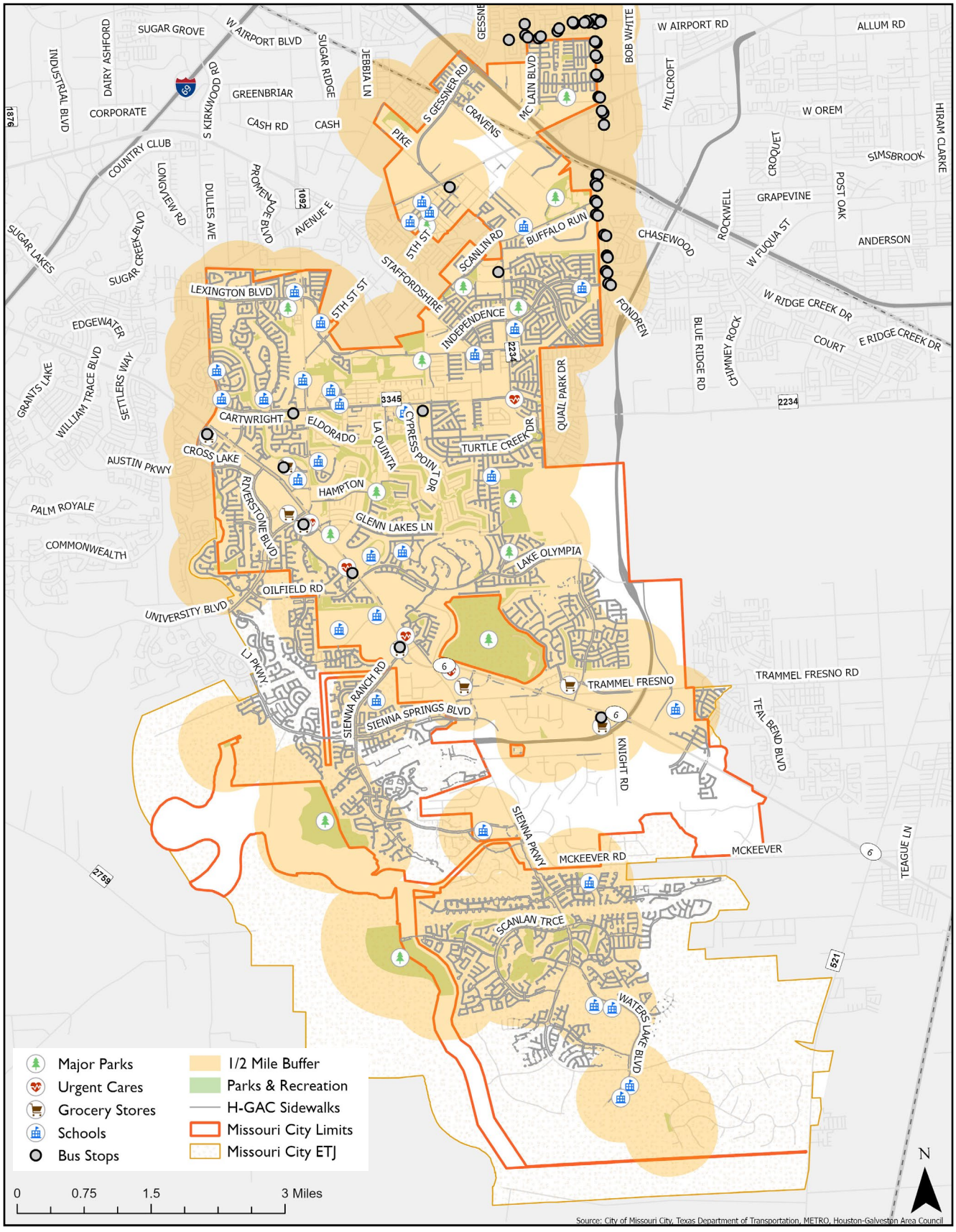
5.3 DEMAND AND RISK ASSESSMENT

Two of the three primary goals of the mobility plan and their resulting objectives and measures were specially characterized with an emphasis on bicycle and pedestrian modes. There was a need to better understand where the areas of highest mobility demand and risk existed for these modes. This assessment was used throughout the evaluation of recommendations.

5.3.1 High Demand Areas

Demand was analyzed first to better understand where people may be using the non-motorized transportation network the most. High demand areas include schools, grocery stores, urgent cares, major parks, and bus stops. These uses are typically those that are more heavily traveled by non-motorized users. Once these high demand areas were identified, a half-mile buffer was placed around each, which is the typical maximum distance a pedestrian will travel. Figure 5.3.1a displays the high demand locations in the city, highlighted in orange

FIGURE 5.3.1A – HIGH DEMAND AREAS

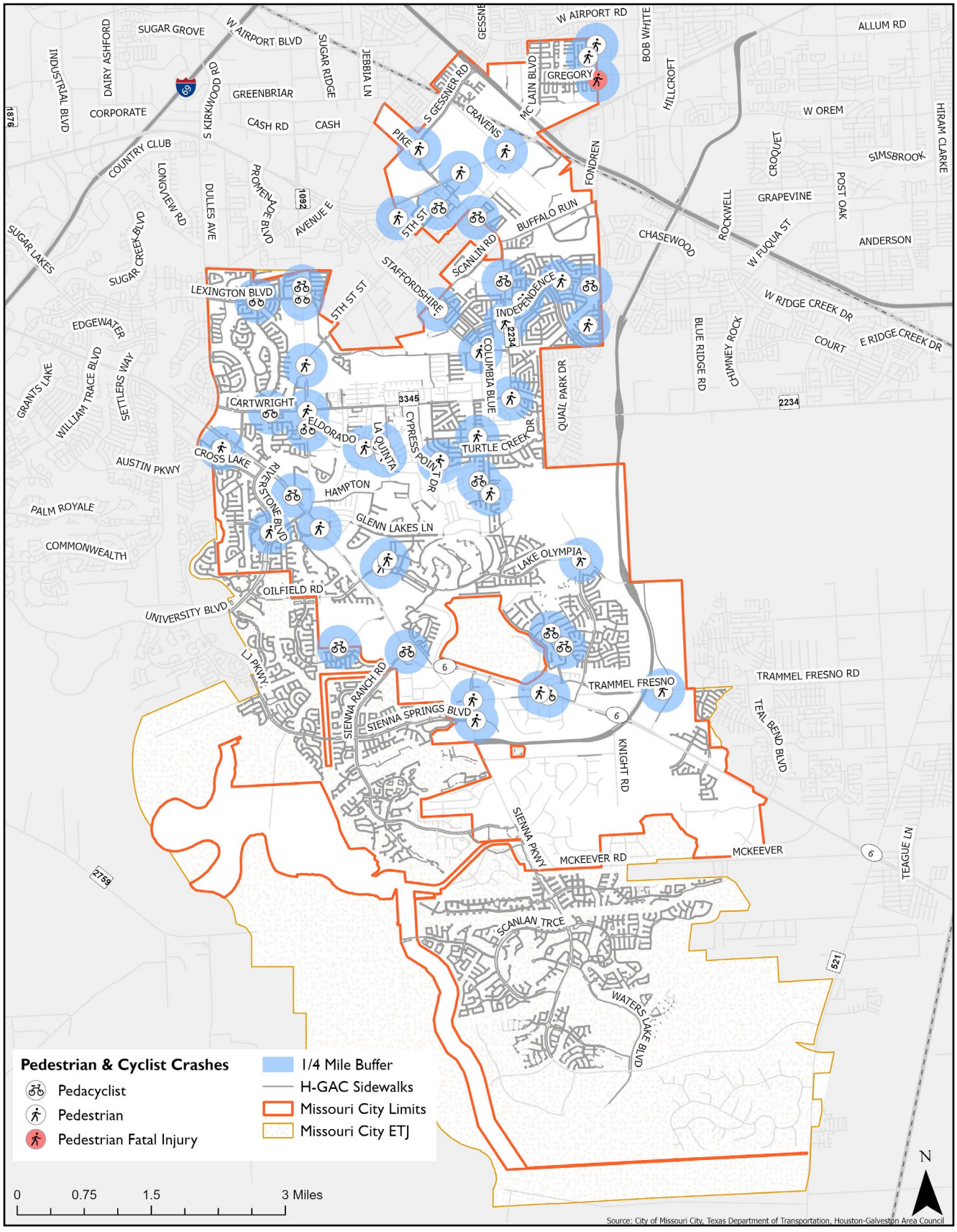


5.3.2 High Risk Areas

After identifying where people may want to walk or cycle most frequently, there was a need to identify where the areas of highest safety risks currently existed. Pedestrian and cyclist safety was a specific concern pointed out in the community engagement process, therefore crash data was evaluated to identify locations where pedestrian and cyclist related crashes occurred. A quarter-mile buffer was placed around these locations, and they were classified as high-risk areas for pedestrians and cyclists.

Figure 5.3.2a displays the high risk locations within the city.

FIGURE 5.3.2A – HIGH RISK AREAS

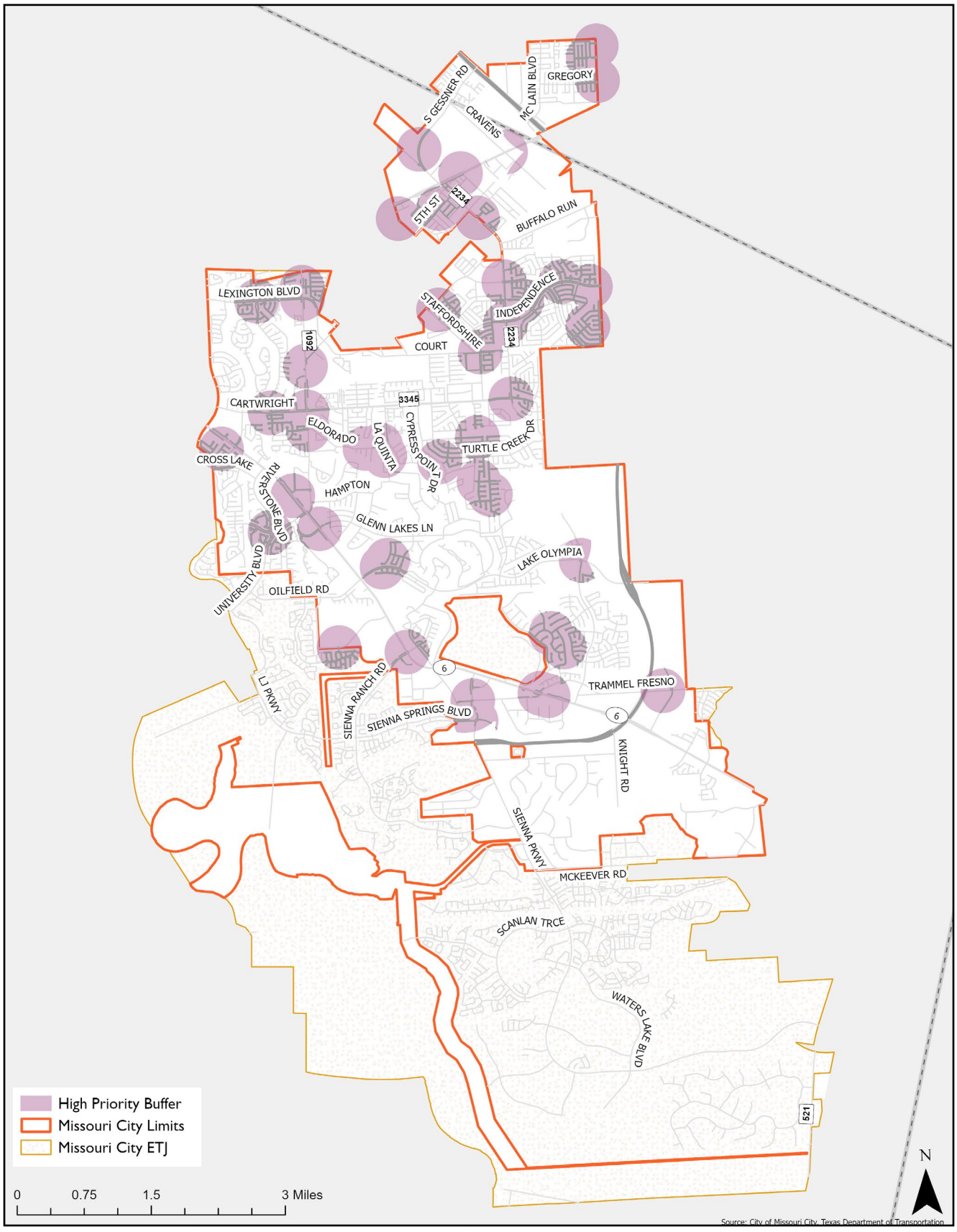


5.3.3 High Priority Areas

Once the high demand and high risk areas were identified, they were overlaid on top of one another. The locations that were in both the high demand and high risk areas were identified as high priority. Given the vast activity demand throughout the city as a whole, almost all high risk areas became high priority areas, with a few minor exceptions. For recommendation evaluation purposes, there was no difference between high risk and high priority.

Figure 5.3.3a displays the high priority locations within the city.

FIGURE 5.3.3A – HIGH PRIORITY AREAS



5.4 IMPROVEMENTS EVALUATION AND BENEFITS

5.4.1 Mobility Benefits

Using the high demand buffer area, mobility benefits were evaluated on the following measures:

- Connectivity, gaps
- Modes, facilities

5.4.1.1 Connectivity/Gaps

In evaluating the mobility benefits of a recommendation based on connectivity, the recommendation was awarded points based on a determined set of criteria. If the recommendation fell within the high demand buffer and was a new connection, it was awarded three points as this had the greatest benefit to mobility. If the recommendation was in the high demand buffer but was not a new connection, it was awarded two points. Recommendations outside of the high demand buffer were awarded one point.

5.4.1.2 Modes/Facilities

Modes and facilities were evaluated using the similar criteria as connectivity. If a recommendation fell within the high demand buffer and proposed a new mode or facility, it was awarded three points. If the recommendation was in the high demand buffer but was an improvement to the existing facility, it was awarded two points. Upgrading existing sidewalks to 10' sidepaths was included in this category. Recommendations for new modes or facilities outside of the high demand buffer area were awarded one point.

5.4.2 Safety Benefits

Safety is an important goal for the city and was also identified as a major priority of the residents during the community engagement process. Safety benefits were evaluated on the following measures using crash data:

- Pedestrian-specific crash data
- Conflict points and crash data

5.4.2.1 Pedestrian-Specific Crash Data

Similar to the method used to evaluate mobility benefits, safety benefits were awarded points based on a set of criteria. The maximum number of points was awarded to recommendations that had the greatest impact on safety, while the lowest number of points was awarded to improvements that were safety-based but would have a smaller impact on safety based on the set criteria. If the recommendation fell within the high-risk buffer, it was awarded three points. If the recommendation was not in the high-risk buffer but was on a high-speed roadway, it was awarded two points. If the recommendation did not fall within the high-risk buffer and was not a high-speed roadway, it was awarded one point.

5.4.2.2 Conflict Points and Crash Data

Intersection safety was another concern highlighted in the community engagement process. Crash data was used to identify the intersections of study; if they were within areas with high crash density, they were chosen for evaluation. Number of conflict points was the measure used to set the criteria to evaluate the intersection recommendations.

Each intersection has a typical number of conflict points based on its geometry. A typical four-leg intersection will have 32 vehicle-to-vehicle conflict points, while a typical three-leg intersection will have only 9 vehicle-to-vehicle conflict points. If pedestrian facilities are present at an intersection, this creates vehicle-to-pedestrian conflict points in addition to the vehicle-to-vehicle conflict points. Using the number of conflict points, a set of criteria was created for evaluating the intersection recommendations. If the recommendation was at a four-leg intersection with pedestrian or bicycle facilities present, the recommendation was awarded three points. For recommendations at four-leg intersections with no pedestrian or bicycle facilities present, the recommendation was awarded two points. One point was awarded to recommendation at three-leg intersections.

5.4.3 Efficiency Benefits

Efficiency benefits are specific to corridors and intersections. When evaluating the recommendations for efficiency benefits, the recommendation was awarded zero or two points. All recommendations not related to operations along corridors or at intersections, were given zero points in this category as they were not efficiency related. Recommendations regarding operational improvements, such as timing, were classified as efficiency related and awarded two points.

Specific improvements related to efficiency were not recommended. Rather, it is recommended to study priority corridors and intersections as identified in the recommendations table in Appendix C for specific improvements. Two measures that should be consistently evaluated are travel times and traffic volumes. Prior to implementation of any recommendations along corridors or at intersections, travel times should be taken to establish a baseline measurement. They should be measured again in incremental time periods after construction to evaluate if the recommended improvement is increasing efficiency.

5.4.4 Citizen Concern

In addition to evaluating the recommendations on the three goals of mobility, safety, and efficiency, citizen concern was also considered. The residents have the most interaction with city facilities on a daily basis. It is important for the residents to be able to travel safely and efficiently. Therefore, recommended improvements that were related to a citizen concern were awarded two points. If a recommendation was not based on a citizen concern, it was not awarded any points in this category.

5.4.5 Overall Evaluation

Each recommendation was evaluated using the performance measures described in this chapter and was awarded points on how the recommendation fulfilled each goal. The points awarded per recommendation for each goal were then multiplied by the weight assigned to the goal. The assigned weight of each goal is listed below.

- **Mobility** – 30%
- **Efficiency** – 20%
- **Safety** – 30%
- **Citizen Concern** – 20%

The weighted points were summed for each recommendation and the recommendations ranked. The recommendations with the most points were ranked higher than the recommendations with fewer points. The scoring and ranking of the recommendations are included in Appendix C.

5.5 IMPROVEMENT COSTS

Each recommendation has an associated unit cost. The unit used to quantify the recommendation may be Intersection (Int), Linear Feet (LF), or Each (EA). These costs were estimated using current industry practice and the most recent TxDOT bid documents. A table summarizing the cost estimates and assumptions can be found in Appendix C.

5.6 POTENTIAL FUNDING OPTIONS

The cost of constructing and maintaining mobility improvements can be significant. The following are different methods for financing construction and maintenance of improvements.

5.6.1 Local Funding Strategies

No revenue stream is more local and locally controlled than those directly available to the city as a result of local taxes and fees. Three methods most commonly used for funding local mobility improvements include:

- General fund includes revenues available through the annual collection of taxes and fees, including ad valorem taxes,
- Bonds or Certificates of Obligation allow communities to issue debt for purposes of public works, including recommendations made by this study. Bonds typically require voter approval whereas Certificates of Obligation may be issued without a vote of the general public.
- Cities may issue a special sales tax for purposes of economic development, including right-of-way improvements. The tax is typically monitored by an Economic Development Corporation and traditionally does not exceed ½ cent. The types of eligible projects can differ by community based upon ballot language.

Special Finance Districts. Special finance districts are permitted through the Texas State Legislature for purposes of making or maintaining improvements that spur private development or maintain the quality of an area.

- Tax Increment Reinvestment Zone. A tax increment reinvestment zone, more commonly known as TIRZ, is a creation of a municipality or county and may be created either by the government entity or by petition. A TIRZ begins by establishing a “base value”. The taxes gained by an increase in value above the base value is the “increment” that is available annually to a reinvestment zone for purposes of making capital improvements. Capital improvements can include mobility improvements such as those recommended in this study. A TIRZ can use both annual allotment and bonds as methods for financing improvements. A TIRZ expires by a set date at which time both the base value and increment are collected by the municipality. Other government entities such as counties and emergency districts can participate in a TIRZ. Each entity can determine percentage of “participation” in which case only a percentage of increment is available for use by the TIRZ. Refer to Appendix C for maps of TIRZ 1, 2, and 3 where Missouri City is a participant.
- Municipal Management District. A municipal management district is a government entity created by the State of Texas either through specific legislation or through the Texas Commission for Environmental Quality. A management district is funded through an annual assessment (in the same manner as a homeowners association), a property tax or a sales tax. While created by the state, a management district is only funded through petition of property owners (in the case of an assessment) or by vote (in the case of a sales or property tax). A management district can pay for the cost of construction of improvements in the right-of-way; however, the amount of available revenue typically limits the scale of construction allowed. On the other hand, a management district is an excellent tool for ongoing maintenance of improvements beyond major road reconstruction.

5.6.2 State Funding Strategies

TxDOT TA and SRTS Program – TxDOT administers Transportation Alternatives Set-Aside (TA) and Safe Routes to School (SRTS) Program funds for locally sponsored bicycle and pedestrian infrastructure projects in communities less than 200,000.

TxDOT HSIP – formulaic funds for safety related projects based on crash history. Formulaic funds safety projects that are consistent with the State's strategic highway safety plan (SHSP) and that correct or improve a hazardous road location or feature or address a highway safety problem.

Texas Enterprise Zone – a state sales and use tax refund program to encourage private investment and job creation in economically distressed areas of the state. Nominated companies that meet minimum capital investment thresholds can receive up to $3.75 million.

5.6.3 Federal Funding Sources

H-GAC Transportation Improvement Program (TIP) – finances transportation improvement projects using US Department of Transportation funds over a period of four years. This study is intended to inform the TIP. Communities can submit projects for funding through the TIP as part of the competitive process. Projects require matching funds and are selected based upon a variety of criteria. Communities can also utilize local funds, including those available through special finance districts, as leverage to pursue federal funding for projects, both within the TIP and through other grants that may become available from time to time.

Community Development Block Grant (CDBG) – funds are available through the US Department of Housing and Urban Development for purposes of meeting three national objectives including benefit to low- and moderate-income persons, preventing or eliminating slums or blight, and meeting urgent needs. While it is unlikely that projects associated with this study meet the latter two criteria, several would be eligible for funding in an effort to benefit low- and moderate-income persons.

The City of Missouri City is classified as an "entitlement city" and is assigned an annual allotment of CDBG funds to use on a variety of projects. The city's CDBG expected allocation for the PY22 Action Plan is $272,757.00.[1]

[1] *https://www.missouricitytx.gov/DocumentCenter/View/14877/PY2022-Annual-Action-Plan-Summary-of-Funding*

Other resources are often available through the CDBG program to address major events, including CDBG-DR funds (disaster recovery). However, those funds serve a very specific purpose and are managed through the State of Texas.

Infrastructure Investment and Jobs Act – funds improvements to surface, air, and marine transportation systems; energy systems; water and wastewater systems; environmental programs; and broadband networks. Approximately $284 billion has been allocated for transportation systems alone, which includes road safety, public transit, and ports.

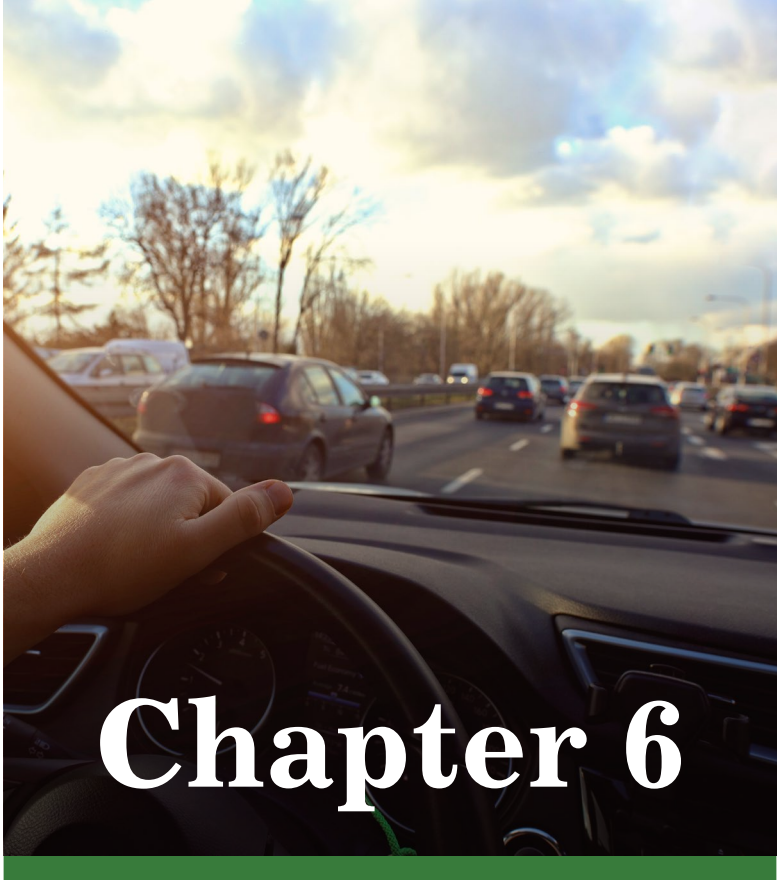
Rebuilding American Infrastructure with Sustainability and Equity (RAISE) Grant (previously known as BUILD and TIGER grants) – funds projects that: (1) support transportation projects that focus on creating good-paying jobs, improving safety, applying transformative technology, and explicitly addressing climate change and advancing racial equity; (2) build, repair, rebuild, and revitalize freight and passenger transportation networks; and/or (3) improve access to reliable, safe, and affordable transportation

Infrastructure for Rebuilding America (INFRA) Grant – funds projects that improve the safety, efficiency, and reliability of the movement of freight and people in and across rural and urban areas (emphasis on freight-related projects).

Consolidated Rail Infrastructure and Safety Improvement (CRISI) Program – funds the deployment of railroad safety technology, capital projects that address congestion challenges, facilitate ridership growth, and increase multimodal connections, railway and roadway safety improvements such as signals and barriers, safety programs, corridor service development plans, and workforce development activities.

Safe Streets and Roads for All (SS4A) Program – developing "Vision Zero" action plans and other improvements to reduce crashes and fatalities, especially for cyclists and pedestrians.

NHTSA Highway Safety Programs – formulaic funds for programs for improving driver behavior and safety. These include programs to reduce injuries and death from crashes, improve driver education, provide proficiency testing and physical and driving examination, and improve pedestrian performance and bicycle safety.



Chapter 6

Capital Improvement Plan (CIP)

Capital Improvement Plan (CIP)

A recommended Capital Improvement Plan (CIP) project list was developed based on the evaluated recommendations and needs of the city. Fourteen projects were identified and included in the CIP to help the city achieve the goals and objectives identified in this study.

For each project listed in the CIP, a prioritized schedule, description, basis for recommendation, and estimated construction cost are provided. Short-term projects generally indicate a start date within 0-2 years, mid-term from 3-7 years, and long-term indicates 8+ years. These recommendations are being made at a static time, while city conditions are continually changing. Actual implementation of these projects will vary based on funding availability, actual growth that occurs, and general changes over time.

The estimated costs are approximate and could vary from what is listed in the CIP list. Each year the city should distribute its budget to make progress on a variety of projects. The distribution of funds should be based on mobility needs identified by city staff, feedback received from citizens about mobility priorities, and other factors. An example of a yearly distribution of mobility funds is provided below assuming a $1M budget for each year.

- Roadway/Intersection Improvements (40%) - $400,000
- Traffic Signal Operations/Timing (20%) – $200,000
- Active Transportation (20%) – $200,000
- Other mobility items (20%) - $200,000

It is difficult to adequately meet the mobility needs of a growing Missouri City with a limited annual budget. Other revenue sources such as grants and bonds should be identified to address the various mobility needs within the city.

Several funding sources are identified in Chapter 5 and may impact the yearly distribution of funds. Depending on the funding opportunities available each year and whether the City is successful in obtaining them may allow for some or all projects from a specific project category to be funded. For example, if the city received funds through the TXDOT TA and SRTS Program, then there may be an emphasis on bicycle and pedestrian projects for that year.

The CIP list of projects, as well as information for each project, are provided on the following pages.

CIP IMPLEMENTATION PLAN

PROJECT	DESCRIPTION	BASIS FOR RECOMMENDATION	ESTIMATED CONSTRUCTION COST
PROJECT 1 ***Signal Timing*** SHORT-TERM	Develop and implement a 4-year citywide signal retiming program such that 1/4 of the City's signals are retimed annually. This program should be continued as an on-going 4-year plan into the future.	Research indicates retiming traffic signals is one of the most cost-effective tasks an agency can do to improve traffic flow and can improve traffic flow by 25% or more. The FHWA "Traffic Signal Timing Manual" recommends signals be timed every 3-5 years. FHWA "Signal Timing on a Shoestring" offers guidance on low-cost methods to retiming traffic signals.	$200,000 annually
PROJECT 2 ***Intersection Improvements*** SHORT-TERM	Perform studies of priority intersections that are the most congested and with high crash incidence for safety and mobility enhancements.	As development increases giving rise to increased traffic volumes, intersections should be evaluated, and recommendations made, to ensure safety and efficiency for all users.	$400,000/ intersection
PROJECT 3 ***Sidewalks*** SHORT-TERM	Install sidewalks along priority corridors within high demand and high risk areas.	Several gaps in sidewalks exist in the city today. Due to the increasing demand for multi-modal transportation and mobility, sidewalks enhance connectivity while increasing safety for pedestrians. Overall, sidewalks enhance the quality of life for residents within communities.	$40/LF
PROJECT 4 ***Safe Routes to School*** SHORT-TERM	Recommend increased illumination and sidewalks within a half-mile buffer of schools to increase student safety.	Increased illumination and sidewalks are recommended specifically near schools. Illumination increases pedestrian safety by improving visibility, reducing glare from vehicle lights, and helping to reduce the likelihood of crashes. Sidewalks increase connectivity while providing students a designated safe walking area separate from motorists.	$150,000 annually

CIP IMPLEMENTATION PLAN (CONTINUED)

PROJECT	DESCRIPTION	BASIS FOR RECOMMENDATION	ESTIMATED CONSTRUCTION COST
PROJECT 5 ***Pedestrian Bridges*** MID-TERM	Design and install pedestrian bridges at priority locations.	Pedestrian bridges provide pedestrians with designated crossing areas increasing safety and connectivity. Pedestrian bridges allow access to areas otherwise inaccessible, or unsafe to access, and further connect the existing parks and trails. Project should also consider enhancing pedestrian safety on existing bridge facilities.	$300,000/ bridge
PROJECT 6 ***Bike Lanes*** MID-TERM	Design and install bike lanes along priority corridors.	Due to the increasing demand for multi-modal transportation and mobility, bike lanes enhance connectivity while increasing safety for cyclists. Bike lanes allow for cyclists to ride at comfortable speeds and create a designated space in the roadway allowing for greater visibility by motorists.	$80,000/mile
PROJECT 7 ***Buffered Bike Lanes*** MID-TERM	Design and install buffered bike lanes along priority corridors.	Due to the increasing demand for multi-modal transportation and mobility, buffered bike lanes enhance connectivity while increasing safety for cyclists. Buffered bike lanes allow for cyclists to pass one another, ride side-by-side, and enhance the perception of safety by providing greater separation between motorists and cyclists.	$160,000/mile
PROJECT 8 ***Mid-Block Crossings*** MID-TERM	Design and install mid-block crossings at priority locations.	Mid-block crossings provide pedestrians with designated crossing areas increasing safety and connectivity. Mid-block crossings support multi-modal transportation by allowing pedestrians to safely and legally access desired destinations.	$75,000/ crossing

CIP IMPLEMENTATION PLAN (CONTINUED)

PROJECT	DESCRIPTION	BASIS FOR RECOMMENDATION	ESTIMATED CONSTRUCTION COST
PROJECT 9 ***Shared Use Paths*** MID-TERM	Design and install shared use paths along priority corridors.	Due to the increasing demand for multi-modal transportation and mobility, shared use paths enhance connectivity while increasing safety for multiple modes of transportation. Shared use paths are preferred on roadways with higher traffic volumes and speeds.	$600,000/mile
PROJECT 10 ***Sienna Parkway Widening*** LONG-TERM	Perform study for potential widening of Sienna Parkway. Design and construct additional lanes based on the results of the study.	Due to increased development and growth, widening provides increased capacity allowing for more service of vehicular traffic. There are several variables related to this widening such as whether it is planned more in the median or outside, impact to trees, drainage, ROW, etc. and hence the estimated costs may vary depending on these factors.	Study: $1M Construction: $20M-40M
PROJECT 11 ***Shared Route*** LONG-TERM	Design and install shared routes along priority corridors.	Due to the increasing demand for multi-modal transportation and mobility, shared routes are easily implementable and increase safety for cyclists. Shared routes do not require additional pavement, and encourage cyclists to position themselves safely in lanes while giving notice to motorists of the potential presence of cyclists.	$55,000/mile
PROJECT 12 ***Parking with Bike Lane*** LONG-TERM	Design and install bike lanes with parking lanes along priority corridors.	Due to the increasing demand for multi-modal transportation and mobility, bike lanes enhance connectivity while increasing safety for cyclists. In locations with on-street parking, bike lanes with parking lanes allow for cyclists to travel safely while allowing space for vehicles to park.	$160,000/mile

CIP IMPLEMENTATION PLAN (CONTINUED)

PROJECT	DESCRIPTION	BASIS FOR RECOMMENDATION	ESTIMATED CONSTRUCTION COST
PROJECT 13 ***Trails*** MID-TERM	Install and expand trails at priority locations.	Due to the increasing demand for multi-modal transportation and mobility, trails enhance connectivity while creating open spaces for communities. Trails promote outdoor recreation for non-motorized transportation and connect users to high demand destinations such as parks.	$600,000/mile
PROJECT 14 ***Major Thoroughfare Plan*** SHORT-TERM	Recommend update to Major Thoroughfare Plan.	The Major Thoroughfare Plan (MTP) should be updated to reflect existing conditions, align with the Public Infrastructure Design Manual (PIDM), and account for potential future alignments. This will create uniformity between the city's documents and allow for easier adherance to city policies. This is anticipated as a minimal update and does not include a full study.	$50,000

PROJECT 1

Signal Timing

PROJECT DESCRIPTION

The Traffic Signal Timing project includes developing, implementing, and fine-tuning traffic signal timing. For a city the size of Missouri City, it is healthy to perform routine traffic signal retiming every year, which should be approximately one-fourth of all signals. This way, all traffic signals are retimed every 4 years. Development can influence the frequency of revisiting traffic operations. Likewise, for areas of the city with little to no traffic pattern change, the frequency of update can be every 5 years.

Recommended Deployment Date

FY 2023-2027 and thereafter.

BASIS FOR RECOMMENDATION

Traffic signal retiming is one of the most cost-effective tasks an agency can do to improve traffic flow. Research indicates traffic flow can improve by 25% or more with signal retiming. The Federal Highway Administration (FHWA) recommends signals be retimed every 3-5 years in their Traffic Signal Timing Manual. FHWA has another manual, Signal Timing on a Shoestring, that offers guidance on low-cost methods to retiming traffic signals.

PROJECT BENEFITS

Benefits of traffic signal timing include improved safety, maximized capacity of existing facilities, reduced delay and fuel costs, increased speed, reduced travel time, reduced delay, increased travel reliability, decreased fuel consumption, reduced emissions, and improved air quality. The Institute of Transportation Engineers (ITE) reports a benefit cost ratio of 15 to 50:1, which represents a significant return on investment.

ESTIMATED COST

It is recommended to allocate approximately $200,000.00 per year for signal timing; which would allow for retiming of 15 to 25 traffic signals per year.

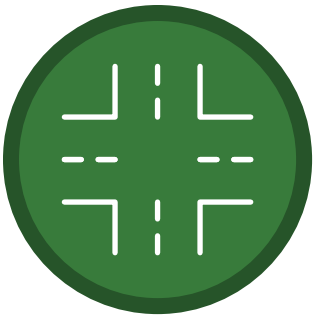
LOCATIONS

For the next several fiscal years, the city should plan to retime approximately 15 intersections per year. As the number of intersections increase, the city should plan to increase the number of intersections retimed per year. It is recommended to prioritize the following corridors for retiming:

- Sienna Parkway
- FM 1092/University Boulevard
- Cartwright Road
- Texas Parkway
- Lake Olympia Parkway/Oilfield Road
- Lexington Boulevard/Independence Boulevard/Court Road
- SH 6

RELATED PROJECT(S)

This project can be deployed independently of other projects.



PROJECT 2

Intersection Improvements

PROJECT DESCRIPTION

The Intersection Improvements project will further study priority intersections within the city that are the most congested and with a high crash incidence for safety and mobility enhancements. As part of this project, studies shall be performed to analyze the safety and efficiency of the priority intersections listed below. Recommendations shall be provided and should include geometric and/or operational improvements, e.g., turn lanes, curb/median, pedestrian facilities, signing/striping, or lane configuration.

Recommended Deployment Date

FY 2024 and beyond.

BASIS FOR RECOMMENDATION

As development increases giving rise to increased traffic volumes, intersections should be evaluated, and recommendations made, to ensure safety and efficiency for all users. The intersections below have been identified as having a safety and/or mobility concern based on data.

PROJECT BENEFITS

Benefits of intersection improvements include increased safety, maximized capacity, enhanced mobility, reduced delay and travel times, and overall improved user experience. Focusing specifically on safety, the city would greatly benefit from the reduction in costs associated with crashes at the priority intersections.

ESTIMATED COST

Intersection evaluations, and the recommendations stemming from the evaluations, can vary greatly in cost depending on the type of improvement recommended. Intersections studies, including developing recommendations, can be estimated to be approximately $400,000.00 each. It is suggested that $3 million be allocated for such improvements at all five locations.

LOCATIONS

It is recommended to prioritize the following locations for intersection improvements:

- FM 1092 at Cartwright Road
- FM 1092 at Lexington Boulevard
- FM 1092 at SH 6
- SH 6 at Sienna Parkway
- SH 6 at Lake Olympia Parkway

RELATED PROJECT(S)

This project does not have any dependencies.

PROJECT 3

Sidewalks

PROJECT DESCRIPTION

The Sidewalks project includes the design and installation of sidewalks along priority corridors within the high demand and high risk areas identified in this plan. These are areas in the city identified as having high pedestrian activity and an increased risk to pedestrian safety. The project includes the development of Plans, Specifications & Estimates (PS&E) and subsequent construction of proposed sidewalks.

Recommended Deployment Date

Q3 2023 onwards.

BASIS FOR RECOMMENDATION

Several gaps in sidewalks exist in the city today. Due to the increasing demand for multi-modal transportation and mobility, it is recommended that sidewalks be installed and connected specifically in the high demand and high risk areas. This will allow for increased connectivity and safety for pedestrians.

PROJECT BENEFITS

Separated from vehicular traffic, sidewalks provide a designated facility for pedestrians to travel safely. Users of all ages and abilities would be able to more safely access destinations serviced by a sidewalk. Sidewalks are the backbone of the pedestrian network by connecting people to their homes and other destinations, thus enhancing the quality of life for residents.

ESTIMATED COST

The cost of a sidewalk can vary and is dependent on the length of the facility needed. It is recommended to allocate approximately $40.00 per linear foot for proposed sidewalk.

LOCATIONS

It is recommended to prioritize installation of sidewalks in the high demand and high risk areas. Refer to Chapter 5 for figures displaying high demand and high risk areas in the city.

RELATED PROJECT(S)

This project does not have any dependencies.

PROJECT 4

Safe Routes to School

PROJECT DESCRIPTION

The Safe Routes to School project includes the design and installation of illumination and sidewalks within a half-mile radius of schools within the city. The project includes the development of Plans, Specifications & Estimates (PS&E) and subsequent construction and installation of proposed sidewalks and safety lighting along those routes.

Recommended Deployment Date

FY 2024 and beyond.

BASIS FOR RECOMMENDATION

There are several gaps in sidewalks, as well as minimal to no illumination, currently near schools. It is recommended that sidewalks and illumination be installed near schools to provide increased safety and mobility for students.

PROJECT BENEFITS

Illumination increases student safety by improving visibility, reducing glare from vehicle lights, and helps reduce the likelihood of crashes. Sidewalks increase connectivity while providing students a designated safe walking space separate from motorists.

ESTIMATED COST

It is recommended to allocate approximately $150,000.00 annually for sidewalk and illumination projects near schools. This type of project is eligible for grant funding.

LOCATIONS

All schools in the city and extraterritorial jurisdiction (ETJ).

RELATED PROJECT(S)

This project does not have any dependencies.

PROJECT 5

Pedestrian Bridges

PROJECT DESCRIPTION

The Pedestrian Bridges project will design and install pedestrian bridges at priority locations listed below. The project includes the development of Plans, Specifications & Estimates (PS&E) and subsequent construction of the proposed pedestrian bridges.

Recommended Deployment Date

FY 2025 and beyond.

BASIS FOR RECOMMENDATION

Pedestrian bridges provide pedestrians with designated crossing areas increasing safety and connectivity. The city and residents would benefit greatly from increasing the access to desired locations further connecting the existing parks and trails.

PROJECT BENEFITS

Pedestrian bridges support multi-modal transportation by allowing pedestrians to safely access desired destinations. Pedestrian bridges allow access to areas otherwise inaccessible, or unsafe to access.

ESTIMATED COST

It is recommended to allocate approximately $300,000.00 for a pedestrian bridge. This estimate cost is to be confirmed by a detailed design for the specific location.

LOCATIONS

It is recommended to prioritize the following locations for installation of pedestrian bridges:

- SH 6; connecting Kitty Hollow Park and shopping centers on south side of SH 6, near Sharkey's Cuts for Kids
- Middle Oyster Creek; connecting proposed trail from Glenn Lakes Lane to Lake Olympia Middle School
- FM 1092; connecting proposed trail from Independence Park to American Legion Park
- Channel A; connecting proposed trail from Independence Park to American Legion Park, near Bay Shore Boulevard and Waterford Village Boulevard

RELATED PROJECT(S)

This project does not have any dependencies. However it is recommended that the proposed trail extensions be installed prior to, or concurrently, as the pedestrian bridges at these select locations. This project requires coordination with Missouri City Parks Department.

PROJECT 6

Bike Lanes

PROJECT DESCRIPTION

The Bike Lanes project will design and install bike lanes on priority corridors identified below. Bike lanes are typically identified through signage, striping, or other pavement markings/treatments. The project includes the development of Plans, Specifications & Estimates (PS&E) and subsequent construction of proposed bike lanes.

Recommended Deployment Date

Q3 2023 and beyond.

BASIS FOR RECOMMENDATION

Due to the increasing demand for multi-modal transportation and mobility, bike lanes enhance connectivity while increasing safety for cyclists.

PROJECT BENEFITS

Bike lanes create a designated space in the roadway for cyclists allowing cyclists to travel at comfortable speeds while also creating greater visibility by motorists. Bike lanes encourage ridership regardless of skill and increase the perception of safety among cyclists.

ESTIMATED COST

It is recommended to allocate $80,000.00 per mile of proposed bike lane.

LOCATIONS

It is recommended to prioritize the following locations for installation of bike lanes:

- Hurricane Lane from Senior Road to Trammel-Fresno Road
- Sienna Springs Boulevard from Sienna Parkway to the future Fort Bend Toll Road connection
- Trammel-Fresno Road from Missouri City Limits to the east to McKeever Road

RELATED PROJECT(S)

This project does not have any dependencies.

PROJECT 7

Buffered Bike Lanes

PROJECT DESCRIPTION

Buffered bike lanes function similarly to bike lanes by providing a designated space on the roadway for cyclists. However, buffered bike lanes include a striped buffer between the vehicle travel lane and the bike lane providing additional safety and comfort to cyclists.

The Buffered Bike Lane project will design and install buffered bike lanes on priority corridors identified below. The project includes the development of Plans, Specifications & Estimates (PS&E) and subsequent construction of proposed buffered bike lanes.

Recommended Deployment Date

Q3 2023 and beyond.

BASIS FOR RECOMMENDATION

Buffered bike lanes enhance connectivity while providing additional safety and comfort for cyclists helping to address the increasing demand for multi-modal transportation and mobility.

PROJECT BENEFITS

Similar to bike lanes, buffered bike lanes create a designated space in the roadway for cyclists allowing cyclists to travel at comfortable speeds while also creating greater visibility by motorists. Buffered bike lanes provide greater separation from motorists than non-buffered bike lanes creating increased safety and comfort for cyclists.

ESTIMATED COST

Due to the additional striping required for buffered bike lanes compared to non-buffered bike lanes, it is recommended to allocate $160,000.00 per mile of proposed buffered bike lane.

LOCATIONS

It is recommended to prioritize the following locations for installation of buffered bike lanes:

- Sienna Springs Boulevard from Sienna Parkway to Sienna Springs Way
- Glenn Lakes Lane from SH 6 to S University Boulevard
- Lakestone Boulevard from Riverstone Boulevard to Steep Bank Creek
- Oyster Creek Place Drive from Peninsulas Drive to SH 6
- Peninsulas Drive from 300 feet south of Oyster Creek Village Drive to Oyster Creek Place Drive

RELATED PROJECT(S)

This project does not have any dependencies.

PROJECT 8

Mid-Block Crossings

PROJECT DESCRIPTION

The Mid-Block Crossings project will design and install mid-block crossings at priority locations listed below. The project includes the development of Plans, Specifications & Estimates (PS&E) and subsequent construction of the proposed mid-block crossings.

Recommended Deployment Date

FY 2024

BASIS FOR RECOMMENDATION

Mid-block crossings provide pedestrians with designated crossing areas that allow them to cross roadways at high demand locations other than intersections in a safe manner. The residents and visitors would benefit greatly from increased access to desired locations and further connect existing parks and trails.

PROJECT BENEFITS

Mid-block crossings support multi-modal transportation by allowing pedestrians to safely access desired destinations. At locations where pedestrians and cyclists might have unsafely crossed a street, mid-block crossings provide a designated crossing space.

ESTIMATED COST

The cost of a typical mid-block crossing can be estimated to be approximately $75,000.00.

LOCATIONS

It is recommended to prioritize the following locations for installation of mid-block crossings:

- Trammel-Fresno Road near Dry Creek Drive; connecting the residential neighborhood to the future Fort Bend Town Center
- La Quinta Drive; connecting proposed trail extension from Gulf Coast Water Authority (GCWA) trail to Stafford Run, near Quail Valley Golf Course & City Centre
- S University Boulevard near Glenn Lakes Lane

RELATED PROJECT(S)

This project does not have any dependencies. However it is recommended that the proposed trail or sidewalk extensions be installed prior to, or concurrently, as the mid-block crossings at select locations. This project requires coordination with Missouri City Parks Department.

PROJECT 9

Shared Use Paths

PROJECT DESCRIPTION

Shared use paths, or sidepaths, function similarly to trails providing physical separation from motorized vehicles. The paths are designed for two-way travel for pedestrians, cyclists, and other non-motorized modes.

The Shared Use Path project will design and install shared use paths along priority corridors. The project includes the development of Plans, Specifications & Estimates (PS&E) and subsequent construction of proposed shared use paths at the locations below.

Recommended Deployment Date

Q3 2023

BASIS FOR RECOMMENDATION

The city and its citizens would benefit greatly by investment in the installation of shared use paths along the priority corridors mentioned below. Due to the increasing demand for multi-modal transportation and mobility, shared use paths would enhance connectivity while increasing safety for multiple modes of transportation.

PROJECT BENEFITS

Shared use paths attract a wider variety of users due to the enhanced safety provided by a fully separated facility. Users of all ages and abilities would be able to more safely access destinations serviced by a shared use path. Specifically, shared use paths provide access to destinations along limited-access corridors where bike facilities may not be appropriate. Hence, shared use paths contribute to an improved quality of life for city residents.

ESTIMATED COST

The cost of a shared use path can vary and is dependent on the length of the facility needed. It is recommended to allocate approximately $600,000.00 per mile of proposed path. As an example, to implement them at each of the two high priority corridors, , it would be approximately $1.9 million along Texas Parkway and approximately $3.1 million along Lexington Boulevard.

LOCATIONS

It is recommended to prioritize the following locations for installation of shared use paths:

- Texas Parkway from US 90A to the City Limits
- Lexington Boulevard/Independence Boulevard from Dulles Avenue to the City Limits
- Cartwright Road from Dulles Avenue to Texas Parkway
- SH 6 from Missouri City Limits to the east and west
- FM 1092 from north City Limits of Missouri City to SH 6

RELATED PROJECT(S)

This project does not have any dependencies.

PROJECT 10

Sienna Parkway Widening

PROJECT DESCRIPTION

The Sienna Parkway Widening project will initially study Sienna Parkway to determine the feasibility and benefits of widening the corridor from four lanes to six lanes in certain segments. This project includes the initial study, development of Plans, Specifications & Estimates (PS&E) and subsequent construction of Sienna Parkway widening. However, the development of plans and subsequent construction will be based on the results of the study.

Recommended Deployment Date

FY 2024

BASIS FOR RECOMMENDATION

Due to increased development and growth, it is recommended to study the feasibility and potential benefits of widening Sienna Parkway. The portion of Missouri City south of SH 6 continues to grow and develop. As one of the only major corridors servicing this area, it is important that Sienna Parkway has sufficient capacity to handle the growing demand.

PROJECT BENEFITS

Increased capacity is the main benefit of roadway widening. Widening Sienna Parkway allows residents serviced by this corridor to travel more efficiently as well as improving the overall flow of the surrounding network. The improved capacity will also enhance the quality of life and increase economic activity in this part of the city.

ESTIMATED COST

The cost of roadway widening can vary based on existing conditions and various other factors along the roadway. There are several variables related to this roadway reconstruction project such as whether the widening is planned more in the median or outside, impact to trees, drainage, ROW, etc. and hence the estimated costs may vary depending on these factors. It is recommended to allocate approximately $1 million for the study and between $20 million to $40 million for design and construction.

LOCATIONS

Sienna Parkway

RELATED PROJECT(S)

This project does not have any dependencies.

PROJECT 11

Shared Route

PROJECT DESCRIPTION

The Shared Routes project includes design and installation of shared routes on corridors provided in Appendix C. This project includes the development of Plans, Specifications & Estimates (PS&E) and subsequent implementation of proposed shared routes.

Recommended Deployment Date

FY 2024

BASIS FOR RECOMMENDATION

Shared routes are easily implementable and increase safety for cyclists while addressing the increasing demand for multi-modal mobility.

PROJECT BENEFITS

Shared routes do not require additional pavement and are generally achieved through signage and limited pavement markings which makes it is less costly to implement. Shared routes encourage cyclists to position themselves safely in lanes while giving notice to motorists of the potential presence of cyclists. Additionally, shared routes reduce the likelihood of wrong-way bicycling by providing a wayfinding element along bike routes.

ESTIMATED COST

It is recommended to allocate $55,000.00 per mile of proposed shared route.

LOCATIONS

During the evaluation, multiple locations ranked similarly. Therefore, it is recommended to implement the shared routes ranked similarly on a needs basis to be determined by the city.

RELATED PROJECT(S)

This project does not have any dependencies.

PROJECT 12

Parking with Bike Lane

PROJECT DESCRIPTION

The Parking with Bike Lanes project will design and install parking lanes with bike lanes on priority corridors identified below. The project includes the development of Plans, Specifications & Estimates (PS&E) and subsequent construction of proposed parking and bike lanes.

Recommended Deployment Date

FY 2024

BASIS FOR RECOMMENDATION

For specific roadways with sufficient width, it is recommended to provide bike lanes and on-street parallel parking. Bike lanes increase connectivity while increasing safety for cyclists. In locations with on-street parking, bike lanes with parking lanes allow for multi-modal mobility while meeting the demand for on-street parking.

PROJECT BENEFITS

Bike lanes create a designated space in the roadway for cyclists allowing cyclists to travel at comfortable speeds while also creating greater visibility by motorists. Parking lanes provide designated spaces for motorists to safely park while aiding in speed reductions along the roadway facility. Overall, bike lanes with parking lanes enhances the convenience for a neighborhood or commercial area and benefits both cyclists and motorists.

ESTIMATED COST

It is recommended to allocate $160,000.00 per mile of proposed bike lane with parking lane.

LOCATIONS

It is recommended to prioritize the following locations for installation of bike lanes with parking lanes:

- Crow Valley Drive from 350 feet north of the intersection of Crow Valley Drive and Lake Olympia Parkway to Lake Olympia Parkway
- Hampton Drive from 100 feet west of Windsor Quail Valley Post-Acute Healthcare Center east driveway to FM 1092
- McLain Boulevard from W Airport Boulevard to McLain Park
- Quail Village Drive from Quail Valley Elementary School to Cartwright Road

RELATED PROJECT(S)

This project does not have any dependencies.

PROJECT 13

Trails

PROJECT DESCRIPTION

Trails, similar to shared-use paths, provide physical separation from motorized vehicles. The paths are designed for two-way travel for pedestrians, cyclists, and other non-motorized modes.

The Trails project will design and install trails at the priority locations. The project includes the development of Plans, Specifications & Estimates (PS&E) and subsequent construction of proposed trails.

Recommended Deployment Date

FY 2024

BASIS FOR RECOMMENDATION

The city and its citizens would benefit greatly by investment in the installation of trails along the priority corridors listed below. Trails enhance connectivity and allow for multi-modal mobility while creating open spaces for communities.

PROJECT BENEFITS

Trails promote outdoor recreation for non-motorized transportation and connect users to high demand destinations such as parks. Additionally, trails provide users of all ages and abilities a safe, accessible, and attractive area to exercise or travel. Hence, trails contribute to an improved quality of life for city residents.

ESTIMATED COST

The cost of a trail can vary and is dependent on the length of the facility needed. It is recommended to allocate approximately $600,000.00 per mile of proposed trail.

LOCATIONS

During the evaluation, multiple locations ranked similarly. Therefore, it is recommended to implement the trails ranked on a needs basis. Prioritization and needs should be coordinated with the Parks Department.

RELATED PROJECT(S)

This project does not have any dependencies, however specific trails can be installed concurrently with proposed pedestrian bridges at select locations. This project requires coordination with the Missouri City Parks Department.

PROJECT 14

Major Thoroughfare Plan

PROJECT DESCRIPTION

The Major Thoroughfare Plan project is focused on updating the existing Major Thoroughfare Plan to reflect existing conditions, align with the Public Infrastructure Design Manual, and account for potential future alignments. This project is anticipated as a minimal update to the existing plan and does not include a full study.

Recommended Deployment Date

Q3 2023

BASIS FOR RECOMMENDATION

The Major Thoroughfare Plan does not currently account for recently constructed roadways and developments, nor does it parallel the functional classifications provided in the Public Infrastructure Design Manual. Several of the proposed roadway alignments have already been constructed and others are no longer possible due to recent developments.

PROJECT BENEFITS

Updating the Major Thoroughfare Plan to accurately reflect existing conditions and align with the Public Infrastructure Design Manual will create uniformity between the city's documents and allow for easier adherence to city policies.

ESTIMATED COST

It is recommended to allocate approximately $50,000.00 to update the Major Thoroughfare Plan.

LOCATIONS

N/A

RELATED PROJECT(S)

This project does not have any dependencies.

Appendix

Appendix

A. PUBLIC ENGAGEMENT

B. THE CITY TODAY

C. RECOMMENDATIONS/EVALUATION AND IMPLEMENTATION

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