



Envision Old 6th Ward TIRZ: A Mobility Plan for the Future



Prepared for:
Old 6th Ward TIRZ (TIRZ 13)
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Chapter

1

About the
Plan



Building on a History of Mobility

Old Sixth Ward predates the automobile. When platted in the 1850s, the district's 300-foot blocks and dense street grid catered to a community that walked everywhere they needed to go. Today, almost two centuries later, the freedom to walk between businesses, parks, public transit on Washington and Houston Avenues, and 19th century Victorian homes endures, and is part of the neighborhood's allure for residents and visitors alike.

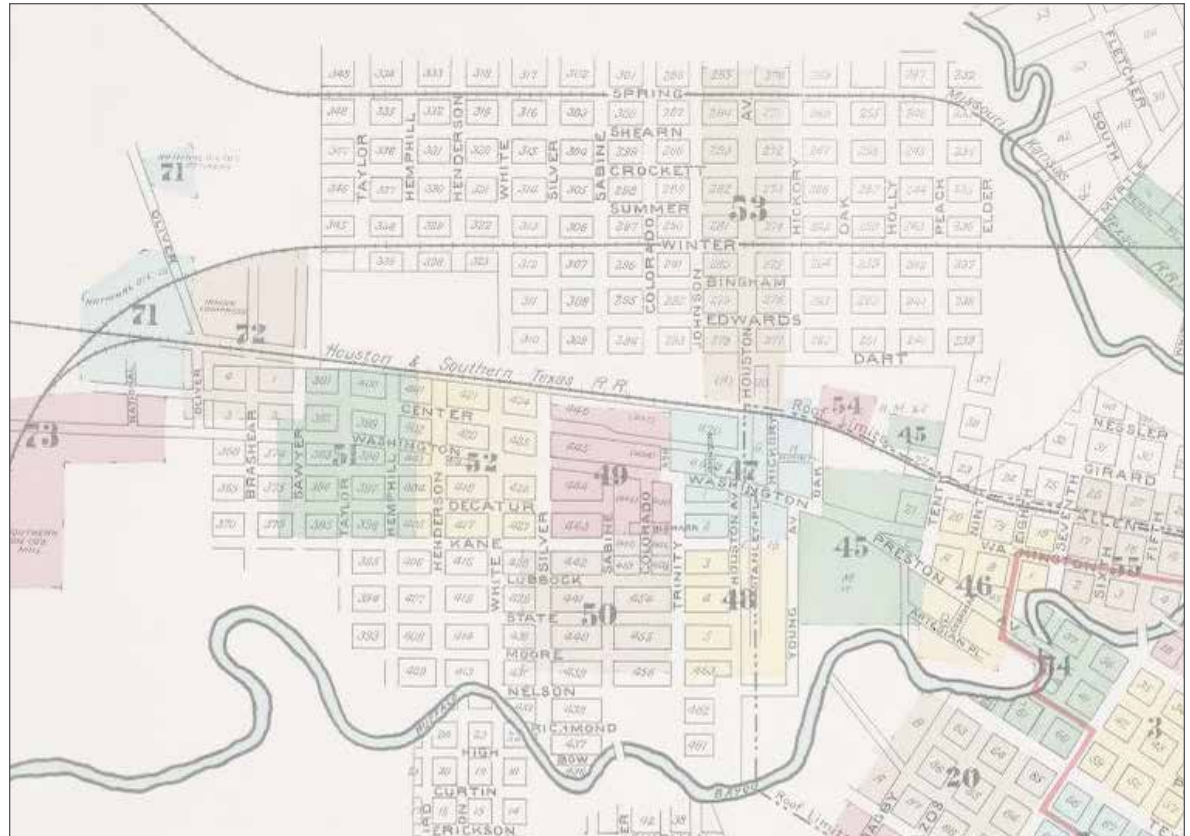
While the narrow, tree-lined streets south of Washington Avenue contribute to the Old Sixth Ward's charm, the available right-of-way and aging infrastructure present challenges to maintaining streets that serve a wide range of modes and uses. This plan represents an opportunity to identify mobility solutions to meet today's needs while preserving the unique history.



Historic home in Old 6th Ward



Historic homes and brick street in Old 6th Ward

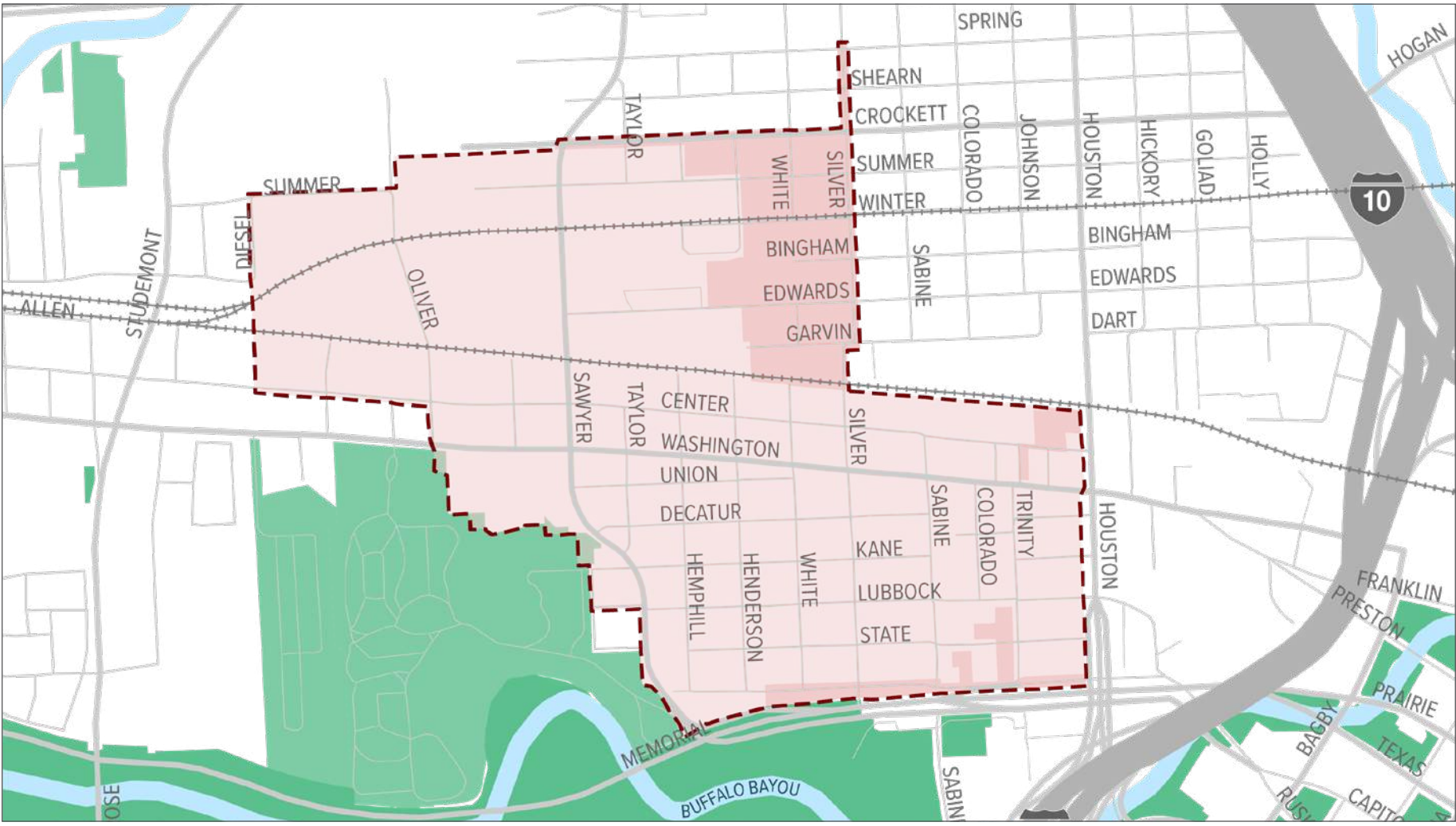


A map of Old Sixth Ward in 1896

Source: Library of Congress

Study Area

The Old Sixth Ward Tax Increment Reinvestment Zone (TIRZ 13, or the TIRZ) was established by the City of Houston in December 1999 as a way to attract new investment into the community. TIRZ 13 is funded by an increment tax on new development and is responsible for developing infrastructure and mobility projects within the area shown in pink in the map below. Areas in dark pink on the map represent key corridors and areas within the community that are important for community mobility. As such, these areas were incorporated into the study area to ensure comprehensive development of solutions.



TIRZ 13 Boundary & Project Study Area

- Study Area
- TIRZ 13: Old Sixth Ward
- Extended Study Area

TIRZ 13 Mobility Plan

Mobility Plan Overview

The TIRZ 13 Mobility Plan was created to provide recommendations and guidance to the TIRZ that maximize the benefits generated from investments in mobility and prioritize meaningful projects based on costs, impacts, and timelines. These recommendations were based on the outcomes of a detailed assessment of the district. These findings can be found in the Fact Book and Sidewalk Assessment in Appendix A. These appendices include: socio-economic data, commute characteristics, journey to work analyses, transit assessment, roadway network review, land uses and land value assessments, sidewalk and ramp condition, key corridor profiles, and other contributing factors.

From the analysis of data presented in these appendices and outreach with community members and stakeholders (Appendix D), a Case For Action was developed. The Case for Action, detailed in Chapter 2: Building On Opportunities, creates an overarching vision for the TIRZ that reflects community needs and establishes 4 themes to guide project development and investment.

Chapter 3: Making Connections builds off of the data analyzed during the creation of the Fact Book and Sidewalk Assessment and the guiding themes identified in Chapter 2. It suggests improvements for walking, biking, transit, and other vehicle access and holistic recommendations to create Great Streets that are built on the needs and opportunities for each of these modes. Chapter 4: The Action Plan, gives the TIRZ implementation and funding tools, along with a list of recommended short-term and longterm projects to realize the recommendations outlined in the previous chapter. The Action Plan also includes programs and policies that encourage the construction of good infrastructure and encourage residents and businesses to participate in sidewalk improvements.

As a key north-south corridor and potential facility for people biking, a detailed assessment was conducted that provided feasibility analysis and design of a bikeway along the corridor and assessment of a signalized crossing at Washington Avenue. This information is provided in Appendix B with the supporting data in Appendix E. Information from Appendix B was utilized in development of recommendations in Chapter 3.

Core Mobility Plan Components

Ch. 1 Introduction

Ch. 2 Building on Opportunities

Ch. 3 Making Connections

Ch. 4 Action Plan

Supporting Information & Documentation

Appendix A Fact Book

Appendix B Silver Street Assessment

Appendix C Cost Estimates

Appendix D Community Engagement

Appendix E Traffic Counts & Signal Analysis



Chapter

2

Building on
Opportunities

Identifying and Building on Opportunities

The TIRZ 13 Mobility Plan provides a tool for the TIRZ to prioritize and invest in projects that advance actionable opportunities aimed at improving the district for its residents, workers, and visitors. Understanding the current needs and state of mobility with TIRZ 13 is key to identifying how to meet the needs and improve mobility options. The Fact Book (Appendix A) provides an analysis of existing transportation facilities and mobility conditions and was used as the primary basis for identifying the foundation of mobility, gaps in the network, connecting facilities, and overall how people get around the TIRZ. In addition to the Fact Book, community feedback (Appendix E) was assessed and layered on top of the data analysis to put the community's perspective and context into the needs and how to potentially address them to provide improved mobility. That information, combined, provides this plan with clear opportunities that can be utilized to structure future improvements.

When mobility options are available and accessible to people communities can thrive. Great mobility options that feel safe and are easy to use or get to (like bike trails, walking, and transit) connect more people to more places. This can lead to a higher quality of life, expanded economic opportunities, enhanced development, and allow a community to thrive at its fullest potential. Opportunities exist within TIRZ 13 to enhance accessibility, mobility, and safety for people walking, biking, accessing transit, and driving in ways that will contribute to the continuing enhancement of the community. It is essential to look at all of these mobility options together in order to understand and identify where improvements can work together and build off of new or past projects within or near the TIRZ, as well as its existing networks, history, and unique culture.

Building on opportunities that are already present allows for this plan to be actionable and attainable while reinforcing and leveraging past investments and the community as a whole. This section highlights the opportunities that can be built upon as a "Case for Action." The Case for Action (CFA) is developed to pull forward opportunities in an action-oriented and aspirational way, effectively setting the goals for this Plan.

What is the Case for Action?

Old 6th Ward is one of the most distinctive and dynamic areas in Houston with a beautiful, historic district on the south side and a rapidly evolving mixed-use neighborhood in the north. Nestled between Downtown to the east, Buffalo Bayou Park to the south, and the Heights to the north, Old 6th Ward is well positioned for future growth and prosperity. Despite its prime location, there are many barriers to mobility within and around the district that impact people's ability to move around safely and access the many destinations and attractions by any mode. This mobility plan provides a blueprint for the TIRZ that will facilitate improved mobility, economic development, and enhanced quality of life. Specifically, this plan will address the four Case for Action statements identified below. Each of these statements are defined on the following pages.



1. Bridge the gaps between people and great places while building on the historic street grid



2. Encourage an active, walkable community for people of all ages and abilities



3. Reinforce the neighborhood's history, cultural vibrancy, and quality of life



4. Leverage resources to realize the full economic and placemaking potential of the community



CFA Statement 1: Bridge the gaps between people and great places while building on the historic street grid

Objective: Movement to, from, and within the community should be comfortable, convenient, and intuitive no matter if people walk, bike, use a wheelchair, ride transit, or drive.

TIRZ 13 has evolved over the decades but maintains a charming, dense, historic street grid that functions as the foundation of a walkable, bikeable community. Despite these great bones, barriers to mobility within and adjacent to the study area prevent it from being connected internally, to Downtown, and many other nearby destinations and areas. Barriers exist in many forms, such as missing or poor quality sidewalks, gaps in bikeways, bus stop inaccessibility, railroad crossings, freeways, and even bayous. The railroad track crossings can be hazardous for people walking, riding a bike, and using a wheelchair or stroller as crossings are often degraded and uneven. While the barriers may disconnect the community and reduce access, many opportunities exist to improve safe crossings and increase connections to trails and destinations.

Improving connectivity within the study area could have significant impacts on mobility in the community. Approximately 45% of trips made within the study area are fewer than 3 miles in length, meaning they have the highest potential of being made by a mode other than driving. While there are no existing high-comfort bikeways in the study area, the MKT Trail and Buffalo Bayou Trail are adjacent on the north and south, respectively. This presents a significant opportunity to connect to these high-quality, regional trail networks.

For longer trips, several METRO bus routes traverse the study area and connect it to destinations across the greater Houston region. Improving walking and biking access to bus stops could better connect and integrate the TIRZ with the rest of Houston. Additionally, METRO's future BOOST improvements along the 85-Antoine/Washington route present an opportunity to make significant improvements within the community.

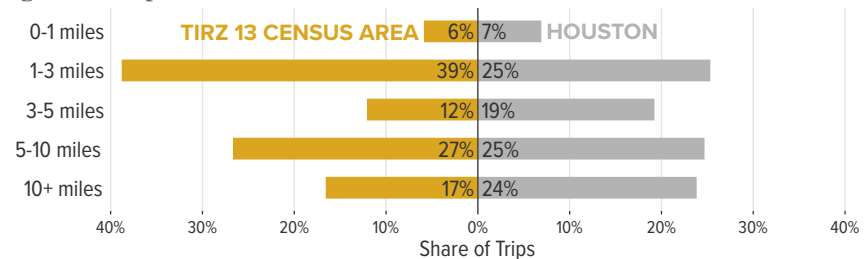


METRO Route 85 - Antoine provides 6th Ward with frequent service, every 10 minutes during peak hours



Railroad crossing on Silver Street highlights lack of comfortable, high quality options for people not in a vehicle

Figure 1. Trip Distance



Source: H-GAC Travel Demand Model Trip Distance Outputs, 2019



NINE at-grade railroad crossings within one-half mile of Old Sixth Ward



600 combined bus boardings and alightings everyday at stops within and directly bordering the TIRZ



CFA Statement 2: Encourage an active, walkable community for people of all ages and abilities

Objective: Residents, workers, and visitors should feel safe walking around the community regardless of their ages, backgrounds, or abilities.

Much of the Old 6th Ward has a walkable street grid that, paired with recent investments, has created a fairly high level of walkability, primarily in the southern neighborhood area. As the community continues to evolve and grow, there are a variety of destinations that draw in people of all ages and mobility abilities. Today, moving around the community without a car can be challenging and, at times, unsafe. As many trips are short (3 miles or less), this presents a clear need and opportunity for improvements that can help make a variety of trips safer and easier. Almost three-fourths of the blocks in the study area have sidewalks that are either missing or non-traversable. The map here highlights that most of these sidewalks are in the northern part of the study area. Busy railway crossings also keep people from accessing the many diverse destinations the community has to offer.

Washington Avenue is a higher-speed thoroughfare with few safe crossing options. Streets like Washington Avenue also present safety concerns for the community. Over the past six years there have been over 350 vehicles crashes within the study area. At the same time, vehicles are traveling at excessively high speeds along the community's major streets. In conjunction with the a fractured network of sidewalks and safe pedestrian crossings, these conditions create an unsafe environment for people walking and biking. Residents and visitors will choose not to walk or bike if they do not have infrastructure that supports a safe trip. Washington Avenue at Silver Street is also one of the highest crash locations. Improvements focused around safety and well designed streets can facilitate more efficient travel for drivers as well. This represents a clear opportunity to improve safety and connectivity for all modes.



71% of TIRZ sidewalks are not traversable or are completely missing



68% of community members express concerns about crossing busy streets



Speeds on major roads average 20%-30% higher than the posted speed limit

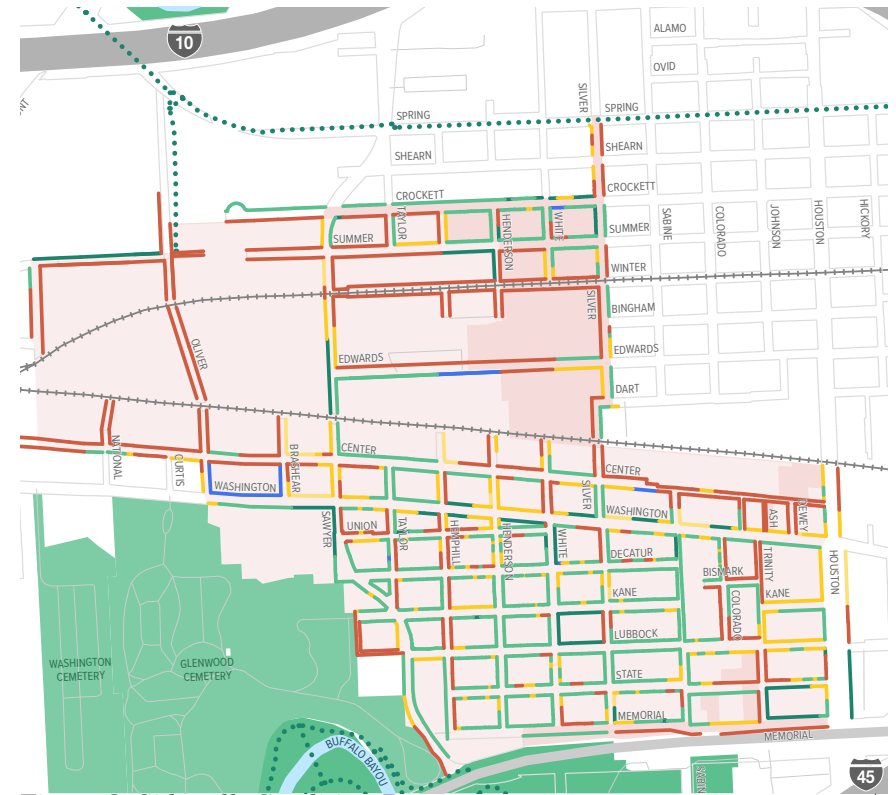


Figure 2. Sidewalk Condition By Parcel

- A: Flat, 5'+
- C: Not Traversable, 5'+
- Study Area
- B: Flat, Less than 5'
- D: Not Traversable, Less than 5'
- Under Construction
- Missing

Source: TIRZ 13 Mobility Plan Sidewalk Assessment October 2020, Harris County Appraisal District



Non-Traversable Sidewalk



Inaccessible Ramp



Incomplete Sidewalk



Accessible Ramp and Traversable Sidewalk



CFA Statement 3: Reinforce the neighborhood’s history, cultural vibrancy, and quality of life


Objective: Elevate the quality of life for the community by building on unique cultural assets and rich history to ensure it will continue to be a healthy, thriving neighborhood for years to come.

TIRZ 13 is home to a wide breadth of unique and dynamic destinations that make it stand out from other communities in the Greater Houston Area. The south side of the study area is the oldest residential neighborhood in Houston, while the north side is a thriving arts district, with renown breweries, and diverse mixed-use developments. These aspects meld together to create a neighborhood that has become an exceptionally attractive place to live, work, play, and visit.

Investing in mobility improvements creates an opportunity to take this attractiveness to the next level and create a more vibrant, healthy community. Places that give residents viable transportation choices, like walking, biking, and riding transit, tend to be healthier places with less air pollution, more options for physical activity, and fewer traffic-related fatalities or injuries. Additionally, mobility enhancements reinforce local businesses and provide opportunities for future economic development that continues to add to the unique and desirable nature of the community.

Physical activity is a key component to maintaining and building healthy bodies, minds, and communities. Health experts estimate people who get at least 150 minutes of physical activity a week have a 33 percent lower risk of death overall. According to the Centers for Disease Control and Prevention, residents of neighborhoods with accessible sidewalks, pedestrian crossings, and protected bike lanes, are more engaged in physical activity. Observing behavior of those within the study area, you see a community that is active. The community’s close proximity to Buffalo Bayou Park and the MKT Trail are one of the key attractions for those wishing to live within the study area.

 *Approximately 27% of buildings in the district are over 100 years of age*

 *Nearly 37 miles of trails are immediately adjacent to the TIRZ, including Greenways along Buffalo and White Oak Bayous*

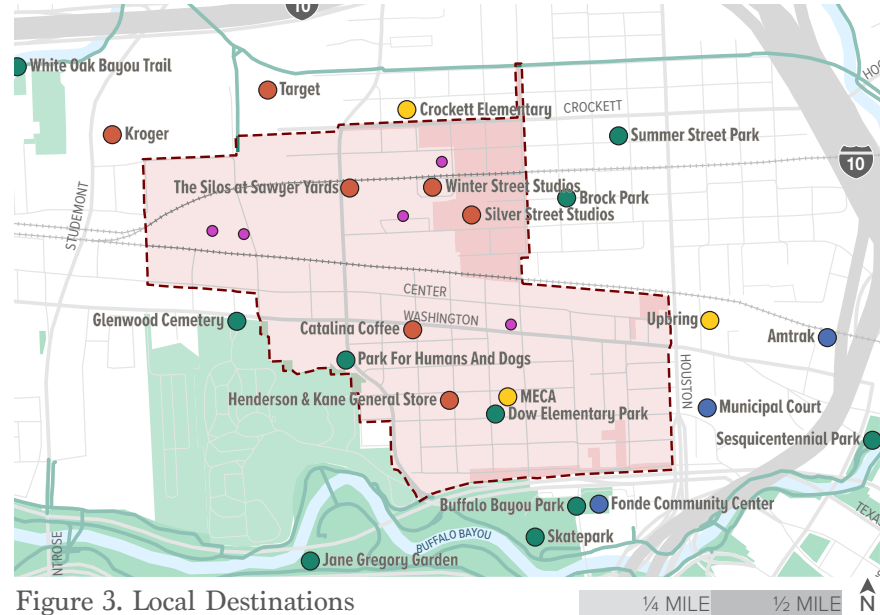


Figure 3. Local Destinations

- Parks
- Civic
- Schools
- Commercial
- Brewery
- Study Area



The Arts District is dotted with beautiful murals and art studios



The TIRZ is home to over 300 Victorian-Era buildings



Buffalo Bayou, just south of 6th Ward, boasts 15 miles of trails



CFA Statement 4: Leverage resources to realize the full economic and placemaking potential of the community

Objective: Coordinate with local and regional organizations to provide the study area with opportunities to leverage funding mechanisms to reinforce the community’s goals, investments, and sense of place.

Leveraging resources can lead to increased opportunities for mobility improvements and economic development. Given the needs and position of the TIRZ, funding partnerships and focused coordination are the primary means to gain resources and increase potential project implementation. Historically, grant applications are most successful when partnerships are involved. Great streets can be platforms for community, arts, and economic development and a foundation for many types of partnerships.

Working with businesses, non-profits, developers, community groups, and agencies can expand the available financial resources and build support that creates more robust projects. For example, partnering with local artists and businesses to leverage local funding with donations and in-kind services (such as painting or tree planting) for public art and neighborhood events can enhance overall support of the TIRZ, community value, and placemaking. Conversely, working with a developer to incorporate sidewalks and walking and biking access can increase mobility options.

Additionally, working closely with the City of Houston on the development of bike facilities or METRO on transit improvements can allow the TIRZ to combine local needs and project priorities with larger-scale projects. This can result in cost savings and increased levels of implementation. TIRZ 13’s location, situated conveniently between Downtown, 4th Ward, Buffalo Bayou, and other TIRZs, provides ample opportunity to cooperate with regional partners for a variety of projects within the study area and beyond. For example, Washington Avenue is an important corridor for many jurisdictions, not just TIRZ 13. Working together with partners can facilitate long-term and holistic improvements along this corridor that will support and reinforce the TIRZ’s efforts.

Leveraging resources is not only about partnerships but also building on investments over time. Small projects can be the foundation for larger investments by creating access or other opportunities. Additionally, small projects can work together to build a network that helps highlight larger-scale benefits that provide meaningful change and improvement, like safety, to the community.

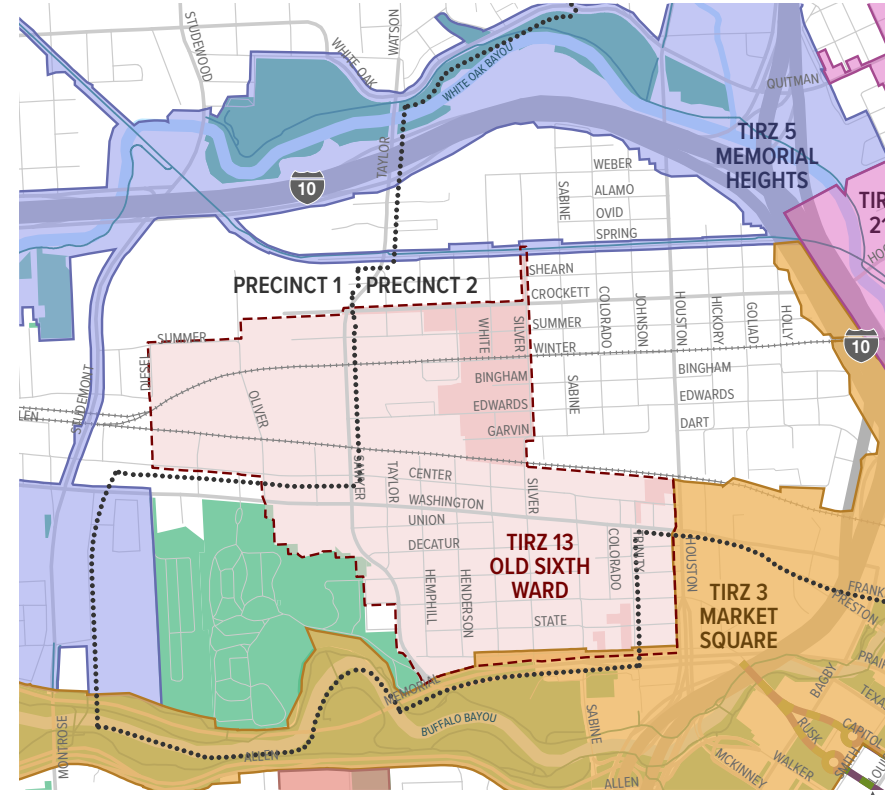


Figure 4. Surrounding TIRZs & Precincts

- Study Area
- TIRZ 3: Market Square
- TIRZ 13: Old Sixth Ward
- TIRZ 5: Memorial Heights
- Expansion Area
- Harris County Precinct Boundary

Source: City of Houston, Harris County



TIRZ 13 is adjacent to or within 5 key agencies for partnerships



planned City of Houston bicycle and METRO transit projects within Old Sixth Ward



Chapter

3

Making
Connections



Introduction

Making connections focuses on connectivity to destinations and between the various modes people can use to get there. Whether by walking, biking, driving or riding transit, each of these modes must be considered together to create a multimodal network that works together and identify where improvements are needed. The result of making connections is that when assessed together, the multimodal network will provide accessible mobility options for people of all ages and abilities to move around the community. This chapter identifies improvements for each modal network and a collective recommendation to create Great Streets that are built on the needs and opportunities for each of the modes.

The following highlights how walkability, bikeways, transit, and vehicle access are important networks that work together to provide mobility options. Great Streets reinforce the community's activity, character, and vibrancy by connecting these networks in ways that are safe and comfortable for all members of the community.

Improving Walkability

Walkability is the foundation of mobility by providing a way that all people, regardless of ability can connect to parks, businesses, schools, and a variety of other destinations. A strong sidewalk network encourages people to exercise more, access neighborhood parks, and have social connections. They are places for children to play, neighbors to meet, and communities to grow. Comfortable, accessible sidewalks and street crossings are also cornerstones of thriving commercial corridors. Better sidewalks and crossings give visitors and residents a reason to walk or bike to their favorite stores or park once in the district and walk from storefront to storefront after that. This section identifies walkability needs and enhancements for sidewalks and street crossings. Some improvements in this section may be included in Great Streets. Other improvements expand beyond the key corridors and into the neighborhoods to facilitate access to Great Streets.

Building a Bikeway Network

This section lays the foundation for a bikeway network that is accessible and comfortable for people of all ages and abilities. Safe bikeways provide people with the ability to exercise in the community, access regional trails, and expand their ability to reach destinations within the community without a vehicle. While the recommendations here are incorporated within the proposed Great Streets, this section identifies near-term opportunities to build a bike network and a longer-term vision for the community. Additionally, key components that facilitate biking, such as end-of-trip facilities and connections to transit, are identified.

Enhancing & Accessing Transit

Transit plays a vital role in mobility. The Old Sixth Ward is in a prime location to leverage existing and future investments to increase local and regional travel options. This section highlights opportunities to coordinate with METRO and other partners on future transit projects and enhancements. Specific improvements related to the transit service and existing bus stops that make transit more useful and accessible are identified. Many of these recommendations coordinate with Great Streets, but other recommendations go beyond to think through important regional connections for the future.

Access for Vehicles

The Old Sixth Ward has a historic street grid that has served a variety of purposes over time. The streets provide vital access for many to businesses, community destinations, schools, and more. While demand for walking, biking, and transit are important, it is also important to consider vehicle access in the study area and where improvements are needed for safety and access to goods and services. Throughout the study area, the current and projected demands for vehicle access were examined to ensure feasibility of other mode and overall network improvements. Enhancements for vehicle access and safety are incorporated into Great Streets recommendations where applicable.

Creating Great Streets

Streets are the backbones of communities and neighborhoods. “Great Streets” refers to improvements to those streets where there are overlapping modes and integrates them to make it easier for people to get around the community in a variety of ways. Walking, biking, driving, and transit work together to create comprehensive mobility options and, ultimately, Great Streets. By integrating these modes, a street can better serve the variety of needs in the community and provide a platform for supporting economic development, housing, community health, and more. Figure 1 on the following page shows an example of these components and how they fit together.

The Great Streets section is focused on key corridors that together provide enhanced multimodal connectivity within the community. Building Great Streets provides critical access and mobility options while reinforcing surrounding land uses and contributes to new development. Great Streets also create a platform to build upon the community’s history and sense of place with opportunities to incorporate historical elements and art with mobility. This section identifies specific improvements to create a Great Streets network.

Chapter Organization

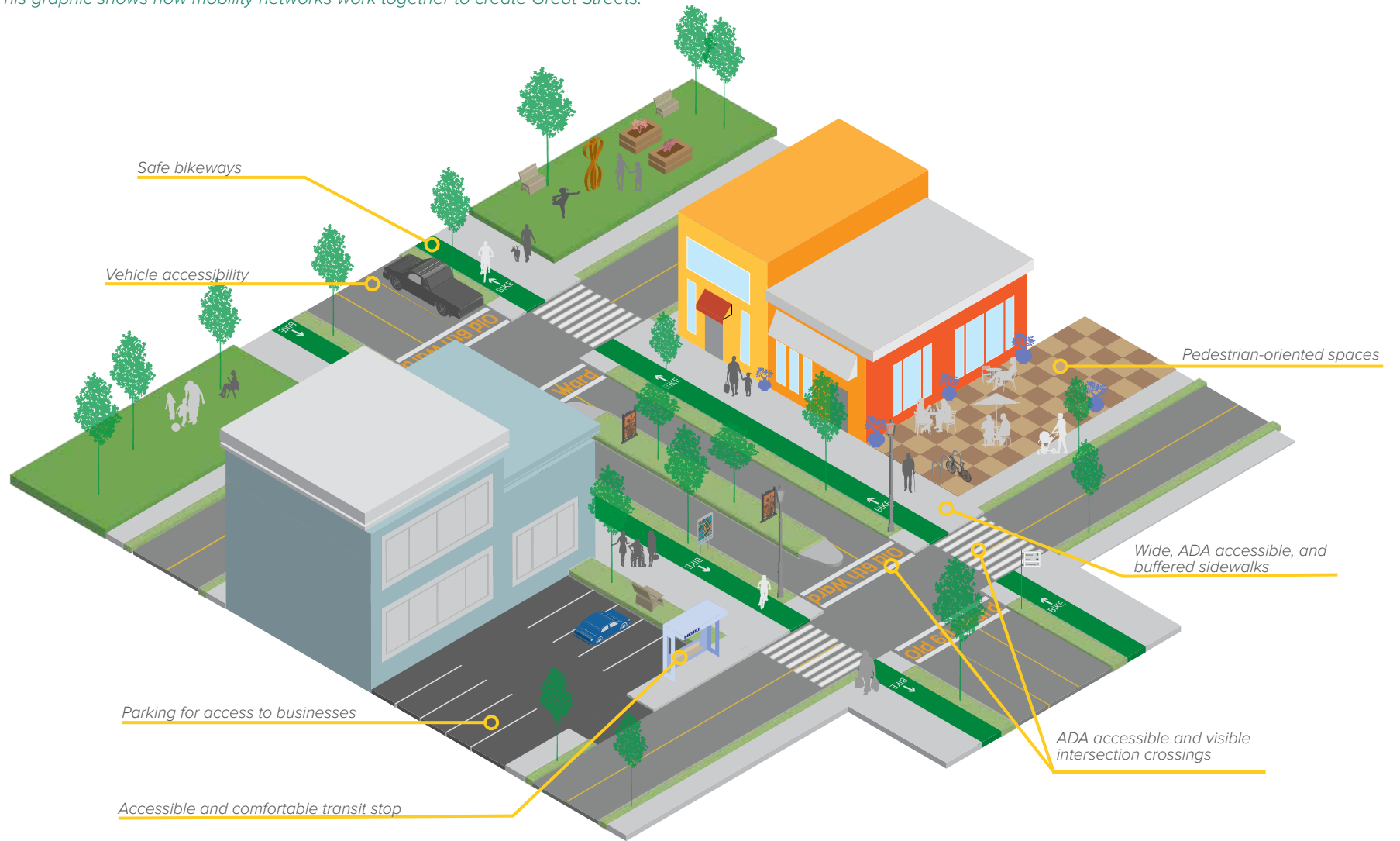
The Making Connections chapter is organized by mode in the order below to provide an in depth understanding of the network improvements that are recommended.

- Improving Walkability
- Building a Bikeway Network
- Enhancing & Accessing Transit
- Creating Great Streets

The chapter brings each of the walking, biking, and transit network improvements together within the Creating Great Streets section with specific corridor project recommendations.

Figure 1. Components of a Great Street

This graphic shows how mobility networks work together to create Great Streets.



Improving Walkability

The TIRZ 13 area is rooted in walkability. Components like sidewalk quality, destination access, and improved crossings are explored further in this section as the core of improving walkability and building on previous investments.

Public street right-of-way typically measures between 50 and 70 feet, with some segments, like parts of Sabine St, being as narrow as 30 feet. Today, the narrow street right-of-way is in high demand: public utilities, drainage infrastructure, the roadway, sidewalks, lighting, driveway access, transit stops, mature street trees, and other elements must all fit within this space. Implementing, upgrading, and maintaining multimodal infrastructure, such as sidewalks and curb ramps, that meets today's standards and competing demands will require creative design and thoughtful consideration of priorities and trade-offs.

North of Washington Avenue, two Union Pacific Railroad lines flanked by light industrial land uses have characterized the area for over a century. Recent and upcoming redevelopment of warehouses and other industrial buildings present opportunities to rebuild sidewalks, roadways, and other street infrastructure. While many streets have narrow right-of-way (as in the southern portion of the Study Area) and limited walking infrastructure, opportunities to expand the public realm have become more frequent in this area with the turnover of industrial parcels.

Recent Investments

The TIRZ has prioritized sidewalk investments over the past twenty years, constructing 4.4 miles of new brick sidewalks within the neighborhood to match the historical context. New development projects have also improved sidewalks within the study area. New developments are required to meet City standards for surrounding infrastructure, often resulting in new and wider sidewalks.

These investments have made significant improvements in walkability and laid the foundation to continue that work throughout the entire study area to make it a walkable community from end to end. This section considers these recent investments along with condition assessments to identify where future investments are most needed.



Sabine Street

One of the few brick streets remaining in Houston, recently rebuilt by the TIRZ.



Hemphill Street

Recently rebuilt brick sidewalks between Lubbock Street and State Street



Silver Street

Recently rebuilt brick sidewalks between Kane Street and Lubbock Street

Sidewalk Condition

To gauge the state of existing sidewalks and develop a comprehensive walkability strategy, this plan includes an assessment of all sidewalks and ramps in the Study Area. The full results and methodology of the assessment can be found in Appendix B. The following presents highlights from that assessment.

Assessment Criteria

The assessment, conducted in October 2020, captures both the width and state of repair of sidewalks on each parcel. Figure 3 shows examples of the four ratings assigned to existing sidewalks. Sidewalks rated A or B (shown in shades of green in Figure 3–Figure 5) provide a smooth, flat surface that someone with mobility challenges can easily traverse. Meanwhile, sidewalks rated C or D (shown in shades of yellow) contain a vertical deflection of at least one inch that acts as a tripping hazard and poses challenges to people using wheelchairs or pushing strollers. Sidewalks rated A or C are at least five feet wide, the current City of Houston standard, whereas sidewalks rated B or D are less than five feet wide. Many TIRZ-led sidewalk projects were built prior to the City’s adoption of the five-foot standard in 2009, but are otherwise in good repair. The assessment also captures missing sidewalks (shown in red) and active construction (blue).

A Walk is as Good as its Worst Segment

The assessment reveals that 43 percent of all parcels in the Study Area have flat sidewalks that are readily traversable by someone using a wheelchair. As Figure 4 illustrates, traversable sidewalks are the norm in the residential area south of Washington Avenue, the result of investments by the TIRZ over the past two decades. The TIRZ’s upcoming reconstruction of Hemphill Street will further improve sidewalks in this area.

However, when looking at full blocks as in Figure 5, only 26 percent of the street frontage is does not contain deflections that could impact the ability to traverse the segment for someone with mobility challenges, with only 4 percent of block faces meeting the City’s five-foot standard. To people walking and rolling, a block is only as good as its worst segment, meaning instances of missing or deflected sidewalk pose major obstacles to walkability. The proposed sidewalk program builds on this assessment and highlights opportunities to increase the share of fully traversable blocks through minor spot fixes or new ramps.



Figure 3. Sidewalk Condition Matrix

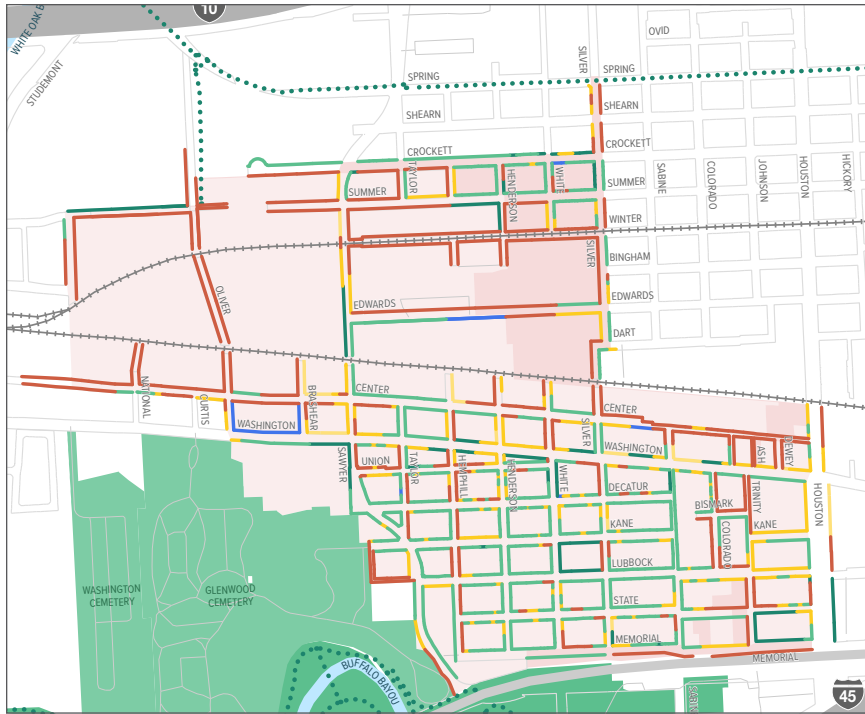


Figure 4. Sidewalk Condition By Parcel

- A: Flat, 5'+
- B: Flat, Less than 5'
- Under Construction
- C: Contains Deflections, 5'+
- D: Contains Deflections, Less than 5'
- Missing
- Study Area Off-Street
- Bicycle/Pedestrian Facility

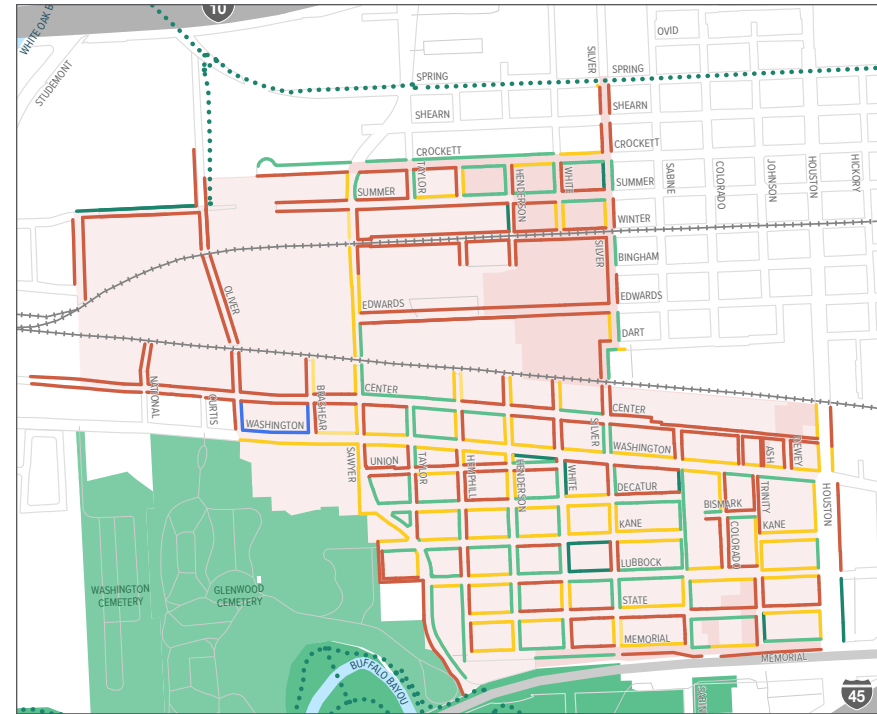
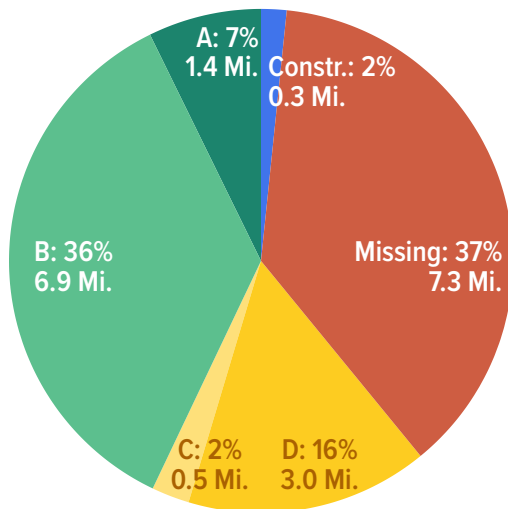
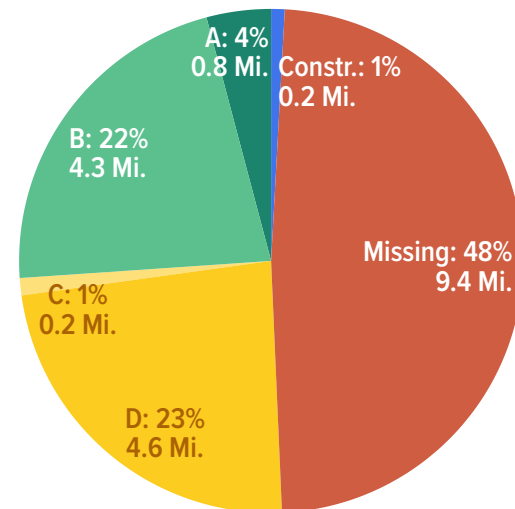


Figure 5. Sidewalk Condition By Block

1/4 MILE 1/2 MILE N



A majority of missing sidewalk segments are located to the north of Washington Avenue. a greater level of investment is needed on this north side, opposed to the south of Washington Avenue where investments in walkability have previously been made. Investments to the south of Washington Avenue primarily consist of smaller-scale spot fixes.



Source: TIRZ 13 Mobility Plan Sidewalk Assessment October 2020, Harris County Appraisal District

Destination Access

Figure 6 illustrates the extent to which each block face provides access to prioritized destinations, another key consideration in the sidewalk improvement strategy. Blocks along Sawyer Street and Washington Avenue—as well as the residential streets between Sawyer Street and Silver Street south of Washington Avenue—provide the greatest walking access to destinations. The destination access analysis scores each block face based on its proximity to businesses, schools, parks, public transit, and other destinations. Understanding the destination access aids in developing priorities for walkability improvements.

Methodology

To prioritize blocks serving key places, the analysis distinguishes between major and minor destinations. Major destinations are weighted by a factor of 5 compared to minor destinations, and each block's score is a function of the number of major destinations within a half-mile walk and the minor destinations within a quarter-mile walk. Major destinations include grocery stores, Crockett Elementary, access to bayou trails and Spotts Park (weighted by a factor of 10), planned transit stations, bus stops served by frequent routes (namely the 56 Airline/Montrose and 85 Antoine/Washington, and analyzed using a quarter-mile walk shed), and connection points to other neighborhoods. Minor destinations include other business and civic institutions, smaller parks, and bus stops served by less frequent routes.

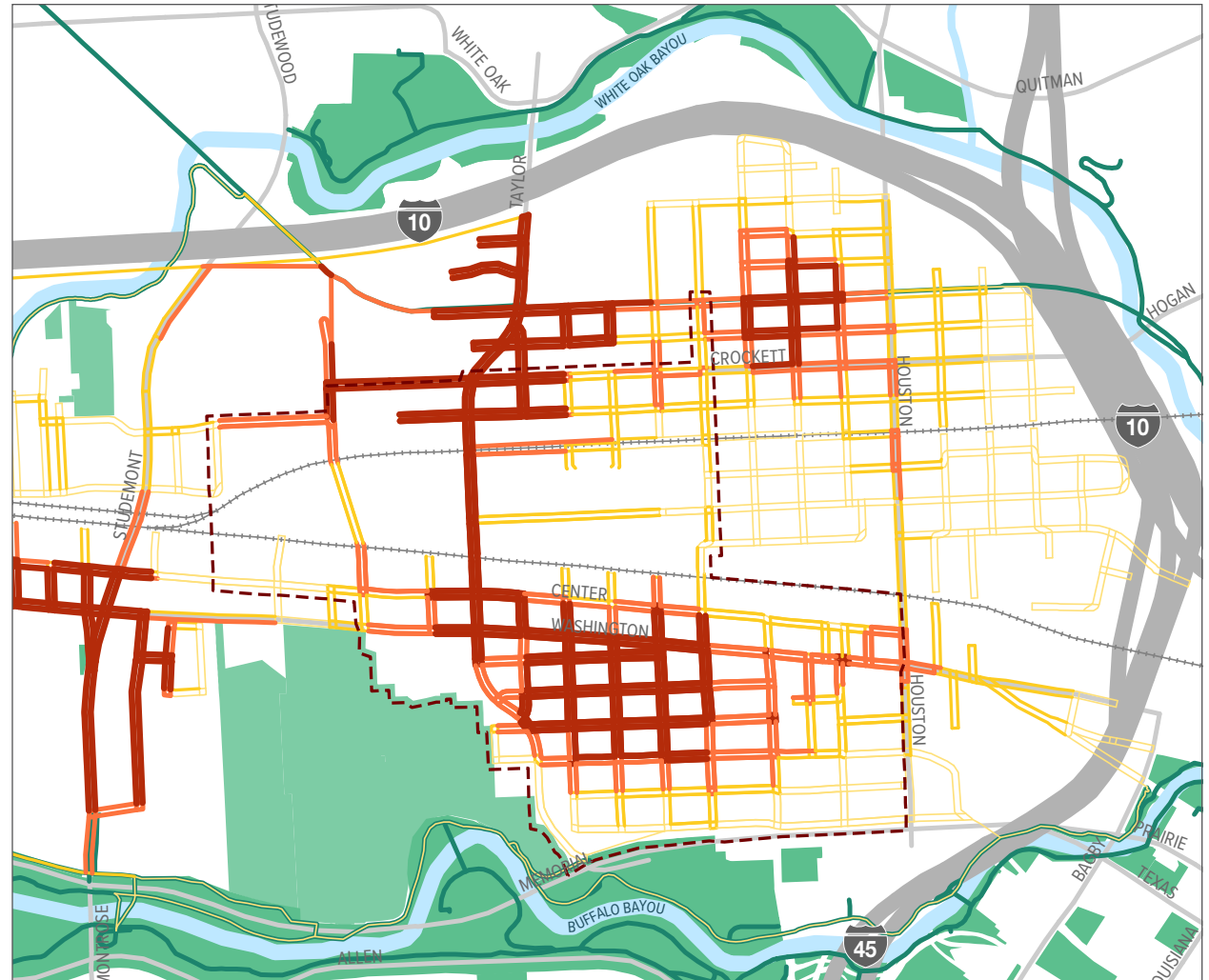


Figure 6. Destination Access

- Most Destinations: 55+
- More Destinations: 45–55
- Some Destinations: 35–45
- Few Destinations: 0–35

 Study Area

Major and minor destinations are grouped and weighted as described in the destinations access methodology.





Figure 7. Improved Crossings

- Existing Signal
- Existing Improved Crossing
- Proposed Signal
- Proposed All-Way Stop
- Proposed Unsignalized Treatments

- 85th Percentile Speed¹
- Study Area

The 85th percentile speed is considered the speed at which most drivers feel safe and comfortable during normal conditions. While 85 percent of drivers are at or below this speed, the remaining 15 percent travel faster.

Source: City of Houston

Improved Crossings

Safe street crossings are a cornerstone of walkable neighborhoods and thriving commercial corridors. On major streets like Washington Avenue, Sawyer Street, Crockett Street, and Houston Avenue, heavy vehicle traffic traveling at high speeds creates a dangerous environment for people walking and biking looking to cross the street. More than two thirds—68 percent—of residents and visitors who completed a survey conducted as a part of this plan reported feeling unsafe crossing major roads in the Study Area.

Long gaps between signalized intersections, such as the 0.6-mile gap between the Sawyer Street and Houston Avenue signals on Washington Avenue, discourage people from walking and using transit. For example, the 85 Antoine/ Washington bus stops at Silver Street are located 0.3 miles from the nearest signal, requiring riders to walk an additional 0.6 miles to reach the stops via a safe, controlled crossing—a twelve-minute deviation that many are unwilling to make.

Figure 7 shows intersections recommended for multimodal crossing improvements alongside the 85th percentile speeds¹ on major roadways. The recommendations consider the destination access analysis in Figure 6, the feasibility of improvements, and appropriate spacing. The proposed improvements establish safe crossings at regular intervals (approximately every 800 feet) on Washington Avenue, addressing the 0.6-mile gap between existing signals.

Safe Crossings Improve Destination Access

Together, the safe street crossings recommended in Figure 7 can dramatically improve walking access to destinations, particularly in the areas surrounding Washington Avenue and Crockett Street.

Figures 8 and 9 model the number of destinations within a quarter- to half-mile walk of each block face with and without the crossing improvements. Figure 8 assumes that people walking can only safely cross major roadways (Washington Avenue, Sawyer Street, Crockett Street, and Houston Avenue) at existing signaled or improved pedestrian crossings (namely the painted median refuge at Sawyer Street and Edwards Street and the raised crosswalk at Sawyer Street and Decatur Street). Figure 9, meanwhile, shows the number of

destinations within a quarter- to half-mile walk of each block face with the recommended safe crossings in place.

Figure 10 on the following page compares the two scenarios, showing the net change in the destination scores for each block face once pedestrians can safely cross at the recommended locations. The scores for each block face are calculated based on the same methodology as the destination access analysis shown in Figure 6 on page 18 (which assumes people can cross at all intersections regardless of existing safety conditions).

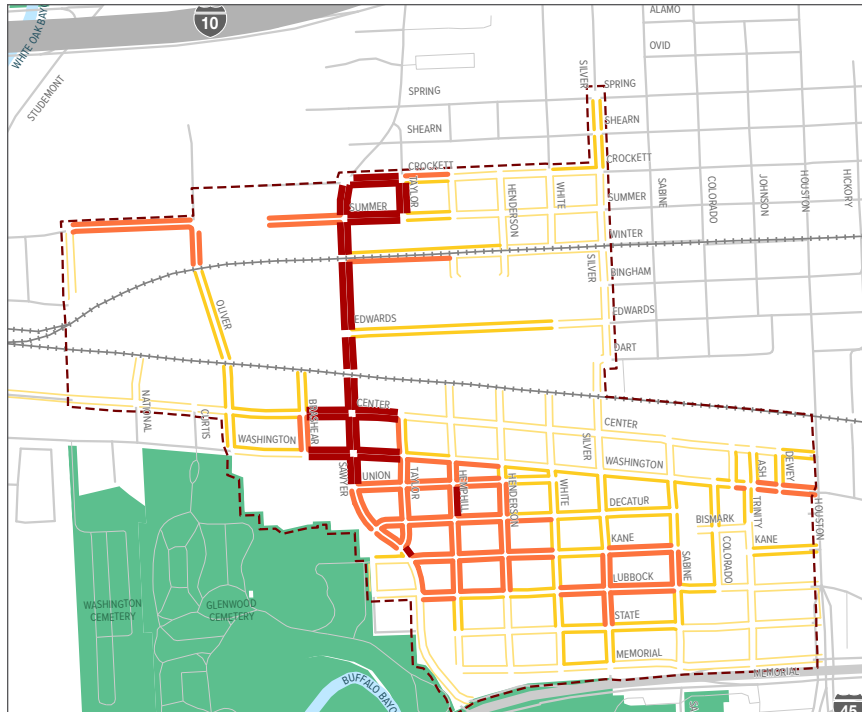


Figure 8. Destination Access without Improved Crossings

- Most Destinations: 55+
- More Destinations: 45–55
- Some Destinations: 35–45
- Few Destinations: 0–35

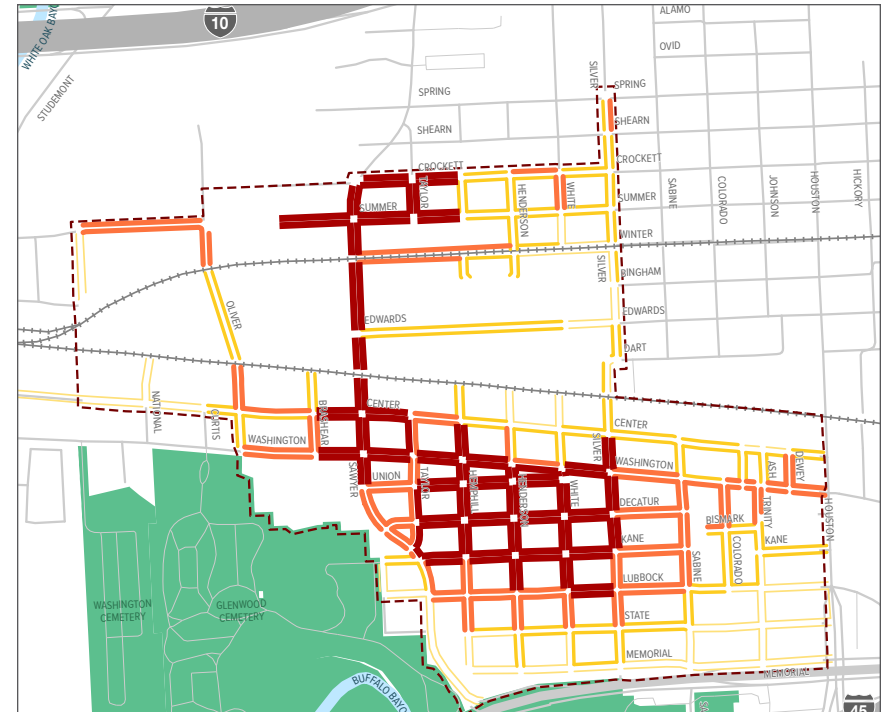
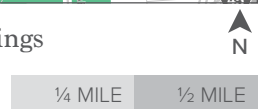


Figure 9. Destination Access with Improved Crossings

Major and minor destinations are grouped and weighted as described in the destination access methodology on page 18.



The Great Streets section of this chapter and the Silver Street schematic design and memorandum in Appendix B provide more detailed recommendations regarding specific treatments at each of the improved crossing locations.

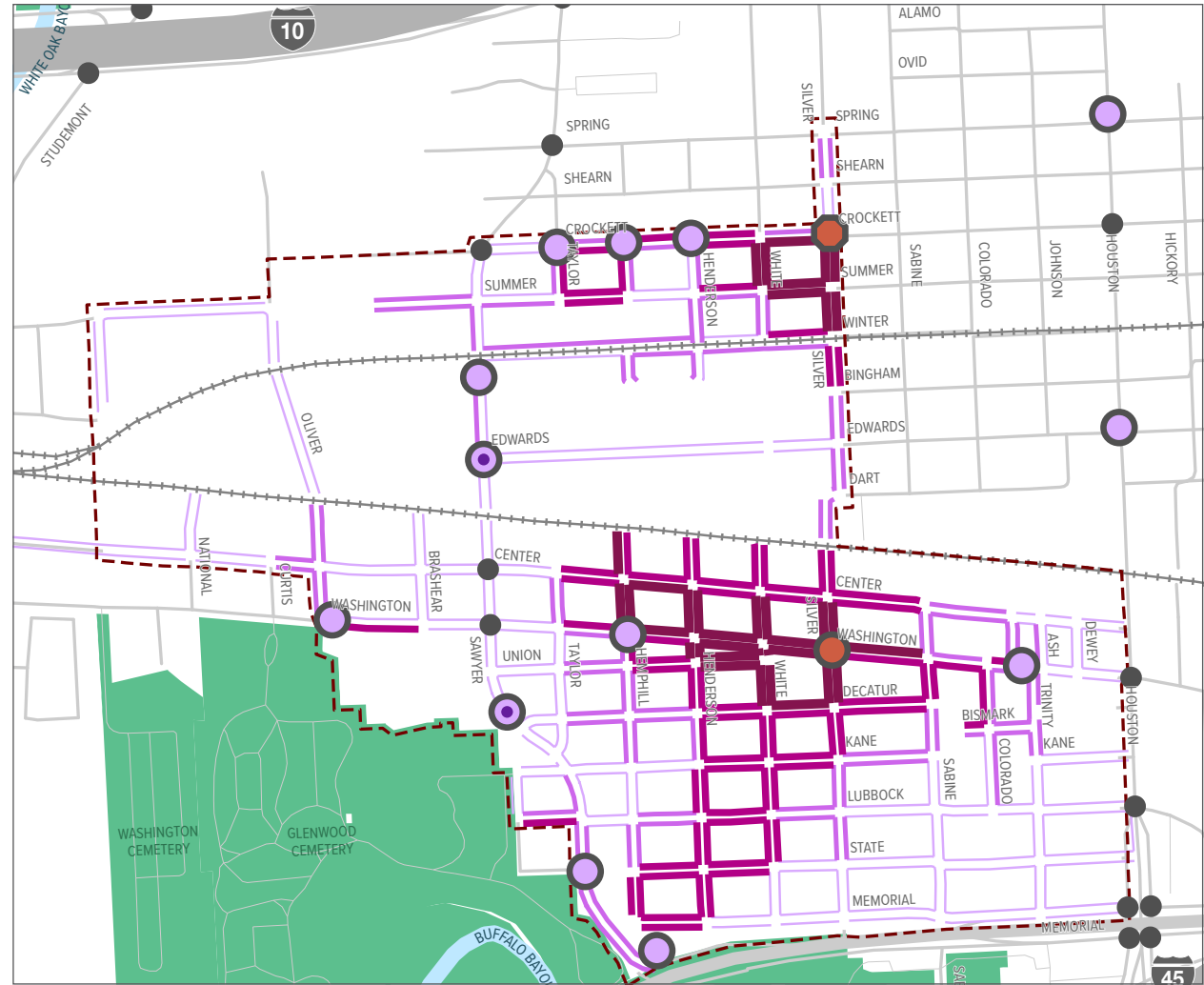
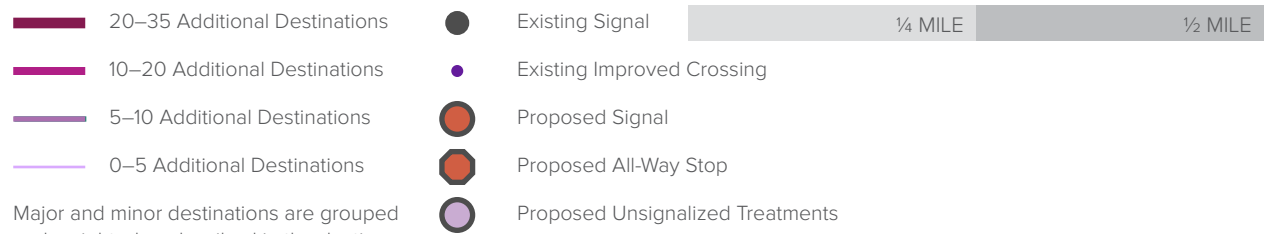


Figure 10. Additional Destination Access with Improved Crossings



Major and minor destinations are grouped and weighted as described in the destination access methodology on page 18.

Creating a Sidewalk Program

The Sidewalk Program, shown in Figure 11, provides a road map to establishing an accessible, complete sidewalk network in Old Sixth Ward in the coming years. The program prioritizes improvements in places that serve the most destinations, with the understanding that implementing all of the desired upgrades within a single budget cycle would be cost-prohibitive for the TIRZ.

Recent & Upcoming Projects

The TIRZ has built over 4.4 miles of new brick sidewalks throughout the community since 1998, primarily in the residential neighborhood south of Washington Avenue. Most recently, the TIRZ’s Sabine Street project (shown in dark blue in Figure 11) built new sidewalks and ramps between Washington Avenue and Lubbock Street. The upcoming reconstruction of Hemphill Street (shown in light blue) will do the same.

Moving forward, many of the desired sidewalk and ramp improvements within the TIRZ are best addressed through larger corridor projects, because pedestrian infrastructure is an essential part of any complete street. This plan proposes multimodal investments including sidewalks on several key corridors in Old Sixth Ward, shown in light purple and discussed in more detail in the Great Streets section of this chapter.

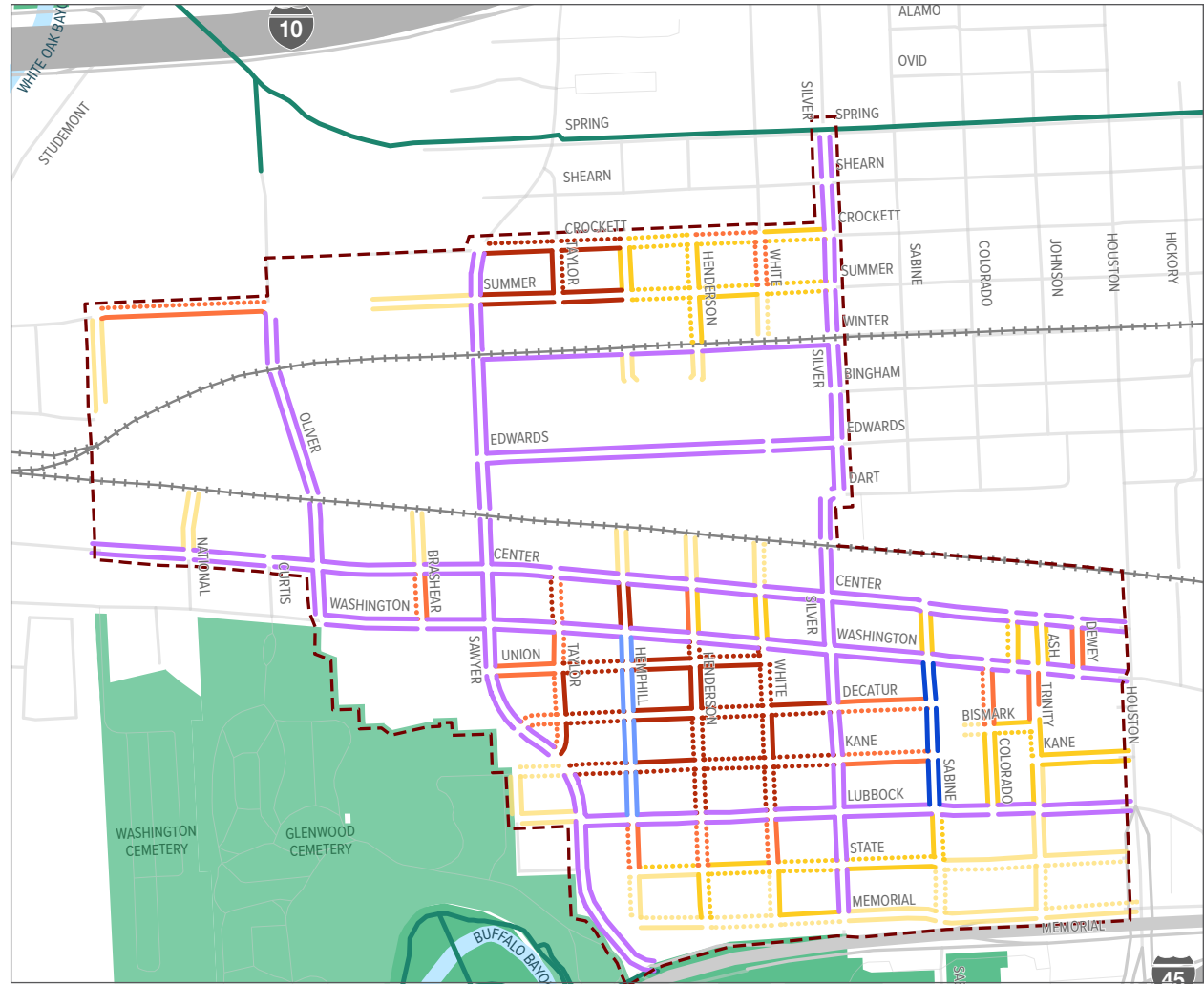
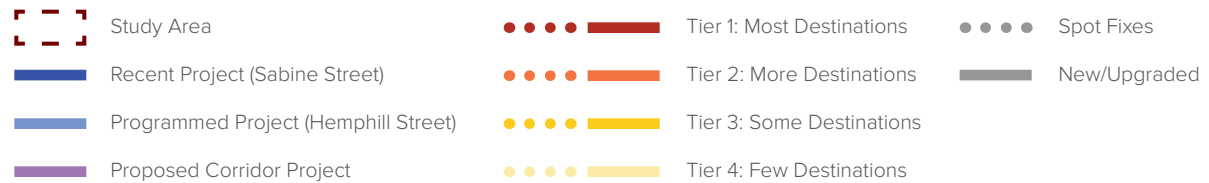


Figure 11. Sidewalk Program



A Tiered Approach

The Sidewalk Program focuses on blocks outside of recent, planned, or proposed corridor projects. Building on the destination access analysis in Figure 10, the program classifies block faces into tiers based on their proximity to destinations. The phasing recommendations shown in Figure 11 prioritize blocks serving more destinations for improvement first, beginning with Tier 1.

Level of Improvement

The Sidewalk Program also estimates the level of effort and investment needed to achieve a comfortable and accessible walking surface on each block face based on the conditions documented in the sidewalk assessment.

Spot Fixes

Several blocks in Old Sixth Ward will require only minor upgrades to previous sidewalk investments made by the TIRZ or private developers. Blocks faces identified for spot fixes, shown in a dotted line, will require sidewalk improvements on less than 100 linear feet (or less than one quarter) of the block face. As photographed to the right, many of these blocks will require only minor improvements, such as relaying brick to accommodate tree roots or addressing a driveway that does not provide a level walking surface. Some of these block faces have entirely smooth, flat sidewalks, but would benefit from new ramps connecting to street crossings at either end of the block.

New or Upgraded

Blocks faces identified for new or upgraded sidewalks, shown in a solid line, will require sidewalk improvements on over 100 linear feet (and more than a quarter) of the block face. Some of these blocks may require complete sidewalk reconstruction or new construction in places where sidewalks are severely deteriorating or missing.



Spot Fix:

Small gap in brick sidewalk near mature street tree



Spot Fix:

Crumbling driveway separating otherwise accessible sidewalk



Spot Fix:

Missing ramp at the terminus of an otherwise accessible sidewalk



New Sidewalk:

Oliver Street requiring construction to link new businesses and residential developments

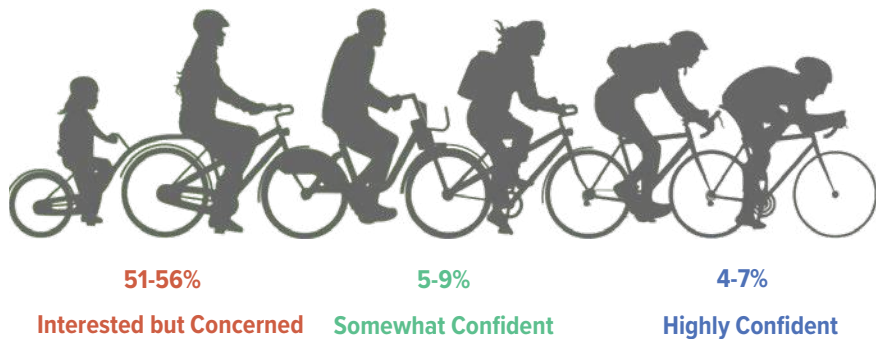
Building a Bikeway Network

The TIRZ 13 area is a key regional bikeway nexus. The nearby access to the MKT, White Oak Bayou, and Buffalo Bayou Trails provides the community with high-comfort bikeway access for recreation and to a variety of destinations in Houston. However, connectivity from the TIRZ to these trails is lacking. Creating these bikeway connections is a key opportunity to enhancing safety, quality of life, and economic development. This section identifies priorities to create a bicycle network within the study area and provides direction regarding complementary facilities such as bike share station locations and end-of-trip needs.

Building a Network for All

Creating a bicycle network within the study area requires an understanding of the needs and types of users that the network is aimed at accommodating. It is recommended that the TIRZ prioritize an “all ages and abilities” bike network. All ages and abilities is a specified practice of bikeway design that is focused on providing comfortable, safe, and equitable facilities. This ensures that no matter the experience level of a person riding a bicycle, there are mobility options available to reach community destinations.

Figure 12. Types of Riders



Source: FHWA

Types of Riders

To be a viable transportation mode, the bicycle network must accommodate all types of users. This includes children, seniors, women, bike share users, people of color, low-income riders, people with disabilities, those moving goods or cargo, and confident cyclists. These users have a range of abilities that impacts their confidence and feeling of comfort on any given bikeway. Figure 12 highlights another way to view these types of riders. A majority of people biking in most communities fall into the “interested but concerned” category. These are people who would like to ride a bicycle but do not feel comfortable sharing the road with vehicles. Those who are “somewhat confident” are riders who would prefer protection but will ride with vehicles in the roadway in some situations, and riders who are “highly confident” will ride with vehicles in many situations and feel comfortable taking full use of a travel lane. Since most people are in the “interested but concerned” category, providing bikeways that meet their needs ensures that the most people who want to ride in the community have the opportunity to do so.

Context-Sensitive Design

To ensure that a bicycle facility will be comfortable and safe for riders of all ages and abilities, it is essential to design it appropriately for the roadway characteristics. The number of lanes present, the number of vehicles using those lanes, and the speed vehicles travel are the major contextual factors that indicate what type of facility needs to be built. Other contributing factors include the amount of curbside activity and the number of turning vehicle conflicts. There are multiple resources available that provide guidance on bikeway facility types that take these components into account. The National Association of City Transportation Officials (NACTO) Contextual Guidance for Selecting All Ages & Abilities Bikeways and the Federal Highway Administration (FHWA) Bikeway Selection Guide are suggested reference for future design of bikeways within the study area.

Types of Bikeway Design

To build a great bicycle network it is not appropriate or feasible to place a protected bike lane on every street. It is important to use a variety of bikeways that provide safe access in residential neighborhoods as well as busier streets with a variety of uses and activity. Figure 13 highlights the three types of bike facilities that are recommended within the study area. They include:

- Shared On-Street facilities that are appropriate for streets with low traffic volumes and speeds. Typically this is used in a residential area. Shared facilities can also incorporate traffic calming elements, signage, and pavement markings to identify the route for bikes and communicate the expectation of people biking to drivers.
- Dedicated On-Street facilities that are delineated as a separate lane. These are most often used where traffic volumes are higher and/or vehicle speeds are higher than a typical residential neighborhood. This type of facility can consist of a striped bike lane only, include a striped buffer or at the highest level a physical barrier between the bike lane and vehicles.

- Off-Street trails or sidepaths are facilities that are separated from the roadway completely and are wider allowing for both bicycle and pedestrian use.

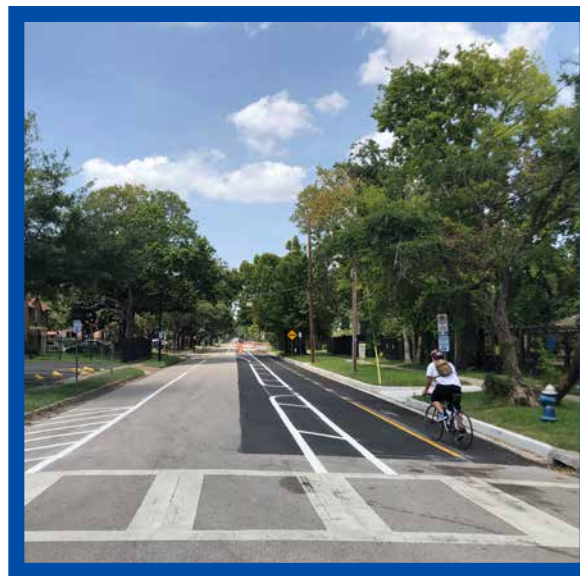
Creating a Network

When developing a bicycle network to connect the community there are multiple approaches that can be taken. One way is to focus on development of bikeways one at a time or when there are opportunities to incorporate a new bike facility into a larger project, such as a roadway restriping or reconstruction. Alternatively, best practices from around the country show that when bikeways are built as a network in a short period of time the benefits and usage of the facilities increase significantly. Those benefits include safety, higher rates of use, and even increased spending at local businesses.

Figure 13. Types of Bicycle Facilities



Shared On-Street



Dedicated On-Street



Off-Street

Creating Connections Now & In The Future

Within the study area there are many opportunities to create safe connections for people biking. The FactBook (Appendix A) highlighted the existing gap in bicycle facilities, planned facilities from the City of Houston Bike Plan, and data that shows where people are biking in the community today. This information tells us where the greatest needs are as well as where there are opportunities to build on in the near term.

Near-Term Priorities

Figure 14 shows the proposed Near-term Priority Bikeway Network. As shown in the map, there are six corridors that begin to create essential connections and the foundation of a network within the study area. These proposed priorities consist of opportunities that are easier to implement and lower in cost. The six facilities shown in Figure 14 are detailed below.

- 1 Washington Street: Washington Street is recommended to include a protected bike lane in each direction along the corridor. As the corridor extends beyond the study area, coordination with other entities for continuity will be important. These facilities would be served by at least two B-Cycle stations, one that is programmed and one that already exists.
- 2 Sawyer Street: South of Washington Street, Sawyer Street is proposed to have an on-street dedicated bike lanes. This bikeway would connect to an existing B-Cycle station and provide direct access from Washington Street to Buffalo Bayou Trail. To connect to the trail, it is recommended to develop an off-street facility that would connect North Memorial Way at Hemphill Street to Sawyer Street, then travel off-street to the trailhead.

- 3 Edwards Street: Between Sawyer and Silver Streets, Edwards Street is proposed to include on-street bike lanes.
- 4 Lubbock Street: Lubbock Street is proposed to be a mixed facility with sections of both on-street dedicated bike lanes and shared on-street facilities where appropriate. As the width of Lubbock Street increases eastbound at Sabine Street, the facility would become an on-street bike lane that connects to Houston Avenue and the Courthouse Site. West of Sabine Street, the bikeway would transition to a shared on-street facility.
- 5 Silver Street: Silver Street is proposed to be a mixed facility with sections of both on-street bike lanes and shared on-street facilities. The sections are determined by how much space there is in the right-of-way as well as the surrounding context. See Appendix B Silver Street Detailed Assessment for additional detail of this corridor.

North Memorial Way is proposed to be an on-street shared bikeway from Silver Street to Hemphill Street. At this point the bikeway would connect to an off-street facility that would provide access to Buffalo Bayou Trail via Sawyer Street.

In addition to these priority bikeways within the study area, there are several bikeways adjacent to the study area that could connect into these facilities. They are shown in Figure 14 as dotted lines. Coordination with the City of Houston and other entities to build these connections will help the TIRZ develop a connected network.

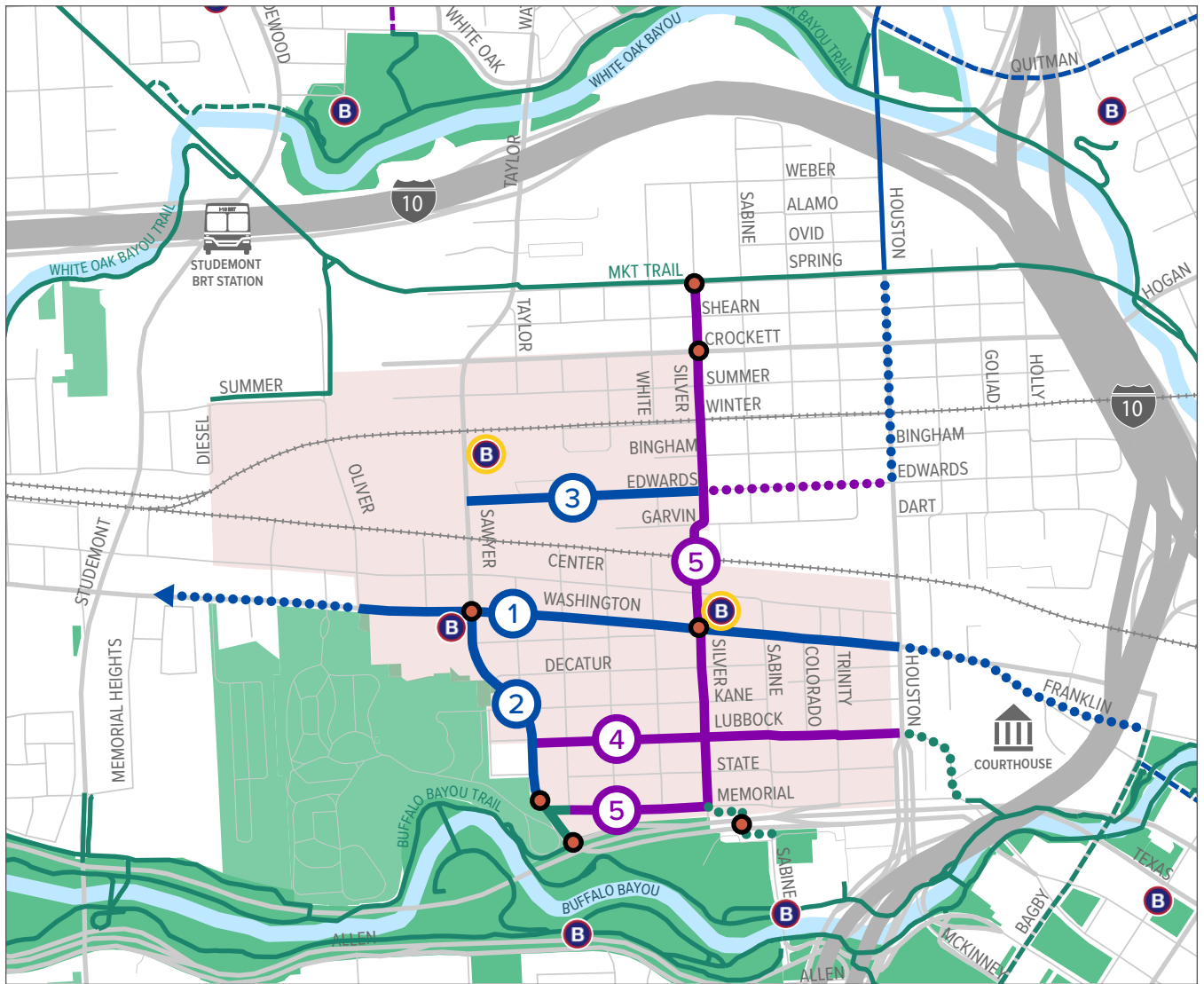
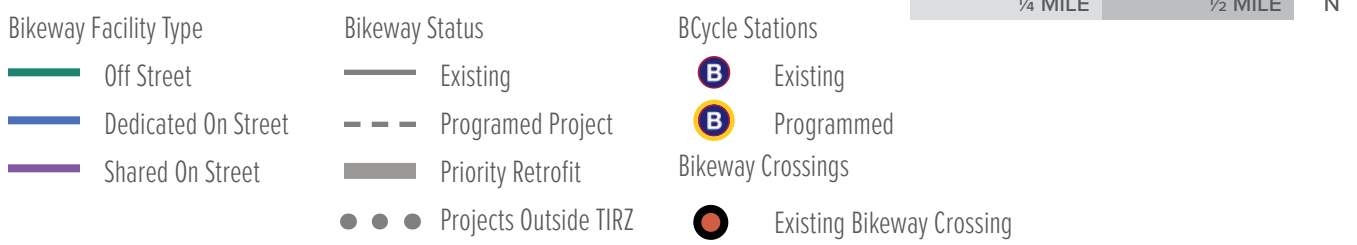


Figure 14. Near-Term Priority Bikeways



Future Vision for Bicycling

The near-term priority bikeways provide the foundation of a network, but longer-term work must be done to create a safe, connected, and comfortable network for the community. Figure 15 shows the long-term bikeway vision in the study area and beyond. These proposed projects are considered long-term due to crossing and intersection components and/or higher project costs due to appropriate design or corridor context. The following information provides context the proposed long-term vision bikeways as highlighted in Figure 15.

- ⑥ Washington Avenue: The long-term vision for Washington Avenue revolves around a complete street reconstruction. A reconstruction of the corridor would allow for flexibility in providing enhanced bike and pedestrian access. For example, a future bikeway could be elevated to be at curb level, it could include wide sidewalks paired with a Center Street bikeway, or other options. This long-term bikeway vision is encompassed in the Washington Avenue Great Streets Vision (page 32).
- ⑦ Center Street: Center street is proposed to be a comfortable shared-street facility. Center Street is envisioned to pair with Washington Avenue to provide additional east-west connectivity that connects to businesses and provides options for different bicycling needs.
- ⑧ Sawyer Street: North of Washington Avenue, Sawyer Street is proposed to include on-street bike lanes and/or and off-street facility that would provide a direct connection for businesses and residents to the MKT Trail. In the long-term, Sawyer street would provide a comfortable on-street connection between Buffalo Bayou and the MKT Trail.
- ⑨ Crockett Street: While just adjacent to the TIRZ and outside of the study area, Crockett Street is an important connecting corridor. It is part of a longer planned bikeway corridor that continues on Hogan and Lorraine Streets to the east. It is recommended that this corridor include dedicated on-street bike lanes.
- ⑩ Oliver Street: Oliver Street is proposed to provide an off-street facility between Washington Avenue and Summer Street, which links to the MKT Trail.
- ⑪ Winter Street: Winter Street is proposed to be an off-street facility that would be developed as a walkable, bikeable trail and promenade Between Sawyer and Silver Streets. This facility would create a destination itself that reinforces surrounding development. A rendering of what this promenade could look like is shown in the Great Streets section of the chapter.



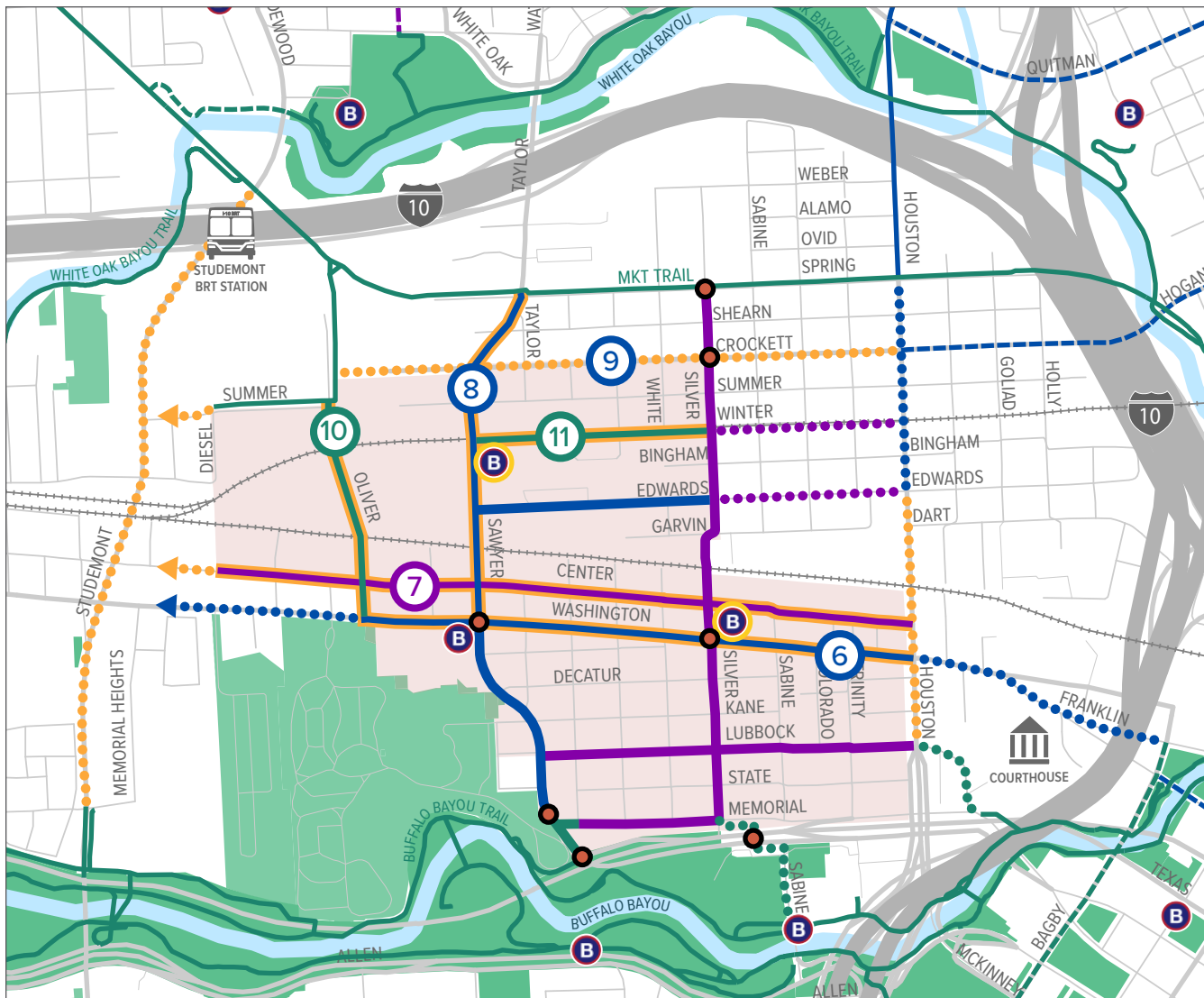


Figure 15. Long-term Bikeway Vision

Bikeway Facility Type	Bikeway Status	BCycle Stations	Study Area
— Off Street	— Existing	B Existing	 Study Area
— Dedicated On Street	— Programed Project	B Programmed	
— Shared On Street	— Priority Retrofit	B Programmed	
— Street Reconstruction	— Vision Reconstruction	● New or Improved Bikeway Crossing	
	●●● Projects Outside TIRZ	Bikeway Crossings	

End-Of-Trip Facilities

To accommodate and encourage cycling as a mode of daily transportation, facilities must be provided at destinations welcoming cyclists. These facilities include secure bike parking, bike share stations, and changing rooms, lockers, and showers for employees. The TIRZ can partner with businesses to encourage these facilities as well as coordinate with others to place more bike parking and bike share options within the study area.

Bicycle Parking

Convenient bike parking is critical to support an increase in bike usage. Providing quality parking to people working at or visiting businesses and other destinations should be standard throughout the study area. Bike racks provide short-term parking at a low cost. The City of Houston has developed a bike rack program through its Go Healthy Houston initiative. Bike racks can be donated to local management districts, businesses, commercial properties, civic associations, and community-based organizations. Racks can be placed on public or private right-of-way. The placement of bike racks is key to their use. It is important to place racks in locations where they are visible to ensure safety and provide easy access to building entrances. The TIRZ can also partner with businesses to provide bike racks or implement a cost-sharing program to split the cost of new bike racks with interested businesses.

Transit Stops

Bicycling can provide critical first/last-mile connections to transit. Bus stops, especially those adjacent to bikeways, should include bicycle parking. If there are stops with high usage of bicycle parking, the TIRZ should consider the installation of more secure bike lockers or cages. Bicycle parking will be incorporated into many bus stops as part of METRO's BOOST program.

Work Places

The TIRZ should work with employers in the district to encourage their employees to commute by bicycle. This can be done by providing secure bicycle storage, changing rooms, and showers at workplaces. The TIRZ should also consider promoting bicycling through the participation of the city-wide Bike to Work Day each year. Additionally, incentive programs can be implemented to encourage commuting not just by bike, but also by walking, transit, and carpooling.

BCycle (Bike Share)

Bike share can be an important part of mobility options. Houston BCycle is the City's system of short-term rental bicycles and stations throughout that connects riders to destinations and recreation. The Fact Book (Appendix A, page 36) shows the existing and planned BCycle stations within the study area. In recent years, Houston BCycle has seen record growth in ridership. Much of this ridership growth has coincided with system expansions into areas with a high density of bike rental stations. Coordinating with Houston BCycle to expand the bike share network in the study area offers the opportunity to take advantage of this ridership growth and further enhance mobility and recreational opportunities.

Expanding the bike share network in tandem with the roll out of the priority and vision bikeway networks can boost the impact and accessibility of each by creating a unified, legible system of bikeways and bike share stations. It is recommended that TIRZ 13 coordinate with Houston BCycle to identify specific station locations within the study area and educate the community and businesses on the benefits of bike share. The TIRZ could set up a cost-sharing program or promotion program for businesses that want to pay for a station on their property.

Figure 16 shows the accessibility impacts of a dense bikeshare network in the study area. Currently, very little of the study area is within comfortable walking distance of a station. The vision of a potential BCycle station network shows how stations near key destinations and points of access for the community could significantly increase that access to cover nearly the entirety of the study area. The station locations in Figure 16 should be refined within input from the community and Houston BCycle.

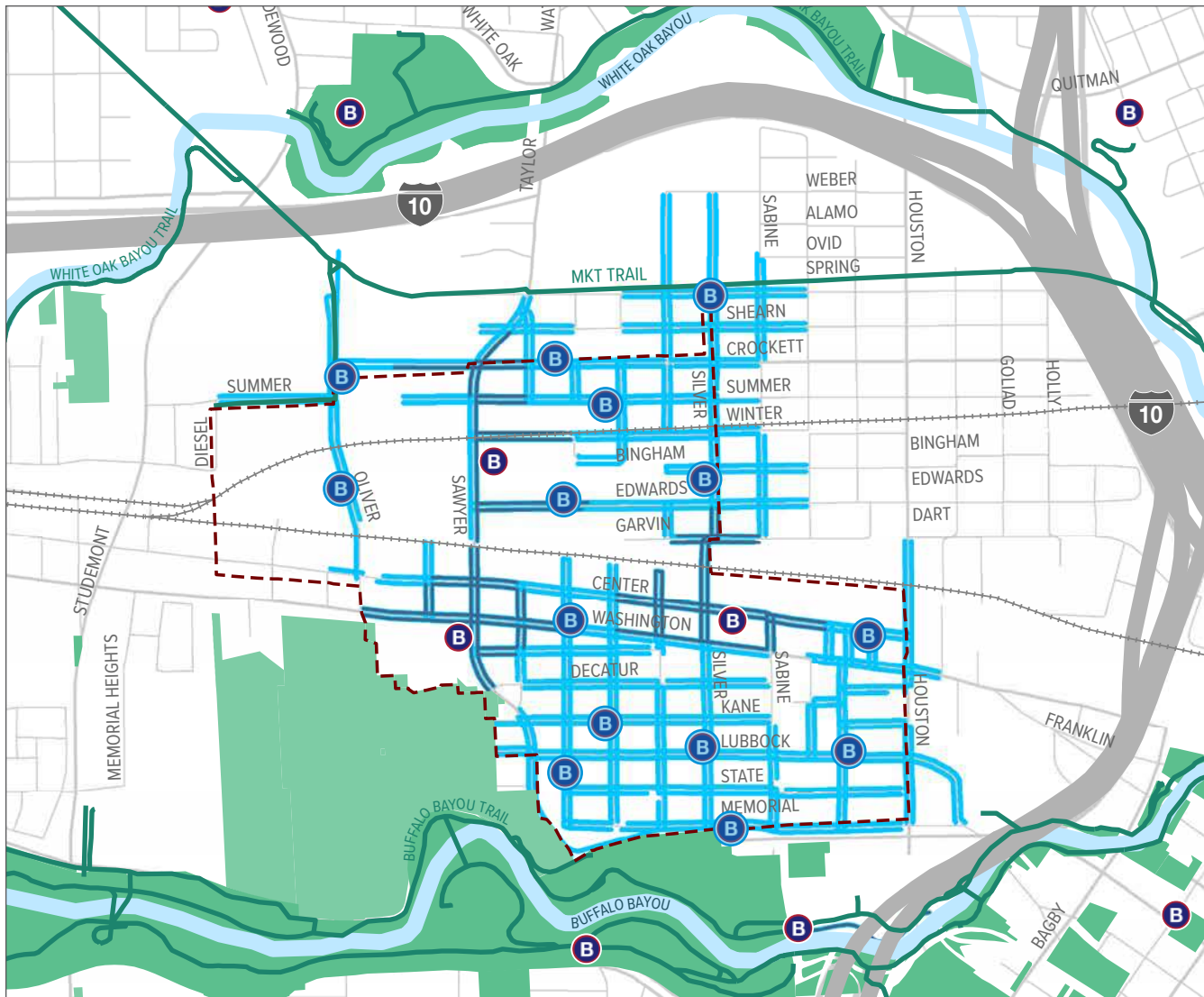


Figure 16. B-Cycle Station Access



Enhancing & Accessing Transit

TIRZ 13 has the advantage of proximity to major destinations that would readily be accessible by transit. Historically, Old Sixth ward was connected to the greater Houston area by a sprawling network of electric streetcar lines. Today, bus lines that run through or directly adjacent to the study area connect the TIRZ to key destinations including Downtown (85 Antoine-Washington, 30 Clinton-Ella, 44 Acres Homes) and the Texas Medical Center (56 Airline Montrose). But even with this available service, fewer people than average for the City of Houston utilize transit, particularly for commute trips. The recommendations in this section identify opportunities to improve access to key destinations and make transit a more competitive mobility option. The proposed improvements are grouped into the following categories and highlighted in Figure 17:

- Bettering Access to Future High-Capacity Transit
- Enhancing Local Bus Options
- Improving Accessibility of Local Bus Routes



Bettering Access to High-Capacity Transit

High capacity transit options refer to services that offer enhanced transit, operate frequently, and move more people at a time than a standard bus. METRORail service and Bus Rapid Transit (BRT) are examples of future services near the study area. The proposed improvements below identify key enhancements and the District's role in increasing transit service and access.

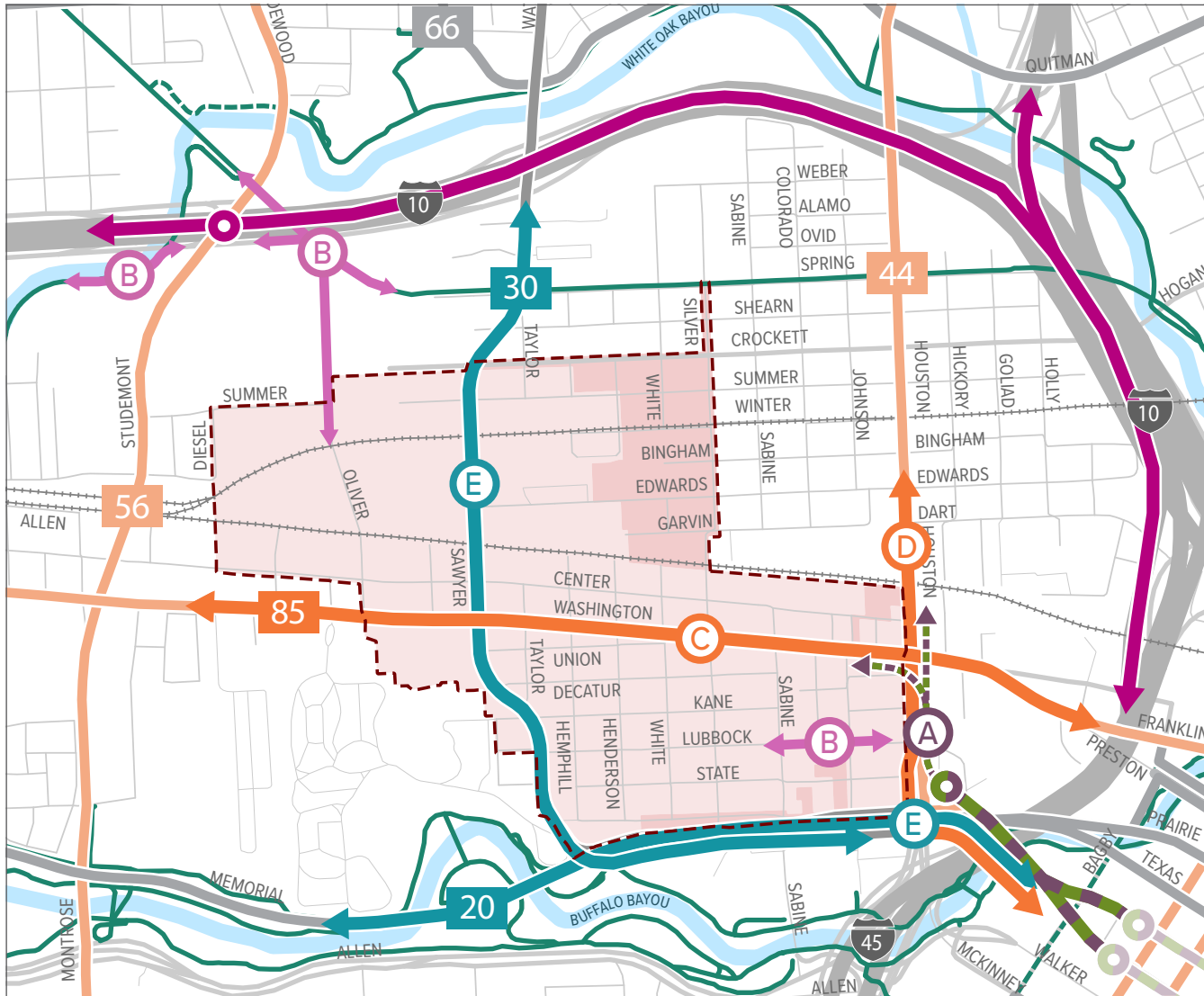
METRORail Purple/Green Line Extension

METRONext proposes a one station extension of the Green and Purple METRORail lines to the City Court Complex area (Houston Street at Lubbock Street). This presents an opportunity to have an accessible rail connection to Downtown. While the TIRZ is not able to implement this as a project, it can advocate for the extension and build improvements that provide multimodal access to the station. The district's focus on making walkable/bikeable connections can provide important support for the viability of the extension and support related transit oriented development.

Beyond the extension and station at the City Court Complex, there is potential for a future further extension of one or both of the Green and Purple lines. While further extension is not in the METRONext Moving Forward Plan, advocating for analysis of these alternatives by METRO is appropriate for the TIRZ. Potential future extensions from the City Court Complex could travel west on Washington, which would service the increased development along the corridor that has occurred as well as future development, or north along Houston Avenue.

Access to Inner Katy BRT

As part of the Inner Katy Bus Rapid Transit (BRT) project a station is planned at Studemont and I-10. While this is not within the study area, its proximity makes it an important access point to the community. Safe, high-comfort access to this station will enable the TIRZ to more easily take advantage of this future service. Additionally this connectivity will help people from other communities in Houston access Old Sixth Ward, supporting community's economic development. It is recommended to provide a link from the MKT and/or the White Oak Bayou trail to the future station. As the project is currently in design, the TIRZ should promptly engage METRO to identify the station's location and determine where the appropriate connection(s) should be located.



Transit Improvement Vision

- A** METRORail Extension and Courthouse Site Development Coordination
- B** Proposed access enhancements to high-capacity transit
- C** 85 Washington BOOST Coordination
- D** 44 Acres Homes BOOST Coordination & Service Enhancements
- E** Service Enhancements and Accessibility Improvements for Non-BOOST Routes

Figure 17. Transit Improvement Vision Overview



- Existing Local Bus Service
- Future BOOST Route
- Existing METRORail Green/Purple Line
- Future Inner-Katy BRT
- Existing Off-Street Bikeways/Trails
- Programmed Off-Street Bikeways/Trails

Source: METRO 2019

Enhancing Local Bus Options

Local bus routes provide important access for the community to a variety of destinations. Not only is the service itself important, but access to the service paired with safe, comfortable bus stops is vital to encouraging more transit use within the community. The following recommendations detail how the TIRZ can work to improve local transit access and service options within the study area.

Washington Avenue BOOST Enhancements

METRONext identifies seventeen frequent and high-ridership local bus routes as BOOST corridors, including the 85 Antoine/Washington (which runs on Washington Avenue through the TIRZ), the 44 Acres Homes (Houston Avenue), and the 56 Airline/Montrose (Studemont Street). The BOOST program includes a variety of treatments to holistically improve the transit experience on these corridors and provide riders with a better walk, a better stop, and a better ride. METRO has selected the 56 Airline/Montrose, which operates on Studemont Street just west of Old Sixth Ward, as one of the first two corridors to receive BOOST improvements.

Moving forward, the TIRZ and other partners can play a pivotal role in advocating for and partnering with METRO on BOOST improvements on Washington Avenue. METRO has not announced the order in which it will implement BOOST corridor projects, and opportunities to partner with TIRZs and other entities on segments of the 85 Antoine/Washington route can encourage the agency to prioritize and expedite BOOST improvements on the corridor.

BOOST improvements can serve as a catalyst for continued development and reinvestment in the community, and present opportunities to leverage and build on Old Sixth Ward’s character and vibrancy. Moreover, the three key goals of BOOST—a better walk, a better stop, and a better ride—described in more detail below dovetail with the TIRZ’s broader mobility goals and the vision for Washington Avenue developed in the Great Streets section of this chapter.

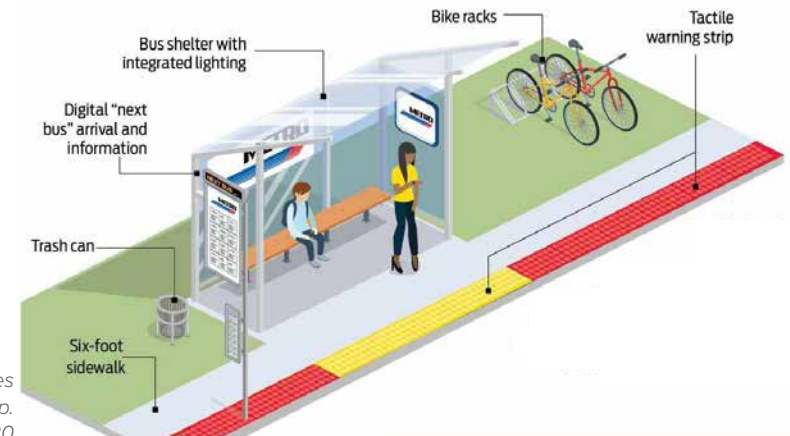
A Better Walk

Making sure people can safely and conveniently access transit is key to encouraging its use. By improving walkability along and to Washington Avenue, the TIRZ can facilitate access to transit and thus increase the demand and applicability of enhanced service. A key element that influences a corridor’s walkability is the ability to cross the street at intersections, particularly near key bus stops. Safe intersection and corridor crossings are an integral part of improving safety and accessibility within the TIRZ and also complements transit service in the corridor.

Additionally, transit and bike connectivity can increase the reach of transit within a community. Bike lanes on Washington Avenue, and those that provide access to the corridor, are important for ensuring that transit is connected to the community by safe, multimodal options.

A Better Stop

Once people arrive at a BOOST bus stop, they will find an elevated, more inviting user experience than a typical METRO bus stop. Stops will have new, distinctive shelters, real-time arrival information, lighting and near-level platforms that getting on and off the bus easier for all users. The BOOST program presents opportunities for the TIRZ to partner with METRO to provide custom bus stop enhancements that contribute to branding and placemaking within the district. The TIRZ could partner with METRO to add elements to the BOOST stops that reflect the community such as custom planters, unique pavement graphics, wayfinding, bike parking, and bike repairs stations.



A rendering of what types of features could be present at a typical BOOST stop. Source: METRO 2020

A Better Ride

In order to provide faster, more reliable service, the BOOST program optimizes the spacing and placement of bus stops and implements transit-friendly signal timing along the length of the corridor. The TIRZ can coordinate with METRO to identify optimal stop locations that achieve quarter-mile stop spacing, provide ample room for shelters and other amenities, and maximize the speed and reliability benefits of transit signal priority.

The TIRZ can also coordinate with METRO to ensure that any upgrades to signals completed as a part of other projects support transit signal priority. Transit signal priority enables a bus to communicate its location to a traffic signal as it approaches, so that the signal may stay green longer (or turn green sooner) to allow the bus to travel through the intersection without delay. When implemented along an entire route, transit signal priority can result in meaningful travel time and reliability improvements, creating faster, more reliable service for riders and generating operating cost savings that METRO can reinvest in additional trips.

Accessibility Upgrades

For local bus routes not included in the BOOST program, METRO plans to upgrade bus stops to meet current accessibility standards. This effort will rebuild inaccessible stops served by the 30 Clinton/Ella on Sawyer Street and the 20 Canal/Memorial on Memorial Drive. METRO will consider adding and relocating bus stops as a part of this effort, which presents the TIRZ with an opportunity to coordinate with the agency on the optimal bus stop locations and advocate for new stops that expand transit access for the community. In particular, the TIRZ can advocate for a new stop on the 20 Canal/Memorial at Memorial Drive and Houston Avenue, which will require a minor realignment of the existing route. This new stop will meaningfully expand transit connections between Old Sixth Ward and Downtown, Uptown, and the East End, because the 20 Canal/Memorial currently travels from Downtown to Shepherd Drive without stopping. The TIRZ should also coordinate improvements to Sawyer Street south of Washington Avenue with METRO in order to leverage resources and avoid multiple rounds of construction as the two agencies upgrade sidewalks and bus stops.

Service Enhancements

Increasing the frequency and extending the span of bus service can make transit a more attractive and convenient option for reaching destinations. METRONext includes funds for systemwide route enhancements, which the agency can use to improve the services offered in Old Sixth Ward. The 30 Clinton/Ella and 44 Acres Homes routes, which run on Sawyer Street and Houston Avenue, respectively, would benefit from more frequent service, as well as more early-morning and late-night trips. On the 30 Clinton/Ella, the TIRZ can advocate that METRO improve upon the hourly service offered today by providing trips every 30 minutes at peak hours or throughout the day. On the 44 Acres Homes, the TIRZ can advocate that METRO provide trips every 15 minutes, especially at peak times, rather than every 20–30 minutes as they do today.

First/Last Mile Connectivity

First/last mile connections provide safe, accessible options for people to walk and bike between transit stops and destinations. Many of the walkability, bikeway, and corridor recommendations—including sidewalks, safe crossings, high-comfort bikeways, and bike parking—can expand transit access by connecting the community to the following routes:

- 56 Airline/Montrose that operates along Studewood Street. Connections to this route would provide better access between the Airline/Heights/Montrose/TMC areas and the study area.
- 44 Acres Homes along Houston Avenue. This route provides important connections to Downtown and Northwest Houston access.
- 20 Canal/Memorial that operates along Memorial Drive. With the implementation of a new stop at Memorial Drive and Houston Avenue, this route can provide connections to Memorial Park, Uptown, Downtown, and East End.
- METRONext identified Regional Express service improvements that could potentially provide service to or near the study area in the future. Working with METRO to identify service patterns that are closer to the study area on Washington or serve the Inner Katy BRT station at Studemont Street will provide clarity and opportunities to ensure access to future service is provided.

Creating Great Streets

Streets are the backbones of communities and neighborhoods. Great Streets address the needs of all users and support economic opportunity, neighborhood character, mobility, access, and safety. In the Old Sixth Ward, re-imagining key corridors can strengthen safety and access to existing businesses and destinations and attract new development aligned with the community's goals. Great Streets present an opportunity to breathe life into our most versatile and highly used corridors, promote and sustain economic activity, and be highly accessible by all modes of transportation. They provide safe access for the community from neighborhoods to destinations and other corridors.

The most successful streets are Great Streets, designed in context with the surrounding land uses in mind and provide multiple mobility options. This doesn't mean that every Great Street must have wide sidewalks, bike lanes, and transit stops. When taken as a network, Great Streets provide mobility options for each mode where they make sense within a community. Some streets may be optimized for transit access and operations, others for biking. While safe pedestrian access should be along all corridors in the study area, the appropriate sidewalk width should vary depending on if the sidewalks are along a busier commercial corridor, like Washington Avenue, or a quiet neighborhood street, like Lubbock Street. The same considerations also apply for bicycle facilities. Some corridors need a protected bike lane, and others need better signage and minor improvements to facilitate safe biking on shared streets.

Developing Great Streets in Old Sixth Ward

Figure 2 shows the proposed Great Streets Corridors that are recommended for improvements within the study area. The corridors that make up the Great Streets network are:

- Washington Avenue
- Center Street
- Edwards Street
- Silver Street
- Sawyer Street
- Oliver Street
- Lubbock Street
- Winter Street

These corridors work together to provide a high level of safe and comfortable access for Old Sixth Ward residents, workers, and visitors. The information in this section provides details regarding recommended improvements to each of these corridors. Recommendations for corridors may consist of near-term improvements, which provide improvements to today's facilities and are easier to implement, and corridor visions. The visions are longer-term efforts that are more complex and higher. They address the comprehensive needs of the community and can be a transformative opportunity to leverage public infrastructure for economic development and placemaking.

Great Streets Corridors

- 1 Washington Avenue Multimodal Improvements
- 2 Washington Avenue Vision
- 3 Center Street Vision
- 4 Edwards Street Multimodal Improvements
- 5 Edwards Street Vision
- 6 Silver Street Bikeway
- 7 Silver Street Vision
- 8 Sawyer Street South Multimodal Improvements
- 9 Sawyer Street North Multimodal Reconstruction
- 10 Oliver Street Reconstruction
- 11 Lubbock Neighborhood Street Improvements
- 12 Winter Street Promenade

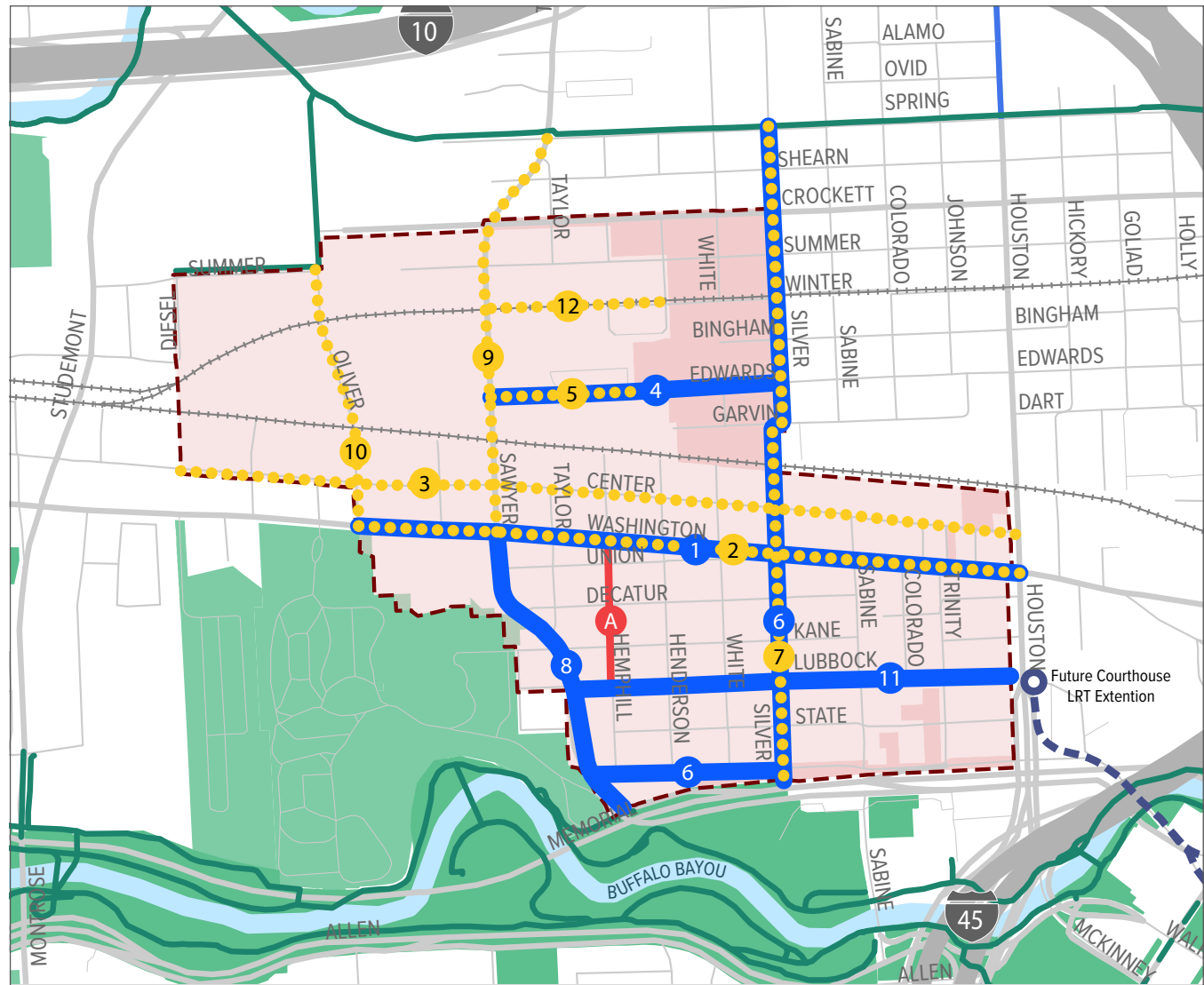


Figure 18. Recommended Great Street Corridor Improvements

- # Improve and Optimize Current Street
- # Street Reconstruction (typically including drainage and utilities as needed)

1 Washington Avenue Multimodal Improvements

Washington Avenue is in the heart of the study area and is a hub of destinations for people who live, work, or visit the community. Today people drive, walk, bike, and ride transit along this busy corridor. While the corridor is a draw for many, it is also a barrier. With few safe crossings, it can be difficult for people to cross the corridor to access the community and destinations to the south and north. Breaking down these barriers and better integrating mobility options for all modes to improve safety and access is the core of this recommendation.

It is recommended that in the near-term Washington Avenue be improved with the following:

- Pavement repair and improvement
- Creation of a high-comfort bikeway
- Enhanced transit stops that are more comfortable, accessible, and consistent with METRO BOOST program
- Repaired sidewalks that meet current ADA standards and free of obstacles and hazards

This recommendation should be coordinated with, or done in partnership with METRO on their BOOST project for the 85 Antoine/ Washington route. Additionally, as the Washington Corridor has needs that extend beyond the TIRZ boundary, it is recommended to coordinate with other TIRZs, the City of Houston, and Harris County to extend the recommended improvements from Oliver Street to Studemont Street and from Houston Street to Bagby Street. The cross-section below and rendering on the following page visualize this recommendation.

2 Washington Avenue Vision

While the near-term proposed improvements can greatly enhance the Washington Avenue corridor, a full reconstruction of the corridor from Bagby Street to Westcott Street is recommended. The reconstruction would provide the highest level of accessibility and safety for all modes while reinforcing the surrounding businesses and facilitating future development along the corridor. The reconstruction would allow for enhanced planning and design that would most appropriately be able to meet the long-term needs of the community and develop Washington Avenue to support the economic and development needs of the future.

While there are established multimodal needs along Washington Avenue, additional enhancements and options for the long-term development of the corridor should be identified. For example, is it desirable for Washington Avenue to be a premier walking and biking corridor or to have high-capacity transit access?

Within the right-of-way, not every option can be accommodated. Developing priorities for the future and working through the trade-offs in accommodations associated with those priorities is essential. For example, if Washington Avenue were to have high-capacity transit, such as bus rapid transit or light rail, along the corridor, it may be necessary to locate high-comfort bike lanes along another parallel corridor, such as Center Street. Conversations and coordination with the community and stakeholders will be essential to developing this vision. Additionally, working with partners to secure grant funding to support this future planning and design work will leverage the work of this plan and the position of the TIRZ.

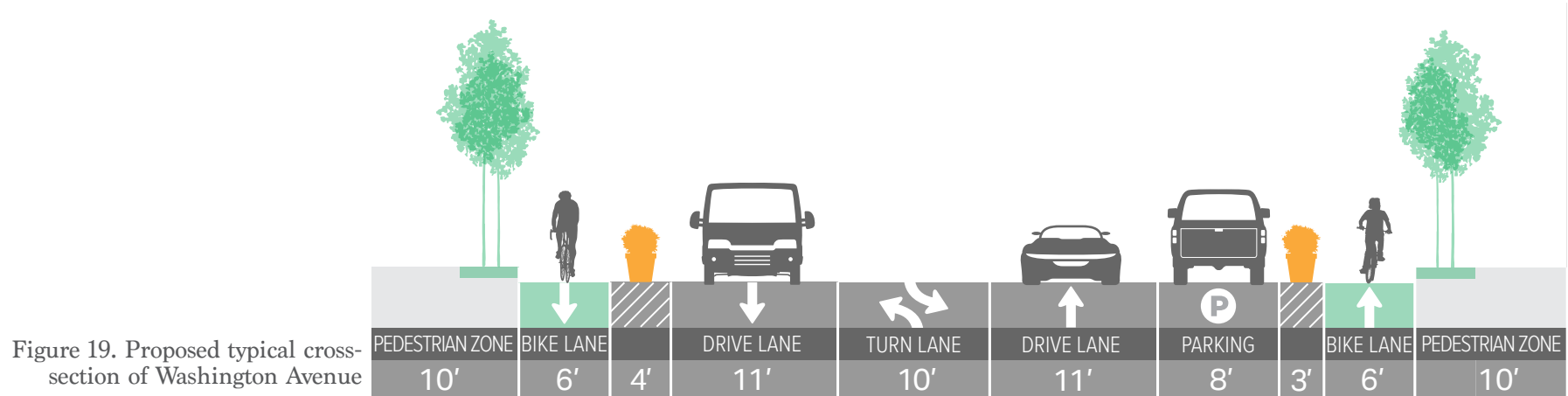


Figure 19. Proposed typical cross-section of Washington Avenue

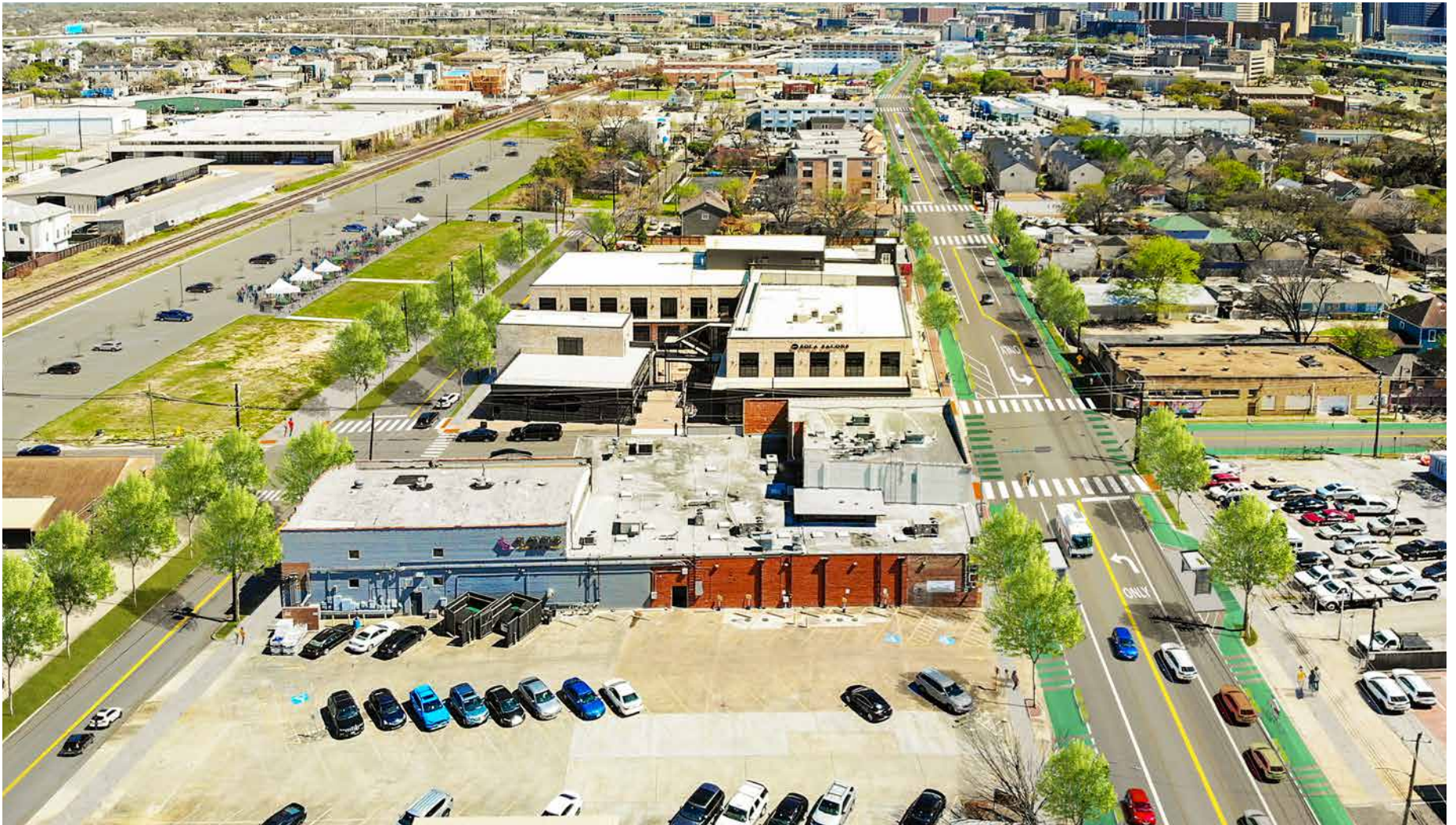


Rendering of proposed multimodal improvements along Washington Avenue at Silver Street

3 Center Street Vision

Center Street runs parallel to Washington Avenue through the study area and beyond. The development along corridor is changing from the historical light-industrial to a new mix of uses. It is recommended that Center Street be reconstructed to align the design with the changing development. It is proposed that Center Street be reconstructed with 6 feet wide sidewalks, improved drainage, and a safe bikeway. These improvements will enhance the overall aesthetic and accessibility of the corridor, increase use, and reinforce development opportunities.

Coordinating the vision and improvements along Center Street with the vision for Washington Avenue is a key opportunity that is recommended to be further explored beyond this study. As Washington Avenue is a busier commercial corridor, the Center Street corridor can provide additional options for people walking and biking to a variety of community destinations.



Rendering of proposed improvements and vision along Center Street and Washington Avenue

4 Edwards Street Multimodal Improvements

The recommendations for Edwards Street apply to the section between Silver Street and Sawyer Street. Development such as Sawyer Yards and Silver Street Studios bring lots of visitors to the area. To support the ability to walk between the many destinations, it is recommended to fill existing gaps or install new sidewalks along both sides of Edwards Street to serve access to adjacent development. New sidewalks should be 6 feet where feasible. Safety improvements would also include high comfort bikeway treatments and intersection improvements along the corridor. This bikeway is an important connection to destinations and transit service on Sawyer Street and to the planned north-south bikeway along Silver Street, ultimately connecting the MKT Trail and Buffalo Bayou Park.



Edwards Street looking east to Silver Street. Map Data: 2020 Google

5 Edwards Street Vision

In the longer-term, drainage is a community concern that will require improvements to the corridor. It is recommended to further study the level of drainage improvements needed to address these issues. For future reconstruction, the design of the corridor could be modified. The key components of walkability and a safe bikeway should be incorporated in any future design, elevating the components to a higher-level of comfort than able to be achieved in the above-mentioned Multimodal Improvements recommendation.



Edwards Street looking west to Sawyer Street. Map Data: 2020 Google

6 Silver Street Bikeway

Silver Street is an important north-south corridor and one of a few that cross the railroad tracks that traverse the study area. This project incorporated a transportation assessment of Silver Street that provides detailed analysis, recommendations, and associated schematic (see Appendix B Silver Street Assessment for details). The recommended improvements identified below prioritize the safety of bicyclists and pedestrians, access to transit, and maintaining reliable vehicular mobility.

- Implement a safe and comfortable bikeway for people of all ages and abilities along the corridor
- Improve trail connections to the Buffalo Bayou and MKT trails
- Install a new traffic signal at Silver Street and Washington Avenue to facilitate safe crossings and turning movements.
- Provide a new all-way stop along Silver Street at the Crockett Street and Dart Street intersections.
- Support access to transit with bus stop enhancements at Washington Avenue and Silver Street.
- Propose closure of the Memorial Drive access from Silver Street to improve safety. Memorial Drive would maintain access from Houston Avenue and Sawyer Street. If Silver Street was closed at Memorial Drive, other design options, such as a shared-on-street bikeway, may be feasible. Reevaluation of traffic volumes and speeds would be required in order to ensure a safe biking experience could be developed. A benefit to shared on-street bikeways would be the potential to maintain on-street parking.

Schematic of proposed bikeway on Silver Street between Bingham Street and Crockett Street



Memorial Way Study & Improvements

Memorial Way provides links to trails and many of the other recommendations identified in this section. It is an important neighborhood street that should be improved to facilitate safe connections for all modes. In particular, the neighborhood connection and wayfinding from Silver Street to Buffalo Bayou Trail access on Sawyer Street will be key linkages for community access. These linkages and improvements could be incorporated into the Silver Street Bikeway Project.

Additionally, as part of Memorial Way is within TIRZ 3, coordination will be important on any recommendations. With additional coordination, improvements and neighborhood connections could be extended to Sabine Street and Houston Avenue. This would provide multiple options for people to connect to destinations safely.

7 Silver Street Vision

The long-term corridor vision for Silver Street builds off of the Silver Street Bikeway recommendations. A key component of the Silver Street vision is enhanced sidewalks: 6 feet wide where feasible, with ADA compliant curb ramps and crossings. Additionally, railroad crossings would be further enhanced for safety of all modes, intersections would receive more extensive modifications to support safety, and drainage would be improved with new curb-and-gutter facilities. Streetscape improvements would also be incorporated into intersection improvements and along the corridor where feasible.



Rendering of proposed bikeway on Silver Street between Lubbock Street and Washington Avenue

8 Sawyer Street South Multimodal Improvements

Sawyer Street is an important north-south corridor that has a variety of surrounding land uses and accommodates a variety of mobility needs. As such, the corridor has been split into two segments to best accommodate the needed improvements along the corridor. Sawyer Street South Multimodal Improvements are applicable between Washington Avenue and Memorial Drive. It is recommended that these improvements develop a safe, high-comfort bikeway connection to Buffalo Bayou Trail along with sidewalk improvements and safe crossings.

The bikeway would be a combination of bike lanes and a side path at the southern terminus to connect into Buffalo Bayou Trail. The existing roadway would consist of two vehicle travel lanes with bike lanes in each direction. A shared-use path on the east side would provide a direct connection to Buffalo Bayou Trail at the southern end of Sawyer Street (near the senior living facility at 2100 Memorial Drive). Restriping to incorporate bike lanes would also better align the travel lanes at the Washington Avenue signalized intersection to improve safety.

It is also proposed to improve walkability along the corridor by filling in existing gaps along Sawyer Street and improve pedestrian safety and visibility at multiple crossings with ADA compliant curb ramps and crosswalks.



Sawyer Street recommendations from the Sawyer Street Vision project

9 Sawyer Street North Reconstruction

Sawyer Street north of Washington Avenue is recommended to be a longer-term project with a full reconstruction of the corridor to Spring Street (MTK Trail). The reconstruction will enable the corridor to provide safe accommodations for multiple modes while providing access to the variety of destinations and accommodate current and future demand from development along the corridor. The proposed elements to be incorporated into the design of this corridor are highlighted below:

- Rail crossings should be improved for safety and accessibility for people walking, biking, and using wheelchairs and strollers.
- Sidewalks should be 6 feet wide where possible with ADA compliant curb ramps and crosswalks. Any gaps in the network or locations with substandard width should be improved.
- High-comfort bikeways should be provided to create and improve access to the trails as well as businesses and developments along the corridor. Such facilities could take shape in the form of bike lanes with a buffer or protection, or as an off-street facility.

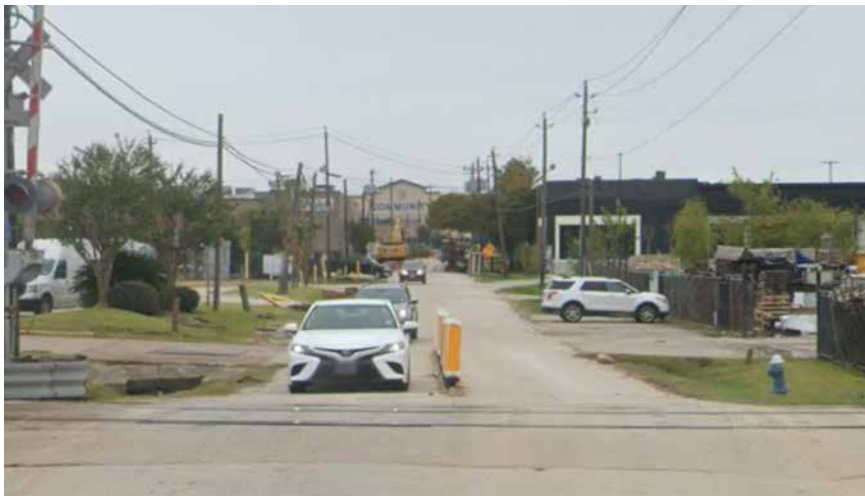
The following are key design considerations to incorporate into the design of this project:

- This recommendation would require using the full 70' of right-of-way (as per MTFP) along the corridor to implement the full cross-section as proposed.
- Coordination with drainage needs and utilities is needed to identify needs and incorporate them into the project.

10 Oliver Street Reconstruction

Oliver Street currently provides access between Washington Avenue and Summer Street/MKT Trail. It is one of the fews streets in the study area that cross both railway lines, providing a critical connection for the mobility through the TIRZ. Along the corridor, there are a variety of land uses and redevelopments occurring. It is recommended to reconstruct Oliver Street to provide improved travel lanes, vehicle access, sidewalks, and a side path for biking. The side path would extend recent construction from the MKT Trail. These improvements will provide a foundation of mobility for all along this corridor and in the western part of the study area.

Oliver Street has multiple rail crossings that should be addressed during the reconstruction to ensure they are safe and visible for people using all modes. Additionally, streetscaping along this corridor can significantly enhance this part of the study area and reinforce the public and private investments that are being made today and planned for the future.



Oliver Street looking south to Washington Avenue.
Map Data: 2020 Google

11 Lubbock Neighborhood Street Improvements

While a predominantly residential street, Lubbock Street provides important access to Sawyer Street, Silver Street, and the City of Houston Court Complex at Houston Avenue. The Court Complex is the site of a potential redevelopment that would include a new station and extension of the Green/Purple METRORail line. Improvements would increase safety for all modes and be a great connection for the community between bayou trails and the proposed redevelopment. To do this, Lubbock Street is recommended to become a Neighborhood Safe Street with the following key components as identified below and shown in the rendering on page 46.

- **Enhanced Walkability:** Close gaps in sidewalk connectivity and construct ADA compliant curb ramps and intersection crossings. It is recommended to realign the sidewalk at Sabine Street so that it does not travel directly under the property at 1718 Lubbock Street for ADA and safety improvements.
- **Improved Safety:** Better safety for all modes could be accomplished through signage and improvements at intersections to enhance visibility of people walking and biking.
- **Sabine Street Intersection:** Enhance the wide intersection and coordinate with the one-way improvements as those advance. Explore the option with the City of Houston to install an all-way stop.
- **Safe Biking:** Incorporate a safe option for biking along the corridor. From Sawyer Street to Sabine Street, a shared on-street bikeway is recommended using signage and roadway markings to indicate the shared use of the corridor as well as wayfinding. At Sabine Street, the corridor widens and transitions from an open-ditch to a curb-and-gutter roadway. East of Sabine Street multiple options could be considered in the future design along with community input.
- **On-Street Bike Lanes:** At Sabine Street the shared on-street bikeway could transition to on-street bike lanes in each direction to Houston Avenue. With this option, on-street parking could be included on the north side of the corridor adjacent to the curb. (This option is shown in the rendering on page 46)
- **Sidepath:** A shared-use sidepath along the corridor between Sabine Street and Houston Avenue could be considered. This would provide shared space for walking and biking back of curb, likely without impacting existing parking.

- Neighborhood Bikeway: Community feedback identified an option to construct roundabout at Trinity Street along with other street treatments to ensure a safe neighborhood street with a shared on-street bikeway similar to the proposed design west of Sabine Street. This would likely not impact existing parking.

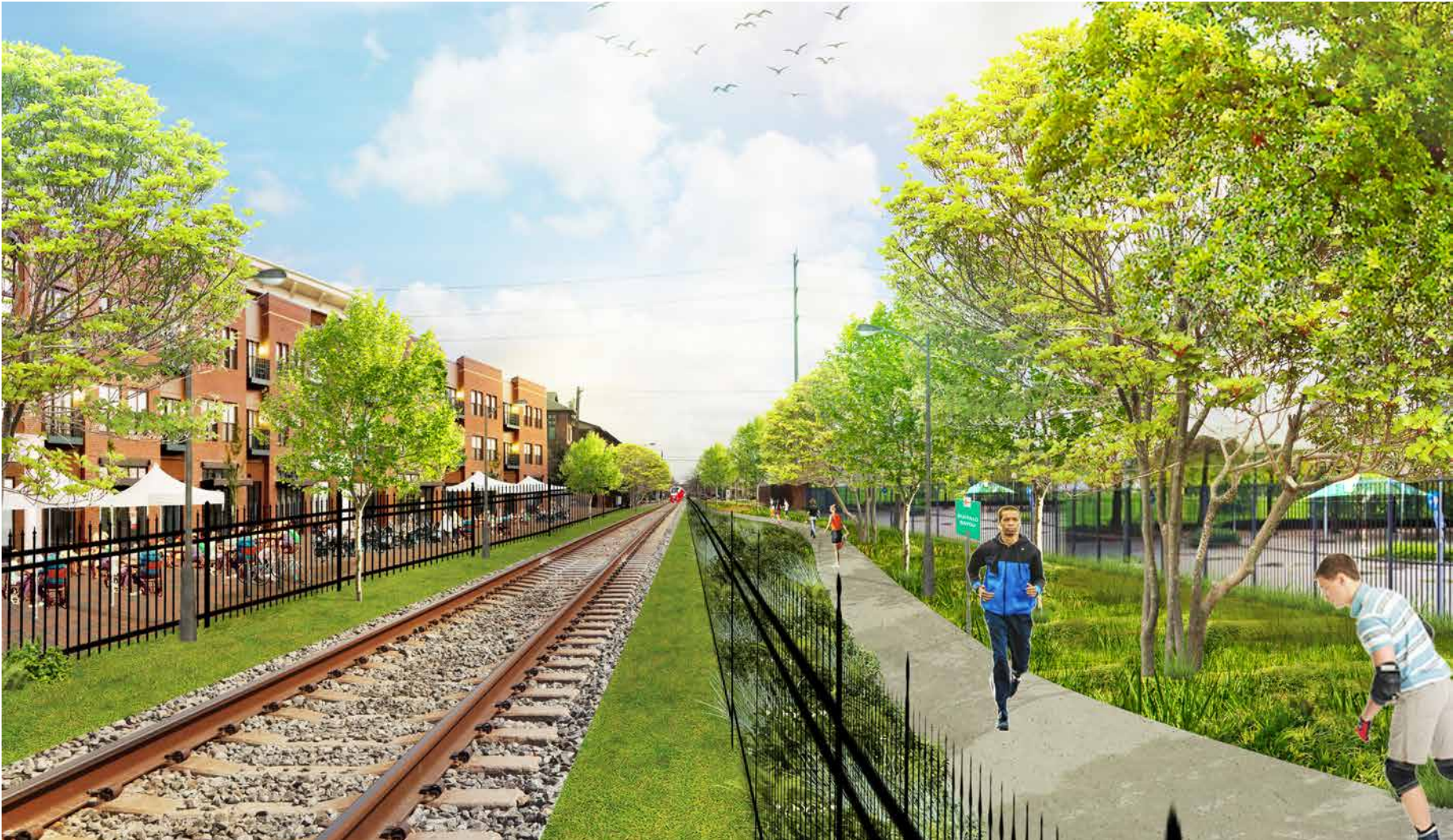


Rendering of proposed Lubbock Street improvements

12 Winter Street Promenade

Between Henderson and Sawyer Streets, Winter Street is proposed to become a walkable/bikeable promenade area that builds on the vibrancy of the neighborhood and creates a new destination for the community. The Winter Street Promenade would bolster existing destinations and encourage future development by leveraging the space around the railroad as an asset that provides access to destinations as well as a place to comfortably walk and bike.

Specifically, Winter Street would be centered around a multiuse trail that could ultimately connect the Silver Street Bikeway and Sawyer Street multimodal improvements. The rendering below visualizes how this promenade concept could be developed.



Rendering of proposed Winter Street Promenade

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Chapter

4

Action Plan

Implementation Action Plan

This plan provides a series of recommendations that build on opportunities in Old Sixth Ward to achieve the ideals in the Case for Action (Chapter 2). The Action Plan presented in this chapter serves as a blueprint for implementing the recommendations in Chapter 3 by bringing together strategies for prioritization, funding, coordination, and other tools to move projects from planning to reality. The Action Plan includes:

- The **Project Action Summary Table**, which lists the recommendations from Chapter 3 alongside planning-level cost estimates, the ease of implementation, suggested time frames, potential funding strategies, and the anticipated roles of the TIRZ.
- The **Implementation Toolbox**, which provides information on partnerships and funding, implementation strategies, policies, and design guidance.

Implementation is a continuous cycle of planning, prioritizing, constructing, and evaluating projects to achieve broader mobility goals. Figure 1 summarizes the recommended projects detailed in Chapter 3 and adds information—described in more detail below—to aid the TIRZ in the implementation process.

Many of the implementation considerations in Figure 1 are interrelated. While the TIRZ can pursue certain recommendations in this plan through existing local funding, it will need to supplement local funds with additional external resources for other projects. The precise order and time frame in which the TIRZ pursues specific projects will depend in part on opportunities to secure additional funding and leverage investments through partnerships and grant applications. Prioritizing and developing projects also requires distinguishing between projects that can generate quick wins, straightforward near-term opportunities, and transformative long-term moves requiring more resources and coordination.

Cost Estimates

- Planning-level cost estimates provide a starting point for use in grant applications and CIP development. Costs should be refined in design. Estimates include the cost of construction, project mobilization (10% of construction), contingency (20 percent of construction), and engineering design (15 percent of construction). Detailed cost estimates are provided in Appendix C.

Project Type

- **Early Opportunities:** These smaller-scale projects utilize existing partnerships or funding streams to create quick wins and build community support for future improvements.
- **Key Improvements:** These projects address important needs or create critical connections, but are not necessarily large-scale or may not require partners.
- **Big Move:** These large-scale projects have the potential to transform mobility in Old Sixth Ward and will typically require partnerships.
- **Strategic Program:** These small-scale projects can be done over time to create significant improvements and community benefit.

Timing

- **Short (1-3 years):** These projects have lower costs and do not typically require extensive right-of way acquisition or coordination.
- **Medium (4-7 years):** These projects have lower or medium costs and may require more coordination or a higher level of effort to implement.
- **Long (8+ years):** These projects have greater complexity and higher costs, require coordination, and may require right-of way acquisition or resolving regulatory issues.
- **Ongoing:** The TIRZ can continuously work on these projects over time.

Ease of Implementation

- **Ease of implementation (EOI)** is a qualitative assessment for how easy or difficult a project will be to implement. This assessment considers cost, right-of-way, regulatory hurdles, coordination with other entities or projects, and the level of the overall project scope. A high EOI means a project is easier to implement.

Implementing Role

TIRZ 13 may act in various capacities to develop and implement projects. Figure 1 defines three roles for the TIRZ:

- **Do-It-Yourself:** Lead the effort and drive funding.
- **Leverage Partnerships:** Participate as a key project partner, provide funding and/or other project development (in-kind) support.
- **Led by Others:** Advocate for the project and participate with partners.

Figure 20. Project Action Summary Table

Project	Cost Estimate	Project Type	Timing	Ease of Implementation	Implementing Role
Washington Avenue Multimodal Improvements	\$ 2,040,000	Key Improvement			
Washington Avenue Vision	\$ 9,542,000	Big Move			
Center Street Vision	\$ 6,921,000	Big Move			
Edwards Street Multimodal Improvements	\$ 438,000	Early Opportunity			
Edwards Street Vision	\$ 1,859,000	Key Improvement			
Silver Street Bikeway	\$ 913,000	Early Opportunity			
Silver Street Vision	\$ 2,879,000	Big Move			
Sawyer Street South Multimodal Improvements	\$ 678,000	Early Opportunity			
Sawyer Street North Reconstruction	\$ 5,138,000	Big Move			
Oliver Street Reconstruction	\$ 1,433,000	Key Improvement			
Lubbock Neighborhood Street Improvements	\$ 475,000	Key Improvement			
Winter Street Promenade	\$ 485,000	Big Move			
District Sidewalk Program	\$ 2,615,000	Strategic Program			
Safe intersection and Street Crossing Program	\$ 696,000	Strategic Program			

Timing

- Short: 1 - 3 years
- Medium: 4 - 7 years
- Long: 8+ years
- Ongoing

Ease of Implementation (EOI)

- Easier to implement
- More difficult to Implement

Implementing Role

- Do-It-Yourself
- Leverage Partnerships
- Led by Others

Implementation Toolbox

The implementation toolbox pulls together three components to aid the TIRZ in developing and constructing the recommendations in this Mobility Plan:

- **Funding & Partnerships:** This section outlines potential opportunities and strategies to secure grant funding and establish partnerships with other entities.
- **Implementation Strategies:** This section details three potential strategies for implementation of recommendations based on funding opportunities and project type.
- **Policies Supporting Implementation:** This section highlights how the TIRZ can leverage this plan and City of Houston policies to aid in implementation.
- **Design Guidance:** This section provides an overview of design considerations to address common barriers across the community as well as references to best practices and design guides.

Funding & Partnerships

Implementation hinges on the availability of resources, particularly funding. The TIRZ can expedite the implementation of the Mobility Plan by identifying multiple funding streams to supplement local resources. When implementing the recommendations, the TIRZ will both manage projects and facilitate coordination. While the TIRZ can fund and implement some recommendations independently, it may need to facilitate partnerships with other entities to complete complex, large-scale capital projects. The TIRZ can also incentivize high-priority projects and prime them for public or private investment in the future.

Pursue Grant Opportunities

Grants leverage local funding streams to increase the amount of projects or programs that can be implemented. Strategic use of grant funding focuses local dollars where they are most needed. TIRZ 13 has a history of successful grant applications from a variety of sources.

Grant opportunities for projects large and small are available from a variety of local, state and national sources. Harris County, H-GAC, and METRO offer local grant opportunities for mobility projects, including bikeways, improving transit stops and access to transit, and safety for all modes.

Target Grants to be Highly Competitive

In order to be competitive in the grant process, it is important for the TIRZ to match the right project(s) to the right grant. The desired outcomes of the grant program should be achievable through the proposed project(s) and the benefits of the proposed project should be well communicated in the grant application. For some grants, it may also be strategic to pair recommendations together that further enhance the benefits and outcomes of the projects. In other cases, seeking funding for a particular component of a large, complex project as relevant grant opportunities arise can provide forward movement toward implementing the project in its entirety.

Leverage Coordination & Partnerships

Partnerships with public agencies, developers, property owners, and businesses are key to successful implementation of projects with community support and grant funding. The recommendations in this plan add significant value in Old Sixth Ward by expanding multimodal choices, safety improvements, and development opportunities. The recommended projects can attract investment interest from other agencies, such as the City of Houston, Harris County, METRO, H-GAC, developers, businesses, and philanthropic and non-profit organizations. In order to coordinate and partner with other agencies, TIRZ 13 must be able to clearly identify the project and its benefits. Additionally, partnerships and coordination can provide information, drive public support, and build capacity.

Implementation Strategies

Prioritizing projects and recommendations to meet the community's needs and aspirations needs is key to achieving the mobility goals envisioned in the Case for Action. While the TIRZ can implement many of the recommendations in this plan as standalone projects, most of the proposed projects depend upon, complement, or build on one another to some degree. A clear understanding of the relationships and dependencies between projects can help the TIRZ build successes and support implementation of the plan. The three implementation strategies highlighted below can help the TIRZ plan for investments, gain support, receive funding, and realize the full benefits of interrelated projects.

Leveraging Investments Over Time

In order to achieve quick wins, the TIRZ can select lower-cost projects—or elements of projects—to fund and implement locally within a short time frame. Then, the TIRZ can build up to implementing more complex recommendations that involve a multitude of partners and require greater investment and coordination.

The TIRZ can also leverage investments over time by breaking down larger and more complex projects into phases. Those phases can in turn be broken down into foundational components that are important to construct first and enhancement components that make the project better, but can be done at a later time without requiring revision of the first phase.

Rapid Implementation Strategies

Rapid implementations strategies focus on reducing the time it takes to implement a project by using lower-cost materials and designing improvements within the existing space or context, as opposed to fully redesigning a facility or area. Rapid implementation materials, such as paint and bollards instead of concrete, typically require less effort to construct and may be easier to remove or alter after initial installation.

This strategy has multiple benefits. First, the community sees changes quicker, which can garner support for future projects or more permanent changes. Additionally, implementing projects in a flexible way that can be easily adjusted later on allows the TIRZ to gather input from businesses, the community, and stakeholders about adjustments in the design to ensure that it meets the needs as intended and is the best design for full construction at a later point.

Building Networks

Finally, the TIRZ can focus on projects that build networks. This refers to fully implementing one or more corridor projects all at once, rather than over time, in order to reap the full benefits of multimodal spines that link destinations throughout the community. While building networks typically requires greater upfront investment, being able to tie in the more significant benefits to a network of improvements can aid in eliciting funding and support from project partners or grants. Walkability and bicycle network improvements, such as the Silver Street bikeway, are well suited for this strategy.

Policies Supporting Implementation

The TIRZ can utilize existing and new policies to help coordinate and implement this plan. The TIRZ can leverage this plan as a tool for coordination with agencies and developers and can build upon the Mobility Plan with a Character and Development Guide. Additionally, the TIRZ can incorporate multiple policies from the City of Houston into coordination and development moving forward that will support the recommendations in this plan and maximize the impact of its investments.

Creating TIRZ Guidelines

Character and development guidelines encourage development and redevelopment that supports walkability and multimodal access, two key components of this plan. Guidelines can encourage street-oriented building design, a spacious and attractive pedestrian realm, and appropriate interaction between adjacent land uses. While the TIRZ cannot directly regulate development, guidelines can provide direction and incentivize developers to adopt best practices such as:

- Wide sidewalks adjacent to all new buildings and pedestrian-oriented building forms create a comfortable and welcoming place that encourages walking and gathering.
- Buffers between the pedestrian area and the street should be incorporated through landscaping, furniture, or other amenities. On streets with public transit routes, an expanded pedestrian realm can accommodate spacious, attractive stops and stations that encourage transit use.
- Shared parking should be evaluated on redevelopment sites to reduce parking area when uses have different peak parking timeframes.
- For large site redevelopments, block length should not exceed 400 feet without introducing a through-connection. The preference is for this connection to be a street, however, in some cases, an alley, pedestrian plaza, or another facility may be appropriate.
- Bicycle routes should connect key destinations and be designed for all ages and abilities.

Leveraging City of Houston Policies

Several City of Houston Code of Ordinances chapters (42, 26, and 33), along with the Walkable Places and TOD Ordinances provide tools that can be used to develop a more walkable, active community. The TIRZ should leverage and build on these tools and parking management strategies to increase the comfortable use of transit, walking, and biking.

Working with developers and property owners to take advantage of flexible and reduced parking requirements, and shared parking can spur economic activity and livability by providing walkable development that places emphasis on access through multiple modes and ensuring the pedestrian realm and surrounding development are coordinated.

The City of Houston’s Walkable Places Ordinance aims to encourage pedestrian-friendly, mixed-use development with an enhanced, walkable public realm. Through an application process, districts designated as “walkable places” can gain access to more development options, tools, and standards available that facilitate safe, attractive options for walking and biking. Some of these components include bringing building facades closer to the road, expanding sidewalks, parking location adjustments, and including bike parking. This new ordinance could be particularly applicable for Washington Avenue.



Photo: City of Houston

Design Guidance

Old Sixth Ward faces various mobility challenges, two of which are particularly common throughout the district: roadway and railroad crossings. These crossings impact all modes, but have more significant mobility and safety impacts for people walking and biking.

Railroad Crossings

Railroad crossings may seem easy to address by building a sidewalk across the tracks. However, depending on usage of the railroad track and the operator, additional components—like warning strips, pedestrian gate arms, and fencing—may be needed for safety. Coordination with Union Pacific Railroad will be important for implementing improvements at railroad crossings.



*Top: Pedestrian crossing in Portland, Oregon
Source: Map Data: 2019 Google*

*Middle: Multimodal freight rail crossing in California
Source: Kevin Fixler, The Press Democrat*

*Bottom Right: Sidewalk crossing in Salem, Oregon
Source: Map Data: 2019 Google*

Bottom Left: Multimodal freight rail crossing in Port Richmond (Philadelphia), Pennsylvania



Roadway Crossings

As discussed in Chapter 3, pedestrian roadway crossings significantly increase access to local destinations. Building pedestrian refuges in medians or center turns lanes decreases the number of lanes of traffic people walking and biking have to contend with at any one time, and presents opportunities to create safe crossing locations between existing signals. Signage and crosswalk striping improves visibility of and for pedestrians, and helps establish expectations for vehicles and pedestrians on who has the right of way and where people should be crossing. Coordination with the City of Houston on new crossings will be required. Three potential crossing improvement locations along Washington Avenue are shown here.



Right images: potential pedestrian crossing improvement locations along Washington Avenue
 Below: Pedestrian crossing with median refuge example from NACTO Urban Street Design Guide



Resources and Best Practices

Many existing resources and design guides provide detailed information and guidance for project development. Figure 2 lists resources, ranging from local best practices to national design guides, that can help the TIRZ incorporate best design practices when implementing the recommendations of this plan.

Figure 21. Resources and Best Practices to Reference

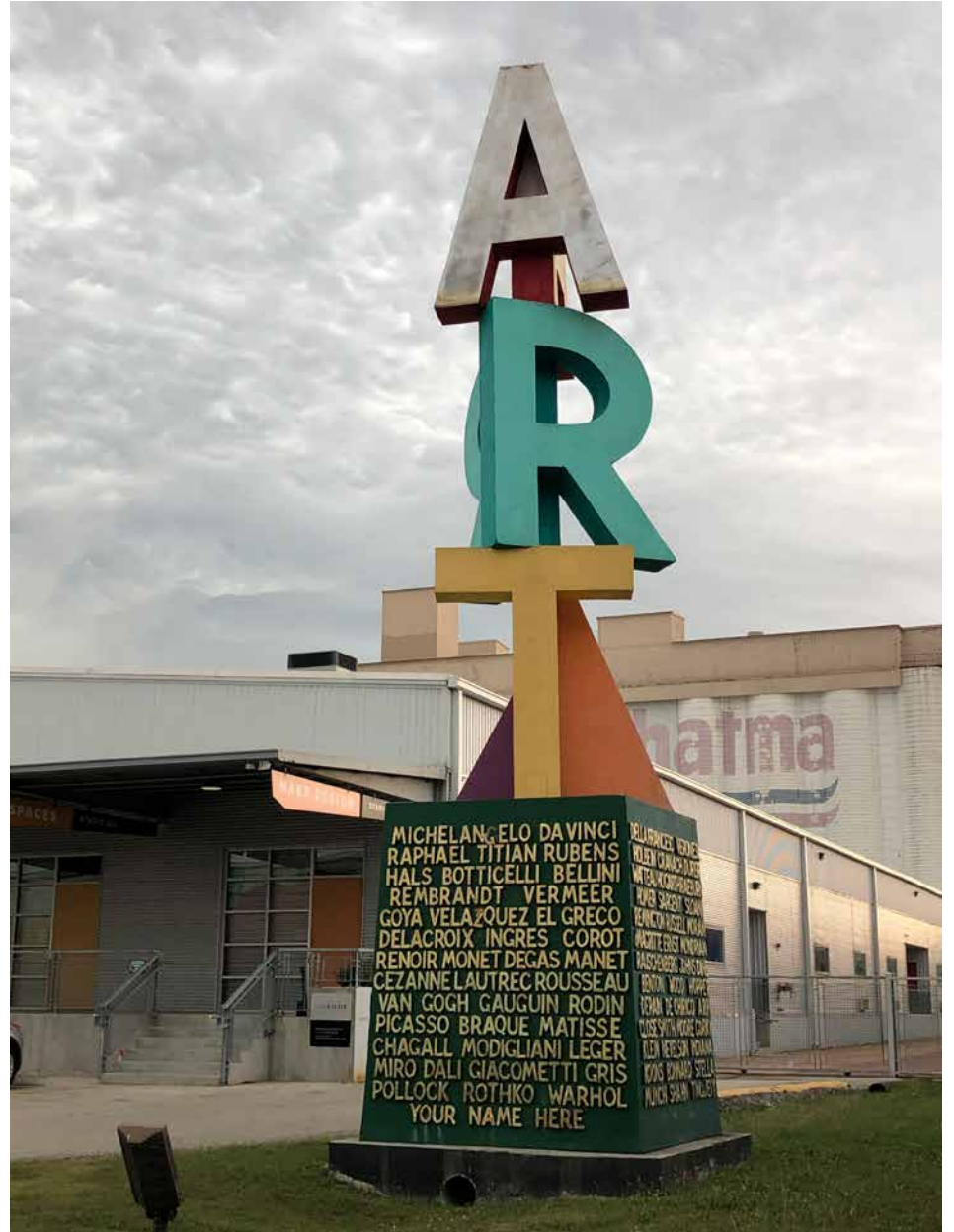
Year	Author	Title	Description
2012	H-GAC	Pedestrian Pathways Guide	Provides best practices, design, and implementation guidance for various types of pedestrian pathways
2014	NACTO	Urban Bikeway Design Guide	Design guidance for various types of bicycle infrastructure
2015	H-GAC	End of Trip Facilities Guide	Provides types of end-of-trip facilities and guidance for placement, design considerations, and cost
2016	H-GAC	Instant Impact Guide	Provides temporary, cost-effective ideas for creating vibrant streets
2016	H-GAC	Designing for Impact: A Regional Guide to Low Impact Development	Includes design considerations and best practices for incorporating environmentally-friendly design along corridors and within development
2017	NACTO	Designing for All Ages and Abilities	Identifies all ages and abilities riders and provides guidance on identifying the appropriate bicycle facility type
2017	FHWA	Proven Safety Countermeasures	Provides information and guidance on multiple safety countermeasures including pedestrian walkways and crossings
2017	ITE	Implementing Context Sensitive Design on Multimodal Corridors: A Practitioner's Handbook	Builds on previous ITE guidance and provides best practices for context-sensitive design, freight accommodations, and more.
2019	FHWA	Bikeway Selection Guide	Resource to identify the appropriate type of bikeway for the surrounding context and constraints
2019	NACTO	Don't Give Up At The Intersection	Provides detailed guidance for intersection design along bikeways
2019	FHWA	Highway-Rail Crossing Handbook, 3rd Edition	Provides pedestrian and bicycle best practices and treatments for railroad crossings
2020	City of Houston	Infrastructure Design Manual (IDM)	Defines City of Houston standards for facility design Chapter 17 provides guidance on appropriate pedestrian and bicycle crossing treatments based on traffic volumes, speeds, and roadway configuration
2020	Harris County	Pedestrian Crosswalk Guidance	Provides guidance on appropriate pedestrian crossing treatments based on traffic volumes, speeds, and roadway configuration

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Appendix

A

Fact Book



Document Overview

This Factbook provides maps, data visualizations, and photos that document the current demographics and transportation conditions in and around TIRZ 13 to inform the definition and implementation of the recommendations in the Mobility Plan. This Factbook will be an Appendix included within the Final Report of the TIRZ 13 Mobility Plan, which is currently ongoing.

This document also includes a section focused on the outputs of the detailed Sidewalk Assessment conducted for this Plan. This section includes the preliminary findings of the assessment and will be expanded on further in upcoming Plan tasks.

The final section of this document includes five corridor profiles that summarize the existing conditions of Key Corridors within the Study Area. These profiles will be the basis of corridor visioning to occur later in Plan development.

Table of Contents

Fact Book	A4
Sidewalk Assessment	A42
Key Corridors Assessment	A60

OLD SIXTH WARD TAX INCREMENT REINVESTMENT ZONE 13

Created in 1998, the Old Sixth Ward Tax Increment Reinvestment Zone (TIRZ 13) works to improve the historic Old Sixth Ward neighborhood area. TIRZ 13 focuses on public infrastructure projects as catalysts for development and quality of life, and helps ensure that local preferences and input guide investments by the City of Houston and other entities.

Figure A.1 shows TIRZ 13 as well as the Study Area considered throughout the Mobility Plan. The Study Area includes:

- the entirety of TIRZ 13,
- Silver Street between Memorial Way and Spring Street,
- blocks bounded by Silver Street, Crockett Street, and the TIRZ, and
- small pockets of land outside of the TIRZ just north of Memorial Drive and just west of Houston Avenue.

This Factbook provides maps, data visualizations, and photos that document the current demographics and transportation conditions in and around TIRZ 13 to inform the definition and implementation of the recommendations in the Mobility Plan.

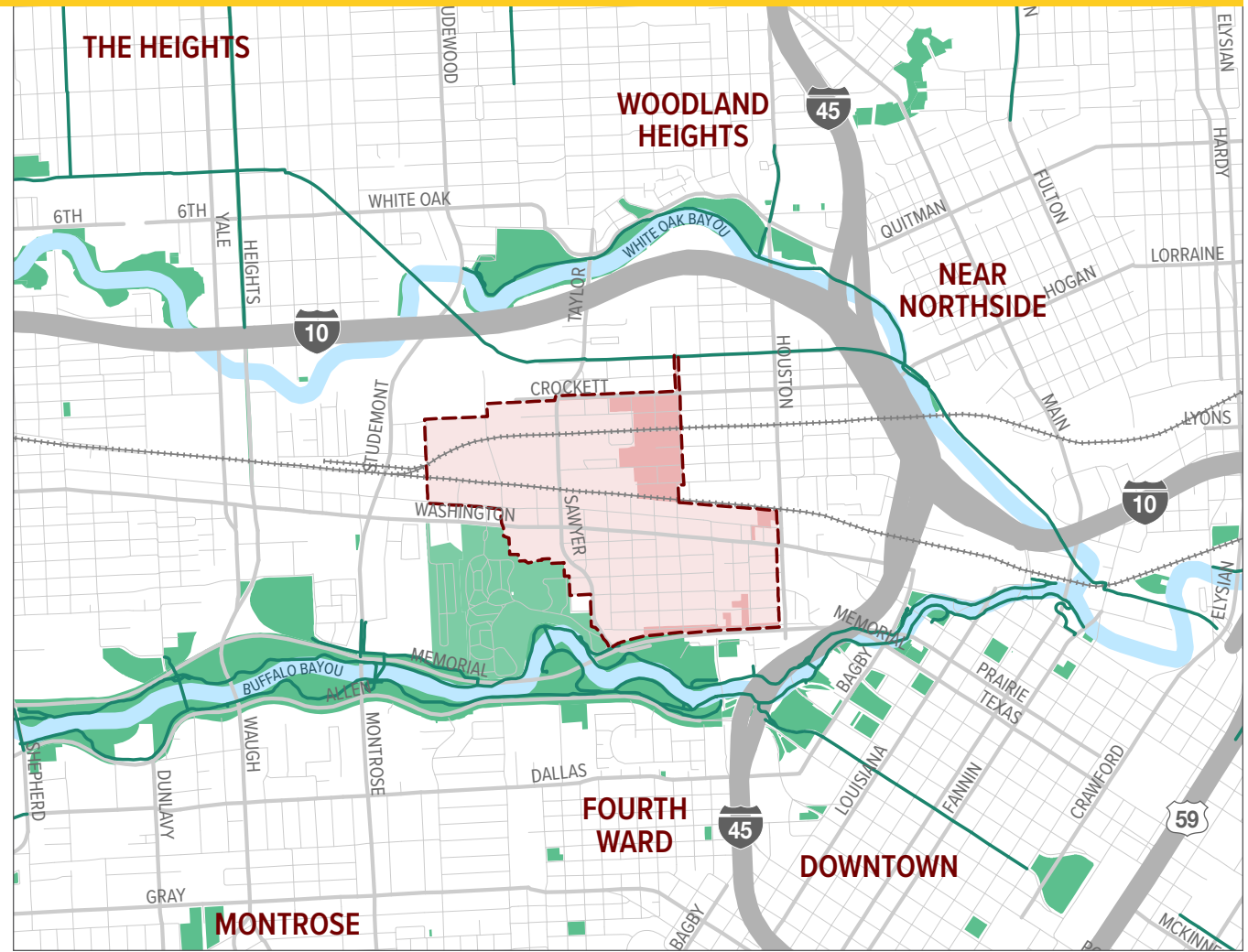


Figure A.1 Old Sixth Ward TIRZ 13 Mobility Plan Study Area



Source: City of Houston

COORDINATION & PARTNERSHIPS

PLANS, PROJECTS, PARTNERS

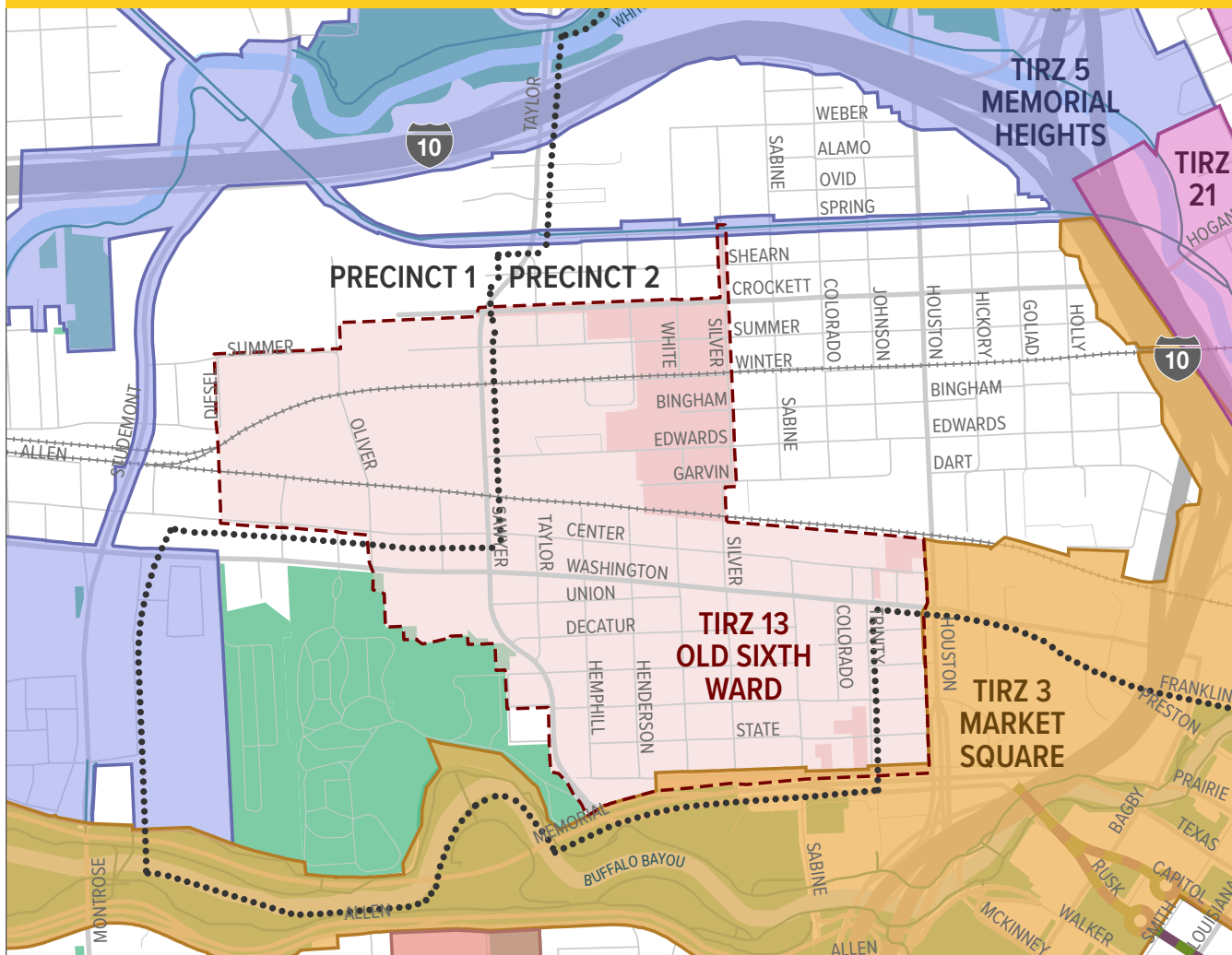


Figure A.2 Surrounding TIRZs & Precincts

- Study Area
- TIRZ 3: Market Square
- TIRZ 13: Old Sixth Ward
- TIRZ 5: Memorial
- Extended Study Area
- Heights

Source: City of Houston, Harris County

Nearby TIRZs

The TIRZs shown in **Figure A.2** fund multimodal mobility improvements within their boundaries, and their efforts can complement capital investments by TIRZ 13. TIRZ 5 (Memorial Heights) includes:

- Washington Avenue west of Washington Cemetery,
- Studemont Street, including the proposed Studemont METRORapid station at IH 10, and
- Heights–MKT Hike & Bike Trail, a shared-use path connecting to the Heights and Downtown.

TIRZ 3 (Market Square) includes:

- Buffalo Bayou Park,
- Memorial Drive,
- Washington Avenue east of Houston Avenue, and
- Houston Avenue south of the Union Pacific passenger rail line.

Harris County Precincts

TIRZ 13 intersects Harris County Precincts One and Two, both of which aspire and often partner with local districts to implement regional multimodal connections.

The Study Area is home to range of land uses and development types. As **Figure A.3** illustrates, the Study Area contains a mix of:

- Single-family residential and small-scale multifamily (including duplexes) in the historic Sixth Ward neighborhood south of Washington Avenue and a small section of the historic First Ward near Crockett Street and Silver Street;
- Mid-rise multi-family (in the form of both condos and apartments) along Sawyer Street, Washington Avenue, and Houston Avenue;
- Commercial and retail—some of which repurposes industrial sites and buildings—concentrated along and north of Washington Avenue;
- Light industrial and warehouses along the railroads;
- Exempt property used for civic and non-profit purposes, including several full blocks immediately north of Washington Avenue; and
- Vacant property, including several large parcels along the railroads.

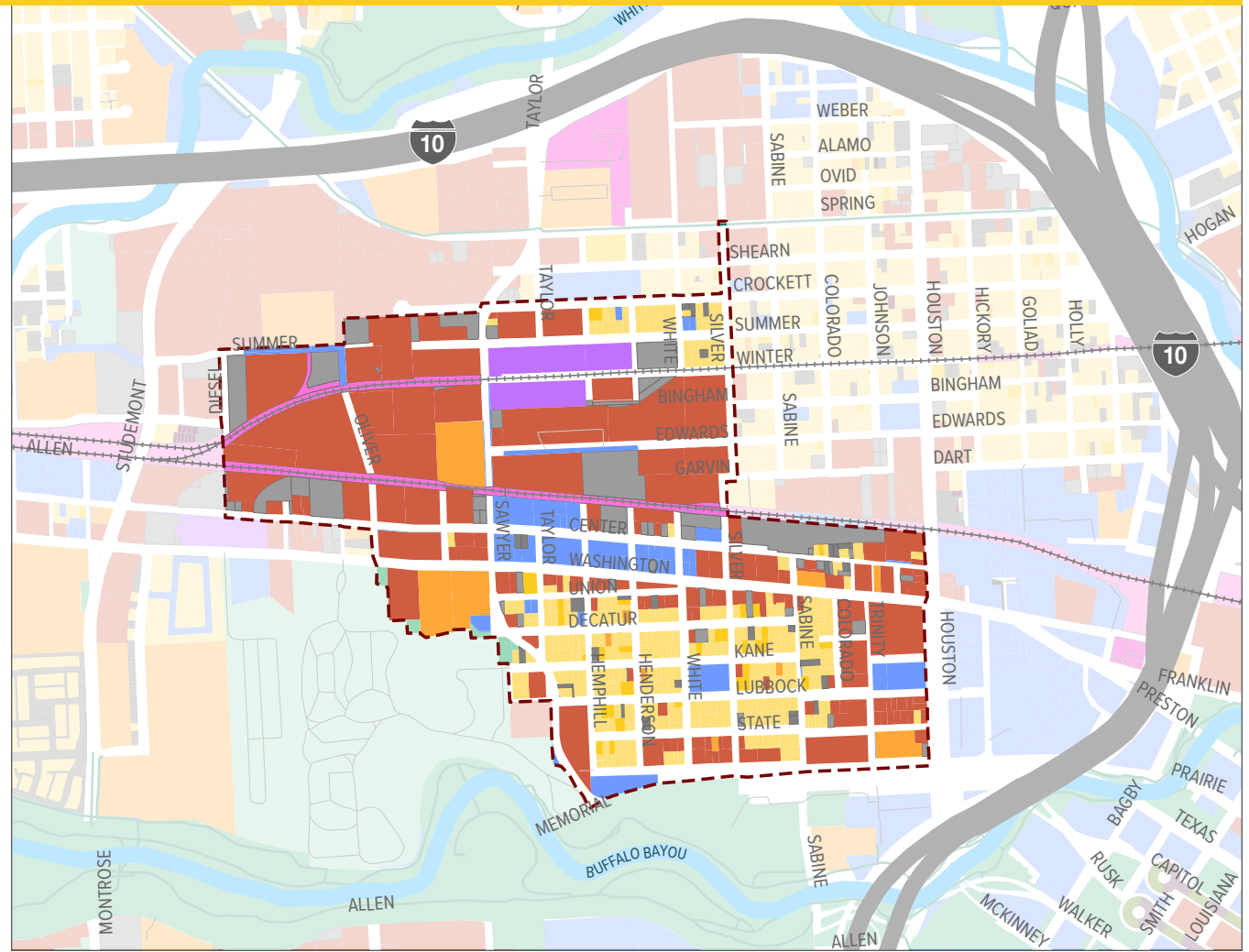


Figure A.3 Land Use



Source: Harris County Appraisal District 2020



Historic Residential & Commercial



New Single-Family Residential



New Multi-Family Residential



*Commercial in Historic Sixth Ward:
Henderson & Kane General Store*



New Commercial: Buffalo Bayou Brewing Co.



*Repurposed Commercial:
The Silos at Sawyer Yards*

The incredible range of destinations in and around TIRZ 13 bolster quality of life for people who live or work in the area and attract visitors from adjacent neighborhoods and throughout the Houston area. As **Figure A.4** illustrates, parks, schools, civic destinations, and businesses (including grocery stores and breweries) lie within or in the immediate vicinity of the TIRZ 13.

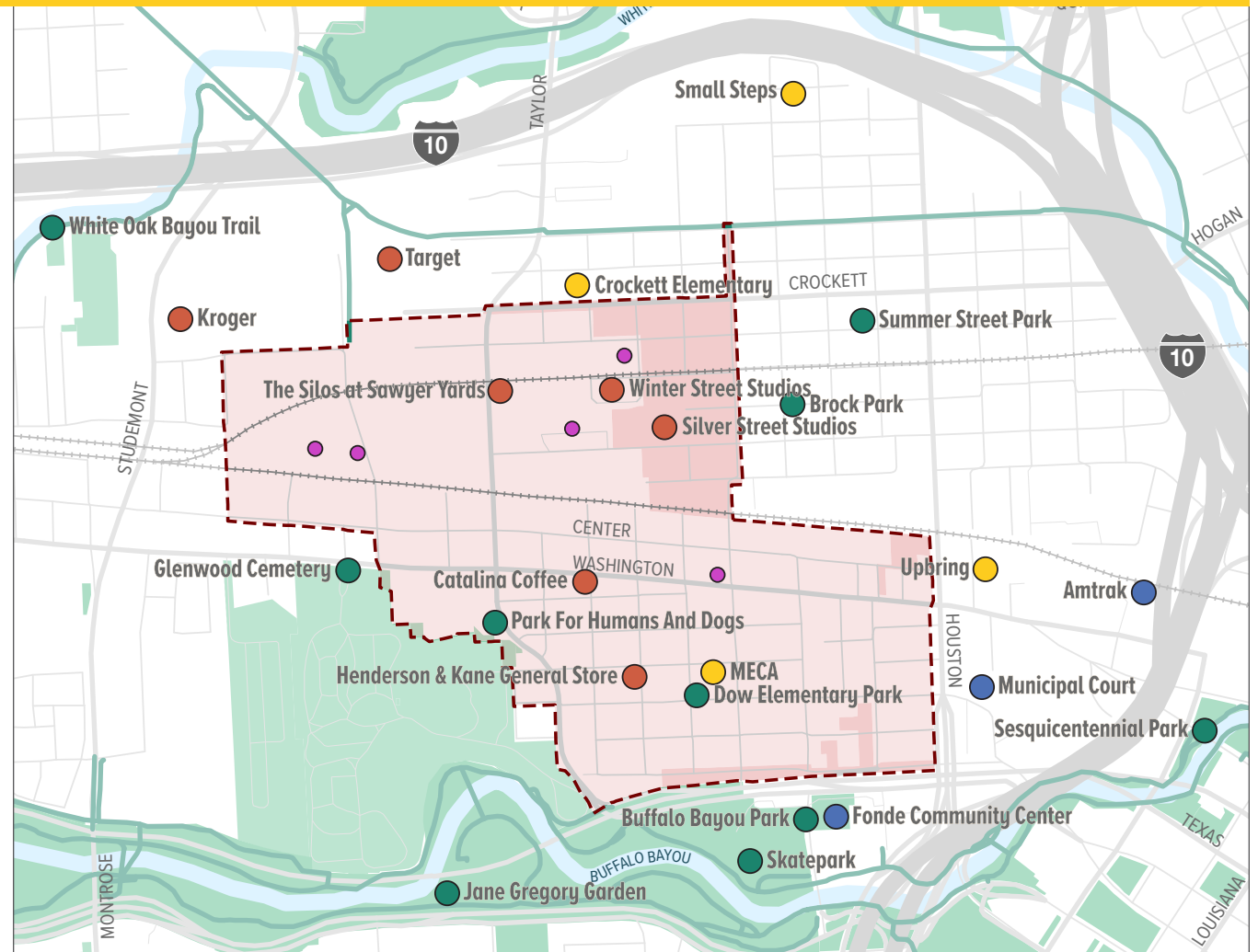


Figure A.4 Local Destinations

- Parks
- Civic
- Schools
- Commercial
- Brewery
- Study Area

Source:



Dow Elementary Park



Crockett Elementary School



The Silos at Sawyer Yards



MECA



Local Breweries



Buffalo Bayou Park

A HISTORIC DISTRICT: BUILDING AGE

One of Houston's oldest neighborhoods, the Old Sixth Ward encompasses historic homes—at least 125 of which date back to the 19th century—alongside brand new buildings on redeveloped industrial sites near the railroads.

Figure A.5 shows the age of buildings throughout the area, highlighting the historic Old Sixth Ward (as designated by the City of Houston and the National Register of Historic Places), which contains many of the oldest buildings in the area.

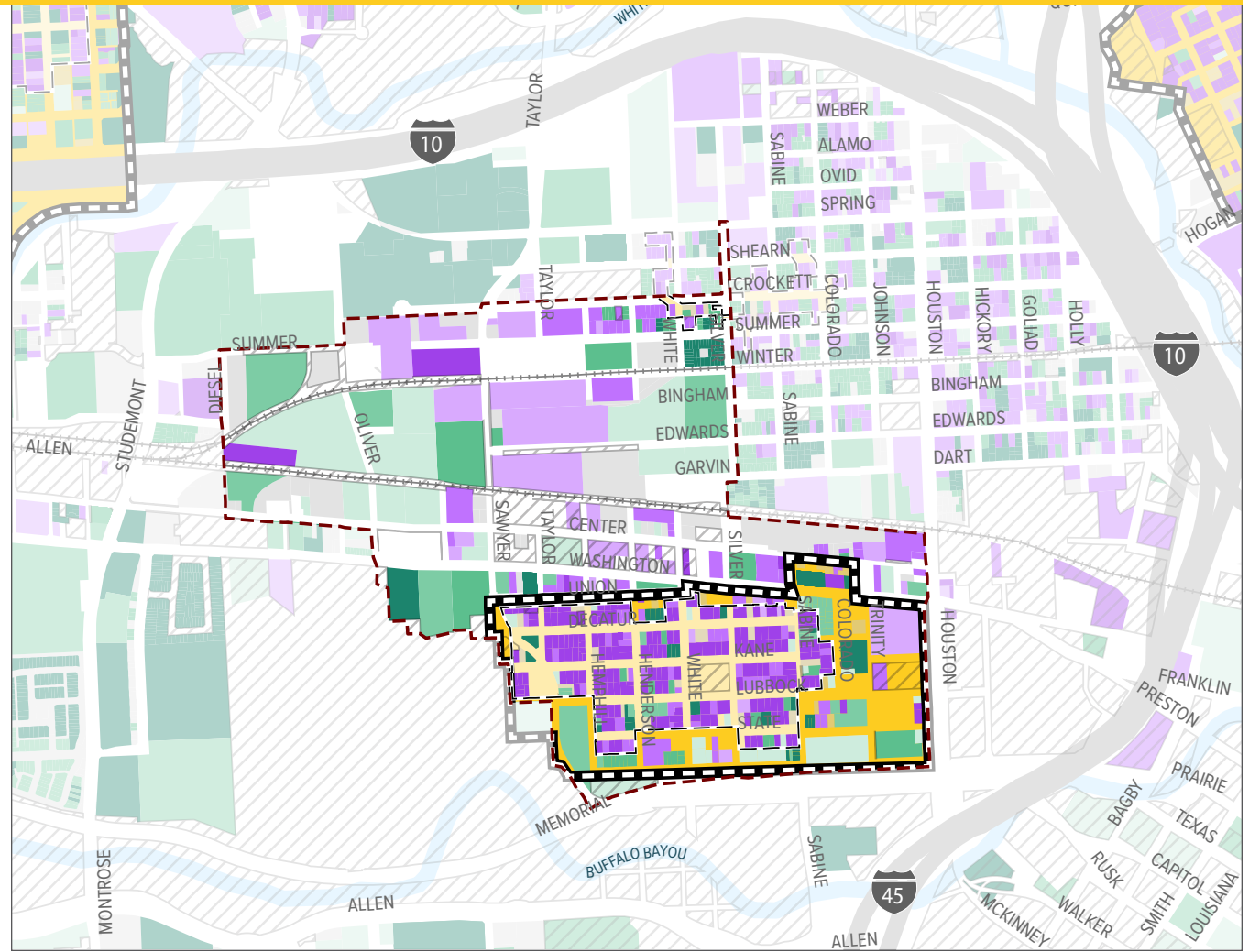
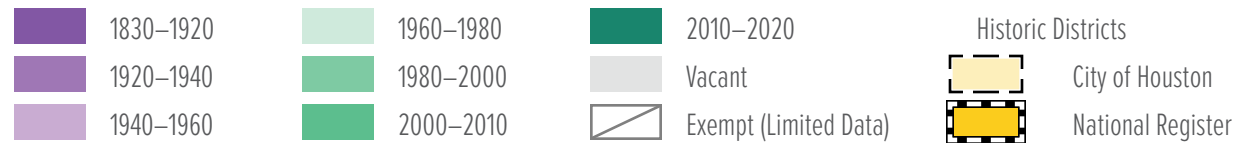
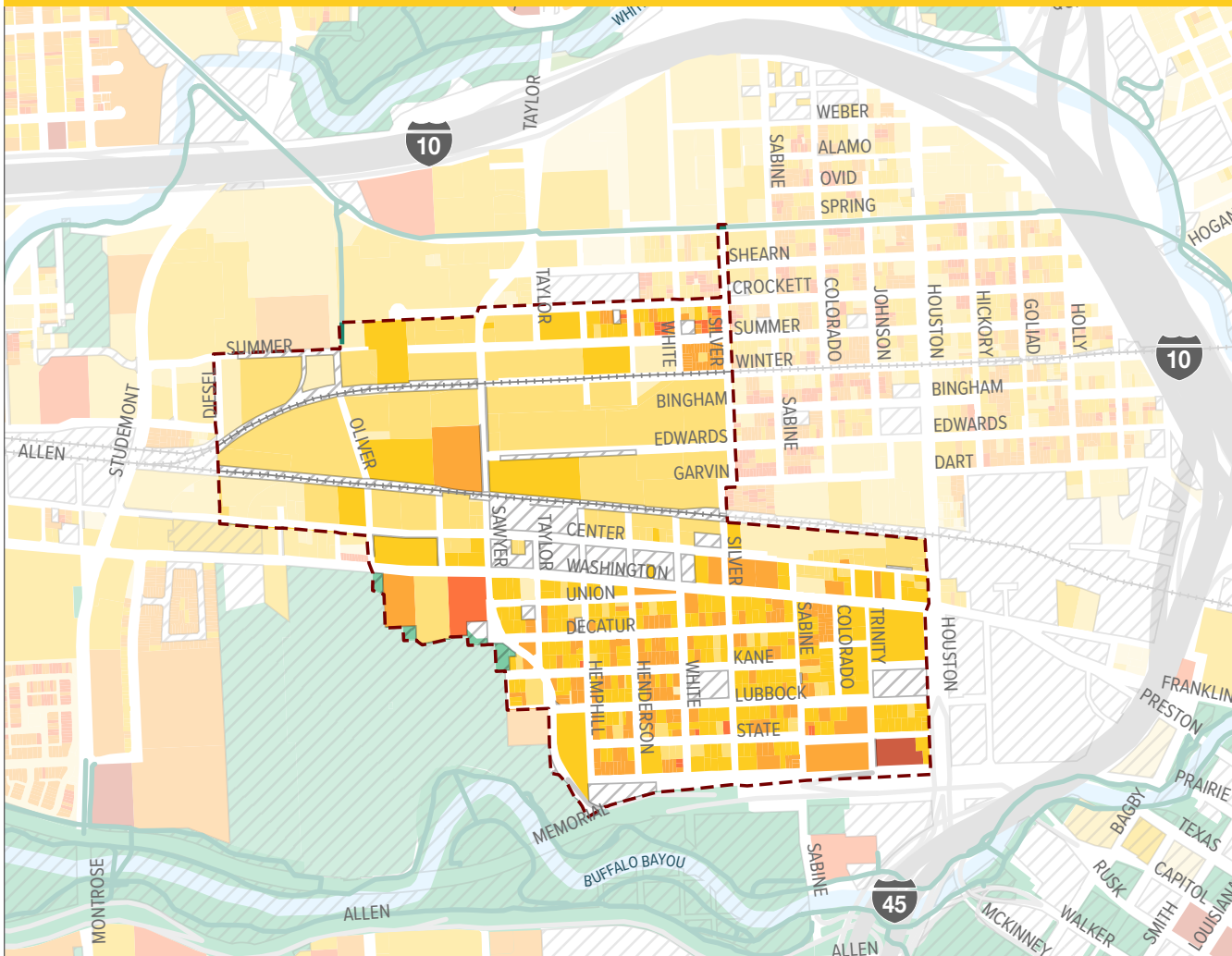


Figure A.5 Building Age & Historic Districts



Source: Harris County Appraisal District 2020, City of Houston, National Register of Historic Places



Property Value

Figure A.6 shows the assessed value of land and improvements per square foot on parcels throughout the area. Newer multi-family developments see the highest assessed values on a square-foot basis in the Study Area. The historic homes in Old Sixth Ward also command high property values.

Exempt Property

A significant amount of tax-exempt property used for civic and non-profit purposes exists throughout the area, most notably on six blocks along and just north of Washington Avenue, primarily owned by Salvation Army. Virtually all of the land beyond the TIRZ's southern border is also tax-exempt, including the Washington and Glenwood cemeteries, Buffalo Bayou Park, and the Courthouse complex.

Figure A.6 Land & Improvements Value



Source: Harris County Appraisal District 2020, City of Houston

TIRZ 13 CENSUS AREA

PEOPLE & PLACES

The Mobility Plan Census Area shown in **Figure A.7** consists of the four census block groups intersecting or directly adjacent to the Study Area. Together, these block groups comprise the area bound by IH 10, IH 45, Buffalo Bayou, and Heights Boulevard/Waugh Drive. Unless otherwise indicated, demographic maps and figures include residents and workers within the Mobility Plan Census Area shown here.

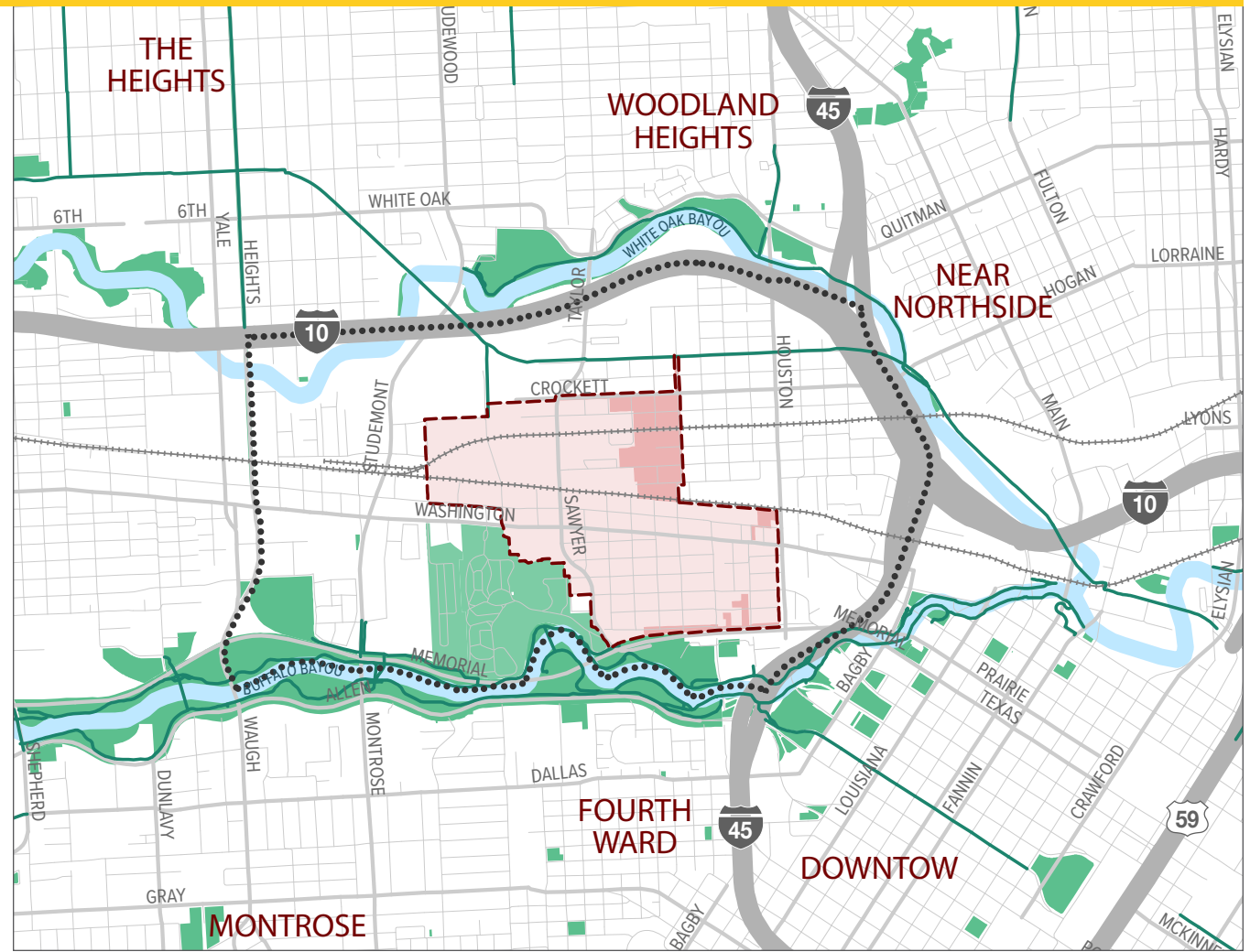


Figure A.7 TIRZ 13 Mobility Plan Census Area

Mobility Plan Study Area

 ● ● ● Mobility Plan Census Area

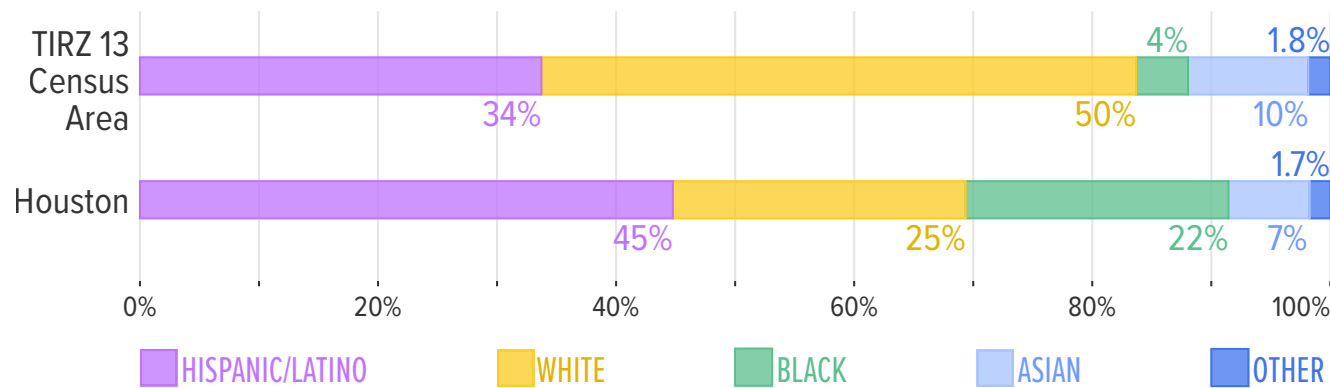
Source: US Census, City of Houston

Table A.1 Census Area Demographics

	TIRZ 13 Census Area	Houston	Harris County
Population	8,900	2,296,000	4,602,500
Households	4,600	848,300	1,583,500
Average Household Size	1.92	2.67	2.88
Housing Vacancy	11%	11%	9%
Renter-Occupied Households	67%	57%	45%
Households in Poverty	9%	20%	16%

Table A.1 and **Figure A.8–Figure A.12** use census data to help paint a portrait of residents living in and near TIRZ 13 in the Census Area shown in Figure A.7. The TIRZ 13 Census Area is home to approximately 8,900 residents in 4,600 households. Two thirds (67 percent) of households are renters, a larger share than in the City of Houston and Harris County. The neighborhood also has a smaller household size and lower poverty rate than the City or the County. The neighborhood is racially and ethnically diverse, though it has fewer people of color—and significantly fewer Black residents—than Houston writ large. Approximately half of residents are white, roughly double the citywide average.

Figure A.8 Race & Ethnicity



Source: US Census American Community Survey 2014–2018
DRAFT FOR REVIEW 07/06/21

Young, Educated Residents

TIRZ 13 area residents are young. Nearly half (47 percent) of the population is age 21–34, compared to 25 percent of residents citywide.

Residents are also well-educated and have high household incomes. Over two thirds (69 percent) of TIRZ 13 area residents over age 25 have a bachelor’s or graduate degree, more than double the share of the City of Houston population. Over half (53 percent) of households make over \$100,000 annually, once again more than double the share (24 percent) of households that earn six figures citywide.

High Car Ownership

Despite the neighborhood’s proximity to destinations and its high percentages of young residents and renters—two groups with lower rates of car ownership nationally—the overwhelming majority of households in the area own or have access to a car. Only four percent of households in the vicinity of TIRZ 13 live without a car, compared to eight percent in the City of Houston.

Figure A.9 Age of Residents

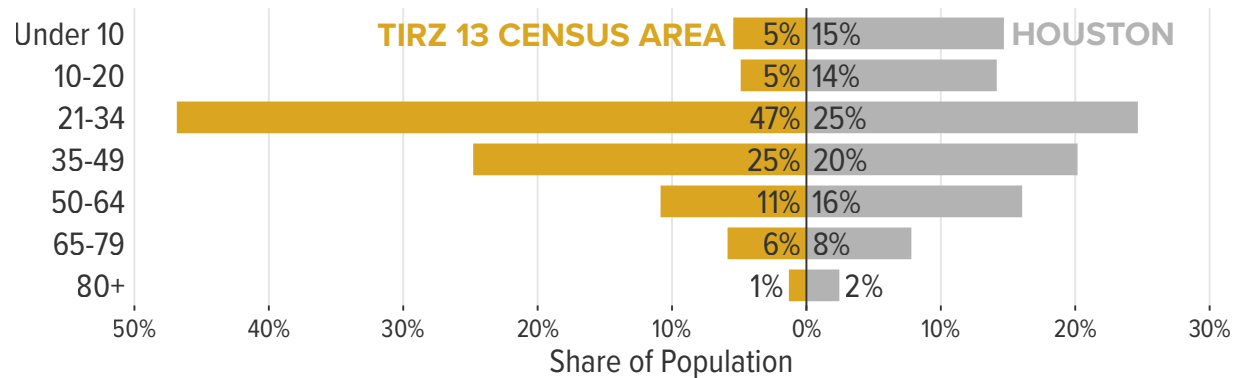
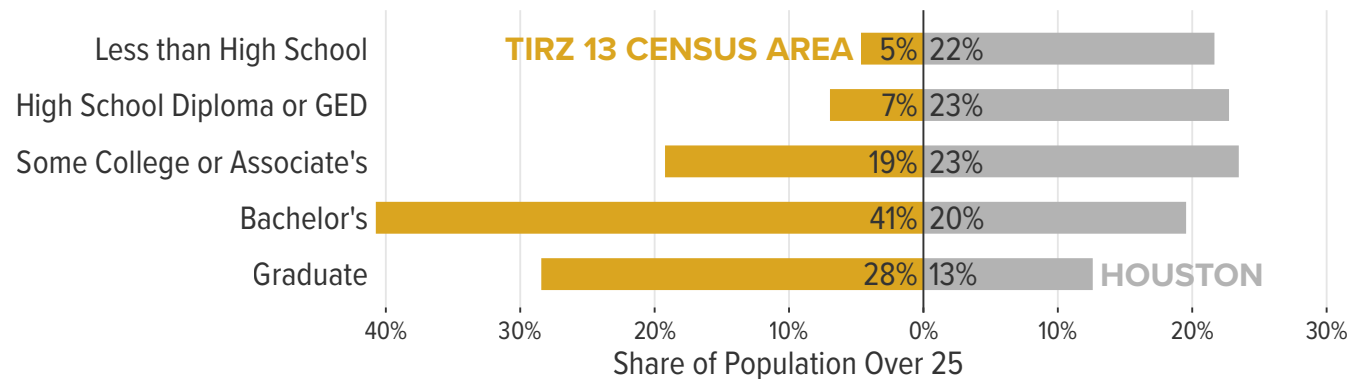


Figure A.10 Educational Attainment



Source: US Census American Community Survey 2014–2018

Figure A.11 Income Distribution

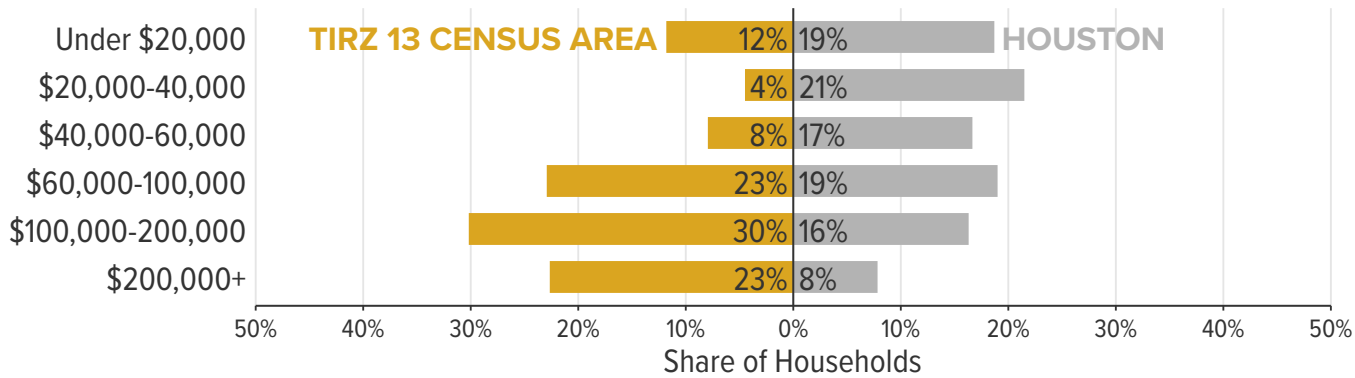
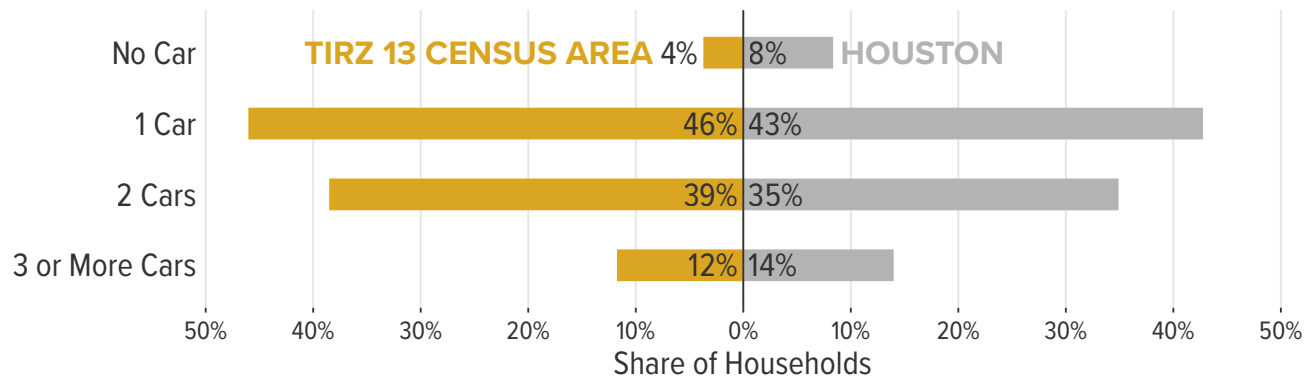


Figure A.12 Vehicle Availability



Source: US Census American Community Survey 2014–2018

Retail & Service Jobs

As noted in **Table A.2**, most jobs inside the Study Area belong to the retail, administration, and service sectors. Many of these jobs pay low hourly wages. While TIRZ 13 area residents earn higher incomes than the Houstonians writ large, people who work in the Study Area earn much less. Almost two thirds (63 percent) of Study Area jobs less than \$40,000 annually, compared to less than half (48 percent) citywide.

Young, Diverse Workforce

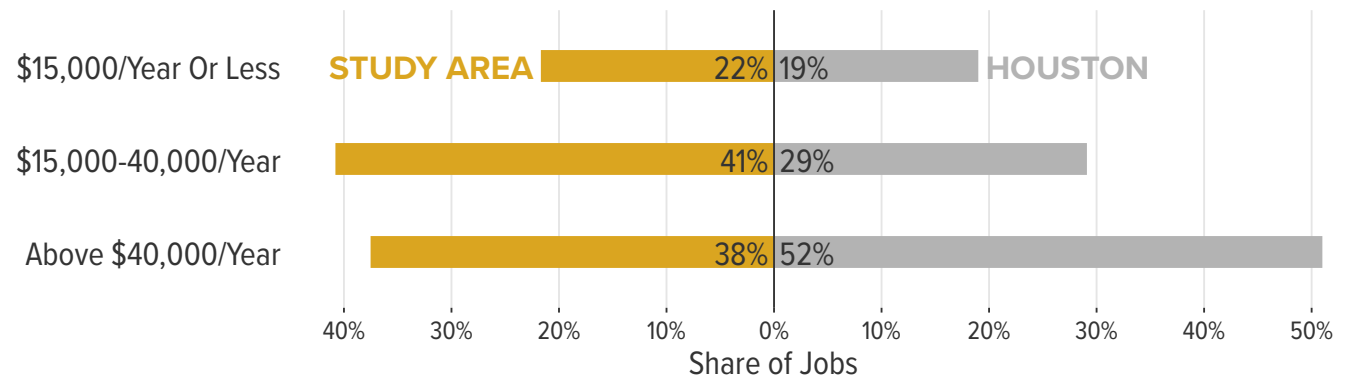
The Study Area employs a younger workforce than the City of Houston, with 29 percent of Study Area workers under 30 years, compared to 22 percent citywide. The Study Area employs a larger share of Latino workers than the City of Houston, and a comparable share of Black workers.

1. The Census Bureau provides employment data at smaller geographic levels than other demographic variables; Table A.2 and Figure A.13–Figure A.15 therefore refer to the Study Area shown in Figure A.1 on page A4 rather than the larger TIRZ 13 Census Area.

Table A.2 Top Employment Sectors

Sector	TIRZ 13 Study Area		City of Houston	
	Jobs	Percent	Jobs	Percent
Retail Trade	432	16%	174,882	10%
Administration & Support, Waste Management & Remediation	407	15%	148,562	9%
Accommodation & Food Services	387	14%	160,714	9%
Other Services (Except Public Administration)	344	12%	48,889	3%
Professional, Scientific, & Technical Services	284	10%	156,463	9%
Wholesale Trade	227	8%	109,548	6%
Finance & Insurance	165	6%	68,762	4%
Information	156	6%	23,029	1%
Other	351	13%	838,823	49%
Total	2,753	100%	1,729,672	100%

Figure A.13 Income of Workers



Source: US Census LEHD Origin-Destination Employment Statistics (LODES) 2017

Figure A.14 Age of Workers

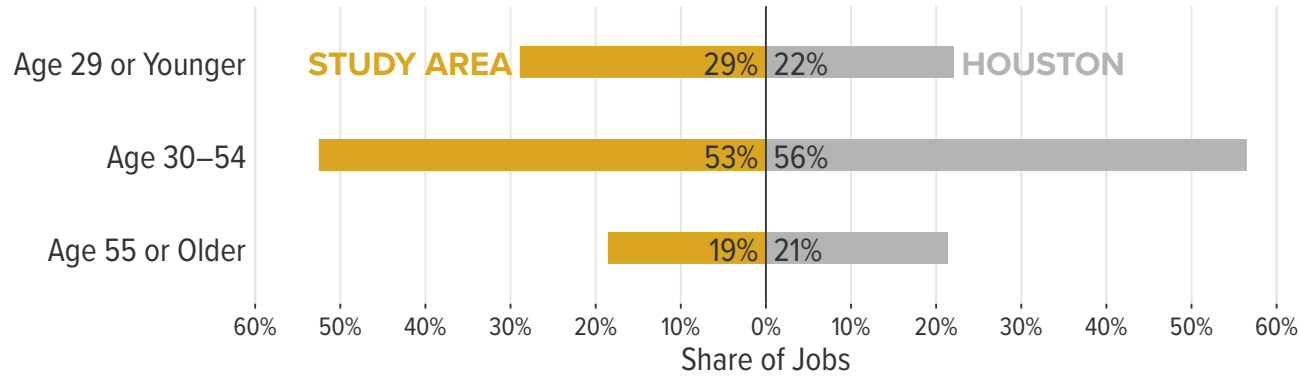
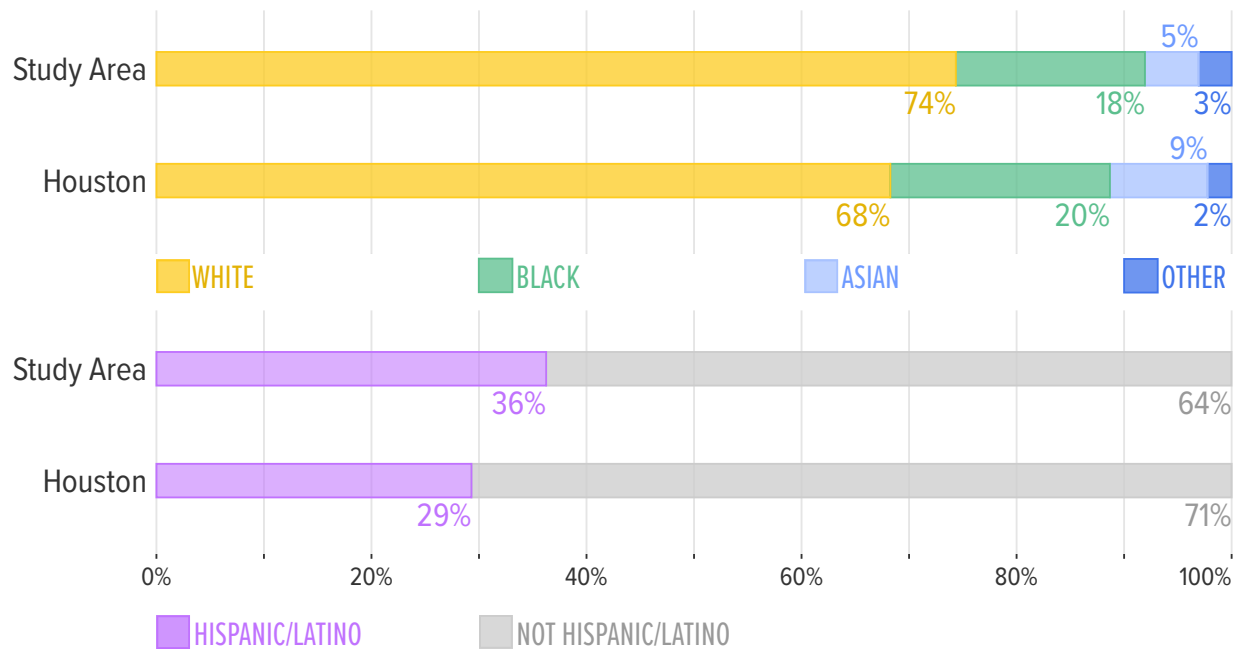


Figure A.15 Race & Ethnicity of Workers



Source: US Census LEHD Origin-Destination Employment Statistics (LODES) 2017

POPULATION DENSITY TODAY

PEOPLE & PLACES

Figure A.16–Figure A.21 take a broader view of the TIRZ 13 and adjacent neighborhoods within the Houston area, examining activity centers with high population and/or employment density both today and in the future.

The Houston area (as defined by the H-GAC eight county region), is poised to add 3.7 million new residents—53 percent of the current population—by 2045. Much of this growth will occur within the urban core, in and around Old Sixth Ward and similar neighborhoods. As Figure A.16 and Figure A.17 illustrate, with darker shades of orange and red representing higher population density, most neighborhoods west of Downtown are projected to add residents between today and 2045.

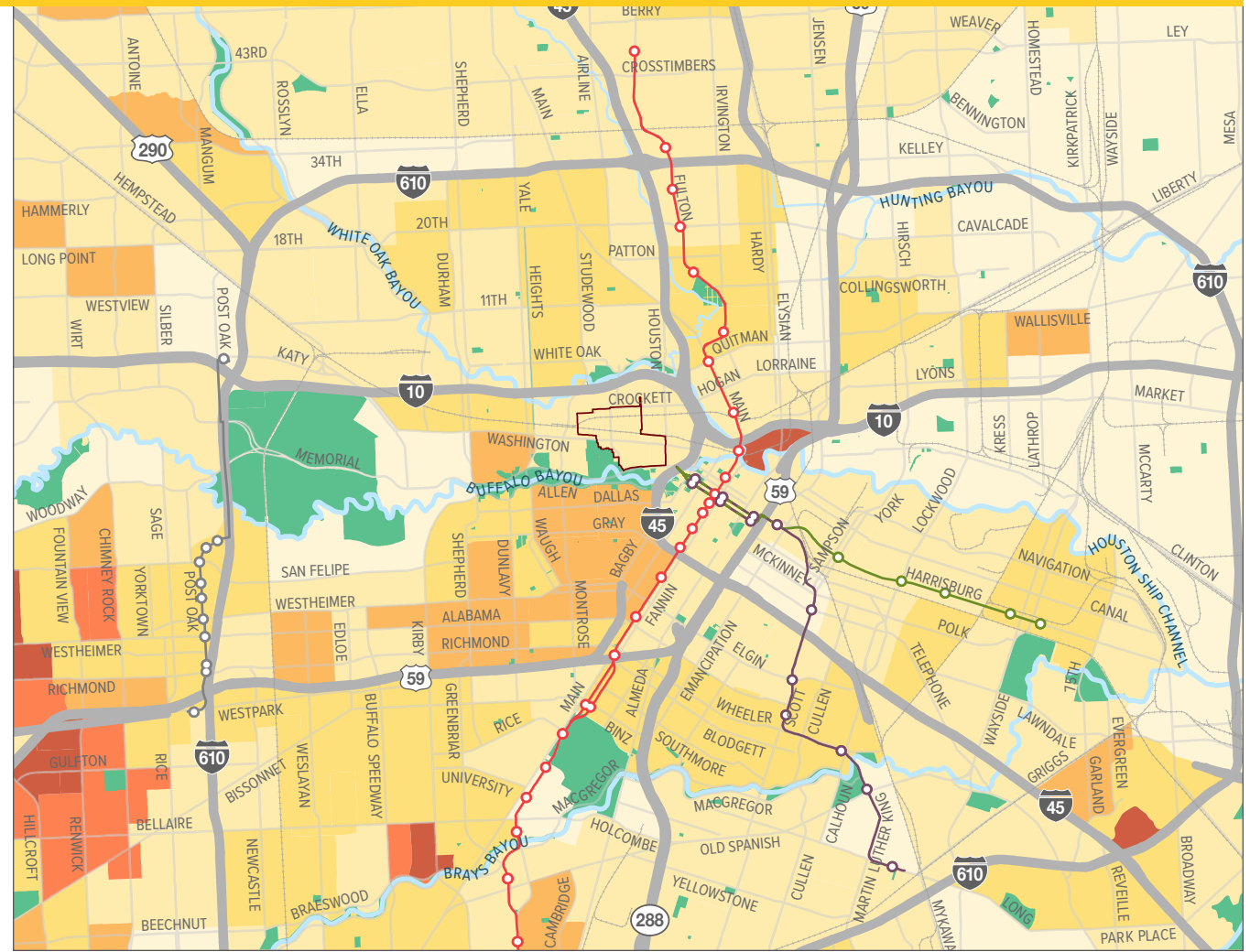
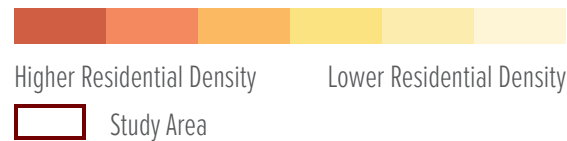


Figure A.16 Population Density 2014–2018

2 MILES

4 MILES



Source: US Census American Community Survey 2014–2018

POPULATION DENSITY 2045

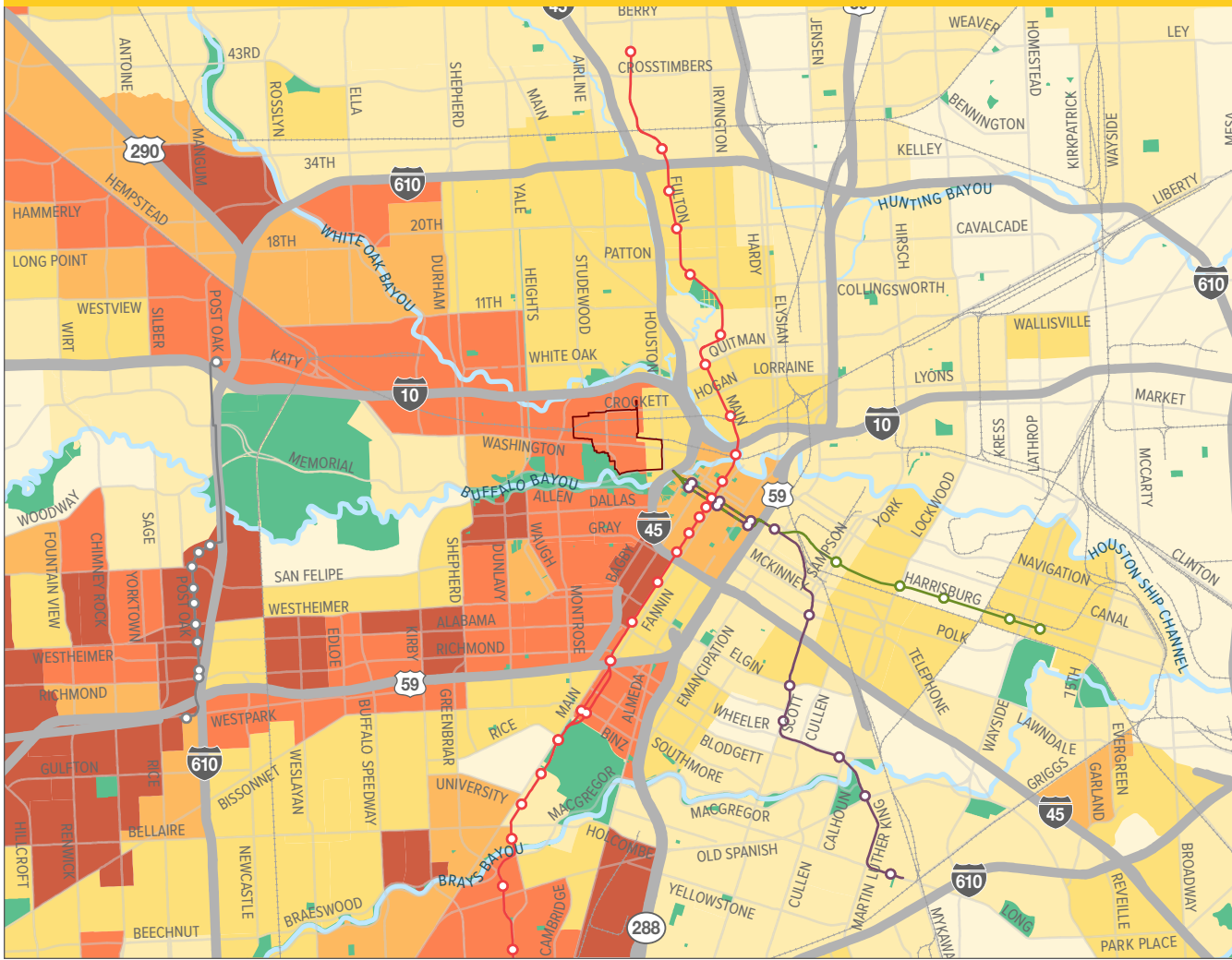


Figure A.17 Population Density 2045

2 MILES 4 MILES



Higher Residential Density Lower Residential Density

Study Area

Source: Houston-Galveston Area Council (H-GAC)

EMPLOYMENT DENSITY TODAY

PEOPLE & PLACES

The Houston region is poised to add 1.3 million new jobs (39 percent of current employment) by 2045, and much of this growth will occur within the urban core. **Figure A.18** and **Figure A.19** show the concentration of employment in 2017 and 2045, respectively, with denser areas in darker shades of blue. Existing job centers like Downtown, Texas Medical Center, Uptown, and Greenway Plaza are expected to remain the densest centers of employment centers through 2045, with Downtown, Uptown, and Texas Medical Center all projected to attract new jobs over the coming decades. The neighborhoods surrounding these key employment centers are also projected to add jobs, as are many of the neighborhoods along IH 10, US 290, and other highway corridors.

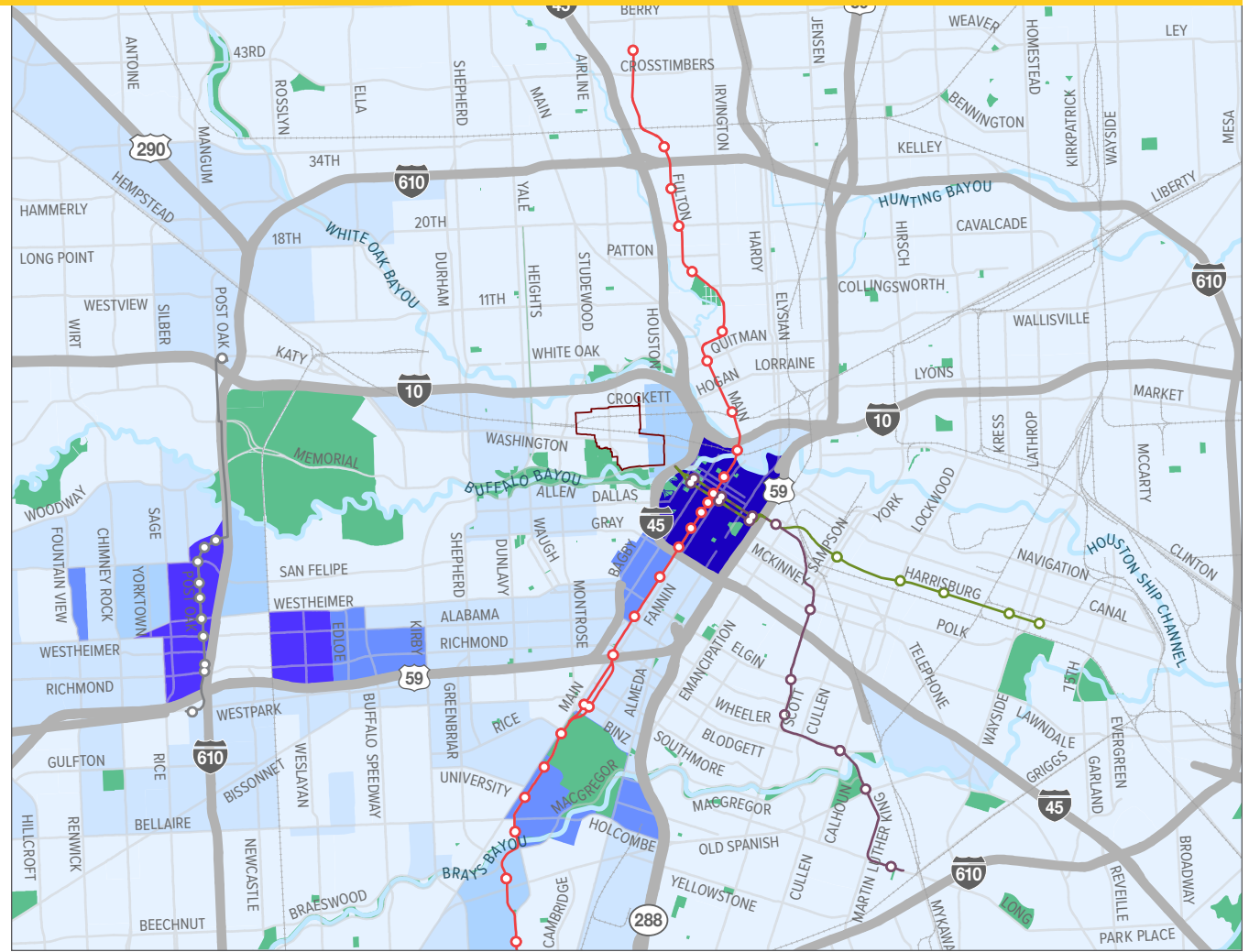


Figure A.18 Employment Density 2017

2 MILES

4 MILES



Higher Employment Density Lower Employment Density

Study Area

Source: US Census LEHD Origin-Destination Employment Statistics (LODES) 2017

EMPLOYMENT DENSITY 2045

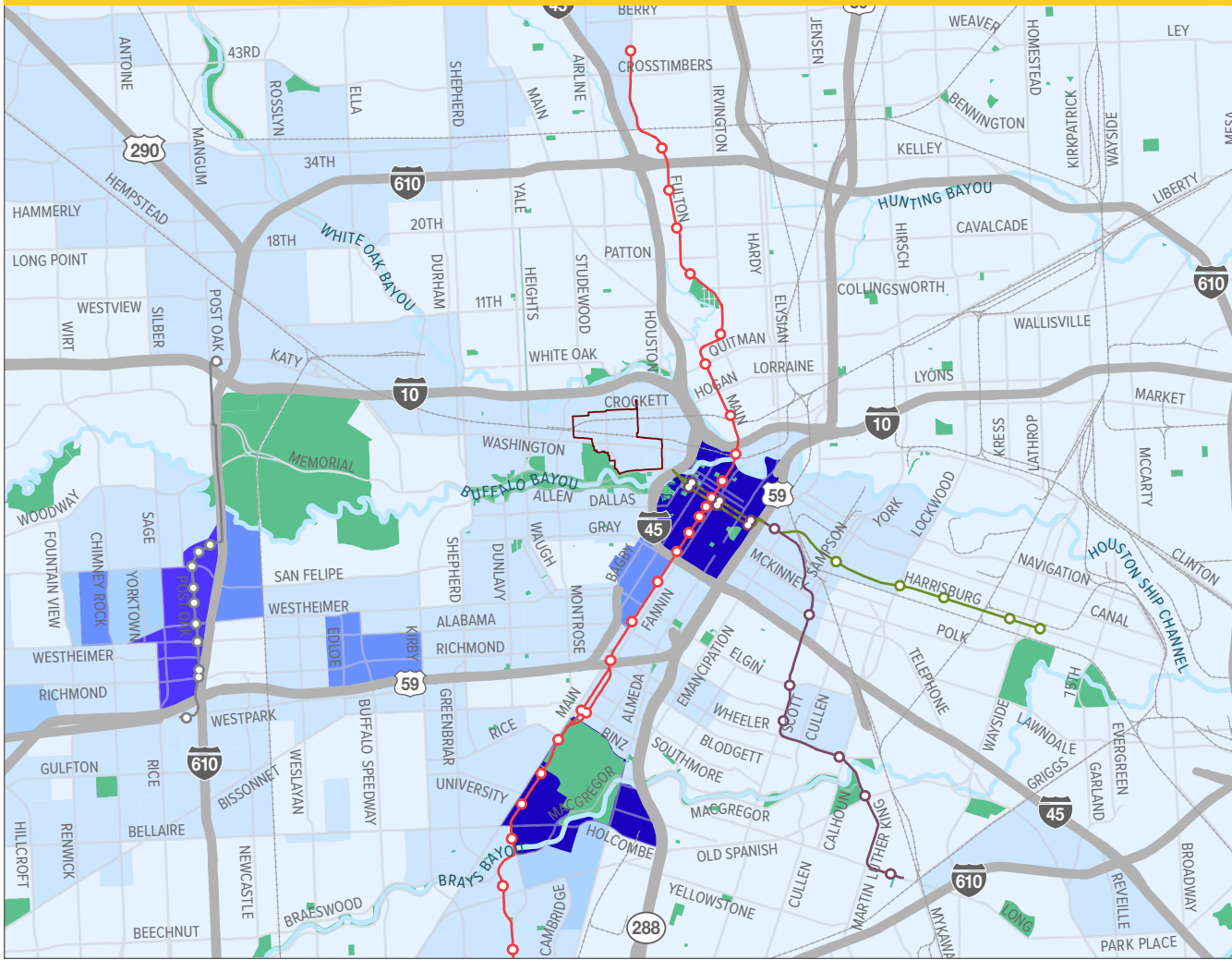


Figure A.19 Employment Density 2045

2 MILES 4 MILES



Higher Employment Density Lower Employment Density

Study Area

Source: Houston-Galveston Area Council (H-GAC)

ACTIVITY DENSITY TODAY

Figure A.20 and Figure A.21 show existing and projected activity density, respectively. The maps show areas with higher residential population densities in darker shades of red, areas with higher concentrations of employment in darker shades of blue, and areas with high concentrations of both residents and jobs in gold.

Today, the Study Area has moderate concentrations of both population and employment, and sits directly adjacent to major job and activity centers in Downtown and northern Montrose. By 2045, the Study Area is expected to add jobs and especially population, and nearby activity centers will likewise grow even denser, underscoring the value of investments that provide safe, multimodal mobility options.

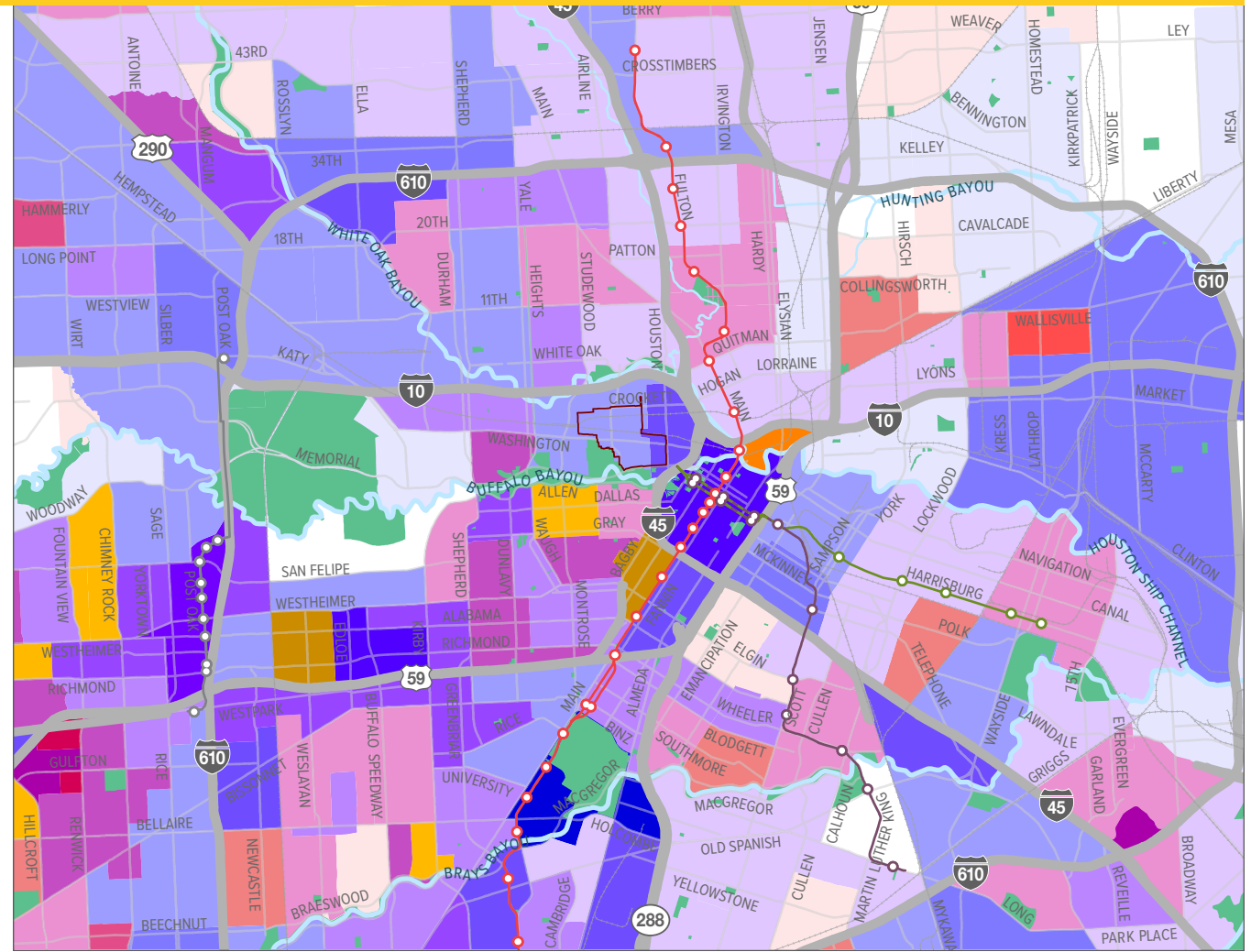
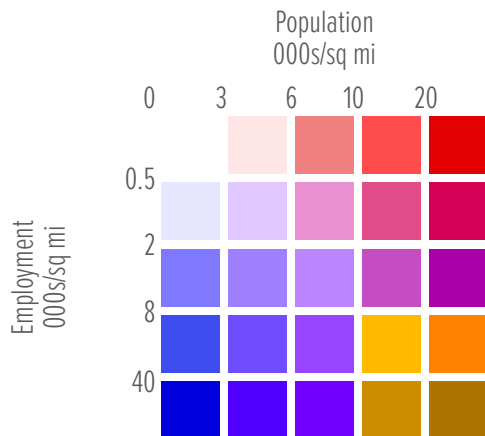


Figure A.20 Activity Density 2014-2018

2 MILES 4 MILES

Study Area



Source: US Census American Community Survey 2014-2018 (Population), LEHD Origin-Destination Employment Statistics (LODES) 2017

ACTIVITY DENSITY 2045

PEOPLE & PLACES

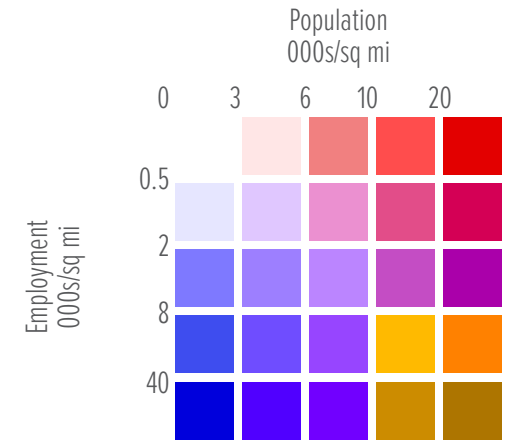
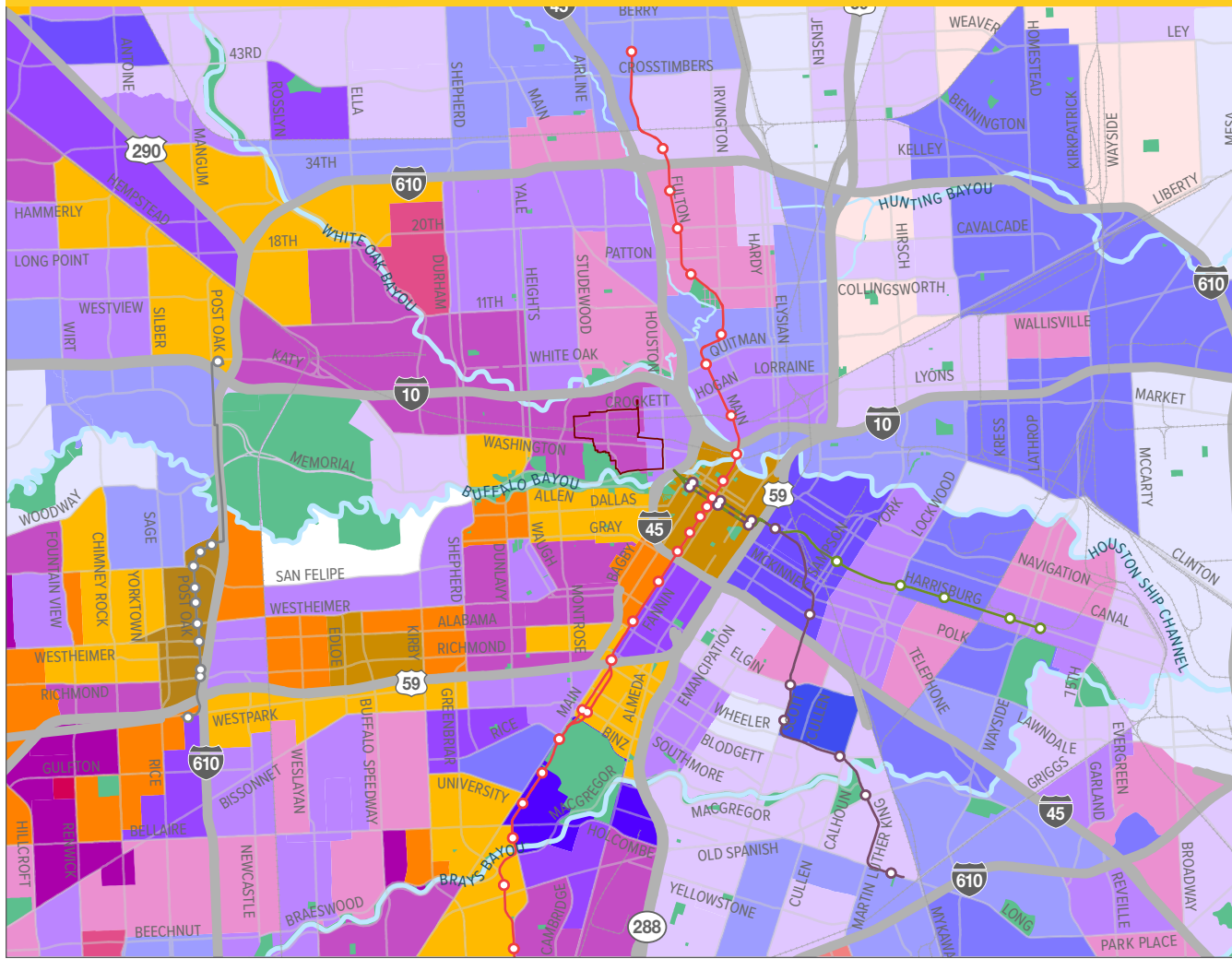


Figure A.21 Activity Density 2045

2 MILES 4 MILES

Study Area

Source: Houston-Galveston Area Council (H-GAC)

WHERE RESIDENTS WORK

The Study Area lies within six miles of the Houston area's four largest job centers—Downtown, Texas Medical Center, Uptown, and Greenway Plaza. The greatest concentrations of TIRZ 13 area residents work in these districts, as illustrated in **Figure A.22**. Many TIRZ 13 area residents also work in or near the neighborhood, especially in the areas just south of Buffalo Bayou east of Waugh Drive and between Sawyer Street, IH 10, and IH 45.

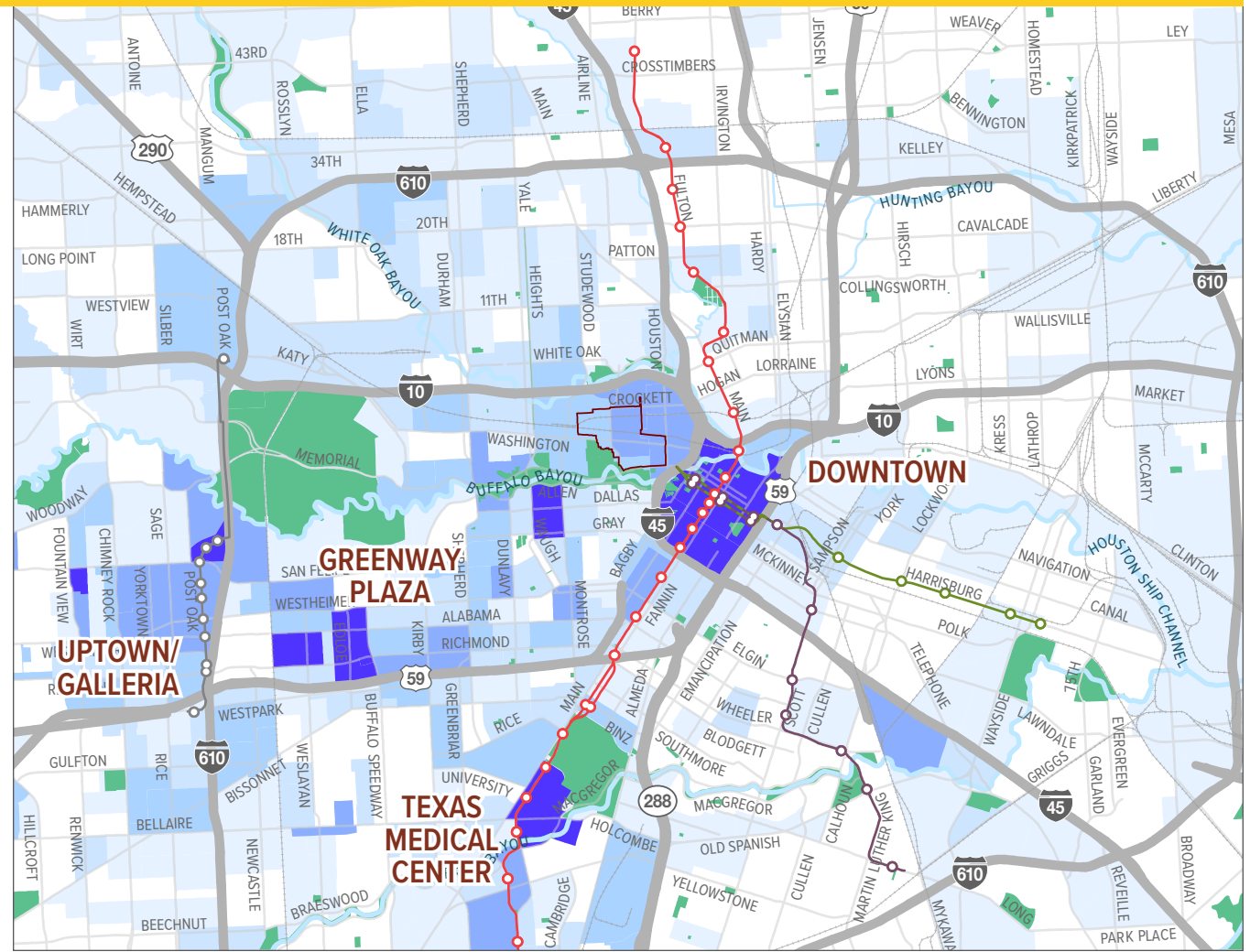


Figure A.22 Where TIRZ 13 Area Residents Work

2 MILES 4 MILES

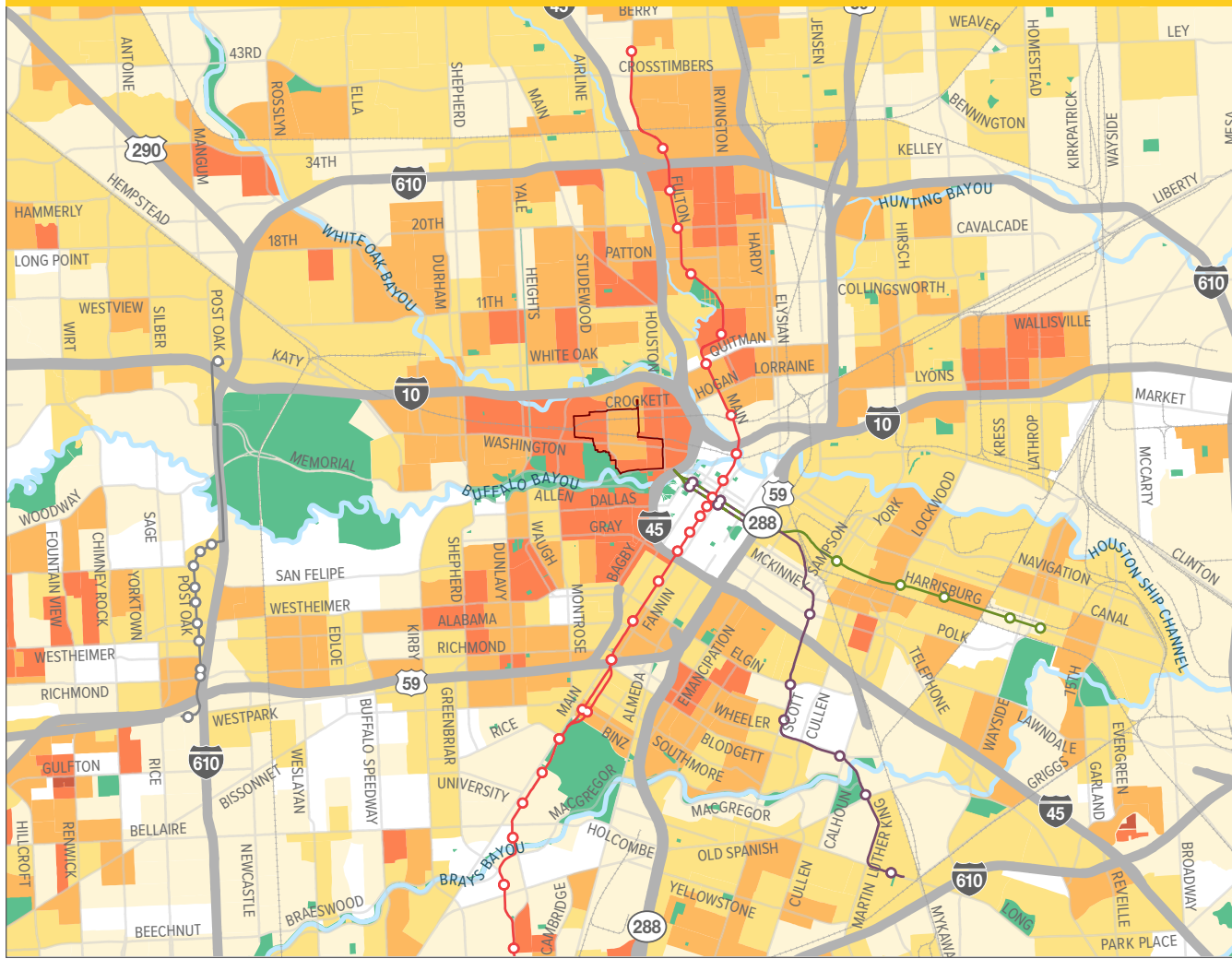
Higher Employment Density Lower Employment Density

Study Area

Source: US Census LEHD Origin-Destination Employment Statistics (LODES) 2017

WHERE WORKERS LIVE

TRIPS



Employees working in the TIRZ 13 area live throughout the region. While many employees live in or near the neighborhood (particularly along the Washington Avenue corridor and in Montrose), others travel from pockets of the Heights, Near Northside, and Third Ward. Other workers live even further still: the highest concentrations of employees live in parts of Gulfton (located southwest of US 59 and IH 610 West) and Pecan Park (northeast of IH 45 and IH 610 South). The wide geographic distribution of where TIRZ 13 are workers live shown in **Figure A.23** underscores the need for a range of transportation options to connect employees traveling to the Study Area.

Figure A.23 Where TIRZ 13 Area Workers Live

2 MILES 4 MILES



Higher Residential Density Lower Residential Density

Study Area

Source: US Census LEHD Origin-Destination Employment Statistics (LODES) 2017

COMMUTE CHARACTERISTICS

TRIPS

Despite the neighborhood's proximity and transit connections to major job centers, 87 percent of residents drive alone to work—a greater share than the 77 percent of commuters who do so citywide.

However, TIRZ 13 area residents tend to have shorter commutes than Houstonians generally. Over two thirds (68 percent) of area residents have a commute less than 30 minutes in each direction, and 15 percent have a commute of 10 minutes or less.

The projects developed and prioritized in this plan aim to improve the range of safe, convenient, multimodal options for commuting and other trips.

Figure A.24 Means of Transportation to Work

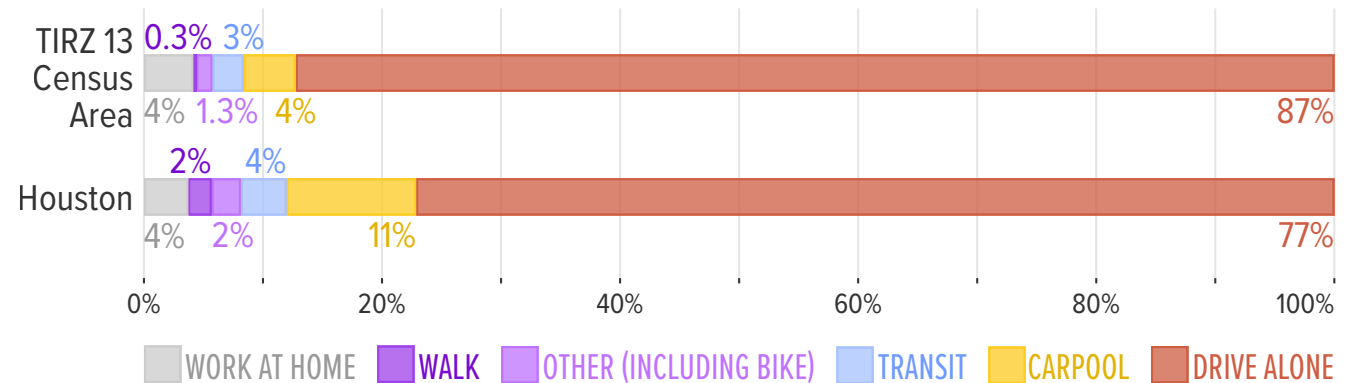
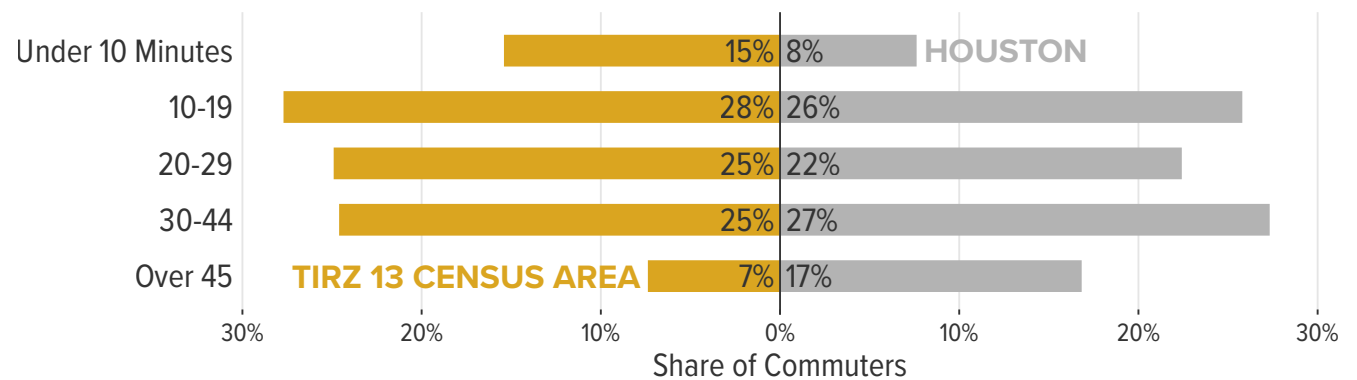


Figure A.25 Travel Time to Work

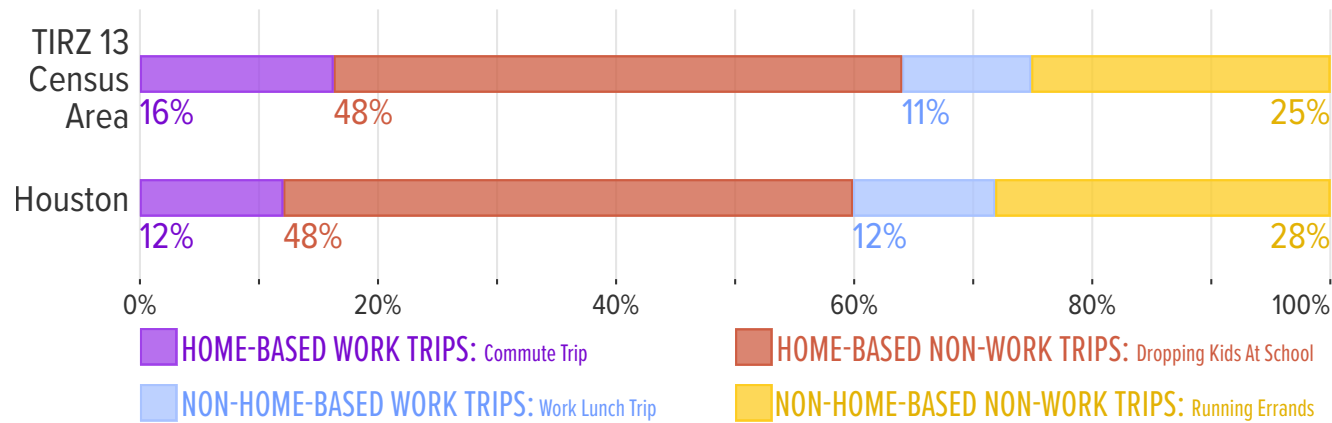


Source: US Census American Community Survey 2014–2018

TRIP CHARACTERISTICS

TRIPS

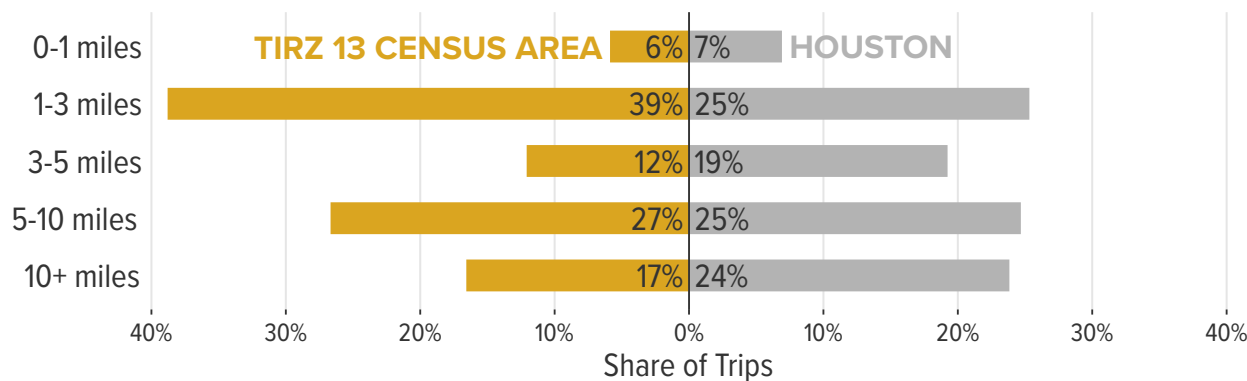
Figure A.26 Trip Types



The commuting data in **Figure A.24** likely underestimates the prevalence of walking, biking, and transit trips. Commutes are often the longest trip people make on a regular basis, and the most likely to be completed by a faster mode like driving or rapid transit (in places where it is available).

However, commutes between home and work make up only a small share of all trips. As indicated in **Figure A.26**, only 16 percent of trips originating in the TIRZ 13 Census Area (shown in Figure A.7 on page A12) are commute (home-based work) trips according to the H-GAC Travel Demand Model. Home-based non-work trips, meanwhile—like traveling between one’s home and a school, a grocery store, or a park—make up almost half (48 percent) of trips originating in and near TIRZ 13.

Figure A.27 Trip Distance



This plan develops a set of projects that can improve the safety and expand the range of multimodal options for all trips, but for short local trips especially. Today, 45 percent of trips originating in the TIRZ 13 Census Area are under three miles, a distance many people are willing to walk or bike if safe facilities exist.

Source: H-GAC Travel Demand Model Trip Distance Outputs, 2019

WHERE CAN YOU GET TO IN 20 MINUTES?

TRIPS

Figure A.28 and Figure A.29 show the areas within a 20 minute walk or bike ride, respectively, from the heart of TIRZ 13. As noted in Table A.3, 20 minutes corresponds to about a mile walk or about a four mile bike ride for a casual cyclist. Buffalo Bayou Park, Stude Park and White Oak Bayou Greenway, and portions of Downtown and Montrose fall within walking distance of TIRZ 13. Major regional destinations including Memorial Park, Hermann Park, Downtown, Texas Medical Center, and Greenway Plaza are all within biking distance of TIRZ 13.

Table A.3 Walking & Biking Travel Times

Travel Time	Walking Distance	Biking Distance
5 Minutes	0.25 Miles	1 Mile
10 Minutes	0.5 Miles	2 Miles
15 Minutes	0.75 Miles	3 Miles
20 Minutes	1 Mile	4 Miles

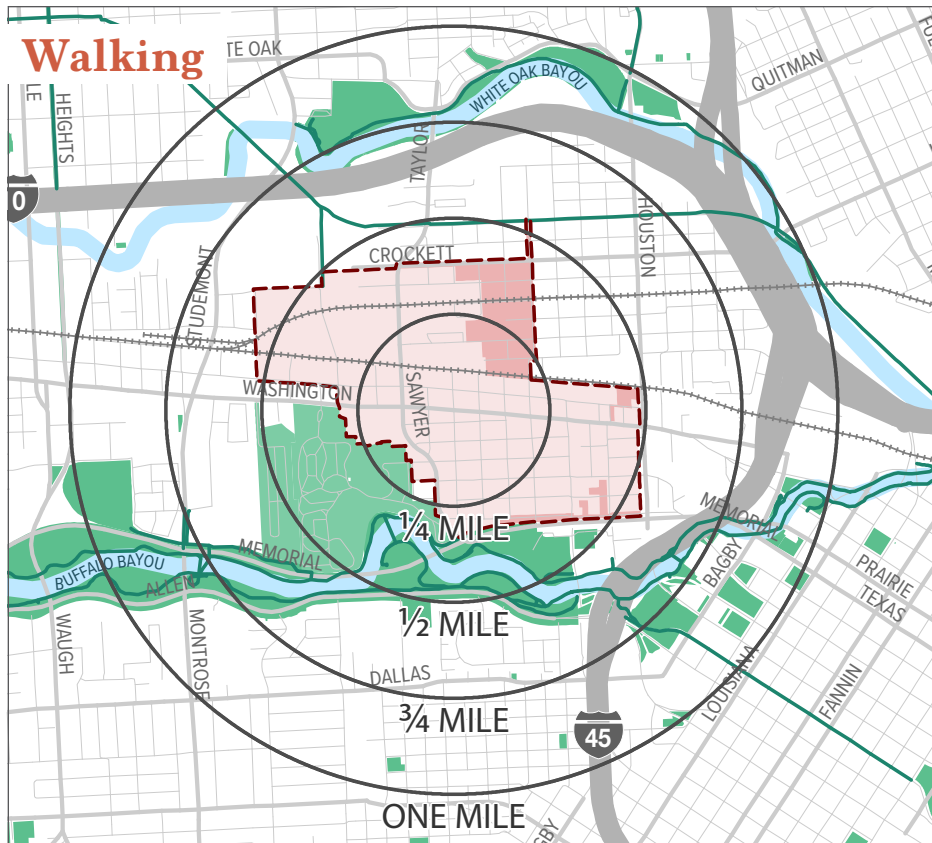


Figure A.28 Walking Distances

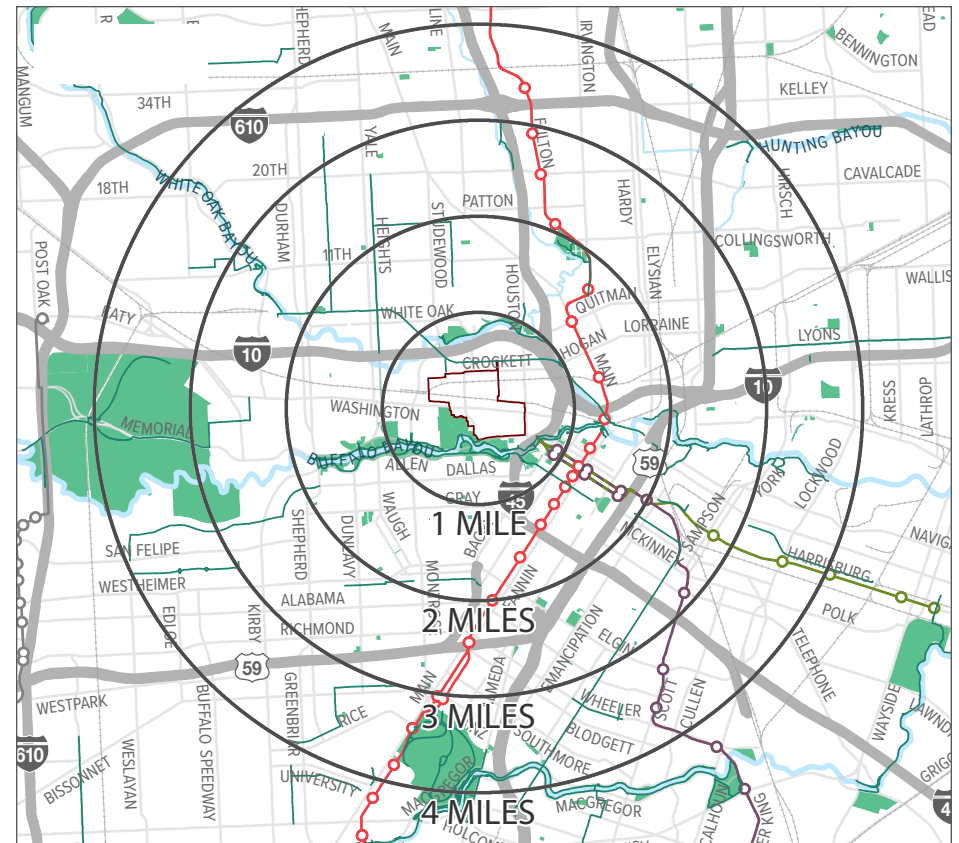


Figure A.29 Biking Distances



STREET NETWORK

MOBILITY

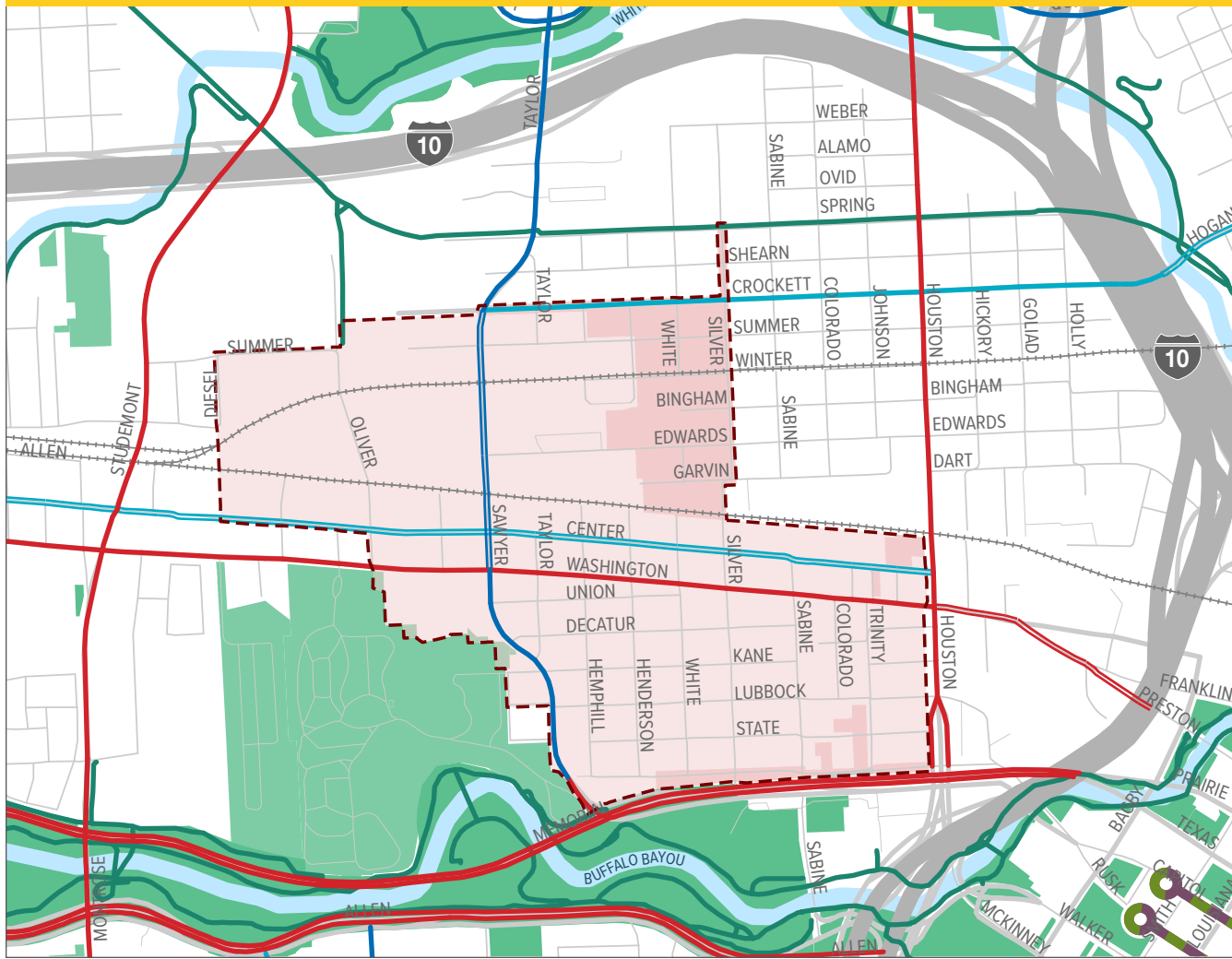
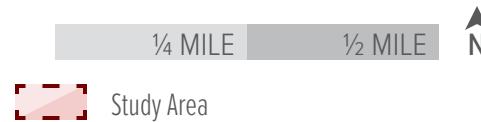


Figure A.30 Major Thoroughfare Plan Street Classification

- Thoroughfares
- Major Collectors
- Minor Collectors
- Trails
- Railroads
- Highways



The City of Houston Major Thoroughfare Plan shown in **Figure A.30** classifies corridors according to their role in the street network. Thoroughfares like Memorial Drive, Washington Avenue, Houston Avenue, and Studemont Street connect the Study Area to the rest of the region. Collectors like Sawyer Street, Center Street, and Crockett Street make key local connections with the Study Area and to nearby neighborhoods.

The remaining local streets provide access to local destinations, though they typically do not connect across barriers like bayous and highways. North of Washington Avenue the local street grid is disconnected, particularly around the rail lines, creating large block sizes and multiple barriers to mobility. South of Washington Avenue the street grid becomes more dense with smaller, more walkable blocks.

Source: City of Houston Major Thoroughfare & Freeway Plan

TIRZ 13 is situated in close proximity to many important, popular, and populous parts of Houston. Despite this proximity, barriers in and around the Study Area impede mobility and access to, from, and within the district—especially for people walking and biking. Bayous, highway, and railroads surround or bisect the Study Area, creating a unique set of obstacles photographed on page A31. **Figure A.31** maps these barriers while also highlighting corridors that provide connectivity across them.

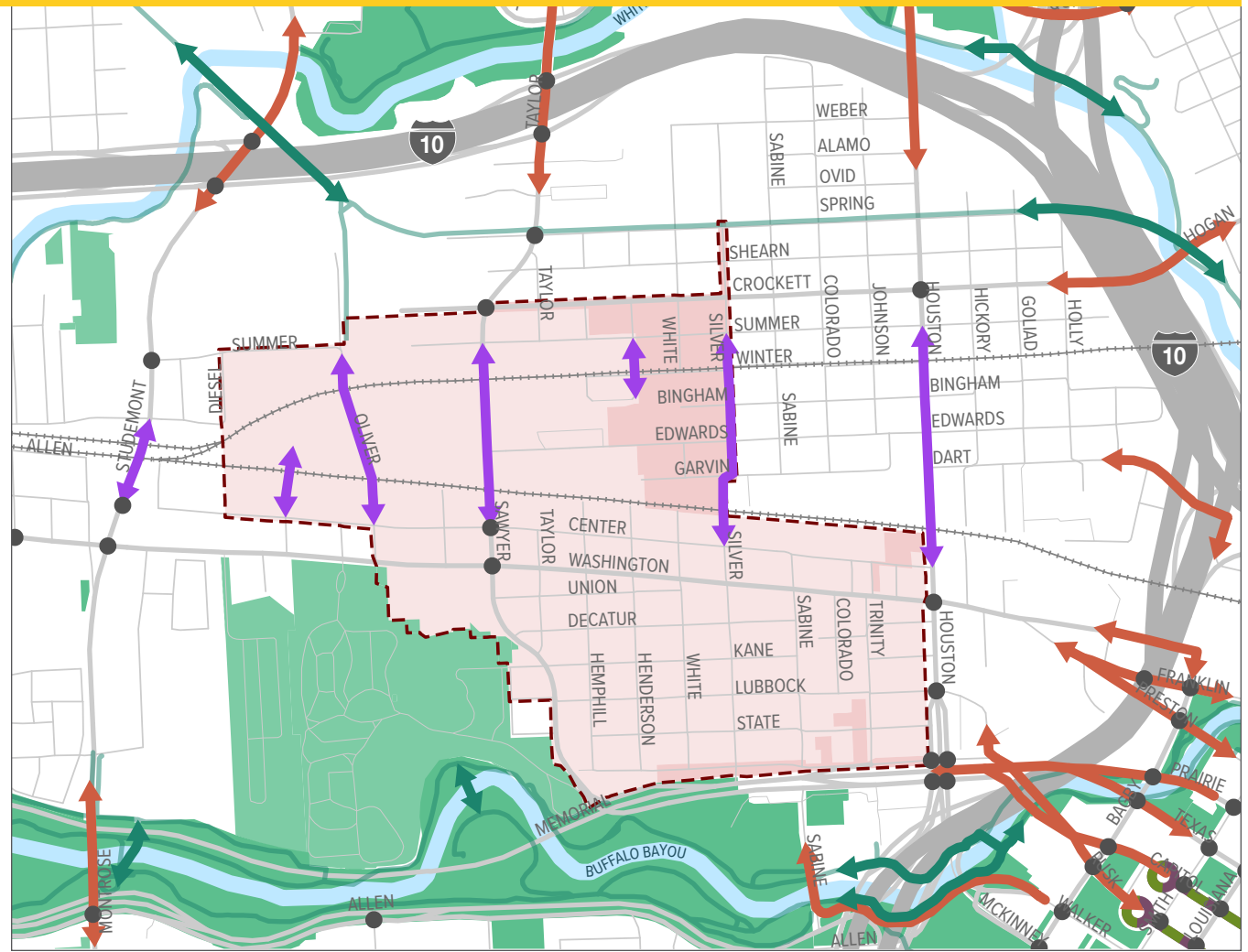


Figure A.31 Connectivity & Barriers

- | | | | | | |
|--|----------------------------------|--|-----------|--|---------------------|
| | Railroad Crossing | | Railroads | | Signalized Crossing |
| | Highway/Bayou Crossing (Streets) | | Highways | | Study Area |
| | Highway/Bayou Crossing (Trails) | | Bayous | | |

Source:



Sawyer Street crossing of UPRR Freight Main near Winter Street



Washington Avenue



High-speed Access Ramps to Freeways



Pedestrian Bridge over Memorial Drive



Heights MKT Trail at IH 10/IH 45



Heights MKT Trail at IH 10

TRAFFIC VOLUMES

In and around TIRZ 13, the select streets that connect neighborhoods divided by highways, bayous, and railroads attract the highest volume of traffic. The highest volumes occur along Memorial Drive along the southern border of the Study Area. Within the Study Area, Washington Avenue boasts the highest traffic volumes, but these volumes decrease significantly as one moves east along the corridor closer to Downtown.

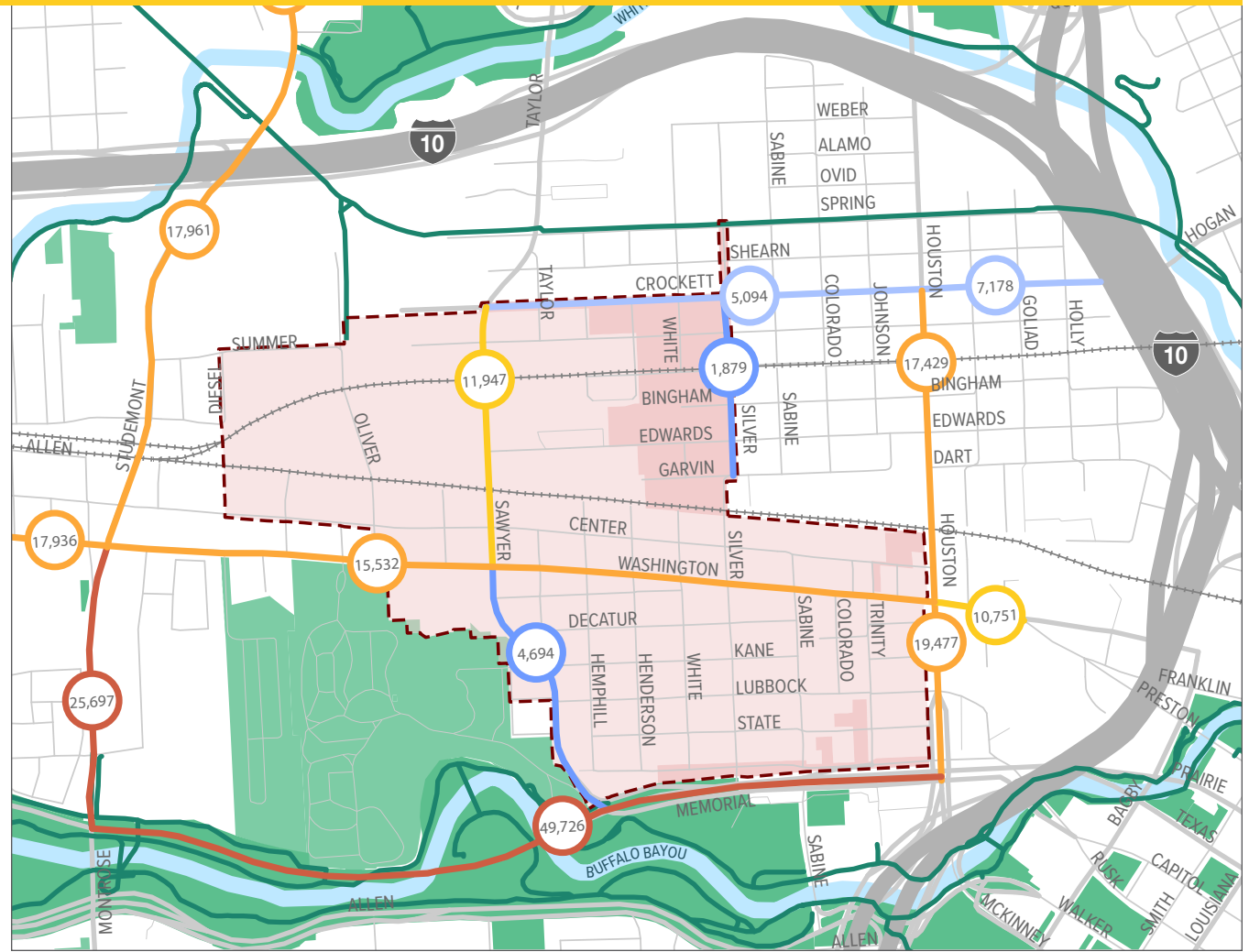
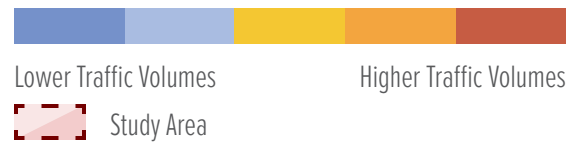


Figure A.32 Average Daily Traffic



Source: City of Houston

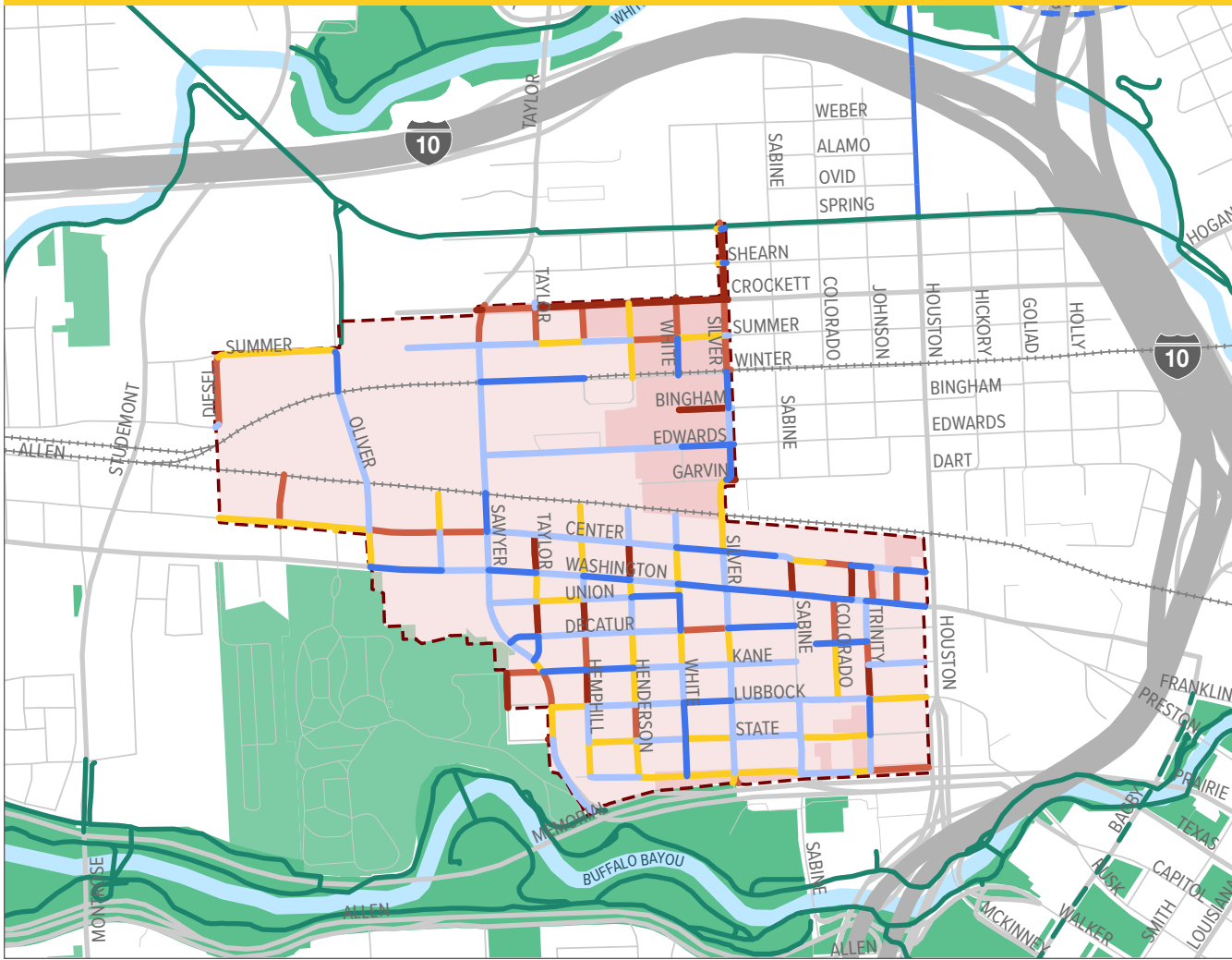


Figure A.33 shows the condition of the pavement on streets within the Study Area, with higher quality pavement shown in shades of blue and worse pavement shown in orange and red. One of the street segments with the lowest pavement quality is the north end of Silver Street.

Figure A.33 Pavement Condition Index (PCI)

- | | |
|---|--|
| █ Good (PCI 86–100) | █ Poor (PCI 41–55) |
| █ Satisfactory (PCI 71–85) | █ Extremely Poor (PCI 0–40) |
| █ Fair (PCI 56–70) | Study Area |

Source: City of Houston

Several local bus routes shown in **Figure A.34** provide service in or near the Study Area:

- The **85 Antoine/Washington** offers frequent service on Washington Avenue, connecting Downtown to Northwest Transit Center, the METRORapid Silver Line in Uptown, and Greenspoint Transit Center.
- The **44 Acres Homes** runs along Houston Avenue into Downtown.
- The **30 Clinton/Ella** runs along Sawyer Street and Memorial Drive, connecting to Downtown.
- The **56 Airline/Montrose** provides frequent service on Studemont Street immediately west of the Study Area.
- The **20 Canal/Memorial** connects Downtown and Uptown via Memorial Drive. The route lacks stops between Shepherd Drive and Downtown, bypassing the Study Area.

Much of the Study Area is within a quarter mile of frequent transit on Washington Avenue. Stops on this corridor see high ridership, particularly near Studemont Street, Sawyer Street, and Houston Avenue, where riders can transfer between routes.

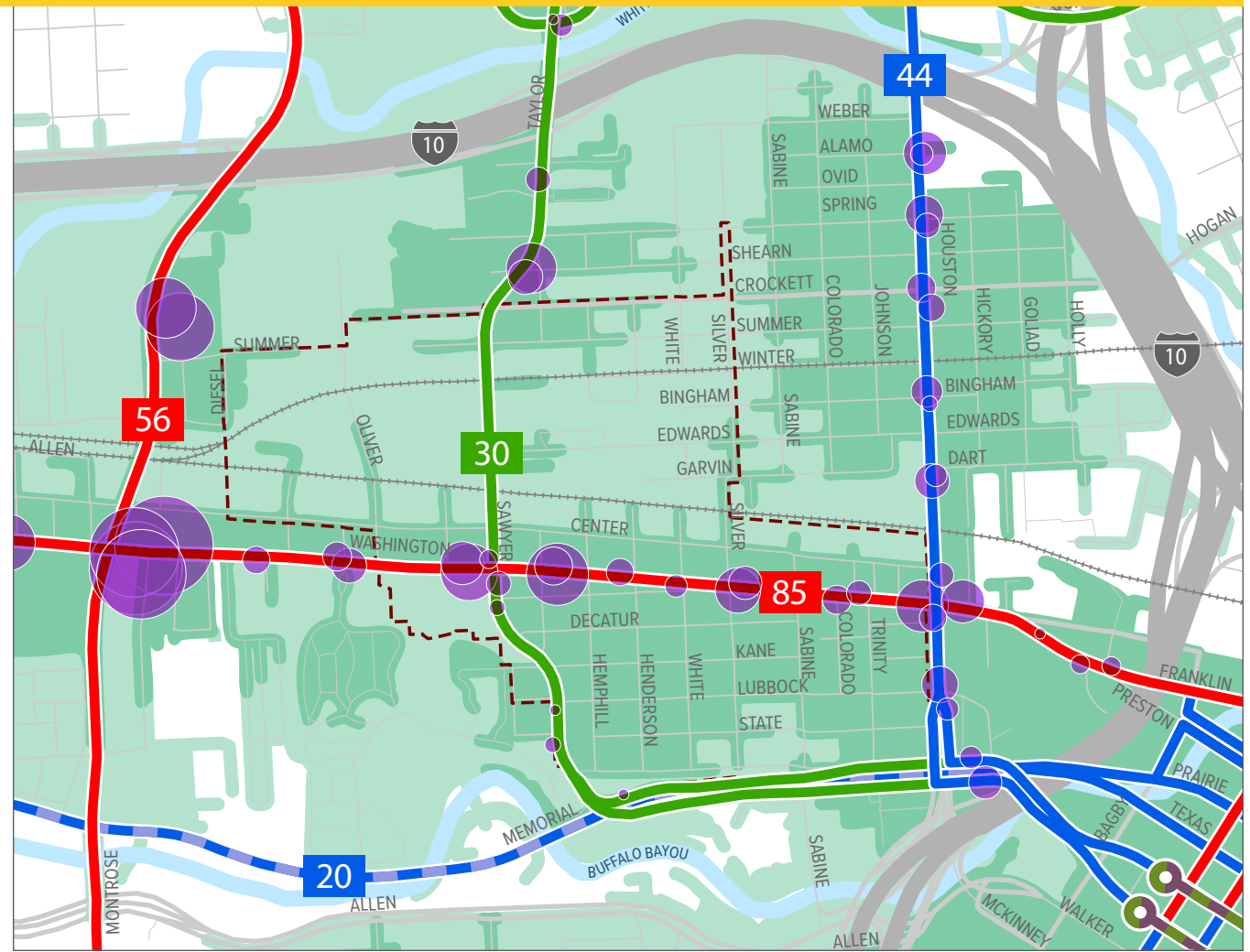
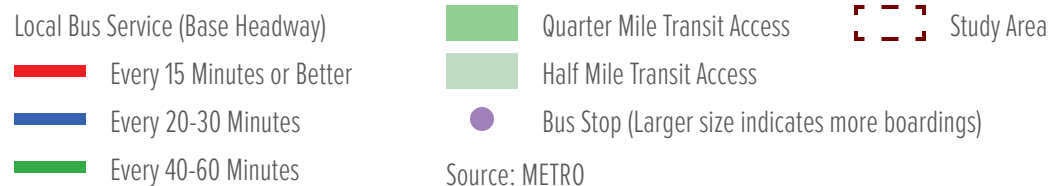


Figure A.34 Transit Service & Access



Source: METRO

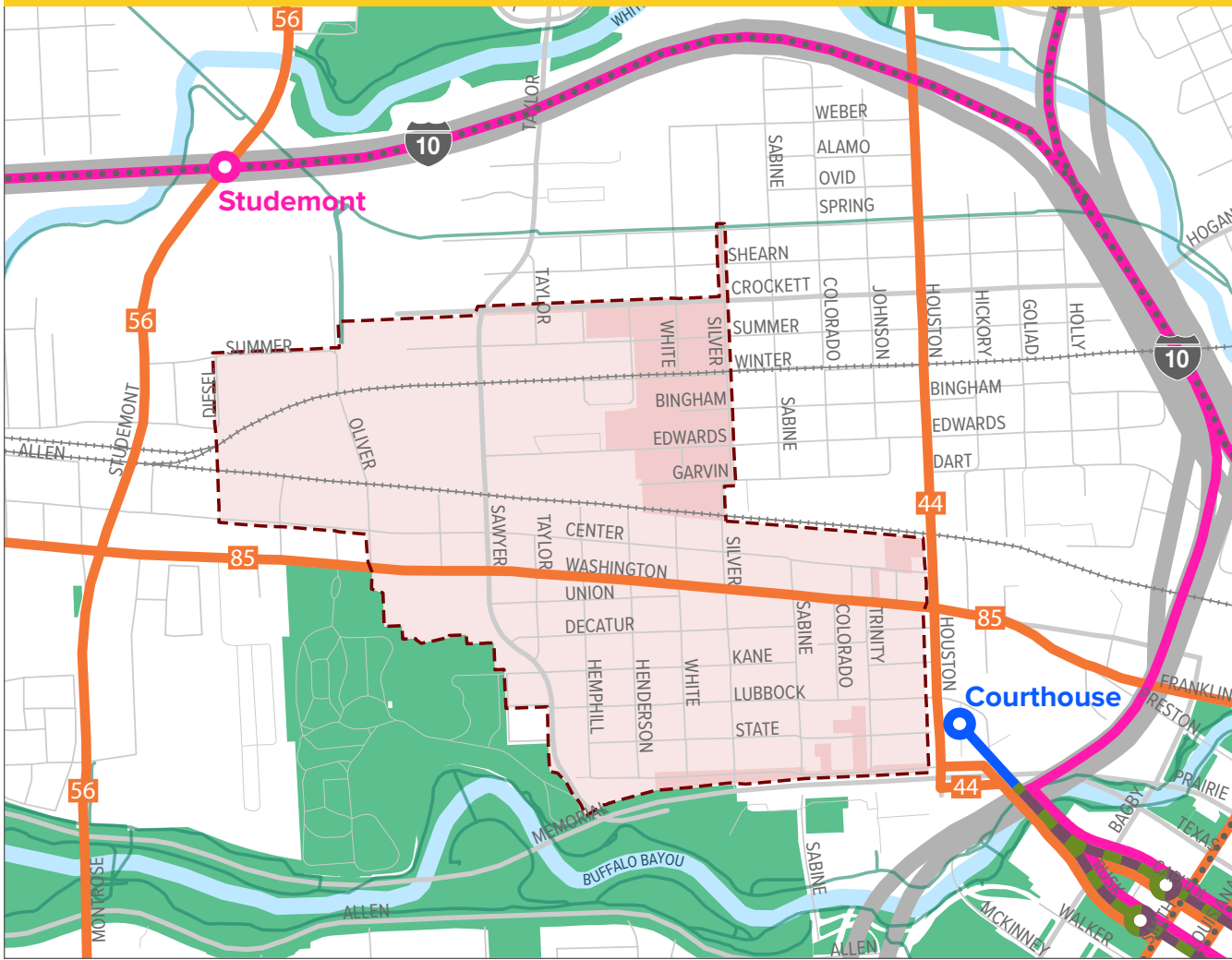


Figure A.35 METRONext Moving Forward Plan

- Proposed METRORail
- Proposed METRORapid (BRT)
- Proposed BOOST
- Proposed Regional Express
- Existing METRORail
- Study Area

Source: METRO

METRORail & METRORapid

METRORail’s Purple and Green Lines will be extended to the Courthouse.

The Inner Katy BRT will connect Downtown to Northwest Transit Center and Uptown via IH 10; with a station in the vicinity of the Study Area at Studemont Street.

Local Bus Improvements

BOOST Corridors

The BOOST program aims to holistically improve the transit experience by providing a better walk, a better stop, and a better ride along 17 of METRO’s busiest local bus routes.

BOOST projects on the 85 Antoine/Washington, the 44 Acres Homes, and the 56 Airline/Montrose will upgrade bus stops and ensure accessible sidewalks on Washington Avenue, Houston Avenue, and Studemont Street.

Universal Accessibility

METRO’s Universal Accessibility program will optimize the placement and improve the accessibility of bus stops on the 30 Clinton/Ella along Sawyer Street.

BIKEWAY NETWORK

As **Figure A.36** makes clear, TIRZ 13 is located in a gap in the high-comfort bikeway network. Although regional connections like the Heights–MKT trail and the Bayou Greenways on Buffalo and White Oak Bayous run along the edges of the district, no high-comfort bikeways run through the neighborhood. Providing safe, comfortA.corridors for biking through the area can give residents, workers, and visitors (many of whom make use of the BCycle bike share system) more options for accessing local destinations, and can connect them to the established trail system for longer trips.

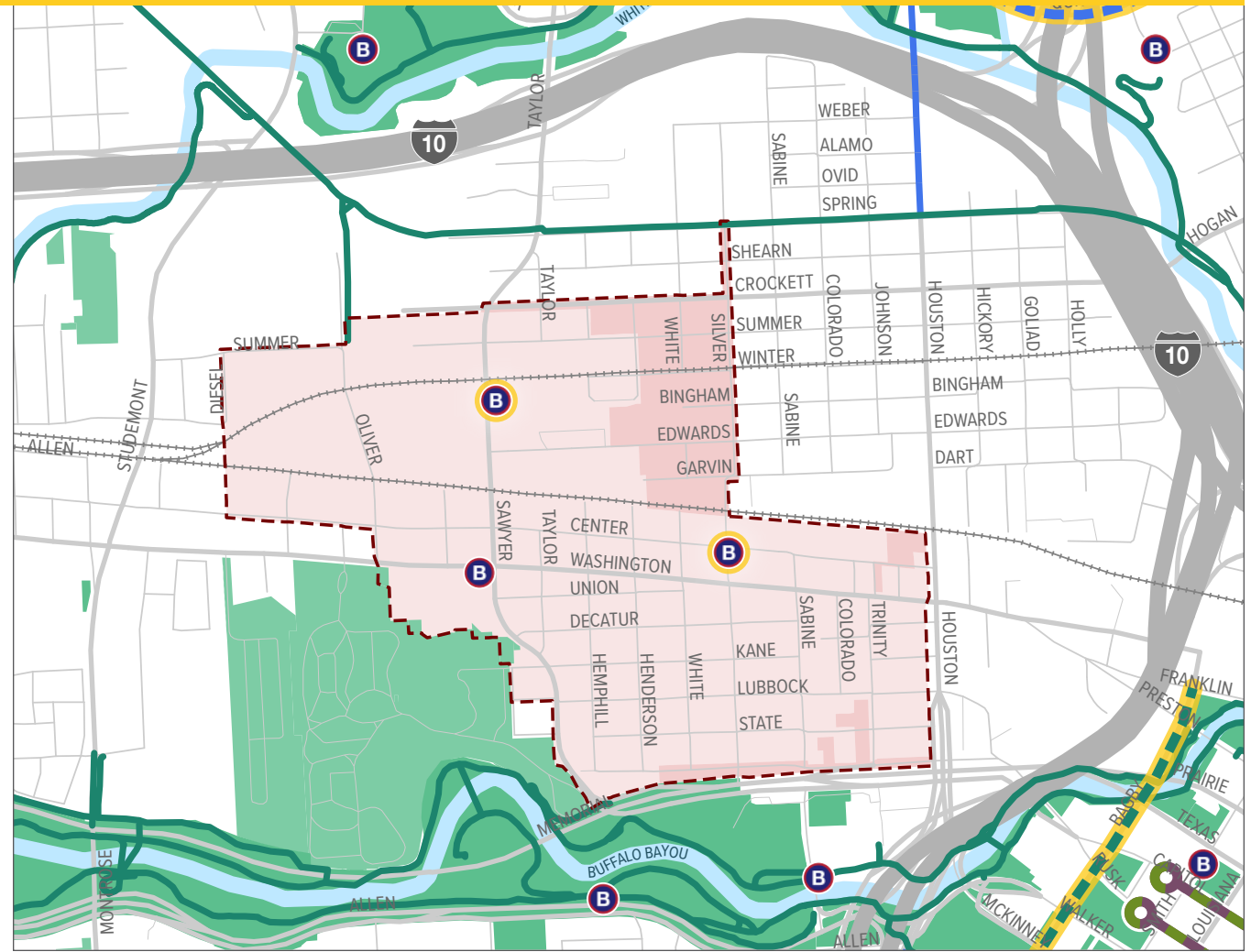


Figure A.36 Existing & Programmed Bikeway Network



Source: City of Houston, Houston Bike Share

HOUSTON BIKE PLAN: VISION NETWORK

MOBILITY

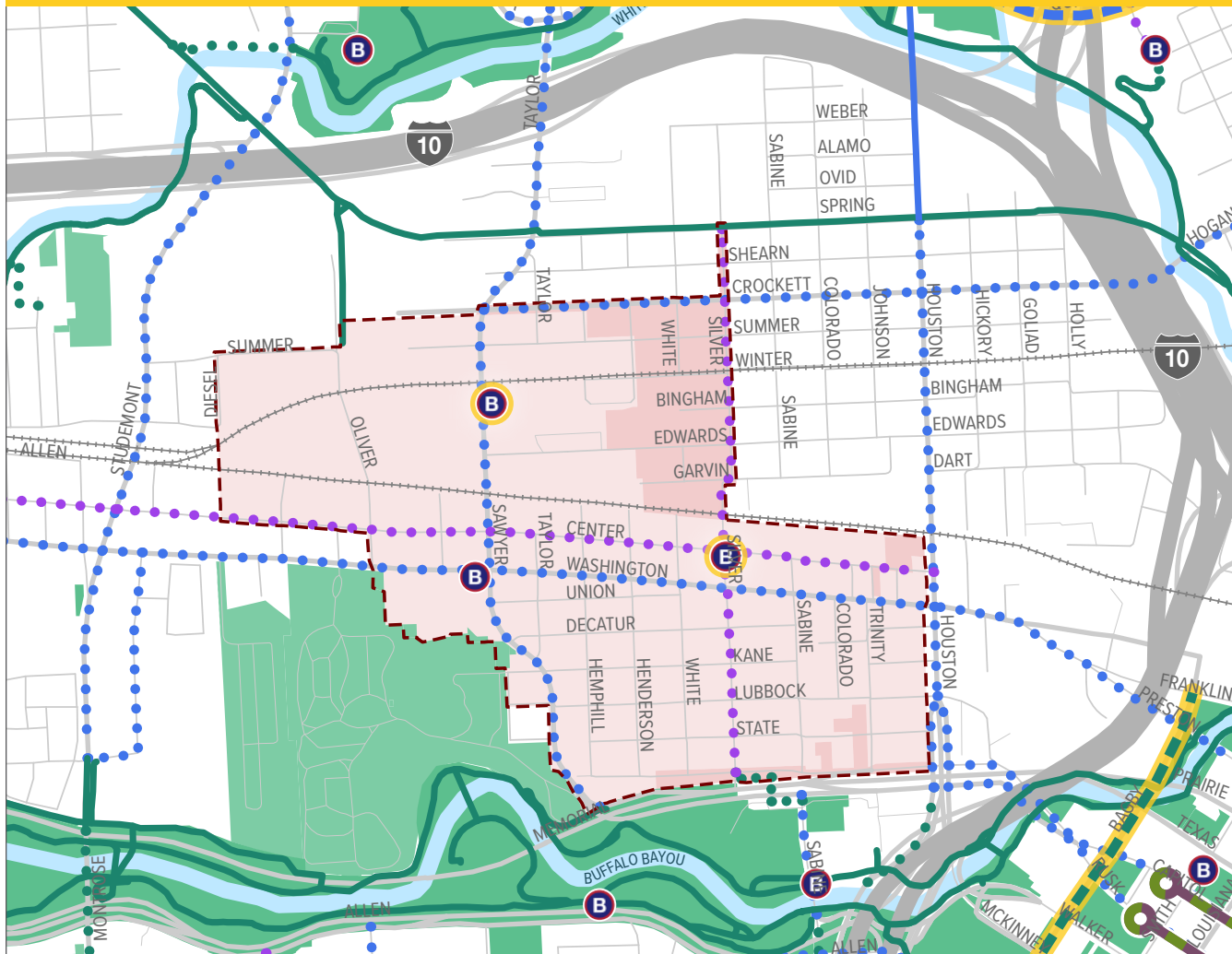


Figure A.37 shows the network of on-street and off-street bikeways envisioned in Houston Bike Plan. This Mobility Plan builds on many of the ideas proposed in the Bike Plan by prioritizing projects based on feasibility and other factors. It also provides conceptual design recommendations to achieve safe, high-comfort facilities that people of all ages and abilities can use and enjoy.

Figure A.37 Houston Bike Plan

Bikeway Facility Type	Bikeway Status	BCycle Stations	Study Area
Off Street	Existing	Existing	Study Area
Dedicated On Street	Under Construction	Programmed	
Shared On Street	Long Term Vision		

Source: City of Houston, Houston Bike Share

BICYCLE ACTIVITY: STRAVA

Figure A.38 shows bicycle activity in and around TIRZ 13 as recorded by Strava, an app that allows cyclists to track their rides. In addition to the off-street shared-use trails (Buffalo Bayou, White Oak Bayou, and Heights MKT), Washington Avenue and Houston Avenue stand out as the highest-volume corridors for cyclists using the Strava app. Within the Study Area, Sawyer Street, Silver Street, Center Street, and Edwards Street also see higher activity among Strava users.

Routes that are popular among Strava users should not be conflated with routes that are safe and comfortable for people of all ages and abilities. Although Strava is a popular app used by a wide range of people, its users are not a representative sample of active (or aspiring) bicyclists. Strava users tend to be more experienced cyclists who ride for exercise—and who often feel more confident biking on fast, busy streets than newer or more casual riders. Group rides—situations where cyclists are more visible to vehicles and experience safety in numbers—also heavily influence Strava data.

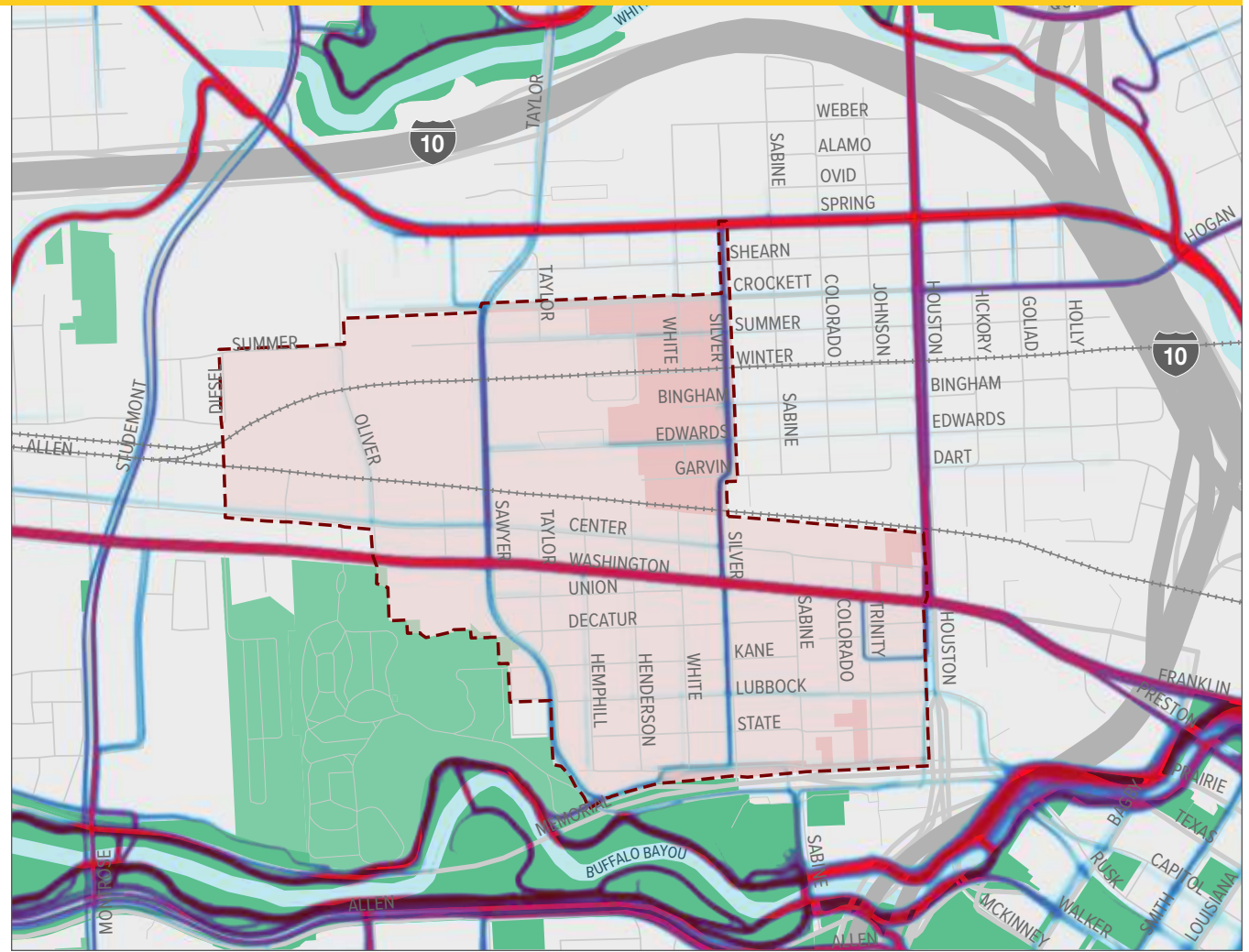


Figure A.38 Strava Bicycle Activity



More Bicycle Activity

Less Bicycle Activity

Study Area

Source: Strava

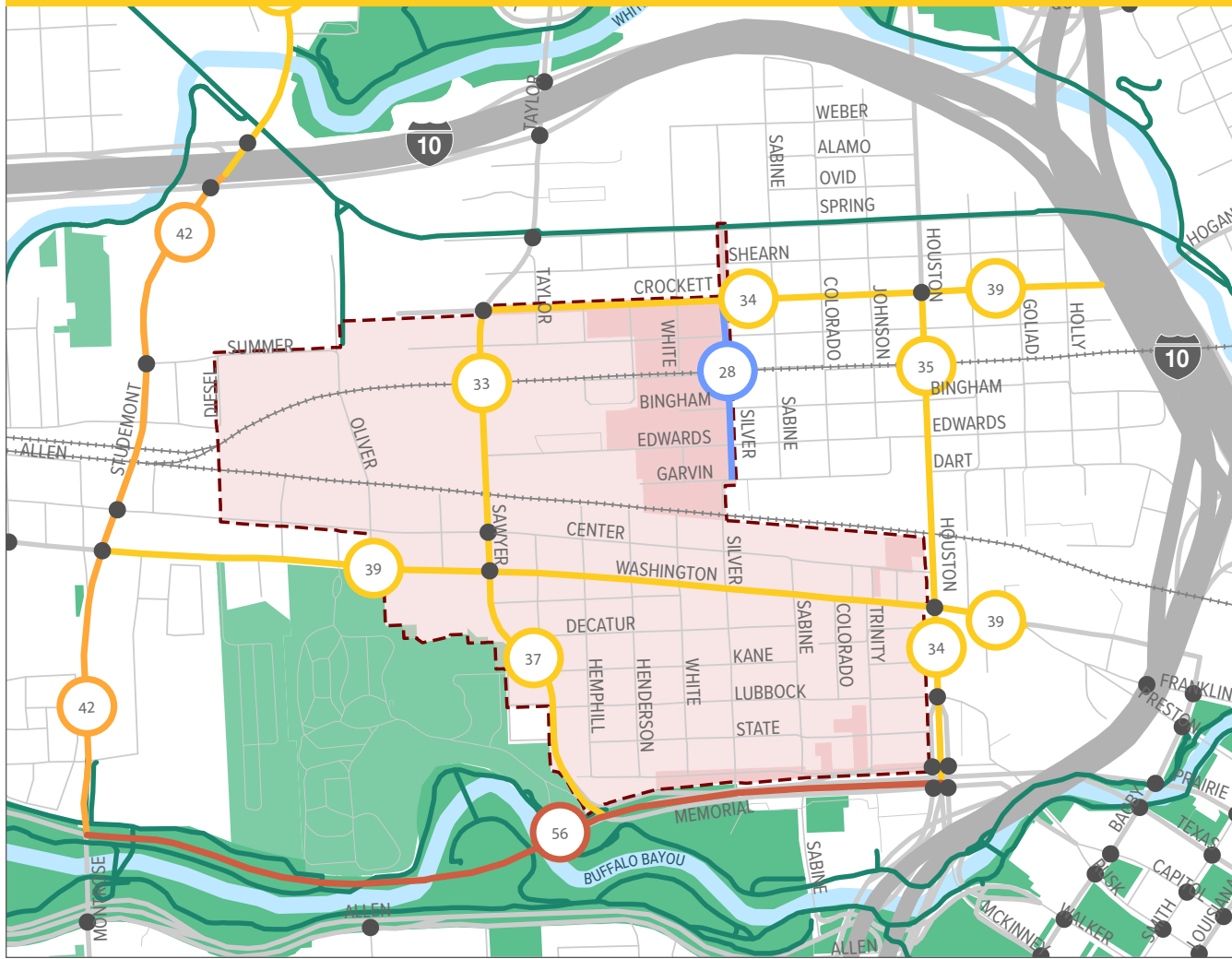


Figure A.39 85th Percentile Speeds



20-29mph 30-39mph 40-49mph >50mph

Study Area Traffic Signal

Source: City of Houston

Figure A.39 displays the 85th percentile speeds on key corridors in and around the Study Area. The 85th percentile speed is generally considered the speed at which most drivers feel safe and comfortable during normal conditions. While 85 percent of drivers travel at or below this speed, the remaining 15 percent travel faster.

Within the Study Area the maximum posted speed limit is 30 miles per hour. However, observed speeds on significantly exceed the posted limit on most roads. On sections of Sawyer Street and Washington Avenue, the 85th percentile speeds exceed 35 miles per hour and approach 40 miles per hour—between 20 percent and 30 percent higher than the posted limit. Fast speeds coupled with high traffic volumes pose safety concerns along these corridors for all road users, and especially for vulnerable road users like pedestrians and bicyclists trying to reach neighborhood destinations or off-street trails. Crossing fast, busy corridors like Washington Avenue can be challenging and dangerous for all modes, particularly given the long gaps between signalized intersections that provide a controlled crossing.

CRASH DENSITY

Table A.4 and **Figure A.40** tally and visualize crashes occurring within the Study Area between 2014–2019. Not surprisingly, the highest density of crashes are clustered along fast, busy thoroughfares and collectors, particularly near signalized intersections.

Within the TIRZ, a majority of these crashes, particularly those that resulted in serious injury, were along Washington Avenue, which experiences high traffic volumes and excessive speeds.

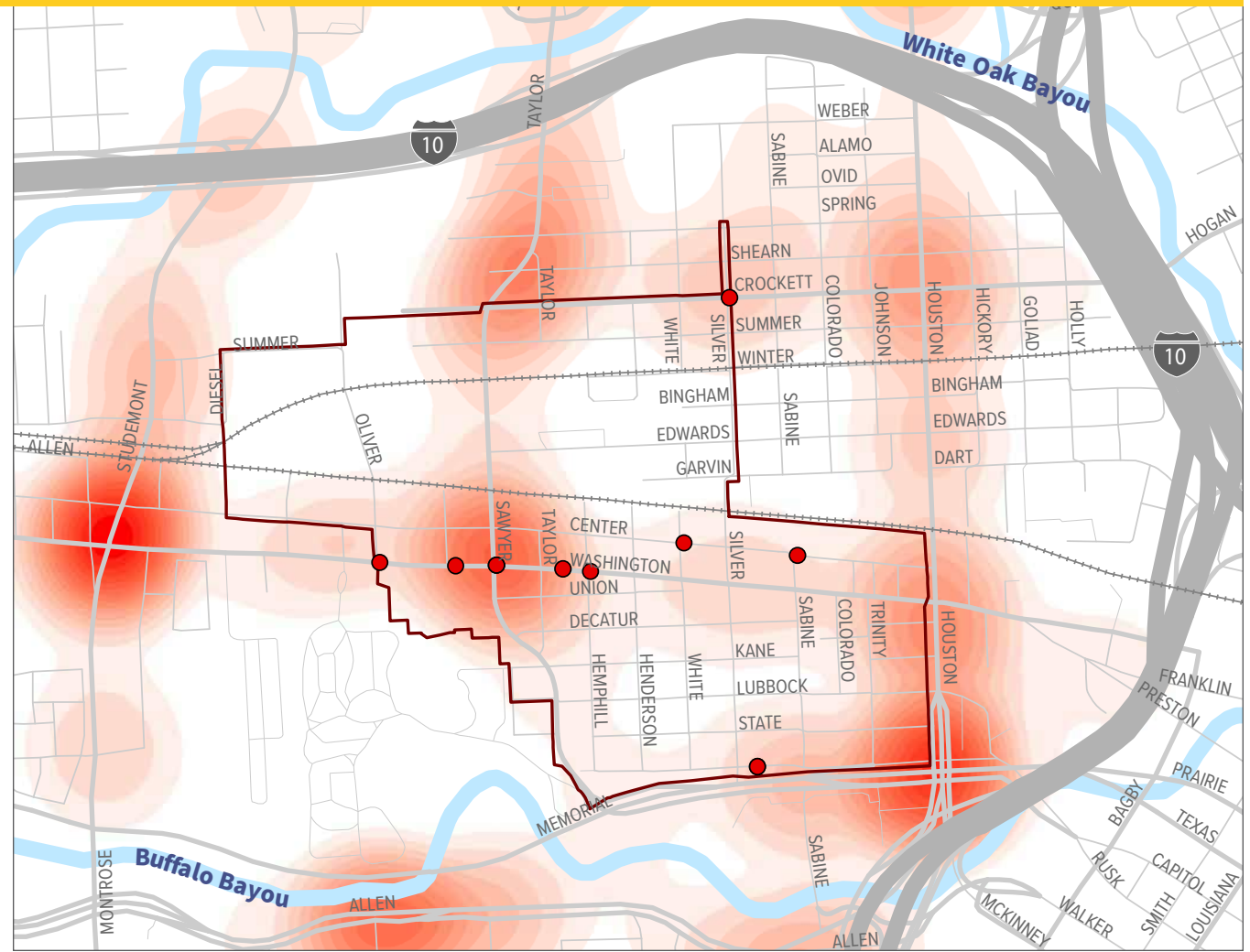


Figure A.40 Crash Density



Source: TxDOT CRIS

Table A.4 Study Area Crashes By Year

Year	Number of Crashes
2014	58
2015	55
2016	60
2017	52
2018	53
2019	63

PEDESTRIAN & BICYCLE CRASH DENSITY

HEALTH & SAFETY

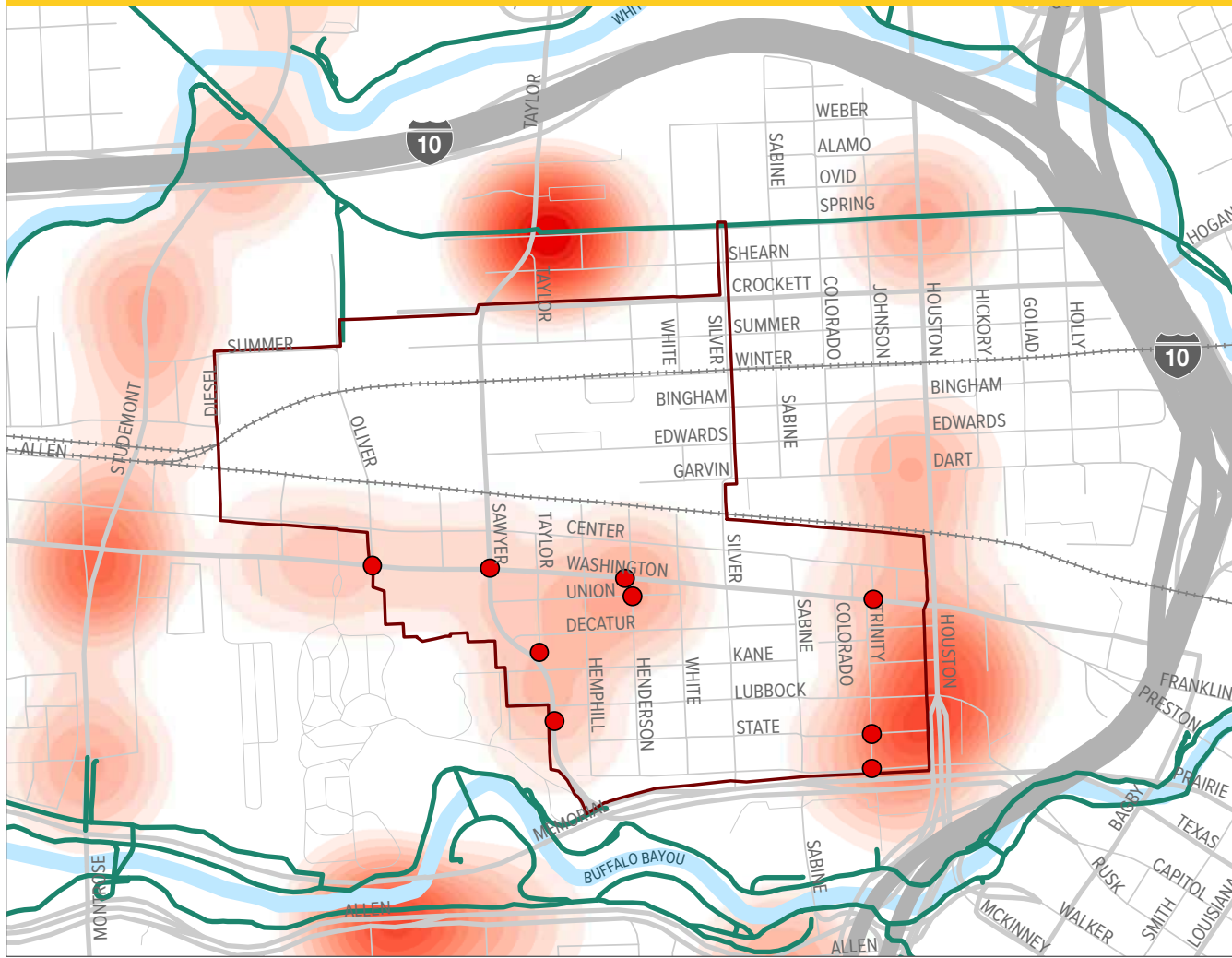


Figure A.41 shows the density of crashes involving pedestrians or bicyclists—both vulnerable road users—in the vicinity of the Study Area from 2014–2019. Within the Study Area there were 5 pedestrian involved crashes and 4 bicycle involved crashes within the assessment period.

The two locations in the area with the most concerning crash history for people walking and biking are:

- Sawyer Street at Spring Street and the Heights–MKT shared-use trail (the site of recent improvements that may mitigate some of these issues),
- Houston Avenue between Washington Avenue and Memorial Drive.

Within the Study Area, crashes involving vulnerable road users are concentrated along Washington Avenue, Houston Avenue, and Sawyer Street, suggesting that residents, workers, and visitors may have difficulty safely crossing these destination-rich corridors by foot or by bike.

Figure A.41 Density of Crashes Involving Pedestrians and Bicyclists



Source: TxDOT CRIS

SIDEWALK ASSESSMENT

An 1850s Neighborhood Built for Walking

The street network of TIRZ 13 was developed before the invention of the automobile, with the first grid laid out sometime in the mid-1800s; the first homes within the Old Sixth Ward were built in the 1850s. The grid roadway network and block sizes supported a community that walked everywhere they needed to go. Walking through the neighborhood, home to the largest concentration of Victorian houses in the City, can transport you back two centuries to the early days of Houston. Today, almost 200 years later, people choose to live within the Old Sixth Ward to have the same freedom to walk everywhere they want to go.

While the historical feel of the Old Sixth Ward is critical to the community's charm, the amount of available right-of-way (ROW), older drainage infrastructure, and property lines that were drawn over 150 years ago present challenges to maintaining the roadways.

Public road ROW can be as narrow as 30', as on Sabine Street. However, ROW is typically between 50' and 70'. Today, the demand on this space of ROW is high. The ROW contains public utilities, drainage infrastructure, the roadway, sidewalks, lighting, and a variety of other elements of public infrastructure.



Figure A.42 1896 Sanborn Fire Insurance Map from Houston, Harris County, Texas

Source: Library of Congress

WALKING WITHIN TIRZ 13

The historical street grid of the Old Sixth Ward presents unique challenges for infrastructure investments due to the high demand on narrow ROW with aging infrastructure.

While much of the north side of the Study Area roadway grid was also laid out before 1900, the area has seen turnover in land uses and redevelopment. Two Union Pacific Railroad lines cross the study area, accompanied by light industrial land uses that defined the neighborhood for decades. Recent redevelopment of these older industrial buildings present opportunities to rebuild roadways as well. While there are still many blocks with narrow ROW and limited walking infrastructure, opportunities for expanded public realms have become more frequent.

Previous Sidewalk Investments

The TIRZ has prioritized sidewalk investments over the past 10 years, with the construction of 4.4 miles of new brick sidewalks within the neighborhood to match the historical context.

Sidewalk investments have also been included within some new development within the area. New developments are required to meet City standards for surrounding infrastructure, often resulting in new and wider sidewalks.

Walkability Today

Building safe and comfortable sidewalks will not only meet the existing demand for better walking conditions, but will also encourage more people to walk. Data analyzed for this study strongly indicates that “if you build it, they will come,” proving a latent demand for more places to walk.

Six percent of trips within the Study Area are within one mile which, on average, takes 20 minutes or less. Another 45 percent are 3 miles or less, easy to take on bike or by riding transit. The Study Area is served by three METRO routes, including one high-frequency route. Everyone boarding and exiting those buses walk to get to and from destinations in and near the Old Sixth Ward.

Safe sidewalks are not only a sign of a vibrant community, but can also help create good habits and behaviors by residents and visitors. A strong sidewalk network encourages people to exercise more and visit neighborhood parks for fresh air. Sidewalks are also a gathering space unto themselves. Wide sidewalks let people hold a conversations as they walk or roll. They are places for children to play, neighbors to meet, a community to grow.

Sidewalks are also a key ingredient to a thriving commercial corridor. Better sidewalks give visitors and residents a reason to walk or bike to their favorite stores, or at least park and walk instead of driving from storefront to storefront. Businesses will cater to the foot traffic, and may invest in seating, art, signage, and other improvements that contribute to the virtuous cycle of sidewalk improvements.

When people have a reason to love their walking experience, they are also more likely to maintain and protect it. Improving sidewalks now will benefit the future residents and businesses of the Old Sixth Ward.

SIDEWALK ASSESSMENT PROCEDURE

Data Collection Process : Parcels and Blocks

The project team walked every block within the Study Area to assess condition, comfort, perceived safety, and feasibility of future sidewalk improvements. All sidewalks were assessed and categorized, giving the project team a robust data set of both quantitative data and qualitative assessments. All data was recorded in GIS mapping software to develop a sidewalk network tracker tool to be used by the TIRZ in the future.

Parcel Assessment

Parcel assessment included an analysis of sidewalk condition for each parcel within the Study Area. For corner or full block parcels, each side of the parcel was assessed independently of the other(s). Often one segment of a parcel is vastly different than another segment due to a variety of factors including trees, drainage conditions, maintenance, and redevelopment. If the condition varied along a parcel, the parcel was scored based on the segment in poorest condition. A sidewalk is only as functional as its worst segment, especially for someone with mobility challenges.

Sidewalk condition was based on both width and state of repair, as shown on the following page. The five condition categories are based on City of Houston (COH) standards that require sidewalks to be 5 feet and without vertical deflections more than one inch. City standards were updated in 2009 with new sidewalk standards that changed the minimum width of sidewalks from 4 feet to 5 feet. Many existing sidewalks within the Study Area were built prior to 2009 and are therefore below current standard.

Block Assessment

Block assessment included a review of attractiveness and safety. Attractiveness and safety were measured on a scale based on the experience of the assessor. Safety was a measure of comfort, not of security. The block-level analysis also included an assessment of existing physical obstructions along the block that could present challenges for sidewalk construction in the future. The block assessments are presented in more detail later in this chapter in **Figure A.54** through **Figure A.56**.



Conducting Field Assessments



Observing Sidewalk Obstructions



Evaluating Pavement Type and Condition



Condition A: Flat and 5 feet or more wide

These sidewalks are flat (traversable) and allow people to walk side-by-side. This should be the minimum standard for new sidewalks, with wider than 5 feet where possible.



Condition B: Flat and less than 5 feet wide

These sidewalks are flat (traversable), but built to the prior 4-foot standard. These are too narrow for people to walk or use a wheelchair side-by-side.



Condition C: Poor condition and 5+ feet wide

Although these sidewalks meet minimum width standards, they are in poor condition (not traversable), making it difficult for people with mobility challenges.



Condition D: Poor Condition, Less than 5 feet

These sidewalks are both too narrow and in poor condition (not traversable). They present physical barriers, especially for those with mobility challenges.



Condition E: Missing, no sidewalk present

Common in the northern section of the Study Area, segments with no sidewalk create major barriers to connectivity. Often “goat tracks” are present along these parcels.



Under Construction

Some parcels include sidewalks under construction. Data was collected between September and October 2020. Parcels that were under construction were not assessed for condition.

SIDEWALK CONDITION ASSESSMENT: PARCELS

The output of the parcel by parcel assessment of sidewalk condition is presented in **Figure A.43**. Summary statistics of this data is presented in the charts in **Figure A.44** and **Figure A.45**.

Currently, within the Study Area, 43% of sidewalks, by length, are traversable. However, even with a large percentage of traversable sidewalks, the Study Area has 7.5 miles of missing sidewalk, primarily located within the northern segments of the Study Area.

The large percentage of sidewalks, by parcel, that are traversable give an impression that sidewalks are generally in good condition. Yet the map indicates condition can vary substantially from one parcel to the next, adjacent parcel.

A person's walk is dictated by more than just parcels of traversable sidewalk. The experience is about the walk in entirety. Therefore, assessing the condition of the network of sidewalks is critical to understand baseline conditions of walkability within the Study Area. A path for a person walking is as comfortable as its worst segment.

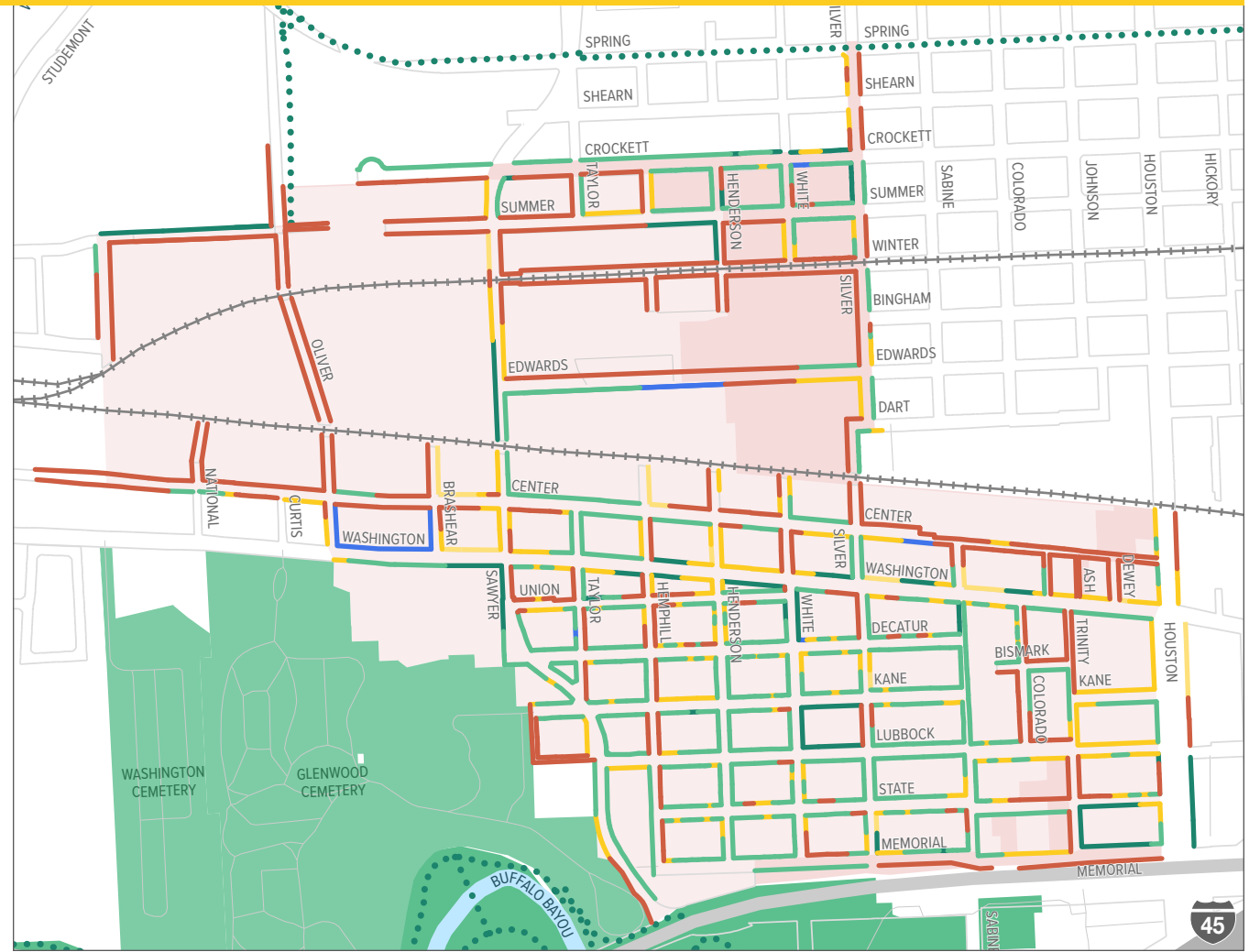
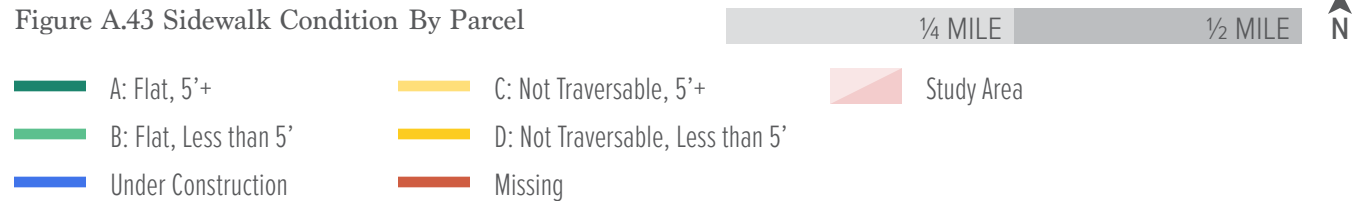


Figure A.43 Sidewalk Condition By Parcel



Source: TIRZ 13 Mobility Plan Sidewalk Assessment October 2020, Harris County Appraisal District

SIDEWALK CONDITION ASSESSMENT: PARCELS

Figure A.44 Condition by Parcel: Percent of Mileage

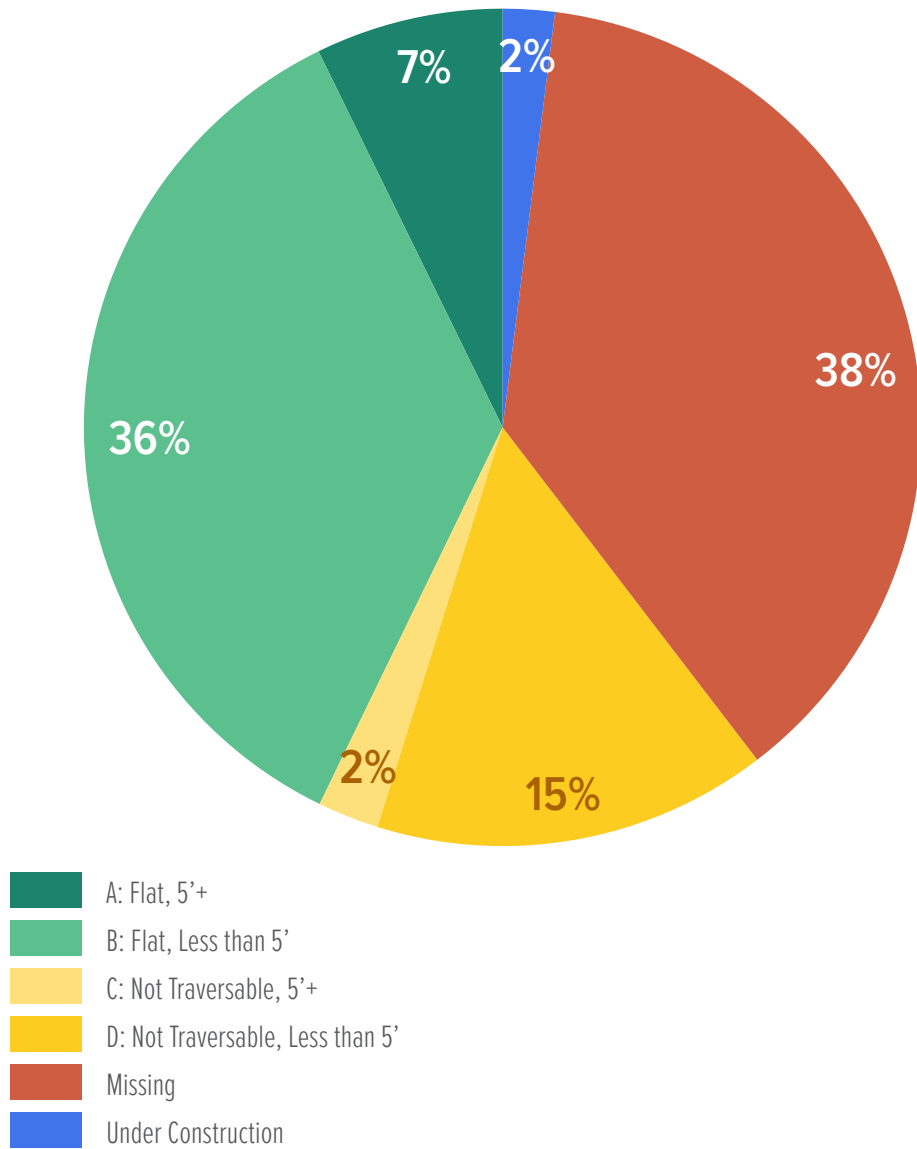
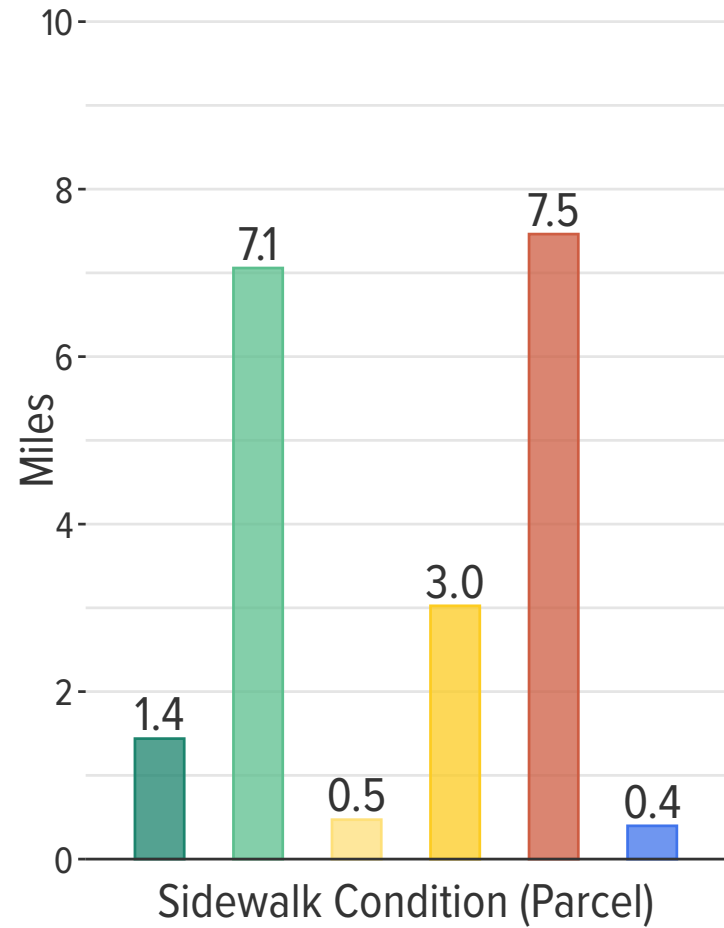


Figure A.45 Condition by Parcel: Total Mileage



Source: TIRZ 13 Mobility Plan Sidewalk Assessment October 2020, Harris County Appraisal District

SIDEWALK CONDITION ASSESSMENT: BLOCK FACES

One segment of poor sidewalk can make a whole block completely inaccessible, particularly for people with mobility challenges or pushing a stroller. Comparing parcel condition to block condition, the percentage of flat, passable sidewalks by linear feet to block condition, the percentage of flat, passable sidewalks decreases from 43% of parcel sidewalks by linear feet to 28% of blocks, as shown in **Figure A.48**. Within the Study Area 47% of block faces have a missing sidewalk.

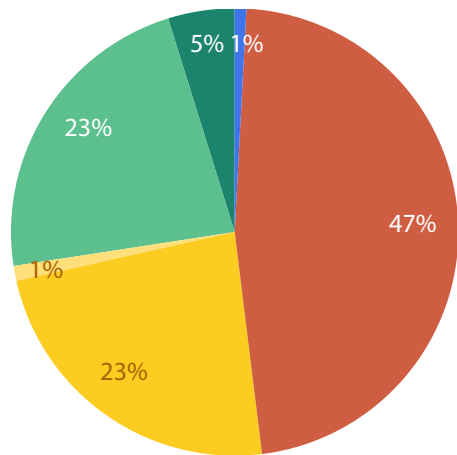


Figure A.47 Worst Condition on Block Face: Percent of Mileage

- A: Flat, 5'+
- B: Flat, Less than 5'
- C: Not Traversable, 5'+
- D: Not Traversable, Less than 5'
- Missing
- Under Construction

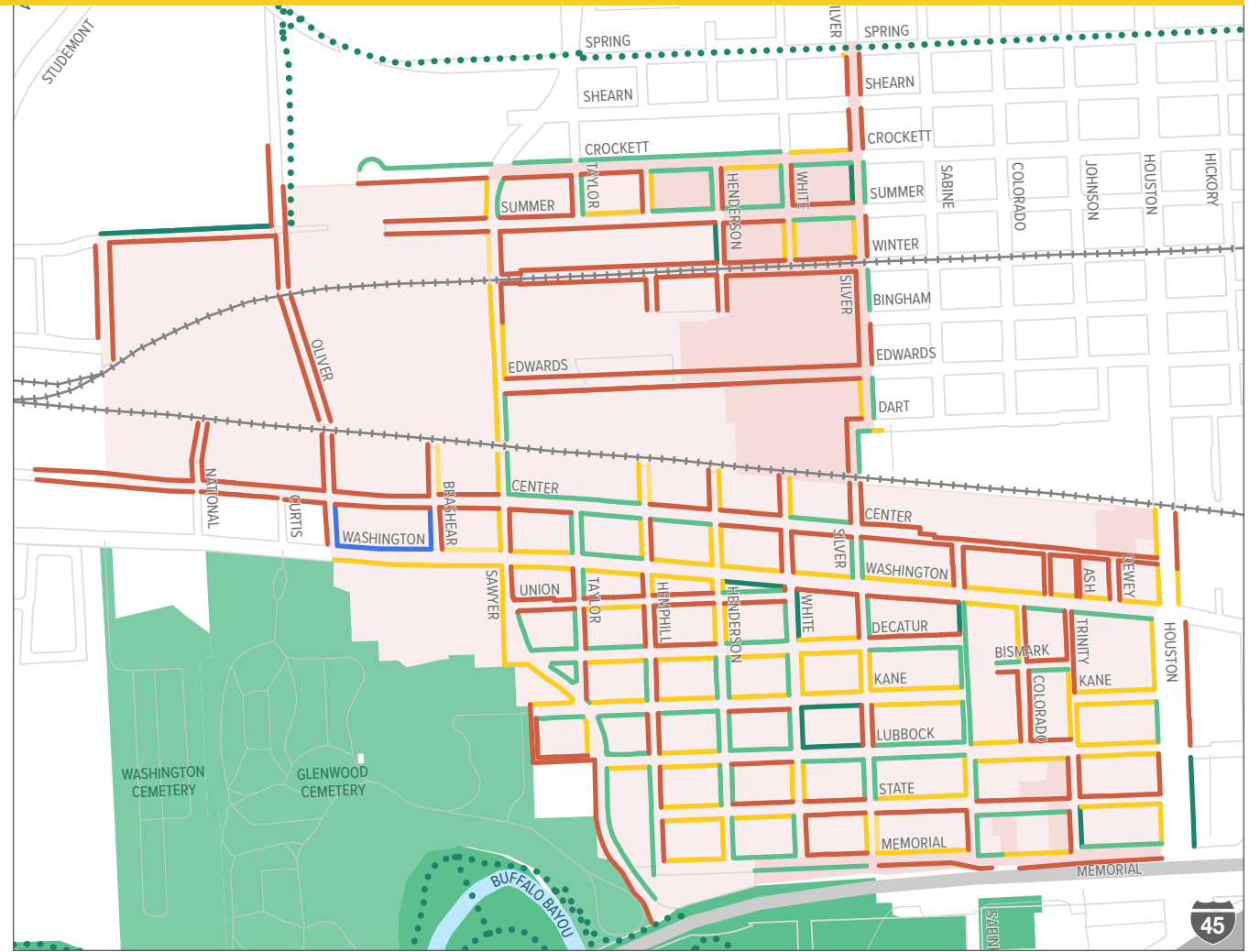


Figure A.46 Worst Sidewalk Condition on Block Face

- A: Flat, 5'+
- B: Flat, Less than 5'
- C: Not Traversable, 5'+
- D: Not Traversable, Less than 5'
- Missing
- Study Area

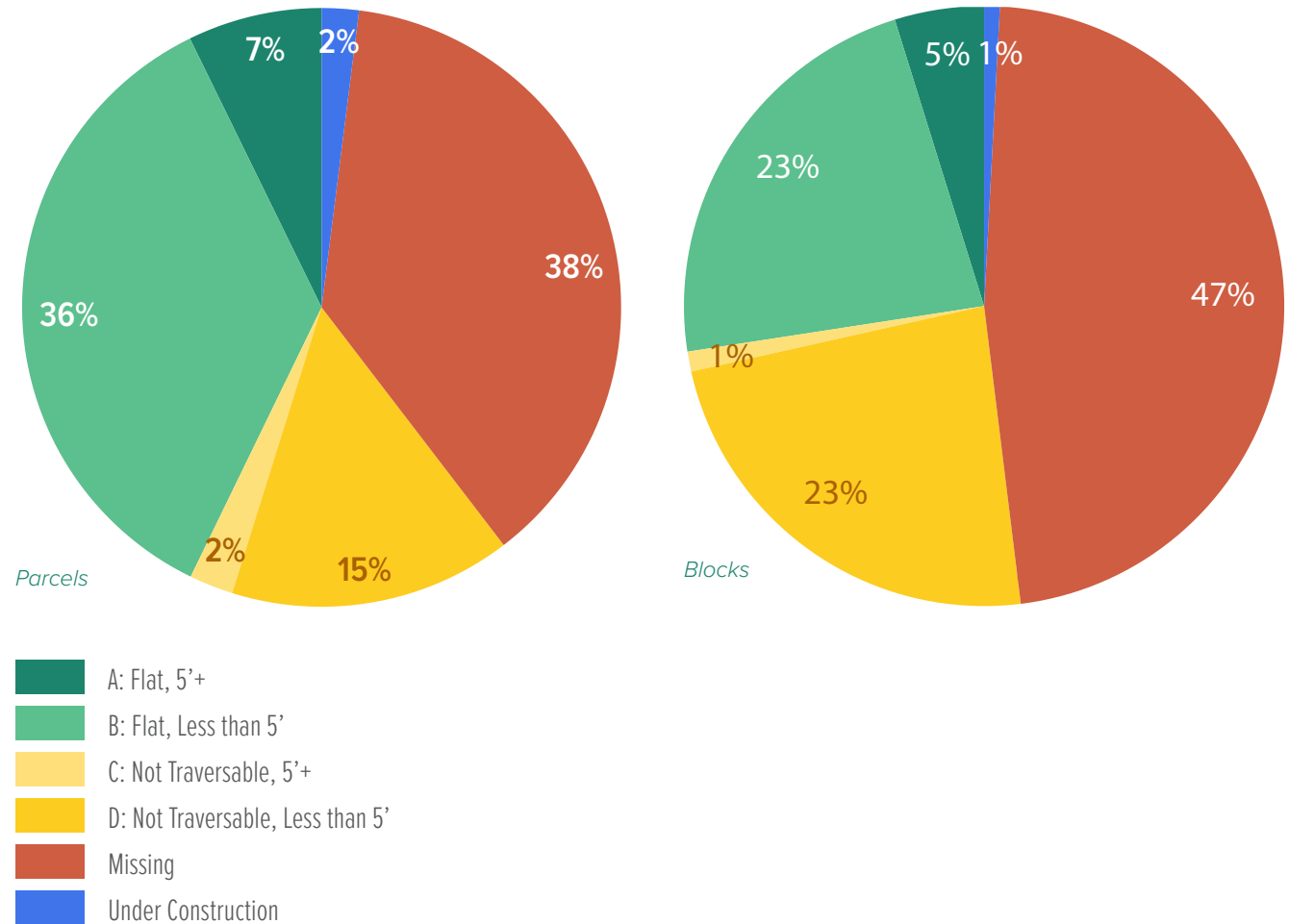
Source: TIRZ 13 Mobility Plan Sidewalk Assessment October 2020, Harris County Appraisal District

SIDEWALK CONDITION ASSESSMENT: PARCELS & BLOCK FACES

The disconnected network of passable sidewalks presents challenges for connectivity; however, it also presents opportunities. Short, smaller projects along one or two blocks can have massive impact if constructed in the right area by improving access for a variety of corridors. In addition, as parcels redevelop, improvements will continue throughout the network. The extensive sidewalk inventory can also be used as a public educational tool for residents to show the impact of improvements to overall connectivity if poor segments on their block are fixed.

Condition by parcel and by block is only one part of assessing network connectivity. Intersection and curb ramp conditions are an important factor for improving walkability as well. The following pages present the intersection assessment conducted and the maps in **Figure A.49** and **Figure A.50** present the findings.

Figure A.48 Parcel Condition vs. Block Face Condition



Source: TIRZ 13 Mobility Plan Sidewalk Assessment October 2020, Harris County Appraisal District

INTERSECTION ASSESSMENT PROCEDURE

Data Collection Process: Intersections

The intersection assessment included an evaluation of curb ramp condition at all corners. Ramp type and condition were recorded and assessed based on COH and Americans with Disabilities Act (ADA) curb ramp standards.

Directional vs Diagonal Ramps

Directional ramps are ideal in most circumstances. Directional ramps direct the person walking to cross the intersection along the crosswalk, even if not marked, instead of directing them into the middle of the intersection. Directional ramps provide benefits to all people walking but their benefit is more impactful for people who are rolling or people who are visually impaired.

Diagonal ramps are shared by two converging sidewalks and typically require a change of direction to follow the crosswalk. At one point, these ramps were a standard. They are typically lower cost to construct than directional ramps. Ideally, diagonal ramps should only be used if constructed in areas where physical constraints make a directional ramp infeasible.



Ramp Condition

Ramps are defined by three condition categories: good, poor, and no ramp. While slopes were not calculated for each ramp, COH slope standards for ramps were used as general guidelines. The focus of this assessment was determining if a ramp was traversable and its ease of use for a person walking or rolling.

To be ADA compliant, a ramp must meet slope guidelines, include a landing area of specific size, and truncated domes. For this assessment, only slope was considered for a ramp to be classified as good. Therefore, even some good ramps, as documented in this report, may not be fully compliant to ADA standards.

A Good Ramp had a perceived slope that matched COH standards, indicating it would be comfortable to traverse by a person rolling. COH standards require truncated domes for all curb ramps; for this assessment a ramp could still be classified as good even without truncated domes.

A Poor Ramp has a slope that is not to COH standard or is unsafe or inaccessible for people with mobility challenges.

No Ramp classifications include corners where there is no ramp and there is no contiguous sidewalks to the curb indicating lack of connectivity from the edge of sidewalk to the curb.

Classification: Directional Poor Ramp



Classification: Direction Good Ramp



Limited ROW Requires Creative Design



Conducting Field Assessments



Open Ditch Drainage Presents Challenges



Newly Built Ramp to ADA Standards



RAMPS & CROSSINGS

The map in **Figure A.49** shows the condition of ramp(s) at each corner of Study Area intersections. Traversable crossings require good ramps at each end of a crosswalk, and few crossings within the Study Area provide that.

A field assessment of 106 intersections indicated 62% of all ramps within the Study Area are poor or missing.

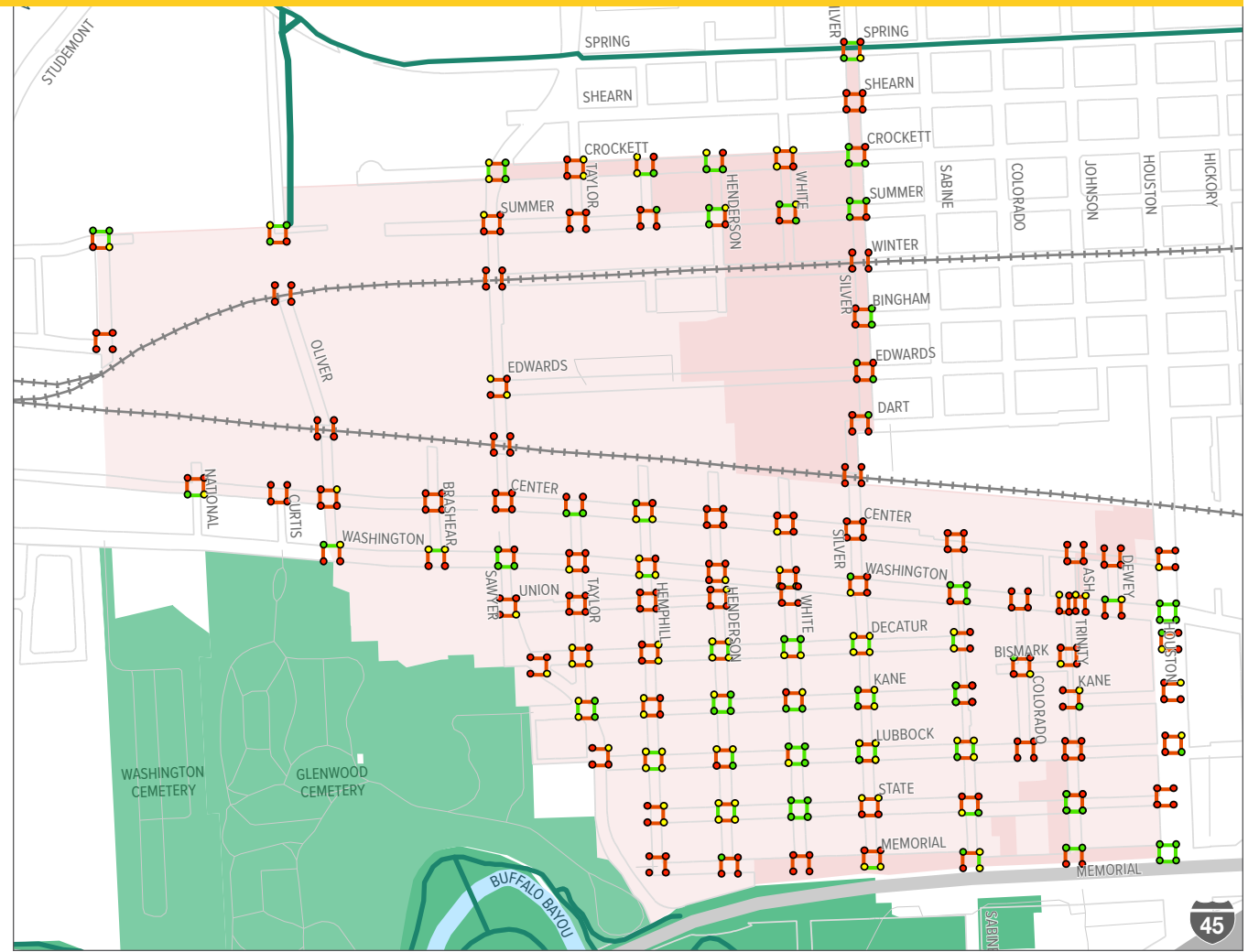
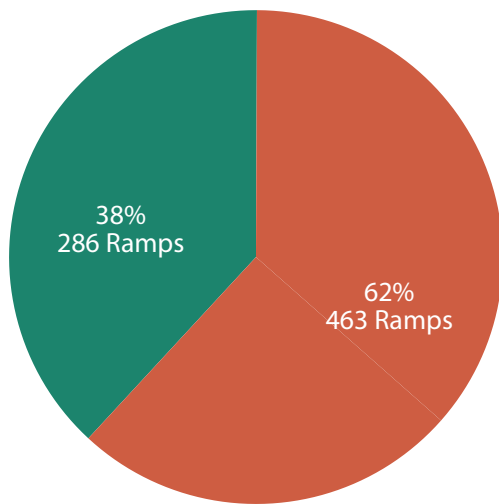
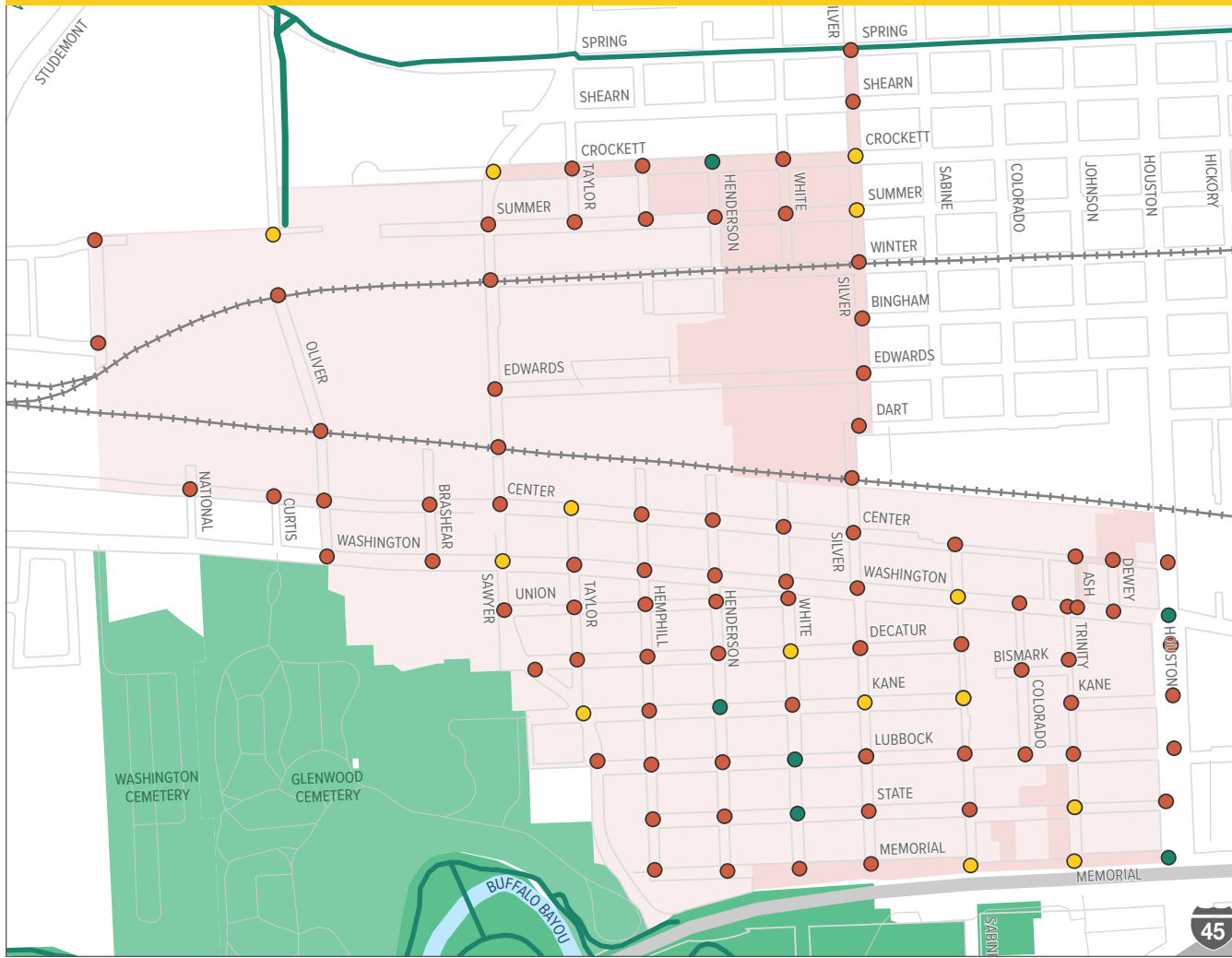


Figure A.49 Ramp Condition



Source: TIRZ 13 Mobility Plan Sidewalk Assessment October 2020, H-GAC STAR*Map

INTERSECTIONS



To assess accessibility of all Study Area intersections, the ramp and crossing data was consolidated into the map in **Figure A.50**. Only 6% of intersections are fully accessible; most intersections are in need of ramp and crossing improvements. Investments to improve crossings at targeted intersections can greatly improve walkability through small projects.

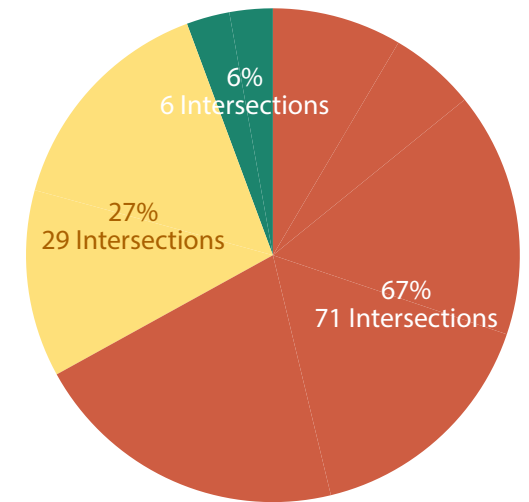


Figure A.50 Intersection Condition

- Accessible: No impassable ramps
 - 1-2 impassable ramps
 - 3+ impassable ramps
- Study Area

Source: TIRZ 13 Mobility Plan Sidewalk Assessment October 2020, H-GAC STAR*Map

Intersections

- Accessible: No impassable ramps
- 1-2 impassable ramps
- 3+ impassable ramps

THE WALKABLE NETWORK

Figure A.51 through Figure A.53 were developed to summarize all the data collected about sidewalk and intersection conditions into an assessment of actual walkability for the sidewalk network within the Study Area. In these maps, the blue blocks have traversable sidewalks of the entire block (Condition A or Condition B).

The blocks in Figure A.51 with red solid lines are segments that are incomplete and not fully traversable with at least one parcel with Condition C or less. These segments present opportunities for targeted sidewalk network improvements that can have vast benefit for walkability.

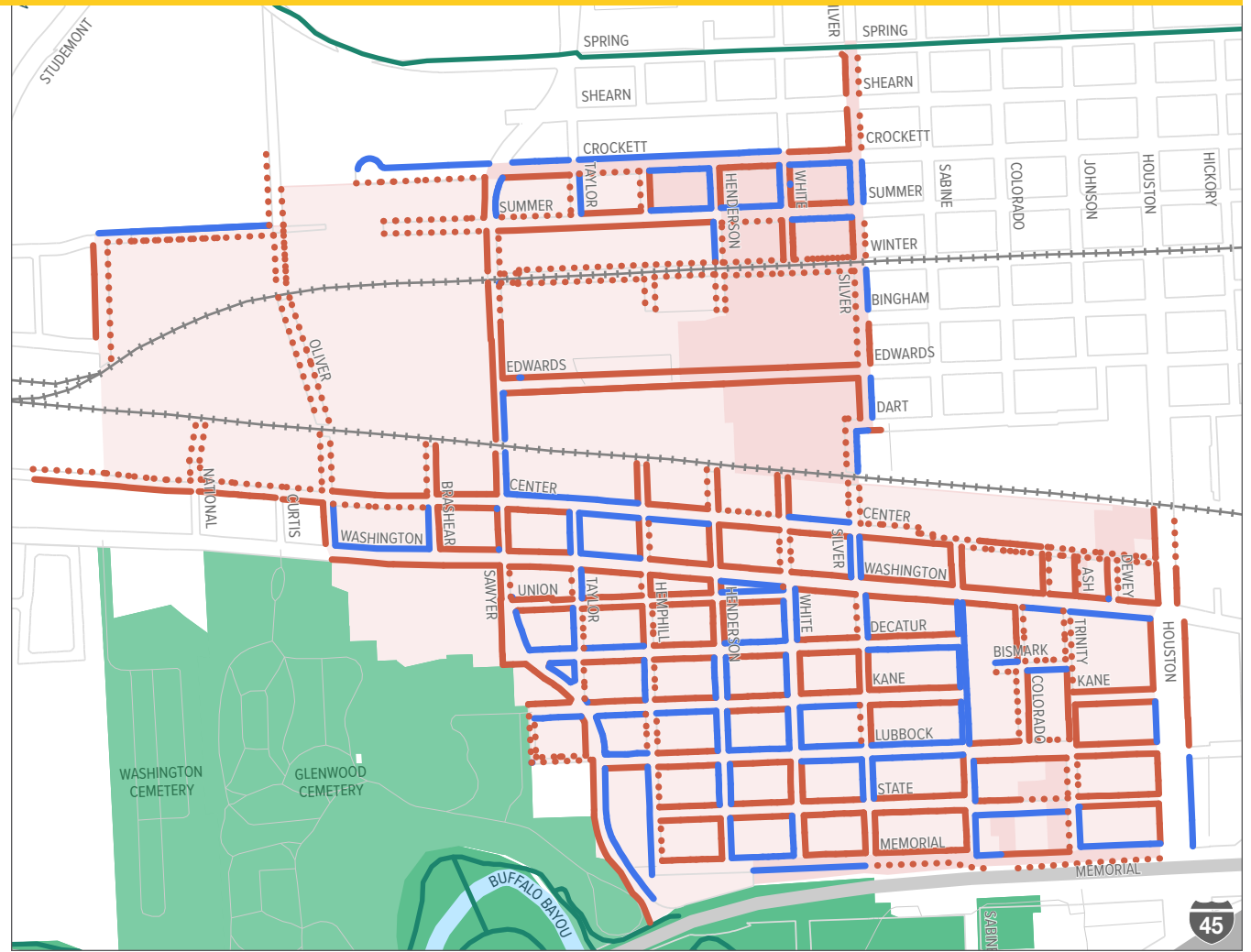


Figure A.51 Traversable, Incomplete, & Missing Block Faces

- Traversable Block Face
- ⋯ Missing Block Face
- Incomplete Block Face
- Study Area

¼ MILE

½ MILE



Source: TIRZ 13 Mobility Plan Sidewalk Assessment October 2020, Harris County Appraisal District

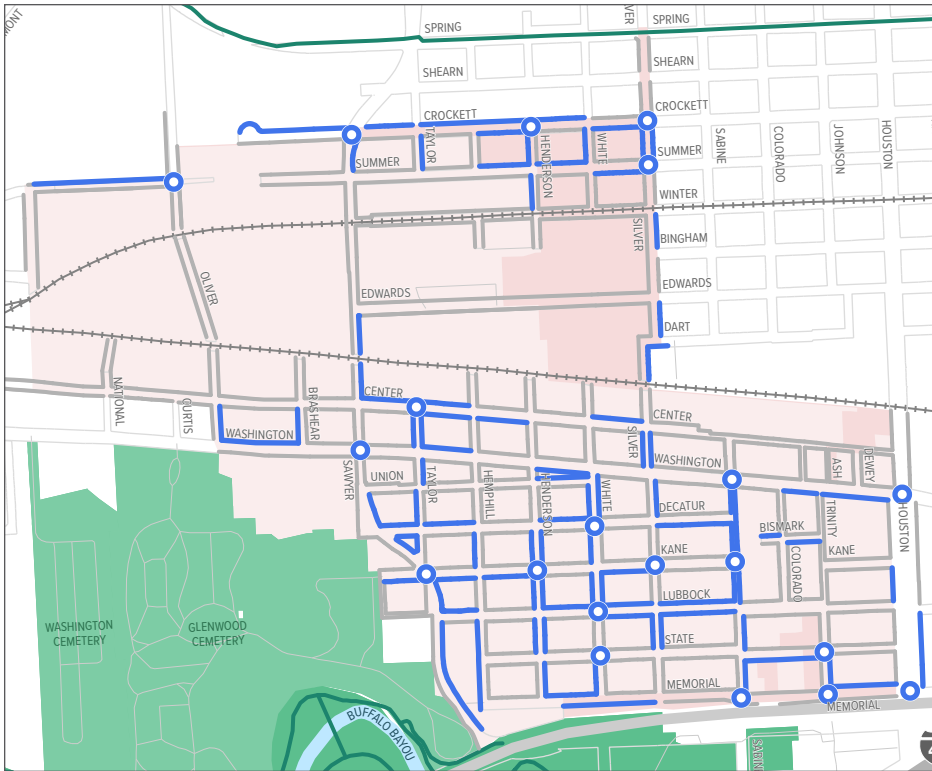


Figure A.52 Complete Block Faces & Intersections

- Complete Block Face
- Complete Intersection
- Study Area

Figure A.53 Incomplete & Missing Block Faces & Intersections

- Incomplete or Missing Block Face
- Incomplete Intersection
- Study Area



Source: TIRZ 13 Mobility Plan Sidewalk Assessment October 2020, Harris County Appraisal District, H-GAC STAR*Map

AN ENJOYABLE WALK

Measuring safety and attractiveness of each block

Well-designed sidewalks are an integral part of creating an enjoyable walk; however there are other factors that can make or break a walking experience. A person walking must feel safe along a corridor. For this assessment, safety was evaluated in relation to infrastructure and environment. Just because a sidewalk is designed to meet standards does not guarantee a safe walking environment. Design that addresses the surrounding environment is critical. For example, a sidewalk along a busy roadway with high volumes and speeds can be improved by a wide buffer from the roadway that includes physical barriers like trees.

A sidewalk should be well-designed to ensure a safe walk, but it should also be appealing for people walking. Creating attractive walking spaces is shown to increase the number of people walking along a corridor. Attractiveness can be enhanced by landscaping, interesting building facades with short set-backs, a variety of building types, a density of other people walking, public art, and many other factors.

Team Assessment of Safety and Attractiveness

The sidewalk condition analysis asked qualitative questions for each block based on team member observations. Two questions – assessing safety and attractiveness – were developed to gather data on the existing walking experience for each block. These questions also align with sidewalk assessments that have been conducted in other neighborhoods, providing continuity across studies within Houston. The two statements assessed for each block within the Study Area are:

- “This block is attractive for walking”
- “I feel safe walking along this block”

The responses to these questions for each block are presented in **Figure A.54** and **Figure A.55**.

Future Sidewalk Construction Feasibility

Along with safety and attractiveness, a feasibility assessment was conducted for each block within the Study Area to assess the future potential of a well-designed, safe, and attractive sidewalk along that block. The feasibility assessment evaluated the perceived ease of construction of a 5-foot or wider sidewalk along that block face. The results of this assessment provide insights into the safety, attractiveness, and overall experience along each block. Often a block with many obstructions affects the overall walking experience, which emphasizes the need for thoughtful and context sensitive design for sidewalks within the Study Area. The summary of this data is presented in **Figure A.56**.

ATTRACTIVENESS

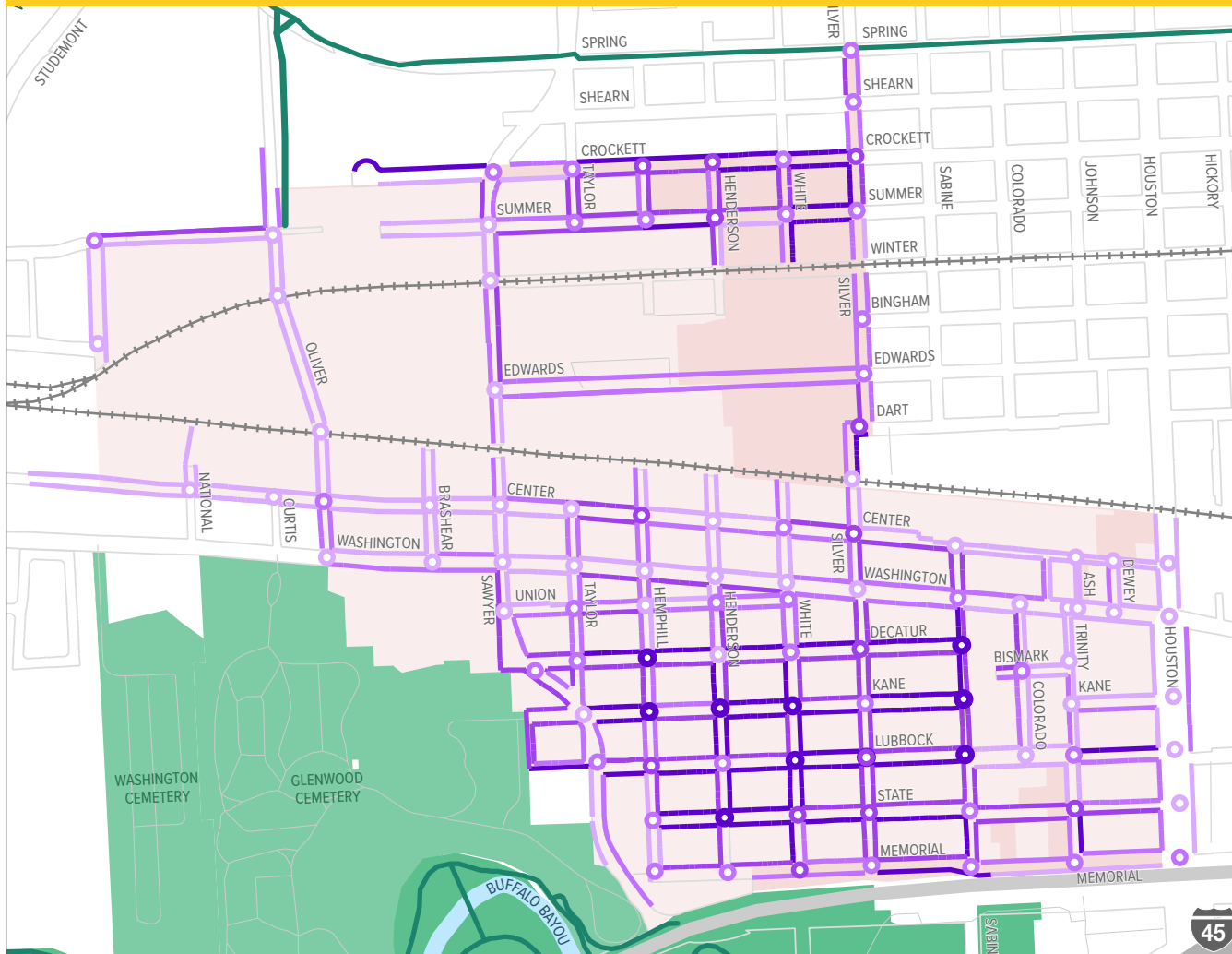


Figure A.54 Attractiveness by Block and Intersection

- 4 - Strongly Agree
- 3
- 2
- 1 - Strongly Disagree

Study Area

Source: TIRZ 13 Mobility Plan Sidewalk Assessment October 2020, Harris County Appraisal District

“This block is attractive for walking”

The map presents the block and intersection attractive assessment conducted by the study team. The darker areas indicate more attractive areas for walking. The darker areas are within the historical neighborhood south of Washington and along the residential parts of Crockett Street and Summer Street in the north.

The Washington Avenue corridor has a low score. The TIRZ has prioritized improving the streetscape along Washington Avenue with the development of streetscape plans for the corridor.

SAFETY

“I feel safe walking along this block”

The map to the right summarizes the assessment of safety while walking for all blocks and intersections within the Study Area. Areas perceived to be safe are typically areas with sidewalks present and also correlate with the attractiveness assessment on the previous page. Unsafe blocks and intersections typically correlate to areas with minimal or missing sidewalks and ramps as well as narrow sections where there is minimal buffer between those walking and moving vehicles.

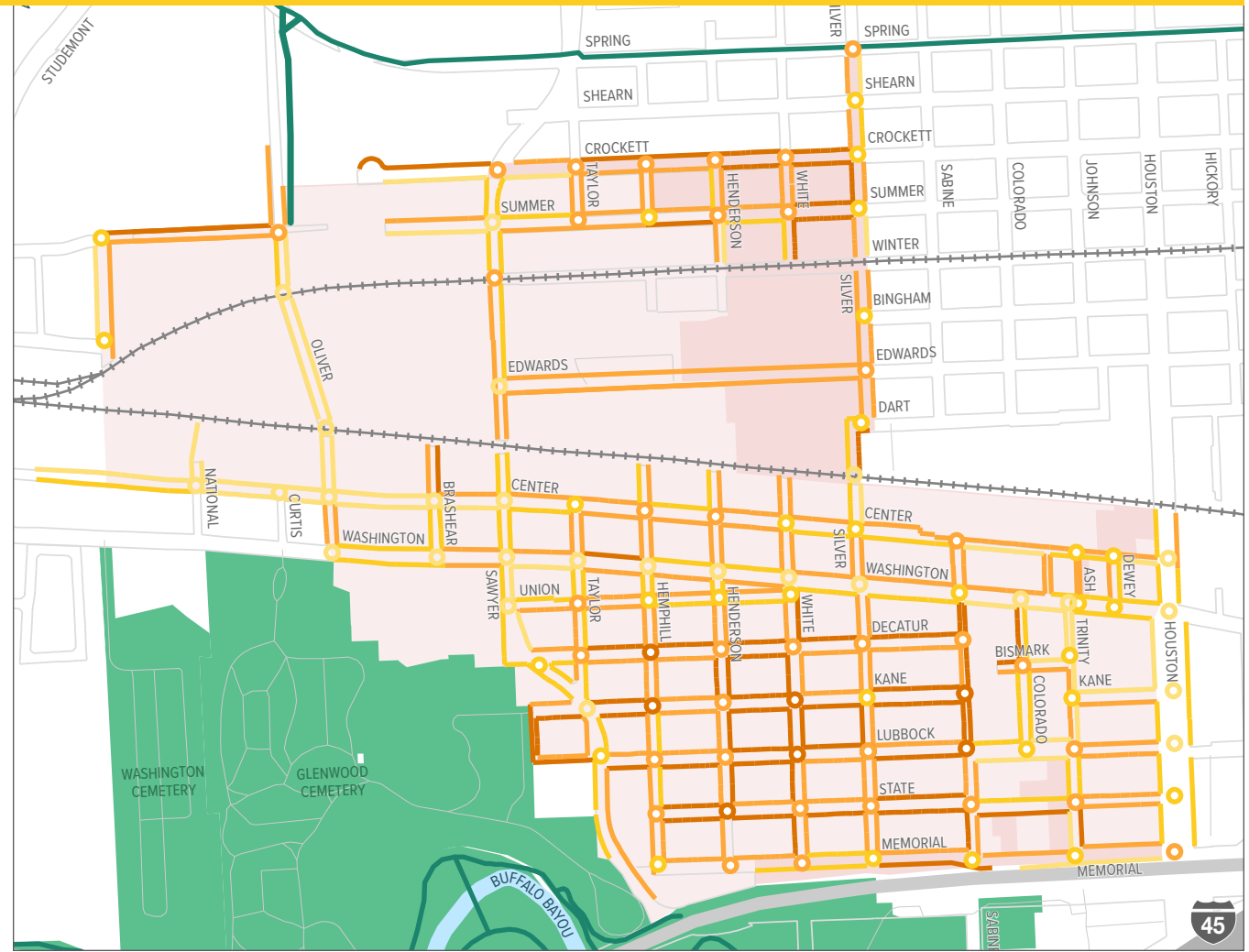


Figure A.55 Safety by Block and Intersection



Source: TIRZ 13 Mobility Plan Sidewalk Assessment October 2020, Harris County Appraisal District

FEASIBILITY OF FUTURE SIDEWALK CONSTRUCTION

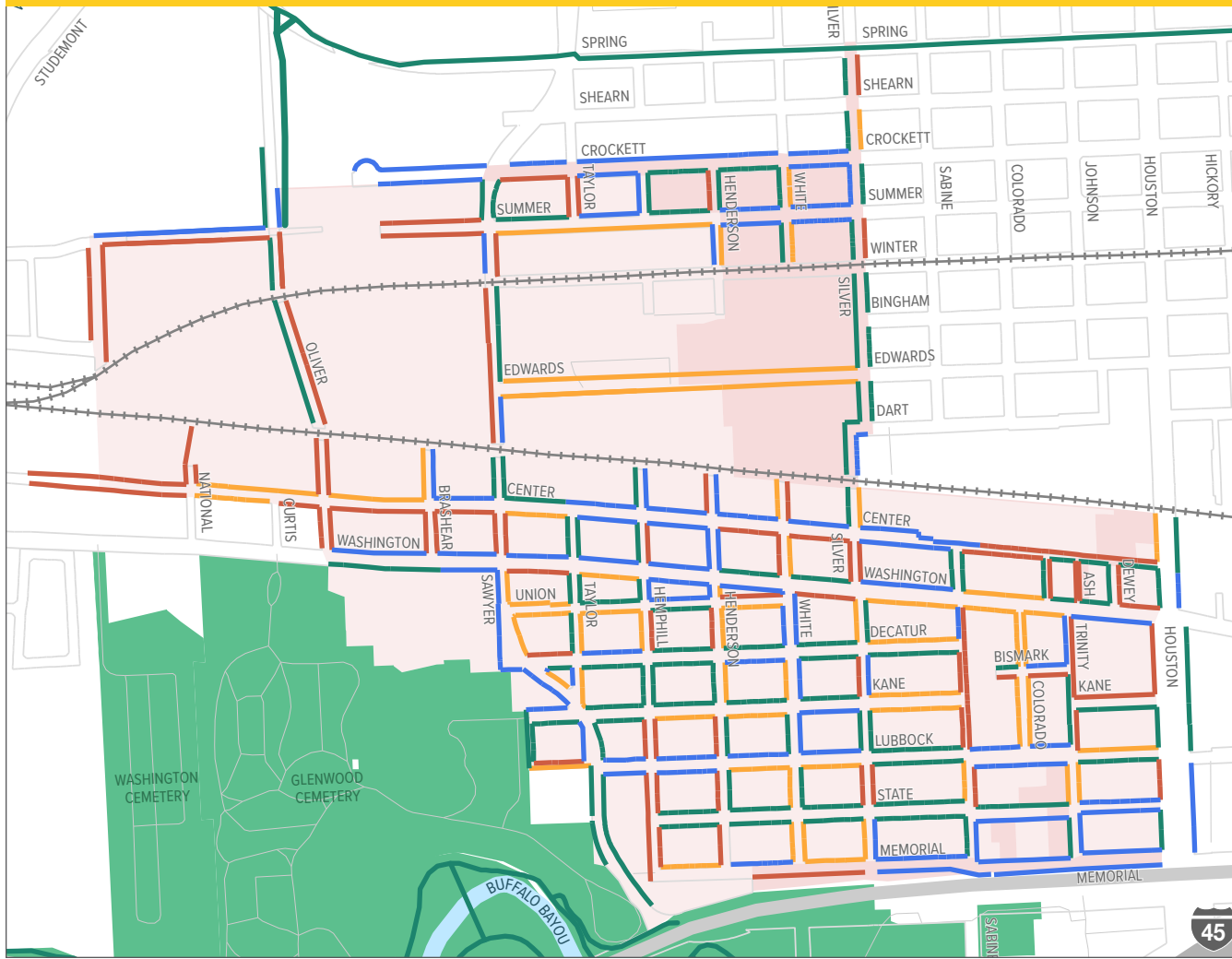


Figure A.56 Feasibility

- █ Appears feasible
- █ A few obstructions (3 or fewer pinch points)
- █ Many obstructions
- █ Other factors making it difficult
- Study Area

Source: TIRZ 13 Mobility Plan Sidewalk Assessment October 2020, Harris County Appraisal District

This map is a resource for future project identification as well as for proposed project cost development. Sidewalks can be very challenging to design and build due to limited space and immovable obstructions.

Project feasibility also helps determine the priority of improvements, as it is a key input into cost. In the short-term, feasible projects can be less expensive, quicker to implement, and are more likely to build momentum in the community for additional investments. More challenging projects may require larger budgets, collaboration with other entities, or a larger-scale capital project, like a roadway rebuild, to implement.

KEY CORRIDORS ASSESSMENT

While TIRZ 13 is home to historic neighborhoods and exciting new development, many of its roadways are aging with poor pavement, below standard sidewalks, and cross-sections that do not align with the needs of the community and surrounding land uses. Redesigning key streets to match these needs will better support residents, business owners, employees, and visitors of the TIRZ.

This chapter outlines the existing conditions of key corridors within the Study Area, presenting data that directly informs the vision and recommendations for each corridor in the Plan. The baseline analysis highlights needs and opportunities to develop future projects focused on improving mobility, safety, and the experience of all roadway users on five corridors (shown in **Figure A.57**):

- Center Street
- Edwards Street
- Sawyer Street
- Silver Street
- Washington Avenue

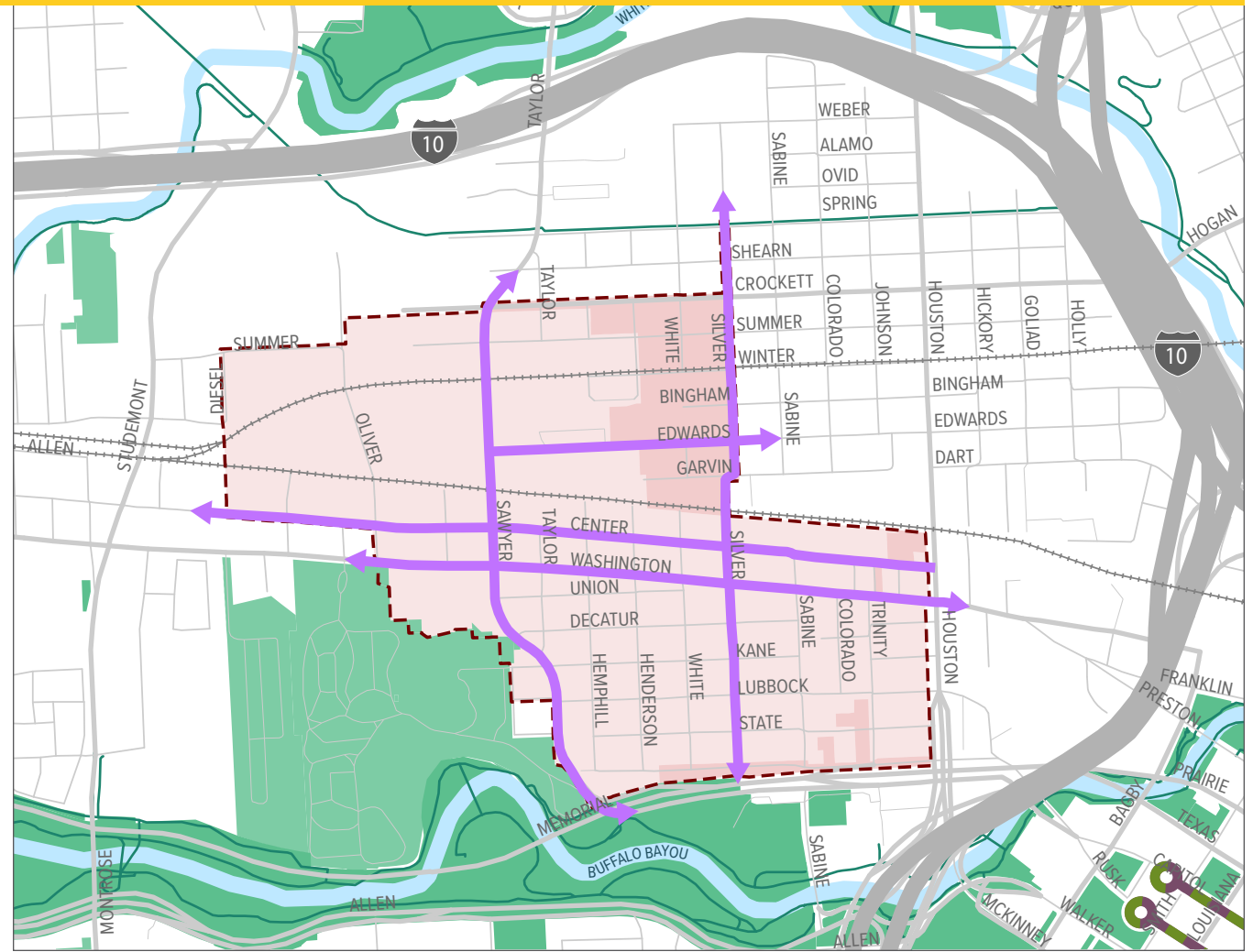
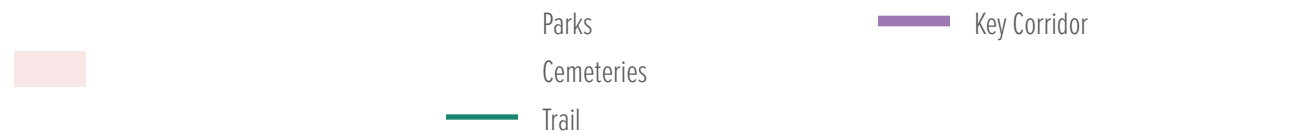


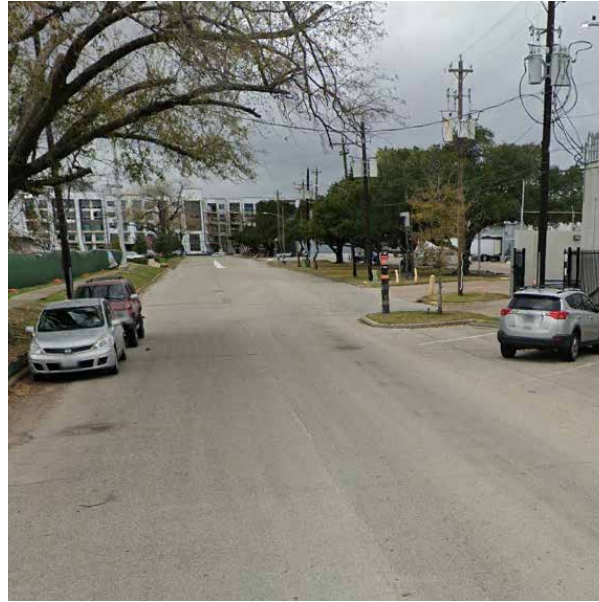
Figure A.57 Key Corridors



Source: Team Analysis



Center Street



Edwards Street



Sawyer Street



Silver Street



Washington Avenue

CENTER STREET

Key Corridor Highlights

- Center Street is a two-lane roadway with very poor pavement that runs parallel to Washington Avenue.
- East of Sabine Street, Center Street has very narrow pavement and right-of-way.
- The *Houston Bike Plan* recommends a shared on-street bicycle facility on the corridor. Many cyclists use the corridor to avoid the heavy vehicle traffic and fast speeds on Washington Avenue.
- Center Street is signalized at most major intersections, reinforcing its popularity as an alternate route to Washington Avenue.

Table A.5 Center Street Corridor Profile

Study Extents	Studemont Street to Houston Avenue Within TIRZ: Diesel Street to Houston Avenue
Typical ROW	West of Sabine: 50'-70'; East of Sabine: 30'- 40'
Typical Pavement Width	West of Sabine: 35'; East of Sabine: 20'
Travel Lanes	2
MTFP Classification	Minor Collector (MN-2-60 to be widened)
Traffic Volumes	No data available
Sidewalks	Varies block by block (see detailed sidewalk analysis)
Bicycle Facilities	None
Transit Routes	None
Street Parking	Typically permitted (exception: north side east of Sabine) A Parking Benefit District with restrictions extends from Sawyer Street to Sabine Street
Land Use	Commercial, distribution, and single-family residential

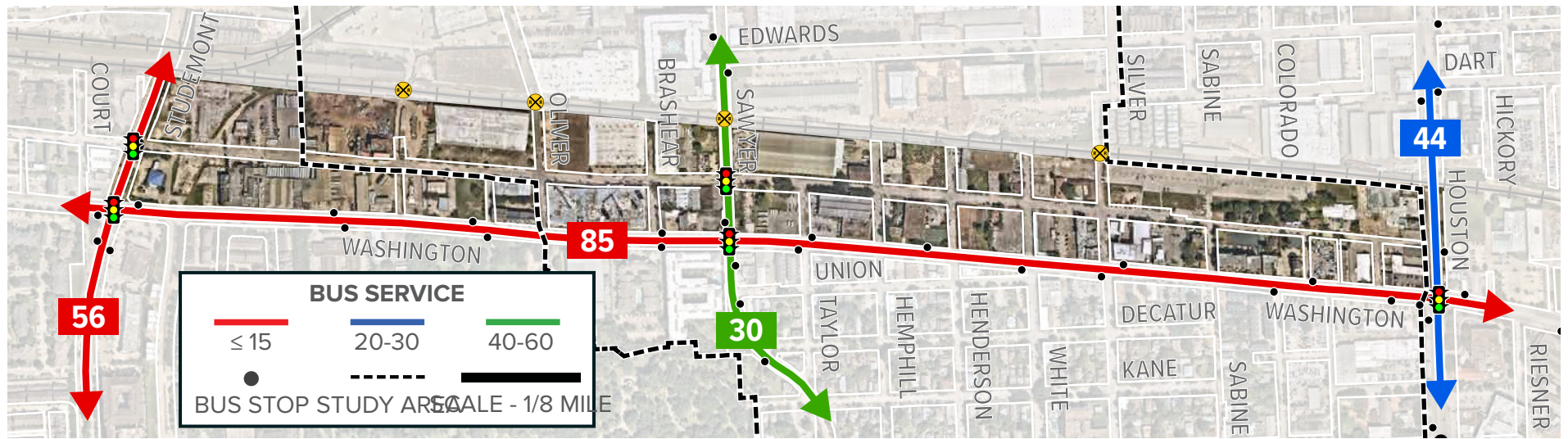


Figure A.58 Center Street Corridor

Source: Nearmap

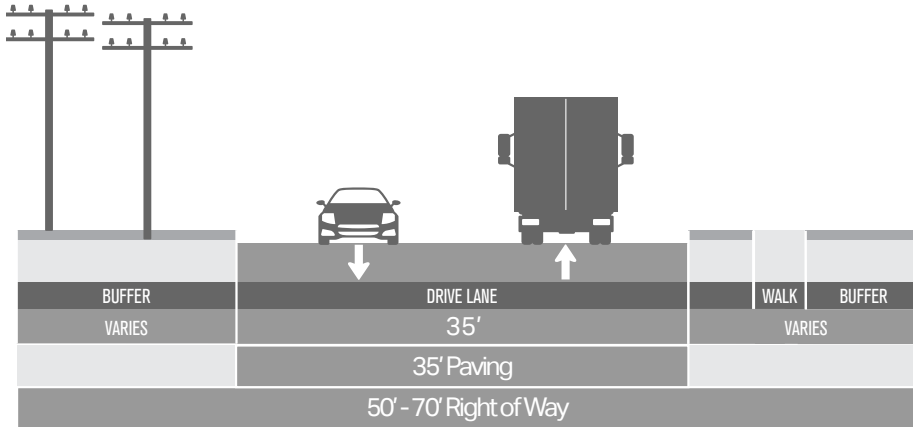


Figure A.59 Existing Typical Center Street Section: West of Sabine



Center Street at Silver Street looking East

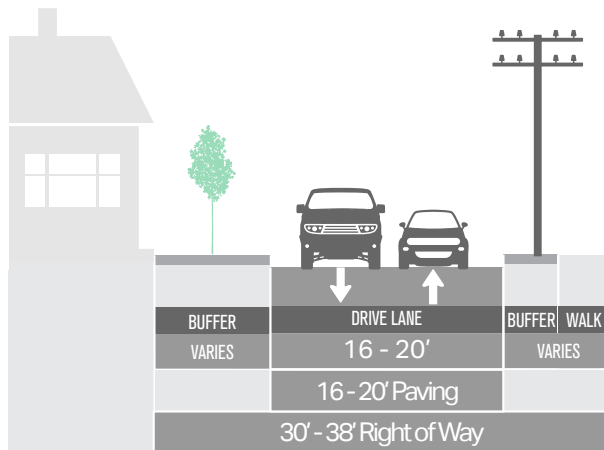


Figure A.60 Existing Typical Center Street Section: East of Sabine



Center Street at Johnson Street looking East

EDWARDS STREET

Key Corridor Highlights

- Edwards Street is a two-lane roadway connecting Sawyer Street to Houston Avenue that has excess pavement width.
- This street is one of only five streets within the Study Area that extends from Sawyer Street to Houston Street.
- Due to its location between the UP railroad lines, Edwards Street is often used as a detour to travel around trains.
- Edwards Street provides access to popular TIRZ destinations such as Sawyer Yards and Silver Street Studios, which is fronted by a section of head-in angle parking.

Table A.6 Edwards Street Corridor Profile

Study Extents	Sawyer Street to Silver Street Within TIRZ: Sawyer Street to Silver Street
Typical ROW	60'-75'
Typical Pavement Width	38'-50'
Travel Lanes	2
MTFP Classification	Local (No Classification)
Traffic Volumes	No data available
Sidewalks	Varies block by block (see detailed sidewalk analysis)
Bicycle Facilities	None
Transit Routes	None
Street Parking	Permitted, head-in angle parking near Silver Street Studios
Land Use	Commercial and single-family residential



Figure A.61 Edwards Street Corridor

Source: Nearmap

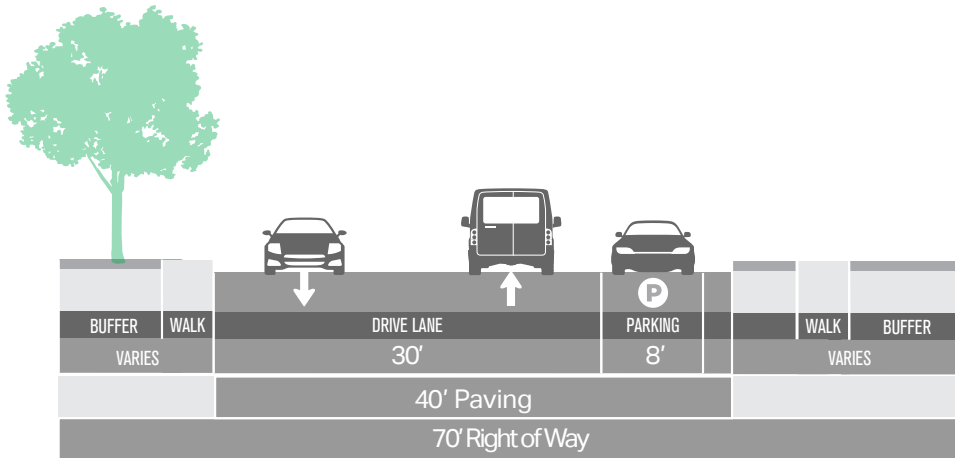


Figure A.62 Existing Typical Edwards Street Section with Permitted Parallel Parking

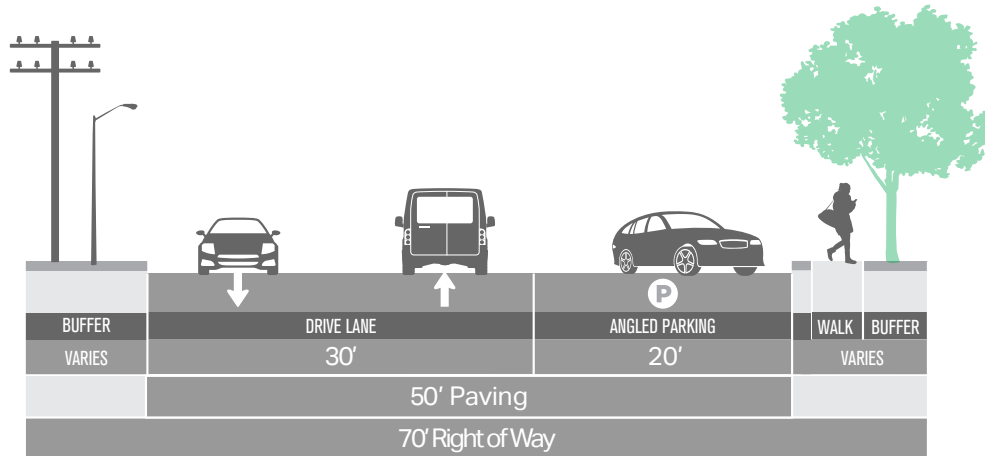


Figure A.63 Existing Typical Edwards Street Section with Head-in Angle Parking



Edwards Street at Silver Street looking East



Edwards Street at Sawyer Street looking East

SAWYER STREET

Key Corridor Highlights

- Sawyer Street is a critical north-south connection between IH 10 and Memorial Drive that crosses both UPRR lines. It is used as an alternative route into downtown when IH 10 is congested.
- Between Crockett Street and Washington Avenue the corridor was recently re-striped to 3 lanes; south of Washington Avenue it is striped with 4 lanes.
- The *Houston Bike Plan* recommends a dedicated bikeway on the corridor, but limited right-of-way north of Washington Avenue will pose challenges.
- Visioning will incorporate *Sawyer Street Vision (2015)* planning work.

Table A.7 Sawyer Street Corridor Profile

Study Extents	Crockett Street to Memorial Drive
Typical ROW	Crockett Street to Washington Avenue: 50'-70' Washington Avenue to Memorial Drive: 60'
Typical Pavement Width	Crockett Street to Washington Avenue: 36' Washington Avenue to Memorial Drive: 40'
Travel Lanes	Crockett Street to Washington Avenue: 3 Washington Avenue to Memorial Drive: 4
MTFP Classification	Major Collector Crockett to Washington: MJ-2-70 to be widened Washington to Memorial: MJ-2-60 sufficient width
Traffic Volumes (vehicles per day)	Crockett Street to Washington Avenue: 11,947 vpd Washington Avenue to Memorial Drive: 4,694 vpd
Sidewalks	Varies, typically present and 4'
Bicycle Facilities	None
Transit Routes	30 Clinton/Ella
Street Parking	Not permitted
Land Use	Commercial and multi-family residential

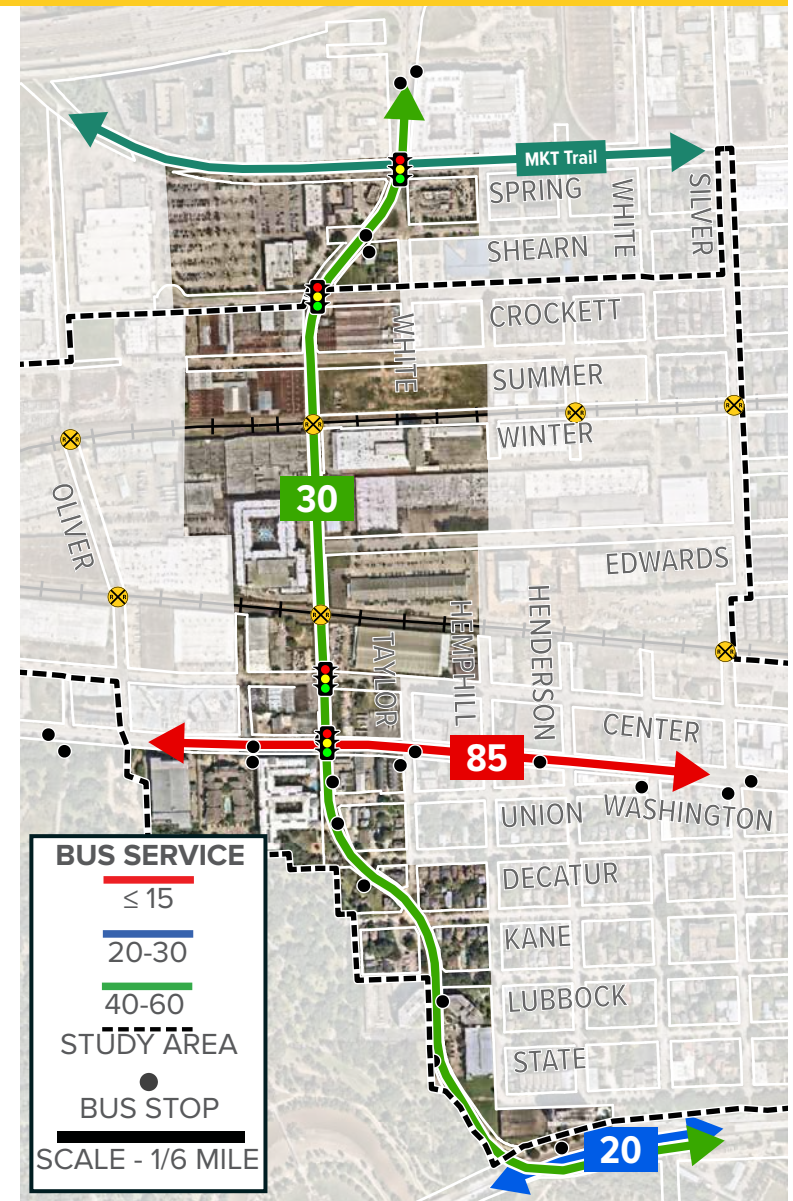


Figure A.64 Sawyer Street Corridor

Source: Nearmap

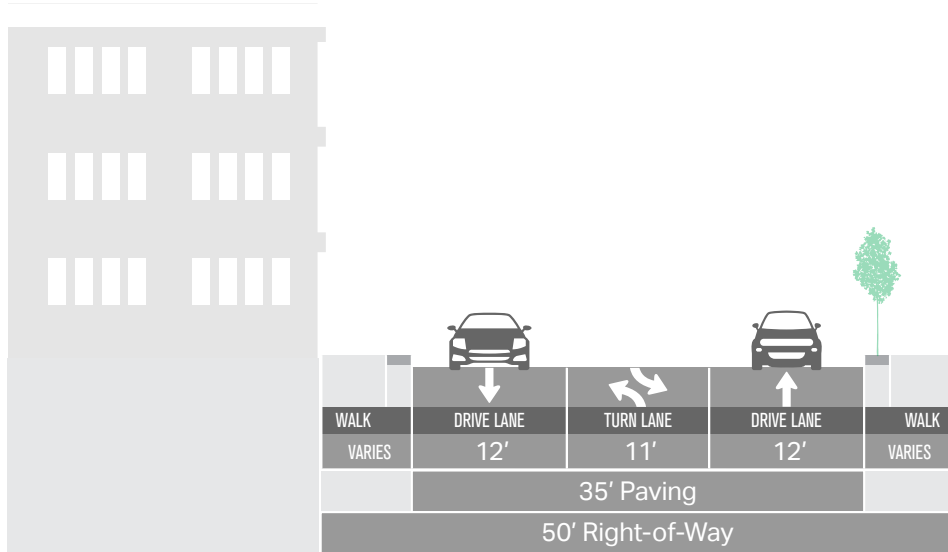


Figure A.65 Existing Typical Sawyer Street Section: North of Washington Avenue



Sawyer Street at Edwards Street

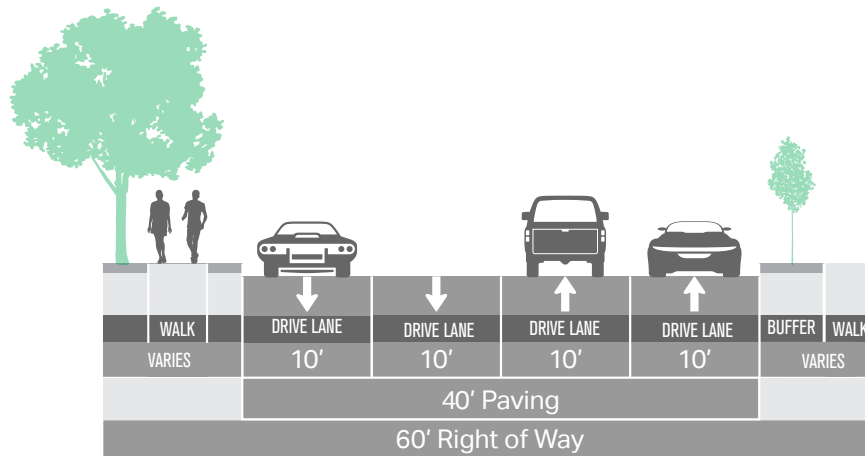


Figure A.66 Existing Typical Sawyer Street Section: South of Washington Avenue



Sawyer Street near Decatur Street

SILVER STREET

Key Corridor Highlights

- Silver Street is a two-lane roadway extending from Spring Street to Memorial Drive. As the only street that crosses both UPRR lines between Sawyer Street and Houston Avenue, it provides a key neighborhood connection for people driving, walking, and bicycling.
- The *Houston Bike Plan* recommends a shared on-street bikeway on the corridor, creating a critical link between the MKT Trail and Buffalo Bayou Park.
- Pavement widths and right-of-way vary substantially along the corridor.
- There is currently no signalized crossing at Washington Avenue.
- Drainage treatments on the corridor include curb and gutter and open ditch.
- This Plan will develop schematic design for Silver Street improvements.

Table A.8 Silver Street Corridor Profile

Study Extents	Spring Street to Memorial Drive Within TIRZ: Oliver Street to Houston Avenue
Typical ROW	Spring Street to Dart Street: 60' Dart Street to Memorial Way: Varies, 45' to 50'
Typical Pavement Width	Spring Street to Washington Avenue: Varies Washington Avenue to Memorial Way: 35'
Travel Lanes	2
MTFP Classification	Local (No Classification)
Traffic Volumes	1,879 vehicles per day (vpd)
Sidewalks	Typically present, but has missing segments
Bicycle Facilities	None
Transit Routes	None
Street Parking	Permitted
Land Use	Commercial and residential

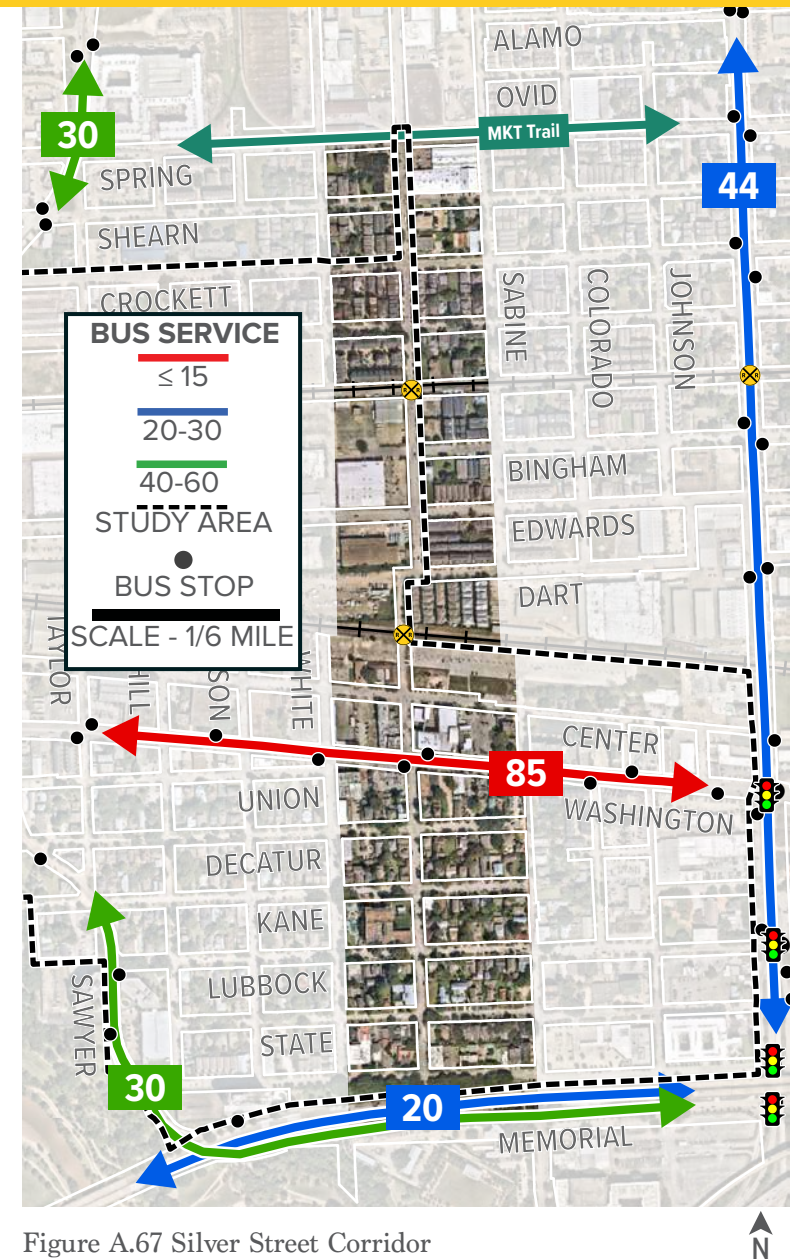


Figure A.67 Silver Street Corridor

Source: Nearmap

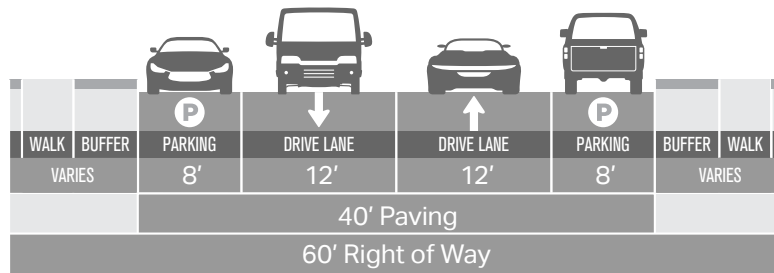


Figure A.68 Existing Typical Silver Street Section: South of Washington Avenue

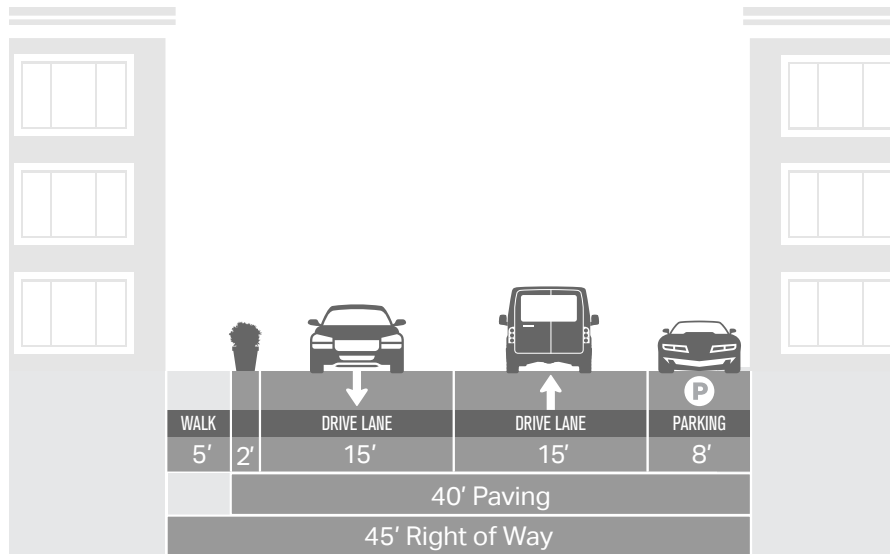


Figure A.69 Existing Silver Street Section: Washington Avenue to Dart Street



Silver Street at UP RR (Passenger Main)



Silver Street at Washington Avenue looking South

WASHINGTON AVENUE

Key Corridor Highlights

- Washington Avenue is a destination-rich commercial corridor and a key regional connection into Downtown.
- Existing vehicular volumes on the five-lane undivided roadway indicate excess roadway capacity.
- Sidewalks are often narrow and in poor condition.
- The signalized crossings at Sawyer Street and Houston Avenue are 0.63 miles apart, leaving a long gap between controlled crossings for people walking and biking.
- METRO's 85 Antoine/Washington route is a BOOST corridor identified in METRONext.
- The *Houston Bike Plan* envisions a dedicated bikeway on the corridor.
- The corridor has been the focus of many previous plans.

Table A.9 Washington Avenue Corridor Profile

Study Extents	Studemont Street to Houston Avenue <i>Within TIRZ: Oliver Street to Houston Avenue</i>
Typical ROW	80'
Typical Pavement Width	60'
Travel Lanes	5, including a center two-way left-turn lane
MTFP Classification	Major Thoroughfare: T-4-80 with sufficient width
Traffic Volumes	15,532 vehicles per day (vpd)
Sidewalks ¹	Present, condition varies, typically 4'
Bicycle Facilities	Marked with shared outside lanes
Transit Routes	85 Washington
Street Parking	Permitted in some areas during off-peak hours
Land Use	Commercial

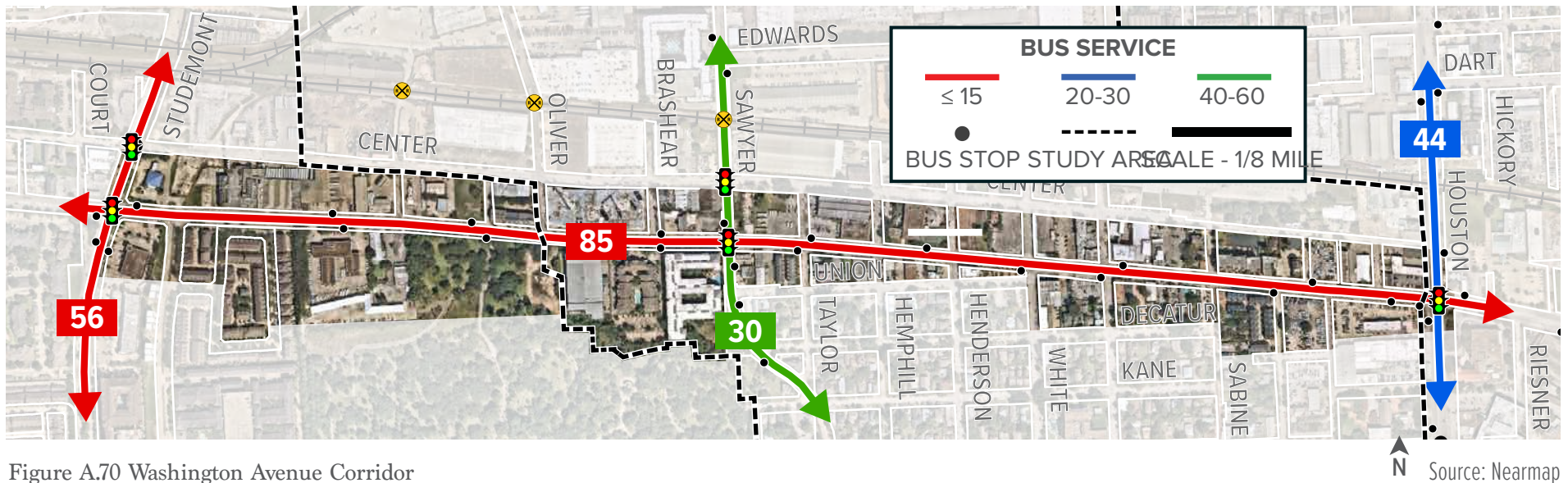


Figure A.70 Washington Avenue Corridor

Source: Nearmap

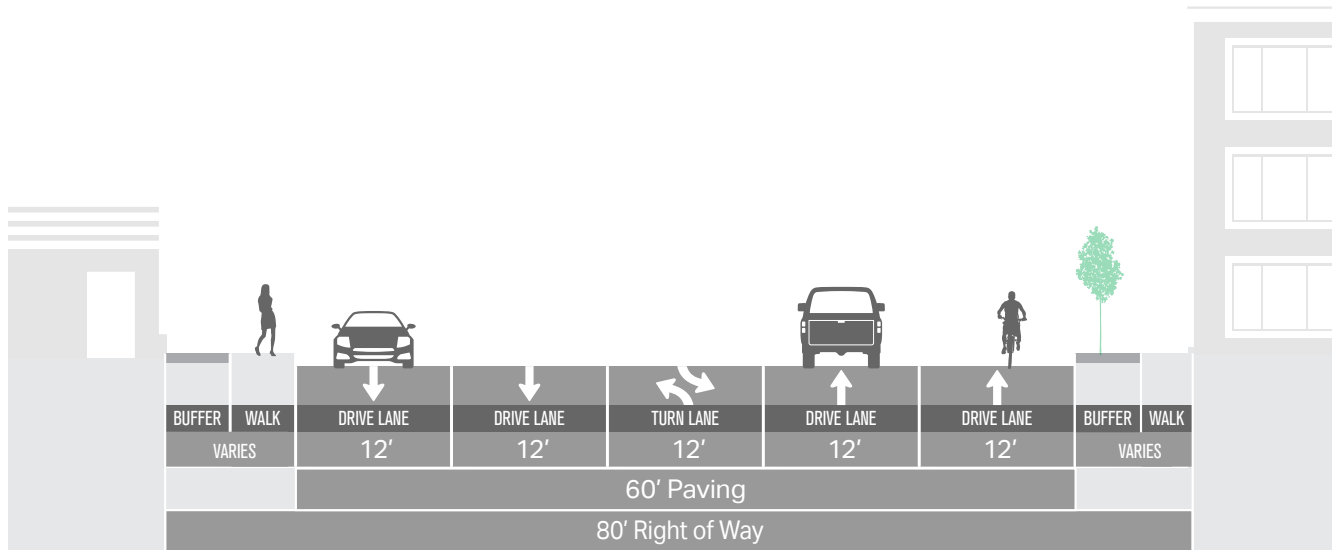


Figure A.71 Existing Washington Avenue Section




Washington Avenue Pedestrian Realm



Washington Avenue Bus Stop

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Appendix
B

Silver Street
Assessment

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Summary

A transportation assessment has been conducted for the Silver Street Corridor in TIRZ 13, also known as the Old Sixth Ward Historic District of Houston, Texas. This study, part of the larger TIRZ 13 Mobility Plan which defines a holistic set of mobility recommendations for the Old Sixth ward area, focuses on developing an All Ages and Abilities (AAA) Bikeway along Silver Street from Buffalo Bayou to the MKT Trail along Spring Street. In addition to improving Silver Streets bike friendliness, the assessment evaluated the pedestrian connectivity and proposed safety improvements at important intersections along the corridor. These improvements prioritize the safety of bicyclists and pedestrians, while maintaining reliable vehicular mobility through the corridor.

Key Recommendations

- Implement an AAA bikeway connecting from Buffalo Bayou Greenway Trail and Memorial Drive, across Washington Avenue and the two railroad tracks, to Spring Street and the MKT Trail connecting north-south through the entire study area. The corridor would include improved trail connections at both ends.
- Continuous sidewalks, including new pedestrian ramps and crosswalks, along the entire corridor.
- Bus stop enhancements for the METRO 85 Antoine-Washington bus route stop at Silver Street and Washington Avenue aligned with METRO's BOOST program.
- Install a new traffic signal at Silver Street and Washington Avenue.
- Provide new all-way stop or similar at Silver Street intersections with Crockett and Dart.
- Propose closure of the Memorial Drive access from Silver Street to improve safety. Memorial Drive would maintain access from Houston Avenue and Sawyer Street.





Introduction

TIRZ 13 is a vibrant live, work, play community. A diverse amount of development and community improvements are continuing to grow the area making the need for improved connectivity and accessibility a priority. The TIRZ 13 Mobility Plan addresses these area improvements with Silver Street playing a key role in a connected and safe bicycle network. The corridor is proposed to include a community bikeway and pedestrian improvements. Silver Street provides a continuous north-south connection through TIRZ 13, connecting Buffalo Bayou and Memorial Drive to the MKT/Spring Street Trail with access across both railroads bisecting the area, see Figure B.1.

The Silver Street bikeway will be the first north-south, All Ages and Abilities, bikeway in the area, providing improvements to not only the bikeability and walkability of the area, but also needed improvements at key intersections. Silver Street is at the approximate halfway point between the signalized crossings of Washington Ave at Sawyer St and Houston, a total distance of approximately 3,330 ft (0.6 miles). A person walking or on a bike who wanted to cross Washington Ave at Silver Street would need to travel over 1/4 mile each way to the nearest safe and marked crossing. For a person walking this could mean an additional 10 minutes of travel time, potentially leading them to making a risky, mid-block crossing or not making the trip at all. The proposed signal at Washington Avenue would provide necessary safety improvements to the neighborhood and mobility benefits for all users. The signal would also be greatly enhanced by the proposed future improvements to the Washington Ave corridor through the TIRZ 13 Mobility Plan. Additionally, added crosswalks, ADA accessible ramps and sidewalk connections will create a must needed complete street corridor within the TIRZ 13 boundary.

Study Area

Silver Street is a key corridor within the TIRZ 13 boundary, as it is one of just three continuous north/south connections through the area, see Figure 1. Along with Oliver Street and Sawyer Street, Silver Street connects from Spring Street and the MKT Hike and Bike Trail in the north (outside of the TIRZ 13 boundary but included in the Mobility Plan study area) over the two railroad tracks and across Washington Avenue to connect to Memorial Drive in the south. The Silver Street Corridor Project encompasses the full north/south connection to provide a safe and comfortable corridor for all users.

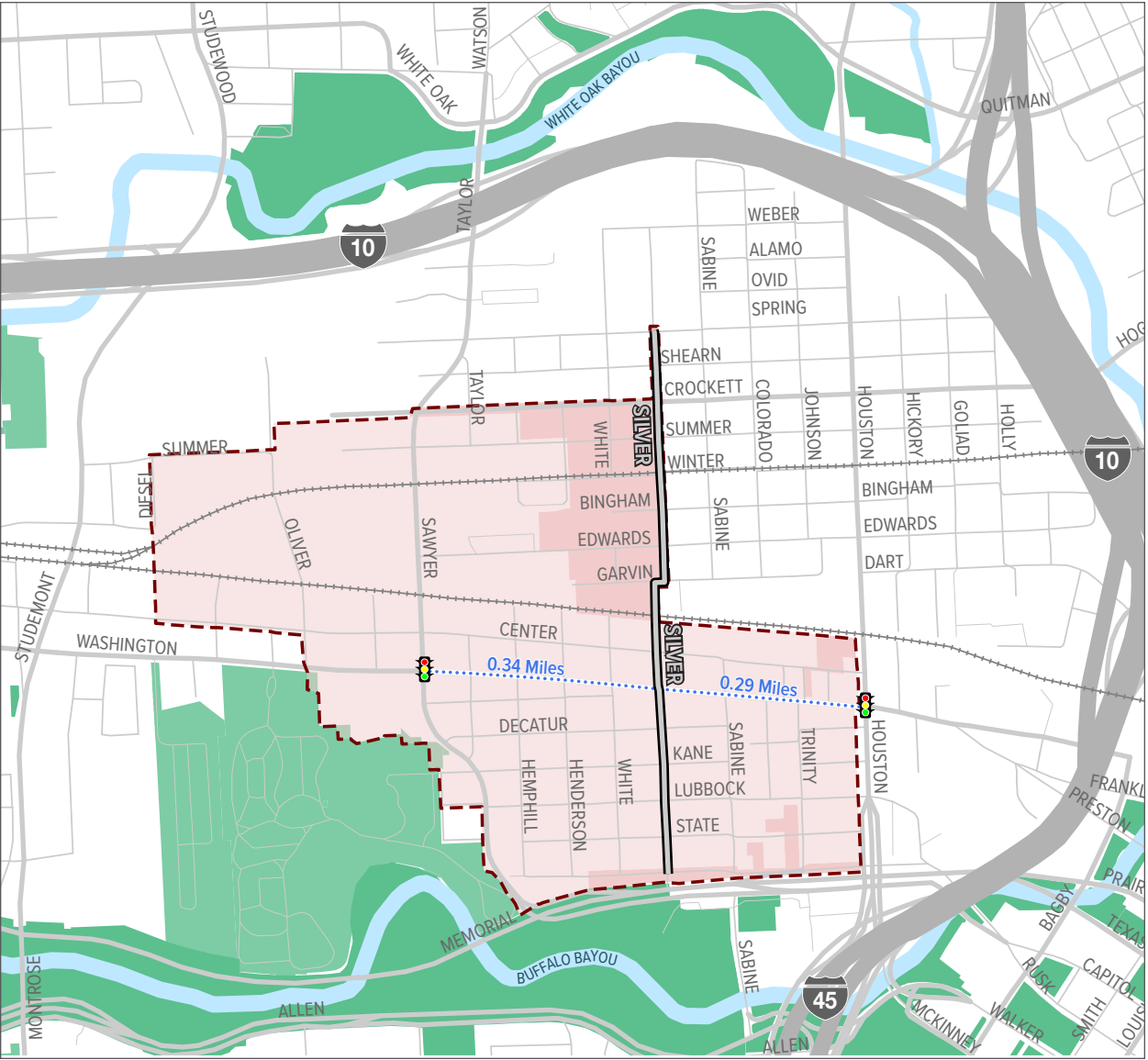


Figure B.1 Study Area

- Study Area
- TIRZ 13: Old Sixth Ward
- Expansion Area

Existing Conditions

Existing conditions were analyzed to determine current issues and conditions along Silver Street to frame the need and types of improvements. Analysis includes examination of land use, the various street segments along the corridor, pedestrian and bicycle facilities, and public transit routes. The following information provides detail for each of those components.

Land Use

Silver Street supports a wide range of land uses, as shown in Figure B.2. South of Washington Ave and north of Winter St, Silver St is a mostly residential street with some driveways. Between Washington Ave and Winter St, Silver St is mostly commercial with restaurants and retail shops centering around the Washington Ave intersection. Between the railroad tracks, Silver St supports other commercial businesses such as a rock-climbing gym, breweries, and artist studios. With such a wide variety of activity, Silver Street needs to comfortably and safely support different trip types and users.



Platypus Brewing (left) and townhouses (right) along Silver Street highlight significant differences in land use along the corridor.

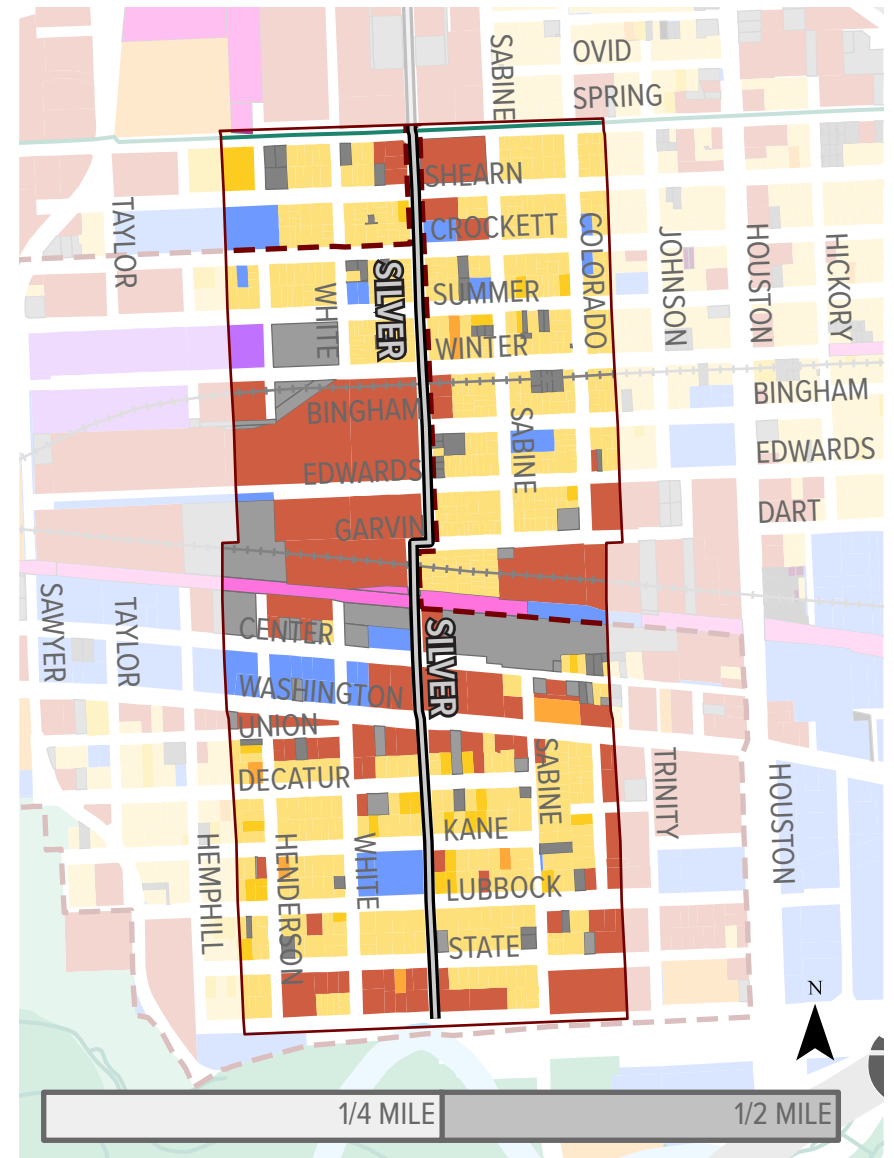


Figure B.2 Land Use



Source: Harris County Appraisal District 2020

Street Segments

From north to south the roadway and pavement context changes and has been split into segments for purposes of this report. The following information provides details on each segment, including the number of lanes, width, speed limits, sidewalk presence, pavement condition, and roadway classification. Pavement condition is defined by the City of Houston GIMS through a pavement condition index (PCI) ranging from 0 (very poor) to 100 (good).

South of Washington Avenue

This segment of Silver Street is a two-way, two-lane, undivided roadway with curbs and gutters and a speed limit of 30 mph. The typical width of the roadway for this segment is 36 feet; the ROW is 50-feet. It is classified on the City of Houston MTFP as a local street. The typical section is shown below in Figure B.3.

Most of the sidewalks along this segment were recently redone with brick through a neighborhood improvement and beautification project. The existing asphalt pavement condition varies from block to block with a PCI ranging from 53 to 81.

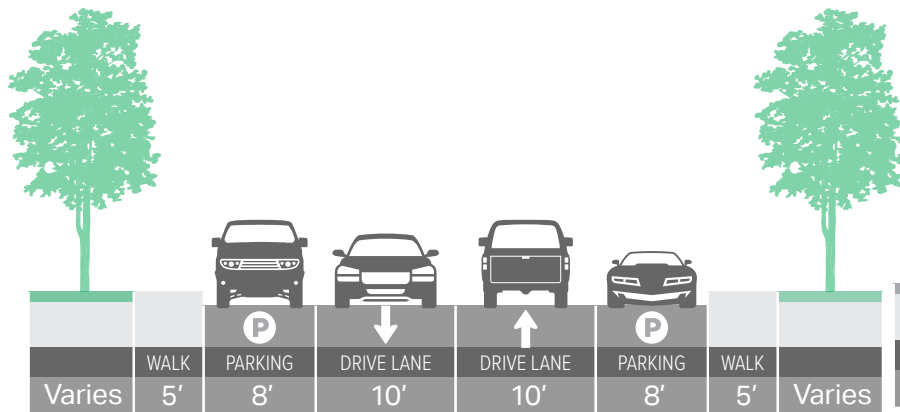


Figure B.3 Existing Cross-Section South of Washington Avenue

Washington Avenue to Dart Street

This segment of Silver Street is the main commercial area along the corridor, centering around the Washington Avenue intersection. The roadway is quite narrow, with only about 20-feet of drivable pavement and crosses over the Union Pacific railroad tracks. The segment between Washington Ave and Center St provides parking on the east side and sidewalks for the entire block (Figure B.4). North of Center St, to Dart St, no sidewalks are present. There are no curbs along the entire segment and the existing pavement is in fair condition, with a PCI of 68-78, although upon field inspections many spot location repairs are needed.

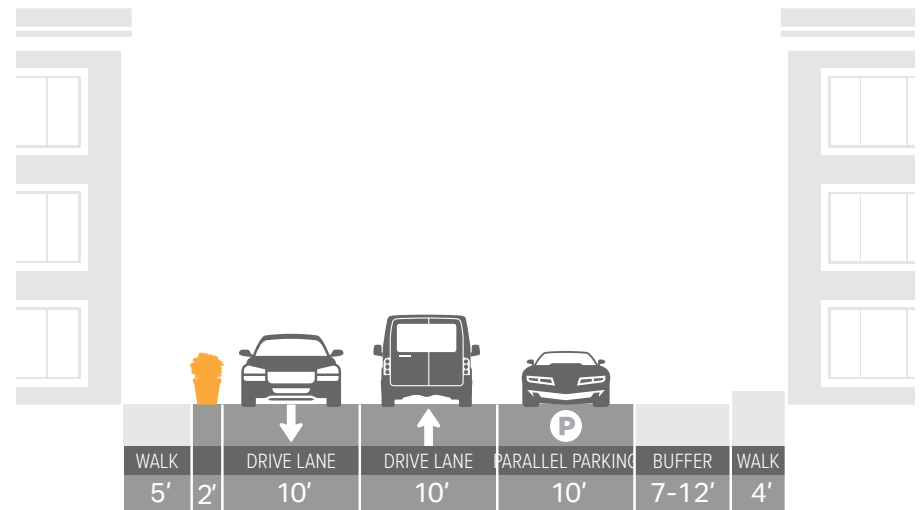


Figure B.4 Existing Cross-Section Washington Avenue to Dart Street



Left: Silver Street south of Washington Avenue, looking south
Right: Silver Street approaching railroad crossing, looking north

Dart Street to Winter Street

This segment of Silver Street is a two-way, two-lane, undivided roadway with curbs and gutters and parking permitted on both sides, as illustrated in Figure B.5. The typical width of the segment is 40-feet and ROW is 60-ft. Sidewalks are provided on both sides of the street and curb ramps are provided at all intersections. The top left photo below shows the existing asphalt roadway in good condition with a PCI of 79-94.

At the northern end of this segment, Silver Street crosses the UP railroad tracks. As the street approaches the tracks from the south, the street narrows and sidewalks end. There are not sidewalks or accessible pavement over the tracks, limiting certain people’s ability to cross the tracks safely or at all. The asphalt pavement within the UP ROW is in poor conditions and does not smoothly align with the concrete track panels.

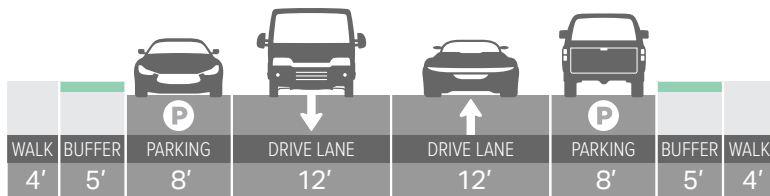


Figure B.5 Existing Cross-Section Dart Street to Winter Street

Winter Street to Crockett Street

Silver Street between Winter Street and Crockett Street is a two-lane, undivided roadway, with open ditch drainage. The roadway is approximately 22-feet wide and a 60-foot ROW, as illustrated in Figure B.6. Much of the segment provides sidewalks along both sides of the street except for the southern section between Winter Street and Summer Street along the east side of the roadway. The asphalt pavement is in fairly poor conditions with a PCI of 61-72. Parking is not prohibited, but very limited on-street parking was observed.

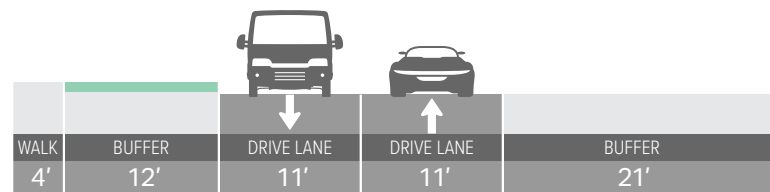


Figure B.6 Existing Cross-Section Winter Street to Crockett Street

Crockett Street to Spring Street

The northernmost segment of Silver Street, from Crockett St to Spring St, is a two-way, two lane, undivided roadway with a mix of curb and gutter and open ditch drainage. The roadway is approximately 35-foot wide and a 60-foot ROW (Figure B.7). Sidewalks are provided along the west side of the street and none are present on the east side. Upon field inspection pavement conditions are poor, as shown in Figure 11, and amplified with a PCI of 24-53.

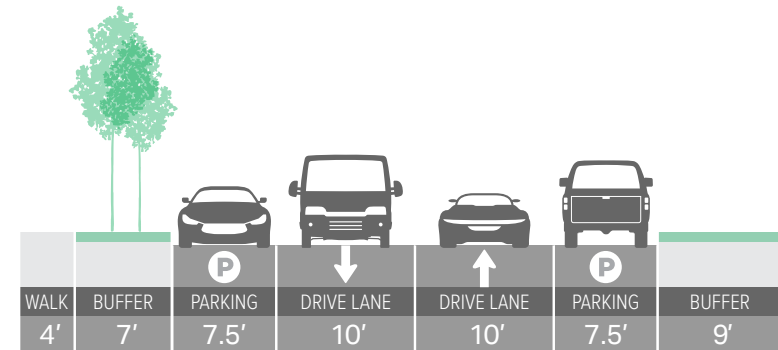


Figure B.7 Existing Cross-Section Crockett Street to Spring Street



Top left: Silver Street north of Dart Street, looking north

Top right: Silver Street approaching railroad crossing, looking north

Bottom right: Silver Street at Shearn Street, looking north

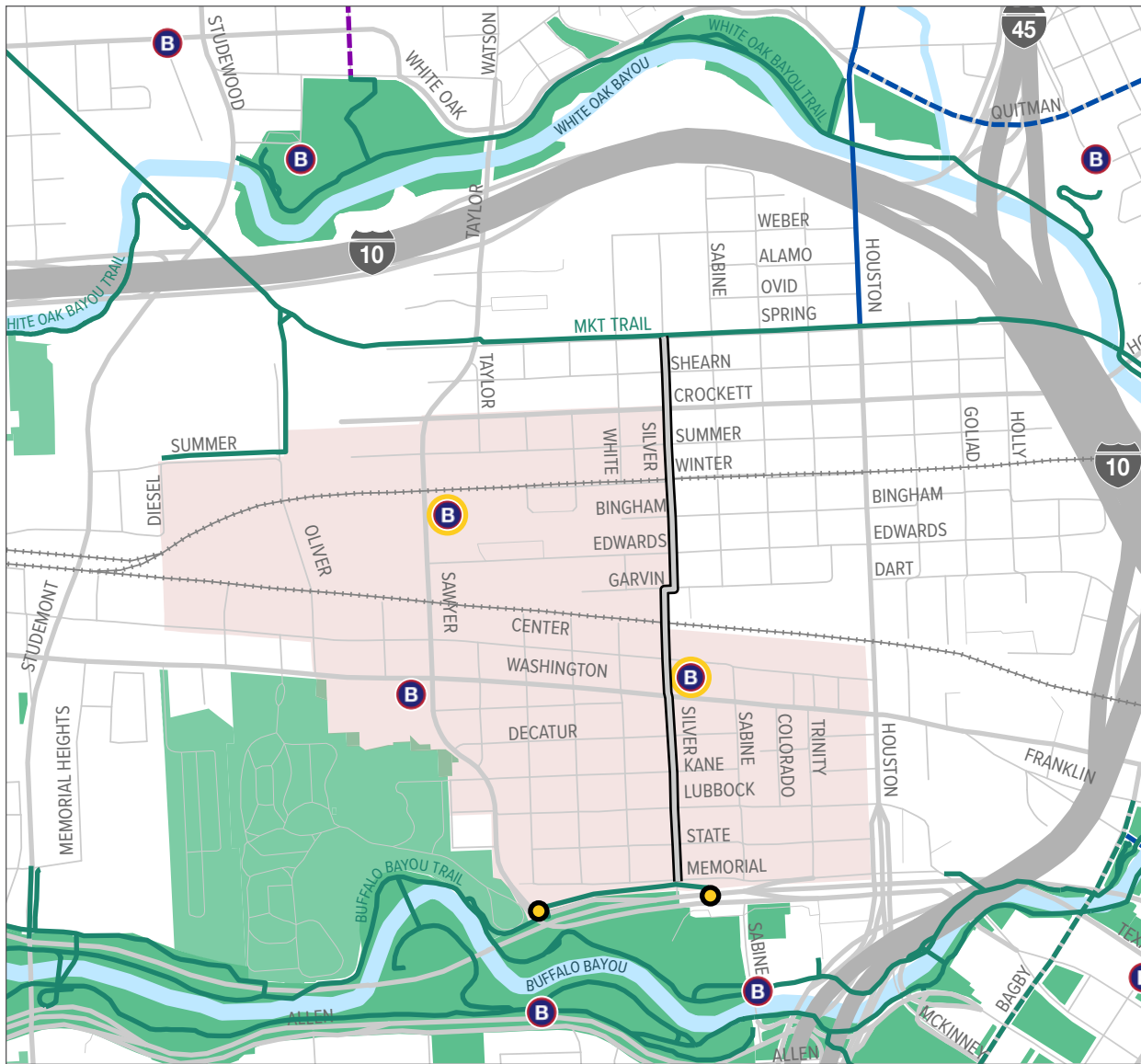


Figure B.8 Bikeways and Bike Share Locations

Pedestrian and Bicycle Accommodations

A majority of the Silver Street block faces provide four-foot-wide sidewalks, but overgrown grass, weeds and street infrastructure, such as utility poles, minimize the effective width of these sidewalks. When sidewalks are present, the condition ranges from poor to good with many uneven segments. Some sidewalks having been recently constructed. Conditions of pedestrian infrastructure at intersections range widely, with many of the sidewalk ramps not ADA compliant, while some intersections do not provide ramps. No crosswalk markings are provided at any intersection and no pedestrian facilities are provided over either railroad crossing.

As shown in Figure B.8, no dedicated bicycle facilities are provided along Silver Street. Silver Street connects to the MKT Hike and Bike Trail along Spring Street. Spring Street terminates at Memorial Parkway which connects to Sawyer Street and provides a connection to the Buffalo Bayou Greenway Trail system. As part of the approved 2017 Houston Bike Plan, Silver Street was designated as a potential short-term implementation opportunity for a shared on-street bikeway.

Public Transportation

Silver Street is accessible via three METRO bus routes with direct access to downtown Houston. Route #30 – Clinton/Ella runs along Sawyer Street, which runs parallel to Silver Street, approximately five blocks west. Route #44 – Acres Homes runs along Houston Avenue, providing stops at Spring Street, Crockett Street, Bingham Street, Center Street and Washington Avenue all providing connections to Silver Street, approximately four blocks east. Route 85 – Antoine/Washington runs along Washington Avenue and provides stops at the Silver Street intersection. The stop pair at Silver Street currently has 21 boardings and 29 alightings (from 2018 data) on an average weekday.

Data Collection

In order to assess traffic volumes, speeds, and safety along the corridor, data collection was required. The following information presents that data, identifying key factors contributing to recommendations in this assessment of Silver Street.

Crash Analysis

The crash data indicates that within the last five years (2014-2018) the majority of the crashes along the Silver Street corridor have occurred around the Washington Street and Crockett Street intersections. Both of these intersections are unsignalized, with Silver Street stop-controlled and limited pedestrian infrastructure to support crossing the busy cross streets. The only reported pedestrian and bicycle crashes in the area occurred along the Henderson Street corridor near Washington Avenue as indicated in Figure B.9.

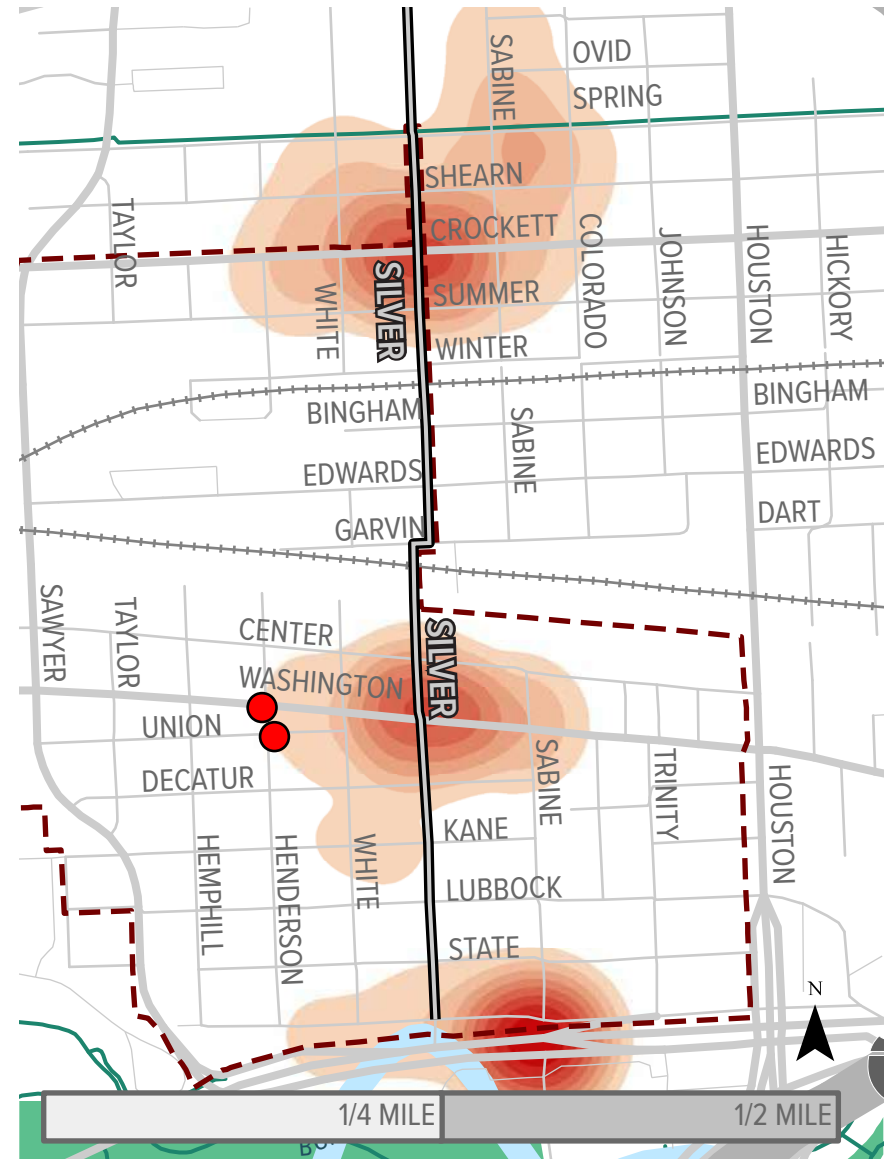


Figure B.9 Density of Crashes Involving Pedestrians and Bicyclists



Source: TxDOT CRIS

Traffic Counts

24-hour average daily traffic (ADT) counts along Silver Street were collected on January 19, 2021 at four locations:

1. North of Shearn St
2. North of Summer St
3. Between Decatur and Kane
4. South of State St

Additionally, The City of Houston GIMS system provides two ADT counts along Washington Avenue close to Silver Street including Washington Avenue between Studemont St and Sawyer St and Washington Avenue between Houston Ave and Preston St.

Figure B.10 provides a summary of these ADT counts. The full traffic count reports can be found in Appendix E.

No turning movement counts (TMCs) were collected for Silver Street for this project. Historical counts from two past studies conducted in the area have captured TMCs at two of the study area intersections listed below. These counts can be found in Appendix E.

1. Silver Street at Crockett Street (May 2017), and
2. Silver Street at Washington Avenue (August 2018).

Speed Data

Speed data was collected in conjunction with the ADT counts and summarized in Figure B.10. The data shows that vehicles tend to travel slower on the northern end of the corridor and faster on the southern end, near Memorial Drive. There is no posted speed limit along Silver Street.

Figure B.10 Traffic Count Data

Count Location	Data	Direction	
Silver Street Counts – January 2021		NB	SB
North of Shearn St	ADT	556	300
	Speed (Avg)	12.1 mph	12.9 mph
	Speed (85th)	17.6 mph	18.4 mph
North of Summer St	ADT	723	651
	Speed (Avg)	10 mph	15.5 mph
	Speed (85th)	15.5 mph	19.9 mph
Between Decatur and Kane	ADT	522	616
	Speed (Avg)	19.4 mph	20.3 mph
	Speed (85th)	25.1 mph	26.7 mph
South of State St	ADT	498	538
	Speed (Avg)	19.7 mph	23.5 mph
	Speed (85th)	25.3 mph	29.0 mph
Washington Avenue Counts – 2019		Total	
Between Studemont St & Sawyer St	ADT	15,532	
	Speed (85th)	39.0 mph	
Between Houston Ave & Preston St	ADT	10,751	
	Speed (85th)	38.5 mph	

Field Observations

Field observations and existing infrastructure evaluations were conducted through the corridor assessment. Observations focused on existing street and sidewalk usage as well as intersection operations. Through these observations it was observed that the sidewalks and pavement conditions along Silver Street do not provide ideal walking and bicycling conditions with many blocks missing segments of sidewalk or no sidewalks provided at all. Along with mixed sidewalk and pavement conditions, the intersections along the corridor provide varying levels of pedestrian infrastructure and safe crossing facilities. Many intersections did not provide ADA accessible ramps on some or all corners and very few intersections had marked crosswalks. Crossing the main thoroughfare through the area, Washington Street, is extremely difficult with no crosswalks, pedestrian ramps, or median refuges, all while navigating traffic from five lanes at a speed of close to 40 mph.



Cyclist crossing Washington Avenue

In addition to observing infrastructure conditions, use of the corridor was also observed. The hub of activity along Silver Street occurred within the dense block between Washington Ave and Center St where vehicles and pedestrians interacted along the shared street. Residents, transit users, and visitors to the area trying to access the businesses up and down Washington Street looked to cross the busy roadway any chance there was a break in traffic, or observed crossing one direction of traffic, waiting in the center turn lane, then crossing the other direction. This frogger like crossing activity is not ideal for any road user, pedestrian, bicyclist, or driver alike.

The northern terminus of Silver Street connecting to the MLK/Spring Street trail creates another intersection with a lot of activity and interaction between drivers, pedestrians, and cyclists. Most of the activity happens along the trail, but residents of the area where observed crossing Spring Street to access the trail.

The railroad crossings were observed locations where pedestrians had a difficult time navigating. There were no pedestrian crossings and therefore footpaths were created to connect the abrupt ending of a sidewalk to the vehicle travel lanes in order for pedestrians to cross the tracks.



Person pushing a stroller across the railroad tracks on Silver Street

Silver Street Corridor: Recommended Design

The primary goal in redesigning Silver Street is to create a safer environment for all road users, particularly vulnerable road users like pedestrians, bicyclists and people riding transit. The recommendations from this study follow the core principles for designing for all ages and abilities. This concept is applied to all aspects of the design related to the vulnerable users including bikeways, sidewalks, safer crossings, and transit integration.

Core Design Principle: Designing for All Ages and Abilities

Bikeways

The National Association of City Transportation Officials (NACTO) guidance for designing bikeways sets criteria for bikeway facilities that are comfortable for people of All Ages & Abilities (AAA) focused on safety, comfort and equity. AAA bikeways reduce the occurrence of conflicts between bicyclists and motor vehicles, particularly in instances of high vehicle speed and volume. NACTO provides guidance for selecting bikeway facilities using thresholds of motor vehicle volumes and speeds. These thresholds encourage more separation between people biking and motorists on roadways with high volumes and high speeds. For corridors like Silver Street, this translates into providing shared, on-street bikeways with some segments of standard bikeways where space allows.

Sidewalks

To make roadways safe for pedestrians, sidewalks should be comfortable and designed to reduce the amount of interaction between pedestrians and vehicles. According to the City of Houston Infrastructure Design Manual (IDM), sidewalks should be a minimum of five feet wide, with a preferred width of six feet. Where possible, sidewalks should be separated from vehicle lanes by a buffer and should also consider the surrounding land uses when determining appropriate width, buffer and other amenities including seating, shade, and lighting.

Intersection Treatments

Safety and comfort for pedestrians should not stop at the sidewalk but should extend into intersections where conflicts with vehicles are most likely. Safe intersections make pedestrians more visible to motorists and encourage slower vehicle turning speeds. Safe intersection treatments will also improve safety for bicyclists sharing the roadway with motor vehicles by reducing conflicts and speeds.

Crossings at intersections should be clearly marked so that drivers know where to expect pedestrians and corner radii should be minimized to reduce turning speeds. In places where visibility and/or speeding are issues, raised crossings can slow vehicles and improve safety. At signalized intersections, signals should be clear for both pedestrians and motorists and should allow enough time for people walking slowly to cross comfortably. Bike boxes can be used at signalized or stop controlled intersections to provide a safe and visible place for bicyclists to queue. Examples of some of these treatments are shown below.

Transit Integration

METRO's BOOST program aims to provide a better walk, a better stop, and a better ride on frequent, high-ridership local bus corridors, and encompasses a coordinated set of capital and service optimization treatments to holistically improve customers' transit experience. Improved street crossings at unsignalized intersections near bus stops contribute to BOOST goals by providing riders with safer access to and from the bus.

Today, fast and heavy vehicle traffic makes it challenging for people to safely cross BOOST corridors at unsignalized intersections. To facilitate access to transit service, METRO typically would like to provide safe, accessible crossings of BOOST corridors at select stop pairs located more than one-sixteenth mile from the nearest controlled crossings at signals or all-way stops. Stops located more than one-sixteenth mile (330 feet, or approximately one block in Downtown Houston) from a traffic signal or all-way stop require that customers travel an additional eighth-mile to reach the stop via a safe, controlled crossing—a deviation of several minutes that many are unwilling to make.

As described in METRO's BOOST Basis of Design, stop pairs located more than one-sixteenth mile from a controlled crossing that meet one or more of the following criteria are strong candidates for unsignalized crossing improvements:

- Expected to see a combined total of at least 20 daily boardings after stop optimization. Estimates of expected boardings take into account existing ridership data as well as the new stop locations. Stop optimization typically reduces the total number of stops along a corridor, meaning many of the optimized stops will see more activity after BOOST implementation.
- Directly adjacent to first- and last-mile connections identified for improvements.
- Directly adjacent to key destinations such as schools, parks, services, or shopping.

Corridor Concepts

Implementing the design principles of designing for AAA, the Silver Street corridor becomes a safer, more accessible, and pleasant street to drive, walk, and bike on. The key features of the recommended Silver Street corridor include:

- AAA bikeway connecting from Buffalo Bayou Greenway Trail and Memorial Drive, across Washington Avenue and the two railroad tracks, to Spring Street and the MKT Trail. Project would include improved, safer trail connections at each end.
- Continuous sidewalks, including new pedestrian ramps and crosswalks, along the entire corridor.
- Bus stop enhancements for the METRO 85 bus route stop at Silver Street and Washington Avenue aligning with the BOOST program.
- New traffic signal at Silver Street and Washington Avenue.
- New all-way stop or similar at Silver Street intersections with Crockett and Dart.
- Propose closure of the Memorial Drive access from Silver Street to improve safety. Memorial Drive would maintain access from Houston Avenue and Sawyer Street.

These features along with other segment specific and key intersection improvements create the Silver Street Corridor Improvement Recommendations. A corridor schematic showing all the proposed improvements is provided in Appendix E. Specific segment designs, descriptions and cross-sections are discussed below.

South of Washington Avenue

The proposed cross-section from Memorial Drive to Washington Avenue would provide two ten foot vehicle travel lanes and two six foot buffered bike lanes. The existing on-street parking would be converted to a buffered bike lane connecting to a proposed trail along the Memorial Drive Park Extension and the entrance to Buffalo Bayou Greenway Trail. Figure B.11 shows the proposed typical cross-section within this segment of Silver Street. Intersection treatments will vary based on control type and could provide physical barriers, bike boxes, and/or bicycle conflict markings. Crosswalks and ADA ramps, if not already provided, are proposed at all intersection for all directions.

The proposed cross-section is based on existing traffic conditions and providing dedicated bike lanes offers a safer travel way for bikes within this higher speed segment of Silver Street. As proposed in the TIRZ 13 Mobility Plan, the Memorial Drive on-/off-ramp is recommended to be closed. If the ramp were to close, traffic patterns and speeds could change. It is recommended that at the time of implementation of the Silver Street bikeway, new traffic counts within this segment be collected and the appropriate cross-section be confirmed. If volumes and speeds decrease, a shared-use lane could be implemented and on-street parking could be maintained.

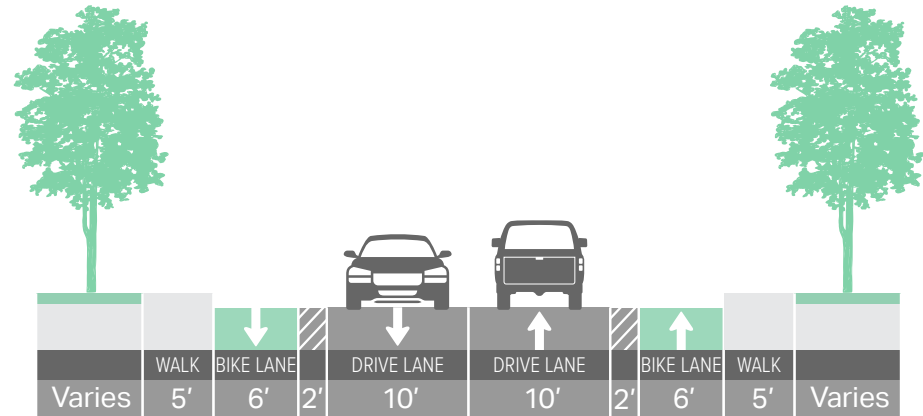


Figure B.11 Proposed Cross-Section South of Washington Avenue

Washington Avenue to Dart Street

Within the land use context and restrictive roadway width, the proposed cross-section (Figure B.12) would provide two eleven-foot shared travel lanes with parking along the eastern side, where space is provided. There are currently plans to provide curb and gutter and a continuous sidewalk along the eastern side of Silver Street within this segment. Along the western side of the street between Washington Avenue and Center Street, physical barriers such as raised planters or tree pits are suggested to provide separations between pedestrians and vehicles. A sidewalk connection over the railroad tracks along the east side of the street is proposed to provide a safer environment for residents north of Washington Ave to access the commercial businesses without having to travel within the roadway.

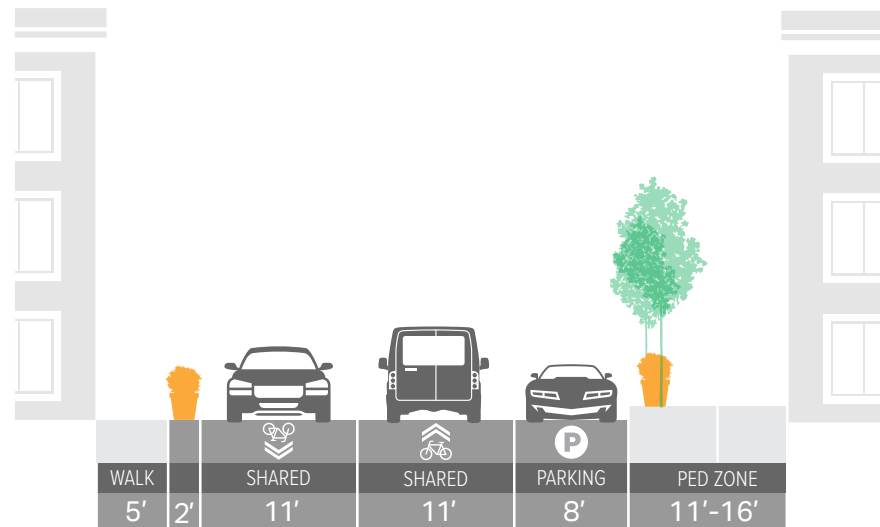


Figure B.12 Proposed Cross-Section Washington Avenue to Dart Street

Dart Street to Winter Street

This segment of Silver Street is approximately 40-feet wide, curb-to-curb with parking on both sides. The proposed cross-section (Figure B.13) would add two six-foot bike lanes with two ten-foot vehicle travel lanes. On-street parking would be allowed on the east side of the street adjacent to the town homes accessed from Silver Street. Intersections would provide updated ADA ramps, if not already provided, with crosswalks and bicycle conflict markings.

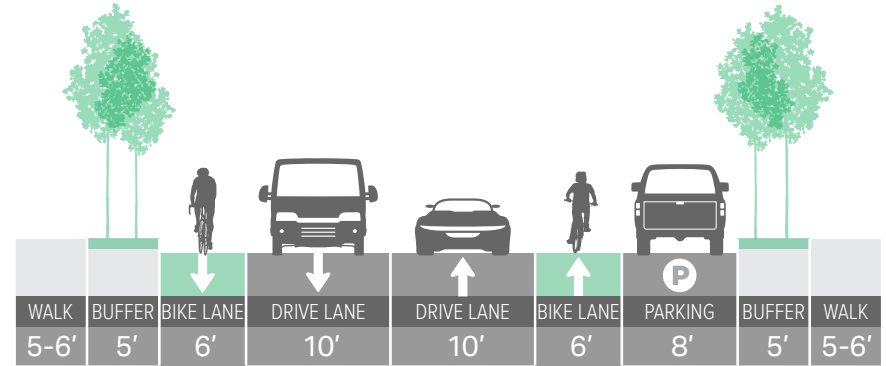


Figure B.13 Proposed Cross-Section Dart Street to Winter Street

Winter Street to Crockett Street

The proposed cross-section (Figure B.14) of Silver Street between Winter Street and Crockett Street will provide two eleven-foot shared-use lanes. Intersections would provide updated ADA ramps, if not already provided, with crosswalks.

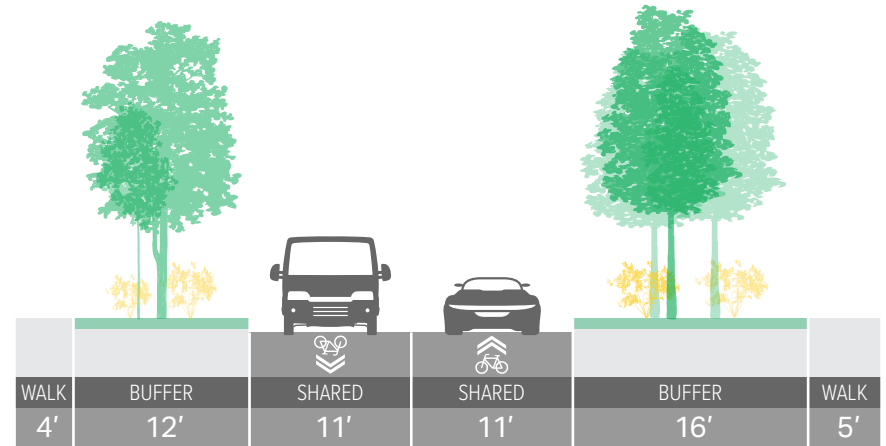


Figure B.14 Proposed Cross-Section Winter Street to Crockett Street

Crockett Street to Spring Street

This segment of Silver Street varies in width and pavement condition. The proposed cross-section (Figure B.15) provides a shared-use lane southbound with on-street parking where pavement is provided. Northbound provides a vehicle travel lane and a buffered six-foot bike lane. This segment connects to the MKT Trail at Spring Street.

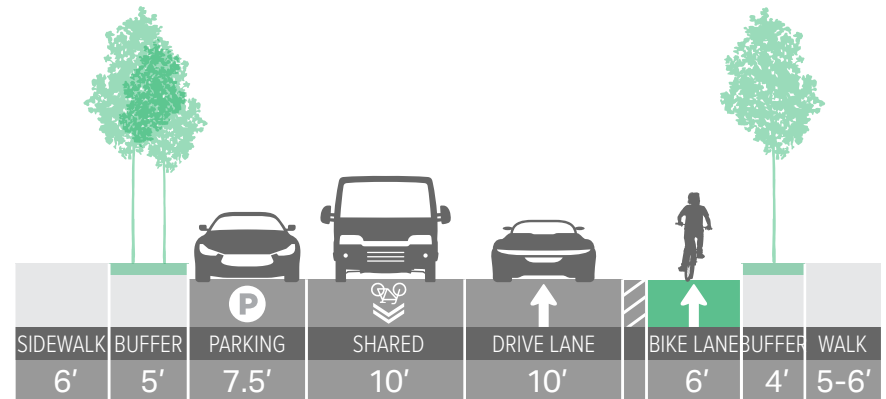


Figure B.15 Proposed Cross-Section Crockett Street to Spring Street

Key Intersections

The Silver Street corridor improvements focus on providing AAA bicycle and pedestrian facilities and improved transit accommodations. Proposed intersection improvements will maintain existing operations while designing for AAA pedestrian and bicycle infrastructure. Individual intersection treatments are shown in the corridor schematic and key intersections are highlighted below.

Silver Street at Memorial Drive/Buffalo Bayou

Silver Street at Memorial Drive is the southern terminus of the Silver Street corridor. The intersection is the gateway to Buffalo Bayou Greenway Trail and the Memorial Drive Pedestrian Bridge. Included in the Silver Street corridor improvements are enhanced connections to these facilities along the Memorial Park Extension.

Within the TIRZ 13 Mobility Plan the pedestrian bridge is recommended to be rebuilt to accommodate bicycles and mobility challenged individuals, as the bridge is currently only accessible via stairs. Additionally, the plan proposes to abandon the Memorial Drive on/off-ramps at Silver Street due to the current unsafe merging conditions. See the TIRZ 13 Mobility Plan for more details.

With this in mind, the proposed intersection design utilizes the Memorial Park Extension and existing pathways to provide enhanced bicycle and pedestrian crossings connecting to Buffalo Bayou Greenway Trail and the Memorial Drive Pedestrian Bridge. Figure B.16 illustrates the recommended Silver Street at Memorial Drive intersection.

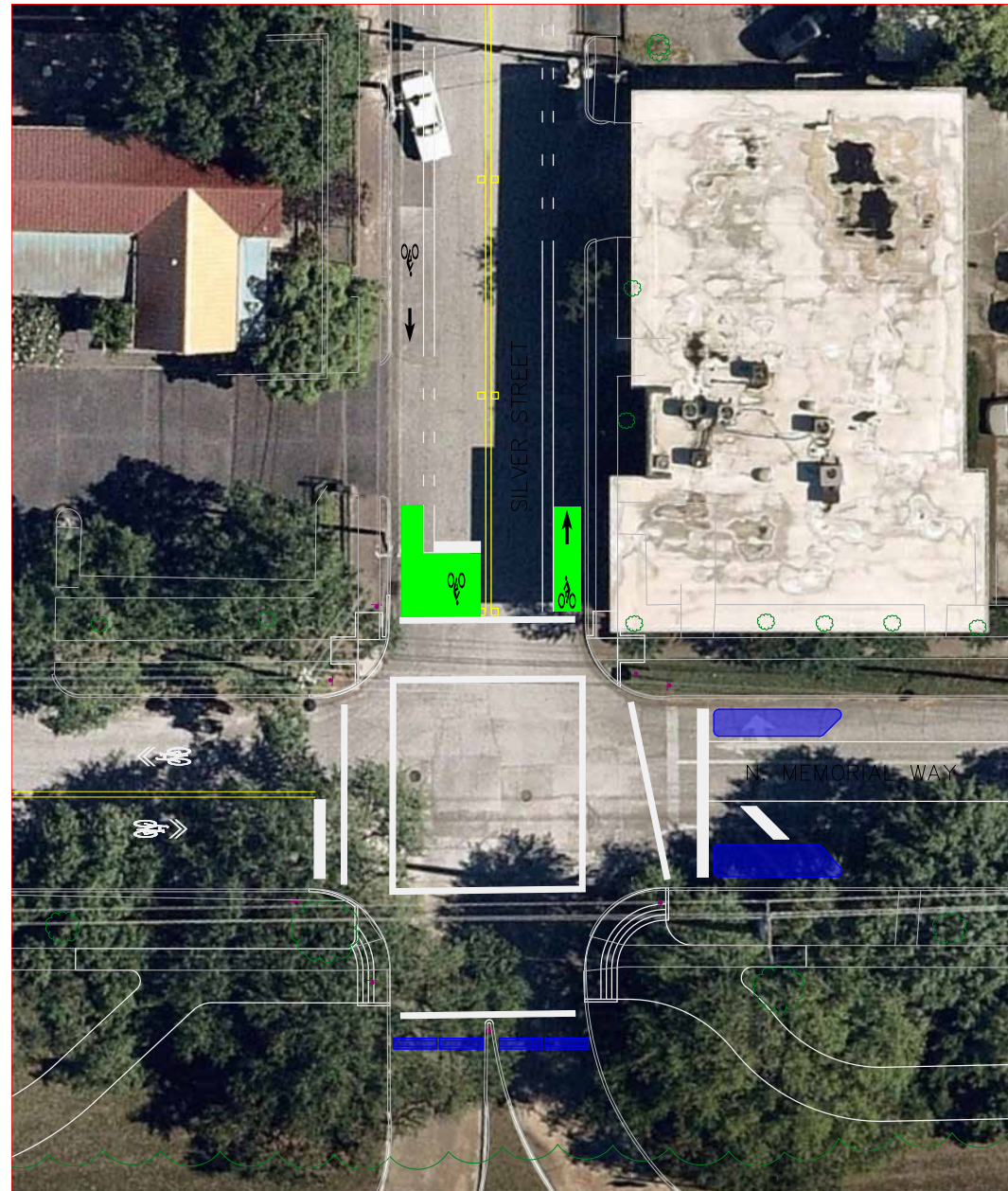


Figure B.16 Schematic Design of Silver Street at Memorial Drive

Silver Street at Washington Avenue

The main street crossing connecting the southern residential segments of Silver Street to the ever-expanding commercial activity of the northern segments of Silver Street, this intersection holds the key to providing a complete Silver Street Corridor. Currently Washington Avenue is difficult to cross, with five lanes of traffic traveling anywhere between 30 and 50 mph and no crosswalks, Washington Avenue becomes a barrier to the neighborhood. Additionally, the only other safe, controlled, crossings along Washington Avenue within the study area are at Sawyer Street and Houston Avenue, more that a half-mile away in either direction.

With the proposed corridor improvements to Silver Street, including an AAA bikeway and improved pedestrian and transit infrastructure, the Silver Street at Washington Avenue needs to provide safe intersection design to accommodate all modes traversing the intersection. A traffic signal analysis was conducted, see section below, and under future conditions a signal is warranted. Based on this analysis and the need to eliminate Washington Avenue as a barrier to the neighborhood, a traffic signal is recommended at this intersection. Figure B.17 illustrates one possible design for this intersection.

The proposed traffic signal would provide new pedestrian and bicycle crossings and signals across Washington Ave and improve the existing crosswalks across Silver St. New pedestrian ramps would be constructed at all four corners and bike boxes would be installed on all approaches.

The proposed intersection improvements would be designsto integrate into any Washington Avenue roadway improvements. As discussed in the TIRZ 13 Modality Plan, reimagining of the Washington Avenue corridor, or the short- and long-term have been proposed and would integrate seamlessly with the proposed improvements to the Silver Street corridor and specifically to the Silver Street at Washington Avenue traffic signal.

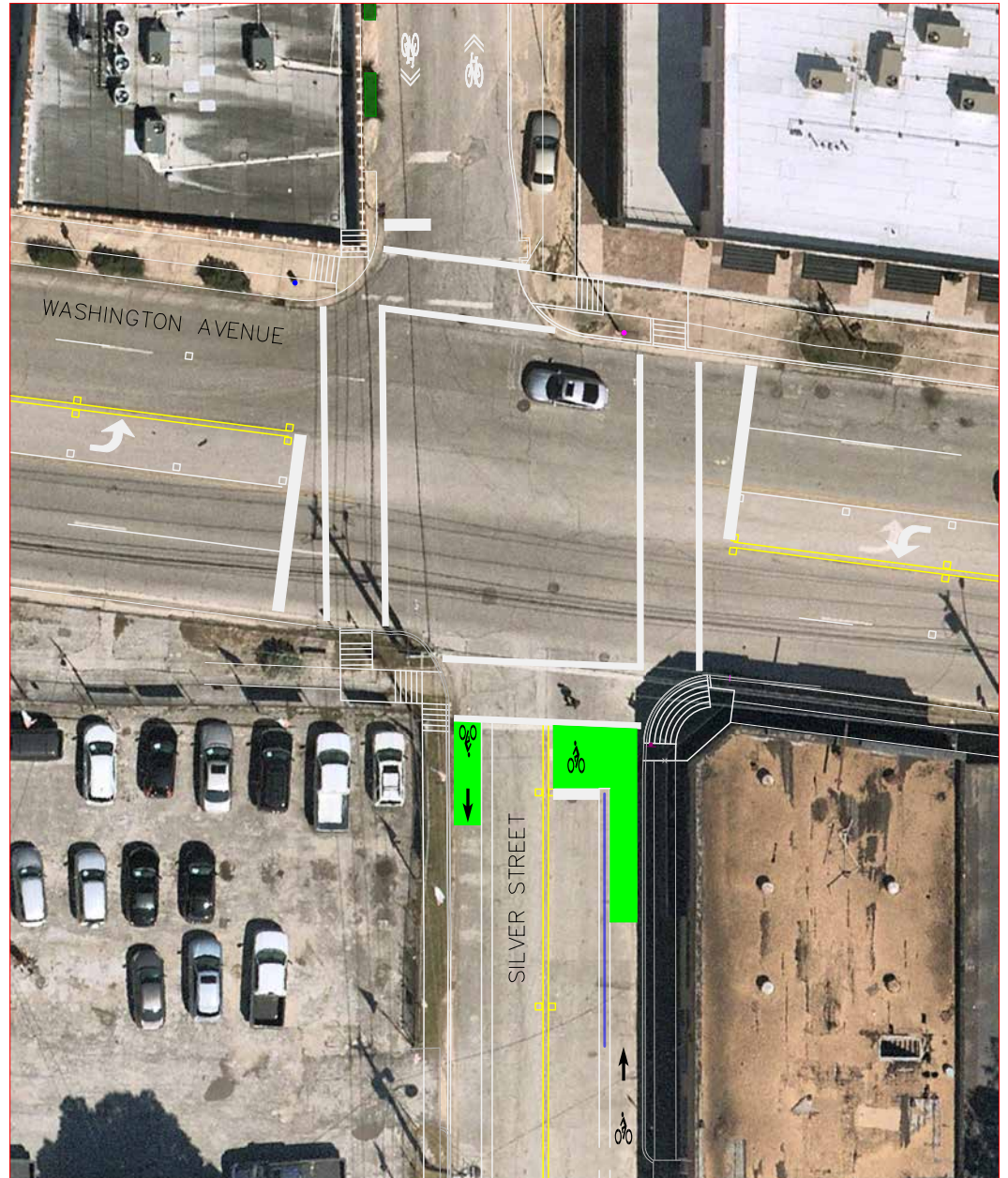


Figure B.17 Schematic Design of Silver Street at Washington Avenue

Silver Street at Dart Street

Silver Street makes a jog in alignment at Dart Street creating a unique and complex intersection. Currently Silver Street is stop controlled while Dart Street is free-flow. The proposed traffic control would create an always stop and adding crosswalks and pedestrian ramps across all approaches.

Figure B.18 illustrates the proposed design. This design would provide a more controlled intersection, eliminating dangerous conflicts that could arise in the current design.

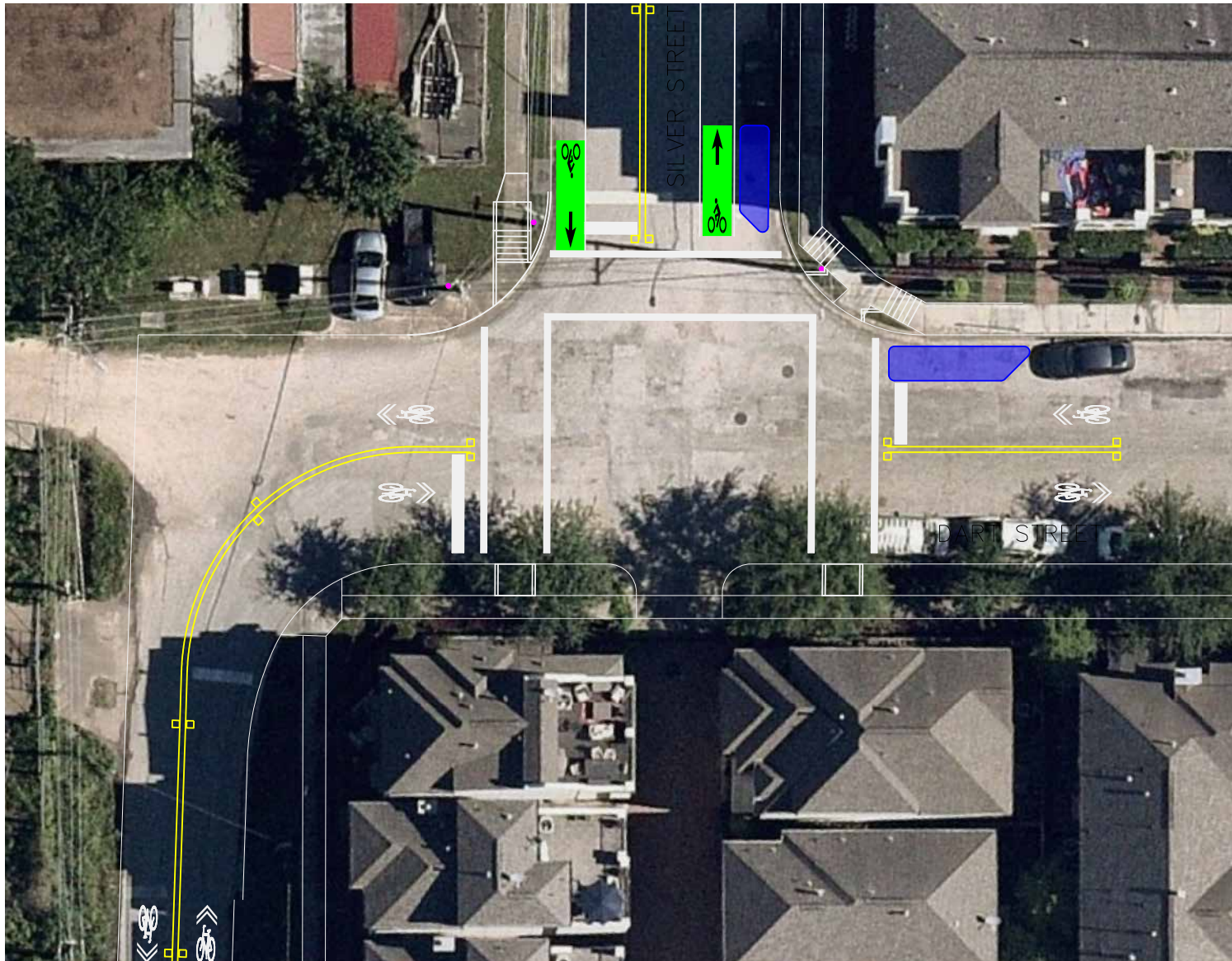


Figure B.18 Schematic Design of Silver Street at Dart Street

Silver Street at Crockett Street

The intersection of Silver Street and Crockett Street is currently a two-way stop with Silver Street stop-controlled and Crockett Street free-flow. Crockett Street is a busy east-west connection within the area and has been studied previously for the implementation of an on-street bikeway and improved design for safety and connectivity. Taking into consideration these previous studies and proposed pedestrian and bicycle improvements along Crockett Street an all-way stop at Silver Street is proposed. This will improve safety at the intersection and allow pedestrians and bicyclist to safely navigate the crossing and connect the two improved corridors. Figure B.19 illustrates the all-way stop intersection design with updated crosswalks, ADA ramps, and bikeway pavement markings.

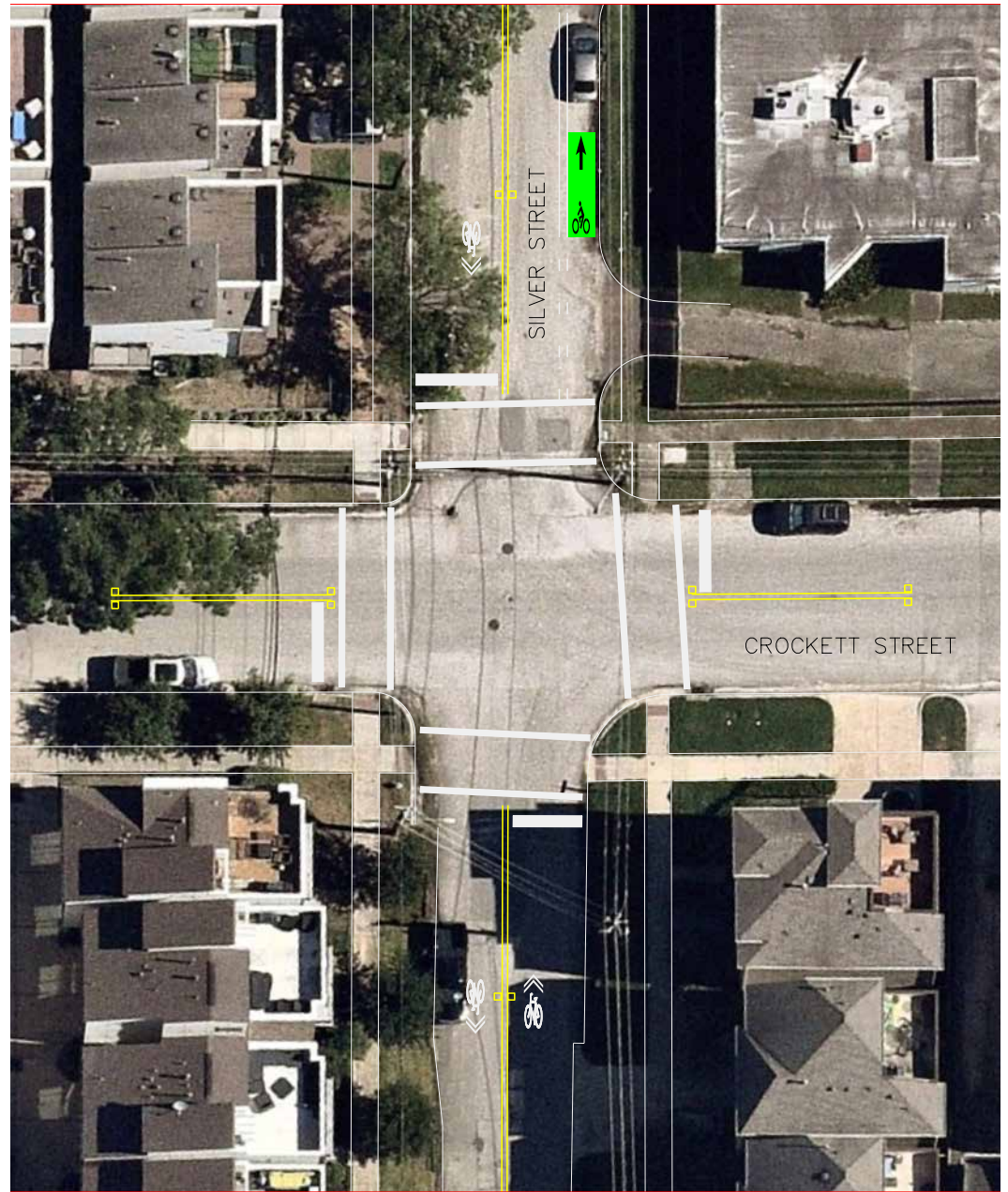


Figure B.19 Schematic Design of Silver Street at Crockett Street

Silver Street at Spring Street/MKT Trail

A vital connection to the larger Houston area trails network, the Silver Street at Spring Street intersection is the northern terminus of the proposed Silver Street Improvements. All-way stop control will be maintained with pedestrian ramps and crosswalks added to all approaches. The trail crossing is pulled back, away from the roadway to provide a bike turn box as illustrated in Figure B.20.

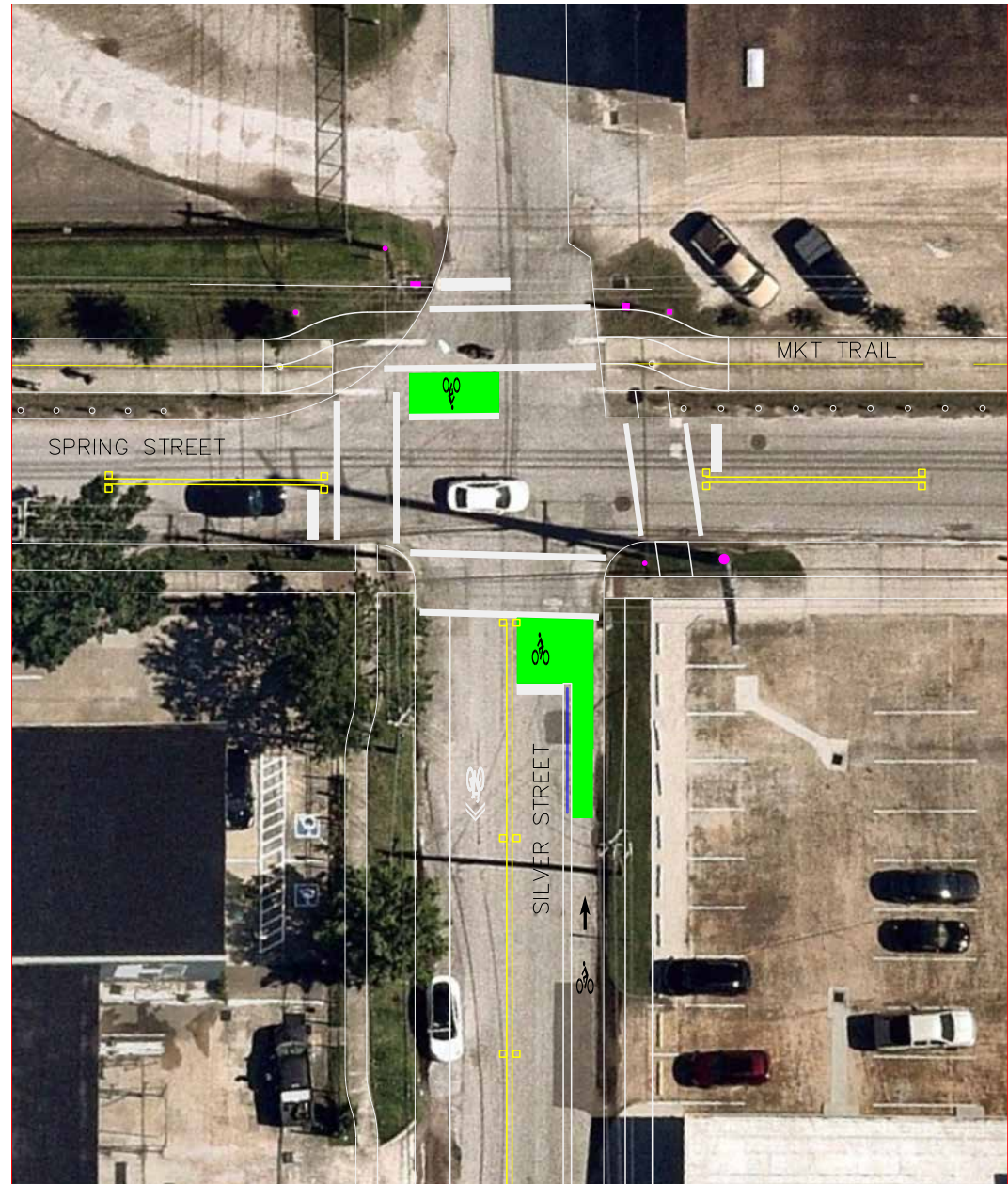


Figure B.20 Schematic Design of Silver Street at Spring Street

Traffic Signal Analysis: Silver Street at Washington Avenue

The intersection of Silver Street at Washington Avenue is currently stop controlled on Silver Street and the approximate halfway point between the signalized crossings of Washington Ave at Sawyer St and Houston. Located 1,500 feet east of the traffic signal at Sawyer Street and 1,700 west of the traffic signal at Houston Avenue a person walking or on a bike who wanted to cross Washington Ave at or near Silver Street would need to travel over 1/4 mile each way to the nearest safe and marked crossing. For a person walking, this could mean an additional 10 minutes of travel time, potentially leading them to make a risky, mid-block crossing or not make the trip at all. The proposed signal at Washington Avenue would provide necessary safety improvements to the neighborhood and mobility benefits for all users.

Traffic Signal Warrant Analysis

A traffic signal warrant analysis (TSWA) was completed for the intersection in accordance with the Texas Manual of Uniform Traffic Control Devices. A traffic signal is considered able to be installed if at least one of the following nine warrants is satisfied by projected conditions. For this analysis, a build-out date of 2023 was used with an annual growth rate of one percent. No vehicles or pedestrians from nearby intersections are redistributed for the purposes of this analysis. Counts are included as Appendix E.

- Warrant 1: Eight-Hour Vehicular Volume – Not Warranted
- Warrant 2: Four-Hour Vehicular Volume – Not Warranted
- Warrant 3: Peak Hour – Warranted
- Warrant 4: Pedestrian Volume – Not Warranted
- Warrant 5: School Crossing – Not Applicable
- Warrant 6: Coordinated Signal System – Not Warranted
- Warrant 7: Crash Experience – Not Warranted
- Warrant 8: Roadway Network – Warranted
- Warrant 9: Intersection Near a Grade Crossing – Not Warranted

Based on existing street geometry and 2023 traffic projections, Warrant 3 and Warrant 8 are satisfied and a traffic signal is warranted to be installed. Warrant 3 is satisfied based on TMUTCD Figure 4C-3. Warrant 8 is satisfied based on traffic volumes and the equidistant location of the intersection from the nearest controlled crossing of Washington Avenue, a major roadway. Silver Street is also one of the few roadways that extends continuously north-south through the neighborhood. TSWA figures and analysis are provided in Appendix E.

Supporting Reasons

The warrants specified in the TMUTCD are typically the main rationale in considering new traffic signals but do not include robust considerations for pedestrians or bicyclists. The warrants primarily consider the impact of traffic signals on vehicular safety and delay. For example, Warrant 4 – Pedestrian Volumes, is satisfied if the pedestrian traffic at the intersection is high enough to justify delay to vehicles. Traffic signals may also be desired at intersections for reasons not stipulated in the TMUTCD such as the following:

- Meeting unmet demand for pedestrian crossings at a given intersection.
- Reducing distance to safe crossings for pedestrians trying to cross major roadways at nearby locations.
- Providing larger time gaps for bicyclists crossing major roadways.
- Improving access to a pair of bus stops across a major roadway.
- Mitigating traffic collisions at an intersection that has a low number of more severe injuries.

Aside from the traffic signal warrants, the intersection of Silver Street at Washington Avenue would benefit from a traffic signal for some of these other reasons. In particular:

- Existing pedestrian crossing demand across Washington Avenue as indicated by the high number of pedestrians crossing Silver Street on the south side of the intersection (more than 20 per hour for four hours of the day).
- Importance of the intersection to a bicycling corridor on Silver Street as it is difficult intersection to cross comfortably on a bike.
- The long distance to the nearest crossing of Washington Avenue.
- The 85 – Antoine/Washington Metro bus route currently runs along Washington Avenue and stops in both directions at Silver Street. As part of its designation as a BOOST corridor in the METRONext service improvement plan, the route is slated to receive improvements that will increase ridership, reliability, speed, frequency, and access to the route.
- Managing potential conflicts between vehicles and vulnerable road users.
- The importance of Silver Street as a north-south corridor that crosses both the UP rail tracks in the neighborhood.

Alternative Analysis

Other potential crossing treatments that were consider included a median closure on Washington Avenue or the implementation of a HAWK/Pedestrian Signal.

- A median closure is not preferred due to Silver Street’s importance to cross-neighborhood vehicular traffic, especially as a corridor that crossing both freight rail tracks. Closing the median would require vehicles travelling within the neighborhood to travel further west or east to a continuous north-south roadway.
- A HAWK/Pedestrian Signal cannot be installed at an intersection with high minor street traffic and would have to be built 100’ or more away from Silver Street. Moving the improved crossing away from Silver Street and the bus stops is not preferred as it increases crossing distance, decreasing likelihood of usage. A crossing away from the intersection would not be directly usable by bicyclists on Silver Street forcing bicyclists to choose between a quicker or safer crossing location and putting bicyclists in conflict on sidewalks. A HAWK or pedestrian signal would not provide safer crossings for vehicles traveling along Silver.

Existing street geometry and projected traffic warrants that a traffic signal at the intersection of Silver Street at Washington Avenue be installed. Additionally, pedestrian, bicyclist, and bus rider safety and accessibility would benefit from a new traffic signal at the intersection.



Silver Street at Washington Avenue looking south

Conclusion

TIRZ 13 offers residents, business owners, and visitors a fantastic mix of historical infrastructure with modern amenities creating a vibrant community for people to walk, bike, take transit, and drive. With an abundant mix of mobility options, making sure all interactions are safe and there is access to all the TIRZ 13 has to offer is a top priority. Through the TIRZ 13 Mobility Plan these opportunities are address and mobility recommendations for the area are provided. Within the TIRZ, Silver Street is an active corridor providing seamless connectivity through the area as it is only one of three, north-south, streets crossing the two railroad tracks. The Silver Street recommendations discussed within this corridor assessment and summarized below will improve accessibility for all users of the street.

- Implement an AAA bikeway connecting from Buffalo Bayou Greenway Trail and Memorial Drive, across Washington Avenue and the two railroad tracks, to Spring Street and the MKT Trail connecting north-south through the entire study area. The corridor would include improved trail connections at both ends.
- Continuous sidewalks, including new pedestrian ramps and crosswalks, along the entire corridor.
- Bus stop enhancements for the METRO 85 Antoine-Washington bus route stop at Silver Street and Washington Avenue aligned with METRO's BOOST program.
- Install a new traffic signal at Silver Street and Washington Avenue.
- Provide new all-way stop or similar at Silver Street intersections with Crockett and Dart.
- Propose closure of the Memorial Drive access from Silver Street to improve safety. Memorial Drive would maintain access from Houston Avenue and Sawyer Street.



Silver Street at Washington Avenue looking north

Appendix

C

Cost
Estimates

Cost Estimates

This appendix provides detailed information that shows how cost estimates for recommended projects were developed. Cost estimate assumptions used in the calculations are provided in Figure C.1 and referenced in Figure C.2 as appropriate. The cost estimates provided in this section are intended to be used for project planning purposes and should be refined in the design process.

Figure C.1 Cost Estimate Table Assumption References

- ^APricing includes New Sidewalk (\$12/SF), Demolition (\$3/SF)*
- ^BCost Based on Sidewalk Modelling assessment includes replacement of poor quality sidewalks, filling of sidewalk gaps and new curb ramps*
- ^C Estimate based on recent project bid prices*
- ^GBased on METRO Harrisburg Overpass Mid-Block Crossings which included Demolition, Ped Ramps, Pavement Markings, Signs (Static and Solar Powered), TCP, SWPPP and Permits for \$41,000 (2 crosswalks) plus contingency for refuge islands*
- ^HBased on Leeland at Cullen Intersection includes all striping for crosswalks, stop bars, pedestrian ramps, landings (installation and demolition) - \$14,713*

Figure C.2 Cost Estimate Table

TIRZ Project Number	Unit Price/ Linear Foot	1 Washington Avenue Multimodal Improvements		2 Washington Avenue Vision		3 Center Street Vision		4 Edwards Street Multimodal Improvements	
		Qty.	TOTAL	Qty.	TOTAL	Qty.	TOTAL	Qty.	TOTAL
Improvement Items									
6 FT SidewalkA	\$63		\$0		\$0		\$0		\$0
5 FT SidewalkA	\$55		\$0		\$0		\$0		\$0
10 FT Sidewalk/SidepathA	\$110		\$0		\$0		\$0		\$0
Proposed Curb Ramps - Each	\$2,250		\$0		\$0		\$0		\$0
Corridor Sidewalk Improvements (From Detailed Study Model) (Each)	\$1	636406	\$636,406		\$0		\$0	221,935	\$221,935
Neighborhood Bikeway/Safe StreetC	\$34		\$0		\$0		\$0	880	\$30,000
Standard Bike LanesC	\$53		\$0		\$0		\$0	950	\$50,379
Protected Bike LanesC	\$104	4,150	\$432,292		\$0		\$0		\$0
Two-Way Cycle TrackC	\$85		\$0		\$0		\$0		\$0
Street Restripe (Remove \$8/FT and Install \$20/FT)C	\$28		\$0		\$0		\$0		\$0
Proposed New Bus Shelters and Pad (Each)	\$25,000		\$0		\$0		\$0		\$0
Proposed General Pavement (Overlay) Repair	\$150		\$0		\$0		\$0		\$0
Proposed Floating Bus Stops (Each)	\$25,000	10	\$250,000		\$0		\$0		\$0
Proposed Mid-block CrossingsG	\$40,500		\$0		\$0		\$0		\$0
Proposed Traffic Calming Elements (Each Location)	\$25,000		\$0		\$0		\$0		\$0
Traffic Signal (Each)	\$250,000		\$0	4	\$1,000,000	3	\$750,000		\$0
Signal Modification (Each)	\$30,000	2	\$60,000		\$0		\$0		\$0
Signalized Pedestrian/Bike Crossing (Each)	\$150,000		\$0		\$0		\$0		\$0
Flashing Crossing Signs - RRFB or other (Each)	\$15,000		\$0		\$0		\$0		\$0
Shade Trees (Each)	\$700	40	\$28,000		\$0		\$0		\$0
Roadway Rebuild Minor (\$1.1million per lane mile)	\$208		\$0		\$0		\$0		\$0
Roadway Rebuild Major (\$1.3million per lane mile)	\$246		\$0	20,750	\$5,108,902	14,820	\$3,648,864		\$0
Drainage Minor (\$400k per mile)	\$76		\$0		\$0	4,940	\$374,242		\$0
Drainage Minor (\$600k per mile)	\$114		\$0	4,150	\$471,591		\$0		\$0
Subtotal	Typical		\$1,406,698		\$6,580,492		\$4,773,106		\$302,314
Mobilization	10%	10%	\$140,670	10%	\$658,049	10%	\$477,311	10%	\$30,231
Contingency	20%	20%	\$281,340	20%	\$1,316,098	20%	\$954,621	20%	\$60,463
Engineering/Design	15%	15%	\$211,005	15%	\$987,074	15%	\$715,966	15%	\$45,347
Total			\$2,039,712		\$9,541,714		\$6,921,004		\$438,355

Figure C.2 Cost Estimate Table continued...

TIRZ Project Number		5 Edwards Street Vision		6 Silver Street Bikeway		6 Memorial Way Study & Safe Street Improvements		7 Silver Street Vision	
Improvement Items	Unit Price/ Linear Foot	Qty.	TOTAL	Qty.	TOTAL	Qty.	TOTAL	Qty.	TOTAL
6 FT SidewalkA	\$63		\$0		\$0		\$0		\$0
5 FT SidewalkA	\$55		\$0		\$0	480	\$26,400		\$0
10 FT Sidewalk/SidepathA	\$110		\$0		\$0		\$0		\$0
Proposed Curb Ramps - Each	\$2,250		\$0		\$0		\$0		\$0
Corridor Sidewalk Improvements (From Detailed Study Model) (Each)	\$1		\$0		\$0		\$0	596,156	\$596,156
Neighborhood Bikeway/Safe StreetC	\$34		\$0	2,750	\$93,750	480	\$16,364		\$0
Standard Bike LanesC	\$53		\$0	1,550	\$82,197		\$0		\$0
Protected Bike LanesC	\$104		\$0		\$0		\$0		\$0
Two-Way Cycle TrackC	\$85		\$0		\$0		\$0		\$0
Street Restripe (Remove \$8/FT and Install \$20/FT)C	\$28		\$0		\$0		\$0		\$0
Proposed New Bus Shelters and Pad (Each)	\$25,000		\$0		\$0		\$0		\$0
Proposed General Pavement (Overlay) Repair	\$150		\$0	1,075	\$161,250		\$0		\$0
Proposed Floating Bus Stops (Each)	\$25,000		\$0		\$0		\$0		\$0
Proposed Mid-block CrossingsG	\$40,500		\$0		\$0		\$0		\$0
Proposed Traffic Calming Elements (Each Location)	\$25,000		\$0		\$0		\$0		\$0
Traffic Signal (Each)	\$250,000		\$0	1	\$250,000		\$0		\$0
Signal Modification (Each)	\$30,000		\$0		\$0		\$0	2	\$60,000
Signalized Pedestrian/Bike Crossing (Each)	\$150,000		\$0		\$0		\$0		\$0
Flashing Crossing Signs - RRFB or other (Each)	\$15,000		\$0		\$0		\$0		\$0
Shade Trees (Each)	\$700		\$0		\$0		\$0		\$0
Roadway Rebuild Minor (\$1.1million per lane mile)	\$208	5,490	\$1,143,750		\$0		\$0	5,400	\$1,125,000
Roadway Rebuild Major (\$1.3million per lane mile)	\$246		\$0		\$0		\$0		\$0
Drainage Minor (\$400k per mile)	\$76	1,830	\$138,636		\$0		\$0	2,700	\$204,545
Drainage Minor (\$600k per mile)	\$114		\$0		\$0		\$0		\$0
Subtotal	Typical		\$1,282,386		\$587,197		\$42,764		\$1,985,701
Mobilization	10%	10%	\$128,239	10%	\$58,720	10%	\$4,276	10%	\$198,570
Contingency	20%	20%	\$256,477	20%	\$117,439	20%	\$8,553	20%	\$397,140
Engineering/Design	15%	15%	\$192,358	15%	\$88,080	15%	\$6,415	15%	\$297,855
Total			\$1,859,460		\$851,436		\$62,007		\$2,879,267

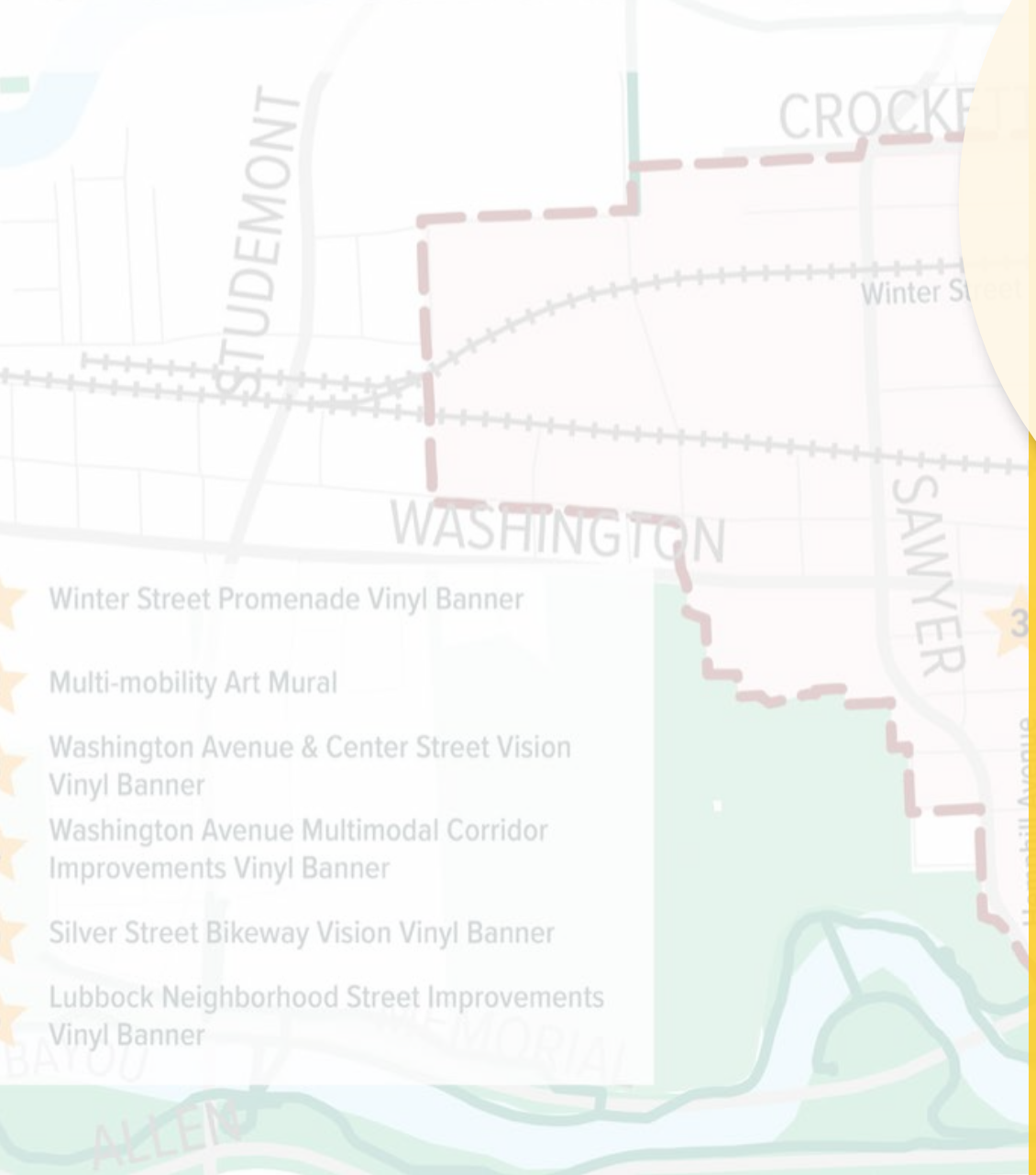
Figure C.2 Cost Estimate Table continued..

TIRZ Project Number	Unit Price/ Linear Foot	8 Sawyer Street South Multimodal Improvements		9 Sawyer Street North Reconstruction		10 Oliver Street Reconstruction		11 Lubbock Neighborhood Street Improvements	
		Qty.	TOTAL	Qty.	TOTAL	Qty.	TOTAL	Qty.	TOTAL
Improvement Items									
6 FT SidewalkA	\$63		\$0		\$0		\$0		\$0
5 FT SidewalkA	\$55		\$0		\$0		\$0		\$0
10 FT Sidewalk/SidepathA	\$110	600	\$66,000		\$0	1,640	\$180,400		\$0
Proposed Curb Ramps - Each	\$2,250		\$0		\$0		\$0		\$0
Corridor Sidewalk Improvements (From Detailed Study Model) (Each)	\$1	140,818	\$140,818		\$0		\$0	202,030	\$202,030
Neighborhood Bikeway/Safe StreetC	\$34		\$0		\$0		\$0	2,950	\$100,568
Standard Bike LanesC	\$53	1,500	\$79,545		\$0		\$0		\$0
Protected Bike LanesC	\$104		\$0		\$0		\$0		\$0
Two-Way Cycle TrackC	\$85		\$0		\$0		\$0		\$0
Street Restripe (Remove \$8/FT and Install \$20/FT)C	\$28		\$0		\$0		\$0		\$0
Proposed New Bus Shelters and Pad (Each)	\$25,000	4	\$100,000		\$0		\$0		\$0
Proposed General Pavement (Overlay) Repair	\$150		\$0		\$0		\$0		\$0
Proposed Floating Bus Stops (Each)	\$25,000		\$0		\$0		\$0		\$0
Proposed Mid-block CrossingsG	\$40,500	2	\$81,000		\$0		\$0		\$0
Proposed Traffic Calming Elements (Each Location)	\$25,000		\$0		\$0		\$0	1	\$25,000
Traffic Signal (Each)	\$250,000		\$0	1	\$250,000		\$0		\$0
Signal Modification (Each)	\$30,000		\$0	2	\$60,000		\$0		\$0
Signalized Pedestrian/Bike Crossing (Each)	\$150,000		\$0		\$0		\$0		\$0
Flashing Crossing Signs - RRFB or other (Each)	\$15,000		\$0		\$0		\$0		\$0
Shade Trees (Each)	\$700		\$0		\$0		\$0		\$0
Roadway Rebuild Minor (\$1.1million per lane mile)	\$208		\$0		\$0	3,280	\$683,333		\$0
Roadway Rebuild Major (\$1.3million per lane mile)	\$246		\$0	11,910	\$2,932,386		\$0		\$0
Drainage Minor (\$400k per mile)	\$76		\$0	3,970	\$300,758	1,640	\$124,242		\$0
Drainage Minor (\$600k per mile)	\$114		\$0		\$0		\$0		\$0
Subtotal	Typical		\$467,363		\$3,543,144		\$987,976		\$327,598
Mobilization	10%	10%	\$46,736	10%	\$354,314	10%	\$98,798	10%	\$32,760
Contingency	20%	20%	\$93,473	20%	\$708,629	20%	\$197,595	20%	\$65,520
Engineering/Design	15%	15%	\$70,105	15%	\$531,472	15%	\$148,196	15%	\$49,140
Total			\$677,677		\$5,137,559		\$1,432,565		\$475,017

Figure C.2 Cost Estimate Table continued...

TIRZ Project Number		12 Winter Street Promenade		13 District Sidewalk Program		14 Safe Intersection & Street Crossing Program	
Improvement Items	Unit Price/ Linear Foot	Qty.	TOTAL	Qty.	TOTAL	Qty.	TOTAL
6 FT SidewalkA	\$63		\$0	7,835	\$493,605		\$0
6 Ft Sidewalk (New Construction, No Demolition)	\$42		\$0	17,358	\$729,036		\$0
5 FT SidewalkA	\$55		\$0		\$0		\$0
10 FT Sidewalk/SidepathA	\$110	1,800	\$198,000		\$0		\$0
Proposed Curb Ramps - Each	\$2,250		\$0	258	\$580,500		\$0
Neighborhood Bikeway/Safe StreetC	\$34		\$0		\$0		\$0
Standard Bike LanesC	\$53		\$0		\$0		\$0
Protected Bike LanesC	\$104		\$0		\$0		\$0
Two-Way Cycle TrackC	\$85		\$0		\$0		\$0
Street Restripe (Remove \$8/FT and Install \$20/FT)C	\$28		\$0		\$0		\$0
Proposed New Bus Shelters and Pad (Each)	\$25,000		\$0		\$0		\$0
Proposed General Pavement (Overlay) Repair	\$150		\$0		\$0		\$0
Proposed Floating Bus Stops (Each)	\$25,000		\$0		\$0		\$0
Proposed Mid-block CrossingsG	\$40,500		\$0		\$0	10	\$405,000
Proposed Traffic Calming Elements (Each Location)	\$25,000		\$0		\$0		\$0
Traffic Signal (Each)	\$250,000		\$0		\$0		\$0
Signal Modification (Each)	\$30,000		\$0		\$0		\$0
Signalized Pedestrian/Bike Crossing (Each)	\$150,000		\$0		\$0		\$0
Flashing Crossing Signs - RRFB or other (Each)	\$15,000		\$0		\$0	5	\$75,000
Shade Trees (Each)	\$700		\$0		\$0		\$0
Roadway Rebuild Minor (\$1.1million per lane mile)	\$208		\$0		\$0		\$0
Roadway Rebuild Major (\$1.3million per lane mile)	\$246		\$0		\$0		\$0
Drainage Minor (\$400k per mile)	\$76	1,800	\$136,364		\$0		\$0
Drainage Minor (\$600k per mile)	\$114		\$0		\$0		\$0
Subtotal	Typical		\$334,364		\$1,803,141		\$480,000
Mobilization	10%	10%	\$33,436	10%	\$180,314	10%	\$48,000
Contingency	20%	20%	\$66,873	20%	\$360,628	20%	\$96,000
Engineering/Design	15%	15%	\$50,155	15%	\$270,471	15%	\$72,000
Total			\$484,827		\$2,614,554		\$696,000

TIRZ 13 Mobility Plan Art Installations



Community Engagement

Introduction

Community engagement was a central tenet of the TIRZ 13 Mobility Plan throughout the planning process, from early November 2020 through May 2021. The community engagement process was multi-pronged, with a wide variety of stakeholders engaged during the seven month process. Due to the ongoing impacts of the COVID 19 pandemic, the project team utilized both in-person and virtual engagement strategies to ensure that the plan was a reflection of the community it is intended to serve.

At the start of the project, the following engagement goals and objectives were developed:

1. Guarantee that community input shapes the final recommendations of the project.
2. Ensure that a healthy mix of residents, businesses, landowners, and other stakeholders that accurately represent the makeup of TIRZ 13 are engaged throughout the duration of the project.
3. Utilize engagement methods that promote the mobility goals of the project, such as self-guided walking or biking tours, whenever possible.
4. Promote the Mobility Plan in the already existing and thriving community events that occur in TIRZ 13, e.g. Second Saturdays or the Drive-In at Sawyer Yards.

The following engagement strategies were utilized: project marketing, stakeholder interviews, visioning survey, an interactive map, a public meeting, a self-guided virtual tour, and public placemaking. The themes, goals, and strategies outlined in this report have been heavily influenced and informed by feedback and ideas received from stakeholders and members of the public throughout this plan, whether obtained from conversations that occurred during focus groups or through comments made in the numerous public surveys.

Project Marketing

It was important to ensure that residents and visitors of the Old Sixth Ward and beyond were aware that this plan was taking place and that it was community driven and solicited their feedback. A project website was developed that included information such as the goals, timeline, and a map of the study area. Individuals were also able to access the website to rewatch previously recorded public meetings and access engagement efforts like the visioning survey and interactive tour. A press release was also issued in November, which resulted in several articles and radio interviews with the project team about the study.





HOUSTON


Popular Neighborhood Near Downtown Houston Looks To Fix Its Mobility Issues

Despite being close to downtown's attractions, Old Sixth Ward residents have a problem getting there by foot or by bike. New development on Washington Avenue has also created traffic and parking challenges.

GAIL DELAUGHTER | DECEMBER 2, 2020, 11:23 AM

Share



1 / 12

Houston Public Media article on the TIRZ 13 Mobility Plan, December 2020

Source: Houston Public Media

Old Sixth Ward TIRZ to evaluate mobility options



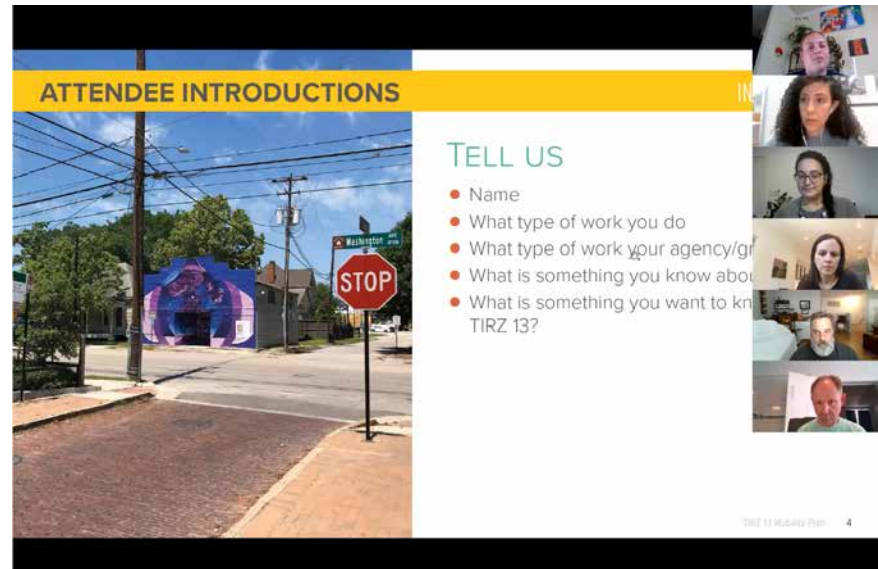
The Old Sixth Ward Tax Increment Reinvestment Zone has announced a mobility study to identify potential improvements to safety, walkability and bicycle access in the area. (Community Impact staff)

Community Impact article on the TIRZ 13 Mobility Plan, November 2020

Source: Community Impact Newspaper

Interviews

In December 2020, January 2021, and April 2021, the project team interviewed 24 different individuals. These interviews ranged from conversations walking around the Old Sixth Ward neighborhood, one-to-one interviews, multiple group interviews, and a stakeholder workshop.



Stakeholder workshop for nonprofits and local agencies, December 2020

Source: Asakura Robinson



TIRZ 13 Mobility Plan Website, May 2021

Source: Social Pinpoint

The following themes six themes emerged through the discussions with the stakeholders:

- 1. Public infrastructure in the study area is in poor shape.** Whether it's the state of the sidewalks, the number of unused telephone poles, or the state of drainage infrastructure, many stakeholders have expressed that public infrastructure and streetscapes in the study area needs to be improved. The lack of an original plat for the area as well as inconsistencies in how rights-of-way are indicated in deeds over time has created ambiguity around where private property begins and ends, especially regarding sidewalks.
- 2. Walking in the study area is onerous.** Many of the study area's residents and visitors walk as a primary and/or secondary mode of transportation both to and from and within the study area. However, walking can be a difficult task. Putting aside streets with missing sidewalk segments, those that do have sidewalks are not ADA compliant and tend to have many obstacles blocking them, especially south of Washington. Trees and bushes from private property tend to encroach on the sidewalk along with parked cars and trash cans. It was mentioned that maintenance on brick sidewalks does not happen because it is not a City of Houston standard. Additionally, traversing major corridors such as Washington or Silver by foot tends to be difficult to many.
- 3. Safety is a large priority for all stakeholders.** Multimodal safety has been brought up by almost all stakeholders. There is particular concern over unsafe pedestrian and bike crossings at major intersections as well as speeding traffic. From protected bike lanes to safe crosswalks and accessible curb ramps to traffic signals and traffic calming measures, several stakeholders have expressed that there could be numerous safety improvements that can take place throughout the study area that will encourage multimodality.

4. How Washington, Silver, and Sawyer are designed moving forward will impact the district immensely. Washington, Silver, and Sawyer Streets are three of the four corridors studied specifically, and they are also three of the most widely mentioned corridors by our stakeholders. How they are designed and how they are used both within the study area, but also as part of a much larger network will set the tone for interacting with the Old Sixth Ward. Stakeholders were interested in bicycle and bus uses coexisting in Washington, linking pedestrian and bicycle facilities to transit, and improving north/south connections within the study area.

5. It's important to acknowledge and pay homage to the history of the District. The history of the Old Sixth Ward is one of the study area's biggest assets. It is the oldest historic district in Houston and Sabine is the oldest brick street in the city. As one stakeholder put it, "There aren't many neighborhoods in Houston with history like the Old Sixth Ward," and so it's important to understand the history of the district whilst trying to see how that can be incorporated into future mobility plans.

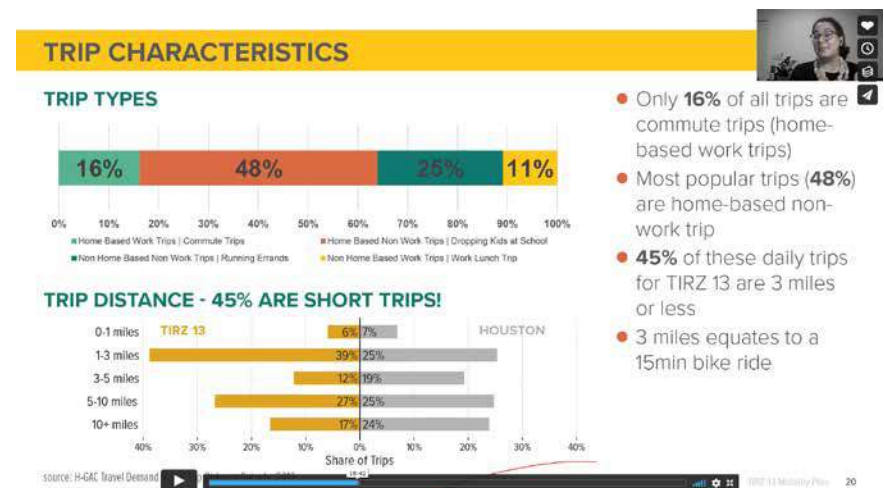
6. Creating linkages with future projects can spell out success. Because the study area sits at a great location, with Interstate access, proximity to downtown and Buffalo Bayou, there are a number of future projects that will affect the study area, e.g. METRO Boost, North Houston Highway Improvement Project, etc. Making note of these projects and planning with them will prime the study area to grow in a sustainable and forward thinking manner.

A special thank you to the following individuals who took time to speak with us on the mobility opportunities and challenges for the Old Sixth Ward area:

First Name	Last Name	
Amar	Mohite	Precinct 1
Brandie	Lockett	City of Houston, Public Works
Claude	Anello	Old Sixth Ward TIRZ Board
Cynthia	Card	Old Sixth Ward Neighborhood Association
Danni	Sabota	Old Sixth Ward Neighborhood Association
David	Fields	City of Houston, Planning and Development
Derek	Sellers	City of Houston, Housing & Community Development
Frank	Karbarz	BCycle
Frank	Liu	Lovett Commercial
Grace	Zuniga	Sawyer Yards
Jane	Cahill West	Old Sixth Ward resident
Joe	Cutrufo	BikeHouston
Jon	Deal	Deal Company
Jonathan	Brooks	LINK Houston
Jorge	Bustamante	Harris County Precinct 2
Marie	Hoke	TIRZ 3
Max	Gonzalez	Catalina Coffee
Mike	VanDusen	Super Neighborhood 22
Neal	Parker	Old Sixth Ward resident
Rachael	Die	METRO
Ray	Guerra	Harris County Precinct 2
Stacie	Fairchild	Super Neighborhood 22
Steve	Gibson	Western General
Tom	McCasland	City of Houston, Housing & Community Development

Public Meeting

A public meeting was held on December 3, 2020. The 90-minute meeting introduced the project team, presented the study approach and timeline, and exhibited the plan's preliminary findings like the sidewalk condition assessment, crash data, and commute characteristics for the area. The community engagement strategy was also presented. Finally, the meeting allowed for 30 minutes of question and answer with attendees. The public meeting garnered over 40 participants and a recording of the meeting was made available 24 hours later on the project website along with a copy of the presentation slides.



Virtual public meeting, December 2020

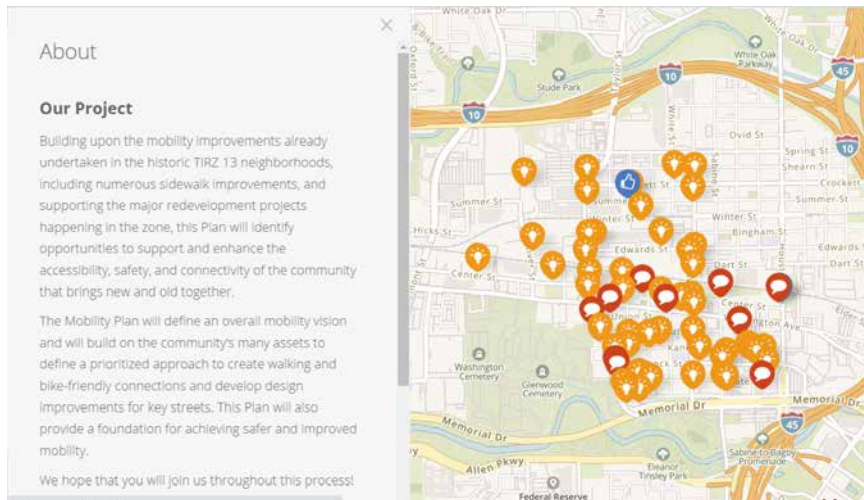
Source: Asakura Robinson

Interactive Map

An interactive map was created as part of the initial visioning process and available through the project website. Participants were able to leave comments on the map based on three categories:

- Something I Like
- Ideas and Suggestions
- Other Comments

Once a location and category were chosen, participants could leave a comment. People could also “upvote” or “downvote” other participants’ comments. The interactive map was open between November 20, 2020 and January 20, 2021 and 95 comments were made on the map.



Interactive map, January 2021

Source: Social Pinpoint

Most of the comments centered around the following corridors: Sawyer, Washington, Silver, Center, and Lubbock, with these streets collectively being mentioned 70 times in the interactive map by participants. Furthermore, after coding all the comments, the top five rated issues were inadequate or missing sidewalks, unsafe crossings, speeding cars, missing connections, and broken sidewalks. Figure D.1 represents the top 10 rated issues. The top five rated solutions were adding a crosswalk, adding sidewalk, adding a bike facility, fixing a sidewalk, and including crossing lights at signalized intersections.

Tally vs. Issue

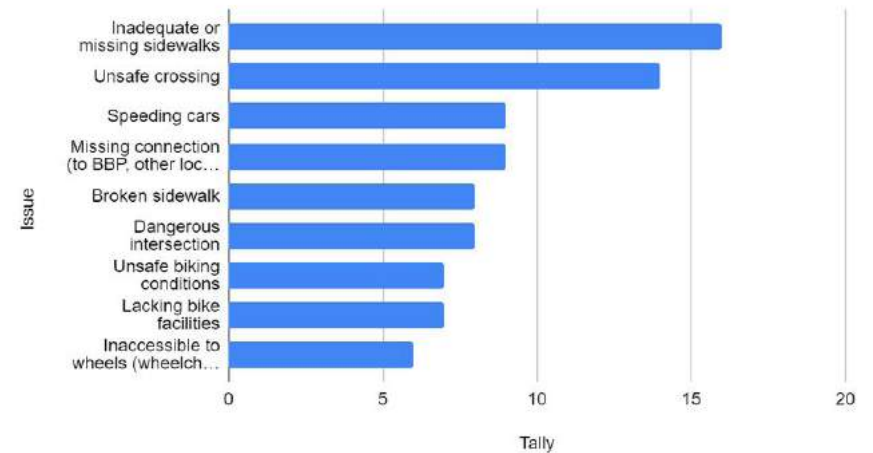


Figure D.1 Top issues identified by participants in interactive map

Visioning Survey

A visioning survey was open between November 20 and December 31, 2020. Its goals were to evaluate the opportunities and challenges of mobility in the study area. The survey received 53 responses in total. Most of the survey respondents lived in the study area (30%), owned property in the area (36%), worked in the study area (40%), and/or shopped, ate, and went to events in the area (68%).

Driving alone was the primary mode of transportation for 66% of respondents when they travel to and from the study area. Walking or biking was the secondary mode of transportation for 89% of the respondents, indicating a high possibility for alternative modes of transportation within the area. However, 74% of respondents indicated that sidewalks were bad or missing, 68% of respondents indicated that they have difficulty crossing busy streets, and 34% of respondents said they feel unsafe while biking. Additionally, almost one in five respondents indicated that they would walk, bike, or take transit if these options were improved, and over two-thirds of respondents indicated that they would love for walking, biking, or transit to be safer even though they already engage in these modes.

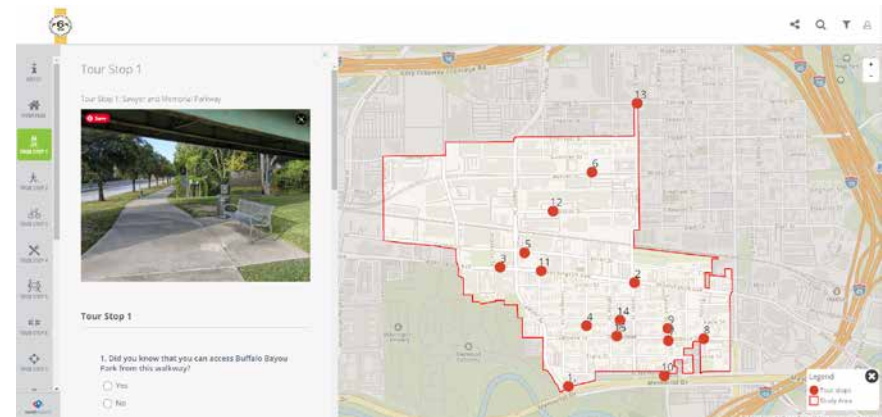
Finally, when asked which top three priorities from a list of 12, would make getting around the study area easier or more enjoyable, respondents answered as follows:

- Improving sidewalks so they are wider, smoother, and accessible for everyone, including people with mobility challenges (70%)
- Designing safe places for people walking and biking to cross busy roads (68%)
- Creating safe places for people to bike (44%)

Responses and feedback to this survey was then used to create the interactive self-guided tour.

Self-guided Tour

The self-guided tour invited residents and visitors to participate in a walk/bike tour, allowing them to experience mobility and accessibility of the Old Sixth Ward Area from their computer screens. An interactive map created a virtual adventure through the neighborhood, where participants could identify assets or desired improvements, as well as provide detailed feedback at various “stops” identified throughout the neighborhood. The self-guided tour used the information collected from the stakeholder interviews, interactive map, visioning survey, and public meeting to ask residents and visitors about potential recommendations for the study area. For example, a question asked at which intersection residents would like to see a crosswalk on Washington. Another asked what type of new design elements would the “tour takers” like to see within the intersection at Lubbock and Sabine.



Self-guided tour

Source: Social Pinpoint

The project team received 347 responses to the self-guided tour. These responses helped inform the recommendations found in the TIRZ 13 Mobility Plan. For example, 88% of respondents wanted to see a crosswalk placed on the intersection of Washington Avenue and Silver Street. This is an example of one suggestion that has been included in the Plan.

Placemaking

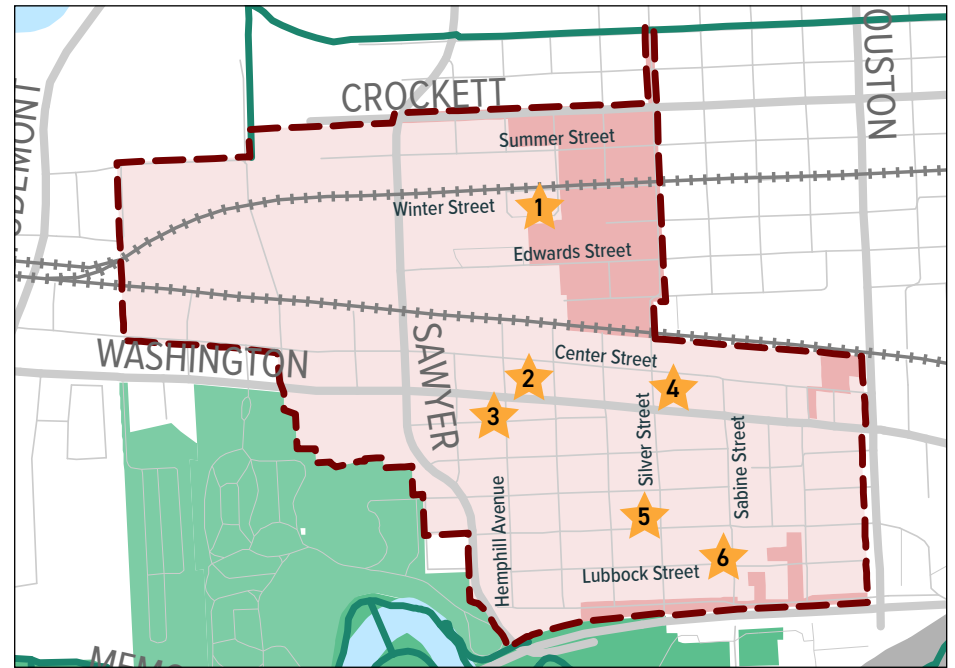
Public Banners

Five before and after banners were added around the study area to showcase renderings that reflect the recommendations of the project. The goal of publicly displaying the renderings was to elicit a conversation from residents and visitors of the study area about what the future vision for the Old Sixth Ward could be. Displaying the banners very closely in location to the area rendered allows viewers to see what the current corridors look like compared to what they could look like if recommendations were implemented. The five locations of the renderings were as follows:

- Catalina Coffee on the southwest corner of Hemphill and Washington showcased the Washington Avenue and Center Street rendering
- Winter Street Studios on the north facing fence of Henderson and Silver showcased the Winter Street rendering
- 1818 Washington on the northeast corner of Silver and Washington showcased the Washington Avenue rendering
- MECA on the northwest corner of Silver and Lubbock showcased the Silver Street rendering
- A TIRZ board member's home on the southwest corner of Lubbock and Sabine showcased the Lubbock Street rendering

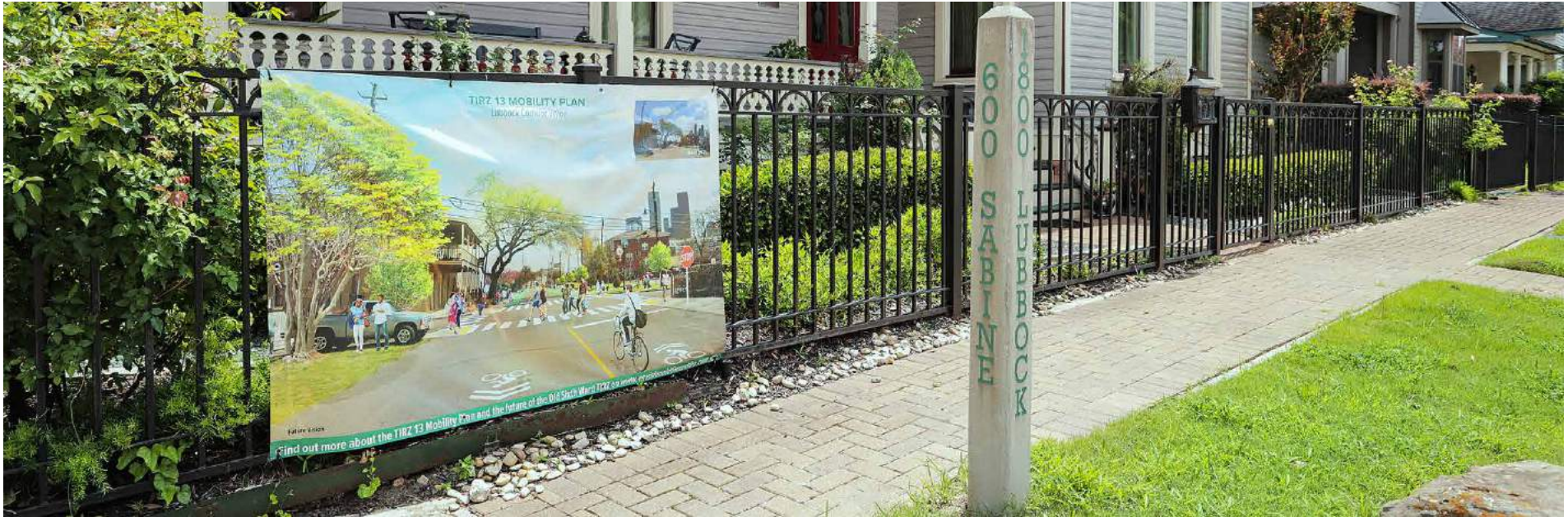
Art Mural

An art mural was also commissioned on the Salvation Army Wall facing Hemphill on 2118 Washington Avenue. An art mural was chosen as one of the implementable actions out of this plan to commemorate multi-mobility within the Old Sixth Ward TIRZ, but also to celebrate that the study area falls completely within the Arts District Houston boundary. The mural was painted by Sylvia Blanco, a long-time Houston resident and in Figure XX you can see.



Map of Art Installations in the study area

- 1 Winter Street Promenade Vinyl Banner
- 2 Multi-mobility Art Mural
- 3 Washington Avenue & Center Street Vision Vinyl Banner
- 4 Washington Avenue Multimodal Corridor Improvements Vinyl Banner
- 5 Silver Street Bikeway Vision Vinyl Banner
- 6 Lubbock Neighborhood Street Improvements Vinyl Banner



Lubbock Neighborhood Street Improvements vinyl banner



Winter Street Promenade vinyl banner



TIRZ 13 Mobility Plan art mural



Silver Street Bikeway Vision vinyl banner



Washington Avenue Multimodal Corridor Improvements vinyl banner



Washington Avenue and Center Street Vision vinyl banner



Envision Old 6th Ward TIRZ Header

Envision Old 6th Ward TIRZ

In conjunction with the public banners and the art mural, a website, named Envision Old Sixth 6th TIRZ, was developed to showcase the before and after of the renderings, host the draft and final report, and allow for stakeholders to provide comments on the proposed recommendations through a short survey. This website will remain accessible even after the study has ended.

For more information, please visit: www.envisionold6wardtirz.com.

Draft Report Survey

On May 15, a short four-question survey was promoted to the public to ask them about the five renderings and their associated recommendations as well as ask them about the overall TIRZ 13 Mobility Plan. The draft plan was made publically available on May 27. The survey ran from May 15 to July 1. The project team received 261 responses during that time.

Questions 1 asked, “Please indicate your level of agreement with the following statement: I think the proposed projects will improve mobility options and the quality of life in the Old 6th Ward TIRZ.” Figure 47% and 10% strongly agreed and agreed, respectively, with a little over 25% and 17% disagreeing and strongly disagreeing, respectively. Figure D.2 showcases the results of that question.

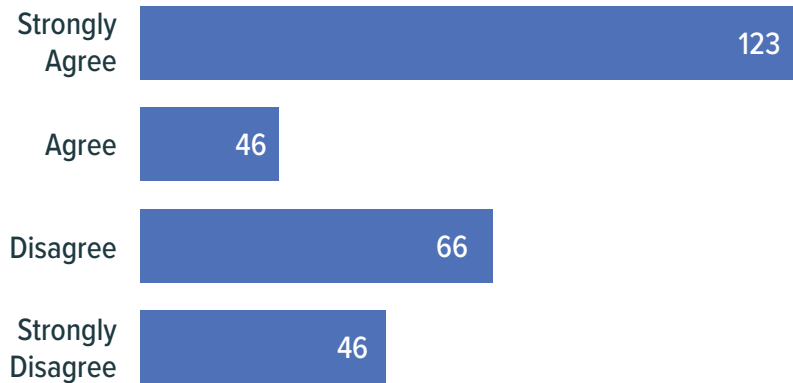


Figure D.2 Responses to Question 1 of the draft report survey

Question 2 asked, “Please indicate your level of agreement with the following statement: I would like to see further development and implementation of the recommended Mobility Plan projects in Old 6th Ward TIRZ.” Similarly to Question 1, close to 57% of respondents strongly agreed and agreed with the statement and a little over 42% disagreed and strongly disagreed with the statment.

Question 3 asked what project would be most beneficial to the neighborhood if implemented. Figure D.3. showcases the results of the question. The project that respondents wanted to see the most was the Washington Avenue and Center Street Vision, with approximately 45% of respondents voting for that project. The Washington Avenue Multimodal Corridor Improvements came in second with almost 29% of the vote. Additionally 10% of respondents wanted to see general sidewalk and intersection projects that improve walkability across the study area.

Finally, Question 4 asked if there was anything else that the public wanted to let the project team know. Over 50% of responses to that question stated that residents felt that dedicated bike lanes on Lubbock St are unnecessary, and rather a continuous shared on-street bikeway is all that is needed. The project team took into consideration an alternative solution, which included a small traffic circle at Lubbock & Trinity that would serve to slow down cars, improve overall safety, maintain parking, and beautify the neighborhood.

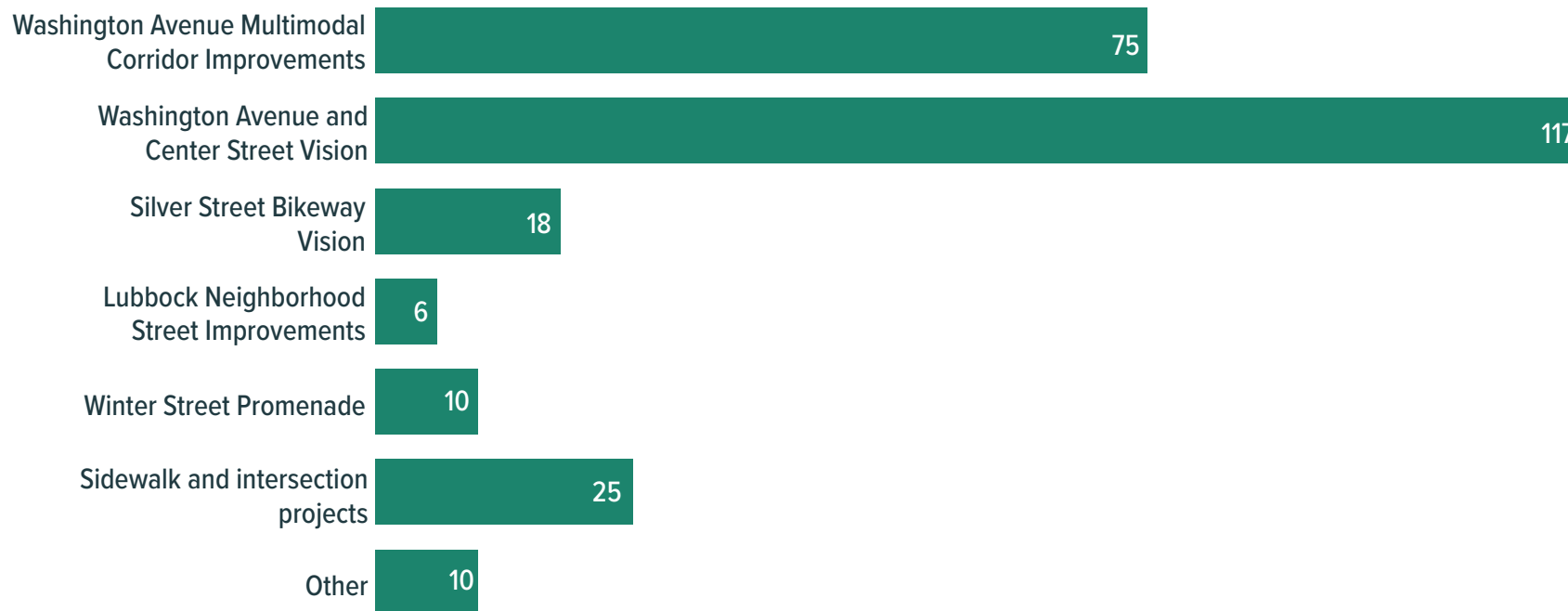


Figure D.3 Responses to Question 3 of the draft report survey

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Appendix

E

Traffic Counts &
Signal Analysis

City of Houston Traffic Management - Volume

Requested Address: **1301 washington**
Segment: **FRANKLIN TO HOUSTON AVE**

LAT, LONG : 29.7666334, -95.369741

Incoming Radar Unit : **R1012**

Outgoing Radar Unit : **R1019**

hr:mm	Monday 3/18/2019		Tuesday 3/19/2019		Wednesday 3/20/2019		Thursday 3/21/2019		Friday 3/22/2019		Saturday 3/23/2019		Sunday 3/24/2019		Mon-Fri Average		7 Day Average		
	EAST	WEST	EAST	WEST	EAST	WEST	EAST	WEST	EAST	WEST	EAST	WEST	EAST	WEST	EAST	WEST	EAST	WEST	
12:00 AM	0	0	8	4	16	11	0	0	0	0	0	0	0	0	12.0	7.5	12.0	7.5	
1:00 AM	0	0	13	10	9	11	0	0	0	0	0	0	0	0	11.0	10.5	11.0	10.5	
2:00 AM	0	0	10	4	10	9	0	0	0	0	0	0	0	0	10.0	6.5	10.0	6.5	
3:00 AM	0	0	28	10	23	9	0	0	0	0	0	0	0	0	25.5	9.5	25.5	9.5	
4:00 AM	0	0	82	77	78	66	0	0	0	0	0	0	0	0	80.0	71.5	80.0	71.5	
5:00 AM	0	0	279	159	263	131	0	0	0	0	0	0	0	0	271.0	145.0	271.0	145.0	
6:00 AM	0	0	456	247	456	259	0	0	0	0	0	0	0	0	456.0	253.0	456.0	253.0	
7:00 AM	0	0	564	271	282	123	0	0	0	0	0	0	0	0	423.0	197.0	423.0	197.0	
8:00 AM	149	71	514	282	0	0	0	0	0	0	0	0	0	0	331.5	176.5	331.5	176.5	
9:00 AM	264	218	284	243	0	0	0	0	0	0	0	0	0	0	274.0	230.5	274.0	230.5	
10:00 AM	308	329	385	393	0	0	0	0	0	0	0	0	0	0	346.5	361.0	346.5	361.0	
11:00 AM	371	283	493	321	0	0	0	0	0	0	0	0	0	0	432.0	302.0	432.0	302.0	
12:00 PM	366	255	367	303	0	0	0	0	0	0	0	0	0	0	366.5	279.0	366.5	279.0	
1:00 PM	327	242	338	427	0	0	0	0	0	0	0	0	0	0	332.5	334.5	332.5	334.5	
2:00 PM	315	254	349	261	0	0	0	0	0	0	0	0	0	0	332.0	257.5	332.0	257.5	
3:00 PM	400	357	396	375	0	0	0	0	0	0	0	0	0	0	398.0	366.0	398.0	366.0	
4:00 PM	351	459	406	499	0	0	0	0	0	0	0	0	0	0	378.5	479.0	378.5	479.0	
5:00 PM	318	242	376	353	0	0	0	0	0	0	0	0	0	0	347.0	297.5	347.0	297.5	
6:00 PM	161	123	200	181	0	0	0	0	0	0	0	0	0	0	180.5	152.0	180.5	152.0	
7:00 PM	112	74	123	125	0	0	0	0	0	0	0	0	0	0	117.5	99.5	117.5	99.5	
8:00 PM	92	44	141	88	0	0	0	0	0	0	0	0	0	0	116.5	66.0	116.5	66.0	
9:00 PM	54	60	81	75	0	0	0	0	0	0	0	0	0	0	67.5	67.5	67.5	67.5	
10:00 PM	42	20	52	48	0	0	0	0	0	0	0	0	0	0	47.0	34.0	47.0	34.0	
11:00 PM	20	10	27	23	0	0	0	0	0	0	0	0	0	0	23.5	16.5	23.5	16.5	
TOTALS	3650	3041	5972	4779	1137	619	0	0	0	0	0	0	0	0	5379.5	4219.5	5379.5	4219.5	
COMBINED	6691		10751		1756		0		0		0		0		9599.0		9599.0		
SPLIT (%)	54.6%	45.4%	55.5%	44.5%	64.7%	35.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	56.0%	44.0%	56.0%	44.0%	
PEAK HOURS																			
12:00:00 AM -																			
12:00:00 PM	11:00 AM	10:00 AM	7:00 AM	10:00 AM	6:00 AM	6:00 AM	-	-	-	-	-	-	-	-	6:00 AM	10:00 AM	6:00 AM	10:00 AM	
Volume	371	329	564	393	456	259	-	-	-	-	-	-	-	-	456	361	456	361	
12:00:00 PM -																			
12:00:00 AM	3:00 PM	4:00 PM	4:00 PM	4:00 PM	-	-	-	-	-	-	-	-	-	-	3:00 PM	4:00 PM	3:00 PM	4:00 PM	
Volume	400	459	406	499	-	-	-	-	-	-	-	-	-	-	398	479	398	479	

City of Houston

Traffic Management - Speed Report

Requested Address: 1301 washington

DATE TESTED: 3/19/2019

Radar Unit : R1012 & R1019

Segment: FRANKLIN TO HOUSTON AVE

DAILY COMBINED SPEED

Starting Hr:min	<15	15 to <20	20 to <25	25 to <30	30 to <35	35 to <40	40 to <45	45 to <50	50 to <55	55 to <60	60 to <65	65 to <70	70 to <75	75 to >100	Total Counts
12:00 AM	0	0	0	2	6	4	0	0	0	0	0	0	0	0	12
1:00 AM	0	1	1	5	9	5	2	0	0	0	0	0	0	0	23
2:00 AM	0	0	0	2	5	6	0	0	1	0	0	0	0	0	14
3:00 AM	0	0	0	9	7	11	6	5	0	0	0	0	0	0	38
4:00 AM	1	6	5	19	57	54	14	3	0	0	0	0	0	0	159
5:00 AM	1	1	21	44	171	152	41	6	0	1	0	0	0	0	438
6:00 AM	0	2	20	87	300	229	58	5	2	0	0	0	0	0	703
7:00 AM	0	1	16	104	346	294	65	7	2	0	0	0	0	0	835
8:00 AM	0	4	13	81	304	301	82	10	1	0	0	0	0	0	796
9:00 AM	0	4	19	77	204	182	38	2	1	0	0	0	0	0	527
10:00 AM	0	9	29	112	298	257	67	6	0	0	0	0	0	0	778
11:00 AM	1	9	29	113	352	256	44	10	0	0	0	0	0	0	814
12:00 PM	0	6	22	95	251	225	64	3	3	1	0	0	0	0	670
1:00 PM	0	15	37	105	314	230	58	4	1	1	0	0	0	0	765
2:00 PM	0	3	25	78	238	195	58	12	1	0	0	0	0	0	610
3:00 PM	0	1	15	74	260	304	97	19	1	0	0	0	0	0	771
4:00 PM	3	2	16	48	277	405	133	19	2	0	0	0	0	0	905
5:00 PM	0	5	13	50	205	360	81	14	1	0	0	0	0	0	729
6:00 PM	0	1	4	23	139	155	49	9	1	0	0	0	0	0	381
7:00 PM	0	0	4	19	93	97	29	6	0	0	0	0	0	0	248
8:00 PM	0	0	3	27	97	80	17	1	4	0	0	0	0	0	229
9:00 PM	0	0	3	12	57	56	19	7	1	0	1	0	0	0	156
10:00 PM	0	0	2	16	38	31	9	3	1	0	0	0	0	0	100
11:00 PM	0	1	1	7	20	14	5	1	1	0	0	0	0	0	50
Totals	6	71	298	1209	4048	3903	1036	152	24	3	1	0	0	0	10751

Percentile Speeds	10%	15%	50%	85%	90%	Posted Speed	30	Average (Mean)	Minimum (mph)	Maximum (mph)
(mph)	28.5	29.5	34.5	38.5	39.5			34.1	12.0	58.5
Speeds Exceeded	25mph	35mph	45mph	55mph	65mph	75mph				
	10376	5119	180	4	0	0				
	96.5%	47.6%	1.7%	0.0%	0.0%	0.0%				

City of Houston Traffic Management

Requested Address: 1301 washington
Segment: FRANKLIN TO HOUSTON AVE

DATE TESTED: 3/19/2019

Radar Unit : R1012
Radar Unit : R1019

EAST				
Time	Percentile	Small	Medium	Large
12:00 AM	0.1%	0	8	0
1:00 AM	0.2%	0	12	1
2:00 AM	0.2%	0	10	0
3:00 AM	0.5%	0	27	1
4:00 AM	1.4%	0	77	5
5:00 AM	4.7%	9	255	15
6:00 AM	7.6%	14	418	24
7:00 AM	9.4%	9	520	35
8:00 AM	8.6%	9	489	16
9:00 AM	4.8%	12	250	22
10:00 AM	6.4%	8	353	24
11:00 AM	8.3%	7	461	25
12:00 PM	6.1%	9	332	26
1:00 PM	5.7%	6	308	24
2:00 PM	5.8%	7	322	20
3:00 PM	6.6%	7	364	25
4:00 PM	6.8%	14	372	20
5:00 PM	6.3%	8	350	18
6:00 PM	3.3%	3	188	9
7:00 PM	2.1%	1	117	5
8:00 PM	2.4%	0	137	4
9:00 PM	1.4%	1	76	4
10:00 PM	0.9%	0	49	3
11:00 PM	0.5%	0	22	5
TOTAL	5972	124	5517	331
Percentile %		2.1%	92.4%	5.5%

WEST				
Time	Percentile	Small	Medium	Large
12:00 AM	0.1%	0	4	0
1:00 AM	0.2%	2	8	0
2:00 AM	0.1%	0	4	0
3:00 AM	0.2%	0	9	1
4:00 AM	1.6%	2	67	8
5:00 AM	3.3%	2	148	9
6:00 AM	5.2%	9	220	18
7:00 AM	5.7%	10	250	11
8:00 AM	5.9%	5	258	19
9:00 AM	5.1%	5	223	15
10:00 AM	8.2%	9	367	17
11:00 AM	6.7%	9	301	11
12:00 PM	6.3%	5	285	13
1:00 PM	8.9%	10	405	12
2:00 PM	5.5%	4	242	15
3:00 PM	7.8%	3	360	12
4:00 PM	10.4%	2	488	9
5:00 PM	7.4%	7	333	13
6:00 PM	3.8%	2	172	7
7:00 PM	2.6%	3	117	5
8:00 PM	1.8%	0	85	3
9:00 PM	1.6%	3	69	3
10:00 PM	1.0%	1	44	3
11:00 PM	0.5%	1	21	1
TOTAL	4779	94	4480	205
Percentile %		2.0%	93.7%	4.3%

MERGED VEHICLE CLASS				
Time	Percentile	Small	Medium	Large
12:00 AM	0.1%	0	12	0
1:00 AM	0.2%	2	20	1
2:00 AM	0.1%	0	14	0
3:00 AM	0.4%	0	36	2
4:00 AM	1.5%	2	144	13
5:00 AM	4.1%	11	403	24
6:00 AM	6.5%	23	638	42
7:00 AM	7.8%	19	770	46
8:00 AM	7.4%	14	747	35
9:00 AM	4.9%	17	473	37
10:00 AM	7.2%	17	720	41
11:00 AM	7.6%	16	762	36
12:00 PM	6.2%	14	617	39
1:00 PM	7.1%	16	713	36
2:00 PM	5.7%	11	564	35
3:00 PM	7.2%	10	724	37
4:00 PM	8.4%	16	860	29
5:00 PM	6.8%	15	683	31
6:00 PM	3.5%	5	360	16
7:00 PM	2.3%	4	234	10
8:00 PM	2.1%	0	222	7
9:00 PM	1.5%	4	145	7
10:00 PM	0.9%	1	93	6
11:00 PM	0.5%	1	43	6
TOTAL	10751	218	9997	536
Percentile %		2.0%	93.0%	5.0%

Small Vehicle less than 14ft
Medium Vehicle between 14ft and 20ft
Large Vehicle greater than 20ft

City of Houston Traffic Management - Volume

Requested Address: **2215 WASHINGTON**
Segment: **HOUSTON AVE TO STUDEMONT**

LAT, LONG : 29.7683397, -95.3809621

Incoming Radar Unit : **R1012**
Outgoing Radar Unit : **R1019**

hr:mm	Monday 3/18/2019		Tuesday 3/19/2019		Wednesday 3/20/2019		Thursday 3/21/2019		Friday 3/22/2019		Saturday 3/23/2019		Sunday 3/24/2019		Mon-Fri Average		7 Day Average		
	EAST	WEST	EAST	WEST	EAST	WEST	EAST	WEST	EAST	WEST	EAST	WEST	EAST	WEST	EAST	WEST	EAST	WEST	
12:00 AM	0	0	17	14	26	26	0	0	0	0	0	0	0	0	21.5	20.0	21.5	20.0	
1:00 AM	0	0	18	16	24	11	0	0	0	0	0	0	0	0	21.0	13.5	21.0	13.5	
2:00 AM	0	0	11	15	17	14	0	0	0	0	0	0	0	0	14.0	14.5	14.0	14.5	
3:00 AM	0	0	19	37	21	28	0	0	0	0	0	0	0	0	20.0	32.5	20.0	32.5	
4:00 AM	0	0	77	65	72	65	0	0	0	0	0	0	0	0	74.5	65.0	74.5	65.0	
5:00 AM	0	0	280	149	230	170	0	0	0	0	0	0	0	0	255.0	159.5	255.0	159.5	
6:00 AM	0	0	571	311	562	321	0	0	0	0	0	0	0	0	566.5	316.0	566.5	316.0	
7:00 AM	0	0	668	350	552	244	0	0	0	0	0	0	0	0	610.0	297.0	610.0	297.0	
8:00 AM	0	0	603	373	0	0	0	0	0	0	0	0	0	0	603.0	373.0	603.0	373.0	
9:00 AM	355	361	401	372	0	0	0	0	0	0	0	0	0	0	378.0	366.5	378.0	366.5	
10:00 AM	433	486	472	592	0	0	0	0	0	0	0	0	0	0	452.5	539.0	452.5	539.0	
11:00 AM	534	537	574	570	0	0	0	0	0	0	0	0	0	0	554.0	553.5	554.0	553.5	
12:00 PM	506	477	532	545	0	0	0	0	0	0	0	0	0	0	519.0	511.0	519.0	511.0	
1:00 PM	446	465	487	458	0	0	0	0	0	0	0	0	0	0	466.5	461.5	466.5	461.5	
2:00 PM	446	437	493	448	0	0	0	0	0	0	0	0	0	0	469.5	442.5	469.5	442.5	
3:00 PM	642	495	669	487	0	0	0	0	0	0	0	0	0	0	655.5	491.0	655.5	491.0	
4:00 PM	660	537	755	576	0	0	0	0	0	0	0	0	0	0	707.5	556.5	707.5	556.5	
5:00 PM	543	401	713	535	0	0	0	0	0	0	0	0	0	0	628.0	468.0	628.0	468.0	
6:00 PM	284	288	357	401	0	0	0	0	0	0	0	0	0	0	320.5	344.5	320.5	344.5	
7:00 PM	219	236	235	309	0	0	0	0	0	0	0	0	0	0	227.0	272.5	227.0	272.5	
8:00 PM	190	163	195	278	0	0	0	0	0	0	0	0	0	0	192.5	220.5	192.5	220.5	
9:00 PM	104	103	128	127	0	0	0	0	0	0	0	0	0	0	116.0	115.0	116.0	115.0	
10:00 PM	64	64	88	63	0	0	0	0	0	0	0	0	0	0	76.0	63.5	76.0	63.5	
11:00 PM	29	32	34	44	0	0	0	0	0	0	0	0	0	0	31.5	38.0	31.5	38.0	
TOTALS	5455	5082	8397	7135	1504	879	0	0	0	0	0	0	0	0	7979.5	6734.5	7979.5	6734.5	
COMBINED	10537		15532		2383		0		0		0		0		14714.0		14714.0		
SPLIT (%)	51.8%	48.2%	54.1%	45.9%	63.1%	36.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	54.2%	45.8%	54.2%	45.8%	
PEAK HOURS																			
12:00:00 AM -																			
12:00:00 PM	11:00 AM	11:00 AM	7:00 AM	10:00 AM	6:00 AM	6:00 AM	-	-	-	-	-	-	-	-	7:00 AM	11:00 AM	7:00 AM	11:00 AM	
Volume	534	537	668	592	562	321	-	-	-	-	-	-	-	-	610	554	610	554	
12:00:00 PM -																			
12:00:00 AM	4:00 PM	4:00 PM	4:00 PM	4:00 PM	-	-	-	-	-	-	-	-	-	-	4:00 PM	4:00 PM	4:00 PM	4:00 PM	
Volume	660	537	755	576	-	-	-	-	-	-	-	-	-	-	708	557	708	557	

City of Houston Traffic Management - Speed Report

Requested Address: 2215 WASHINGTON

DATE TESTED: 3/19/2019

Radar Unit : R1012 & R1019

Segment: HOUSTON AVE TO STUDEMONT

DAILY COMBINED SPEED

Starting Hr:min	<15	15 to <20	20 to <25	25 to <30	30 to <35	35 to <40	40 to <45	45 to <50	50 to <55	55 to <60	60 to <65	65 to <70	70 to <75	75 to >100	Total Counts
12:00 AM	0	0	0	4	14	10	3	0	0	0	0	0	0	0	31
1:00 AM	1	1	2	6	13	6	3	2	0	0	0	0	0	0	34
2:00 AM	0	1	1	3	7	10	2	2	0	0	0	0	0	0	26
3:00 AM	0	3	0	7	20	20	4	2	0	0	0	0	0	0	56
4:00 AM	0	1	3	12	52	49	16	7	2	0	0	0	0	0	142
5:00 AM	1	2	6	37	184	137	48	12	1	1	0	0	0	0	429
6:00 AM	0	3	21	98	367	314	73	6	0	0	0	0	0	0	882
7:00 AM	2	3	22	79	372	372	146	18	2	1	1	0	0	0	1018
8:00 AM	2	3	29	80	328	357	150	27	0	0	0	0	0	0	976
9:00 AM	1	10	33	86	253	261	106	21	1	0	0	0	1	0	773
10:00 AM	2	7	31	117	420	349	121	15	2	1	0	0	0	0	1065
11:00 AM	2	1	35	127	474	391	97	14	2	0	0	0	0	0	1143
12:00 PM	4	7	45	130	417	373	84	14	2	1	0	0	0	0	1077
1:00 PM	0	12	37	102	353	321	101	18	1	0	0	0	0	0	945
2:00 PM	1	9	40	114	359	303	93	20	0	2	0	0	0	0	941
3:00 PM	0	7	19	100	411	468	122	26	2	0	0	0	0	1	1156
4:00 PM	0	6	34	152	472	516	135	11	4	1	0	0	0	0	1331
5:00 PM	2	9	29	104	438	466	174	20	5	1	0	0	0	0	1248
6:00 PM	0	8	16	45	268	295	98	19	9	0	0	0	0	0	758
7:00 PM	0	6	16	74	228	166	47	6	0	1	0	0	0	0	544
8:00 PM	0	3	11	57	194	161	43	1	2	0	0	0	1	0	473
9:00 PM	1	2	6	32	111	76	20	5	1	1	0	0	0	0	255
10:00 PM	0	1	2	20	58	43	21	5	1	0	0	0	0	0	151
11:00 PM	0	3	6	13	31	13	8	2	2	0	0	0	0	0	78
Totals	19	108	444	1599	5844	5477	1715	273	39	10	1	0	2	1	15532

Percentile Speeds	10%	15%	50%	85%	90%	Posted Speed	30	Average (Mean)	Minimum (mph)	Maximum (mph)
(mph)	28.0	30.0	34.5	39.0	40.5			34.3	12.0	69.5
Speeds Exceeded	25mph	35mph	45mph	55mph	65mph	75mph				
	14961	7518	326	14	3	3				
	96.3%	48.4%	2.1%	0.1%	0.0%	0.0%				

City of Houston Traffic Management

Requested Address: 2215 WASHINGTON
Segment: HOUSTON AVE TO STUDEMONT

DATE TESTED: 3/19/2019

Radar Unit : R1012
Radar Unit : R1019

EAST				
Time	Percentile	Small	Medium	Large
12:00 AM	0.2%	0	16	1
1:00 AM	0.2%	0	16	2
2:00 AM	0.1%	0	11	0
3:00 AM	0.2%	0	18	1
4:00 AM	0.9%	1	71	5
5:00 AM	3.3%	6	256	18
6:00 AM	6.8%	13	529	29
7:00 AM	8.0%	16	618	34
8:00 AM	7.2%	6	563	34
9:00 AM	4.8%	9	368	24
10:00 AM	5.6%	11	426	35
11:00 AM	6.8%	10	531	33
12:00 PM	6.3%	4	501	27
1:00 PM	5.8%	7	461	19
2:00 PM	5.9%	4	464	25
3:00 PM	8.0%	9	627	33
4:00 PM	9.0%	12	718	25
5:00 PM	8.5%	8	677	28
6:00 PM	4.3%	6	336	15
7:00 PM	2.8%	4	219	12
8:00 PM	2.3%	3	182	10
9:00 PM	1.5%	1	123	4
10:00 PM	1.0%	1	81	6
11:00 PM	0.4%	0	31	3
TOTAL	8397	131	7843	423
Percentile %		1.6%	93.4%	5.0%

WEST				
Time	Percentile	Small	Medium	Large
12:00 AM	0.2%	0	13	1
1:00 AM	0.2%	0	15	1
2:00 AM	0.2%	0	14	1
3:00 AM	0.5%	0	36	1
4:00 AM	0.9%	0	58	7
5:00 AM	2.1%	0	141	8
6:00 AM	4.4%	5	286	20
7:00 AM	4.9%	3	329	18
8:00 AM	5.2%	5	336	32
9:00 AM	5.2%	6	345	21
10:00 AM	8.3%	5	558	29
11:00 AM	8.0%	4	548	18
12:00 PM	7.6%	3	528	14
1:00 PM	6.4%	0	438	20
2:00 PM	6.3%	3	422	23
3:00 PM	6.8%	2	462	23
4:00 PM	8.1%	1	557	18
5:00 PM	7.5%	2	519	14
6:00 PM	5.6%	1	393	7
7:00 PM	4.3%	0	304	5
8:00 PM	3.9%	3	269	6
9:00 PM	1.8%	0	122	5
10:00 PM	0.9%	0	60	3
11:00 PM	0.6%	0	43	1
TOTAL	7135	43	6796	296
Percentile %		0.6%	95.2%	4.1%

MERGED VEHICLE CLASS				
Time	Percentile	Small	Medium	Large
12:00 AM	0.2%	0	29	2
1:00 AM	0.2%	0	31	3
2:00 AM	0.2%	0	25	1
3:00 AM	0.4%	0	54	2
4:00 AM	0.9%	1	129	12
5:00 AM	2.8%	6	397	26
6:00 AM	5.7%	18	815	49
7:00 AM	6.6%	19	947	52
8:00 AM	6.3%	11	899	66
9:00 AM	5.0%	15	713	45
10:00 AM	6.9%	16	984	64
11:00 AM	7.4%	14	1079	51
12:00 PM	6.9%	7	1029	41
1:00 PM	6.1%	7	899	39
2:00 PM	6.1%	7	886	48
3:00 PM	7.4%	11	1089	56
4:00 PM	8.6%	13	1275	43
5:00 PM	8.0%	10	1196	42
6:00 PM	4.9%	7	729	22
7:00 PM	3.5%	4	523	17
8:00 PM	3.0%	6	451	16
9:00 PM	1.6%	1	245	9
10:00 PM	1.0%	1	141	9
11:00 PM	0.5%	0	74	4
TOTAL	15532	174	14639	719
Percentile %		1.1%	94.3%	4.6%

Small Vehicle less than 14ft
 Medium Vehicle between 14ft and 20ft
 Large Vehicle greater than 20ft



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Location: Silver St Just north of Shearn St
 Start Date: 1/19/2021

Direction: Northbound

1/19/2021	0 - 15	> 15 -	> 20 -	> 25 -	> 30 -	> 35 -	> 40 -	> 45 -	> 50 -	> 55 -	> 60 -	> 65 -	> 70	Total
Time	MPH	20 MPH	25 MPH	30 MPH	35 MPH	40 MPH	45 MPH	50 MPH	55 MPH	60 MPH	65 MPH	70 MPH	MPH	
0:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0:15	0	1	0	0	0	0	0	0	0	0	0	0	0	1
0:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
1:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15	0	1	0	0	0	0	0	0	0	0	0	0	0	1
1:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
2:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1
2:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
3:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1
3:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
4:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
4:15	0	2	0	0	0	0	0	0	0	0	0	0	0	2
4:30	0	1	0	0	0	0	0	0	0	0	0	0	0	1
4:45	1	1	0	0	0	0	0	0	0	0	0	0	0	2
5:00	1	5	0	0	0	0	0	0	0	0	0	0	0	6
5:00	1	3	0	0	0	0	0	0	0	0	0	0	0	4
5:15	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:30	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:45	1	0	0	0	0	0	0	0	0	0	0	0	0	1
6:00	4	3	0	0	0	0	0	0	0	0	0	0	0	7
6:00	6	3	0	0	0	0	0	0	0	0	0	0	0	9
6:15	4	2	0	0	0	0	0	0	0	0	0	0	0	6
6:30	4	1	0	0	0	0	0	0	0	0	0	0	0	5
6:45	3	8	0	0	0	0	0	0	0	0	0	0	0	11
7:00	17	14	0	0	0	0	0	0	0	0	0	0	0	31
7:00	5	7	0	0	0	0	0	0	0	0	0	0	0	12
7:15	5	3	0	0	0	0	0	0	0	0	0	0	0	8
7:30	4	1	0	0	0	0	0	0	0	0	0	0	0	5
7:45	4	3	0	0	0	0	0	0	0	0	0	0	0	7
8:00	18	14	0	0	0	0	0	0	0	0	0	0	0	32
8:00	5	1	2	0	0	0	0	0	0	0	0	0	0	8
8:15	7	1	0	0	0	0	0	0	0	0	0	0	0	8
8:30	7	1	1	0	0	0	0	0	0	0	0	0	0	9
8:45	4	5	1	0	0	0	0	0	0	0	0	0	0	10
9:00	23	8	4	0	0	0	0	0	0	0	0	0	0	35
9:00	4	3	0	0	0	0	0	0	0	0	0	0	0	7
9:15	5	2	1	0	0	0	0	0	0	0	0	0	0	8
9:30	5	1	0	0	0	0	0	0	0	0	0	0	0	6
9:45	4	4	0	0	0	0	0	0	0	0	0	0	0	8
10:00	18	10	1	0	0	0	0	0	0	0	0	0	0	29
10:00	3	2	0	0	0	0	0	0	0	0	0	0	0	5
10:15	5	1	0	0	0	0	0	0	0	0	0	0	0	6
10:30	2	5	0	0	0	0	0	0	0	0	0	0	0	7
10:45	9	2	0	0	0	0	0	0	0	0	0	0	0	11
11:00	19	10	0	0	0	0	0	0	0	0	0	0	0	29
11:00	5	2	0	0	0	0	0	0	0	0	0	0	0	7
11:15	11	5	0	0	0	0	0	0	0	0	0	0	0	16
11:30	6	2	0	0	0	0	0	0	0	0	0	0	0	8
11:45	11	4	1	0	0	0	0	0	0	0	0	0	0	16
12:00	33	13	1	0	0	0	0	0	0	0	0	0	0	47
12:00	8	1	1	0	0	0	0	0	0	0	0	0	0	10



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Location: Silver St Just north of Shearn St
 Start Date: 1/19/2021

12:15	10	5	0	0	0	0	0	0	0	0	0	0	0	15
12:30	3	0	0	0	0	0	0	0	0	0	0	0	0	3
12:45	14	4	0	0	0	0	0	0	0	0	0	0	0	18
<hr/>														
	35	10	1	0	0	0	0	0	0	0	0	0	0	46
13:00	10	6	0	0	0	0	0	0	0	0	0	0	0	16
13:15	2	3	1	0	0	0	0	0	0	0	0	0	0	6
13:30	7	5	0	0	0	0	0	0	0	0	0	0	0	12
13:45	3	5	1	0	0	0	0	0	0	0	0	0	0	9
<hr/>														
	22	19	2	0	0	0	0	0	0	0	0	0	0	43
14:00	3	7	0	0	0	0	0	0	0	0	0	0	0	10
14:15	2	4	0	0	0	0	0	0	0	0	0	0	0	6
14:30	4	8	0	0	0	0	0	0	0	0	0	0	0	12
14:45	6	4	0	0	0	0	0	0	0	0	0	0	0	10
<hr/>														
	15	23	0	0	0	0	0	0	0	0	0	0	0	38
15:00	2	5	1	0	0	0	0	0	0	0	0	0	0	8
15:15	3	4	0	0	0	0	0	0	0	0	0	0	0	7
15:30	1	4	1	0	0	0	0	0	0	0	0	0	0	6
15:45	1	0	2	0	0	0	0	0	0	0	0	0	0	3
<hr/>														
	7	13	4	0	0	0	0	0	0	0	0	0	0	24
16:00	4	5	0	0	0	0	0	0	0	0	0	0	0	9
16:15	1	8	0	0	0	0	0	0	0	0	0	0	0	9
16:30	6	7	0	0	0	0	0	0	0	0	0	0	0	13
16:45	4	1	0	0	0	0	0	0	0	0	0	0	0	5
<hr/>														
	15	21	0	0	0	0	0	0	0	0	0	0	0	36
17:00	8	1	0	0	0	0	0	0	0	0	0	0	0	9
17:15	8	1	0	0	0	0	0	0	0	0	0	0	0	9
17:30	7	1	0	0	0	0	0	0	0	0	0	0	0	8
17:45	8	4	0	0	0	0	0	0	0	0	0	0	0	12
<hr/>														
	31	7	0	0	0	0	0	0	0	0	0	0	0	38
18:00	6	1	0	0	0	0	0	0	0	0	0	0	0	7
18:15	12	4	0	0	0	0	0	0	0	0	0	0	0	16
18:30	7	6	0	0	0	0	0	0	0	0	0	0	0	13
18:45	8	3	0	0	0	0	0	0	0	0	0	0	0	11
<hr/>														
	33	14	0	0	0	0	0	0	0	0	0	0	0	47
19:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
19:15	2	2	0	0	0	0	0	0	0	0	0	0	0	4
19:30	2	7	0	0	0	0	0	0	0	0	0	0	0	9
19:45	1	3	1	0	0	0	0	0	0	0	0	0	0	5
<hr/>														
	5	14	1	0	0	0	0	0	0	0	0	0	0	20
20:00	2	3	0	0	0	0	0	0	0	0	0	0	0	5
20:15	3	3	1	0	0	0	0	0	0	0	0	0	0	7
20:30	1	4	0	0	0	0	0	0	0	0	0	0	0	5
20:45	0	5	0	0	0	0	0	0	0	0	0	0	0	5
<hr/>														
	6	15	1	0	0	0	0	0	0	0	0	0	0	22
21:00	1	1	0	0	0	0	0	0	0	0	0	0	0	2
21:15	0	1	0	0	0	0	0	0	0	0	0	0	0	1
21:30	0	4	0	0	0	0	0	0	0	0	0	0	0	4
21:45	0	1	0	0	0	0	0	0	0	0	0	0	0	1
<hr/>														
	1	7	0	0	0	0	0	0	0	0	0	0	0	8
22:00	1	1	0	0	0	0	0	0	0	0	0	0	0	2
22:15	1	4	0	0	0	0	0	0	0	0	0	0	0	5
22:30	0	3	0	0	0	0	0	0	0	0	0	0	0	3
22:45	2	1	0	0	0	0	0	0	0	0	0	0	0	3
<hr/>														
	4	9	0	0	0	0	0	0	0	0	0	0	0	13
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23:15	0	1	0	0	0	0	0	0	0	0	0	0	0	1
23:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<hr/>														
Total	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Total	307	233	16	0	0	0	0	0	0	0	0	0	0	556

Percentile	15th	50th	85th	95th
Speed	10.4	14.4	17.6	19.3
Mean Speed (Average)	12.1			
10 MPH Pace Speed	10-19			



Location: Silver St Just north of Shearn St
Start Date: 1/19/2021

Number in Pace	332
Percent in Pace	59.7%
Number > 30 MPH	0
Percent > 30 MPH	0.0%



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Location: Silver St Just north of Shearn St
 Start Date: 1/19/2021

Direction: Southbound

1/19/2021	0 - 15	> 15 -	> 20 -	> 25 -	> 30 -	> 35 -	> 40 -	> 45 -	> 50 -	> 55 -	> 60 -	> 65 -	> 70	Total
Time	MPH	20 MPH	25 MPH	30 MPH	35 MPH	40 MPH	45 MPH	50 MPH	55 MPH	60 MPH	65 MPH	70 MPH	MPH	
0:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15	0	0	1	0	0	0	0	0	0	0	0	0	0	1
1:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45	1	0	0	0	0	0	0	0	0	0	0	0	0	1
2:00	1	0	1	0	0	0	0	0	0	0	0	0	0	2
2:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45	0	0	1	0	0	0	0	0	0	0	0	0	0	1
4:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1
4:15	0	0	1	0	0	0	0	0	0	0	0	0	0	1
4:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45	2	0	0	0	0	0	0	0	0	0	0	0	0	2
5:00	2	0	1	0	0	0	0	0	0	0	0	0	0	3
5:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30	3	1	0	0	0	0	0	0	0	0	0	0	0	4
5:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00	1	0	0	0	0	0	0	0	0	0	0	0	0	1
6:15	3	2	0	0	0	0	0	0	0	0	0	0	0	5
6:30	1	0	0	0	0	0	0	0	0	0	0	0	0	1
6:45	2	1	0	1	0	0	0	0	0	0	0	0	0	4
7:00	1	1	0	0	0	0	0	0	0	0	0	0	0	2
7:15	7	4	0	1	0	0	0	0	0	0	0	0	0	12
7:30	0	4	0	0	0	0	0	0	0	0	0	0	0	4
7:45	2	2	0	0	0	0	0	0	0	0	0	0	0	4
8:00	3	1	0	0	0	0	0	0	0	0	0	0	0	4
8:15	3	2	0	0	0	0	0	0	0	0	0	0	0	5
8:30	8	9	0	0	0	0	0	0	0	0	0	0	0	17
8:45	3	0	0	0	0	0	0	0	0	0	0	0	0	3
9:00	1	2	0	0	0	0	0	0	0	0	0	0	0	3
9:15	1	0	0	0	0	0	0	0	0	0	0	0	0	1
9:30	0	2	1	0	0	0	0	0	0	0	0	0	0	3
9:45	0	2	1	0	0	0	0	0	0	0	0	0	0	3
10:00	5	4	1	0	0	0	0	0	0	0	0	0	0	10
10:15	6	0	0	0	0	0	0	0	0	0	0	0	0	6
10:30	2	0	2	0	0	0	0	0	0	0	0	0	0	4
10:45	2	2	0	0	0	0	0	0	0	0	0	0	0	4
11:00	2	4	0	0	0	0	0	0	0	0	0	0	0	6
11:15	12	6	2	0	0	0	0	0	0	0	0	0	0	20
11:30	4	1	0	0	0	0	0	0	0	0	0	0	0	5
11:45	1	0	0	0	0	0	0	0	0	0	0	0	0	1
12:00	3	0	0	0	0	0	0	0	0	0	0	0	0	3
12:00	9	1	0	0	0	0	0	0	0	0	0	0	0	10
12:00	3	1	0	1	0	0	0	0	0	0	0	0	0	5
12:00	1	6	0	0	0	0	0	0	0	0	0	0	0	7
12:00	4	2	0	0	0	0	0	0	0	0	0	0	0	6
12:00	5	2	0	0	0	0	0	0	0	0	0	0	0	7
12:00	13	11	0	1	0	0	0	0	0	0	0	0	0	25
12:00	3	1	0	0	0	0	0	0	0	0	0	0	0	4

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Location: Silver St Just north of Shearn St
Start Date: 1/19/2021

12:15	4	1	0	0	0	0	0	0	0	0	0	0	0	5
12:30	3	3	0	0	0	0	0	0	0	0	0	0	0	6
12:45	3	0	1	0	0	0	0	0	0	0	0	0	0	4
	13	5	1	0	0	0	0	0	0	0	0	0	0	19
13:00	9	5	0	0	0	0	0	0	0	0	0	0	0	14
13:15	3	4	1	0	0	0	0	0	0	0	0	0	0	8
13:30	0	4	3	0	0	0	0	0	0	0	0	0	0	7
13:45	1	4	2	0	0	0	0	0	0	0	0	0	0	7
	13	17	6	0	0	0	0	0	0	0	0	0	0	36
14:00	1	2	0	0	0	0	0	0	0	0	0	0	0	3
14:15	3	1	1	0	0	0	0	0	0	0	0	0	0	5
14:30	2	3	0	0	0	0	0	0	0	0	0	0	0	5
14:45	2	1	0	0	0	0	0	0	0	0	0	0	0	3
	8	7	1	0	0	0	0	0	0	0	0	0	0	16
15:00	1	3	1	0	0	0	0	0	0	0	0	0	0	5
15:15	3	2	1	0	0	0	0	0	0	0	0	0	0	6
15:30	1	4	1	0	0	0	0	0	0	0	0	0	0	6
15:45	2	5	0	0	0	0	0	0	0	0	0	0	0	7
	7	14	3	0	0	0	0	0	0	0	0	0	0	24
16:00	0	4	1	0	0	0	0	0	0	0	0	0	0	5
16:15	6	2	1	0	0	0	0	0	0	0	0	0	0	9
16:30	2	3	1	0	0	0	0	0	0	0	0	0	0	6
16:45	3	1	0	0	0	0	0	0	0	0	0	0	0	4
	11	10	3	0	0	0	0	0	0	0	0	0	0	24
17:00	4	4	0	0	0	0	0	0	0	0	0	0	0	8
17:15	6	1	0	0	0	0	0	0	0	0	0	0	0	7
17:30	3	2	0	0	0	0	0	0	0	0	0	0	0	5
17:45	6	0	0	0	0	0	0	0	0	0	0	0	0	6
	19	7	0	0	0	0	0	0	0	0	0	0	0	26
18:00	3	3	0	0	0	0	0	0	0	0	0	0	0	6
18:15	0	0	0	1	0	0	0	0	0	0	0	0	0	1
18:30	5	1	0	0	0	0	0	0	0	0	0	0	0	6
18:45	2	3	0	0	0	0	0	0	0	0	0	0	0	5
	10	7	0	1	0	0	0	0	0	0	0	0	0	18
19:00	1	3	0	0	0	0	0	0	0	0	0	0	0	4
19:15	0	4	2	0	0	0	0	0	0	0	0	0	0	6
19:30	5	2	0	0	0	0	0	0	0	0	0	0	0	7
19:45	3	2	0	0	0	0	0	0	0	0	0	0	0	5
	9	11	2	0	0	0	0	0	0	0	0	0	0	22
20:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1
20:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20:30	0	2	0	0	0	0	0	0	0	0	0	0	0	2
20:45	1	2	0	0	0	0	0	0	0	0	0	0	0	3
	1	4	1	0	0	0	0	0	0	0	0	0	0	6
21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21:15	1	2	0	0	0	0	0	0	0	0	0	0	0	3
21:30	0	1	0	0	0	0	0	0	0	0	0	0	0	1
21:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1	3	0	0	0	0	0	0	0	0	0	0	0	4
22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	153	121	23	3	0	0	0	0	0	0	0	0	0	300

Percentile 15th 50th 85th 95th
Speed 9.9 14.8 18.4 20.9
Mean Speed (Average) 12.9
10 MPH Pace Speed 10-19



Location: Silver St Just north of Shearn St
Start Date: 1/19/2021

Number in Pace	170
Percent in Pace	56.7%
Number > 30 MPH	0
Percent > 30 MPH	0.0%



TRAFFIC DATA REPORT
SPEED STUDY

Location: Silver Street Just south of
State St
Start Date: 1/19/2021

Direction: Southbound

1/19/2021	0 - 15	> 15 -	> 20 -	> 25 -	> 30 -	> 35 -	> 40 -	> 45 -	> 50 -	> 55 -	> 60 -	> 65 -	> 70	Total
Time	MPH	20 MPH	25 MPH	30 MPH	35 MPH	40 MPH	45 MPH	50 MPH	55 MPH	60 MPH	65 MPH	70 MPH	MPH	
0:00	1	0	0	0	0	0	0	0	0	0	0	0	0	1
0:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00	1	0	0	0	0	0	0	0	0	0	0	0	0	1
1:15	0	0	0	1	0	0	0	0	0	0	0	0	0	1
1:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45	0	0	0	1	0	0	0	0	0	0	0	0	0	1
2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1
3:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30	0	0	0	1	0	0	0	0	0	0	0	0	0	1
4:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00	0	0	0	1	0	0	0	0	0	0	0	0	0	1
5:15	0	0	0	1	0	0	0	0	0	0	0	0	0	1
5:30	0	0	1	0	0	0	0	0	0	0	0	0	0	1
5:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00	0	0	1	1	0	0	0	0	0	0	0	0	0	2
6:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30	0	0	1	0	2	0	0	0	0	0	0	0	0	3
6:45	2	0	2	0	0	0	0	0	0	0	0	0	0	4
7:00	2	1	3	2	0	0	0	0	0	0	0	0	0	8
7:15	1	1	1	2	0	0	0	0	0	0	0	0	0	5
7:30	0	2	7	5	0	0	0	0	0	0	0	0	0	14
7:45	2	0	5	0	0	0	0	0	0	0	0	0	0	7
8:00	1	1	7	0	0	0	0	0	0	0	0	0	0	9
8:15	4	4	20	7	0	0	0	0	0	0	0	0	0	35
8:30	0	4	2	2	1	0	0	0	0	0	0	0	0	9
8:45	0	2	3	3	0	1	0	0	0	0	0	0	0	9
9:00	0	1	2	3	0	0	0	0	0	0	0	0	0	6
9:15	2	2	1	2	1	0	0	0	0	0	0	0	0	8
9:30	2	9	8	10	2	1	0	0	0	0	0	0	0	32
9:45	2	3	2	5	0	0	0	0	0	0	0	0	0	12
10:00	1	0	0	2	0	0	0	0	0	0	0	0	0	3
10:15	3	1	2	1	0	0	0	0	0	0	0	0	0	7
10:30	0	1	4	2	0	0	0	0	0	0	0	0	0	7
10:45	6	5	8	10	0	0	0	0	0	0	0	0	0	29
11:00	0	1	3	1	1	0	0	0	0	0	0	0	0	6
11:15	1	4	1	4	0	0	0	0	0	0	0	0	0	10
11:30	1	2	0	5	1	0	0	0	0	0	0	0	0	9
11:45	0	2	2	0	0	0	0	0	0	0	0	0	0	4
12:00	2	9	6	10	2	0	0	0	0	0	0	0	0	29
	1	1	1	2	2	0	0	0	0	0	0	0	0	7
	1	1	1	1	0	0	0	0	0	0	0	0	0	4
	0	0	2	5	1	0	0	0	0	0	0	0	0	8
	1	1	1	4	1	1	0	0	0	0	0	0	0	9
	3	3	5	12	4	1	0	0	0	0	0	0	0	28
	3	0	3	3	0	0	0	0	0	0	0	0	0	9



TRAFFIC DATA REPORT
SPEED STUDY

Location: Silver Street Just south of
State St
Start Date: 1/19/2021

12:15	1	1	0	2	1	2	0	0	0	0	0	0	0	7
12:30	0	1	1	4	0	1	0	0	0	0	0	0	0	7
12:45	0	0	2	3	0	0	0	0	0	0	0	0	0	5
13:00	4	2	6	12	1	3	0	0	0	0	0	0	0	28
13:15	0	1	4	1	1	0	0	0	0	0	0	0	0	7
13:30	1	1	3	3	0	0	0	0	0	0	0	0	0	8
13:45	1	2	1	7	1	0	0	0	0	0	0	0	0	12
14:00	0	2	2	4	3	0	0	0	0	0	0	0	0	11
14:15	2	6	10	15	5	0	0	0	0	0	0	0	0	38
14:30	1	5	0	5	1	0	0	0	0	0	0	0	0	12
14:45	1	0	3	5	1	0	0	0	0	0	0	0	0	10
15:00	2	2	3	5	0	0	0	0	0	0	0	0	0	12
15:15	0	1	3	0	3	0	0	0	0	0	0	0	0	7
15:30	4	8	9	15	5	0	0	0	0	0	0	0	0	41
15:45	1	3	3	2	0	0	0	0	0	0	0	0	0	9
16:00	0	0	2	3	1	0	1	0	0	0	0	0	0	7
16:15	0	1	2	4	2	1	0	0	0	0	0	0	0	10
16:30	0	2	3	5	1	1	0	0	0	0	0	0	0	12
16:45	1	6	10	14	4	2	1	0	0	0	0	0	0	38
17:00	2	2	3	5	0	0	0	0	0	0	0	0	0	12
17:15	0	1	7	5	2	1	0	0	0	0	0	0	0	16
17:30	1	3	4	4	3	0	0	0	0	0	0	0	0	15
17:45	1	1	5	4	1	0	0	0	0	0	0	0	0	12
18:00	4	7	19	18	6	1	0	0	0	0	0	0	0	55
18:15	0	2	4	6	0	1	0	0	0	0	0	0	0	13
18:30	0	3	9	4	2	0	0	0	0	0	0	0	0	18
18:45	2	2	6	6	1	0	0	0	0	0	0	0	0	17
19:00	2	1	1	5	1	0	0	0	0	0	0	0	0	10
19:15	4	8	20	21	4	1	0	0	0	0	0	0	0	58
19:30	0	4	5	5	1	0	0	0	0	0	0	0	0	15
19:45	0	1	4	4	1	0	0	0	0	0	0	0	0	10
20:00	0	1	6	6	1	0	0	0	0	0	0	0	0	14
20:15	0	1	0	4	1	0	0	0	0	0	0	0	0	6
20:30	0	7	15	19	4	0	0	0	0	0	0	0	0	45
20:45	0	1	2	0	0	0	0	0	0	0	0	0	0	3
21:00	0	1	0	0	2	0	0	0	0	0	0	0	0	3
21:15	1	0	1	0	1	0	0	0	0	0	0	0	0	3
21:30	0	0	0	2	0	0	0	0	0	0	0	0	0	2
21:45	0	0	0	2	0	0	0	0	0	0	0	0	0	11
22:00	1	2	3	2	3	0	0	0	0	0	0	0	0	6
22:15	0	2	1	3	0	0	0	0	0	0	0	0	0	6
22:30	0	0	3	5	0	1	0	0	0	0	0	0	0	9
22:45	0	1	2	1	1	0	0	0	0	0	0	0	0	5
23:00	0	0	2	2	1	0	0	0	0	0	0	0	0	5
23:15	0	3	8	11	2	1	0	0	0	0	0	0	0	25
23:30	1	0	3	2	0	0	0	0	0	0	0	0	0	6
23:45	0	1	2	1	0	0	0	0	0	0	0	0	0	4
24:00	1	0	1	1	1	1	0	0	0	0	0	0	0	5
24:15	2	0	1	0	0	0	0	0	0	0	0	0	0	3
24:30	4	1	7	4	1	1	0	0	0	0	0	0	0	18
24:45	0	0	0	0	1	0	0	0	0	0	0	0	0	1
25:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1
25:15	0	2	1	0	0	0	0	0	0	0	0	0	0	3
25:30	0	0	0	1	1	0	0	0	0	0	0	0	0	2
25:45	0	2	2	1	2	0	0	0	0	0	0	0	0	7
26:00	1	0	2	1	0	0	0	0	0	0	0	0	0	4
26:15	0	0	0	1	0	0	0	0	0	0	0	0	0	1
26:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26:45	0	1	0	0	0	0	0	0	0	0	0	0	0	1
27:00	1	1	2	2	0	0	0	0	0	0	0	0	0	6
Total	45	84	162	189	46	11	1	0	0	0	0	0	0	538

Percentile 15th 50th 85th 95th
Speed 17.3 24.4 29 32.2
Mean Speed (Average) 23.5
10 MPH Pace Speed 20-29



TRAFFIC DATA REPORT
SPEED STUDY

Location: Silver Street Just south of
State St
Start Date: 1/19/2021

Number in Pace	349
Percent in Pace	64.9%
Number > 30 MPH	58
Percent > 30 MPH	10.8%



TRAFFIC DATA REPORT
SPEED STUDY

Location: Silver Street Just south of
State St
Start Date: 1/19/2021

Direction: Northbound

1/19/2021	0 - 15	> 15 -	> 20 -	> 25 -	> 30 -	> 35 -	> 40 -	> 45 -	> 50 -	> 55 -	> 60 -	> 65 -	> 70	Total
Time	MPH	20 MPH	25 MPH	30 MPH	35 MPH	40 MPH	45 MPH	50 MPH	55 MPH	60 MPH	65 MPH	70 MPH	MPH	
0:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1
0:15	0	0	1	0	0	0	0	0	0	0	0	0	0	1
0:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00	0	0	1	0	1	0	0	0	0	0	0	0	0	2
1:15	0	1	0	0	0	0	0	0	0	0	0	0	0	1
1:30	0	0	2	0	0	0	0	0	0	0	0	0	0	2
1:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15	0	1	2	0	0	0	0	0	0	0	0	0	0	3
2:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15	0	0	1	1	0	0	0	0	0	0	0	0	0	2
6:30	0	1	2	0	0	0	0	0	0	0	0	0	0	3
6:45	1	1	1	0	1	0	0	0	0	0	0	0	0	4
7:00	1	2	4	1	1	0	0	0	0	0	0	0	0	9
7:15	1	0	0	0	0	0	0	0	0	0	0	0	0	1
7:30	0	1	6	2	0	0	0	0	0	0	0	0	0	9
7:45	1	1	1	0	0	0	0	0	0	0	0	0	0	3
8:00	0	0	2	3	0	0	0	0	0	0	0	0	0	5
8:15	2	2	9	5	0	0	0	0	0	0	0	0	0	18
8:30	2	0	3	2	0	0	0	0	0	0	0	0	0	7
8:45	3	2	1	0	0	0	0	0	0	0	0	0	0	6
9:00	0	2	2	1	0	0	0	0	0	0	0	0	0	5
9:15	2	0	5	0	0	0	0	0	0	0	0	0	0	7
9:30	7	4	11	3	0	0	0	0	0	0	0	0	0	25
9:45	0	4	7	1	0	1	0	0	0	0	0	0	0	13
10:00	2	0	1	0	0	0	0	0	0	0	0	0	0	3
10:15	2	3	3	0	0	0	0	0	0	0	0	0	0	8
10:30	0	4	2	0	0	0	0	0	0	0	0	0	0	6
10:45	4	11	13	1	0	1	0	0	0	0	0	0	0	30
11:00	2	0	5	1	0	0	0	0	0	0	0	0	0	8
11:15	0	3	3	0	0	0	0	0	0	0	0	0	0	6
11:30	0	0	3	1	0	0	0	0	0	0	0	0	0	4
11:45	1	0	1	0	0	0	0	0	0	0	0	0	0	2
12:00	3	3	12	2	0	0	0	0	0	0	0	0	0	20
	2	3	5	1	0	0	0	0	0	0	0	0	0	11
	1	3	3	0	0	0	0	0	0	0	0	0	0	7
	1	1	1	0	0	0	0	0	0	0	0	0	0	3
	0	2	5	5	0	0	0	0	0	0	0	0	0	12
	4	9	14	6	0	0	0	0	0	0	0	0	0	33
	4	3	4	3	1	0	0	0	0	0	0	0	0	15



TRAFFIC DATA REPORT
SPEED STUDY

Location: Silver Street Just south of
State St
Start Date: 1/19/2021

12:15	0	3	2	1	1	0	0	0	0	0	0	0	0	7
12:30	1	2	4	3	0	1	0	0	0	0	0	0	0	11
12:45	0	1	3	2	0	0	0	0	0	0	0	0	0	6
13:00	5	9	13	9	2	1	0	0	0	0	0	0	0	39
13:15	1	1	3	2	0	0	0	0	0	0	0	0	0	7
13:30	0	3	5	1	0	0	0	0	0	0	0	0	0	9
13:45	3	1	3	2	0	0	0	0	0	0	0	0	0	9
14:00	3	2	3	2	0	0	0	0	0	0	0	0	0	10
14:15	7	7	14	7	0	0	0	0	0	0	0	0	0	35
14:30	1	1	2	1	0	0	0	0	0	0	0	0	0	5
14:45	1	2	4	3	0	0	0	0	0	0	0	0	0	10
15:00	4	0	7	0	0	0	0	0	0	0	0	0	0	11
15:15	3	1	2	1	0	0	0	0	0	0	0	0	0	7
15:30	9	4	15	5	0	0	0	0	0	0	0	0	0	33
15:45	0	0	3	3	0	0	0	0	0	0	0	0	0	6
16:00	0	2	6	1	1	0	0	0	0	0	0	0	0	10
16:15	2	4	2	0	0	0	0	0	0	0	0	0	0	8
16:30	1	2	4	1	0	0	0	0	0	0	0	0	0	8
16:45	3	8	15	5	1	0	0	0	0	0	0	0	0	32
17:00	3	2	3	4	0	0	0	0	0	0	0	0	0	12
17:15	0	2	5	0	0	0	0	0	0	0	0	0	0	7
17:30	3	6	5	2	0	0	0	0	0	0	0	0	0	16
17:45	1	5	3	3	0	0	0	0	0	0	0	0	0	12
18:00	7	15	16	9	0	0	0	0	0	0	0	0	0	47
18:15	2	5	5	1	0	0	0	0	0	0	0	0	0	13
18:30	0	5	8	5	0	0	0	0	0	0	0	0	0	18
18:45	4	5	2	2	0	0	0	0	0	0	0	0	0	13
19:00	2	7	2	1	0	0	0	0	0	0	0	0	0	12
19:15	8	22	17	9	0	0	0	0	0	0	0	0	0	56
19:30	1	3	6	1	0	0	0	0	0	0	0	0	0	11
19:45	5	7	4	1	1	0	0	0	0	0	0	0	0	18
20:00	2	1	3	0	0	0	0	0	0	0	0	0	0	6
20:15	0	5	4	0	0	0	0	0	0	0	0	0	0	9
20:30	8	16	17	2	1	0	0	0	0	0	0	0	0	44
20:45	2	3	5	1	0	0	0	0	0	0	0	0	0	11
21:00	1	1	5	3	0	0	0	0	0	0	0	0	0	10
21:15	0	2	2	2	0	0	0	0	0	0	0	0	0	6
21:30	0	1	6	0	0	0	0	0	0	0	0	0	0	7
21:45	3	7	18	6	0	0	0	0	0	0	0	0	0	34
22:00	1	3	2	2	0	0	0	0	0	0	0	0	0	8
22:15	1	0	3	0	0	0	0	0	0	0	0	0	0	4
22:30	1	0	0	1	0	0	0	0	0	0	0	0	0	2
22:45	2	0	1	0	0	0	0	0	0	0	0	0	0	3
23:00	5	3	6	3	0	0	0	0	0	0	0	0	0	17
23:15	3	1	2	1	0	0	0	0	0	0	0	0	0	7
23:30	1	3	0	0	0	0	0	0	0	0	0	0	0	4
23:45	1	2	0	1	0	0	0	0	0	0	0	0	0	4
24:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24:15	5	6	2	2	0	0	0	0	0	0	0	0	0	15
24:30	1	1	0	1	0	0	0	0	0	0	0	0	0	3
24:45	0	1	1	0	0	0	0	0	0	0	0	0	0	2
25:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Total	82	132	200	76	6	2	0	0	0	0	0	0	0	498

Percentile	15th	50th	85th	95th
Speed	14.4	20.8	25.3	27.7
Mean Speed (Average)	19.7			
10 MPH Pace Speed	15-24			



TRAFFIC DATA REPORT
SPEED STUDY

Location: Silver Street Just south of
State St
Start Date: 1/19/2021

Number in Pace	329
Percent in Pace	66.1%
Number > 30 MPH	8
Percent > 30 MPH	1.6%



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Location: Silver St Just north of
 Summer St
 Start Date: 1/19/2021

Direction: Northbound

1/19/2021	0 - 15	> 15 -	> 20 -	> 25 -	> 30 -	> 35 -	> 40 -	> 45 -	> 50 -	> 55 -	> 60 -	> 65 -	> 70	Total
Time	MPH	20 MPH	25 MPH	30 MPH	35 MPH	40 MPH	45 MPH	50 MPH	55 MPH	60 MPH	65 MPH	70 MPH	MPH	
0:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0:15	1	0	0	0	0	0	0	0	0	0	0	0	0	1
0:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00	1	0	0	0	0	0	0	0	0	0	0	0	0	1
1:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30	1	0	0	0	0	0	0	0	0	0	0	0	0	1
1:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15	1	0	0	0	0	0	0	0	0	0	0	0	0	1
2:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00	1	0	0	0	0	0	0	0	0	0	0	0	0	1
3:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15	0	1	0	0	0	0	0	0	0	0	0	0	0	1
4:30	1	0	0	0	0	0	0	0	0	0	0	0	0	1
4:45	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:00	1	1	0	0	0	0	0	0	0	0	0	0	0	2
5:15	3	2	0	0	0	0	0	0	0	0	0	0	0	5
5:30	2	2	0	0	0	0	0	0	0	0	0	0	0	4
5:45	1	1	0	0	0	0	0	0	0	0	0	0	0	2
6:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15	1	0	0	0	0	0	0	0	0	0	0	0	0	1
6:30	4	3	0	0	0	0	0	0	0	0	0	0	0	7
6:45	5	0	0	0	0	0	0	0	0	0	0	0	0	5
7:00	3	1	0	0	0	0	0	0	0	0	0	0	0	4
7:15	3	1	0	0	0	0	0	0	0	0	0	0	0	4
7:30	8	2	0	0	0	0	0	0	0	0	0	0	0	10
7:45	19	4	0	0	0	0	0	0	0	0	0	0	0	23
8:00	13	0	0	0	0	0	0	0	0	0	0	0	0	13
8:15	9	0	0	0	0	0	0	0	0	0	0	0	0	9
8:30	4	1	0	0	0	0	0	0	0	0	0	0	0	5
8:45	10	1	0	0	0	0	0	0	0	0	0	0	0	11
9:00	36	2	0	0	0	0	0	0	0	0	0	0	0	38
9:15	12	3	0	0	0	0	0	0	0	0	0	0	0	15
9:30	10	1	0	0	0	0	0	0	0	0	0	0	0	11
9:45	7	0	0	0	0	0	0	0	0	0	0	0	0	7
10:00	6	3	0	0	0	0	0	0	0	0	0	0	0	9
10:15	35	7	0	0	0	0	0	0	0	0	0	0	0	42
10:30	7	1	0	0	0	0	0	0	0	0	0	0	0	8
10:45	5	2	0	0	0	0	0	0	0	0	0	0	0	7
11:00	6	2	0	0	0	0	0	0	0	0	0	0	0	8
11:15	9	2	0	0	0	0	0	0	0	0	0	0	0	11
11:30	27	7	0	0	0	0	0	0	0	0	0	0	0	34
11:45	5	0	0	0	0	0	0	0	0	0	0	0	0	5
12:00	9	2	0	0	0	0	0	0	0	0	0	0	0	11
12:15	10	2	0	0	0	0	0	0	0	0	0	0	0	12
12:30	2	1	0	0	0	0	0	0	0	0	0	0	0	3
12:45	26	5	0	0	0	0	0	0	0	0	0	0	0	31
13:00	8	1	0	0	0	0	0	0	0	0	0	0	0	9
13:15	18	2	0	0	0	0	0	0	0	0	0	0	0	20
13:30	8	2	0	0	0	0	0	0	0	0	0	0	0	10
13:45	15	4	0	0	0	0	0	0	0	0	0	0	0	19
14:00	49	9	0	0	0	0	0	0	0	0	0	0	0	58
14:15	15	3	0	0	0	0	0	0	0	0	0	0	0	18



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Location: Silver St Just north of
 Summer St
 Start Date: 1/19/2021

12:15	11	6	0	0	0	0	0	0	0	0	0	0	0	17
12:30	1	6	0	0	0	0	0	0	0	0	0	0	0	7
12:45	10	6	0	0	0	0	0	0	0	0	0	0	0	16
<hr/>														
	37	21	0	0	0	0	0	0	0	0	0	0	0	58
13:00	9	5	0	0	0	0	0	0	0	0	0	0	0	14
13:15	3	1	1	0	0	0	0	0	0	0	0	0	0	5
13:30	10	7	0	0	0	0	0	0	0	0	0	0	0	17
13:45	4	4	0	0	0	0	0	0	0	0	0	0	0	8
<hr/>														
	26	17	1	0	0	0	0	0	0	0	0	0	0	44
14:00	6	2	0	0	0	0	0	0	0	0	0	0	0	8
14:15	2	1	0	0	0	0	0	0	0	0	0	0	0	3
14:30	8	7	0	0	0	0	0	0	0	0	0	0	0	15
14:45	9	6	0	0	0	0	0	0	0	0	0	0	0	15
<hr/>														
	25	16	0	0	0	0	0	0	0	0	0	0	0	41
15:00	9	3	0	0	0	0	0	0	0	0	0	0	0	12
15:15	9	4	0	0	0	0	0	0	0	0	0	0	0	13
15:30	9	2	0	0	0	0	0	0	0	0	0	0	0	11
15:45	6	2	0	0	0	0	0	0	0	0	0	0	0	8
<hr/>														
	33	11	0	0	0	0	0	0	0	0	0	0	0	44
16:00	11	1	0	0	0	0	0	0	0	0	0	0	0	12
16:15	8	5	0	0	0	0	0	0	0	0	0	0	0	13
16:30	12	3	0	0	0	0	0	0	0	0	0	0	0	15
16:45	6	5	0	0	0	0	0	0	0	0	0	0	0	11
<hr/>														
	37	14	0	0	0	0	0	0	0	0	0	0	0	51
17:00	18	6	0	0	0	0	0	0	0	0	0	0	0	24
17:15	11	4	0	0	0	0	0	0	0	0	0	0	0	15
17:30	16	2	0	0	0	0	0	0	0	0	0	0	0	18
17:45	11	4	0	0	0	0	0	0	0	0	0	0	0	15
<hr/>														
	56	16	0	0	0	0	0	0	0	0	0	0	0	72
18:00	14	3	0	0	0	0	0	0	0	0	0	0	0	17
18:15	18	4	0	0	0	0	0	0	0	0	0	0	0	22
18:30	12	3	0	0	0	0	0	0	0	0	0	0	0	15
18:45	9	2	0	0	0	0	0	0	0	0	0	0	0	11
<hr/>														
	53	12	0	0	0	0	0	0	0	0	0	0	0	65
19:00	8	2	0	0	0	0	0	0	0	0	0	0	0	10
19:15	3	1	0	0	0	0	0	0	0	0	0	0	0	4
19:30	6	4	0	0	0	0	0	0	0	0	0	0	0	10
19:45	11	1	0	0	0	0	0	0	0	0	0	0	0	12
<hr/>														
	28	8	0	0	0	0	0	0	0	0	0	0	0	36
20:00	5	4	0	0	0	0	0	0	0	0	0	0	0	9
20:15	5	3	0	0	0	0	0	0	0	0	0	0	0	8
20:30	9	2	0	0	0	0	0	0	0	0	0	0	0	11
20:45	6	1	0	0	0	0	0	0	0	0	0	0	0	7
<hr/>														
	25	10	0	0	0	0	0	0	0	0	0	0	0	35
21:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
21:15	1	1	0	0	0	0	0	0	0	0	0	0	0	2
21:30	7	0	0	0	0	0	0	0	0	0	0	0	0	7
21:45	1	2	0	0	0	0	0	0	0	0	0	0	0	3
<hr/>														
	9	5	0	0	0	0	0	0	0	0	0	0	0	14
22:00	3	1	0	0	0	0	0	0	0	0	0	0	0	4
22:15	5	0	0	0	0	0	0	0	0	0	0	0	0	5
22:30	2	2	0	0	0	0	0	0	0	0	0	0	0	4
22:45	3	0	0	0	0	0	0	0	0	0	0	0	0	3
<hr/>														
	13	3	0	0	0	0	0	0	0	0	0	0	0	16
23:00	1	1	0	0	0	0	0	0	0	0	0	0	0	2
23:15	0	2	0	0	0	0	0	0	0	0	0	0	0	2
23:30	2	0	0	0	0	0	0	0	0	0	0	0	0	2
23:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<hr/>														
Total	3	3	0	0	0	0	0	0	0	0	0	0	0	6
<hr/>														
Total	547	175	1	0	0	0	0	0	0	0	0	0	0	723

Percentile	15th	50th	85th	95th
Speed	10.3	13.4	15.5	16.9
Mean Speed (Average)	10.0			
10 MPH Pace Speed	1-10			



Location: Silver St Just north of
Summer St
Start Date: 1/19/2021

Number in Pace	362
Percent in Pace	50.1%
Number > 30 MPH	0
Percent > 30 MPH	0.0%



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Location: Silver St Just north of
 Summer St
 Start Date: 1/19/2021

Direction: Southbound

1/19/2021	0 - 15	> 15 -	> 20 -	> 25 -	> 30 -	> 35 -	> 40 -	> 45 -	> 50 -	> 55 -	> 60 -	> 65 -	> 70	Total
Time	MPH	20 MPH	25 MPH	30 MPH	35 MPH	40 MPH	45 MPH	50 MPH	55 MPH	60 MPH	65 MPH	70 MPH	MPH	
0:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15	0	1	0	0	0	0	0	0	0	0	0	0	0	1
1:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45	1	1	0	0	0	0	0	0	0	0	0	0	0	2
2:00	1	2	0	0	0	0	0	0	0	0	0	0	0	3
2:15	1	0	1	0	0	0	0	0	0	0	0	0	0	2
2:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00	1	0	1	0	0	0	0	0	0	0	0	0	0	2
3:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15	0	1	0	0	0	0	0	0	0	0	0	0	0	1
4:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45	0	0	1	0	0	0	0	0	0	0	0	0	0	1
5:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2
5:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30	0	2	0	0	0	0	0	0	0	0	0	0	0	2
5:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:55	3	2	0	0	0	0	0	0	0	0	0	0	0	5
6:00	3	4	0	0	0	0	0	0	0	0	0	0	0	7
6:15	2	2	0	0	0	0	0	0	0	0	0	0	0	4
6:30	5	3	0	0	0	0	0	0	0	0	0	0	0	8
6:45	1	3	0	0	0	0	0	0	0	0	0	0	0	4
6:55	4	4	1	0	0	0	0	0	0	0	0	0	0	9
7:00	12	12	1	0	0	0	0	0	0	0	0	0	0	25
7:15	4	7	0	0	0	0	0	0	0	0	0	0	0	11
7:30	2	12	0	0	0	0	0	0	0	0	0	0	0	14
7:45	5	4	1	0	0	0	0	0	0	0	0	0	0	10
7:55	1	6	0	0	0	0	0	0	0	0	0	0	0	7
8:00	12	29	1	0	0	0	0	0	0	0	0	0	0	42
8:15	1	6	0	0	0	0	0	0	0	0	0	0	0	7
8:30	1	4	1	0	0	0	0	0	0	0	0	0	0	6
8:45	1	7	1	0	0	0	0	0	0	0	0	0	0	9
8:55	7	7	2	0	0	0	0	0	0	0	0	0	0	16
9:00	10	24	4	0	0	0	0	0	0	0	0	0	0	38
9:15	3	4	0	0	0	0	0	0	0	0	0	0	0	7
9:30	1	1	2	0	0	0	0	0	0	0	0	0	0	4
9:45	6	3	0	0	0	0	0	0	0	0	0	0	0	9
9:55	1	8	2	0	0	0	0	0	0	0	0	0	0	11
10:00	11	16	4	0	0	0	0	0	0	0	0	0	0	31
10:15	2	1	2	0	0	0	0	0	0	0	0	0	0	5
10:30	2	8	0	0	0	0	0	0	0	0	0	0	0	10
10:45	3	2	0	0	0	0	0	0	0	0	0	0	0	5
10:55	2	6	1	0	0	0	0	0	0	0	0	0	0	9
11:00	9	17	3	0	0	0	0	0	0	0	0	0	0	29
11:15	4	3	0	1	0	0	0	0	0	0	0	0	0	8
11:30	1	8	2	0	0	0	0	0	0	0	0	0	0	11
11:45	6	8	0	0	0	0	0	0	0	0	0	0	0	14
11:55	3	3	1	0	0	0	0	0	0	0	0	0	0	7
12:00	14	22	3	1	0	0	0	0	0	0	0	0	0	40
12:05	3	6	1	0	0	0	0	0	0	0	0	0	0	10



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Location: Silver St Just north of
 Summer St
 Start Date: 1/19/2021

12:15	2	7	4	0	0	0	0	0	0	0	0	0	0	13
12:30	2	10	1	0	0	0	0	0	0	0	0	0	0	13
12:45	4	8	1	1	0	0	0	0	0	0	0	0	0	14
	11	31	7	1	0	0	0	0	0	0	0	0	0	50
13:00	1	5	5	1	1	0	0	0	0	0	0	0	0	13
13:15	3	11	3	0	0	0	0	0	0	0	0	0	0	17
13:30	2	4	5	0	0	0	0	0	0	0	0	0	0	11
13:45	0	5	1	0	0	0	0	0	0	0	0	0	0	6
	6	25	14	1	1	0	0	0	0	0	0	0	0	47
14:00	1	6	5	0	0	0	0	0	0	0	0	0	0	12
14:15	1	7	2	0	0	0	0	0	0	0	0	0	0	10
14:30	1	3	1	0	0	0	0	0	0	0	0	0	0	5
14:45	2	6	0	0	0	0	0	0	0	0	0	0	0	8
	5	22	8	0	0	0	0	0	0	0	0	0	0	35
15:00	2	6	0	0	0	0	0	0	0	0	0	0	0	8
15:15	4	3	0	0	0	0	0	0	0	0	0	0	0	7
15:30	0	9	2	0	0	0	0	0	0	0	0	0	0	11
15:45	2	6	0	0	0	0	0	0	0	0	0	0	0	8
	8	24	2	0	0	0	0	0	0	0	0	0	0	34
16:00	2	8	4	0	0	0	0	0	0	0	0	0	0	14
16:15	4	11	2	0	0	0	0	0	0	0	0	0	0	17
16:30	2	11	2	1	0	0	0	0	0	0	0	0	0	16
16:45	8	4	4	0	0	0	0	0	0	0	0	0	0	16
	16	34	12	1	0	0	0	0	0	0	0	0	0	63
17:00	2	8	3	0	0	0	0	0	0	0	0	0	0	13
17:15	5	6	1	0	0	0	0	0	0	0	0	0	0	12
17:30	4	7	2	0	0	0	0	0	0	0	0	0	0	13
17:45	6	11	0	0	0	0	0	0	0	0	0	0	0	17
	17	32	6	0	0	0	0	0	0	0	0	0	0	55
18:00	5	7	1	0	0	0	0	0	0	0	0	0	0	13
18:15	3	2	4	0	0	0	0	0	0	0	0	0	0	9
18:30	5	9	1	0	0	0	0	0	0	0	0	0	0	15
18:45	9	11	2	0	0	0	0	0	0	0	0	0	0	22
	22	29	8	0	0	0	0	0	0	0	0	0	0	59
19:00	5	3	0	0	0	0	0	0	0	0	0	0	0	8
19:15	4	4	2	0	0	0	0	0	0	0	0	0	0	10
19:30	0	9	3	0	0	0	0	0	0	0	0	0	0	12
19:45	8	3	2	0	0	0	0	0	0	0	0	0	0	13
	17	19	7	0	0	0	0	0	0	0	0	0	0	43
20:00	1	6	3	0	0	0	0	0	0	0	0	0	0	10
20:15	2	3	0	0	0	0	0	0	0	0	0	0	0	5
20:30	0	1	2	0	0	0	0	0	0	0	0	0	0	3
20:45	2	5	2	1	0	0	0	0	0	0	0	0	0	10
	5	15	7	1	0	0	0	0	0	0	0	0	0	28
21:00	0	2	1	0	0	0	0	0	0	0	0	0	0	3
21:15	3	3	0	0	0	0	0	0	0	0	0	0	0	6
21:30	0	2	1	0	0	0	0	0	0	0	0	0	0	3
21:45	0	0	1	0	0	0	0	0	0	0	0	0	0	1
	3	7	3	0	0	0	0	0	0	0	0	0	0	13
22:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
22:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22:45	0	3	0	0	0	0	0	0	0	0	0	0	0	3
	0	5	0	0	0	0	0	0	0	0	0	0	0	5
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	183	370	92	5	1	0	0	0	0	0	0	0	0	651

Percentile	15th	50th	85th	95th
Speed	12.7	16.5	19.9	21.4
Mean Speed (Average)	15.5			
10 MPH Pace Speed	15-24			



Location: Silver St Just north of
Summer St
Start Date: 1/19/2021

Number in Pace	461
Percent in Pace	70.8%
Number > 30 MPH	1
Percent > 30 MPH	0.2%



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Location: Silver St between Decatur
 St and Kane St
 Start Date: 1/19/2021

Direction: Southbound

1/19/2021	0 - 15	> 15 -	> 20 -	> 25 -	> 30 -	> 35 -	> 40 -	> 45 -	> 50 -	> 55 -	> 60 -	> 65 -	> 70	Total
Time	MPH	20 MPH	25 MPH	30 MPH	35 MPH	40 MPH	45 MPH	50 MPH	55 MPH	60 MPH	65 MPH	70 MPH	MPH	
0:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15	0	0	0	0	1	0	0	0	0	0	0	0	0	1
1:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	1	0	0	0	0	0	0	0	0	0	1
2:15	0	0	0	0	0	0	1	0	0	0	0	0	0	1
2:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	1	0	0	0	0	0	0	0	1
3:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30	0	0	0	1	0	0	0	0	0	0	0	0	0	1
4:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00	0	0	0	1	0	0	0	0	0	0	0	0	0	1
5:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30	0	1	0	0	0	0	0	0	0	0	0	0	0	1
5:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00	0	1	0	1	0	0	0	0	0	0	0	0	0	2
6:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30	0	0	1	0	0	0	0	0	0	0	0	0	0	1
6:45	0	2	1	2	0	0	0	0	0	0	0	0	0	5
7:00	2	1	2	1	0	0	0	0	0	0	0	0	0	6
7:15	2	3	4	3	0	0	0	0	0	0	0	0	0	12
7:30	0	3	2	1	0	0	0	0	0	0	0	0	0	6
7:45	2	3	5	5	0	0	0	0	0	0	0	0	0	15
8:00	1	1	1	2	0	0	0	0	0	0	0	0	0	5
8:15	2	3	1	2	2	0	0	0	0	0	0	0	0	10
8:30	5	10	9	10	2	0	0	0	0	0	0	0	0	36
8:45	4	3	2	1	1	0	0	0	0	0	0	0	0	11
9:00	2	3	4	0	0	0	0	0	0	0	0	0	0	9
9:15	0	3	2	2	0	0	0	0	0	0	0	0	0	7
9:30	1	4	3	0	1	0	0	0	0	0	0	0	0	9
9:45	7	13	11	3	2	0	0	0	0	0	0	0	0	36
10:00	2	4	4	4	1	0	0	0	0	0	0	0	0	15
10:15	1	3	1	0	0	0	0	0	0	0	0	0	0	5
10:30	3	1	0	1	1	0	0	0	0	0	0	0	0	6
10:45	1	4	2	1	1	0	0	0	0	0	0	0	0	9
11:00	7	12	7	6	3	0	0	0	0	0	0	0	0	35
11:15	0	2	2	0	1	0	0	0	0	0	0	0	0	5
11:30	0	2	2	2	0	0	0	0	0	0	0	0	0	6
11:45	4	3	1	0	2	0	0	0	0	0	0	0	0	10
12:00	2	2	2	0	0	0	0	0	0	0	0	0	0	6
12:15	6	9	7	2	3	0	0	0	0	0	0	0	0	27
12:30	1	0	2	1	0	0	0	0	0	0	0	0	0	4
12:45	3	1	3	2	0	0	0	0	0	0	0	0	0	9
13:00	2	2	5	2	0	0	0	0	0	0	0	0	0	11
13:15	0	3	5	3	2	0	0	0	0	0	0	0	0	13
13:30	6	6	15	8	2	0	0	0	0	0	0	0	0	37
13:45	0	4	5	2	1	0	0	0	0	0	0	0	0	12



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Location: Silver St between Decatur
 St and Kane St
 Start Date: 1/19/2021

12:15	1	1	2	4	1	0	0	0	0	0	0	0	0	9
12:30	2	2	4	1	0	0	0	0	0	0	0	0	0	9
12:45	1	2	1	2	0	0	0	0	0	0	0	0	0	6
<hr/>														
13:00	4	9	12	9	2	0	0	0	0	0	0	0	0	36
13:15	1	3	4	3	0	0	0	0	0	0	0	0	0	11
13:30	3	4	3	2	1	0	0	0	0	0	0	0	0	13
13:45	1	4	7	6	1	0	0	0	0	0	0	0	0	19
<hr/>														
14:00	3	4	5	1	0	0	0	0	0	0	0	0	0	13
14:15	8	15	19	12	2	0	0	0	0	0	0	0	0	56
14:30	3	4	2	3	0	0	0	0	0	0	0	0	0	12
14:45	1	3	3	4	0	0	0	0	0	0	0	0	0	11
<hr/>														
15:00	3	4	5	1	1	0	0	0	0	0	0	0	0	14
15:15	0	1	4	2	1	0	0	0	0	0	0	0	0	8
15:30	7	12	14	10	2	0	0	0	0	0	0	0	0	45
15:45	0	4	4	5	0	0	0	0	0	0	0	0	0	13
<hr/>														
16:00	3	1	2	2	0	0	0	0	0	0	0	0	0	8
16:15	1	4	4	4	0	0	0	0	0	0	0	0	0	13
16:30	3	3	4	1	0	0	0	0	0	0	0	0	0	11
16:45	7	12	14	12	0	0	0	0	0	0	0	0	0	45
<hr/>														
17:00	1	5	7	1	0	0	0	0	0	0	0	0	0	14
17:15	3	7	5	5	1	0	0	0	0	0	0	0	0	21
17:30	2	5	5	0	0	0	0	0	0	0	0	0	0	12
17:45	2	5	4	1	0	0	0	0	0	0	0	0	0	12
<hr/>														
18:00	8	22	21	7	1	0	0	0	0	0	0	0	0	59
18:15	5	6	4	1	1	0	0	0	0	0	0	0	0	17
18:30	6	3	5	3	0	0	0	0	0	0	0	0	0	17
18:45	3	5	8	2	0	0	0	0	0	0	0	0	0	18
<hr/>														
19:00	2	7	3	1	0	0	0	0	0	0	0	0	0	13
19:15	16	21	20	7	1	0	0	0	0	0	0	0	0	65
19:30	4	9	3	1	1	0	0	0	0	0	0	0	0	18
19:45	2	2	5	2	0	0	0	0	0	0	0	0	0	11
<hr/>														
20:00	0	6	3	4	0	0	0	0	0	0	0	0	0	13
20:15	0	2	3	3	1	0	0	0	0	0	0	0	0	9
20:30	6	19	14	10	2	0	0	0	0	0	0	0	0	51
20:45	2	4	3	0	0	0	0	0	0	0	0	0	0	9
<hr/>														
21:00	1	0	2	0	2	0	0	0	0	0	0	0	0	5
21:15	0	3	2	1	0	0	0	0	0	0	0	0	0	6
21:30	1	0	0	2	1	0	0	0	0	0	0	0	0	4
21:45	4	7	7	3	3	0	0	0	0	0	0	0	0	24
<hr/>														
22:00	1	2	2	1	0	0	0	0	0	0	0	0	0	6
22:15	0	1	4	3	0	0	0	0	0	0	0	0	0	8
22:30	0	0	4	1	0	0	0	0	0	0	0	0	0	5
22:45	1	2	3	0	1	0	0	0	0	0	0	0	0	7
<hr/>														
23:00	2	5	13	5	1	0	0	0	0	0	0	0	0	26
23:15	0	0	1	1	2	0	0	0	0	0	0	0	0	4
23:30	0	1	1	2	0	0	0	0	0	0	0	0	0	4
23:45	0	0	1	1	1	0	0	0	0	0	0	0	0	3
<hr/>														
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<hr/>														
Total	95	177	195	117	31	1	0	0	0	0	0	0	0	616

Percentile	15th	50th	85th	95th
Speed	14.8	20.8	26.7	29.9
Mean Speed (Average)	20.3			
10 MPH Pace Speed	15-24			



Location: Silver St between Decatur
St and Kane St
Start Date: 1/19/2021

Number in Pace	369
Percent in Pace	59.9%
Number > 30 MPH	32
Percent > 30 MPH	5.2%



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Location: Silver St between Decatur
 St and Kane St
 Start Date: 1/19/2021

Direction: Northbound

1/19/2021	0 - 15	> 15 -	> 20 -	> 25 -	> 30 -	> 35 -	> 40 -	> 45 -	> 50 -	> 55 -	> 60 -	> 65 -	> 70	Total
Time	MPH	20 MPH	25 MPH	30 MPH	35 MPH	40 MPH	45 MPH	50 MPH	55 MPH	60 MPH	65 MPH	70 MPH	MPH	
0:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15	1	0	0	0	0	0	0	0	0	0	0	0	0	1
1:30	0	0	0	2	0	0	0	0	0	0	0	0	0	2
1:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15	1	0	0	2	0	0	0	0	0	0	0	0	0	3
2:30	0	0	1	0	0	0	0	0	0	0	0	0	0	1
2:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15	0	0	1	0	0	0	0	0	0	0	0	0	0	1
3:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15	0	0	0	1	0	0	0	0	0	0	0	0	0	1
6:30	0	0	2	1	0	0	0	0	0	0	0	0	0	3
6:45	0	2	1	0	0	0	0	0	0	0	0	0	0	3
7:00	0	2	3	2	0	0	0	0	0	0	0	0	0	7
7:15	0	1	0	0	0	0	0	0	0	0	0	0	0	1
7:30	1	4	3	2	0	0	0	0	0	0	0	0	0	10
7:45	4	2	2	1	0	0	0	0	0	0	0	0	0	9
8:00	1	0	0	2	0	0	0	0	0	0	0	0	0	3
8:15	6	7	5	5	0	0	0	0	0	0	0	0	0	23
8:30	3	1	2	0	0	0	0	0	0	0	0	0	0	6
8:45	0	2	2	0	0	0	0	0	0	0	0	0	0	4
9:00	1	1	1	2	0	0	0	0	0	0	0	0	0	5
9:15	0	4	5	0	0	0	0	0	0	0	0	0	0	9
9:30	4	8	10	2	0	0	0	0	0	0	0	0	0	24
9:45	1	2	3	2	0	0	0	0	0	0	0	0	0	8
10:00	3	2	3	0	0	0	0	0	0	0	0	0	0	8
10:15	0	0	5	0	0	0	0	0	0	0	0	0	0	5
10:30	3	1	1	1	0	0	0	0	0	0	0	0	0	6
10:45	7	5	12	3	0	0	0	0	0	0	0	0	0	27
11:00	2	3	2	1	0	0	0	0	0	0	0	0	0	8
11:15	2	4	2	1	0	0	0	0	0	0	0	0	0	9
11:30	3	0	0	1	0	0	0	0	0	0	0	0	0	4
11:45	1	0	1	0	0	0	0	0	0	0	0	0	0	2
12:00	8	7	5	3	0	0	0	0	0	0	0	0	0	23
	2	0	5	0	0	0	0	0	0	0	0	0	0	7
	2	2	1	0	0	0	0	0	0	0	0	0	0	5
	1	3	4	1	0	0	0	0	0	0	0	0	0	9
	3	4	4	2	0	0	0	0	0	0	0	0	0	13
	8	9	14	3	0	0	0	0	0	0	0	0	0	34
	0	3	6	2	0	0	0	0	0	0	0	0	0	11



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Location: Silver St between Decatur
 St and Kane St
 Start Date: 1/19/2021

12:15	2	3	1	3	0	0	0	0	0	0	0	0	0	9
12:30	0	6	3	3	0	0	0	0	0	0	0	0	0	12
12:45	0	1	4	0	0	0	0	0	0	0	0	0	0	5
<hr/>														
	2	13	14	8	0	0	0	0	0	0	0	0	0	37
13:00	0	5	1	4	0	0	0	0	0	0	0	0	0	10
13:15	1	0	3	4	0	0	0	0	0	0	0	0	0	8
13:30	0	2	3	2	0	0	0	0	0	0	0	0	0	7
13:45	0	4	3	1	0	0	0	0	0	0	0	0	0	8
<hr/>														
	1	11	10	11	0	0	0	0	0	0	0	0	0	33
14:00	3	1	1	0	1	0	0	0	0	0	0	0	0	6
14:15	2	3	5	2	0	0	0	0	0	0	0	0	0	12
14:30	0	4	5	1	1	0	0	0	0	0	0	0	0	11
14:45	0	4	3	0	0	0	0	0	0	0	0	0	0	7
<hr/>														
	5	12	14	3	2	0	0	0	0	0	0	0	0	36
15:00	1	0	3	5	0	0	0	0	0	0	0	0	0	9
15:15	1	3	5	1	0	0	0	0	0	0	0	0	0	10
15:30	2	6	4	2	0	0	0	0	0	0	0	0	0	14
15:45	1	3	3	3	0	0	0	0	0	0	0	0	0	10
<hr/>														
	5	12	15	11	0	0	0	0	0	0	0	0	0	43
16:00	2	2	6	2	1	0	0	0	0	0	0	0	0	13
16:15	1	6	2	1	0	0	0	0	0	0	0	0	0	10
16:30	1	4	4	2	0	0	0	0	0	0	0	0	0	11
16:45	4	3	5	3	0	0	0	0	0	0	0	0	0	15
<hr/>														
	8	15	17	8	1	0	0	0	0	0	0	0	0	49
17:00	4	6	7	3	0	0	0	0	0	0	0	0	0	20
17:15	2	3	5	5	0	0	0	0	0	0	0	0	0	15
17:30	1	7	3	1	0	0	0	0	0	0	0	0	0	12
17:45	2	7	3	0	0	0	0	0	0	0	0	0	0	12
<hr/>														
	9	23	18	9	0	0	0	0	0	0	0	0	0	59
18:00	3	4	6	2	0	0	0	0	0	0	0	0	0	15
18:15	3	7	3	1	0	0	0	0	0	0	0	0	0	14
18:30	2	8	5	0	0	0	0	0	0	0	0	0	0	15
18:45	0	7	6	1	0	0	0	0	0	0	0	0	0	14
<hr/>														
	8	26	20	4	0	0	0	0	0	0	0	0	0	58
19:00	2	2	2	3	0	0	0	0	0	0	0	0	0	9
19:15	0	1	2	3	0	0	0	0	0	0	0	0	0	6
19:30	0	2	0	1	0	0	0	0	0	0	0	0	0	3
19:45	0	0	4	0	1	0	0	0	0	0	0	0	0	5
<hr/>														
	2	5	8	7	1	0	0	0	0	0	0	0	0	23
20:00	2	4	5	0	0	0	0	0	0	0	0	0	0	11
20:15	1	3	1	1	0	0	0	0	0	0	0	0	0	6
20:30	0	0	1	1	0	0	0	0	0	0	0	0	0	2
20:45	1	1	0	1	0	0	0	0	0	0	0	0	0	3
<hr/>														
	4	8	7	3	0	0	0	0	0	0	0	0	0	22
21:00	1	1	2	1	0	0	0	0	0	0	0	0	0	5
21:15	1	2	1	0	0	0	0	0	0	0	0	0	0	4
21:30	1	1	1	1	0	0	0	0	0	0	0	0	0	4
21:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<hr/>														
	3	4	4	2	0	0	0	0	0	0	0	0	0	13
22:00	1	2	1	0	0	0	0	0	0	0	0	0	0	4
22:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22:45	1	0	0	0	0	0	0	0	0	0	0	0	0	1
<hr/>														
	2	2	1	0	0	0	0	0	0	0	0	0	0	5
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23:15	0	1	0	0	0	0	0	0	0	0	0	0	0	1
23:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23:45	1	0	0	0	0	0	0	0	0	0	0	0	0	1
<hr/>														
Total	1	1	0	0	0	0	0	0	0	0	0	0	0	2
	84	170	178	86	4	0	0	0	0	0	0	0	0	522

Percentile	15th	50th	85th	95th
Speed	14.7	20.1	25.1	27.6
Mean Speed (Average)	19.4			
10 MPH Pace Speed	15-24			



Location: Silver St between Decatur
St and Kane St
Start Date: 1/19/2021

Number in Pace	345
Percent in Pace	66.1%
Number > 30 MPH	4
Percent > 30 MPH	0.8%

24-Hour Approach Count Summary

Location: Washington Avenue at Silver Street
City, State: Houston, TX
Weather: Sunny, Dry, Smooth
Operator: CJ Hensch

Date: 8/29/2018
Day: Wednesday
File:

Time Beginning	Washington Avenue			Silver Street			COMBINED TOTAL
	EB	WB	Washington Avenue SUBTOTAL	NB	SB	Silver Street SUBTOTAL	
12:00 AM			0			0	0
1:00 AM			0			0	0
2:00 AM			0			0	0
3:00 AM			0			0	0
4:00 AM			0			0	0
5:00 AM			0			0	0
6:00 AM	271	185	456	11	17	28	484
7:00 AM	781	299	1080	30	147	177	1257
8:00 AM	992	380	1372	29	225	254	1626
9:00 AM			0			0	0
10:00 AM			0			0	0
11:30 AM	658	507	1165	106	60	166	1331
12:30 PM	599	520	1119	98	53	151	1270
1:00 PM			0			0	0
2:00 PM			0			0	0
3:00 PM	489	401	890	60	56	116	1006
4:00 PM	670	481	1151	72	69	141	1292
5:00 PM	802	540	1342	91	93	184	1526
6:00 PM	556	410	966	61	70	131	1097
7:00 PM			0			0	0
8:00 PM			0			0	0
9:00 PM			0			0	0
10:00 PM			0			0	0
11:00 PM			0			0	0
TOTALS:	5818	3723	9541	558	790	1348	10889

Annual Growth 1.0%
 Total 5 yr Growth 105%

**TRAFFIC SURVEY - COUNT ANALYSIS
2011TMUTCD WARRANTS**

County: Harris District: 10000
 City: Houston Population: 2,000,000 Survey Date: 08/29/18

Major: Route # Name Washington Avenue Control - Section - Posted Speed Limit 30
 Minor: Name Silver Street Control - Section - Posted Speed Limit 30

Eight High Hours: Lowest volume of 8 hour study is the 8th highest hour. Major and minor 8th high hours may not be the same hour.

Time Begins	Major Street Both Approaches		Minor Street High Vol. Approach		Comments
	Vehicle	Peds.	Vehicle	Peds.	
8:00 AM	1372	6	225		*This intersection meets the 2011 TMUTCD Traffic Signal Warrants # 3,8.
5:00 PM	1342	5	93		*Warrant Analysis uses speed of 35 mph (posted speed limit =35mph)
11:30 AM	1165	0	106		
4:00 PM	1151	2	72		
12:30 PM	1119	2	98		
7:00 AM	1080	3	147		
6:00 PM	966	6	70		*The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.
3:00 PM	890	3	60		

Warrant 1: Eight-Hour Vehicular Volume

NOT WARRANTED

*The Minimum Vehicular Volume, **Condition A**, is intended for application where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

*The Interruption of Continuous Traffic, **Condition B**, is intended for application where the traffic volume on a major street is so heavy that traffic on a minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

*Either Condition may be met in order to satisfy Warrant 1, but if using the 80% Combination, both Conditions must be met.

Condition A: The 8th Highest Hour traffic volumes must meet 100% of the required volumes, depending on urban or rural conditions.

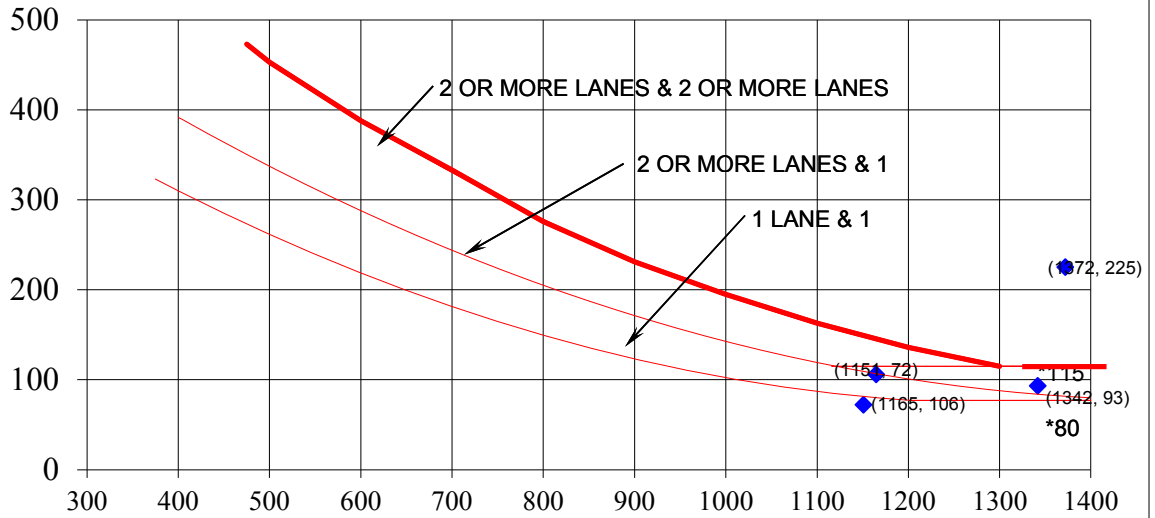
Number of Lanes		Major St. - Both Approaches 8th Highest Hour					Minor St. - High Vol. Approach 8th Highest Hour				
Major Street	Minor Street	Required 100%	80%	70%	56%	Existing 148%	Required 100%	80%	70%	56%	Existing 40%
1	1	500	400	350	280		150	120	105	84	
2 or >	1	600	480	420	336	890	150	120	105	84	60
2 or >	2 or >	600	480	420	336		200	160	140	112	
1	2 or >	500	400	350	280		200	160	140	112	

Condition B: The 8th Highest Hour traffic volumes must meet 100% of the required volumes, depending on urban or rural conditions.

Number of Lanes		Major St. - Both Approaches 8th Highest Hour					Minor St. - High Vol. Approach 8th Highest Hour				
Major Street	Minor Street	Required 100%	80%	70%	56%	Existing 99%	Required 100%	80%	70%	56%	Existing 80%
1	1	750	600	525	420		75	60	53	42	
2 or >	1	900	720	630	504	890	75	60	53	42	60
2 or >	2 or >	900	720	630	504		100	80	70	56	
1	2 or >	750	600	525	420		100	80	70	56	

Minor Street-High Volume Approach-
vph

Warrant 2
Figure 4C-1 Four Hour Vehicular Volume



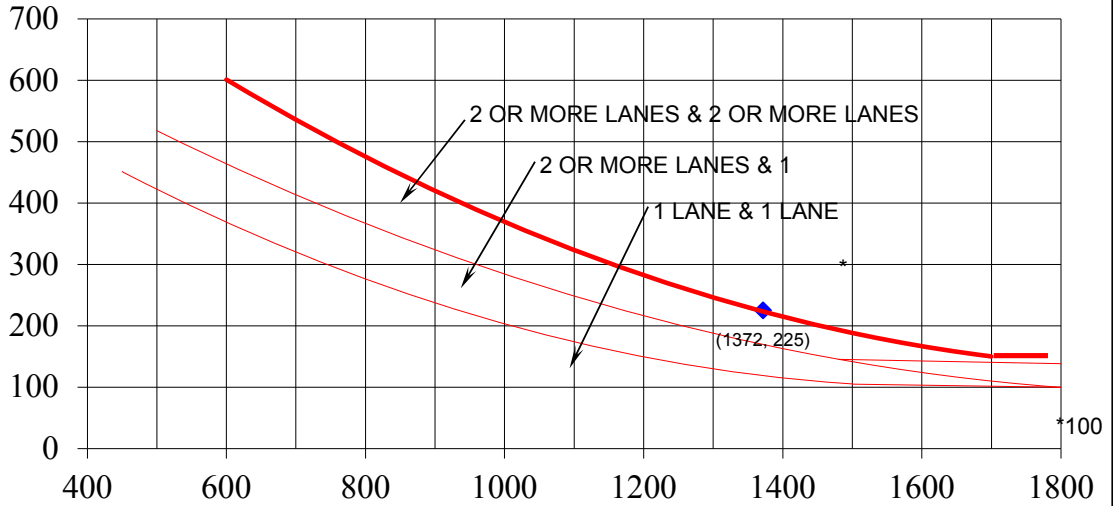
** If data point is outside boundaries of graph, it is plotted at the maximum value found in the boundaries.

Major Street-Total of Both Approaches-vph

* Note: 115 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 80 vph applies as the lower threshold volume for a minor-street approach with

Minor Street-High Volume Approach-
vph

Warrant 3
Figure 4C-3 Peak Hour



** If data point is outside boundaries of graph, it is plotted at the maximum value found in the boundaries.

Major Street-Total of Both Approaches-vph

* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or

Warrant 2: Four-Hour Vehicular Volume

NOT WARRANTED

*The need for a traffic control signal shall be considered if an engineering study finds that, for each of any 4 hours of an average day, the plotted points representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher-volume minor-street approach (one direction only) all fall above the applicable curve in Figure 4C-1 for the existing combination of approach lanes.

*On the minor street, the higher volume shall not be required to be the same approach during each of these 4 hours.

*If the posted speed limit or the 85th-percentile speed on the major street exceeds 40 mph, or if the intersection lies within a built-up area of an isolated community having a population of less than 10,000, Figure 4C-2 may be used in place of Figure 4C-1.

Warrant 3: Peak Hour

WARRANTED

*The need for a traffic control signal shall be considered if an engineering study finds that the criteria in either Category A or Category B are met.

Category A:

- 1. Total stopped time delay on one minor-street approach:
 - For 1 lane:
 - For 2 or more lanes:
- 2. Minor Street Volume: (For One Direction Only)
 - For 1 lane:
 - For 2 or more lanes:
- 3. Total Entering Volume for Entire Intersection:
 - For 3 approaches:
 - For 4 or more approaches:

Required:	Existing:	Condition Satisfied?
4 veh Hours		no
5 Hours		
100 Vehicles	225	Yes
150 Vehicles		
650 Vehicles		
800 Vehicles	1626	Yes

Category B: Does the plotted point fall above the applicable curve in Figure 4C-3? YES* **NO**

*If the posted speed limit or the 85th-percentile speed on the major street exceeds 40 mph, or if the intersection lies within a built-up area of an isolated community having a population of less than 10,000, Figure 4C-4 may be used in place of Figure 4C-3.

Warrant 4: Pedestrian Volume

NOT WARRANTED

*EITHER Conditions A OR B must be met to satisfy Warrant 4.

Condition A

*Ped Volumes Must Satisfy Peak Hour Requirements, or All of the 4 Hour Requirements.

For each of any 4 hours of an average day, the plotted points representing the vehicles per hour on the major street (total of both approaches) and the corresponding pedestrians per hour crossing the major street (total of all crossings) all fall above the curve in Figure 4C-5; or

Hour 1	Hour 2	Hour 3	Hour 4
1372	1119	1342	1165
6	2	5	0

(Check that these are the best count values to use)

Condition B

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding pedestrians per hour crossing the major street (total of all crossings) falls above the curve in Figure 4C-7.

Peak Hour
1372 (Peak Hr Volume, Both Approaches)
6 (Peak Hr Peds Crossing Major Street)

Standard

- *Is the nearest traffic signal greater than 300 feet away? YES NO
- *If NO, would the installation of a traffic control signal impede progressive flow to traffic? YES NO
- *Are there less than 60 gaps per hour in the traffic stream of adequate length to allow pedestrians to cross during the same period when the pedestrian volume criterion is satisfied? YES NO

Option:

If the posted or statutory speed limit or the 85th-percentile speed on the major street exceeds 35 mph, or if the intersection lies within the built-up area of an isolated community having a population of less than 10,000, Figure 4C-6 may be used in place of Figure 4C-5 to evaluate Criterion A in Paragraph 2, and Figure 4C-8 may be used in place of Figure 4C-7 to evaluate Criterion B in Paragraph 2.

Warrant 5: School Crossing

NOT APPLICABLE

- *Are the number of adequate gaps in the traffic stream during the period when the children are using the crossing less than the number of minutes in the same period? YES NO
- *Are there a minimum of 20 students during the highest crossing hour? YES NO
- *Is the nearest traffic control signal greater than 300 ft away? YES NO
- *If NO, would the installation of a traffic control signal impede progressive flow to traffic? YES NO

Warrant 6: Coordinated Signal System

NOT APPLICABLE

*The need for a traffic signal shall be considered if an engineering study finds that one of the following criteria is met:

- A. On a one-way street or a street that has traffic predominantly in one direction, the adjacent traffic control signals are so far apart that they do not provide the necessary degree of vehicular platooning.
- B. On a two-way street, adjacent traffic control signals do not provide the necessary degree of platooning and the proposed and adjacent traffic control signals will collectively provide a progressive operation.

Warrant 7: Crash Experience

NOT WARRANTED ▼

*The need for a traffic signal shall be considered if an engineering study finds that all of the following criteria are met:

- A. Adequate trial of alternatives with satisfactory observance and enforcement has failed to reduce the crash frequency; and
- B. Five or more reported crashes, of types susceptible to correction by a traffic control signal, have occurred within a 12-month period, each crash involving personal injury or property damage; and
- C. For each of any 8 hours of an average day, the traffic volumes listed in Warrant 1 must be at least 80% of the required volumes in Condition A or Condition B, or the volume of pedestrian traffic is not less than 80% of the requirements specified in Warrant 4.

*If the posted or statutory speed limit or the 85th-percentile speed on the major street exceeds 40 mph, or if the intersection lies within the built-up area of an isolated community having a population of less than 10,000, the traffic volumes in the 56 percent columns in Table 4C-1 may be used in place of the 80 percent columns.

Warrant 8: Roadway Network

WARRANTED ▼

*The need for a traffic signal shall be considered if an engineering study finds that the common intersection of two or more major routes meets one or both of the following criteria:

- A. *Is the peak hour (or each of five hours on a weekend) entering traffic for the total of all approaches greater than 1000 vehicles per hour? YES NO
- *Does the 5 year projected volumes meet 1 or more of Warrants 1, 2, or 3, during an average weekday? YES NO
- B. *Does the intersection have a total existing or immediately projected entering volume of at least 1,000 vehicles per hour for each of any 5 hours of a nonnormal business day (Saturday or Sunday)? YES NO

- *A major route as used in this signal warrant shall have one or more of the following characteristics:
1. It is part of the street or highway system that serves as the principal roadway network for through traffic flow.
 2. It includes rural or suburban highways outside, entering, or traversing a City.
 3. It appears as a major route on an official plan such as a major street plan in an urban area traffic and transportation study.
 4. It connects areas of principal traffic generation.
 5. It has surface street freeway or expressway ramp terminals.

Warrant 9: , Intersection Near a Grade Crossing

WARRANTED ▼

*The Intersection Near a Grade Crossing signal warrant is intended for use at a location where none of the conditions described in the other eight traffic signal warrants are met, but the proximity to the intersection of a grade crossing on an intersection approach controlled by a STOP or YIELD sign is the principal reason to consider installing a traffic control signal.

****See Section 4C.10 of 2011 Edition of TXMUTCD, Part 4, for STANDARD AND GUIDANCE**