




# WALK





# BIKE





# MONTROSE

**JUNE 2020**

**Montrose TIRZ 27**

# ACKNOWLEDGMENTS

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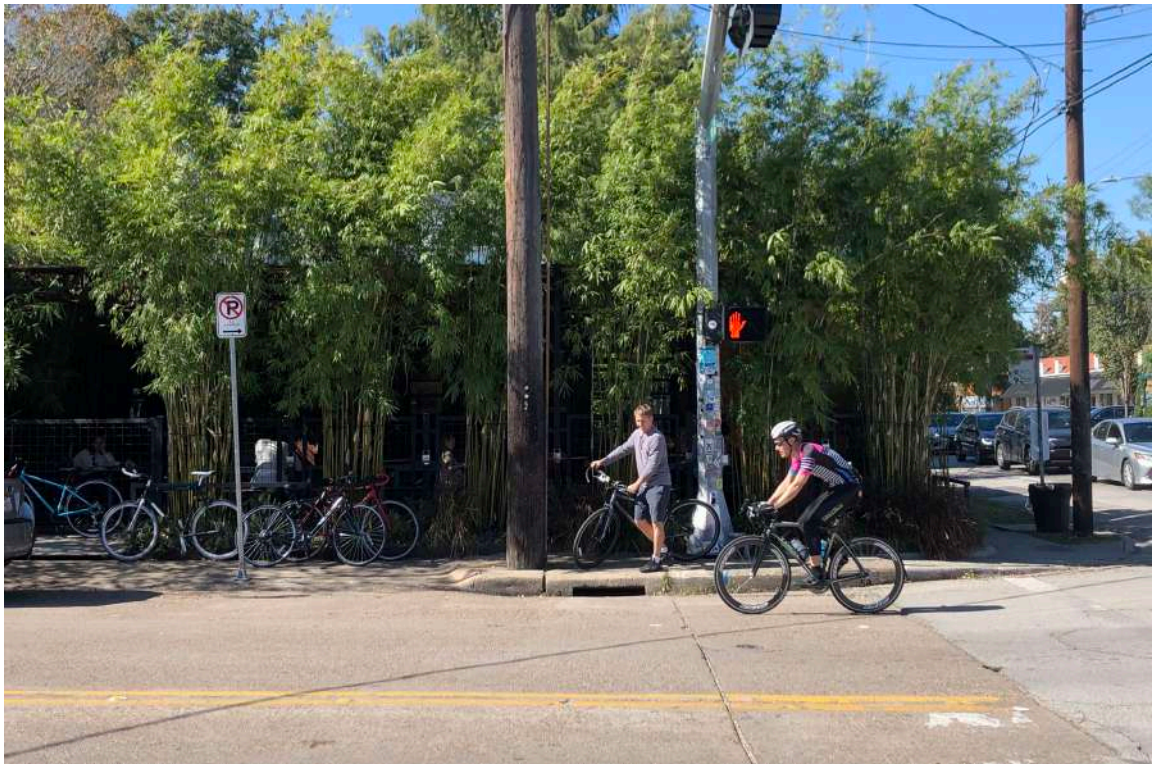
MONTROSE
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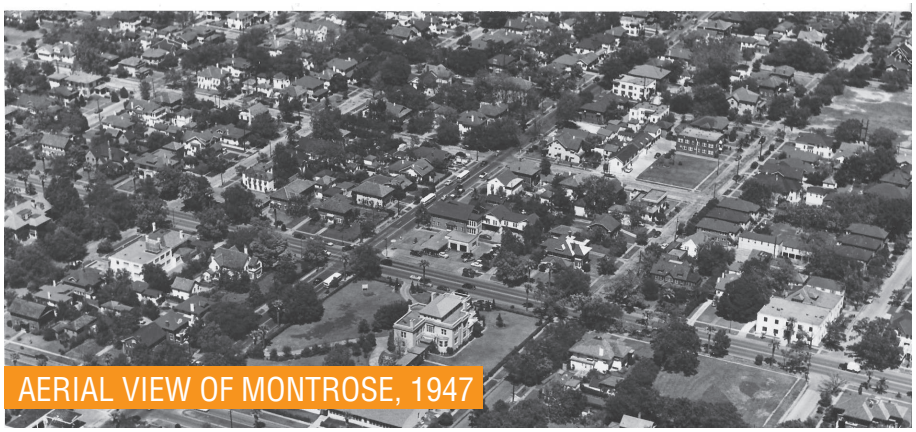


# EXECUTIVE SUMMARY

# THE FUTURE OF MONTROSE IS WALKABLE AND BIKEABLE

## THE NEIGHBORHOOD

Montrose holds a unique place in the story of Houston. Its location and cultural history put it at the center of activity in an ever-growing city – a neighborhood buzzing with residents, tourists, small business owners, students, and retirees. As one of Houston's first streetcar suburbs, Montrose is always on the move. It's the epicenter of the city's LGBTQ+ community, back yard of Buffalo Bayou, and home to institutions like the Menil Collection and the University of St. Thomas. Montrose is a neighborhood where people walk, bike, and ride on one of the seven nearby transit lines. It deserves well-designed streets that make walking and biking enjoyable and safe. This Plan, *Walk+Bike Montrose*, lays out a vision and a set of actions to make that a reality.



AERIAL VIEW OF MONTROSE, 1947

*Source: University of St. Thomas*

| MONTROSE | HOUSTON | |
|---|---|---|
| 23,220 | 2,267,336 | Population |
| 13,185 | 838,950 | Households |
| 1.8 | 2.7 | Average Household Size |
| 49% | 57% | Renter-Occupied Households |
| 10% | 18% | Households in Poverty |

table E.1 Demographic Summary *Source: US Census, 2018*

## COMMUNITY DESTINATIONS




figure E.1 Community Destinations in the Study Area

- Community Center
- Museum/Library
- Grocery Store
- Place of Worship
- School
- Park
- Study Area
- Roadway

*Source: Team Analysis 2020*

## THE VISION

**Montrose is a 20-minute neighborhood.** This means it has plenty of neighborhood destinations and a walkable, bikeable street grid that allows people to accomplish their daily tasks without relying on a car to get there. Right now, Montrose has many of the elements to achieve this Vision, all that's missing is safe infrastructure (see **Figure E.2**). Four pillars define a successful 20-minute neighborhood as (1) Safe, (2) Connected, (3) Affordable, and with (4) Enduring livability.

When Montrose fully achieves the 20-minute vision, every street will be walkable, the community will be fully accessible using a network of bikeways for people of all ages and abilities, and major barriers like wide streets with high vehicle speeds will be reimagined as opportunities to connect, not impede.

## THE FOUR PILLARS OF A 20-MINUTE NEIGHBORHOOD

1. **SAFE** places for people to move around
2. **CONNECTED** network that offers many choices
3. **AFFORDABLE** for many people
4. **ENDURING** livability that embraces history

## THE PLAN

This Plan links that 20-minute vision to a set of tangible actions. First, the Walk Montrose chapter reveals the true extent of necessary sidewalk investments in the neighborhood using detailed parcel-level data. Then, Bike Montrose maps the community bikeways in the near- and long-term that can be linked to form the neighborhood's first true bike network. Finally, the Action Plan chapter names the projects, programs, and policy mechanisms available to fix sidewalks and build new bikeways, making the 20-minute neighborhood a reality.

## THE 20-MINUTE WALKSHED

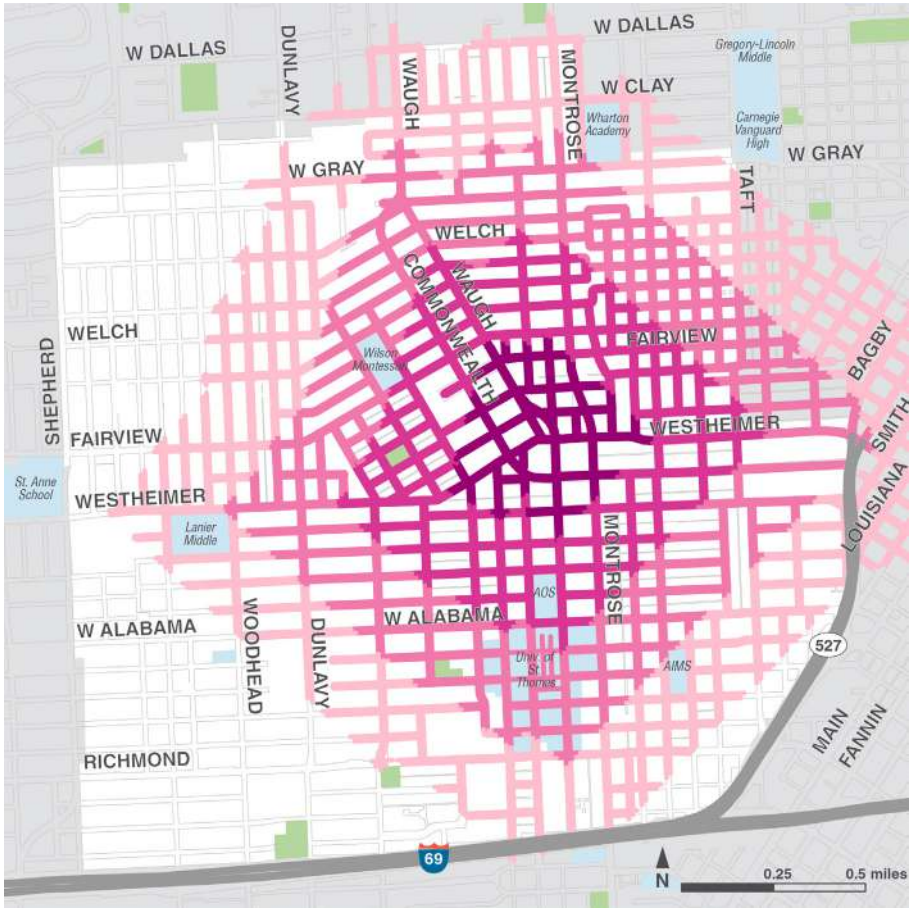



figure E.2 Walkshed from Westheimer Road at Waugh Drive intersection

- 0-5 Minutes
- 5-10 Minutes
- 10-15 Minutes
- 15-20 Minutes
- Highway
- Study Area
- School
- Park

*Source: Team Analysis, 2019*

# WALK MONTROSE

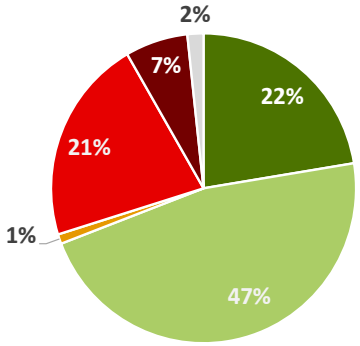
## NEIGHBORHOOD-WIDE SIDEWALK SURVEY

Montrose residents are well aware that the sidewalks in their neighborhood need to be repaired, replaced, or built for the first time. To grasp the extent of sidewalk need, the Plan includes an assessment of all 120 miles of sidewalks in the Study Area. The assessment rated sidewalk condition at the parcel level. Each parcel's condition score is based on sidewalk width (greater or less than 5 feet) and whether or not the sidewalk is flat, broken, or non-existent.

As shown by Conditions A and B in **Figure E.3**, nearly 70% of all sidewalk parcels in Montrose are traversable. However, when looking at the length of a full block, less than 40% are traversable, with only 10% meeting minimum 5-feet standards (see those blocks mapped in **Figure E.4**).

## SIDEWALK CONDITION

### BY PARCEL, 69% IN GOOD CONDITION




### BY BLOCK, 38% IN GOOD CONDITION

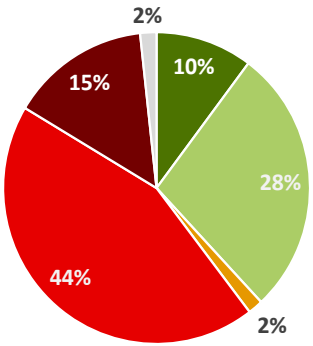



figure E.3 Comparing Parcel and Block Condition by Linear Feet

- A: Flat - 5'+
- B: Flat - Less than 5'
- C: Poor Condition - 5'+
- D: Poor Condition - Less than 5'
- E: No Sidewalk Present
- Under Construction

*Source: Team Analysis, 2019*

## SIDEWALK CONDITION BY BLOCK

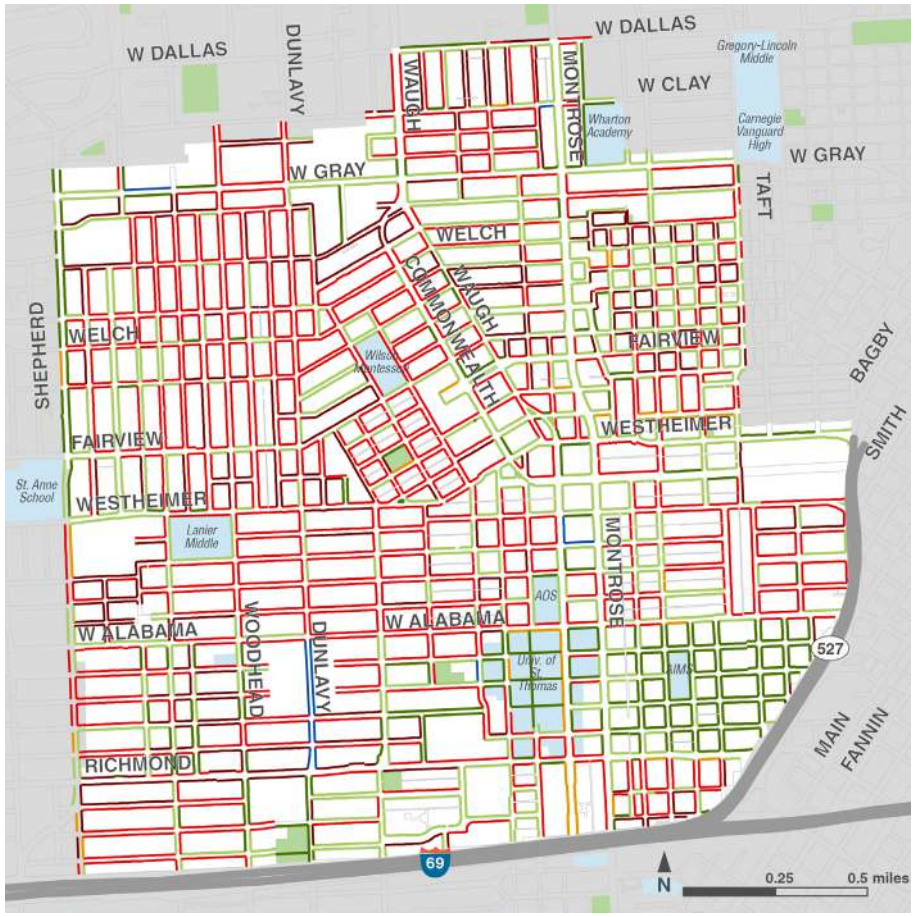



figure E.4 Sidewalk Condition by Block

- Flat - 5'+
- Flat - Less than 5'
- Poor Condition - 5'+
- Poor Condition - Less than 5'
- No Sidewalk Present
- Under Construction
- Highway
- Study Area
- School
- Park

*Source: Team Analysis, 2019*

## PRIORITIZATION METHODOLOGY

In addition to the condition analysis, the Plan includes an assessment of construction feasibility for new sidewalks, and a network analysis showing the importance of each sidewalk segment based on its proximity to neighborhood destinations like schools, grocery stores, and parks.

Combined with the known projects by the TIRZ and other entities in the Study Area, these three inputs offer a powerful tool to prioritize sidewalk improvements and allow the TIRZ to stitch together a coherent strategy for investment (see **Figure E.5**).

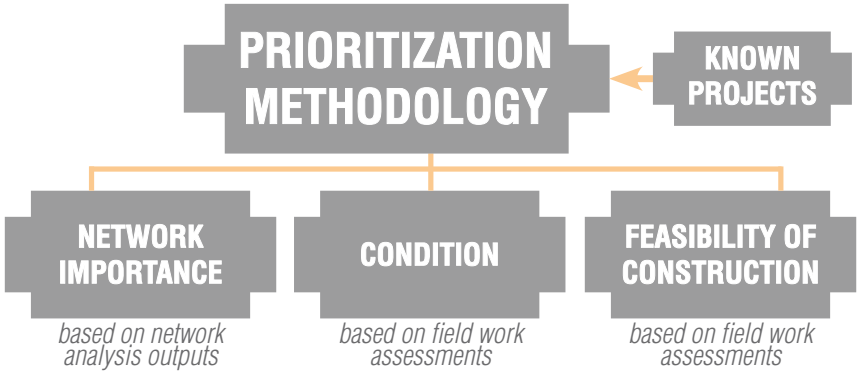



figure E.5 Sidewalk Project Prioritization Methodology

## PRIORITIZING PROJECTS TO IMPROVE WALKABILITY

The Plan identifies nine projects that come from this prioritization methodology. The projects are designed to create greater access for schools and transit routes serving residents and visitors to Montrose. All nine can serve as standalone projects, or be incorporated into other investments like bikeways, drainage improvements, private developer agreements, etc (see **Table E.2**). Project details can be found in **Table E.4** on page 15.

Regardless of their structure, the TIRZ will make a meaningful impact on walkability by investing in these projects (see **Figure E.6**).

| Safe School Access Projects |
|---|
| Wilson Montessori School |
| Wharton Dual Language Academy |
| Lanier Middle School |

| Safe Transit Access Projects | |
|---|---|
| Westheimer Road | West Gray Street |
| Richmond Avenue | West Dallas Street |
| Montrose Boulevard | Shepherd Drive |

table E.2 Short Term Access Projects

## TIRZ PROJECT IMPACT

COMPLETE BLOCKS WITH SIDEWALKS 5'+ AND IN GOOD CONDITION

*Analysis assumes (1) Replacement of sidewalks not rated as "A" condition; (2) Every project includes sidewalk replacement; (3) Each set of projects builds from left to right*

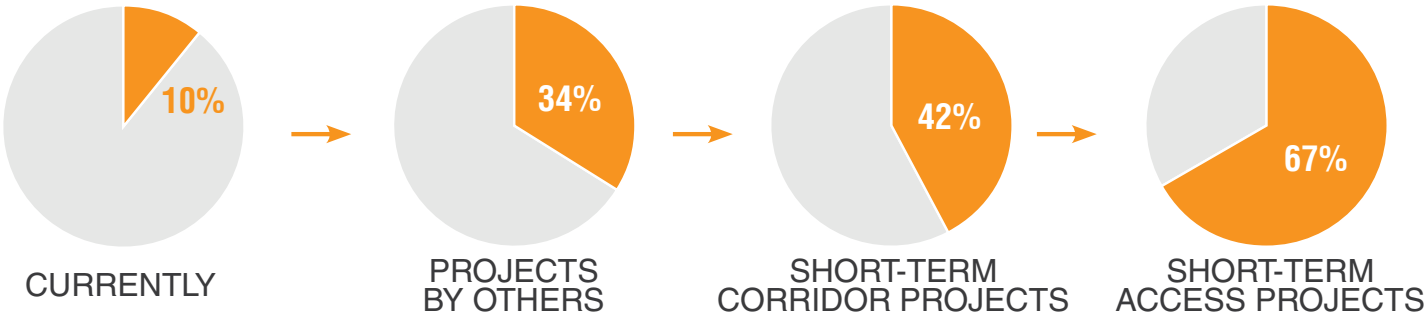



figure E.6 Impact of Sidewalk Projects on Block Condition

# BIKE MONTROSE

## A MONTROSE BIKE NETWORK FOR ALL

For Montrose to be a true 20-minute neighborhood, people biking need safe ways to move around the Study Area. The best way to achieve that safety is to build a full bikeway network that allows for easy connections to all parts of the neighborhood.

Well-designed bikeways should be built to serve all bicyclists – regardless of skill level, age, ability, or comfort level (see **Figure E.7**). When thinking through the design of Montrose's bikeway network, the TIRZ can follow the principles of All Ages and Abilities (AAA) from the National Association of City Transportation Officials (NACTO). AAA design guidance can help the TIRZ identify the appropriate bikeway facility depending on the amount of right-of-way available on a street, the typical vehicle speeds, and vehicle volumes.

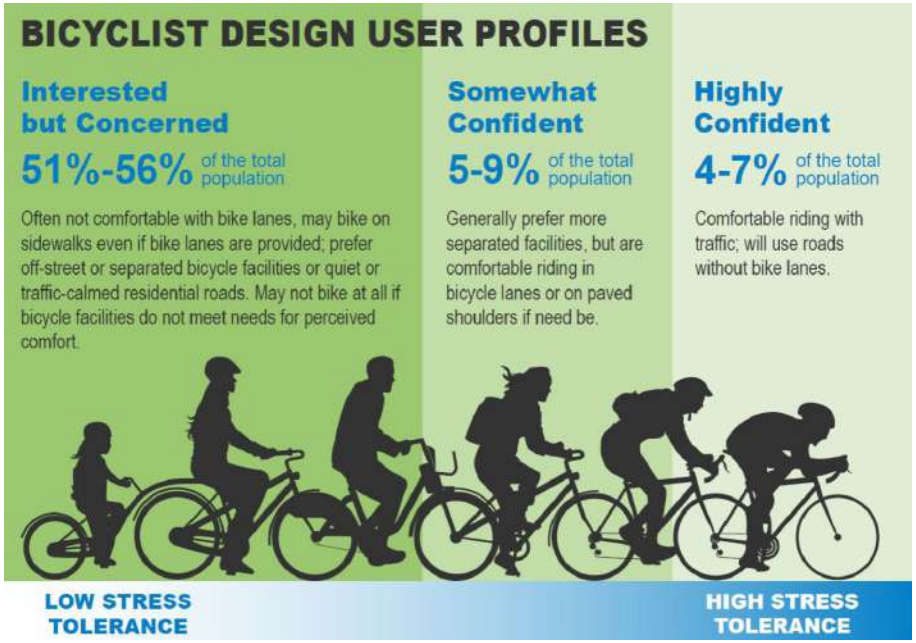



figure E.7 Bicyclist Design User Profiles

*Note: Percentages only reflect adults who have a stated interest in bicycling. Source: Federal Highway Administration Bikeway Selection Design Guide*

## BIKEWAY FACILITY TYPES

Following AAA guidance, the Plan recommends bikeway facility types that correspond to the condition of the roadway. This means that high-vehicle speed, high-vehicle volume streets may need a separated bikeway facility while narrower neighborhood streets may do better with investments that keep speeds low, like speed humps or mini-traffic circles.

The Plan recommends four bikeway types for Montrose, each tailored to fit a different type of street in the Study Area: (1) Neighborhood Safe Streets, (2) Dedicated On-Street Bikeways, (3) Off-Street Bikeways, and (4) Walking Priority Streets.

### Neighborhood Safe Streets

Streets where bikes and cars share the road, with improvements that slow vehicle speeds like crosswalk markings, curb extensions, mini-traffic circles, and traffic diverters.

### Dedicated On-Street Bikeways

Streets with a dedicated bike lane, often protected from vehicle traffic and with green conflict markings at driveways and intersections.

### Off-Street Bikeways

Wide paths behind the street curb, often shared with people walking. Typically located in places with high foot traffic.

### Walking Priority Streets

Streets with wide sidewalks, high-quality transit stops, generous shade and lighting, seating, and end-of-trip facilities like bike parking that make it easier for people walking and biking.

## PRIORITY AND VISION NETWORKS

This Plan proposes a network concept with connected north-south and east-west bikeways (see **Figure E.8**) that fit into one of the four facility type recommendations.

The recommended network build-out occurs in two phases totaling 22 projects (see **Table E.2**). The first phase, or the Priority Network (bolded in **Table E.2**) establishes a core matrix of bikeway spines to be built in existing right-of-way in the short term. The second phase, or Vision Network, adds connections, expanding access to more parts of Montrose. Project details can be found in **Table E.3** on page 14.

Once complete, these two phases would put 99% of all Montrose residents within a quarter mile of the high-comfort network.

## SHORT-TERM CORRIDOR PROJECTS **Priority in Bold**

| | |
|---|---|
| **Neighborhood Safe Streets** | |
| **Hawthorne Street** | West Clay Street |
| **Woodhead Street** | Taft Street |
| **Stanford Street** | Lovett Boulevard |
| **Welch Street** | Graustark Street |
| West Main Street | Harold Street |
| **Dedicated On-Street Bikeways** | |
| *Waugh + Commonwealth (in design)* | Fairview Street |
| **Mandell Street** | West Gray Street (E of Waugh) |
| **West Dallas Street** | |
| **Walking Priority Streets** | |
| Westheimer Road | Dunlavy Street |
| Montrose Boulevard | West Gray Street (W of Waugh) |
| Richmond Avenue | Shepherd Drive |
| **Off-Street Bikeways** | |
| Montrose Boulevard | |

table E.2 Short-Term Corridor Projects

## MONTROSE PRIORITY + VISION BIKEWAY NETWORK

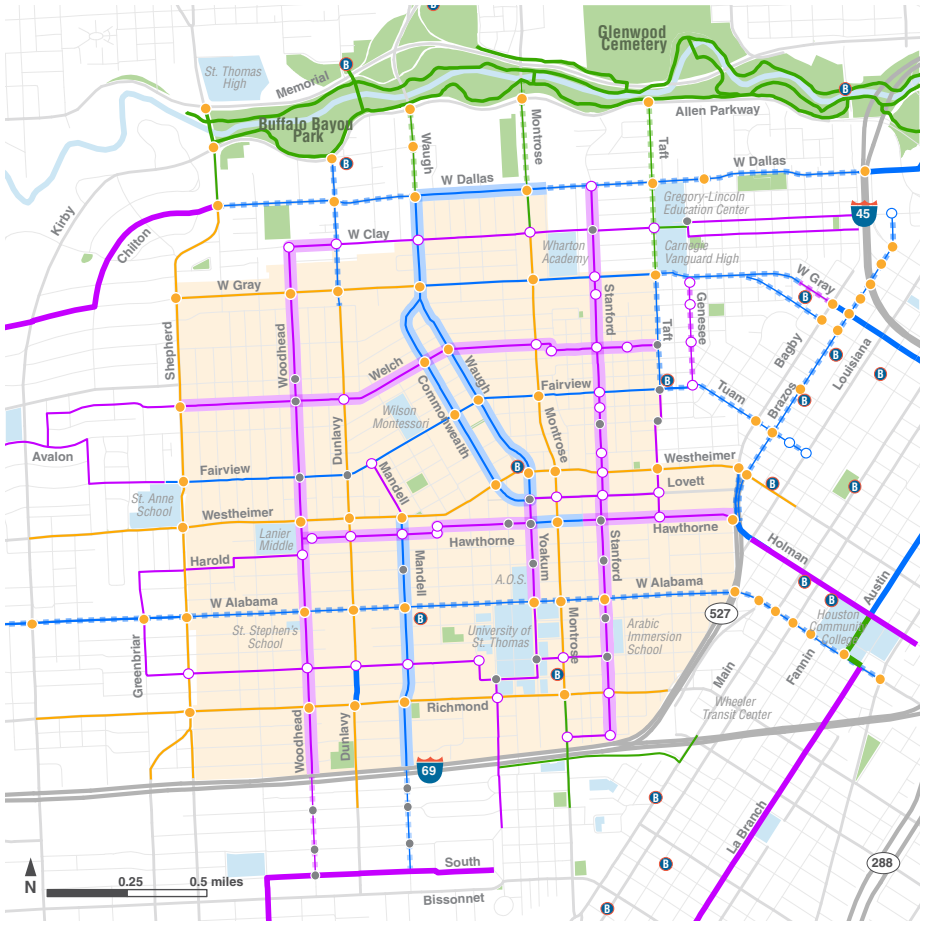



figure E.8 Priority and Vision Bikeway Network

**Facility Type**

- Dedicated On-Street
- Neighborhood Safe Street
- Off-Street
- Walking Priority Streets

Existing / Vision / Priority / By Others

- Signalized Intersection
- Stop-Contr. Intersection (All-Way)
- Stop-Contr. Intersection (Minor Street)
- Roadway
- Study Area
- Park
- School
- Buffalo Bayou
- Houston BCycle Station

*Source: Team Analysis, 2019*

# ACTION PLAN

## TOOLBOX

To build the 20-minute neighborhood infrastructure that Montrose deserves, the TIRZ will need to employ a range of tools for both funding and implementation.

The Implementation Toolbox includes the ability to form partnerships to co-lead, to take a Do-It-Yourself approach for projects the TIRZ wants to lead, or to serve in an advisory role for projects led by others.

The Funding Toolbox includes full funding from the TIRZ coffers, grant opportunities, and funding by other entities in the Study Area.




## IMPLEMENTATION TOOLS

**Key Partnerships**

**Do-It-Yourself**

**Projects by Others**

## FUNDING TOOLS

**TIRZ Budget & Bonds**

**Grant Opportunities**

**Funded by Others**

## RECOMMENDATION CATEGORIES

Plan recommendations fall into four different categories depending on the nature of the improvement. The projects cover all parts of the neighborhood, as shown in **Figure E.9**.

### PROJECTS BY OTHERS

Planned or programmed investments that will occur in the short-term, but are led by other entities. For these investments, the TIRZ can play a critical advisory role.

### SHORT-TERM PROJECTS

Projects that the TIRZ can lead within the next 2 to 5 years, are feasible within the existing right-of-way of the street, and will have a noticeable community impact.

### LONG-TERM PROJECTS

Investments requiring a more involved planning process over a longer period of time. These projects are often for larger streets needing wholesale reconstruction.

### PROGRAMS + POLICIES

Non-capital investments engaging residents and business-es. These are often multi-year efforts that ensure TIRZ improvements are well-received in the community.

## INTEGRATED NETWORK

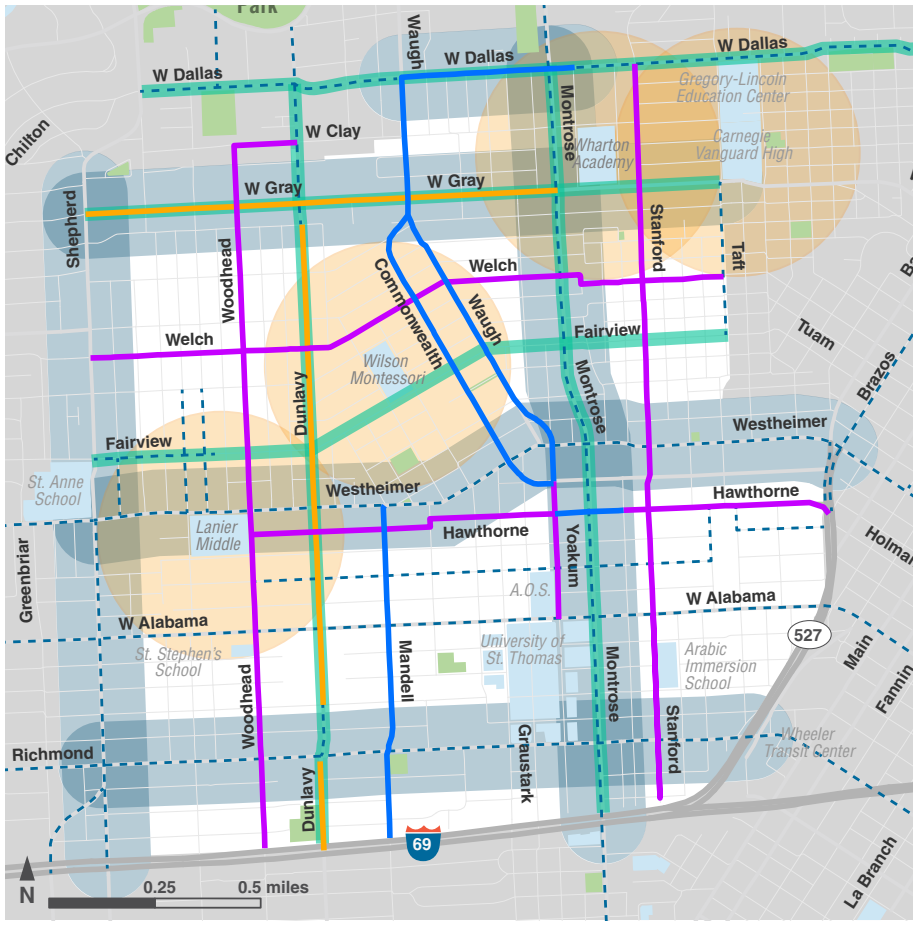



figure E.9 Coverage of *Walk+Bike Montrose* Plan Recommendations

**Short-Term Projects**
- Neighborhood Safe Street
- Dedicated On-Street Bikeway
- Walkable Street Retrofit
- Safe School Access
- Safe Transit Access

**Long Term Projects**

**Projects by Others**

- Roadway
- Study Area
- School
- Park
- Buffalo Bayou

*Source: Team Analysis, 2019*

# SHORT-TERM CORRIDOR PROJECTS

| | DESCRIPTION & BENEFIT | NETWORK IMPORTANCE<br>Tier 1 = most important | COST ESTIMATE* | IMPLEMENTATION & FUNDING | POTENTIAL PARTNERS |
|---|---|---|---|---|---|
| **Neighborhood Safe Streets \|** Intersection and roadway improvements to prevent vehicle speeding and improve safety for people walking and biking including new sidewalks, reconstructed curb ramps, crosswalk markings, curb extensions, speed humps, mini traffic circles, traffic diverters, and wayfinding designed for people walking and biking. | | | | | |
| 1 **Hawthorne Street**<br>1.35 miles | • 2.40 miles of improved sidewalk<br>• 86 improved curb ramps | 8.6 Tier 1 | $1,788,000 | | • County<br>• City |
| 2 **Woodhead Street**<br>1.79 miles | • 2.31 miles of improved sidewalk<br>• 80 improved curb ramps | 6.0 Tier 3 | $2,507,000 | | • County<br>• City |
| 3 **Stanford Street**<br>1.71 miles | • 1.86 miles of improved sidewalk<br>• 117 improved curb ramps | 7.9 Tier 2 | $1,802,000 | | • County<br>• City |
| 4 **Welch Street**<br>1.55 miles | • 2.50 miles of improved sidewalk<br>• 115 improved curb ramps | 5.5 Tier 3 | $2,134,000 | | • County<br>• City |
| **Dedicated On-Street Bikeways \|** New buffered/protected bike lanes with green conflict markings at driveways and intersections, improvements for safe crossings such as leading bicycle and pedestrian signals and protected turns. Improvements also include updated sidewalks and curb ramps. | | | | | |
| 5 **West Dallas Street**<br>0.42 miles | • Connect to programmed bikeway<br>• 0.52 miles of improved sidewalk<br>• 59 improved curb ramps | N/A; prioritized based on partnerships | $395,000 | | • County<br>• City<br>• METRO |
| 6 **Mandell Street**<br>0.78 miles | • 1.14 miles of improved sidewalk<br>• 44 improved curb ramps | 7.4 Tier 2 | $1,186,000 | | • County<br>• City |
| 7 ***Waugh and Commonwealth***<br>*1.16 miles (Currently in Design)* | • 2.60 miles of improved sidewalk<br>• 163 improved curb ramps | 8.3 Tier 1 | $2,589,000 | | • County<br>• City |
| **Walkable Street Retrofits \|** Interim design improvements to reduce and prevent speeding and improve safety for people walking such as updated sidewalks and curb ramps, curb extensions, crosswalk markings, formalized parking, and vehicle lane re-striping. | | | | | |
| 8 **Dunlavy Street**<br>1.34 miles (south of Peden Street) | • 1.69 miles of improved sidewalk<br>• 122 improved curb ramps | 7.3 Tier 2 | $1,063,000 | | • City<br>• Residents |
| 9 **West Gray Street**<br>1.13 miles | • 1.69 miles of improved sidewalk<br>• 62 improved curb ramps | 7.9 Tier 2 | $889,000 | | • City<br>• METRO |

*Cost estimates are rounded up to the nearest $1,000.

table E.3 Short-Term Corridor Projects

# SHORT-TERM ACCESS PROJECTS

| | DESCRIPTION & BENEFIT | NETWORK IMPORTANCE<br>Tier 1 = most important | COST ESTIMATE* | IMPLEMENTATION & FUNDING | POTENTIAL PARTNERS |
|---|---|---|---|---|---|
| **Safe School Access \|** Improvements near schools including updated sidewalks and curb ramps, new crosswalk markings, curb extensions, and additional intersection treatments like leading pedestrian signals where applicable. Improvements can be split and combined with other projects. | | | | | |
| 10 **Wilson Montessori School** | • 4.34 miles of improved sidewalk<br>• 201 improved curb ramps | 5.9 Tier 3 | $2,071,000 | | • County<br>• City<br>• Residents |
| 11 **Wharton Dual Language Academy** | • 2.85 miles of improved sidewalk<br>• 128 improved curb ramps | 6.3 Tier 3 | $1,334,000 | | • County<br>• City<br>• Residents |
| 12 **Lanier Middle School** | • 4.42 miles of improved sidewalk<br>• 152 improved curb ramps | 8.2 Tier 1 | $1,964,000 | | • County<br>• City<br>• Residents |
| 13 **Carnegie Vanguard High School** | • 1.23 miles of improved sidewalk<br>• 56 improved curb ramps | Network importance score not calculated due to proximity to TIRZ boundary edge | $606,000 | | • County<br>• City<br>• Residents |
| **Safe Transit Access \|** Improvements for streets intersecting transit routes including updated sidewalks and curb ramps, new crosswalk markings, curb extensions, and additional intersection treatments like leading pedestrian signals. Improvements can be split and combined with other projects. | | | | | |
| 14 **Westheimer Road** | • 8.86 miles of improved sidewalk<br>• 606 improved curb ramps | 9.8 Tier 1 | $4,703,000 | | • County<br>• City<br>• METRO |
| 15 **Richmond Avenue** | • 5.83 miles of improved sidewalk<br>• 383 improved curb ramps | 6.3 Tier 3 | $3,080,000 | | • County<br>• City<br>• METRO |
| 16 **Montrose Boulevard** | • 10.01 miles of improved sidewalk<br>• 666 improved curb ramps | 8.1 Tier 1 | $5,261,000 | | • County<br>• City<br>• METRO |
| 17 **West Gray Street** | • 6.27 miles of improved sidewalk<br>• 380 improved curb ramps | 7.0 Tier 2 | $3,215,000 | | • County<br>• City<br>• METRO |
| 18 **West Dallas Street** | • 2.13 miles of improved sidewalk<br>• 108 improved curb ramps | 5.6 Tier 3 | $1,045,000 | | • County<br>• City<br>• METRO |
| 19 **Shepherd Drive** | • 6.00 miles of improved sidewalk<br>• 309 improved curb ramps | 9.1 Tier 1 | $2,930,000 | | • County<br>• City<br>• METRO |

**Cost estimates are rounded up to the nearest $1,000.*

table E.4 Short-Term Access Projects



# chapter 1

# INTRODUCTION



# ABOUT MONTROSE

## The Cultural Heart of Houston

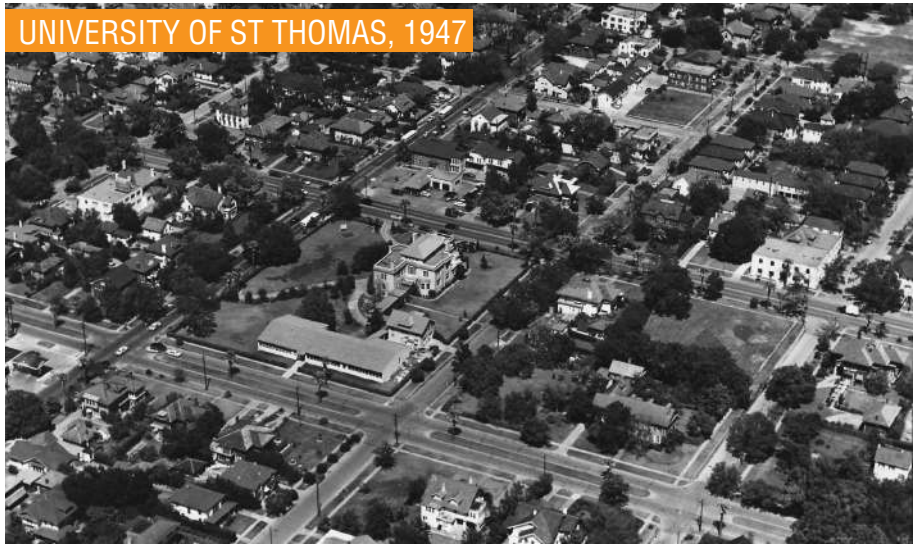
Montrose is the cultural heart of Houston. Home to a vibrant mix of people and places, Montrose has always welcomed those looking for the unique and non-conventional. The character of the neighborhood has been a driver of its history from a street car suburb in the 1910s to the center of Houston's LGBTQ+ community in the 1980s and 1990s. In 1973, Texas Monthly described Montrose as the "strangest neighborhood east of the Pecos." Today, Montrose, maintaining ties to its history, has continued to be a center for Houston's art scene, food scene, music, and nightlife. An enduring legacy central to Houston.

As one of Houston's oldest neighborhoods, Montrose's street grid provides a robust network of varying roadway types, from slow neighborhood streets to bustling boulevards. Along these streets are historical mansions from the 1920s, small bungalows, towering townhomes, affordable quadplexes, laundromats, coffee shops, dive bars, and some of Houston's highest rated restaurants.

From the beginning, it has been a place where residents can find most daily needs within a 20-minute walk. The history and location of the neighborhood has attracted new development, but current infrastructure does not meet the needs of residents. The tight street grid, a design neighborhoods across the country are trying to replicate, provides the basis of a walkable and bikeable neighborhood. On any day, sun shining or pouring rain, people are getting around on foot or on bike. Yet many residents are out-and-about not because of the infrastructure within Montrose, but despite it. Crumbling sidewalks, missing curb ramps, and a lack of safe bikeways may not hinder some Montrose residents, but it keeps many people from getting out into the neighborhood and limits the full potential of Montrose as a full 20-minute neighborhood.

*Walk+Bike Montrose* was developed to create an Action Plan for the community to define the projects, programs, and policies that meet the needs of residents today and into the future. By providing safe, comfortable, and high-quality walking and biking facilities with access to good transit, the infrastructure of Montrose can support the needs of the community and continue to be a thriving neighborhood where everything one needs is within one short 20-minute walk or bike.

UNIVERSITY OF ST THOMAS, 1947

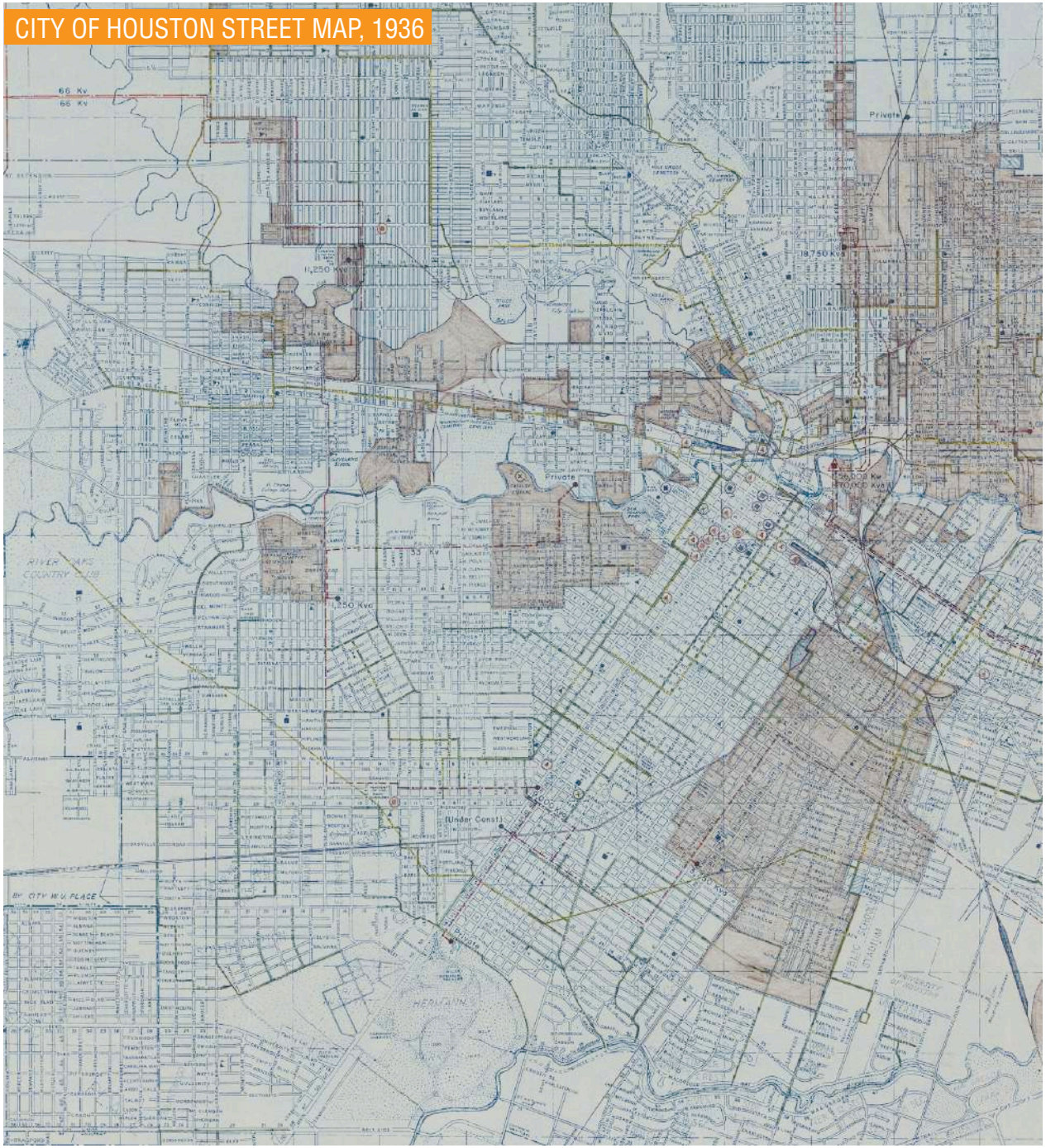


*Source: University of St. Thomas*

MARY'S BAR DURING THE 25TH GAY PRIDE PARADE, 2003




*Source: Houston Chronicle*

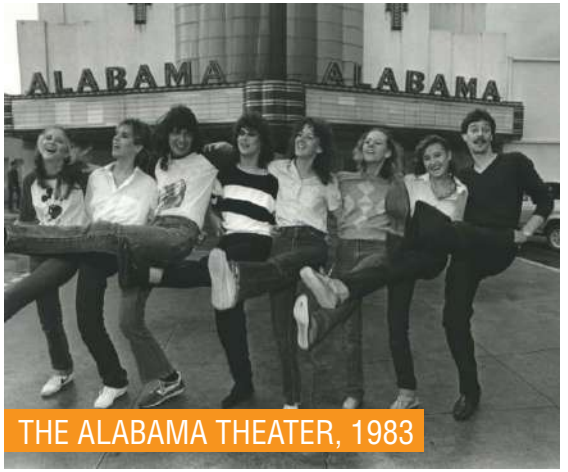


CITY OF HOUSTON STREET MAP, 1936

*Source: University of Houston*




THE WESTHEIMER CURVE




THE ALABAMA THEATER, 1983



THE RED HOT CHILI PEPPERS AT NUMBERS, 1984

*Source for all: Houston Chronicle*

To best understand the community, a detailed assessment of residents, land use, and existing transportation networks was conducted. The detailed assessments are included in The Factbook in *Appendix A*.

## RESIDENTS OF MONTROSE

Montrose is a demographically diverse area with characteristics unlike other neighborhoods in Houston. When compared to the rest of the City, Montrose has a smaller average household size and a slightly lower rate of renters, as shown in **Table 1.1** and **Figure 1.1**. However, some of the biggest differences between Montrose and Houston as a whole are in age, education, and income.

**AGE** A much lower percentage of children under the age of 21 live in Montrose. This is counterbalanced by the higher-than-average portion of Millennials and people over the age of 50 in the neighborhood.

**EDUCATION** Montrose residents tend to have more background in formal education with over two-thirds receiving either a bachelor's or graduate degree. The high percentage of the population with upper-level degrees likely correlates to the large portion of Montrose residents who make over $125,000 per year.

**INCOME** Montrose has about half the poverty rate of the City of Houston. The income of residents has been steadily increasing over the past two decades and leads to questions of affordability and opportunities for life cycle housing within the community.

**MOBILITY** Montrose residents have similar rates of car ownership to the City of Houston, although there are more households in Montrose that only own one vehicle; a likely cause may be the smaller household size and the prevalence of younger adults living alone. Compared to the city as a whole, a smaller portion of Montrose residents drive to work, while a larger portion work from home. Census data also show a larger portion of Montrose residents walking to work, but a smaller percentage using transit. The Census only counts work commutes, so residents are likely walking and biking for other trips, too.

Montrose residents enjoy much shorter travel times to work, likely due to the neighborhood's central location between major employment centers. Around 17% of residents in the neighborhood get to work within 10 minutes, while an additional 39% take fewer than 20 minutes for their commute.

## LOCATION AND LAND USES

Montrose is located west of Downtown Houston within the inner west loop. Montrose contains a healthy mix of residential, commercial and civic uses. Commercial uses are primarily located along busy thoroughfares and major collectors. Single family residential is concentrated along narrower, shorter, local streets.

Historically, single-family residential was primarily small bungalow-style homes. Today, higher density townhomes with two to four homes per lot are more prevalent, increasing residential density. Montrose has a variety of multi-family development types, including duplexes, quadplexes, older garden style apartments, and large mid-rise apartment complexes. The mix of residential housing types makes Montrose one of the densest neighborhoods in Houston, with population per square mile varying from 12,000 to 15,000 depending on location. The Houston average is 3,000 persons per square mile.

Montrose is home to many schools, public and private, along with the University of St. Thomas. The Menil Campus, with multiple museum buildings, is also a central part of the Montrose neighborhood.

## MONTROSE MOBILITY & TRANSPORTATION NETWORKS

Montrose has a robust transit network with several local routes crossing the neighborhood on major corridors and connecting to major destinations across the county. Although a smaller percent of Montrose workers get to work via transit, residents still use METRO's routes regularly. Within the Study Area, transit riders board and disembark buses along Westheimer Road over 3,000 times a day and Montrose Boulevard over 2,400 times. The Factbook in *Appendix A* includes detailed transit data for the community.

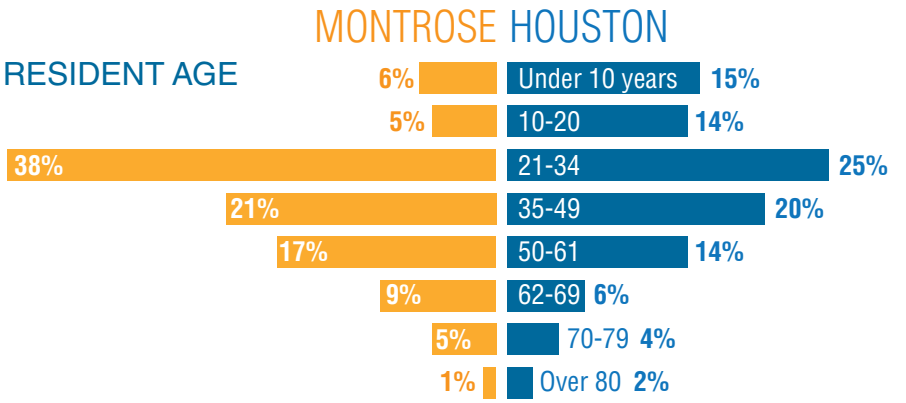
The prevalence of shorter trips in Montrose is not just true for work trips, indicated in the U.S. Census data. Data from the Houston-Galveston Area Council (H-GAC) show that half of all trips originating in Montrose are for distances less than three miles. This includes 10% of all trips that are within one mile. In the City of Houston at-large, only one-third of all trips are less than 3 miles.

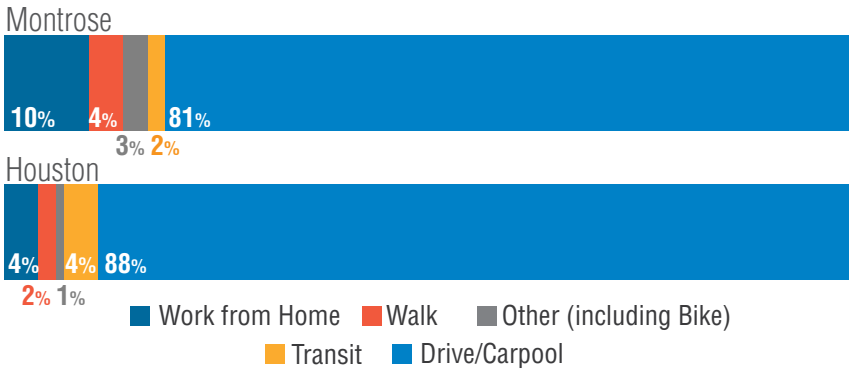
Improvements to sidewalks and bikeways in Montrose will have an oversized impact on residents taking short trips for daily tasks or visitors exploring the city. With the right investments, Montrose is poised to be Houston's most walkable and bikeable neighborhood.

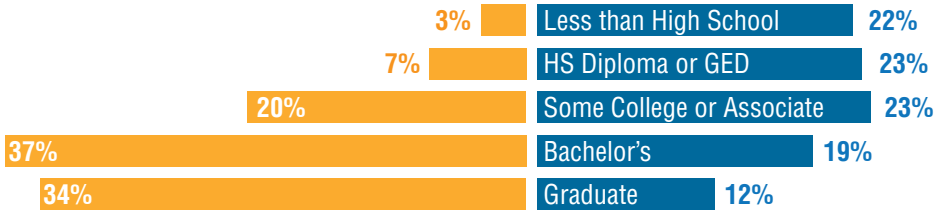
# RESIDENTS OF MONTROSE

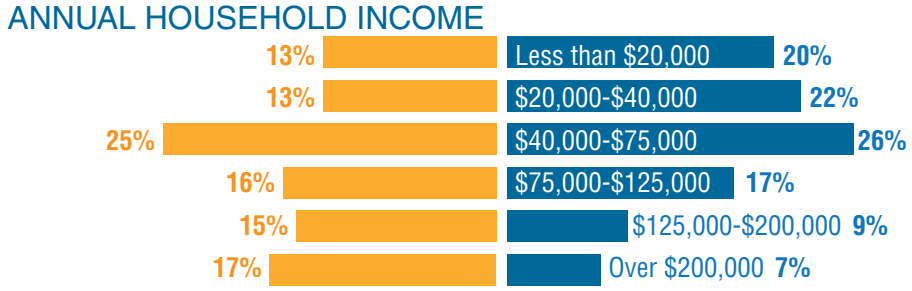
| MONTROSE | HOUSTON | |
|---|---|---|
| 23,220 | 2,267,336 | Population |
| 13,185 | 838,950 | Households |
| 1.8 | 2.7 | Average Household Size |
| 10% | 11% | Housing Vacancy |
| 49% | 57% | Renter-Occupied Households |
| 10% | 18% | Households in Poverty |

table 1.1 Demographic Summary from Factbook *Source: US Census, 2018*




*Source: U.S. Census Bureau*

figure 1.1 Demographic Summary from Factbook *Source: US Census*

# ABOUT TIRZ 27

## An Avenue for Increased Investment in Montrose

### CREATION

The Montrose Tax Increment Reinvestment Zone (TIRZ 27, or the TIRZ) was established by the City of Houston in November 2015 as a way to attract new investment into the community. Taxes attributable to the new improvements (tax increments) are set aside to finance public improvements within the boundaries of the zone over a 30-year period. These investments by the TIRZ can include capital projects such as streets, drainage, water, parks and public facilities, streetscape (sidewalks, lighting, landscaping), parking facilities, affordable housing, and economic development.

The coverage of TIRZ 27 must be at least 70% non-residential parcels, which produces the grid-like, or window-pane boundary seen on the map in **Figure 1.2**. The TIRZ can also invest in surrounding areas as long as investments improve the overall value of the TIRZ. Therefore, the Study Area for this project includes the areas encapsulated within the window-pane boundary of the TIRZ. For the purposes of this report, Montrose refers to the Study Area outlined by the dash in **Figure 1.2**.

### PROJECT PLAN & GOALS

Every TIRZ must develop a Project Plan to guide investment and every capital project on the Capital Improvement Plan must relate to this Project Plan. The Project Plan establishes the project priorities of the TIRZ by general categories. TIRZ 27 has five goals within their project plan, shown to the right. Only projects that align with the Project Plan can be implemented through the Capital Improvement Plan for the TIRZ. Projects identified through this *Walk+Bike Montrose* planning effort are in step with these five goals.

Since its creation, the TIRZ board has put an emphasis on balancing long-term planning with effective, impactful short-term projects to be constructed as soon as possible. This Plan, *Walk+Bike Montrose*, was developed with that balance in mind. It is also intended to complement additional planning efforts currently underway like the *Montrose Livable Center Study* and the *Montrose Area Drainage Study*.

### FIVE GOALS OF THE TIRZ 27 PROJECT PLAN

1. Enhance local parking opportunities and the associated pedestrian friendly environment
2. Stimulate economic development and growth through the development of vacant sites and redevelopment of older areas
3. Develop and enhance open space, parks, plazas, recreational amenities, cultural facilities, and other similar improvements within the zone
4. Facilitate development and redevelopment of affordable housing in the zone
5. Enhance the Montrose transportation network and promote mode choice

# TIRZ BOUNDARY & PROJECT STUDY AREA




figure 1.2 TIRZ and Study Area Boundary

*Source: Team Analysis, 2019*

# BUILDING A BETTER MONTROSE

## To Support People Walking and Biking along Safe and Attractive Streets

### THE *WALK+BIKE MONTROSE* PLAN

The *Walk+Bike Montrose* Plan includes detailed baseline conditions for the TIRZ and creates an Action Plan to identify both short-term and long-term investments to enhance and improve mobility within the neighborhood for people walking, biking, and riding transit.

#### BASELINE DATA COLLECTION & ANALYSIS

The detailed assessment of Montrose residents and their travel behaviors can be found in the Factbook in *Appendix A*. The Factbook includes: socio-economic data, commute characteristics, journey to work analyses, transit assessment, roadway network review, a road log of key corridors, land uses and land value assessments, and other key factors that are an input into creating a detailed Action Plan.

Baseline data collection included a thorough assessment of all roadways and sidewalks within Montrose. All sidewalks within Montrose were walked and assessed, totaling almost 120 miles. The data collection process and insights of the sidewalk assessment are included within *Chapter 3, Walk Montrose*.

Some residential streets in the neighborhood are already safe and comfortable places to bicycle. However, the current infrastructure is not sufficient to create a fully connected and safe network for people biking. *Chapter 4, Bike Montrose* details the existing state of the community's bikeways, and offers both a short-term priority network and a long-term vision network using best practices in bikeway design.

#### THE ACTION PLAN

The *Action Plan, Chapter 5* gives the TIRZ implementation and funding tools, along with a list of recommended short-term and long-term projects to build out safe and comfortable walking and biking networks. 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.

### A 20-MINUTE NEIGHBORHOOD

20-minute neighborhoods are places where residents have easy, convenient access to their daily needs, including grocery stores, restaurants, schools, and parks, without relying on a car. These neighborhoods are characterized by a vibrant mix of commercial and residential land uses and a wide range of mobility options. These qualities make places like Montrose desirable places to live and work.

Montrose has been a 20-minute neighborhood from its beginnings. However, the existing infrastructure makes many neighborhood trips within Montrose fragmented and dangerous. Crumbling sidewalks and pavement present challenges for those walking, bicycling, pushing a stroller, or using assistive devices like a wheelchair. An evening walk down a typical Montrose street can be difficult, even for people without mobility challenges.

Montrose needs infrastructure that makes walking and bicycling to local destinations easy and safe. Mobility choice should be encouraged by providing good and connected networks of sidewalks and bikeways.

The maps and tables in **Figure 1.3** show the distances accessible within a 20-minute walk and a 20-minute bike ride, if a person is not constrained by barriers. The Action Plan developed in this report is intended to remove those barriers by creating new, safe, and enjoyable connections throughout the neighborhood.



*Broken sidewalks creating barriers on Windsor Street in the Cherryhurst area*

# A 20-MINUTE WALK & RIDE

| | 5 MINUTES | 10 MINUTES | 20 MINUTES |
|---|---|---|---|
| WALK | 0.25 miles | 0.5 miles | 1 mile |

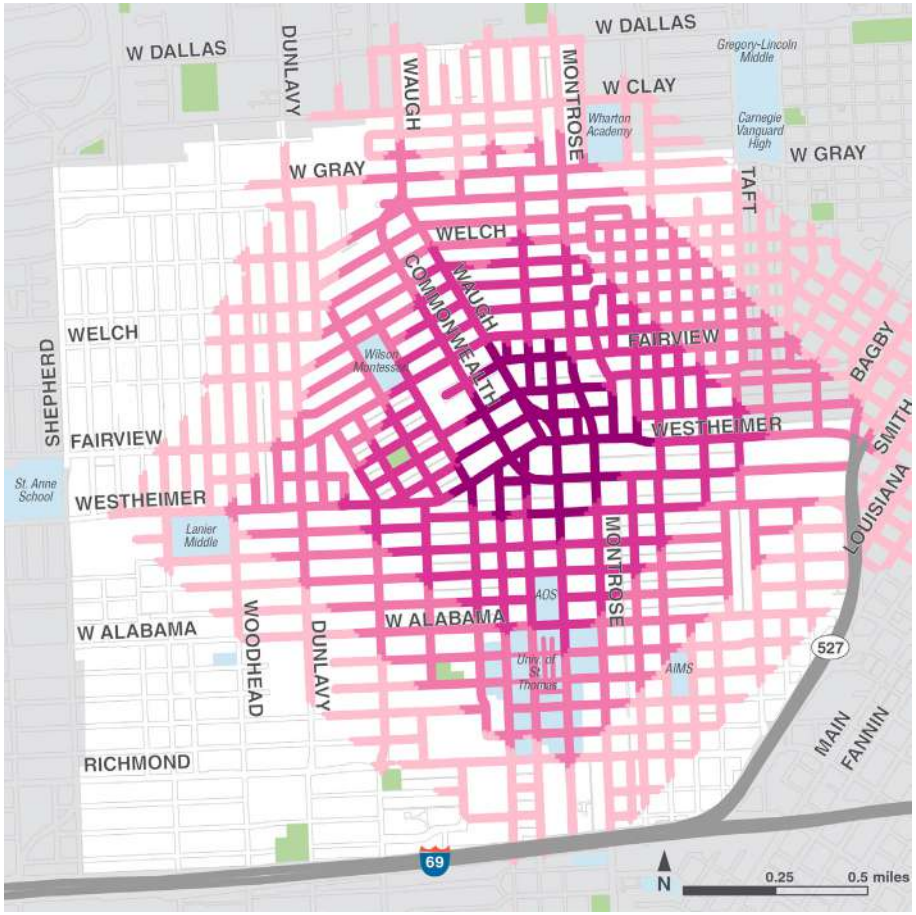



figure 1.3 Walkshed from the Westheimer Road at Waugh Drive intersection

- 0-5 Minutes
- 5-10 Minutes
- 10-15 Minutes
- 15-20 Minutes
- Highway
- Study Area
- School
- Park

*Source: Team Analysis, 2019*

| | 5 MINUTES | 10 MINUTES | 20 MINUTES |
|---|---|---|---|
| BIKE | 1 mile | 2 miles | 4 miles |

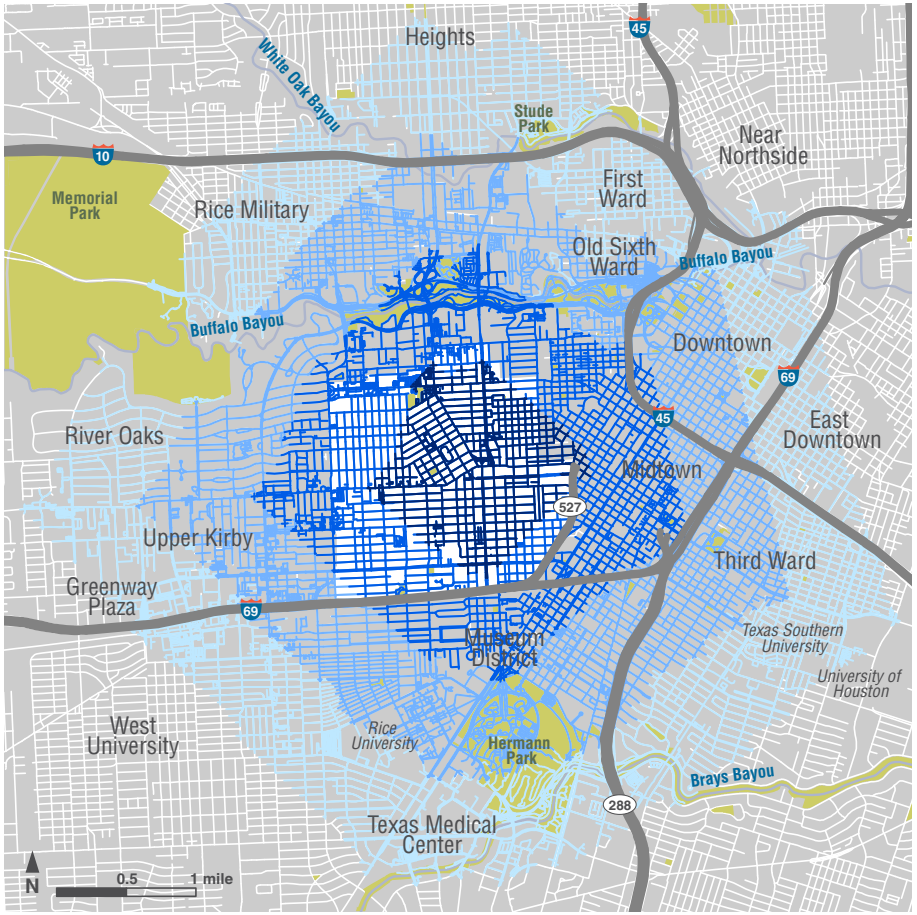



figure 1.4 Bikeshed from the Westheimer Road at Waugh Drive intersection

- 0-5 Minutes
- 5-10 Minutes
- 10-15 Minutes
- 15-20 Minutes
- Highway
- Study Area
- Park

*Source: Team Analysis, 2020*





# chapter 2

# CASE FOR ACTION

# MONTROSE HAS THE FOUNDATION OF A 20-MINUTE NEIGHBORHOOD

## A 20-MINUTE NEIGHBORHOOD ALLOWS A DIVERSE GROUP OF PEOPLE TO EASILY ACCESS ALL THEIR DAILY NEEDS USING A SAFE AND CONNECTED STREET GRID.



# FOUR PILLARS OF A 20-MINUTE NEIGHBORHOOD

Montrose has a mix of destinations and a connected street grid that lets residents meet their daily needs primarily through walking and biking. It is the type of development pattern coveted by communities across the country. Still, Montrose and the TIRZ can do more to build upon that foundation and ensure that mobility and access are not hindered by unsafe conditions. To be a great 20-minute neighborhood, Montrose must be Safe, Connected, Affordable, and with a commitment to an Enduring legacy for current and future residents of this historic community.

1. **SAFE** places for people to move around
2. **CONNECTED** network that offers many choices
3. **AFFORDABLE** for many people
4. **ENDURING** livability that embraces history







# SAFE PLACES FOR PEOPLE TO MOVE AROUND

1

## RESIDENTS AND VISITORS SHOULD FEEL SAFE TRAVELING AROUND MONTROSE, WHETHER THEY CHOOSE TO WALK, BIKE, RIDE TRANSIT, OR DRIVE.

Between 2014 and 2018, over 3,700 crashes in the neighborhood resulted in 6 deaths and 51 serious injuries (see **Figure 2.1**). Crash hot spots show intersections and corridors where vehicle speeds and volumes are high. Combined with the lack of traversable sidewalks and high-comfort bikeways, 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. As a result, more people may prefer driving, increasing the number of cars on the road and exacerbating safety issues. Some residents may decide to stay at home instead of walking or biking to local businesses for dinner, entertainment, or other daily tasks. The TIRZ can set high standards for new infrastructure that prioritizes safety and comfort over high speeds, affirming Montrose as a 20-minute neighborhood.










# CRASHES INVOLVING PEOPLE WALKING AND BIKING

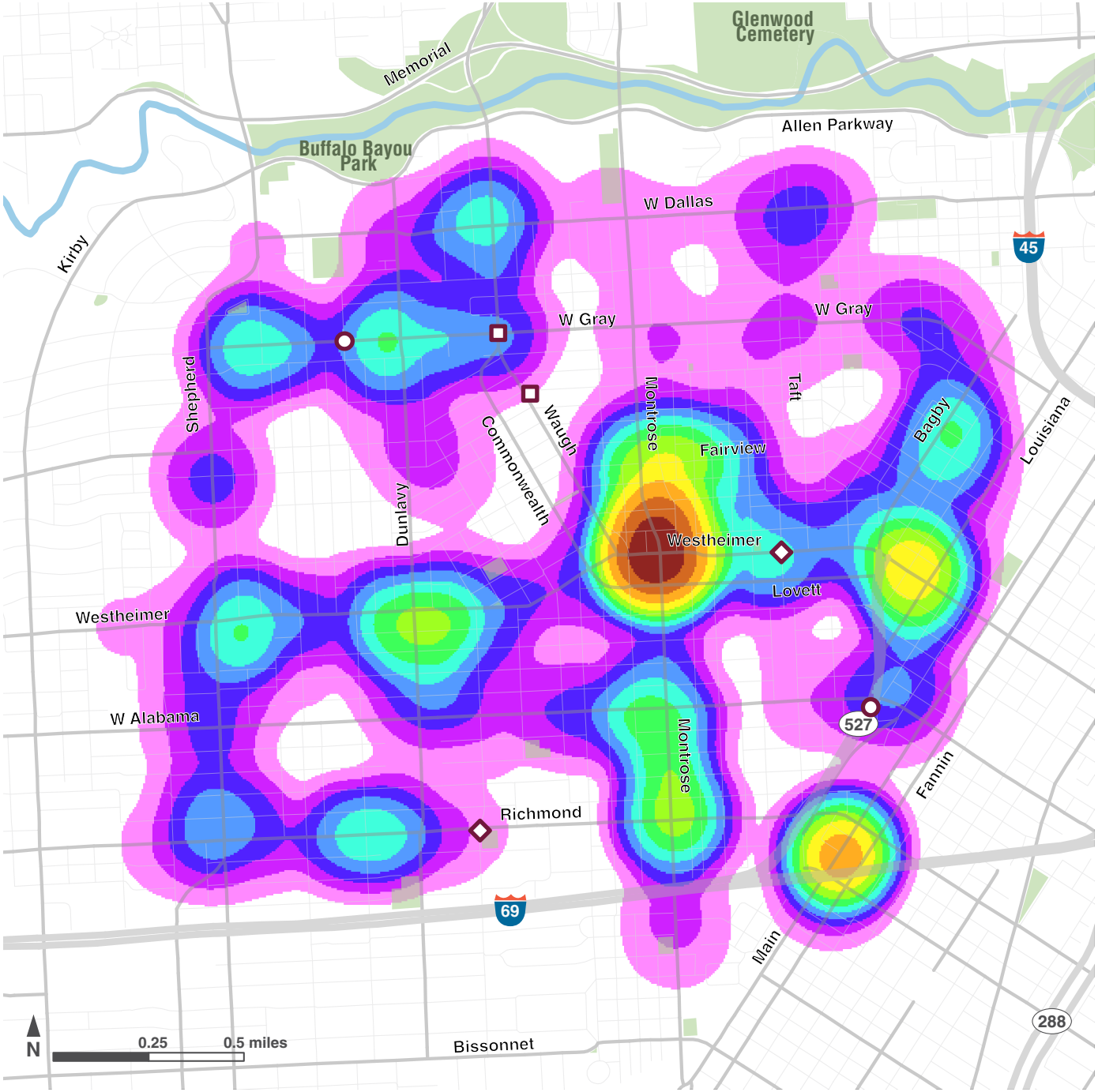



figure 2.1 Crashes involving people walking and biking

*Source: TxDOT CRIS, 2015-2018*

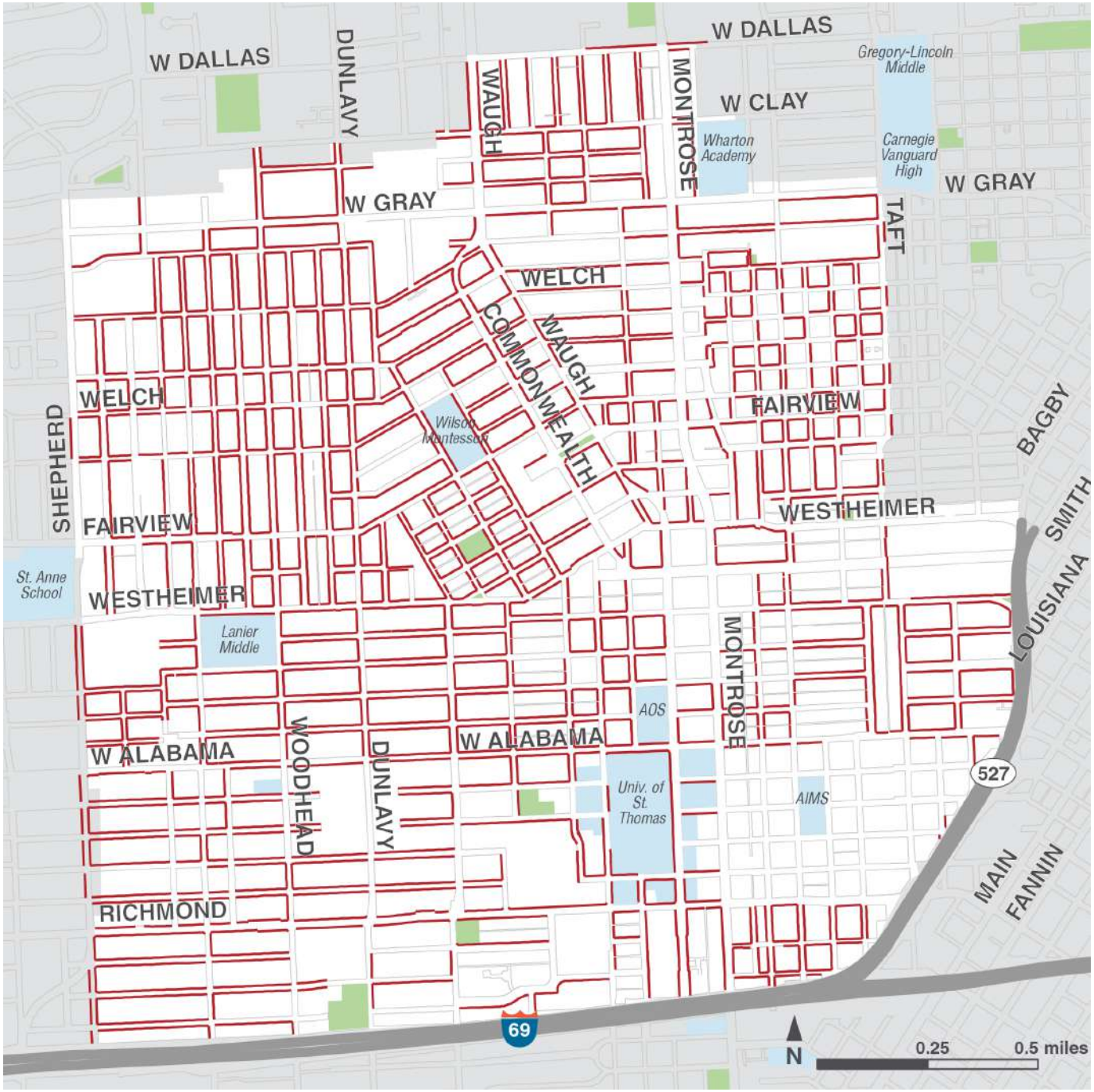



figure 2.2 Incomplete blocks due to poor sidewalk condition

# INCOMPLETE BLOCKS

## Sidewalk gaps

Residents and visitors to Montrose regularly walk to get to local destinations, despite challenging and unsafe conditions. Around 70% of the blocks in the study area have incomplete sidewalks, meaning at least one portion of the sidewalk along the block is missing or in such poor condition that it would be difficult to walk, use a wheelchair, or push a stroller (see **Figure 2.2**).

Strategic investments could improve safety in large portions of the neighborhood. This would make more destinations accessible to more people.

- Complete block
- Incomplete block due to poor or missing sidewalks
- School
- Park
- Study Area

*Source: Team analysis, 2019*

# CONNECTED NETWORK THAT OFFERS MANY CHOICES 2

## MONTROSE NEEDS STREETS THAT SEAMLESSLY CONNECT PEOPLE TO DESTINATIONS, REGARDLESS OF THEIR TRANSPORTATION CHOICE.

People walking, biking, and riding transit in Montrose face major barriers to connectivity. Dangerous sidewalks and intersections leave large gaps for people walking to local destinations or accessing the neighborhood's high-frequency transit lines. For people biking, the only existing high-comfort bikeway is a disconnected segment of Hawthorne Street between Midtown and Lanier Middle School.

The TIRZ can make major improvements to connectivity by creating a grid of high-comfort bikeways and bringing all sidewalks into compliance with the City's standards, so that people of all ages and abilities have 20-minute access to:

- Schools
- Parks
- Transit stops
- Health clinics and pharmacies
- Grocery stores
- Commercial corridors
- Museums and libraries
- Community centers
- Places of worship









## CONNECTIONS WITHIN MONTROSE

Montrose benefits from neighborhood destinations like schools, restaurants and retail, and regional destinations like major museums and universities. Existing sidewalks and bikeways do not provide enough coverage, and are not in sufficient condition to support people walking and biking to those destinations.

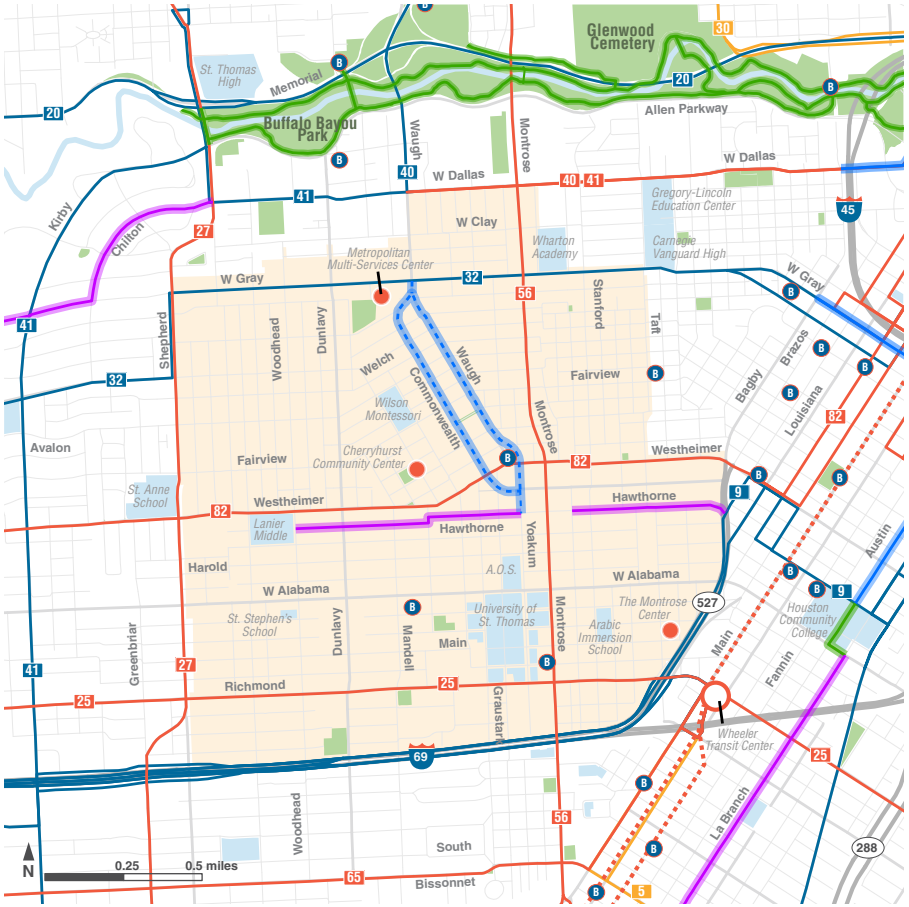



figure 2.3 Connections within Montrose

School
Park
Bayou
Community Center
Study Area
Roadway

Existing Bikeways
- Dedicated On-Street
- Neighborhood Safe Street
- Off-Street Bikeway
- Programmed On-Street

METRO Routes
- 6- to 15-minute headway
- 30-minute headway
- 60-minute headway

*Source: METRO, Houston Bike Share, Team Analysis 2019*

Case for Action
page 34

## CONNECTIONS OUTSIDE MONTROSE

Montrose is centrally located near Houston's largest employment centers, regional parks, and other major destinations. Investments in connectivity allow residents to safely access more places and will make it easy for visitors to get to Montrose for shopping and entertainment.

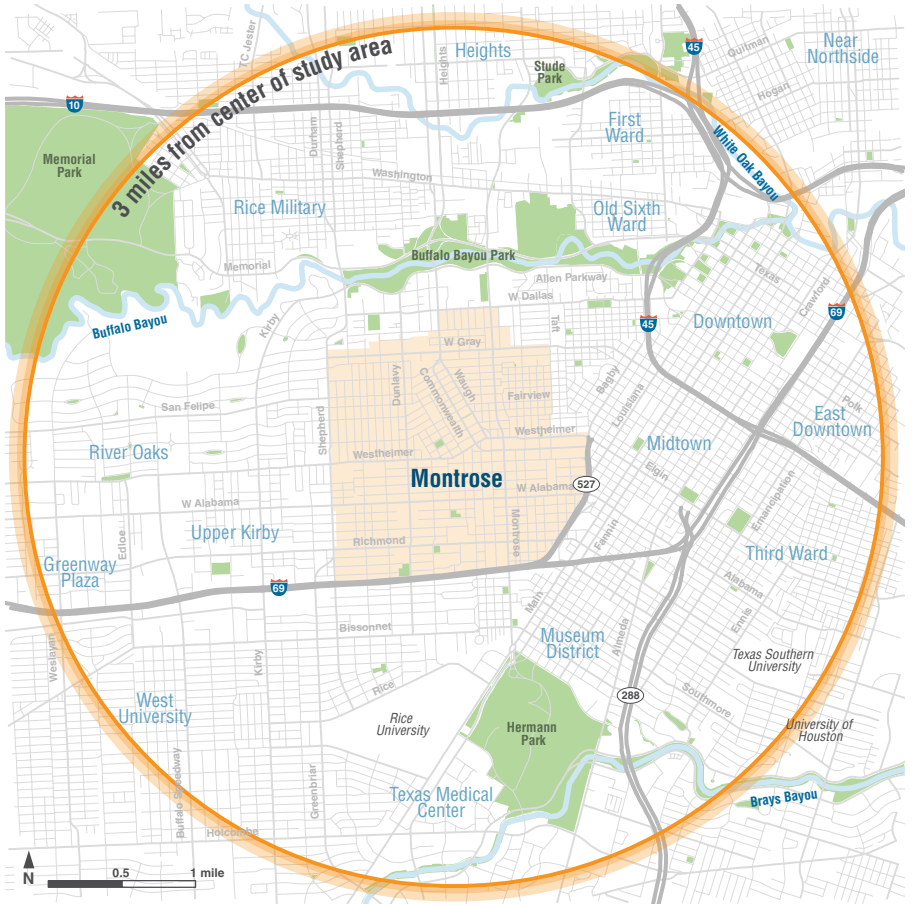



figure 2.4 Connections outside Montrose

Roadway
Study Area
School
Park
Bayou

*Source: Team Analysis 2019*




figure 2.5 Study Area Transit Service

# NEIGHBORHOOD TRANSIT NETWORK

Every transit trip is a walking trip and Montrose is well-served by local bus routes. People riding one of the seven METRO routes in Montrose rely on safe sidewalks to start and end their journeys (**Figure 2.5**).

Currently, 90% of the study area lives less than 1/4 mile from a bus stop. Future investments in bus rapid transit and better bus service will succeed if they are accessible from the community.

6- to 15-minute headway
- 25 Richmond
- 27 Shepherd
- 40 Telep./Heights
- 41 Kirby/Polk
- 56 Airline/Montrose
- 65 Bissonnet
- 82 Westheimer

30-minute headway
- 11 Almeda/Lyons
- 32 Renwick/San Felipe
- 41 Kirby/Polk

60-minute headway
- 5 Southmore
- 30 Clinton/Ella

> 200 daily boardings and alightings

Roadway
Study Area
School
Park
Bayou

*Source: METRO, 2019*

# AFFORDABLE FOR MANY PEOPLE

3

## MONTROSE SHOULD REMAIN AFFORDABLE FOR PEOPLE IN ALL STAGES OF LIFE, FROM STUDENTS TO NEW FAMILIES AND AGING RETIREES.

Montrose is among Houston's most desirable neighborhoods, with new developments breaking ground each year. As more businesses and people move into the neighborhood, residents that have historically called Montrose home find it more difficult to afford the cost of living. Housing and transportation costs take up more than 30% of the typical area household income in all parts of the study area.

Safe and connected networks for people walking, biking, and riding transit allow households to forego the high costs of car ownership and remain in Montrose.









# AFFORDABILITY TODAY

## GROWING HOUSING COSTS

Housing costs in cities have increased as more people want to live in walkable communities with easy access to employment centers and destinations like parks and museums. In Montrose, one in four homeowners and one in three renters are paying more than 30% of their income on housing costs, the level considered unaffordable by the U.S. Department of Housing and Urban Development.

## ADDING TRANSPORTATION

Housing is not the only costs tied to where you live. Transportation also has a major impact on household pocketbooks. According to AAA, the average driver pays $8,500 each year to own and maintain a car. Housing and transportation costs surpass 45% of the area income for much of the northern part of the study area, while portions south of Westheimer Road are more affordable (see **Figure 2.6**).

For Montrose residents already spending over 30% of their income on housing costs, car ownership may not be feasible while walking, biking, and transit are far cheaper options. Even purchasing a METRO day pass every day of the year is one-eighth the cost of vehicle ownership.

A 20-minute neighborhood gives people more transportation choices and allows households to have one less car or forego a vehicle altogether. With responsible investments in walking, biking, and taking transit, the many groups of people who contribute to the diversity of Montrose – young families, early-career working class and non-profit professionals, and college students – can stay in the neighborhood and support the businesses and services already catering to their needs.

## HOUSING & TRANSPORTATION COSTS AS PERCENT OF INCOME FOR TYPICAL AREA HOUSEHOLD

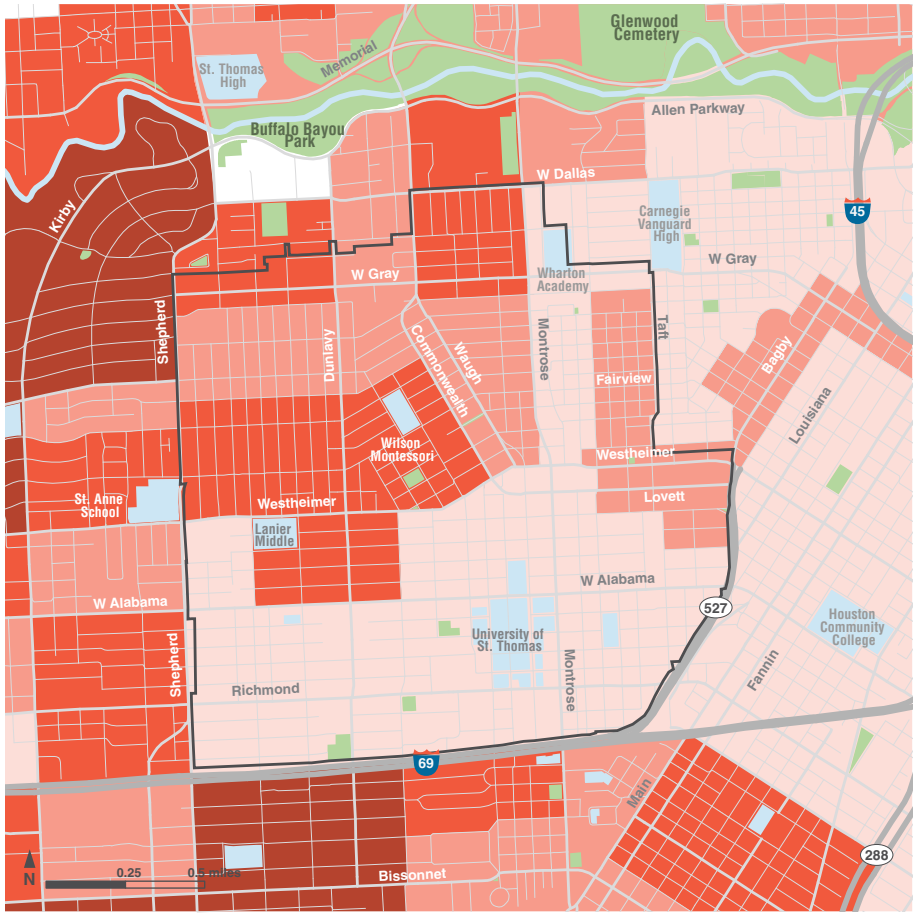



figure 2.6 Housing and transportation costs as percent of typical income

*Source: Center for Neighborhood Technology*

# ENDURING LIVABILITY THAT EMBRACES HISTORY 4

## MONTROSE SHOULD BUILD-IN LIVABILITY TO ENSURE IT WILL REMAIN A GREAT 20-MINUTE NEIGHBORHOOD FOR DECADES TO COME.

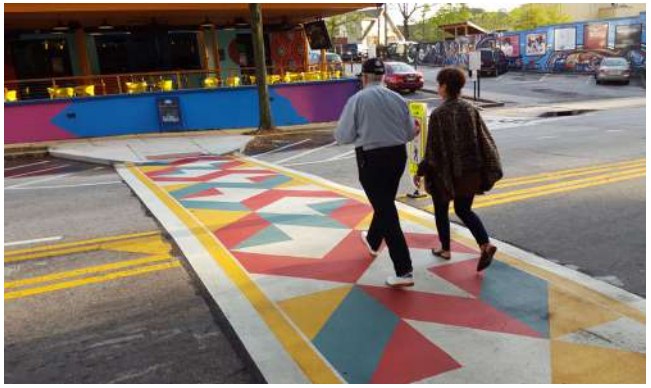
Trends in urban planning and real estate development are spreading the benefits of walkable, bikeable streets to cities across the world. Communities are attempting to recreate what Montrose already has – a tight street grid located near major destinations. If Montrose can build on that foundation to create a truly livable neighborhood, it will attract a broad array of new residents, including families with children, students, and working class households.

The TIRZ can invest strategically today to ensure Montrose endures as a great neighborhood with history, culture, and places where people want to visit and live. This means prioritizing safety and connectivity, but also fostering partnerships to promote placemaking like high-quality parks, public art, and neighborhood events.










*Source: Houston Chronicle*

# COMMUNITY DESTINATIONS

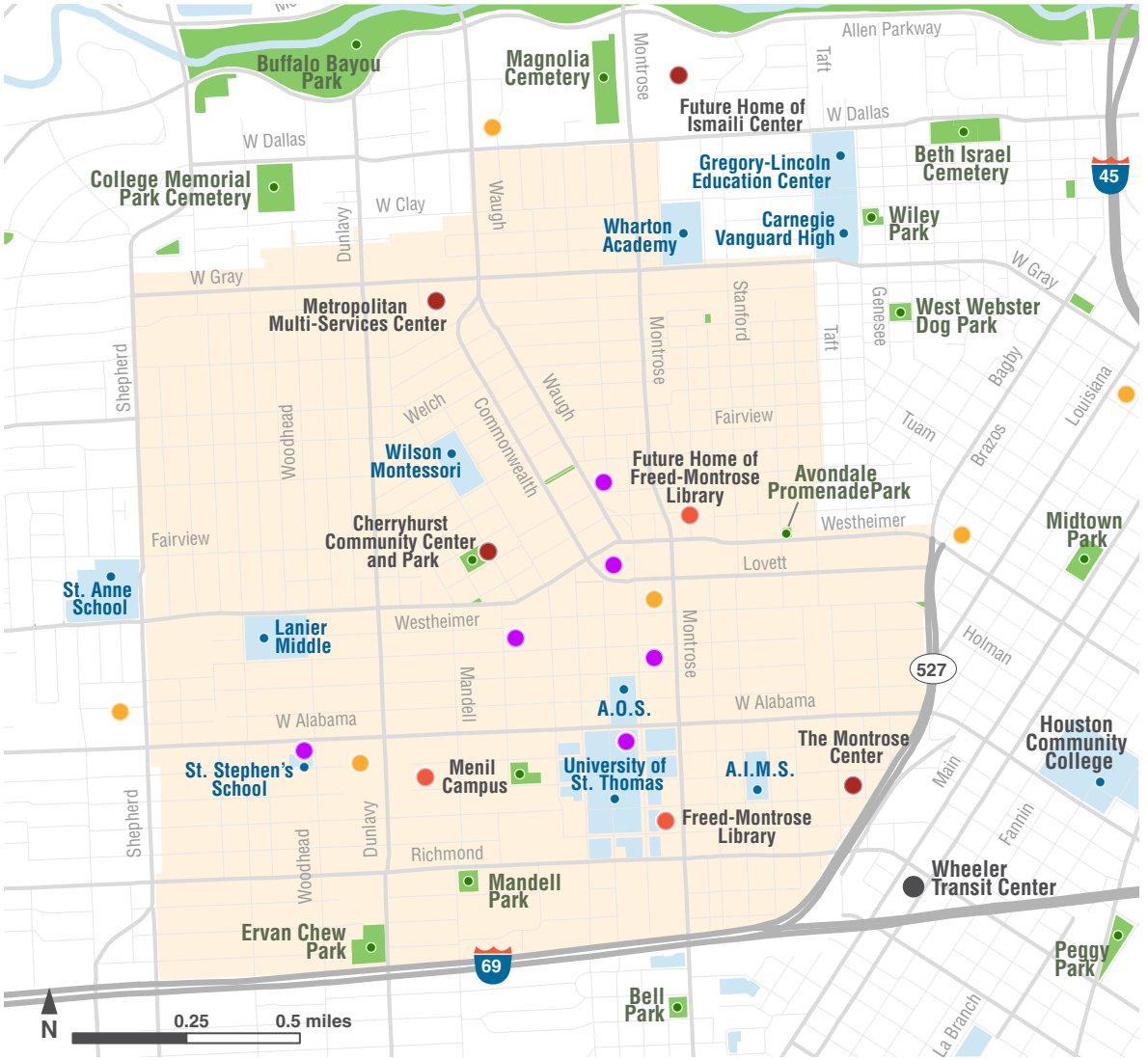



figure 2.7 Community Destinations in the Study Area

- Community Center
- Museum/Library
- Grocery Store
- Place of Worship
- School
- Park
- Study Area
- Roadway

*Source: Team Analysis 2020*



# chapter 3

# WALK MONTROSE



# A WALKABLE MONTROSE

## A safe and comfortable 20-minute neighborhood

### MONTROSE RESIDENTS WANT TO WALK

Ask any resident why they chose to live in Montrose and one of their top reasons will be because they wanted to live in a walkable neighborhood. Ask business owners why they operate in Montrose and they will describe the benefits of locating in a vibrant, urban, walkable area. Residents and business owners within Montrose value walkability, and the tight street grid and mixed land uses within the neighborhood support that goal. However, the existing sidewalk and roadway infrastructure does not.

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. Ten percent of trips within the study area are within one mile which, on average, takes 20 minutes or less. Another 49 percent are 3 miles or less, easy to take on bike or by riding transit. The Study Area is served by seven METRO routes, including five high-frequency routes. Everyone boarding and exiting those buses walk to get to and from destinations in Montrose. **Figure 3.1** depicts the walkshed from the intersection of Waugh Drive at Westheimer Road, and highlights the distances that can be covered in less than 20 minutes.




WALKING TO SCHOOL

The sidewalk infrastructure within Montrose is aging, narrow, and not supportive of a safe walking environment. Dangerous sidewalks and intersections leave large gaps for people walking to local destinations or accessing the neighborhood's high-frequency transit lines. The crash assessment, presented within the *Factbook* (Appendix A), indicates that 145 people walking were involved in crashes between 2014 and 2018. Two pedestrian fatalities were recorded during this time period, and the high number of pedestrian-involved crashes does not include the near-misses that occur throughout Montrose. The TIRZ can make major improvements to connectivity by building sidewalks to the current standards or better, so that people of all ages and abilities have 20-minute access to key destinations within their neighborhood.

### BENEFITS OF WALKABILITY

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 Montrose.

# A 20-MINUTE WALK IN MONTROSE

## Connecting the Neighborhood

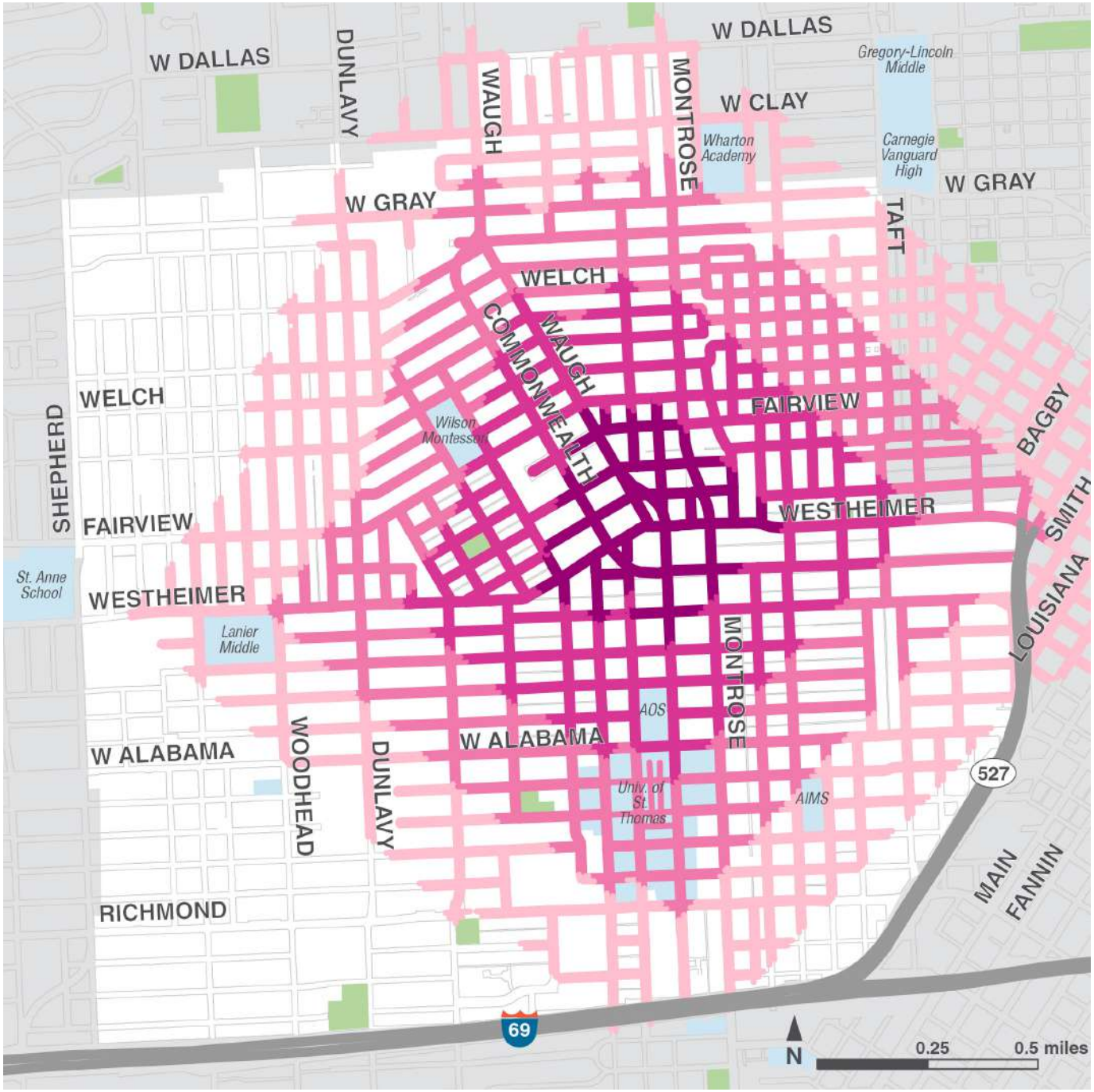



figure 3.1 Walksheds Starting at the Intersection of Westheimer Road at Waugh Drive

**Walkshed**

- 0-5 Minutes
- 5-10 Minutes
- 10-15 Minutes
- 15-20 Minutes

- Highway
- Study Area
- School
- Park

*Source: Team Analysis 2019*

# STUDY AREA




Parcel Boundary
TIRZ Boundary
Study Area
Highway
School
Park

*Source: Team Analysis, 2019*

figure 3.2 TIRZ and Study Area Boundary

# BASELINE CONDITIONS

## A detailed sidewalk assessment

### DATA COLLECTION PROCESS

The project team walked every block within the study area, **Figure 3.2**, to assess condition, comfort, perceived safety, and feasibility of future sidewalk improvements. Almost 120 miles of sidewalk 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** included the assessment of sidewalk condition for each parcel within the Study Area. For corner or full bock 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 (tripping hazards and barriers for people with mobility challenges).

**Block assessment** included assessments 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.

**Intersection assessment** included an assessment of curb ramp condition at all corners. Ramp type and condition were recorded, based on the categories presented on page 47. Comfort and safety were also assessed for all intersections to better understand the crossing roadway experience for a person walking.



STROLLERS OFTEN USE THE ROADWAY WITHIN MONTROSE



WALKING THE DOG AND AVOIDING THE POOR SIDEWALK

# SIDEWALK CONDITION CLASSIFICATIONS

Five classifications of sidewalk condition

## CONDITION A

### FLAT AND 5+ FEET 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-feet 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 AND 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

### NO SIDEWALK PRESENT

While not common in Montrose, 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 August and October 2019. Parcels that were under construction were not assessed for condition.



# RAMP CONDITION CLASSIFICATIONS

## A detailed assessment of ramps for all intersections

For every intersection within the study area, existing conditions were assessed for all ramps. Assessment was based on City of Houston (COH) and American with Disabilities Act (ADA) curb ramp standards.

### DIRECTIONAL VS DIAGONAL

**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, and are therefore prevalent around Montrose. They are also 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.

**A Good Ramp** had a perceived slope that matched COH standards, indicating it would be comfortable to traverse by a person rolling. COH standards requires 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 includes 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.



GOOD DIRECTIONAL RAMPS



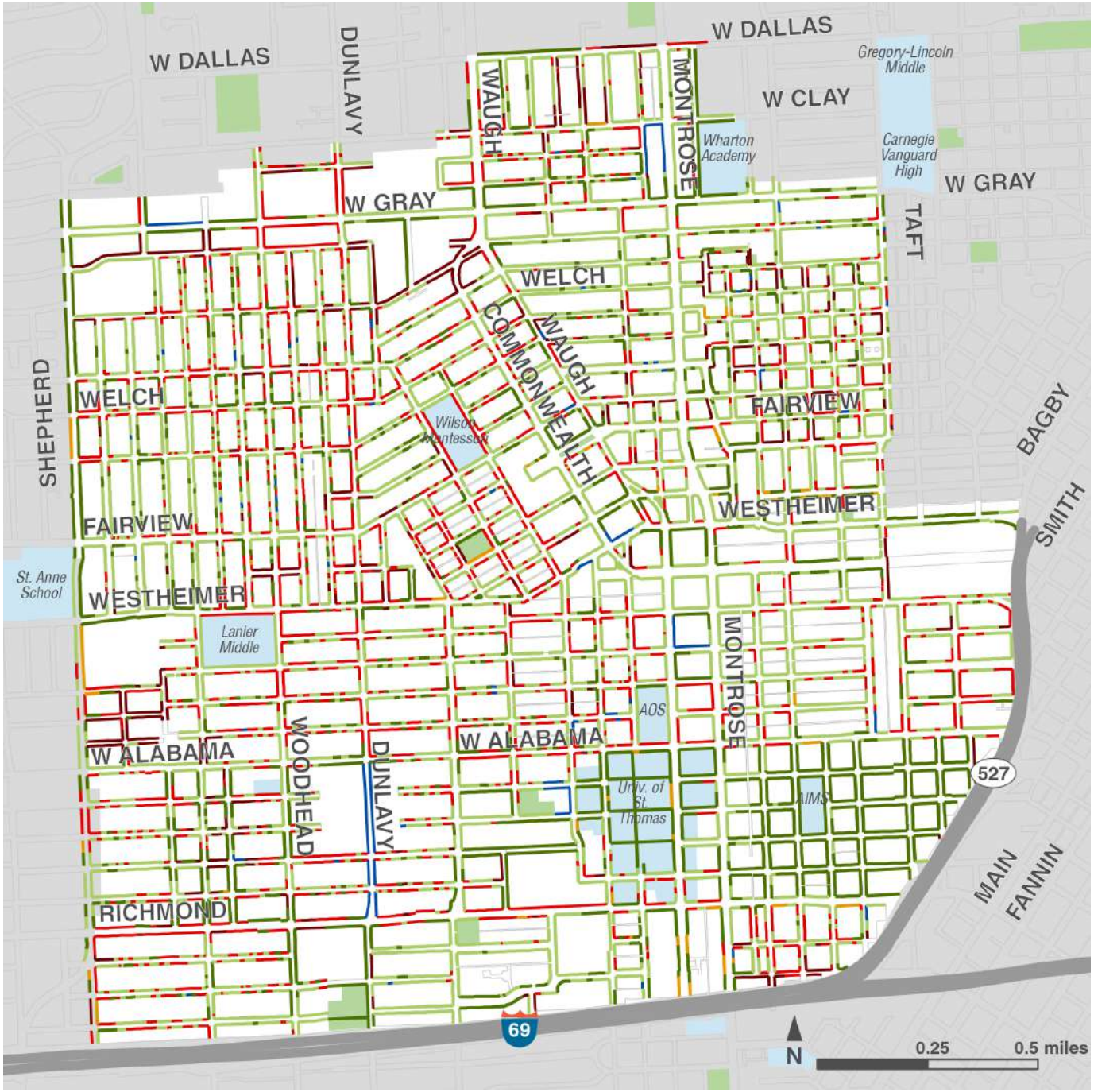
POOR RAMP



NO RAMP (LEFT) & GOOD DIRECTIONAL RAMP (RIGHT)

# SIDEWALK CONDITION ASSESSMENT

## By Parcel




**Sidewalk Condition by Parcel**

- A | Flat - 5'+
- B | Flat - Less than 5'
- C | Poor Condition - 5'+
- D | Poor Condition - Less than 5'
- E | No Sidewalk Present
- Under Construction

- Highway
- Study Area
- School
- Park

*Source: Team Analysis 2019*

figure 3.3 Sidewalk Condition Assessment by Parcel

# SIDEWALK CONDITION ASSESSMENT

## Summary Statistics

The map in **Figure 3.3** depicts the sidewalk condition for all parcels within the Study Area. **Figure 3.4** and **Table 3.1** summarize the condition data collected and show 69% of sidewalks, by length, within Montrose are traversable and 26% are in poor condition and challenging to traverse. These statistics give the impression that sidewalks in the neighborhood are generally in good condition, which does not align with insights from the Factbook, or residents' experience within Montrose.

**Figure 3.3** shows that sidewalk condition can vary substantially from one parcel to the next, adjacent parcel. Therefore, assessing the condition of the network of sidewalks is critical to understand baseline conditions of walkability within Montrose. A path for a person walking is as comfortable as its worst segment, and the patchwork of flat sidewalks and good ramps within Montrose can make many walking paths challenging.

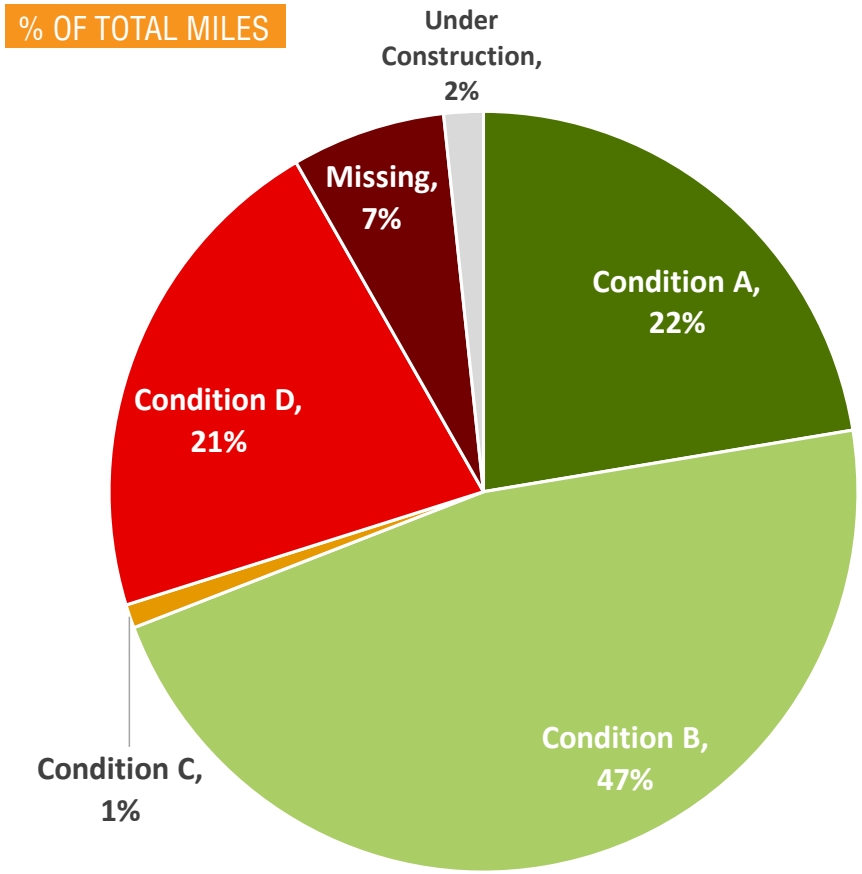



figure 3.4 Summary of Sidewalk Conditions by Parcel
*Source: Team Analysis 2019*

| CONDITION | LENGTH (MI) | % OF TOTAL PARCELS | % OF TOTAL MILEAGE |
|---|---|---|---|
| **Condition A:** Flat 5'+ | 26.26 | 20% | 22% |
| **Condition B:** Flat Less than 5' | 55.37 | 53% | 47% |
| **Condition C:** Poor Condition 5'+ | 1.18 | 1% | 1% |
| **Condition D:** Poor Condition Less than 5' | 25.37 | 20% | 21% |
| **Condition E:** Missing Sidewalk | 7.81 | 5% | 7% |
| **Under Construction** | 1.89 | 1% | 2% |
| **Total** | **117.88** | | |

table 3.1 Summary of Sidewalk Conditions by Parcel & Length
*Source: Team Analysis*

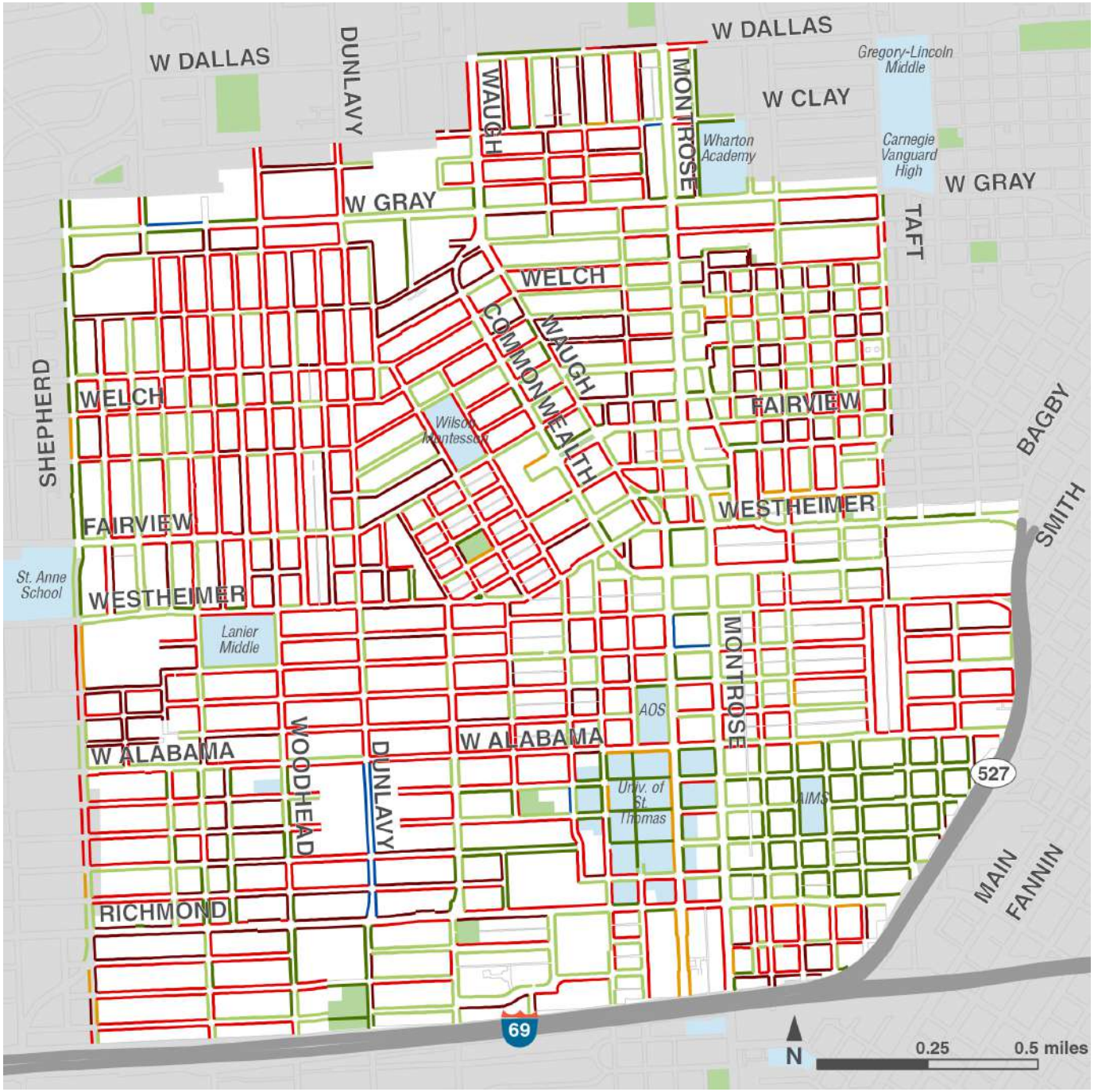



figure 3.5 Sidewalk Condition Assessment by Block

# BLOCK CONDITION ASSESSMENT

## Worst Parcel Condition Controls for Each Block

**Sidewalk Condition by Block**

- A | Flat - 5'+
- B | Flat - Less than 5'
- C | Poor Condition - 5'+
- D | Poor Condition - Less than 5'
- E | No Sidewalk Present
- Under Construction

- Highway
- Study Area
- School
- Park

*Source: Team Analysis, 2019*

## A SIDEWALK IS AS GOOD AS ITS WORST SEGMENT

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 decreases from 69% of parcels sidewalks by linear feet to 38% of blocks, as shown in **Figure 3.6.**

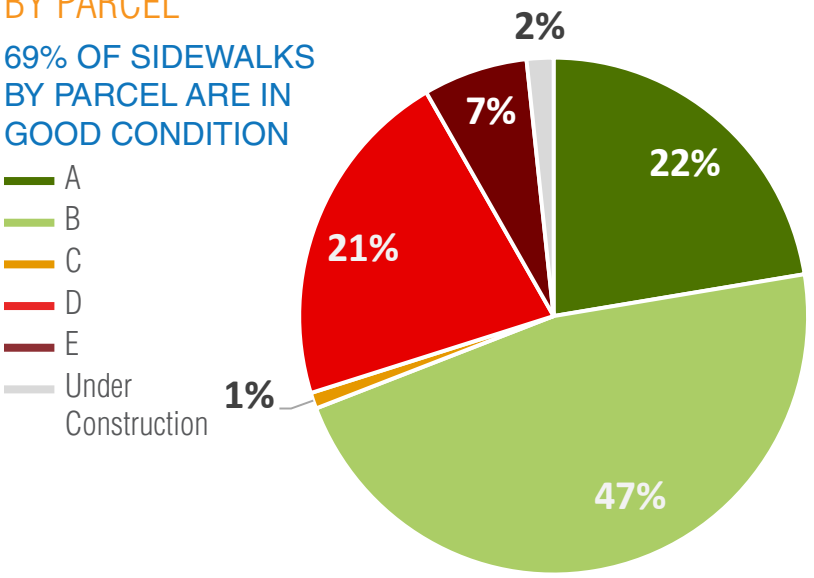
The disconnected network of passable sidewalks presents challenges for connectivity; however, it also presents opportunities. Short, smaller projects along one or two blocks can have massive impact if constructed in the right area by improving access for a variety of corridors. In addition, as parcels 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 map in **Figure 3.7** depicts overall condition of each intersection based on ramp condition and the ability to safely traverse the intersection via existing good condition ramps.




### BY PARCEL

69% OF SIDEWALKS BY PARCEL ARE IN GOOD CONDITION




### BY BLOCK

38% OF SIDEWALKS BY BLOCK ARE IN GOOD CONDITION

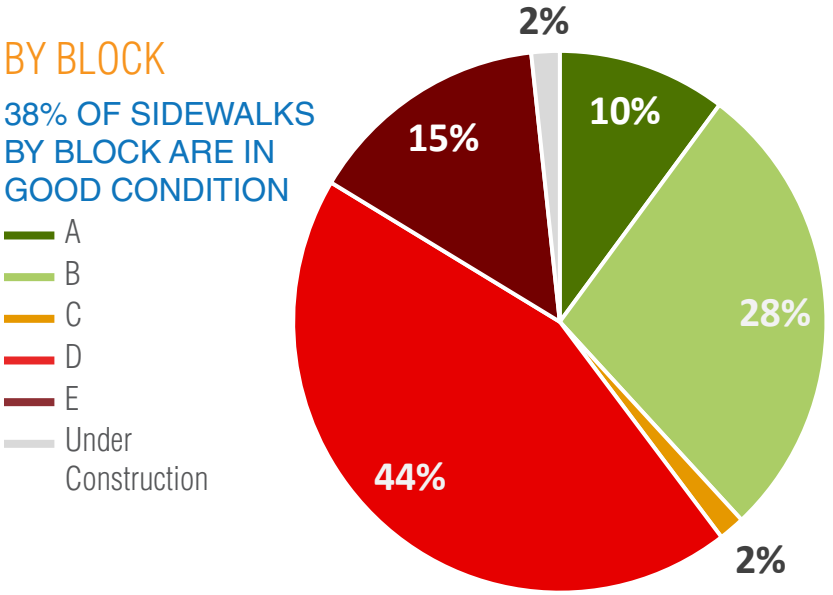



figure 3.6 Comparing Parcel and Block Condition by Linear Feet

*Source: Team Analysis 2019*

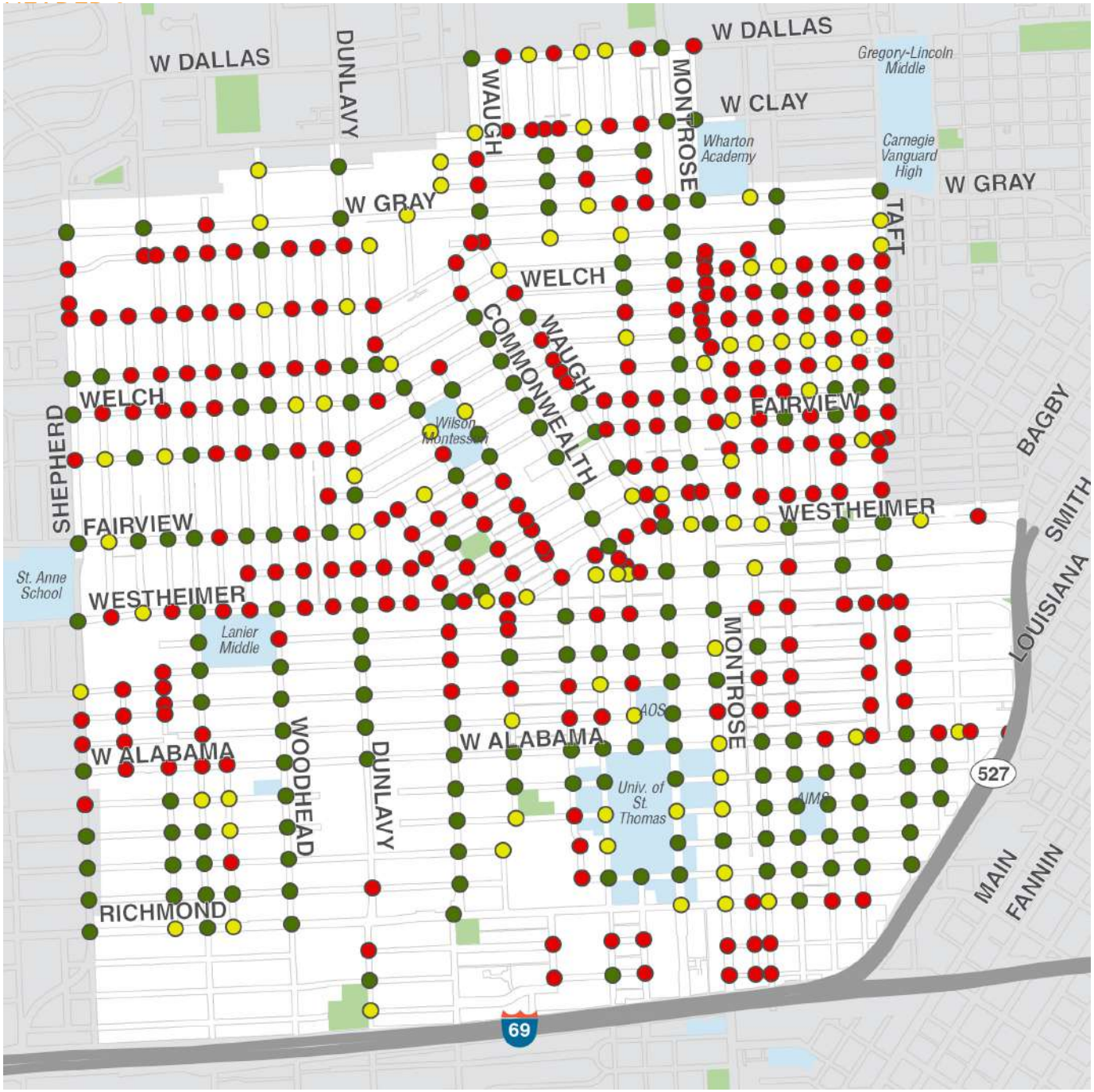
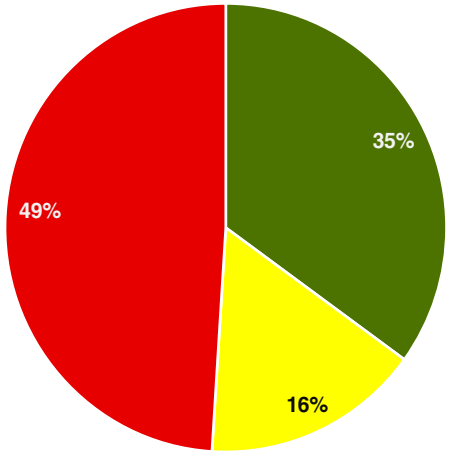



figure 3.7 Intersection Condition Based on Curb Ramp Quality

# CURB RAMP CONDITION ASSESSMENT

## By Intersection




**Ramp Condition by Intersection**

- 0-1 Impassable Ramps
- 2 Impassable Ramps
- 3-8 Impassable Ramps

- Highway
- Study Area
- School
- Park

*Source: Team Analysis, 2019*

# KEY FINDINGS OF DETAILED SIDEWALK NETWORK ANALYSIS

## 6 Key Takeaways

1. People in Montrose walk, even when there is poor sidewalk infrastructure; the potential for more and longer walking trips within the study area is high.
2. 69% of sidewalks by linear foot are passable or better; but only 38% of complete block faces meet this standard.
3. The Study Area is served by seven METRO routes, including five high-frequency routes and the majority of the study area is located within 1/4 mile of a bus top. Everyone boarding and exiting those buses walk to get to and from destinations in Montrose. (See **Figure 3.8**)
4. New developments are building good sidewalks on a parcel-by-parcel basis, creating a piecemeal network of good sidewalks; however this method of reconstruction does not address the worst sections of each block that can strongly hinder connectivity, creating an incomplete network. (See **Figure 3.9**)
5. Full networks of flat, 5' or wider sidewalks are a result of larger infrastructure projects, like the full roadway rebuild project completed within First Montrose Commons in the southeast of the study area. (See **Figure 3.10**)
6. Trees, drainage, and poor maintenance by property owner will continue to be challenges to walkability, but good design practices can mitigate these challenges, as discussed in the next section.
7. A connected, safe, comfortable, and attractive network of sidewalks connects Montrose' unique characteristics and dispersed commercial establishments, and supports Montrose as a 20-mintue neighborhood.



GOING TO THE PARK DESPITE NO SIDEWALK



WALKING TOGETHER DESPITE A NARROW SIDEWALK




figure 3.8 Quarter Mile Transit Stop Coverage

# TRANSIT ACCESS

## Within 1/4 miles

Within 1/4 mile of a transit stop

**6- to 15-minute headway**
- 25 Richmond
- 27 Shepherd
- 40 Telephone/Heights
- 41 Kirby/Polk
- 56 Airline/Montrose
- 65 Bissonnet
- 82 Westheimer

**30-minute headway**
- 9 Gulfton/Holman
- 11 Almeda/Lyons
- 32 Renwick/San Felipe
- 41 Kirby/Polk

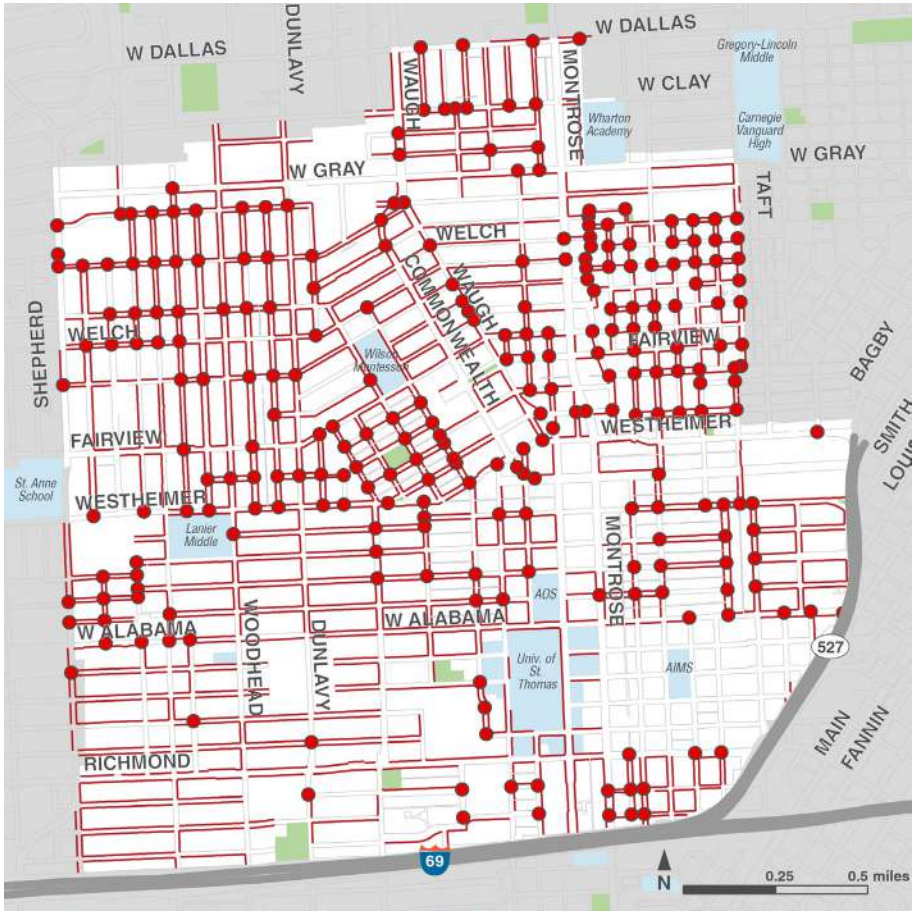
**60-minute headway**
- 5 Southmore
- 30 Clinton/Ella

Study Area
Park
School
Bayou
Roadway

*Source: METRO*

# INCOMPLETE BLOCKS

Blocks with poor condition for at least one parcel + Inaccessible Intersections




**Sidewalk Condition by Block**

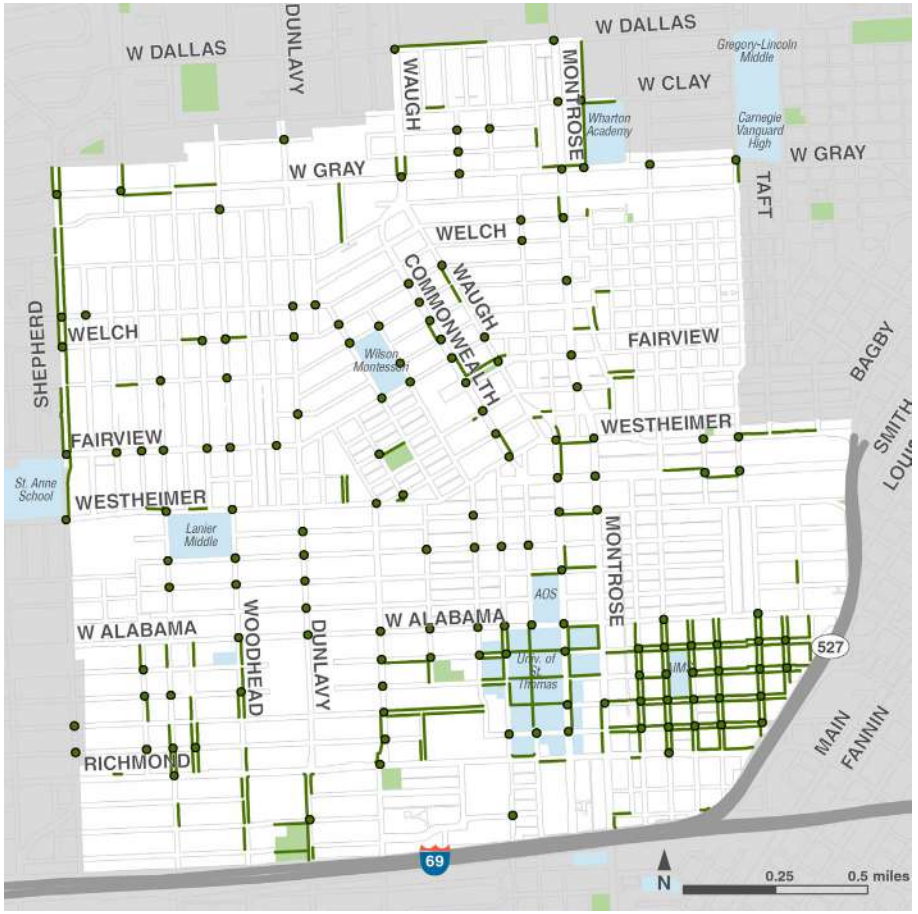
- Incomplete Block Face
- Inaccessible Intersection
- Highway
- Study Area
- School
- Park

figure 3.9 Incomplete Blocks and Inaccessible Intersections

*Source: Team Analysis, 2019*

# COMPLETE BLOCKS

Flat sidewalks, 5'+ wide for a full block + Accessible intersections




**Sidewalk Condition by Block**

- A | Flat - 5'+
- Accessible Intersection
- Highway
- Study Area
- School
- Park

figure 3.10 Traversable Blocks and Intersections

*Source: Team Analysis, 2019*

# 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.

Below are the two questions answered by the team analysis for each block within the study area. The responses to these questions for each block are presented in **Figure 3.11** and **Figure 3.12**.

#### "I FEEL SAFE WALKING ALONG THIS BLOCK"

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

#### "THIS BLOCK IS ATTRACTIVE FOR WALKING"

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

### 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 installing 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 Montrose sidewalks.

The results of this assessment are used in defining future projects within the study area. (See **Figure 3.13** and **Figure 3.16**.)

For each block, the person assessing the block answered the following question:

#### "EASE OF CONSTRUCTING A 5+ SIDEWALK"

- Appears feasible
- A few obstructions (3 or less pinch points)
- Many obstructions
- Other factors making it difficult



ATTRACTIVE RETAIL SIDEWALK TREATMENT



OPEN DITCH DRAINAGE FORCING INACCESSIBLE SOLUTIONS



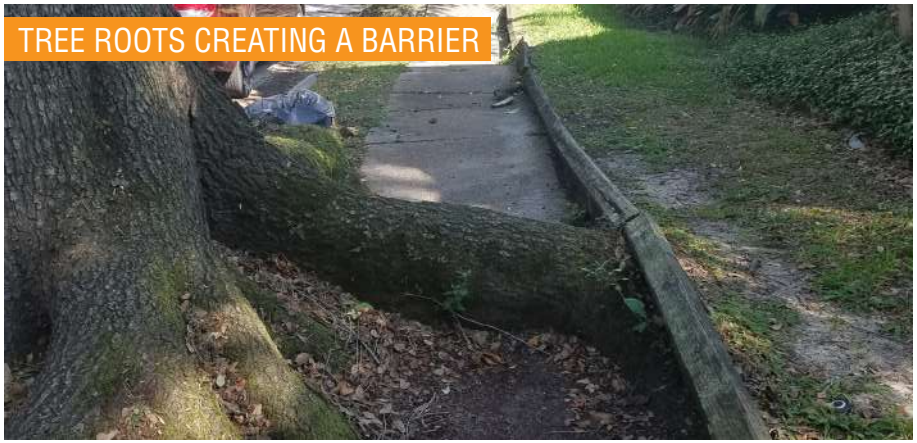
AVOIDING THE POWER POLE



POWER POLE OBSTRUCTING SIDEWALK



FRESHLY PAINTED CROSSWALK



TREE ROOTS CREATING A BARRIER

# SAFETY

"I feel safe walking along this block"




**Safety Assessment by Block**

- 4 - Strongly Agree
- 3
- 2
- 1 - Strongly Disagree
- Highway
- Study Area
- School
- Park

figure 3.11 Perception of Safety by Block

Walk Montrose
page 58

Source: Team Analysis, 2019

# ATTRACTIVENESS

"This block is attractive for walking"




**Block Attractiveness**

- 4 - Strongly Agree
- 3
- 2
- 1 - Strongly Disagree
- Highway
- Study Area
- School
- Park

figure 3.12 Perception of Attractiveness by Block

Source: Team Analysis, 2019

# SIDEWALK DESIGN BEST PRACTICES

## Making Montrose the most walkable neighborhood in Houston

Building good sidewalks is often more challenging than building a new roadway, due to the intricacies of the design and common barriers like open ditch drainage or mature trees. However, building great sidewalks is possible by following best practices and prioritizing the overall walking experience for all users. Even with strong foundational design principles, sidewalks should never be designed using a one-size fits all mentality. Every block is different and its design challenges should be addressed in order to create a great walking environment.

### WIDTH

City standards state sidewalks should be present along all roadways. The minimum sidewalk width is 5 feet on most streets and 6 feet for thoroughfares. In a place like Montrose, where a lot of people are walking to get around, the minimum standard may not be sufficient. Sidewalks of 6 feet or more are often appropriate for streets with many destinations, near schools, and along transit routes.

### CURB RAMPS

Wide, flat sidewalks are only useful if people can safely make it across the street to get to their destination. Every intersection needs directional curb ramps at all four corners. All directional ramps should be aligned with the corresponding ramp on the other side of the street to prevent people with mobility and vision challenges from walking or rolling to the middle of the intersection.

### PRESERVING SHADE WITH HEALTHY TREES

Montrose has some of the best tree cover in the City, with live oaks as old as the neighborhood itself. These trees create much-needed shade for hot Houston summers and add to the appeal of walking.

Unfortunately, tree root systems can break flat sidewalks and create tripping hazards and barriers for people with mobility challenges. Often, root systems extend to the surface because they are not getting needed nutrients from the soil. The TIRZ should consider the health of existing trees and have conversations with residents during the project design phase about replacing unhealthy trees with new, healthy trees that thrive in urban environments. The TIRZ can also employ new technologies like Silva Cell and ADA-approved treatments like gravel and steel plates around tree roots. These options provide flexibility in design and do not require sacrificing accessibility for shade.

### LIGHTING

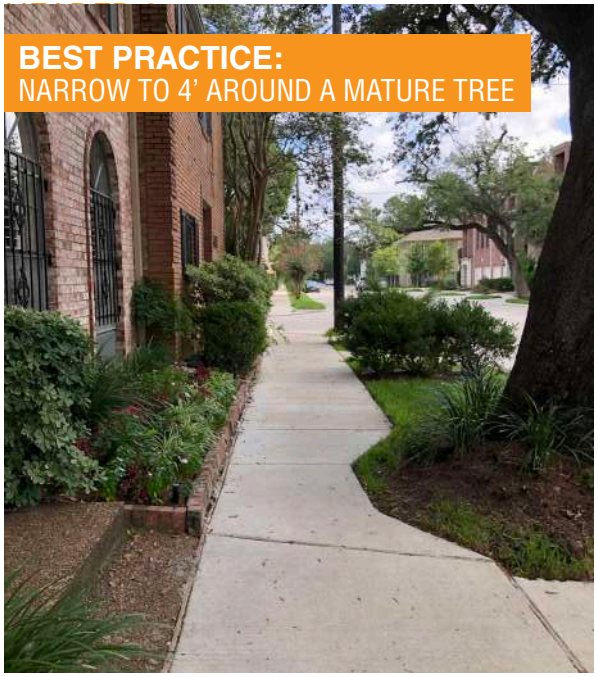
Like shade, lighting makes a walk safer and more comfortable. Well-designed streets have frequently spaced lighting that is human-scaled. In other words, the lighting should be slightly taller than a person and oriented toward the sidewalk, not the vehicle travel lane. Street lights can be placed in the buffer between the sidewalk and the curb to also shed light on bike lanes.

### DRAINAGE

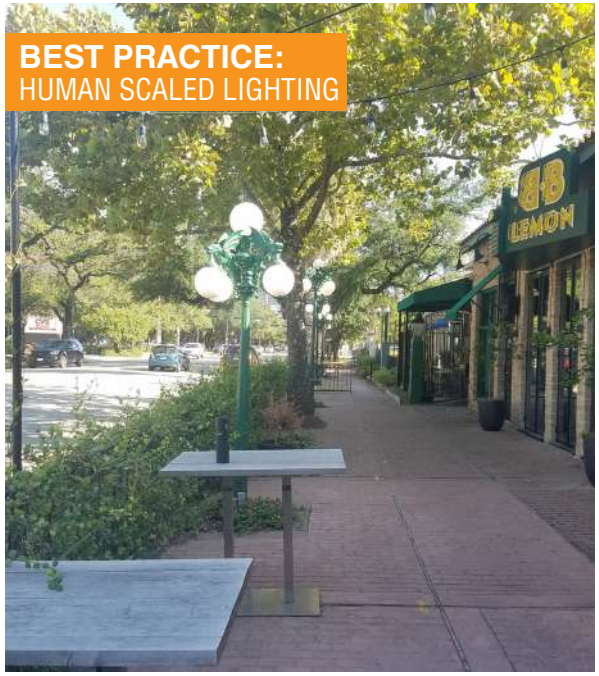
Houston is no stranger to heavy rains, and our city streets are designed as the first line of defense against neighborhood flooding by funneling runoff into stormwater drains. While Montrose has fortunately avoided major flooding in recent years, street design can cause water ponding, especially around curb ramps. If sidewalks are not sloped properly, they can also hold water that is not draining to the street. Any street redesign should ensure that water will not gather in places that make walking more difficult.

### SAFE CROSSINGS

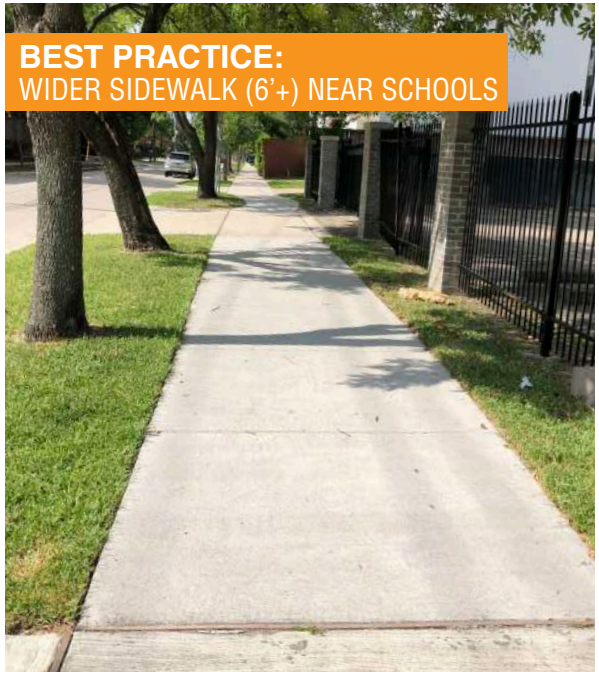
People walking and biking are most likely to come into conflict with vehicles at intersections, especially if a car is making a quick turn. The TIRZ can adopt a range of tactics to make crossings safer at all intersections. Well-marked crosswalks add visibility for people crossing the intersection on foot. Crosswalk paint should be refreshed regularly, and crosswalks should be well-lit to make sure drivers can see people walking, even at night. The TIRZ can also improve the geometric design of intersections by shortening the curb radii at corners to slow turning vehicles. Extending curb radii and prohibiting parking near the intersection will also improve the visibility of people walking and reduce the amount of time needed to cross.



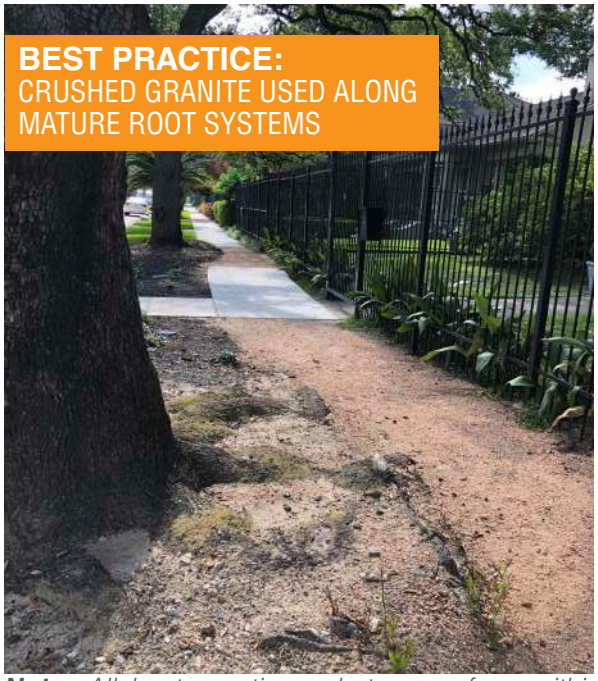
**BEST PRACTICE:**
NARROW TO 4' AROUND A MATURE TREE




**BEST PRACTICE:**
HUMAN SCALED LIGHTING



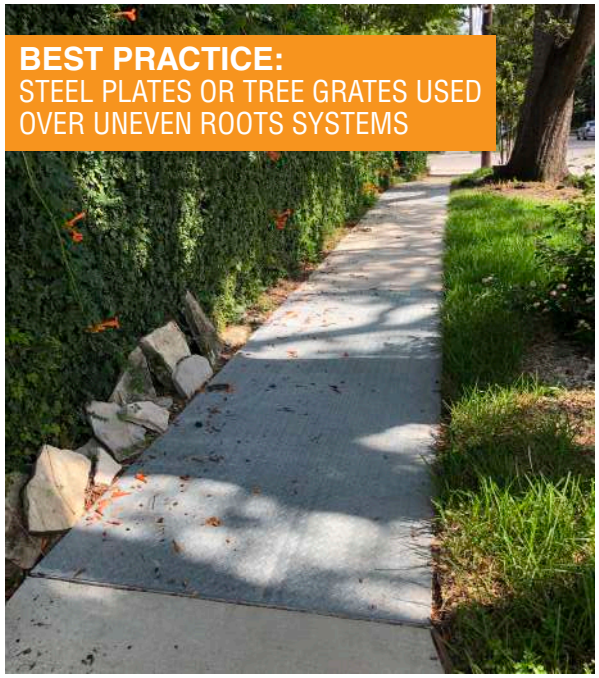
**BEST PRACTICE:**
WIDER SIDEWALK (6'+) NEAR SCHOOLS



**BEST PRACTICE:**
CRUSHED GRANITE USED ALONG MATURE ROOT SYSTEMS



**BEST PRACTICE:**
VISIBLE, PAINTED CROSSWALKS WITH DIRECTIONAL RAMPS



**BEST PRACTICE:**
STEEL PLATES OR TREE GRATES USED OVER UNEVEN ROOTS SYSTEMS

***Note:*** *All best practices photos are from within Montrose Study Area. Photos from First Montrose Commons neighborhood and near BB Lemon on Montrose Boulevard.*

# SIDEWALK PROJECT PRIORITIZATION

## Developing projects to improve walkability

The sidewalk assessment gives the TIRZ a powerful tool to determine where to invest in sidewalk repair and construction in the Study Area. Still, project development can be overwhelming when the baseline conditions analysis indicate that:

- 35 miles of sidewalk need to be rebuilt to achieve flat, traversable sidewalks throughout the Study Area (replacing everything not Condition A or Condition B)
- 1,434 curb ramps need to be rebuilt to have good directional curb ramps at all corners of all intersections

A Sidewalk Project Prioritization Methodology was developed with the goal of creating a project development process for the TIRZ to take the miles of sidewalks that need improvements and divide them into projects with manageable scale and that make a noticeable impact on the community's sidewalks.

## SIDEWALK PROJECT PRIORITIZATION METHODOLOGY

The TIRZ can employ the data of the sidewalk assessment to determine a timeline and strategy for improvements. When developing sidewalk improvement projects there are four key inputs to help the TIRZ prioritize: Known Projects, Network Importance, Condition, and Feasibility of Construction (see **Figure 3.13**). These four elements were used to identify the projects and programs outlined in the *Action Plan* of this report.

### KNOWN PROJECTS

When thinking about how to tackle sidewalk improvements, the TIRZ should start with known projects slated for design. Every capital improvement project – both by the TIRZ or by another agency – presents an opportunity to rebuild sidewalks. Any time a drainage, bikeway, or general mobility project is slated for design and construction, the TIRZ should ensure that the project includes sidewalks that meet or exceed the City's standards. The TIRZ can also take advantage of these Known Projects by investing in connecting and intersecting sidewalks, multiplying the impact of a single project by creating a local network of safe sidewalks.

In addition, the TIRZ should not plan to rebuild a sidewalk that is included within a project by others, but these projects present opportunities to partner to achieve additional goals. Knowing where the City, METRO, Harris County, and private developers plan on improving roadways allows the TIRZ to allocate funds to other parts of the neighborhood that may not have any existing project. The TIRZ can also invest in additional amenities to improve these projects, or pursue complementary projects.

**Figure 3.14** shows Known Projects by Others planned within the Study Area. Each of these projects are expected to include sidewalk improvements. This map also includes areas where sidewalks are in good condition and 5' or wider. The areas depicted in gold show the realm of influence of the TIRZ for sidewalk improvement.

### NETWORK IMPORTANCE

The TIRZ should focus initial resources on areas of the neighborhood that provide greatest value to the most amount of people. Sidewalks that connect to multiple destinations provide a lot of utility to people walking, and support the 20-minute neighborhood concept.

For this analysis, the measure of a sidewalks utility is a metric called Network Importance. Network Importance is an output of a network model that was built to assessed walksheds for all destinations, including transit stops, within the Study Area. The network model overlaps all walksheds for all destinations to highlight areas that are within a short walking distance to multiple destinations.

The network model defines four categories of destinations, shown in **Table 3.2**. Category 1 are the most important, and sidewalks within these destinations walksheds received a higher score. The outputs of the network analysis, showing the Network Importance for each block within the Study Area, are presented in **Figure 3.15**. Blocks that are a deep red have the highest compounded Network Importance score and indicate high utility and proximity to a higher density of community destinations.

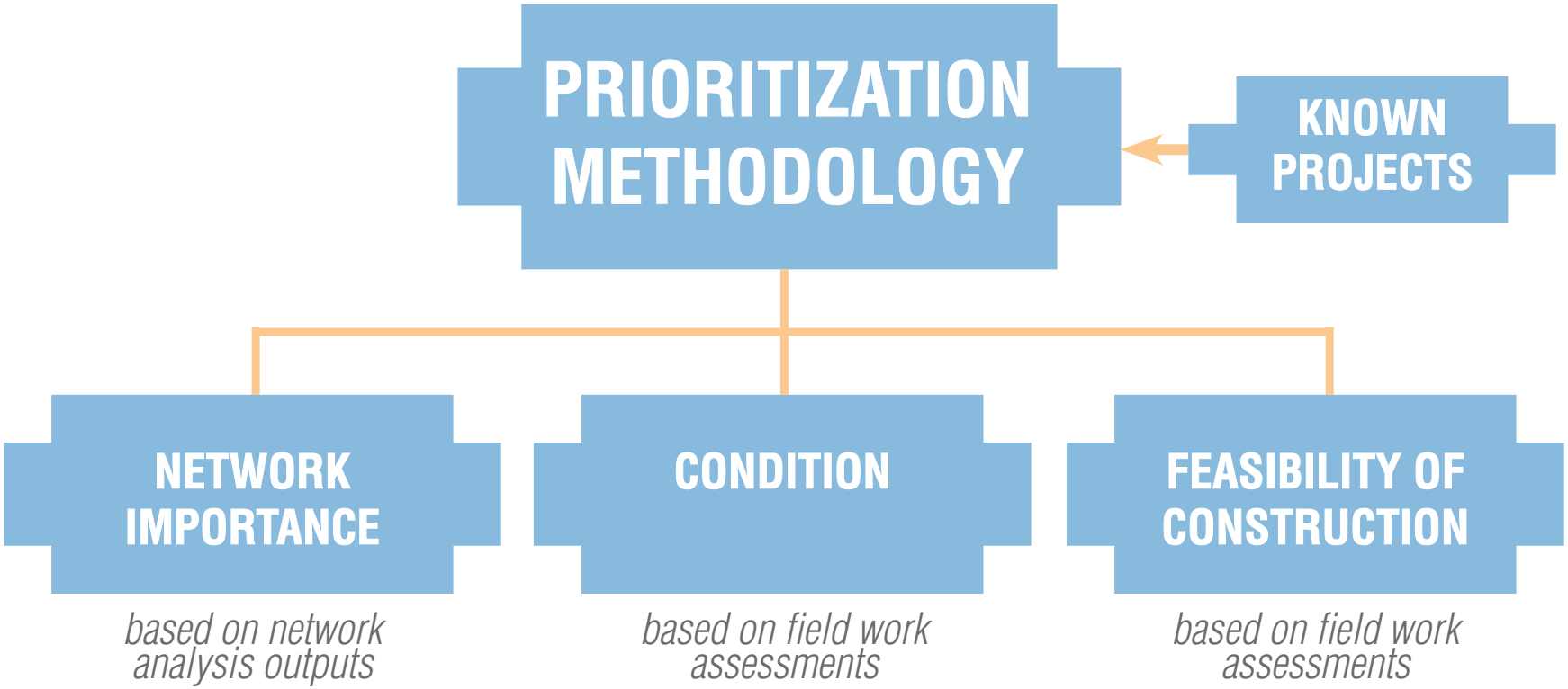



figure 3.13 Sidewalk Project Prioritization Methodology

## CONDITION

Condition is a critical element in project identification. Fixing one block of poor sidewalk can greatly improve walkability and expand the sidewalk network. The sidewalk assessments presented in this chapter (**Figure 3.3**) show the constraints one poor parcel of sidewalk can have on the overall network.

In addition, the assessments are also a key input into budgeting. Estimated project costs can factor into the TIRZ funding timeline, and can help "right-size" a project for grant opportunities.

## FEASIBILITY OF CONSTRUCTION

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. **Figure 3.16** summarizes the feasibility assessment conducted for each block within the Study Area.

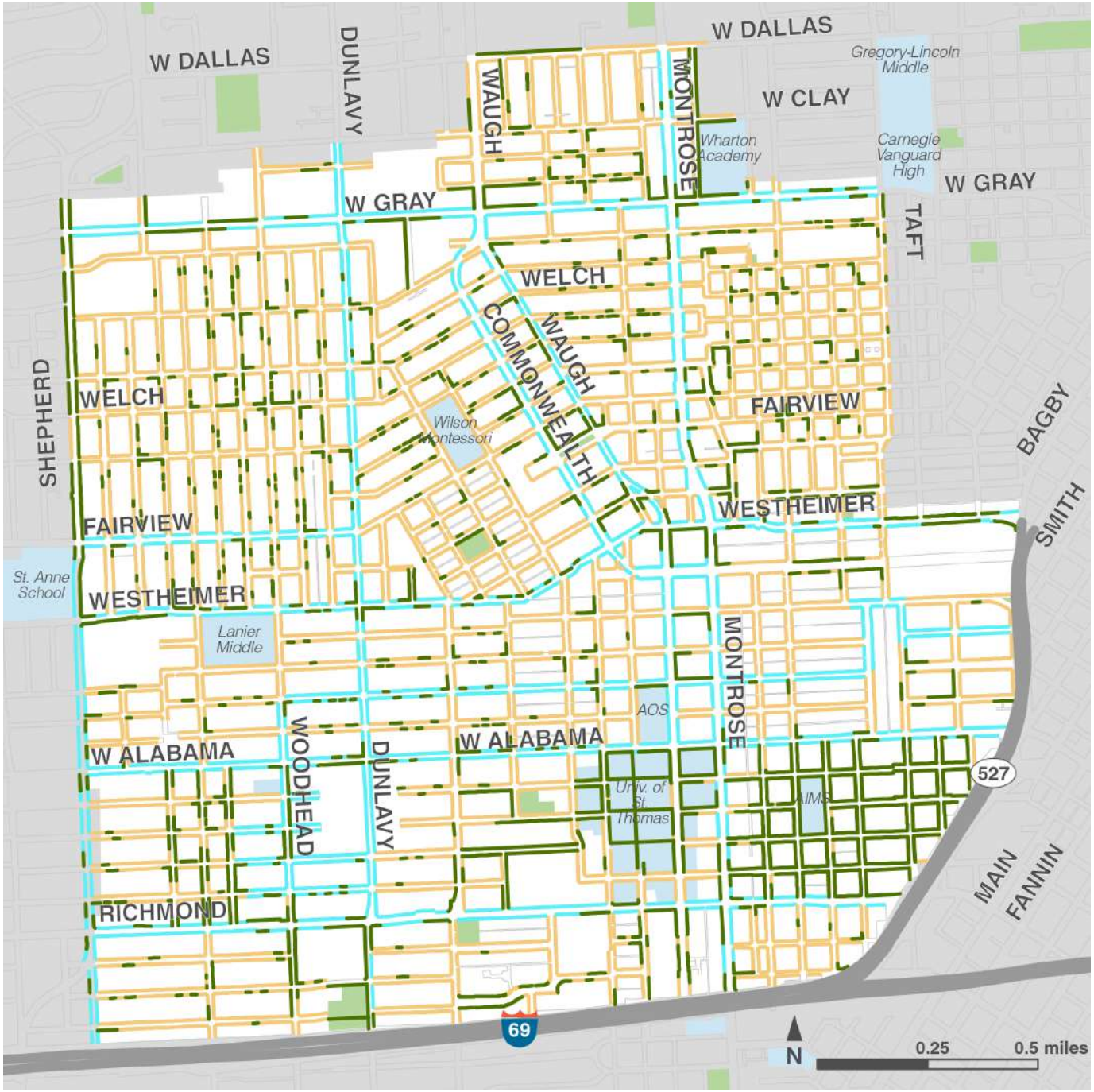



figure 3.14 Known Sidewalk Projects

# KNOWN SIDEWALK PROJECTS

Planned projects by TIRZ and others reveal portions of Montrose in need of improvements

- Planned Project by TIRZ or Others
- No Planned Project
- A | Flat - 5'+
- Highway
- Study Area
- School
- Park

*Source: Team Analysis 2019*

| CATEGORY 1<br>MOST IMPORTANT | CATEGORY 2 | CATEGORY 3 | CATEGORY 4 |
|---|---|---|---|
| • Schools, public and private<br>• Parks and Sparks<br>• Buffalo Bayou Park Access<br>• METRORail Red Line Stations (within 1 mile)<br>• Grocery Stores<br>• University of St. Thomas<br>• Bus Stops | • Community Centers<br>• Health Clinics<br>• Libraries<br>• Post Offices | • Pharmacies<br>• Corner Grocery Stores<br>• Museums | • Other Commercial (Retail, Restaurants & Bars)<br>• Places of Worship |

table 3.2 Network Importance Destination Categories



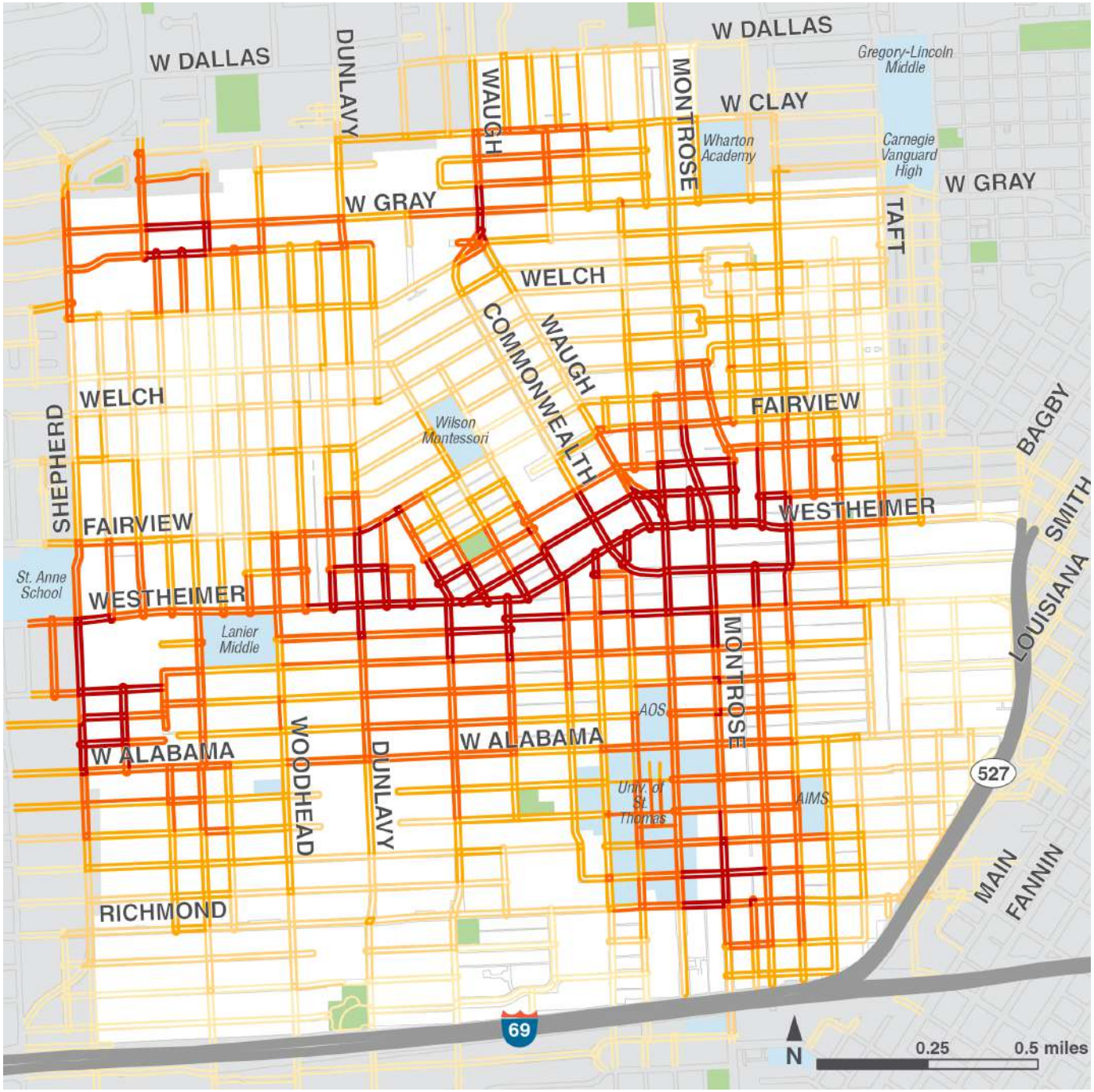



figure 3.15 Network Importance by Block

# NETWORK IMPORTANCE

Blocks connecting to key neighborhood destinations

**Network Importance by Block**

Connects to Fewer Destinations — Connects to More Destinations

- Highway
- Study Area
- School
- Park

*Source: Team Analysis 2020*

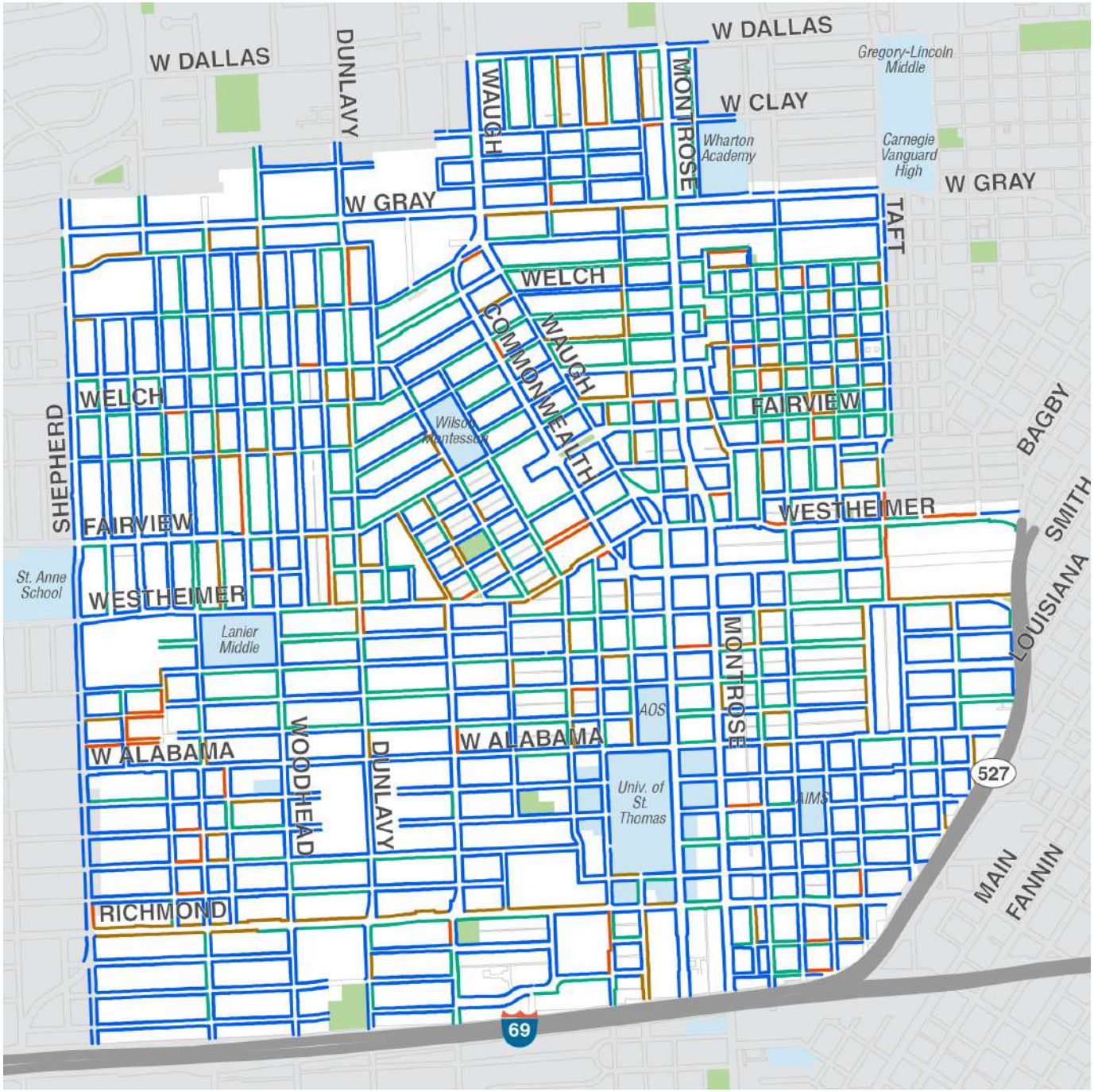



figure 3.16 Perception of Reconstruction Feasibility by Block

# CONSTRUCTION FEASIBILITY BY BLOCK

Ease of constructing a 5'+ sidewalk

**Construction Feasibility**

- Appears feasible
- A few obstructions (3 or less pinch points)
- Many obstructions
- Other factors making it difficult

- Highway
- Study Area
- School
- Park

*Source: Team Analysis 2019*

# MAKING A MEANINGFUL IMPACT ON WALKABILITY

## A sidewalk network to support a 20-minute neighborhood

The analysis conducted within this chapter give the TIRZ a strong baseline of data about existing infrastructure and a project development tool to assist in project planning. Sidewalk rebuild projects should always be a priority for the TIRZ to support the existing and projected increase in walking demand. The prioritization methodology (**Figure 3.12**) was used to define a variety of sidewalk projects within the *Action Plan*. Some projects are in conjunction with bikeways projects, developed in the *Bike Montrose* plan development (next chapter), while some are sidewalk-specific and intended to improve access to key commercial destinations, schools, and transit.

This methodology was developed to not only define projects for this plan but to be an ever evolving and growing tool for the TIRZ as additional opportunities for sidewalk improvements present themselves in the future. Both the sidewalk assessment inventory and network analysis outputs should be maintained, as presented in **Appendix D**, for future project identification.

The TIRZ will lead a significant and much needed change within Montrose to enhance walkability and to finally make the most walkable neighborhood in Houston, actually walkable. Building Montrose a connected, safe, comfortable, and attractive sidewalk network will:

- Improve **SAFETY**
- Provide **CONNECTIONS**
- Support **AFFORDABILITY**
- Ensure an **ENDURING** 20-mintue neighborhood





# chapter 4

# BIKE MONITORS



# BIKE MONTROSE VISION

## A 20-MINUTE NETWORK

Montrose is approximately 1.5 miles wide, the distance of a ten minute bike ride. **Figure 4.2** shows the benefit of Montrose's location, within a short 20-minute bike ride to large swaths of Houston's urban core. Unfortunately, the neighborhood is still difficult to traverse for people biking. Hawthorne Street is the neighborhood's only high-comfort bike facility, but has poor pavement quality and is disconnected by a challenging intersection at Montrose Boulevard.

The TIRZ can bring about the vision of a 20-minute neighborhood by building series of well-designed, connected bikeways across Montrose's street grid. It is critical that the new bikeways form a cohesive grid, increasing the coverage of safe bikeways in the neighborhood to ensure that residents can ride a bike for their daily needs.

Seville, Spain took the network-based approach to its bikeways in 2007, building more than 85 miles of bike lanes in seven years, as shown in **Figure 4.1**. Once constructed, crashes decreased and the number of bike trips increased threefold in the City. Like in Seville, the network in Montrose can start with a few key spines, but can grow and expand over time to connect all parts of the neighborhood.

### BIKEWAY NETWORK BUILD-OUT IN SEVILLE, SPAIN

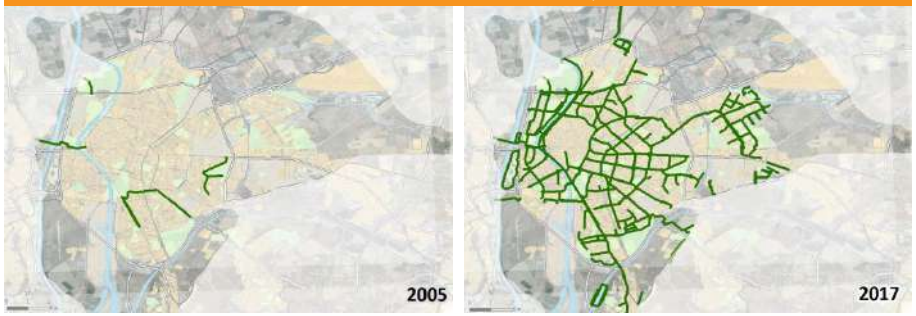



figure 4.1 Bike Network Progress in Seville, Spain *Source: People for Bikes*

## MONTROSE BIKESHED

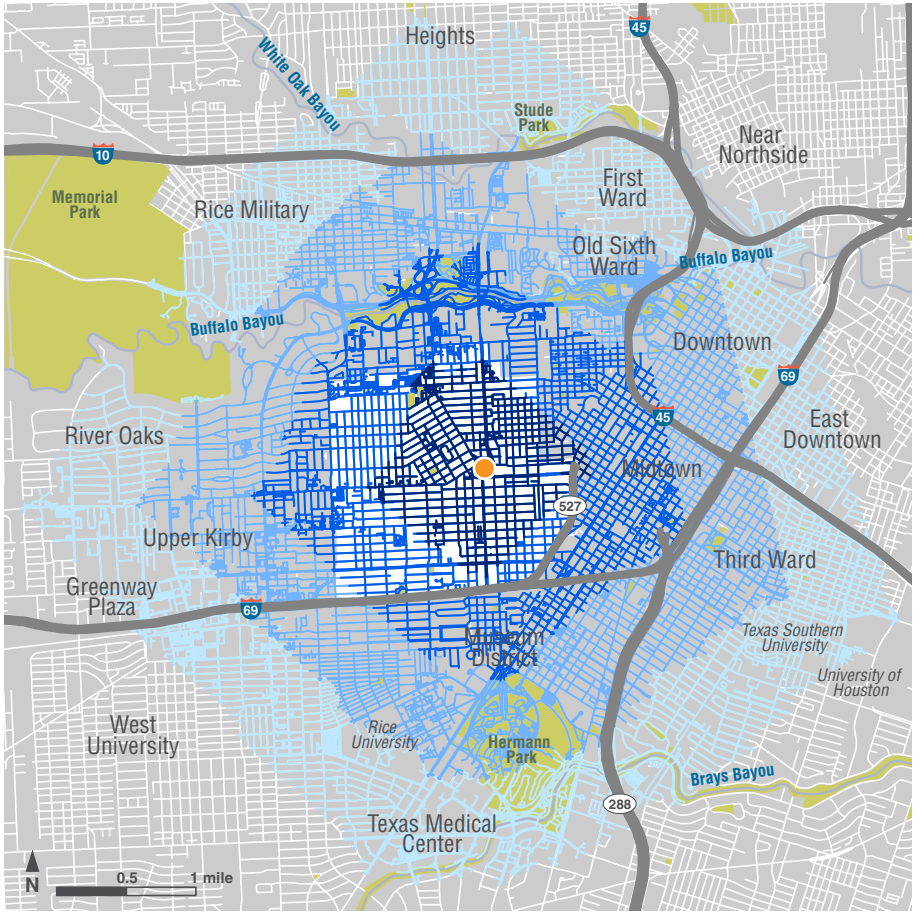



figure 4.2 Bikeshed from the Westheimer Road and Waugh Drive intersection

- 0-5 Minutes
- 5-10 Minutes
- 10-15 Minutes
- 15-20 Minutes
- Westheimer Road and Waugh Drive Intersection
- Highway
- Study Area
- Park

*Source: Team Analysis 2020*

# DESIGN PRINCIPLES TO ACHIEVE THE VISION

## DESIGN FOR ALL AGES AND ABILITIES

When a network is accessible for all types of users, it encourages more people to ride their bicycles. In other words, bikeways that are comfortable for both an eight-year-old and an eighty-year-old are also comfortable for highly confident bike riders. Well-designed bike facilities also benefit people walking by slowing vehicle speeds and increasing the distance between sidewalks and the vehicle travel lane. Safer facilities for all users even benefit drivers by reducing speeds and resolving visibility issues that can cause crashes.

In the last 20 years, global innovations in bikeway design revealed easy and effective strategies that create safer streets for all users. When thinking through the design of Montrose's bikeway network, the TIRZ can follow the principles of All Ages and Abilities (AAA) from the National Association of City Transportation Officials (NACTO).

AAA design guidance, like the bikeway selection table shown in **Figure 4.3**, prioritize building bikeways that are comfortable for even the most vulnerable bicyclists like children, older adults, and people with disabilities. The table shows which types of bikeways are appropriate depending on vehicle speeds, volumes, and other considerations like surrounding land uses and number of people walking nearby.

**Contextual Guidance for Selecting All Ages & Abilities Bikeways**

| Roadway Context | | | | All Ages & Abilities Bicycle Facility |
|---|---|---|---|---|
| Target Motor Vehicle Speed* | Target Max. Motor Vehicle Volume (ADT) | Motor Vehicle Lanes | Key Operational Considerations | |
| *Any* | | *Any* | *Any of the following:* high curbside activity, frequent buses, motor vehicle congestion, or turning conflicts† | **Protected Bicycle Lane** |
| < 10 mph | Less relevant | No centerline, or single lane one-way | Pedestrians share the roadway | **Shared Street** |
| ≤ 20 mph | ≤ 1,000–2,000 | | < 50 motor vehicles per hour in the peak direction at peak hour | **Bicycle Boulevard** |
| ≤ 25 mph | ≤ 500–1,500 | | | |
| | ≤ 1,500 – 3,000 | Single lane each direction, or single lane one-way | Low curbside activity, or low congestion pressure | **Conventional or Buffered Bicycle Lane, or Protected Bicycle Lane** |
| | ≤ 3,000 – 6,000 | | | **Buffered or Protected Bicycle Lane** |
| | Greater than 6,000 | | | **Protected Bicycle Lane** |
| | Any | Multiple lanes per direction | | |
| Greater than 26 mph† | ≤ 6,000 | Single lane each direction | Low curbside activity, or low congestion pressure | **Protected Bicycle Lane, or Reduce Speed** |
| | | Multiple lanes per direction | | **Protected Bicycle Lane, or Reduce to Single Lane & Reduce Speed** |
| | Greater than 6,000 | *Any* | *Any* | **Protected Bicycle Lane, or Bicycle Path** |
| High-speed limited access roadways, natural corridors, or geographic edge conditions with limited conflicts | | *Any* | High pedestrian volume | **Bike Path with Separate Walkway or Protected Bicycle Lane** |
| | | | Low pedestrian volume | **Shared-Use Path or Protected Bicycle Lane** |

*While posted or 85th percentile motor vehicle speed are commonly used design speed targets, 95th percentile speed captures high-end speeding, which causes greater stress to bicyclists and more frequent passing events. Setting target speed based on this threshold results in a higher level of bicycling comfort for the full range of riders.

†Setting 25 mph as a motor vehicle speed threshold for providing protected bikeways is consistent with many cities' traffic safety and Vision Zero policies. However, some cities use a 30 mph posted speed as a threshold for protected bikeways, consistent with providing Level of Traffic Stress level 2 (LTS 2) that can effectively reduce stress and accommodate more types of riders.[16]

‡Operational factors that lead to bikeway conflicts are reasons to provide protected bike lanes regardless of motor vehicle speed and volume.

figure 4.3 NACTO's Contextual Guidance for Selecting All Ages and Abilities Bikeways

# BIKEWAY NETWORK FACILITY TYPES

As shown in AAA guidance, a fully connected network of bikeways requires different design treatments for different street types based on street geometry, available right-of-way, traffic volumes, and vehicle speeds. The primary goal for all streets is to create a safe environment for people walking and biking by encouraging drivers to use a responsible, slower speed.

Taking AAA design principles into consideration, the TIRZ can employ four bikeway types for Montrose: Neighborhood Safe Streets, Dedicated On-Street, Off-Street, and Walking Priority Streets.

Streets with high vehicle speeds and volumes, like West Dallas Street or Waugh Drive, often require a dedicated on-street facility that separates people biking from cars with physical barriers like parked cars or a curb. In residential areas, a neighborhood safe street can provide the right set of tools to divert vehicle traffic and slow speeding drivers with investments like speed humps, curb extensions, and traffic circles.





# THE FOUR FACILITY TYPES

## Neighborhood Safe Street



## Dedicated On-Street



## Off-Street



## Walking Priority Street



# NEIGHBORHOOD SAFE STREET

## CHARACTERISTICS

Neighborhood Safe Streets are places where anyone can feel comfortable biking or walking. Vehicle traffic is light and drivers travel slowly. These streets are a community amenity and should serve as an extension of residents' front yards, creating space for kids to play and neighbors to chat.

Design features of a Neighborhood Safe Street include signage for bicyclists, traffic diverters, small traffic circles, speed bumps, curb extensions, and other similar features that improve the experience for people biking and walking. At major intersections, these streets should be signalized and ensure that people walking and biking are visible to drivers. Where a signal is not an option, intersection design can also include treatments like median refuge islands that allow bicyclists to cross in two phases. At neighborhood intersections, features like traffic circles can ensure that bicyclists are not forced to stop.

## IDEAL LOCATIONS

Safe street treatments work best in places that already have low vehicle speeds and volumes for most of the corridor, but may have issues along certain sections of the street. These tend to be narrower residential streets with local traffic accessing nearby homes or neighborhood businesses.

## IN MONTROSE

Recommended Neighborhood Safe Streets include Woodhead Street, Hawthorne Street, Welch Street, Stanford Street, West Clay Street, West Main Street, and portions of Yoakum Boulevard, Lovett Boulevard, Graustark Street, Mandell Street, Taft Street, and Harold Street.

In this report, proposed Neighborhood Safe Streets are **shown in purple** on maps.



MINI-TRAFFIC CIRCLE



TRAFFIC DIVERTERS





CURB EXTENSION

# DEDICATED ON-STREET BIKEWAY

## CHARACTERISTICS

Dedicated On-Street facilities give people biking enough space to travel safely and comfortably by providing separate bicycle and vehicle travel lanes. People biking can feel at-ease, even on busy streets because they have room to operate and are more visible to passing drivers.

Where space allows, Dedicated On-Street bikeways should be 6.5 feet wide. On roadways with vehicle speeds greater than 25 miles per hour and volumes greater than 6,000 average daily vehicles, the bikeway is recommended to be separated from vehicle lanes by barriers like parked cars or specially designed treatments like flexible posts or armadillos. On streets with slower speeds and volumes, a striped buffer should suffice. Bikeway markings should extend across all intersections with special considerations for bicycle signals and additional protection for people biking through signalized intersections.

## IDEAL LOCATIONS

Dedicated On-Street bikeways work best on busy streets that have medium to high vehicle volumes, but enough roadway right-of-way to accommodate a bike lane and buffer/protection. These tend to be busier residential streets or commercial corridors.

## IN MONTROSE

Recommended Dedicated On-Street bikeways include Waugh Drive and Commonwealth Street, West Alabama Street, Fairview Street, West Dallas Street, and portions of West Gray Street, Taft Street, and Mandell Street.

In this report, proposed Dedicated On-Street bikeways are **shown in blue** on maps.

DEDICATED ON-STREET INTERSECTION TREATMENTS



BUFFERED BIKE LANE



PROTECTED BIKE LANE



PROTECTED BIKE LANE



# OFF-STREET BIKEWAY/PATH

## CHARACTERISTICS

Off-Street bikeways are behind the street curb. They can either be like a sidewalk, but wide enough to be shared with people biking, or can separate walking and biking to minimize conflicts. These facilities offer an extra level of protection from vehicles and often connect to major destinations like Buffalo Bayou to better accommodate visitors like families or people exercising for recreation.

Off-Street bikeways should be ten feet to allow enough room for people to comfortably use the facility. This requires enough right-of-way behind the street curb, which may not be possible on some streets. These facilities need special attention at intersections. Off-Street bikeways will need to remain highly visible to drivers and give enough space for several users to cross the intersection at once.

## IDEAL LOCATIONS

Off-Street facilities are ideal in places with a high number of people walking and biking, places with high vehicle speeds and volumes, and places that have sufficient room behind the curb. Typically, major destinations like schools, parks, museums, and grocery stores make great candidates for Off-Street segments.

## IN MONTROSE

Montrose Boulevard, south of Richmond Avenue, is the only recommended Off-Street bikeway in the Study Area. The TIRZ may also consider investing or partnering with other entities to build Off-Street connections to Buffalo Bayou along Waugh Drive, Montrose Boulevard, and Taft Street.

In this report, proposed Off-Street bikeways are **shown in green** on maps.



OFF-STREET BIKEWAY




OFF-STREET BIKEWAY

# WALKING PRIORITY STREETS

## CHARACTERISTICS

Due to right-of-way constraints caused by high vehicle volumes, narrower widths, or the need to serve transit, some major streets may not have sufficient room for a bikeway. Even without a bikeway, Walking Priority Streets serve an important role in the bikeway network as a high-quality first- and last-block connection to destinations. In a full bikeway network, people can bike close to their destination and use a helpful sidewalk for the final few blocks on a Walking Priority Street.

Well-shaded, wide sidewalks with amenities like lighting and seating and end-of-trip facilities like bike parking give people biking an enjoyable experience for the final few blocks of their trip. Intersections should be safe and comfortable to cross; people walking should be highly visible to drivers. Leading walk phases at signals also allow people to step into the intersection before vehicles begin turning.

## IDEAL LOCATIONS

Walking Priority Streets are ideal for major commercial corridors with several destinations that create high volumes of people walking and driving, but do not have sufficient right-of-way width to allow a Dedicated On-Street bikeway.

## IN MONTROSE

Recommended Walking Priority Streets include Westheimer Road, Dunlavy Street, Montrose Boulevard, Richmond Avenue, Shepherd Drive, and West Gray Street west of Waugh Drive.

In this report, proposed Walking Priority Streets are **shown in gold** on maps.



WALKING PRIORITY STREET



BIKE PARKING ON WALKING PRIORITY STREET

# END-OF-TRIP FACILITIES

Streets that are safe and enjoyable for people biking should include end-of-trip facilities to encourage more people to ride their bike. These amenities ensure easy access to parking, maintenance tools, and places to refresh after a bike ride.

## BIKE PARKING

Secure bicycle parking should be easy to find and abundant throughout the neighborhood. Residents and visitors to Montrose should not be forced to lock their bikes to street signs, or walk multiple blocks to find the nearest bike parking.

## FIX-IT STATIONS

Unexpected issues during a bike ride can be easily fixed with a few simple tools. Regularly placed bicycle fix-it stations with multi-tools, air pumps, a repair stand, and other essentials offer a peace of mind for people biking around Montrose.

## CHANGING ROOMS

Houston's heat and wet weather often prevent more people from biking frequently. Several employers have committed to solve this problem by installing changing facilities and showers in their offices to give sweaty employees the privacy to freshen up after a ride. Although the TIRZ may not directly invest in these facilities, encouraging businesses in Montrose to apply for Bicycle Friendly Business status will increase the number of changing rooms and showers over time.



NEIGHBORHOOD BIKE PARKING


IN-STREET BIKE PARKING

# OTHER CONSIDERATIONS

## LIGHTING AND SHADE

People should feel comfortable biking in Montrose at all times of the year and all times of day – whether midnight, or high noon in the summer. Investments in lighting will not only keep people walking safe, but can also shed light on bike lanes, making it easier to see and avoid heavy debris and poor pavement conditions. Shade from trees, buildings, or other shade structures can also benefit both people walking and biking. Shade trees behind the curb can also keep bike lanes cool, making for a more comfortable ride.

## BIKE SHARE

A safe and connected bike network should be available to all people, regardless of bike ownership. The four bike share stations in the Study Area get used frequently but do not currently provide enough coverage for the whole neighborhood. Houston Bike Share continues to expand the number of BCycle stations throughout the city and the TIRZ should consider a partnership to expand within Montrose. Additional recommendations for bike share can be found on pages 94-99.

## NEW TRANSPORTATION TRENDS

Beyond bike share, micromobility trends like e-scooters, electric bikes, and hoverboards continue to raise questions about the best way to design roadways for the safety and comfort of all users. Driverless automated and connected vehicles also present safety concerns for people walking and biking. The TIRZ should stay aware of these trends to anticipate any consequences of designing bikeways.



SHADED SIDEWALKS




BIKE SHARE STATION

# DEVELOPING A MONTROSE BIKEWAY NETWORK

## To support a 20-minute neighborhood

The ideal bikeway network is not only safe and comfortable, but well connected to neighborhood destinations, offers direct routes for bicyclists, and offers an attractive riding experience that does not require frequent stops and starts for a bicyclist.

### THE CURRENT NETWORK

The only existing high-comfort Montrose bikeway on the Houston Bike Plan is a disconnected east-west section of Hawthorne Street that connects into Midtown. A programmed project by the TIRZ will add protected bike lanes on Waugh Drive and Commonwealth Street, adding high-comfort north-south streets. These two facilities only serve a small portion of the overall Study Area and do not connect to most of the neighborhood's major destinations. The existing network can be seen in **Figure 4.4**.

### THE PRIORITY NETWORK

The recommended priority bikeways further builds out the neighborhood network by making additional north-south and east-west connections in every quadrant of Montrose. As seen in **Figure 4.5**, the priority projects include a mix of Neighborhood Safe Streets and Dedicated On-Street facilities.

### THE VISION NETWORK

The vision network for Montrose expands on the priority network, increasing the concentrations of connections of all four types of bikeways. A map of the vision network can be seen in **Figure 4.6**.





# EXISTING & PROGRAMMED NETWORK

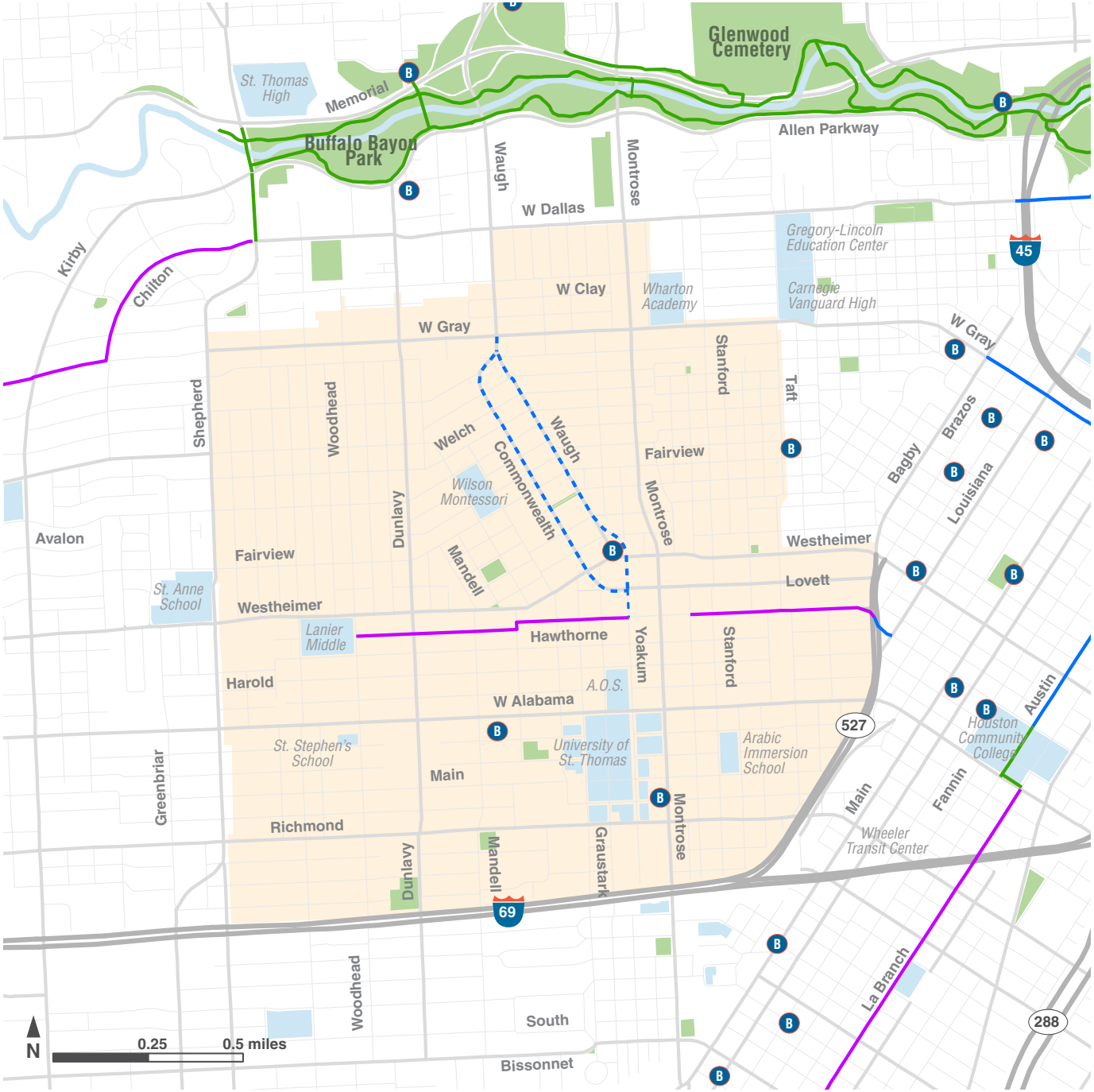



figure 4.4 Existing and Programmed Bicycle Facilities

**Facility Type**

- Dedicated On-Street
- Neighborhood Safe Street
- Off-Street
- Programmed Dedicated On-Street

- Roadway
- Houston BCycle Station
- Study Area
- School
- Park
- Buffalo Bayou

*Source: Team Analysis 2020*

# PRIORITY BIKEWAY NETWORK

## BUILDING A CONNECTED GRID

A well-designed bikeway network allows people – regardless of their age or ability – to travel comfortably to all parts of the neighborhood. In the Study Area, the easiest way to accomplish this is to build a connected grid of high-comfort bikeways that are evenly spaced through Montrose.

The recommended Priority Bikeway Network (see **Table 4.1** and **Figure 4.5**)builds a near-term foundation for the grid using Neighborhood Safe Street and Dedicated On-Street best practices. Three east-west and four north-south bikeways cross the neighborhood on streets with sufficient right-of-way to accommodate an All-Ages-and-Abilities facility without requiring full reconstruction.

The bikeways are also evenly spaced to expand connectivity to every part of Montrose. Only one-third of Montrose residents are within a quarter mile of Hawthorne Street, the only existing high-comfort street network in Montrose. Once complete, this Priority Bikeway Network would give 94% of the neighborhood access to a safe bikeway within a quarter mile.

## RELATIONSHIP TO PROJECTS BY OTHERS

The Priority Bikeway Network does not exist in a vacuum. The network interacts with several projects already planned within the Study Area, and extends beyond Montrose to make connections with key destinations outside the neighborhood.

## PRIORITY NETWORK BIKEWAY PROJECTS

**Neighborhood Safe Streets** Streets where bikes and cars share the road, with improvements that slow vehicle speeds like crosswalk markings, curb extensions, mini traffic circles, and traffic diverters.

1. Hawthorne Neighborhood Safe Street
2. Woodhead Neighborhood Safe Street
3. Stanford Neighborhood Safe Street
4. Welch Neighborhood Safe Street

**Dedicated On-Street Bikeways** Streets with a dedicated bike lane, often protected from vehicle traffic and with green conflict markings at driveways and intersections.

5. West Dallas Bikeway
6. Mandell Bikeway
7. Waugh+Commonwealth Bikeway (Lovett to W Gray in design)

table 4.1 Priority Bikeway Projects

# PRIORITY BIKEWAY NETWORK

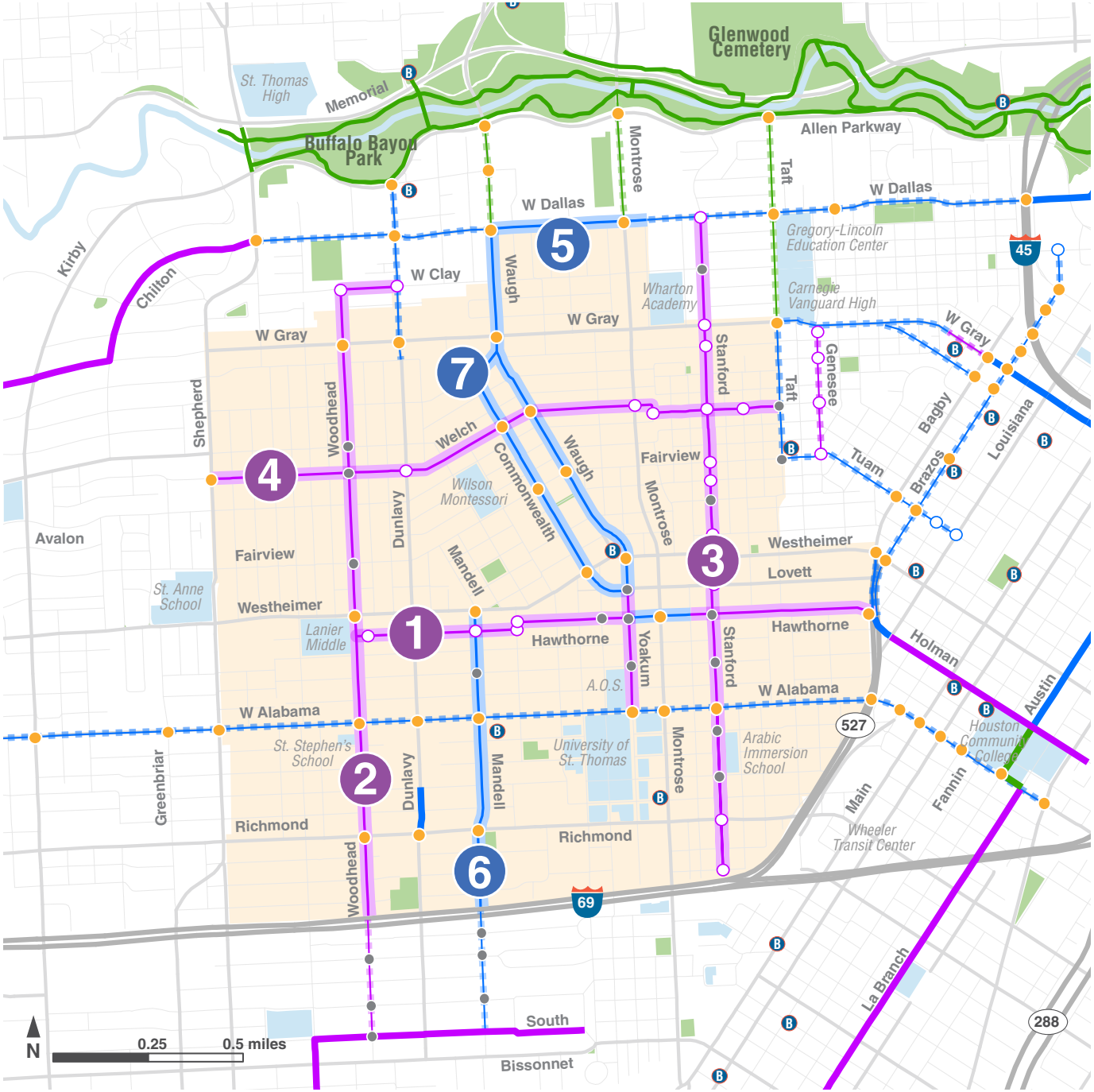



figure 4.5 Priority Bikeway Network

**Facility Type**

- Dedicated On-Street
- Neighborhood Safe Street
- Off-Street
- Walking Priority Streets (Priority / Non-TIRZ)

- Signalized Intersection
- Stop-Contr. Intersection (All-Way)
- Stop-Contr. Intersection (Minor Street)

- Roadway
- Houston BCycle Station
- Study Area
- School
- Park
- Buffalo Bayou

*Source: Team Analysis 2020*

# VISION BIKEWAY NETWORK

## FILLING IN THE GRID

The Vision Bikeway Network, shown in **Table 4.2** and **Figure 4.6**, adds to the foundation of previous investments in the Priority Bikeway Network. These bikeways create a more dense, cohesive grid that makes the 20-minute neighborhood possible for people biking. Some streets in the Vision Bikeway Network require thoughtful planning that can take more time than the short-term priority investments, while others simply fill small gaps to complete final links in the network. Some will require full street reconstruction to achieve a quality bikeway. As with the priority network, the Vision Bikeway Network includes Neighborhood Safe Streets and Dedicated On-Street Bikeways, but adds Walking Priority Streets and Off-Street Bikeways to the mix of facility types in the neighborhood. Walking Priority Streets prioritize investments that make it safer and more comfortable for people walking and riding transit. Off-Street Bikeways are paths behind the curb that are dedicated for bikeways and often shared with people walking at places with higher foot and bicycle traffic.

## WALKABILITY IN A BIKEWAY NETWORK

For major streets in Montrose like Westheimer Road and Montrose Boulevard, existing street widths do not allow enough room for a dedicated bikeway. On some corridors such as Richmond Avenue, future construction projects have dedicated space to other priorities such as transit lanes, which limits space for bikeways. However, wide sidewalks, high-quality transit stops, and more end-of-trip facilities like bicycle parking will still improve the bikeway network by making it easier for people biking to walk or take transit for the first and last few blocks of their trip. The Walking Priority Streets shown on the map not only improve the experience of people walking, but also create a stronger bikeway network and safer mobility options across the Study Area.

## VISION NETWORK BIKEWAY PROJECTS

**Neighborhood Safe Streets** Streets where bikes and cars share the road, with improvements that slow vehicle speeds like crosswalk markings, curb extensions, mini traffic circles, and traffic diverters.

1. West Main Neighborhood Safe Street
2. West Clay Neighborhood Safe Street
3. Taft Neighborhood Safe Street
4. Lovett Neighborhood Safe Street
5. Graustark Neighborhood Safe Street
6. Harold Neighborhood Safe Street

**Dedicated On-Street Bikeways** Streets with a dedicated bike lane, often protected from vehicle traffic and with green conflict markings at driveways and intersections.

7. Fairview Street Bikeway
8. West Gray Bikeway (east of Waugh Drive)

**Walking Priority Streets** Streets with wide sidewalks, high-quality transit stops, generous shade and lighting, seating, and end-of-trip facilities like bike parking that make it easier for people walking and biking.

9. Westheimer Road
10. Montrose Boulevard
11. Richmond Avenue
12. Dunlavy Street
13. West Gray Street (west of Waugh Drive)
14. Shepherd Drive

**Off-Street Bikeway** Wide, paths behind the street curb, often shared with people walking.

15. Montrose Boulevard (north and south connections)

table 4.2 Vision Network Bikeway Projects

# MONTROSE BIKEWAY NETWORK VISION

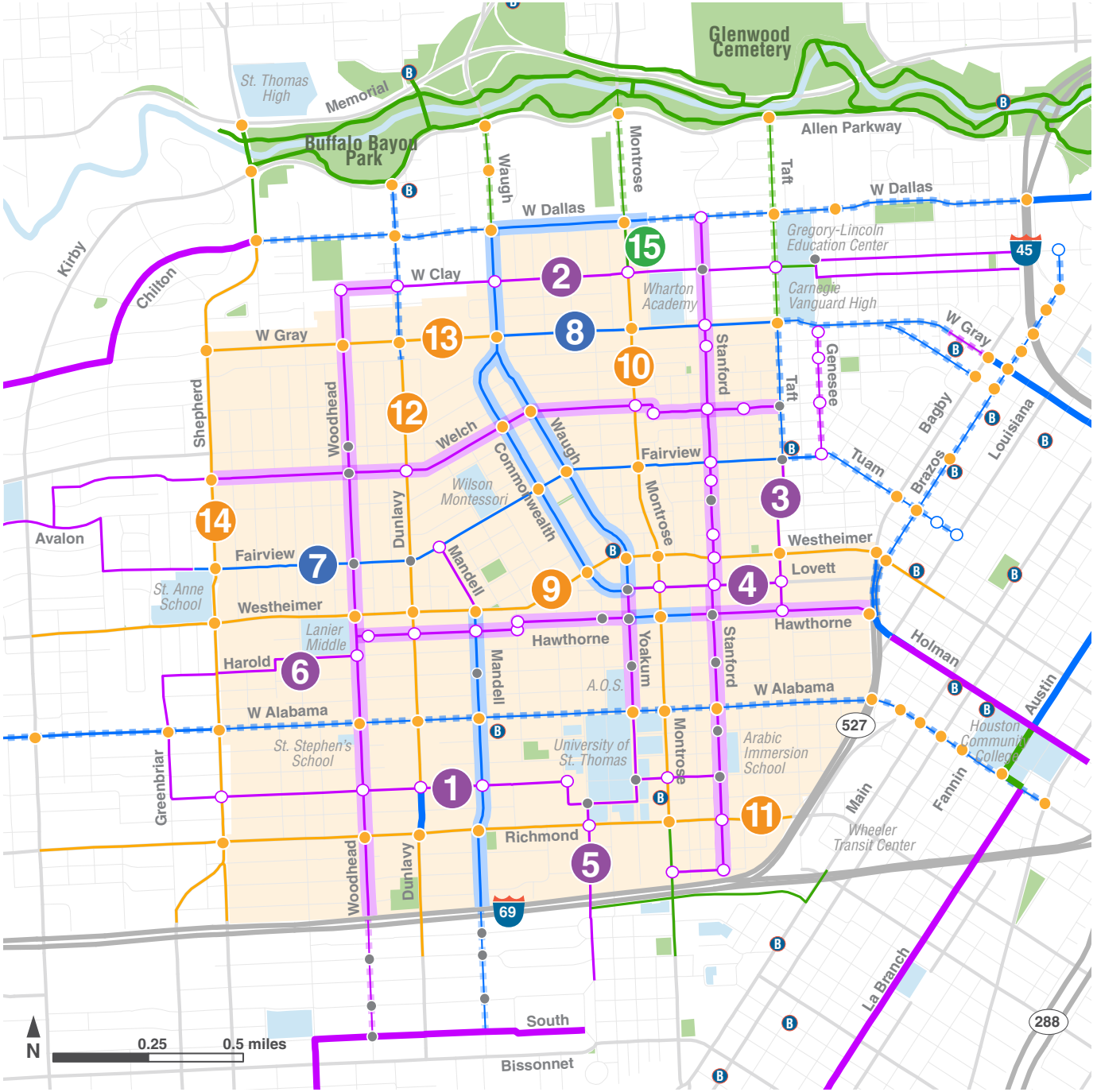



figure 4.6 Montrose Vision Bikeway Network

**Facility Type**

- Dedicated On-Street
- Neighborhood Safe Street
- Off-Street
- Walking Priority Streets

Existing / Vision / Priority / By Others

- Signalized Intersection
- Stop-Contr. Intersection (All-Way)
- Stop-Contr. Intersection (Minor Street)

- Roadway
- Houston BCycle Station
- Study Area
- School
- Park
- Buffalo Bayou

*Source: Team Analysis 2020*

# MONTROSE BIKE SHARE EXPANSION

## CURRENT NETWORK

In early 2020, the Study Area only had four BCycle stations with several others in nearby neighborhoods (see **Figure 4.7**). Destinations and origins for these four stations are mostly within Montrose and nearby neighborhoods, as shown in **Table 4.3**.

- **Menil Collection Station** W. Alabama Street at Mulberry Street
- **Freed Library Station** Montrose Boulevard at Colquitt Street
- **Westheimer & Waugh Station** Westheimer Road at Waugh Drive
- **Taft & Fairview Station** Taft Street at Fairview Street

## EXPANSION

Expansion of the local bike share network will encourage more people to ride, even if they don't own a bicycle. The current opportunity to purchase stations through Houston BCycle represents a rare opportunity to increase mobility options without much investment. The neighborhood's current stations do not sufficiently cover the full Study Area. Investing in an additional 10 to 20 stations would allow for nearly full coverage of the neighborhood, increasing the number of homes and businesses within a quarter mile, or five-minute walk, to a station.

Recommended locations for new BCycle stations are sorted into tiers based on proximity to bikeways on the priority network, increases in coverage across Montrose, and access to major destinations. Recommendations offer ideas for general locations. Final station locations should be selected by the TIRZ and vetted with Houston Bike Share.

Even with ever-changing micromobility trends, like bike share and electric scooters, these expansion recommendations can apply to many different types of technologies. The ultimate goal is to increase access in Montrose.

## DESTINATIONS AND ORIGINS FOR MONTROSE STATIONS

**Destinations outside of Study Area in bold**

**Menil Collection Station** W. Alabama Street at Mulberry Street

| TOP 4 STATION DESTINATIONS | TOP 4 STATION ORIGINS |
|---|---|
| Menil Collection (round trip) | Menil Collection (round trip) |
| **Rice U. Gibbs Rec. Center** | **Rice U. Gibbs Rec. Center** |
| Westheimer & Waugh | Freed Library |
| Freed Library | **Museum of Fine Arts Houston** |

**Freed Library Station** Montrose Boulevard at Colquitt Street

| TOP 4 STATION DESTINATIONS | TOP 4 STATION ORIGINS |
|---|---|
| Freed Library (round trip) | Freed Library (round trip) |
| Westheimer & Waugh | **Ensemble/HCC METRORail Stn.** |
| Menil Collection | Menil Collection |
| **Museum of Fine Arts Houston** | Westheimer & Waugh |

**Westheimer & Waugh Station** Westheimer Road at Waugh Drive

| TOP 4 STATION DESTINATIONS | TOP 4 STATION ORIGINS |
|---|---|
| Westheimer & Waugh (round trip) | Westheimer & Waugh (round trip) |
| **Elgin & Smith** | Freed Library |
| **West Gray & Baldwin** | **Elgin & Smith** |
| Taft & Fairview | Menil Collection |

**Taft & Fairview Station** Taft Street at Fairview Street

| TOP 4 STATION DESTINATIONS | TOP 4 STATION ORIGINS |
|---|---|
| Taft & Fairview (round trip) | Taft & Fairview (round trip) |
| **Clay & Smith** | **Clay & Smith** |
| **West Gray & Baldwin** | **City Hall** |
| **Sabine Bridge** | Westheimer & Waugh |

table 4.3 Destinations and Origins for Montrose BCycle Stations

# EXISTING BCYCLE NETWORK

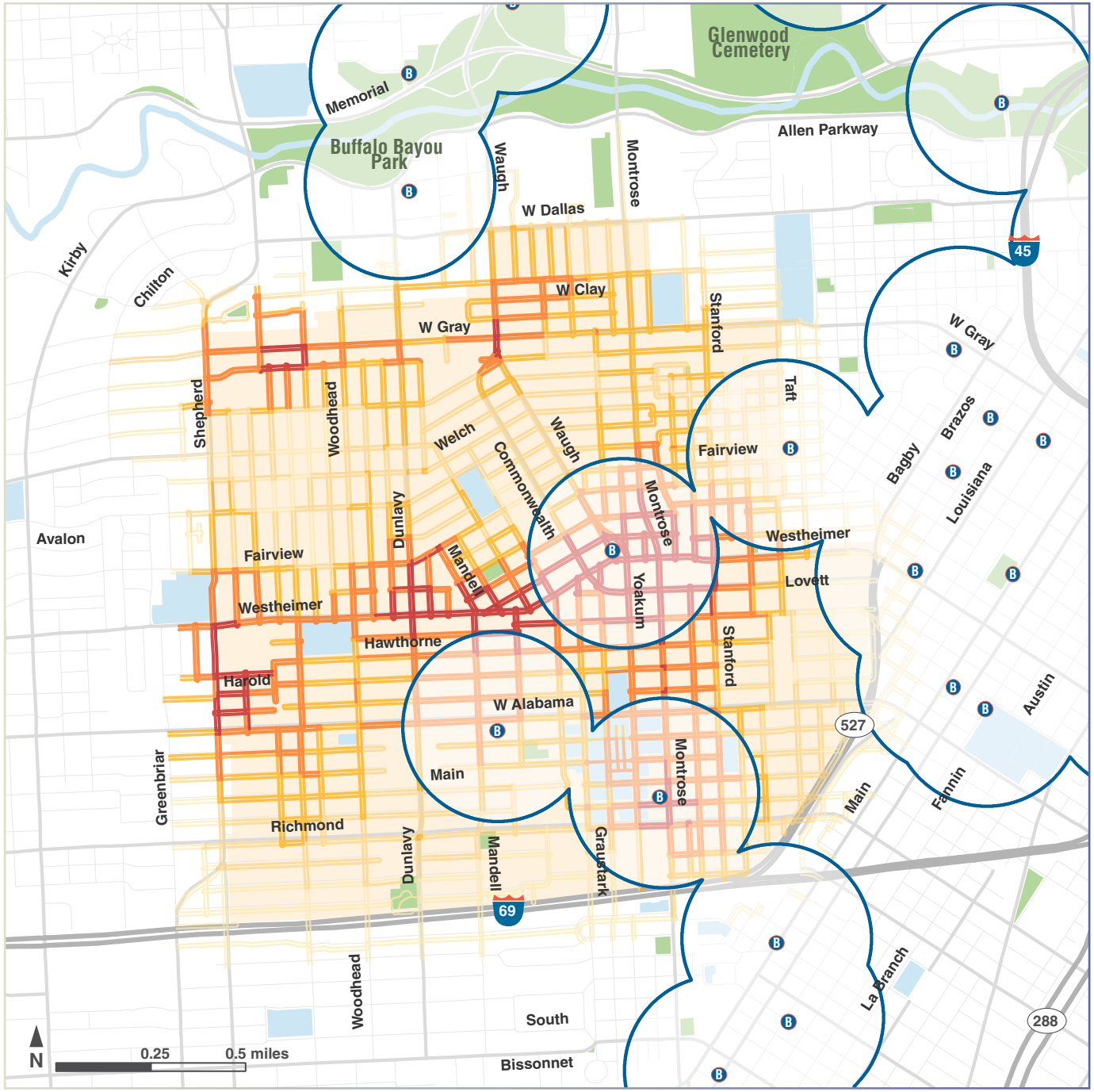



figure 4.7 Current BCycle Network

*Source: Houston Bike Share*

# BIKE SHARE EXPANSION

## TIERS OF EXPANSION

Expansion recommendations are divided into four tiers, shown in **Table 4.4**. The first tier concentrates stations near existing BCycle stations in Montrose and extends new stations north along the TIRZ's investment in the Waugh Drive and Commonwealth Street bikeway. Tier two fills the gap between the Midtown stations and Montrose stations in the eastern side of the Study Area. Finally, tiers three and four expand the network westward until it reaches Shepherd Drive.

The tiers and exact station locations are only recommendations, and can be shifted as the TIRZ and Houston Bike Share solidify priorities and determine the feasibility for specific station locations.

### Tier 1 - Central Montrose

1. Waugh @ Welch (near Rudyard's)
2. Montrose @ Hawthorne (near Kroger)
3. West Dallas @ Waugh (near Whole Foods)
4. Yoakum @ Alabama (near University of St. Thomas)
5. Mandell @ Hawthorne (in street right-of-way)

### Tier 2 - Connecting to the Midtown Network

1. Westheimer @ Whitney (near future Avondale Promenade Park)
2. Montrose @ West Dallas (near future Ismaili Center)
3. Montrose @ Welch (near Texas Art Supply)
4. West Gray @ Taft (near Carnegie Vanguard High School)
5. West Main @ Branard (near The Montrose Center)

### Tier 3 - Expanding West (1)

1. Hawthorne @ Woodhead (near Lanier Middle School)
2. Fairview @ Welch (in street right-of-way)
3. Alabama @ Hazard (near West Alabama Ice House)
4. West Gray @ McDuffie (near River Oaks Theatre)
5. West Gray @ Woodhead (near Kroger)

### Tier 4 - Expanding West (2)

1. Woodhead @ Welch (in street right-of-way)
2. Dunlavy @ Castle Court (near Ervan Chew Park)
3. Mandell @ Richmond (near Mandell Park)
4. Dunlavy @ Fairview (in street right-of-way)
5. Alabama @ Dunlavy (near HEB)

table 4.4 BCycle Station Recommended Tiers

# TIER 1 EXPANSION

1. Waugh @ Welch (near Rudyard's)
2. Montrose @ Hawthorne (near Kroger)
3. W Dallas @ Waugh (near Whole Foods)
4. Yoakum @ Alabama (near University of St. Thomas)
5. Mandell @ Hawthorne (in street right-of-way)

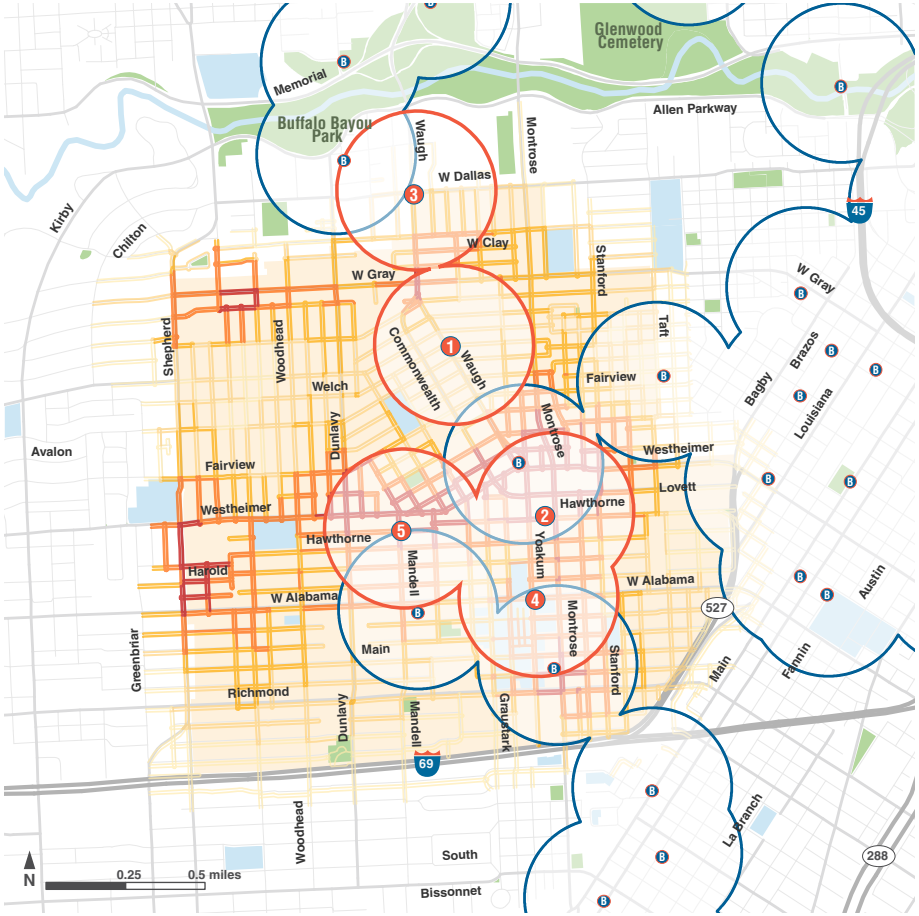



figure 4.8 Proposed Tier 1 BCycle Network Expansion

# TIER 2 EXPANSION

1. Westheimer @ Whitney (near future Avondale Promenade Park)
2. Montrose @ West Dallas (near future Ismaili Center)
3. Montrose @ Welch (near Texas Art Supply)
4. West Gray @ Taft (near Carnegie Vanguard High School)
5. West Main @ Branard (near The Montrose Center)




figure 4.9 Proposed Tier 2 BCycle Network Expansion

Study Area
School
Park
Buffalo Bayou
Roadway
Existing Station
1/4 mile from Station
Added Coverage from Tier
Fewer Destinations
More Destinations
Street Name

*Source for both: Team Analysis 2020*

# TIER 3 EXPANSION

1. Hawthorne @ Woodhead (near Lanier Middle School)
2. Haddon @ Ridgewood (near Metropolitan Multi-Service Center)
3. Alabama @ Hazard (near West Alabama Ice House)
4. West Gray @ McDuffie (near River Oaks Theatre)
5. West Gray @ Woodhead (near Kroger)




figure 4.10 Proposed Tier 3 BCycle Network Expansion

# TIER 4 EXPANSION

1. Woodhead @ Welch (in street right-of-way)
2. Dunlavy @ Castle Court (near Ervan Chew Park)
3. Mandell @ Richmond (near Mandell Park)
4. Dunlavy @ Fairview (in street right-of-way)
5. Alabama @ Dunlavy (near HEB)

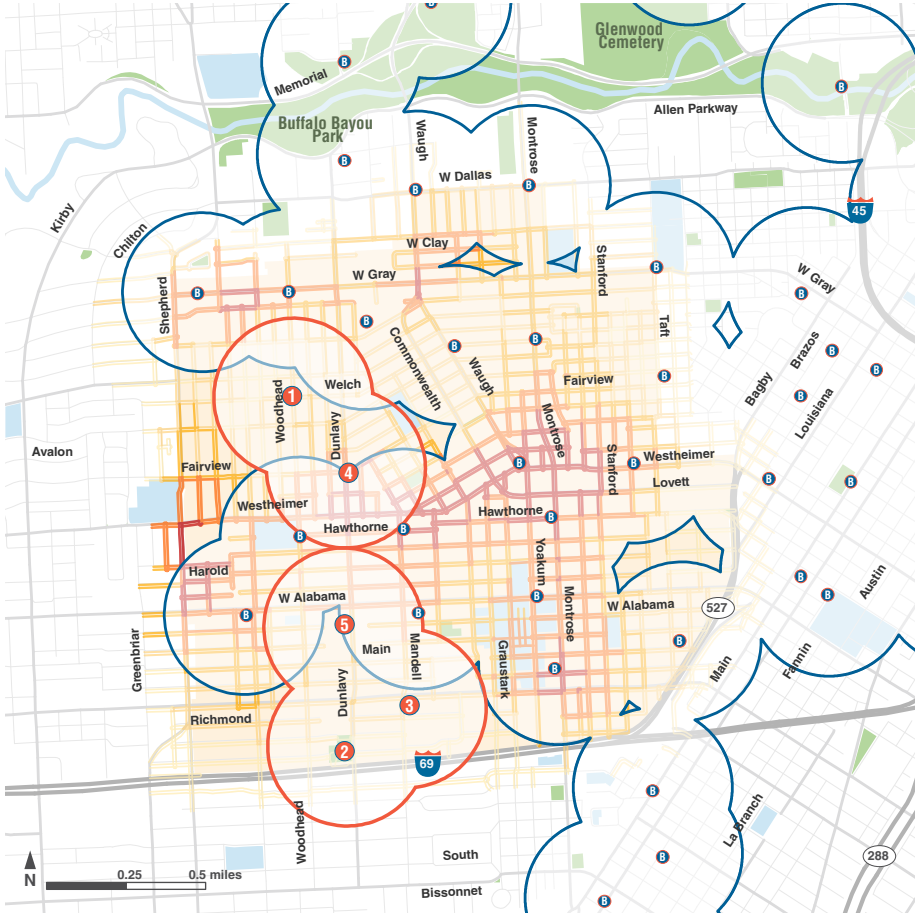



figure 4.11 Proposed Tier 4 BCycle Network Expansion

Study Area
School
Park
Buffalo Bayou
Roadway

Existing Station
1/4 mile from Station
Added Coverage from Tier

Fewer Destinations — More Destinations
**Street Name**

*Source for both: Team Analysis 2020*

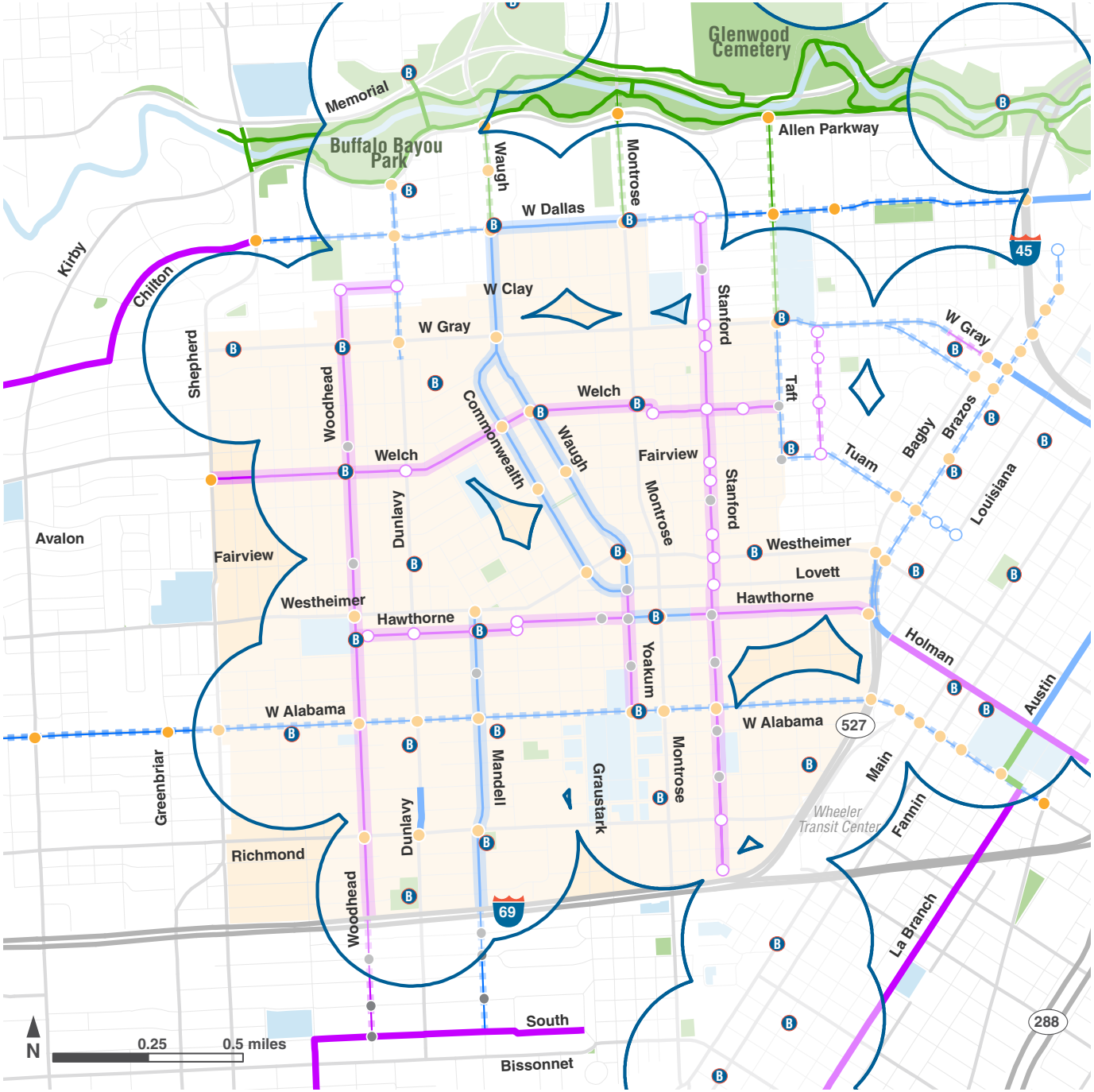



figure 4.12 BCycle Expansion and Priority Network

# BCYCLE EXPANSION & PRIORITY NETWORK

**Facility Type**

- Dedicated On-Street
- Neighborhood Safe Street
- Off-Street
- Walking Priority Streets

*Priority* *By Others*

- Signalized Intersection
- Stop-Controlled Intersection (All-Way)
- Stop-Controlled Intersection (Minor Street)
- Existing/Recommended Station
- 1/4 mile from Station

- Roadway
- Study Area
- School
- Park
- Buffalo Bayou

*Source: Team Analysis 2020*

# BUILDING THE NETWORK MONTROSE DESERVES

## A NEW DAY FOR NEIGHBORHOOD MOBILITY

Montrose has always been a unique place with culture and history that stands apart from other neighborhoods in Houston. But its bike network does not reflect the demand for better facilities or its proximity to Buffalo Bayou and other major destinations where people are already biking.

A well-designed bike network will do more than just make biking easier. It will also present a new transportation option to the residents of Montrose. More people will choose to ride to local businesses, ride for exercise, ride to work and school, or just ride for fun if they can rely on a complete network of safe, high-comfort bikeways that give them easy 20-minute options. These investments have the potential to reshape the way people get around in their neighborhood.

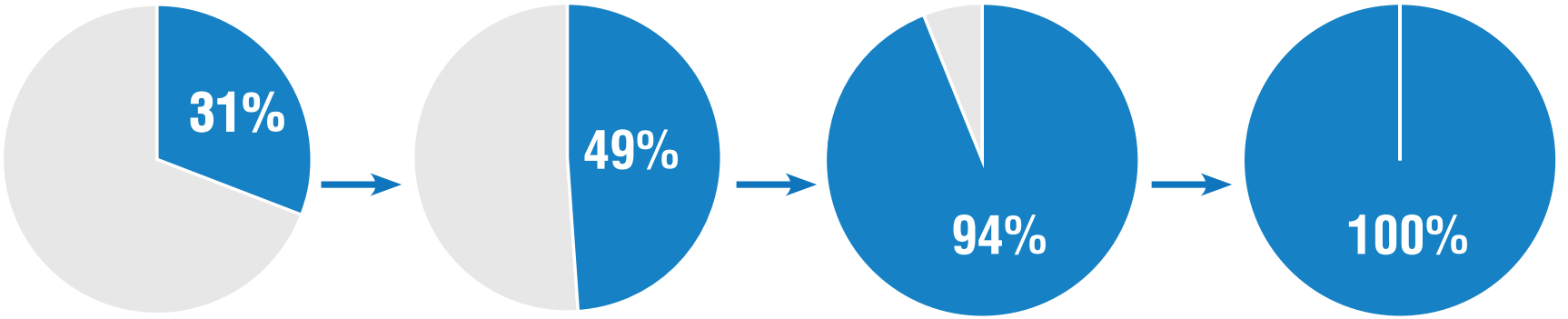
## THE IMPACT OF A NEW NETWORK

Once built, the recommended Priority and Vision Bikeway Networks will be at the finger tips of nearly every resident in Montrose. As it stands, only one in three Montrose residents can reach a comfortable bikeway within a quarter mile, or a five minute walk. This bikeway, Hawthorne Street, is disconnected by challenging intersections and does not link to other bikeways to create that positive network effect.

Fortunately, once the TIRZ has completed its Priority Network, the high-comfort network will be within a quarter mile of 94% of all residents. The Vision Network and planned projects by other entities will bring that to 100%. The proposed network in this Plan creates a truly connected Montrose.

## IMPROVING BIKEWAY ACCESS

### PERCENT OF STUDY AREA POPULATION WITHIN 1/4 MILE OF A HIGH-COMFORT BIKEWAY




*Source: Team Analysis 2020*
*Note: This analysis assumes each set of projects builds from left to right*

## PRIME SEASON FOR PARTNERSHIPS

Since the adoption of the City of Houston Bike Plan in 2015, the call for more and better bikeway has only increased in Houston. The TIRZ is well-positioned to capture and add to this momentum with important partnerships in the near term. In particular, entities like Harris County Precinct One, Houston Bike Share, the City of Houston, and METRO have all made recent investments and are planning future investments in bicycle infrastructure. This Plan allows the TIRZ to articulate its vision for bikeways in Montrose, making it easier for partners to back new investments. The TIRZ should work now to identify those partnerships to gain quick wins that add to that city-wide momentum.




## QUESTIONS TO START EACH YEAR

The Bike Montrose recommendations outlined by the Priority and Vision Bikeway Networks are based on the context of early 2020. Each year may bring new developments that call for a review of these recommendations. Each year, the TIRZ should revisit the Bike Montrose network priorities by answering these questions:

**Current and Programmed Bikeways by the TIRZ**

- What is the status of current TIRZ bikeway projects?
- Are there any lessons learned from the last year of bikeway planning and construction that can be applied to future projects?
- What is this year's planned budget for bikeway design and implementation?
- What funding opportunities such as Transportation Improvement Program (TIP) funds or grant opportunities are available this year?

**Programmed Bikeways by Others**

- What new bikeways are being planned and built by others? How do new projects relate to existing bikeways in Montrose?
- Would any bikeways by others benefit significantly with TIRZ partnership?

**New Bikeways**

- Given the questions above, what are the ideal Bike Montrose recommendations to pursue next, based on urgency, budget, and feasibility?
- How would selected new projects relate to existing projects? To projects by others?



# chapter 5

# ACTION PLAN



# BLUEPRINT FOR IMPLEMENTATION

## Building strong networks for walking and biking

The TIRZ has a wide variety of methods available for building and reinforcing the infrastructure of a 20-minute neighborhood. This chapter should serve as a guidebook as the Board of Directors defines the strategic investments of the organization over the next decade. The Action Plan outlines projects for the TIRZ to pursue, as well as recommended strategies for funding and constructing those projects.

### 20-MINUTE NEIGHBORHOOD PROJECTS

In isolation, each recommended project improves safety and comfort for people walking, biking, and riding transit. Together, projects reinforce the 20-minute vision for Montrose, stitching together a connected fabric in key areas throughout the community. The projects advance the four pillars of a 20-minute neighborhood:

- **SAFE** places for people to move around
- **CONNECTED** network that offers many choices
- **AFFORDABLE** to ensure access for many people
- **ENDURING** livability that embraces history

### USING THIS CHAPTER

The chapter opens by outlining the tools available to the TIRZ and its partners to implement and fund all project types. The TIRZ has many ways to approach its projects, and the toolbox outlines each.

The chapter then describes ongoing and programmed projects by others in the Study Area. Staying informed about the scope, status, and any changes to these known projects, or future new projects, will allow the TIRZ to influence all ongoing projects in the Study Area.

Finally, the chapter closes with a list of recommended Short-Term Projects, Long-Term Projects, and Programs and Policies for the TIRZ to pursue. Each project recommendation includes cost estimates, importance to network connectivity, potential partners, and available implementation and funding tools specific to that project.

### BREAKDOWN OF RECOMMENDATIONS

This chapter splits recommendations into four types: (1) Projects by Others, (2) Short-Term, (3) Long-Term, and (4) Programs and Policies. Each of these project types address improvements for people walking, biking, and riding transit.



# THE TOOLBOX

To build the vision of a true 20-minute neighborhood, the TIRZ will need to draw from a diverse set of tools and a range of funding streams. Fortunately, the TIRZ can be flexible in selecting the ideal strategy for each project depending on urgency, feasibility, project type, and other factors.

The TIRZ can use tools for improvements regardless of mode – walking, biking, or transit. For example, a bikeway project might be implemented in partnership with the City of Houston, but be largely funded through the TIRZ budget, while a school sidewalk project could be a do-it-yourself project that is funded by a grant.

## IMPLEMENTATION

The **Implementation Toolbox** includes leveraging key partnerships, embracing do-it-yourself projects when appropriate, and supporting existing projects by others.

### Key Partnerships

The TIRZ should partner with agencies, developers, civic clubs, and residents on projects that support the TIRZ's goals.

### Do-It-Yourself

The TIRZ can take the lead on projects identified as high-priority that align with their Project Plan.

### Projects by Others

The TIRZ can use its expertise and local knowledge to support and influence projects led by other agencies.

## FUNDING

The **Funding Toolbox** includes the TIRZ budget general fund and bonding authority, grant opportunities, and funds spent by other entities like local governments, developers, civic clubs, and residents.

### TIRZ Budget & Bonds

Funds directly from the TIRZ budget, or from its bonding authority are available for many project types.

### Grant Opportunities

This Plan makes the TIRZ highly competitive for grants that improve walking, biking, and access to transit.

### Funded by Others

Investment by other agencies and developers can fund large portions of the Walk+Bike Montrose vision.

# IMPLEMENTATION TOOLBOX

## Key Partnerships



Residents, civic clubs, and local government agencies like METRO, Harris County, City of Houston share similar goals as the TIRZ to improve walking and biking. Many private developers are also embracing trends in livability, including investments in walkable and bikeable spaces. The TIRZ can forge partnerships to implement projects in the neighborhood.

**To develop key partnerships for implementation, the TIRZ should:**

- Identify candidate projects for partnerships, including more costly projects and those that align with goals of another agency.
- Conduct active outreach with agencies doing work in Montrose and surrounding neighborhoods to understand their goals and project priorities. Share the *Walk+Bike Montrose* Plan with those agencies to discuss potential collaboration.
- Share this Plan with civic clubs and resident groups.
- Continue to work with private developers on developer agreements.

## Do-It-Yourself



The TIRZ has the authority and flexibility to pursue priority projects, programs, and policies for the Study Area. Depending on importance, urgency, and feasibility, the TIRZ may wish to maintain more ownership over a project's final outcomes. In this case, the TIRZ can take a Do-It-Yourself (DIY) approach to lead the design and implementation.

**To tackle DIY projects, the TIRZ should:**

- Regularly review its list of recommended sidewalk and bikeway projects, programs, and policies to determine priorities and identify which are best suited for a DIY approach.
- Update Short-Term project lists and cost estimates to accurately compare eligible projects against one another.
- Maintain an updated map of sidewalk condition to easily identify geographic areas where the TIRZ can lead projects.

## Projects by Others



Several ongoing projects in the Study Area will have a major impact on safety and connectivity for people in Montrose. As a major stakeholder with local knowledge, the TIRZ can support these projects and ensure best practices in design and construction without serving as the project lead.

**To support projects by others, the TIRZ should:**

- Request notifications from the City of Houston and Harris County regarding projects in and around the Study Area.
- Submit comments to the City of Houston and Harris County regarding Capital Improvement Projects (CIPs); request meetings with staff during the CIP design and construction process.
- Request notification from the City of Houston regarding permitting and variance requests. Review requests to identify projects that could include improvements to infrastructure.

# FUNDING TOOLBOX

## TIRZ Budget & Bonds

The TIRZ enjoys discretion over its budget and has the ability to issue bonds as needed. These options give the TIRZ flexibility in project selection and funding, and can be an important tool for forming partnerships.

**To maximize the impact of its own budget, the TIRZ should:**

- Set spending goals for recurring projects, programs, and policies and review those goals annually.
- Regularly review budget numbers for priority projects to determine how much is needed in any given year and how much should be reserved for future projects and partnerships.
- Use bonding authority for large projects that are outside the maximum available budget in a single year.

## Grant Opportunities

The TIRZ and other partner entities working on projects in Montrose are eligible for a range of grants from places like AARP, People for Bikes, AmericaWalks, the National Endowment for the Arts, the National Association of Realtors, and other places that offer grants to improve conditions for people walking, biking, and riding transit.

**To take advantage of grant opportunities, the TIRZ should:**

- Develop a list of grants well-suited for sidewalk and bikeway improvements; review the list regularly for upcoming deadlines.
- Identify data points about the TIRZ and the Study Area that will be useful for grant applications. Update data as needed.
- Reach out to other agencies to gauge interest in partnering on grants, or in submitting letters of support for grant applications.

## Funds from Others

The TIRZ budget is not large enough to fully fund all sidewalk, bikeway, and other roadway improvements in the Study Area. The TIRZ should rely on other agencies to fund projects as well. The TIRZ can support other entities to ensure best design practices and offer to co-fund projects for greater impact.

**To leverage investments by others, the TIRZ should:**

- Build expertise on the Board of Directors about funding obligations and constraints of partner agencies.
- Keep track of investments by other entities in the Study Area.
- Offer to contribute TIRZ funds to existing projects when a partnership has the ability to significantly impact the outcome.

# ALL RECOMMENDED PROJECTS

Every street in Montrose needs some degree of improvement, leaving the TIRZ with many decisions about project selection and timing over the next 25 years. Some investments make sense as near-term projects in the next couple of years, while others will take longer to plan and execute. The recommended projects in this document are split into four categories, each requiring a different set of strategies. Project also cover all parts of the Study Area, improving connectivity and safety for all residents, as seen in **Figure 5.1**.

## PROJECTS BY OTHERS

Planned or programmed investments that will occur in the short-term, but are lead by other entities. For these investments, the TIRZ can play a critical advisory role.

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## SHORT-TERM PROJECTS

Projects that the TIRZ can lead within the next 2 to 5 years, are feasible within the existing right-of-way of the street, and will have a noticeable community impact.

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## LONG-TERM PROJECTS

Investments requiring a more involved planning process over a longer period of time. These projects are often for larger streets needing wholesale reconstruction.

PAGE 112

## PROGRAMS + POLICIES

Non-capital investments engaging residents and businesses. These are often multi-year efforts that ensure TIRZ improvements are well-received in the community.

PAGE 120






# RECOMMENDED PROJECTS

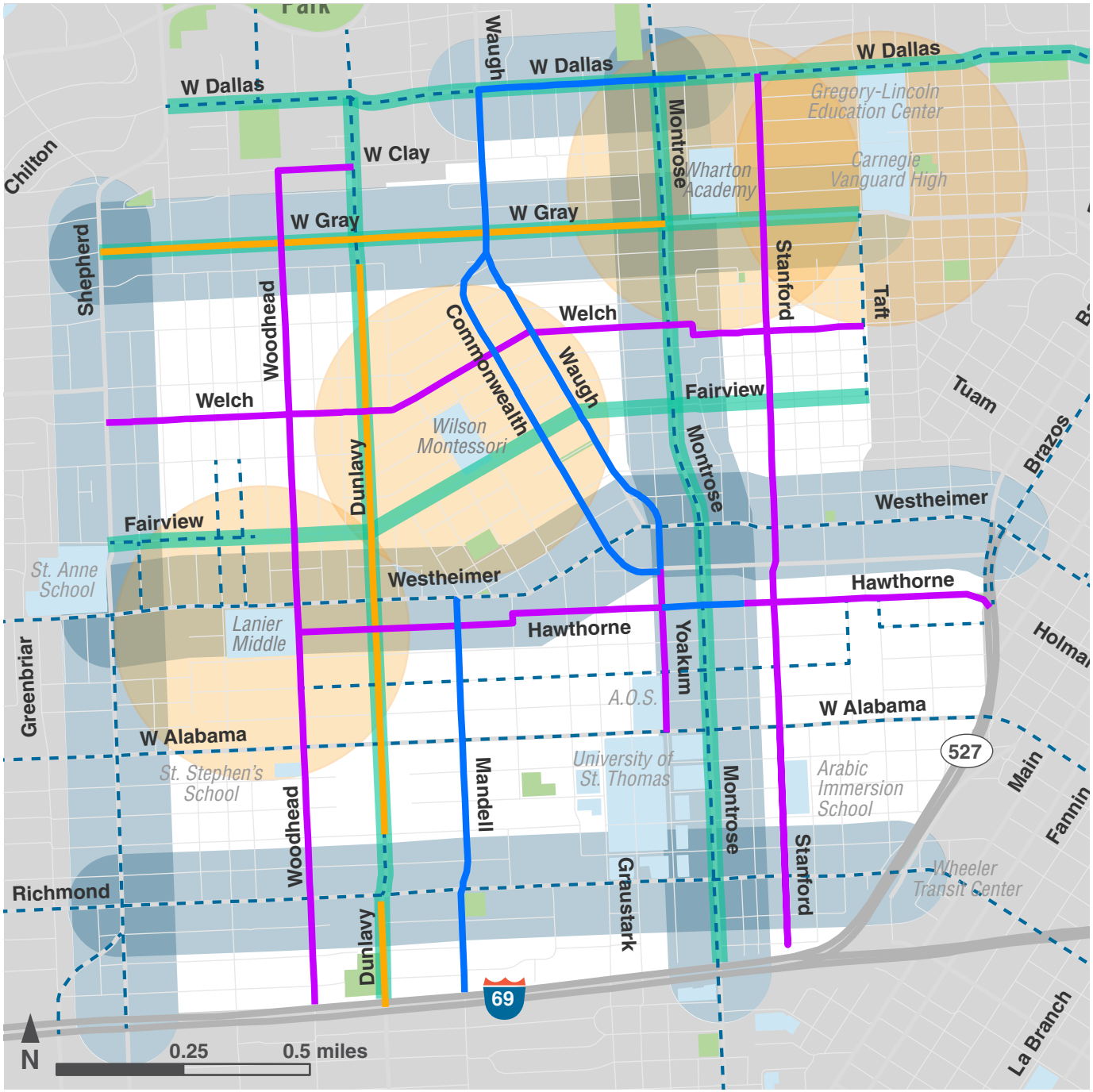



figure 5.1 *Walk+Bike Montrose* Recommended Projects

**Projects by Others**

**Short-Term Projects**
- Neighborhood Safe Street
- Dedicated On-Street Bikeway
- Walkable Street Retrofit
- Safe School Access
- Safe Transit Access

**Long-Term Projects**

- Roadway
- Study Area
- School
- Park
- Buffalo Bayou

*Source: Team Analysis 2020*

# PROJECTS | BY OTHERS

## SUPPORTIVE ROLE FOR THE TIRZ

The TIRZ is not the only entity planning and building infrastructure in Montrose. Several agencies are working on projects in and around the neighborhood like the City of Houston, METRO, Harris County Precinct One, and surrounding TIRZs and management districts (see **Table 5.1** and **Figure 5.2**). Private developments, especially in large blocks near Buffalo Bayou, often include updates to nearby streetscape and storm water utilities.

With its local knowledge and expertise in Montrose, the TIRZ should stay updated on all projects within and near the Study Area. Where possible, the TIRZ can collaborate with the project lead to encourage project design that prioritizes the four pillars of a 20-minute neighborhood. For projects conducted by government agencies like the City of Houston, the TIRZ can also request project updates as needed.

## SMALLER PROJECTS BY OTHERS

While the TIRZ cannot remain omnipresent throughout the Study Area, it can work to support smaller projects like sidewalk reconstruction or parcel-level improvements. During the writing of this report, residents in the Audubon Place neighborhood of Montrose constructed 4-foot sidewalks along multiple parcels – narrower than minimum standards. By working alongside the city, the TIRZ can ensure projects are implemented that support the vision of a 20-minute neighborhood.

## PROJECTS BY OTHERS

### City of Houston Capital Improvement Project (CIP)

1. Lower Westheimer Reconstruction
2. West Alabama Reconstruction
3. Dunlavy Reconstruction
4. Taft Reconstruction
5. Brazos Reconstruction
6. Avalon Place Neighborhood Reconstruction
7. Kipling Pavement Replacement
8. Spur Project between Louisiana and Brazos

### METRO

9. 56 Montrose BOOST Corridor Improvements
10. 25 Richmond METRORapid Improvements
11. 82 Westheimer BOOST Improvements

### Other TIRZs and Management Districts

12. Shepherd Drive Drainage Improvements by Upper Kirby District

### Significant Private Development

13. Montrose Collective
14. Ismaili Center
15. West Dallas developments
16. The Allen

table 5.1 Known Projects by Other Entities

# PROJECTS BY OTHERS

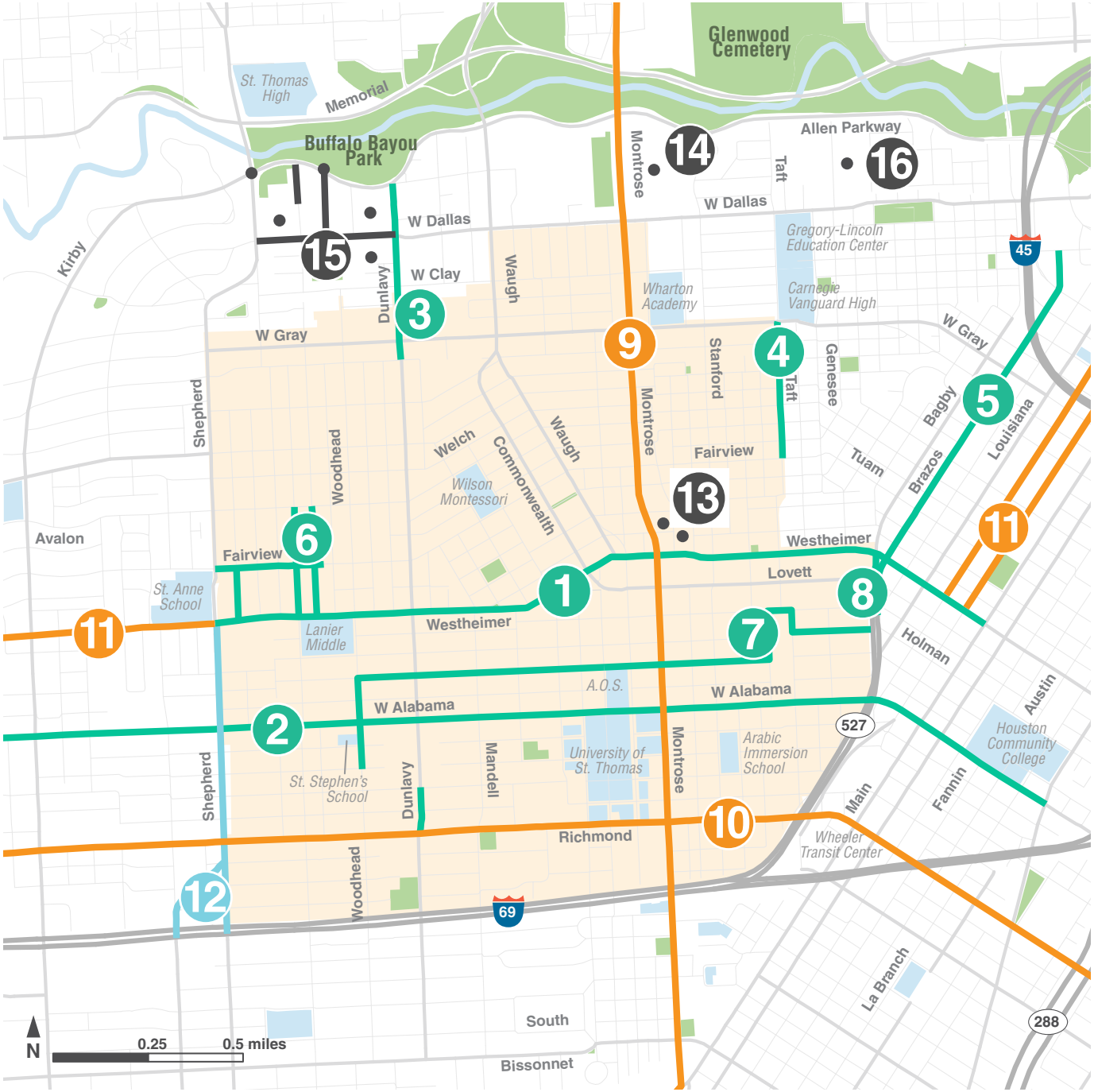



figure 5.2 Known Projects by Other Entities

**Project Lead**

- City of Houston (CIP)
- METRO
- TIRZ/Management District
- Private Developer

- Roadway
- Study Area
- School
- Park
- Buffalo Bayou

*Source: City of Houston, METRO, Upper Kirby Management District, Team analysis*

# MAJOR PROJECTS BY OTHERS

On three streets, projects by others include reconstruction of a major neighborhood roadway, and make TIRZ coordination even more important (see **Figure 5.3**). Richmond Avenue will be reconstructed by METRO with updates for METRORapid and BOOST improvements. Westheimer Road and West Alabama Street are both on the City of Houston CIP list with additional BOOST improvements by METRO on Westheimer Road as well. All three corridors connect to destinations outside of Montrose and carry more than 15,000 daily vehicle trips.

Currently, all three streets act as barriers to residents walking and biking. Wide lanes, poor sidewalks and curb ramps, and a lack of safe and frequent crossings create a challenging environment for residents and prevent the kind of foot traffic that supports local businesses.

The TIRZ should work closely with the City of Houston and METRO in the near term to provide design guidance that aligns with the goals of the TIRZ and reimagines these three streets as travelways that connect the neighborhood fabric instead of separating Montrose.

## THREE MAJOR PROJECTS BY OTHERS

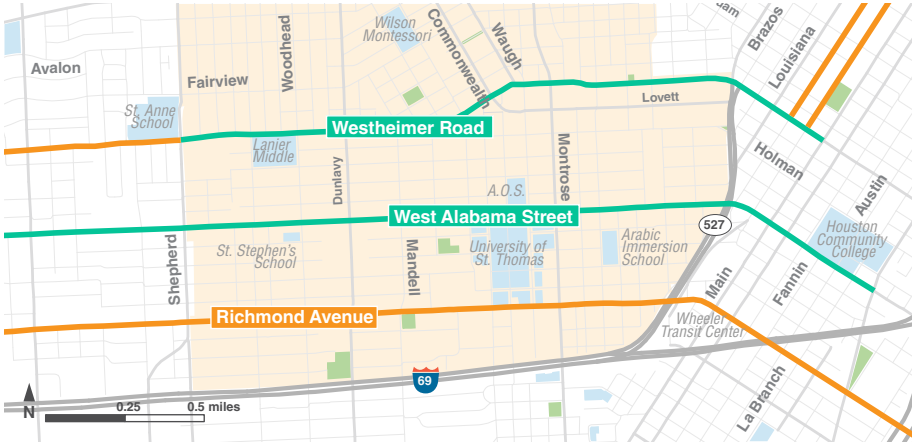


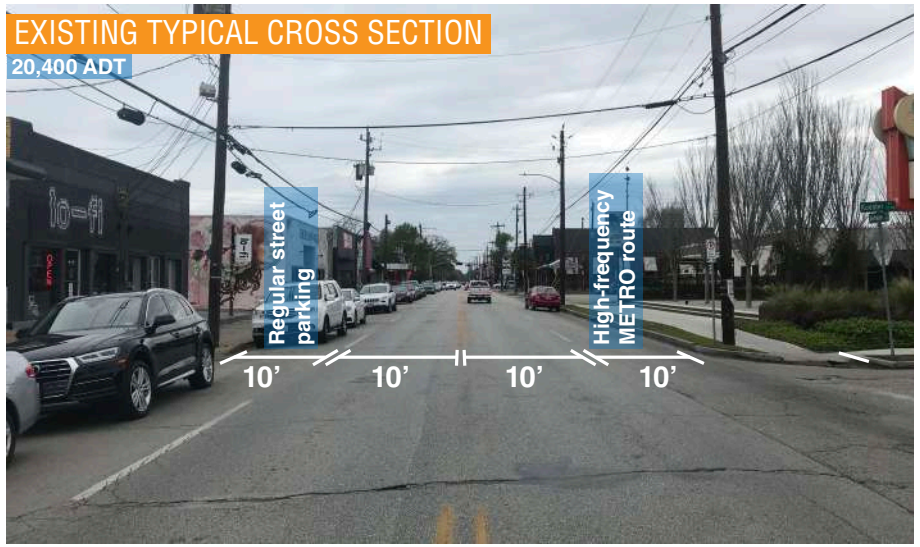

figure 5.3 Major Projects by Other Entities

- City of Houston (CIP)
- METRO Project
- Roadway
- Study Area
- School
- Park
- Buffalo Bayou

Action Plan
page 104

## WESTHEIMER ROAD RECONSTRUCTION

### MAIN STREET OF MONTROSE

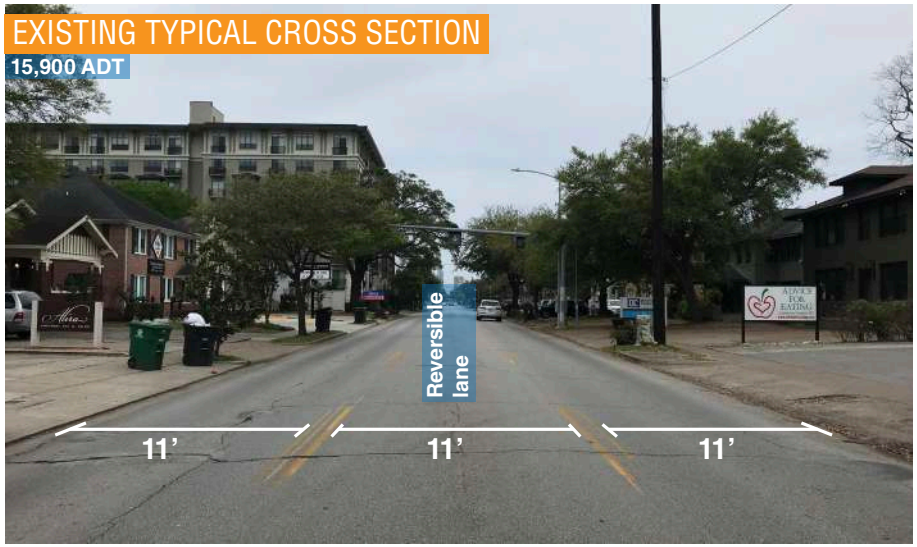



- Planned Project: Align with the goals of the City of Houston Lower Westheimer Study
- Rebuild sidewalks to current standards or better, add amenities like seating, shade trees, lighting, and landscaping, and improve crosswalks at all intersections
- Reallocate vehicle travel lanes to have two through-lanes. Include one center turn lane along the corridor as needed
- Rebuild transit stops to be high-quality, implement transit signal priority, and improve stop spacing
- Where possible, extend the curbs to improve safety and comfort for people walking and to slow vehicle speeds
- Challenges: Limited right-of-way and high vehicle volumes prevent the addition of a Dedicated On-Street bikeway

| NETWORK IMPORTANCE | MAGNITUDE OF COST | IMPLEMENTATION & FUNDING | POTENTIAL PARTNERS |
|---|---|---|---|
| 10 Tier 1 | $$$$ | | • METRO<br>• City |

# ALABAMA STREET RECONSTRUCTION

## NEIGHBORHOOD CULTURAL SPINE

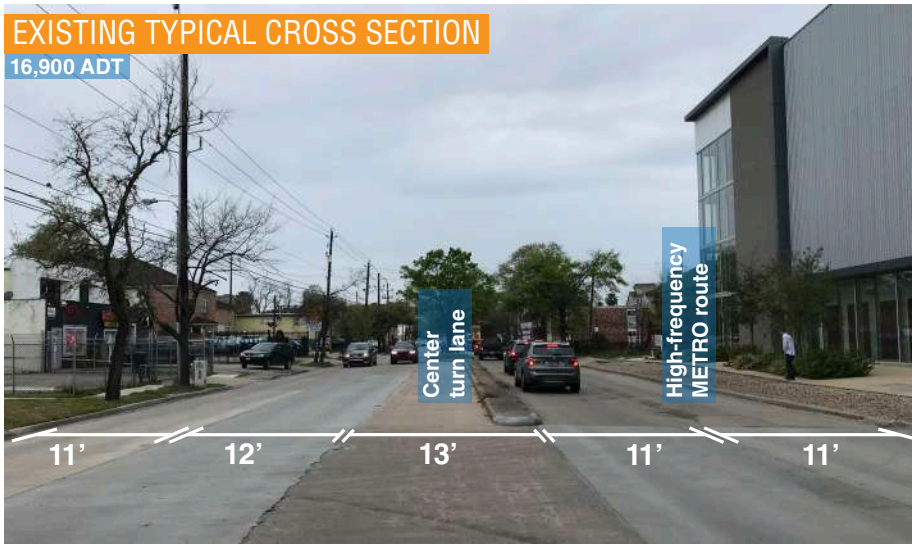



- City of Houston Planned Project
- Rebuild sidewalks to current standards or better, add amenities like seating, shade trees, lighting, and landscaping, and improve crosswalks at all intersections
- Where possible, extend the curbs to improve safety and comfort for people walking and to slow vehicle speeds
- Assess the need for new signals at intersections with more people walking and biking
- Re-size and reallocate vehicle travel lanes to have two through-lanes and turn lane where necessary
- Add a Dedicated On-Street bikeway
- Challenges: Limited right-of-way and mature oak trees makes it difficult to design a high-comfort bikeway

| NETWORK IMPORTANCE | MAGNITUDE OF COST | IMPLEMENTATION & FUNDING | POTENTIAL PARTNERS |
|---|---|---|---|
| 7.9 Tier 2 | $$ | | • City<br>• County |

# RICHMOND AVENUE RECONSTRUCTION

## TRANSIT-ORIENTED AVENUE + GATEWAY TO MIDTOWN




METRO will reconstruct Richmond Avenue to implement METRONext improvements on the 25 Richmond route. This can include:

- Rebuild all sidewalks to current standards or better, widen sidewalks in places with more walking activity, add amenities like seating, shade trees, lighting, and landscaping, and improve crosswalks at all intersections
- Rebuild transit stops to be high-quality, implement transit signal priority, and improve stop spacing
- Reallocate vehicle travel lanes to have two through-lanes and one center turn lane
- Challenges: Limited right-of-way will force trade-offs between vehicles and people walking

| NETWORK IMPORTANCE | MAGNITUDE OF COST | IMPLEMENTATION & FUNDING | POTENTIAL PARTNERS |
|---|---|---|---|
| 6.4 Tier 3 | $$$ | | • METRO<br>• City |

# PROJECTS | SHORT-TERM

Recommended Short-Term projects can be completed within the next 2 to 5 years and will give the TIRZ early successes to build support in the community, complement projects by others, and gain momentum for larger projects in the future.

## PROJECT EXTENTS

Most projects are fully within the Study Area, but some extend further to make important connections. Others remain inside the Study Area, but cross in and out of the TIRZ boundaries. Before committing to any investments, the TIRZ should review project extents and secure the appropriate approvals for projects outside of their jurisdiction.

Project extents were selected to support the goal of building a connected network. The benefits of one project increases when it is part of a larger network of connected sidewalks or bikeways that provide access to where people want to go.

**Figure 5.4** shows the evolution of the sidewalk network, based on complete blocks with wide sidewalks in good condition. As projects by others are constructed, conditions and connections improve. Short-Term projects identified will continue to build out the sidewalk and bikeway networks to make Montrose truly accessible for everyone.

## PROJECT SELECTION

Projects, shown in **Figures 5.4** and **5.5**, were carefully selected based on key characteristics. The projects are spread across Montrose, covering areas with high network importance, in all parts of the neighborhood. All projects are feasible in the short term and do not require wholesale street reconstruction. Finally, projects complement the long list of known projects by others, extending planned improvements further into the neighborhood.

**Tables 5.2** and **5.3** on pages 115 and 117 include (1) a description of expected improvements, (2) planning-level cost estimates, (3) potential partners, and (4) tools for implementation and funding. Each project has a score of network importance. This score is based on the network evaluation conducted during the Walk Montrose evaluation and presented in **Figure 3.15**. Scores presented are weighted averages of network importance by block for each project.

These tables are to be used both for TIRZ project selection as well as to communicate with stakeholders about the "how" and "why" of priority projects for the TIRZ.

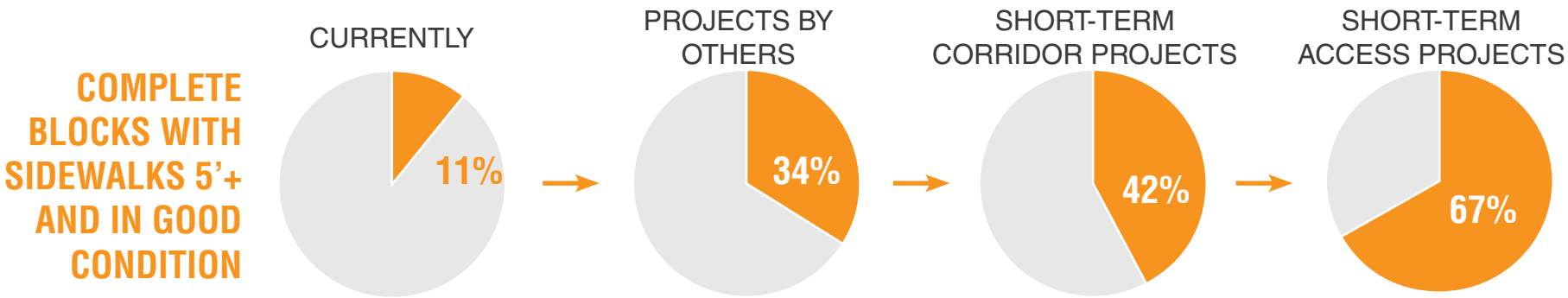



figure 5.4 Evolution of Complete Blocks with Sidewalks 5'+ and in Good Condition

*Source: Team Analysis; Note: This analysis assumes: (1) Replacement of all sidewalks that were not rated as "A" in the condition assessment; (2) Every project includes sidewalk replacement for the full project extent; (3) Each set of projects builds from left to right*

## SHORT-TERM PROJECT TYPES

Short-Term projects are divided into five types. Three project types recommend improvements for corridors and two types are access-based projects that improve connections to community destinations. Some projects are strictly sidewalk improvements, others are bikeways, and some are a combination of both. Corridor Projects, as defined in the following pages, are based on building out a network of safe, comfortable streets within the community to support both biking and walking.

The Access Projects presented in this chapter were identified based on team analysis and discussions with stakeholders, however, the extent of access projects can vary substantially from what is presented here based on funds available, partnerships, and other key implementation factors. For example transit access projects can be divided into smaller projects or combined into larger projects based on grant types or future METRO plans. The sidewalk assessment and network analysis tracker tools developed in this Plan can be used to define variations of access projects in the future.

## CORRIDOR PROJECTS

### NEIGHBORHOOD SAFE STREETS 4 PROJECTS



### DEDICATED ON-STREET BIKEWAYS 2 PROJECTS



### WALKABLE STREET RETROFITS 2 PROJECTS



## ACCESS PROJECTS

### SAFE SCHOOL ACCESS 3 PROJECTS



### SAFE TRANSIT ACCESS 6 PROJECTS



# SHORT-TERM CORRIDOR PROJECTS

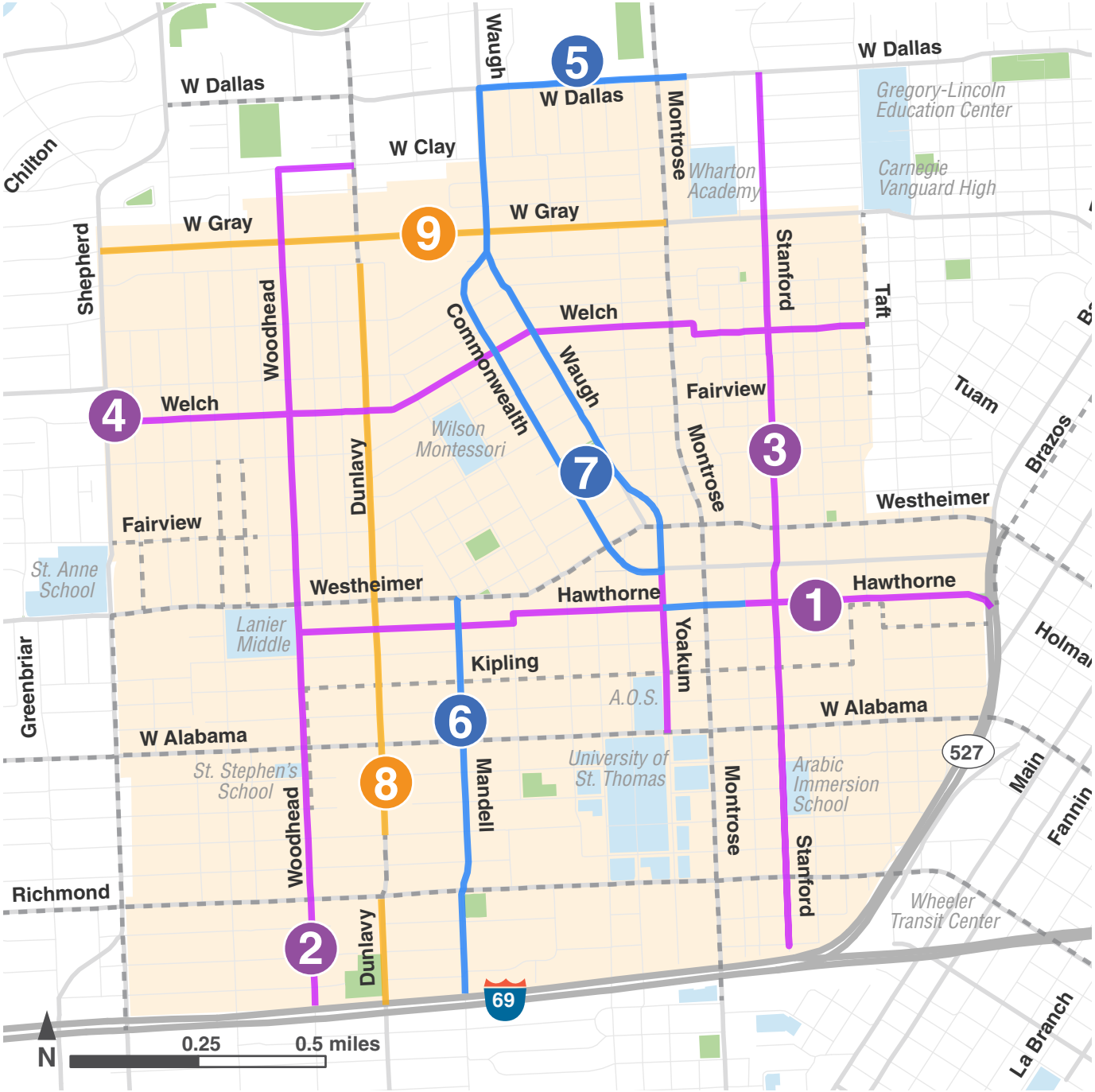



figure 5.4 Short-Term Corridor Projects

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**Project Type**

- Neighborhood Safe Street
- Dedicated On-Street Bikeway
- Walkable Street Retrofit
- Project by Others

- Roadway
- Study Area
- School
- Park
- Buffalo Bayou

*Source: Team Analysis, 2019*

# SHORT-TERM CORRIDOR PROJECTS

| | DESCRIPTION & BENEFIT | NETWORK IMPORTANCE<br>Tier 1 = most important | COST ESTIMATE* | IMPLEMENTATION & FUNDING | POTENTIAL PARTNERS |
|---|---|---|---|---|---|
| **Neighborhood Safe Streets \|** Intersection and roadway improvements to prevent vehicle speeding and improve safety for people walking and biking including new sidewalks, reconstructed curb ramps, crosswalk markings, curb extensions, speed humps, mini traffic circles, traffic diverters, and wayfinding designed for people walking and biking. | | | | | |
| 1 **Hawthorne Street**<br>1.35 miles | • 2.40 miles of improved sidewalk<br>• 86 improved curb ramps | 8.6 Tier 1 | $1,788,000 | | • County<br>• City |
| 2 **Woodhead Street**<br>1.79 miles | • 2.31 miles of improved sidewalk<br>• 80 improved curb ramps | 6.0 Tier 3 | $2,507,000 | | • County<br>• City |
| 3 **Stanford Street**<br>1.71 miles | • 1.86 miles of improved sidewalk<br>• 117 improved curb ramps | 7.9 Tier 2 | $1,802,000 | | • County<br>• City |
| 4 **Welch Street**<br>1.55 miles | • 2.50 miles of improved sidewalk<br>• 115 improved curb ramps | 5.5 Tier 3 | $2,134,000 | | • County<br>• City |
| **Dedicated On-Street Bikeways \|** New buffered/protected bike lanes with green conflict markings at driveways and intersections, improvements for safe crossings such as leading bicycle and pedestrian signals and protected turns. Improvements also include updated sidewalks and curb ramps. | | | | | |
| 5 **West Dallas Street**<br>0.42 miles | • Connect to programmed bikeway<br>• 0.52 miles of improved sidewalk<br>• 59 improved curb ramps | N/A; prioritized based on partnerships | $395,000 | | • County<br>• City<br>• METRO |
| 6 **Mandell Street**<br>0.78 miles | • 1.14 miles of improved sidewalk<br>• 44 improved curb ramps | 7.4 Tier 2 | $1,186,000 | | • County<br>• City |
| 7 ***Waugh and Commonwealth***<br>*1.16 miles (Currently in Design)* | • 2.60 miles of improved sidewalk<br>• 163 improved curb ramps | 8.3 Tier 1 | $2,589,000 | | • County<br>• City |
| **Walkable Street Retrofits \|** Interim design improvements to reduce and prevent speeding and improve safety for people walking such as updated sidewalks and curb ramps, curb extensions, crosswalk markings, formalized parking, and vehicle lane re-striping. | | | | | |
| 8 **Dunlavy Street**<br>1.34 miles (south of Peden Street) | • 1.69 miles of improved sidewalk<br>• 122 improved curb ramps | 7.3 Tier 2 | $1,063,000 | | • City<br>• Residents |
| 9 **West Gray Street**<br>1.13 miles | • 1.69 miles of improved sidewalk<br>• 62 improved curb ramps | 7.9 Tier 2 | $889,000 | | • City<br>• METRO |

table 5.2 Short-Term Corridor Projects

**Cost estimates are rounded up to the nearest $1,000.*

# SHORT-TERM ACCESS PROJECTS




figure 5.5 Short-Term Access Projects

**Project Type**

- Safe School Access
- Safe Transit Access
- Known Project by Others

- Roadway
- Study Area
- School
- Park
- Buffalo Bayou

*Source: Team Analysis 2020*

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# SHORT-TERM ACCESS PROJECTS

| | DESCRIPTION & BENEFIT | NETWORK IMPORTANCE<br>Tier 1 = most important | COST ESTIMATE* | IMPLEMENTATION & FUNDING | POTENTIAL PARTNERS |
|---|---|---|---|---|---|
| **Safe School Access \|** Improvements near schools including updated sidewalks and curb ramps, new crosswalk markings, curb extensions, and additional intersection treatments like leading pedestrian signals where applicable. Improvements can be split and combined with other projects. | | | | | |
| 10 **Wilson Montessori School** | • 4.34 miles of improved sidewalk<br>• 201 improved curb ramps | 5.9 Tier 3 | $2,071,000 | | • County<br>• City<br>• Residents |
| 11 **Wharton Dual Language Academy** | • 2.85 miles of improved sidewalk<br>• 128 improved curb ramps | 6.3 Tier 3 | $1,334,000 | | • County<br>• City<br>• Residents |
| 12 **Lanier Middle School** | • 4.42 miles of improved sidewalk<br>• 152 improved curb ramps | 8.2 Tier 1 | $1,964,000 | | • County<br>• City<br>• Residents |
| 13 **Carnegie Vanguard High School** | • 1.23 miles of improved sidewalk<br>• 56 improved curb ramps | Score not calculated due to proximity to TIRZ boundary edge and limited data available | $606,000 | | • County<br>• City<br>• Residents |
| **Safe Transit Access \|** Improvements for streets intersecting transit routes including updated sidewalks and curb ramps, new crosswalk markings, curb extensions, and additional intersection treatments like leading pedestrian signals. Improvements can be split and combined with other projects. | | | | | |
| 14 **Westheimer Road** | • 8.86 miles of improved sidewalk<br>• 606 improved curb ramps | 9.8 Tier 1 | $4,703,000 | | • County<br>• City<br>• METRO |
| 15 **Richmond Avenue** | • 5.83 miles of improved sidewalk<br>• 383 improved curb ramps | 6.3 Tier 3 | $3,080,000 | | • County<br>• City<br>• METRO |
| 16 **Montrose Boulevard** | • 10.01 miles of improved sidewalk<br>• 666 improved curb ramps | 8.1 Tier 1 | $5,261,000 | | • County<br>• City<br>• METRO |
| 17 **West Gray Street** | • 6.27 miles of improved sidewalk<br>• 380 improved curb ramps | 7.0 Tier 2 | $3,215,000 | | • County<br>• City<br>• METRO |
| 18 **West Dallas Street** | • 2.13 miles of improved sidewalk<br>• 108 improved curb ramps | 5.6 Tier 3 | $1,045,000 | | • County<br>• City<br>• METRO |
| 19 **Shepherd Drive** | • 6.00 miles of improved sidewalk<br>• 309 improved curb ramps | 9.1 Tier 1 | $2,930,000 | | • County<br>• City<br>• METRO |

table 5.3 Short-Term Access Projects **Cost estimates are rounded up to the nearest $1,000.*

# PROJECTS | LONG-TERM VISION PROJECTS

Planning for the future

## LONG-TERM OUTLOOK

While Short-Term Projects can help the TIRZ build momentum and support from the community, larger, more extensive projects require more time to plan and will need to be spaced at intervals to allow the TIRZ to accrue the necessary increment. These Long-Term Projects are for major streets in the Study Area and have the potential to reshape the look, feel, and function of mobility in Montrose (see **Figure 5.6** and **Table 5.4**).

In some cases, projects at this scale require a complete roadway reconstruction to repair poor pavement and re-allocate right-of-way to better serve all road users. These types of projects offer an ideal opportunity to add shade, lighting, and landscaping to a street, and can be coordinated with drainage improvements to address flooding concerns within the community.

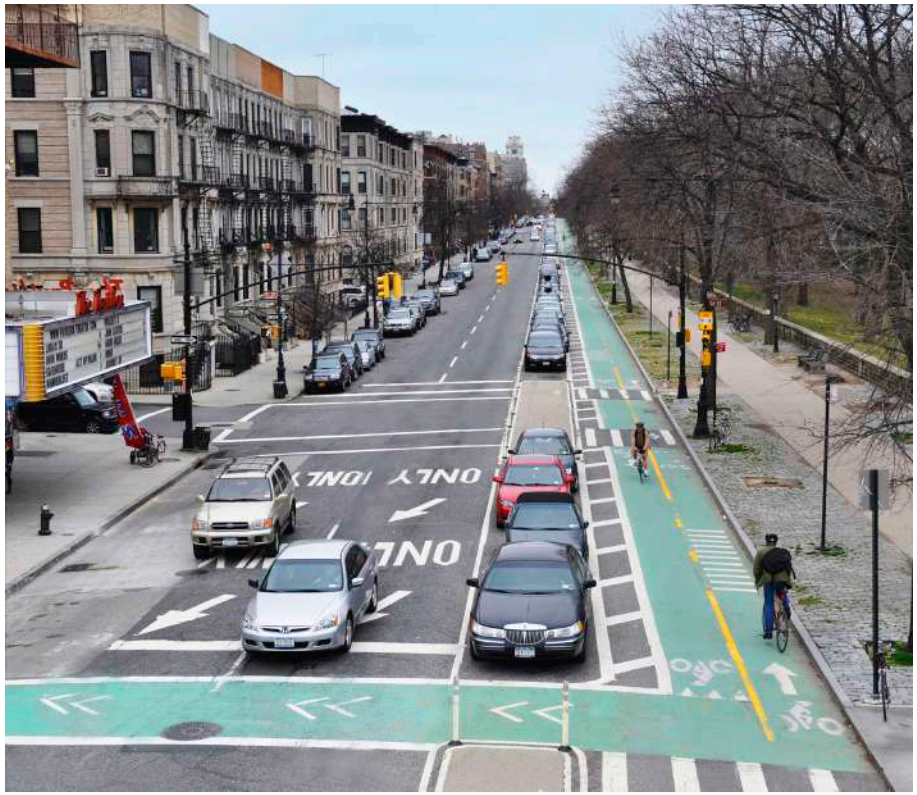
## PROJECT SELECTION

Recommended Long-Term Projects were chosen for their ability to advance the 20-minute neighborhood vision. Nearly all of the roadways on the Long-Term list are not only notoriously dangerous for people walking and biking, but they also act as barriers for those traveling on intersecting streets. Improvements to these streets will make short trips far safer and easier for people walking and biking around Montrose.

Some of the proposed Long-Term Projects are part of Short-Term Projects or Projects by Others. The TIRZ should revisit Short-Term projects, like Dunlavy Street, in the future to reinforce any interim improvements made during the first set of improvements.

| Long-Term Reconstruction Projects |
|---|
| 1 Montrose Boulevard |
| 2 Dunlavy Street |
| 3 Fairview Street |
| 4 West Gray Street |
| 5 West Dallas Street |

table 5.4 Long-Term Reconstruction Projects



# LONG-TERM PROJECTS




figure 5.6 Long-Term Projects

Long-Term Project

Roadway

Study Area

School

Park

Buffalo Bayou

*Source: Team Analysis 2019*

# MONTROSE BOULEVARD

## NORTH-SOUTH COMMUNITY WALKING + TRANSIT SPINE

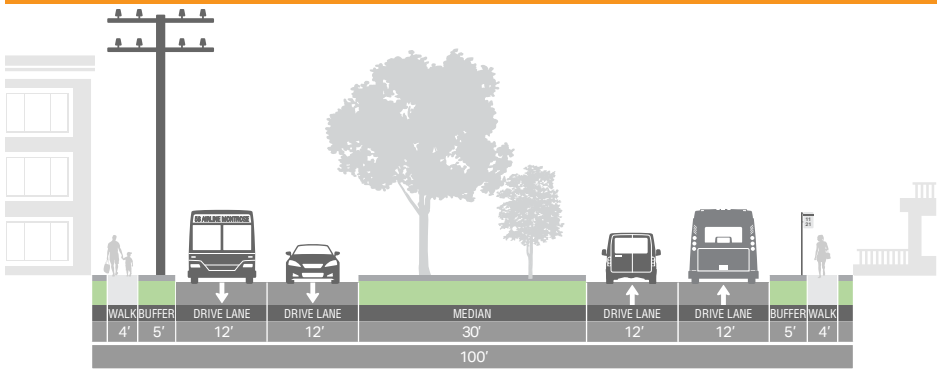
Montrose Boulevard Street and Drainage Reconstruction

- Widen sidewalks beyond current standards and add amenities like seating, shade trees, lighting, and landscaping for people walking along the whole corridor
- Rebuild transit stops and improve stop spacing
- Improve crossings at all intersections along the corridor and add new signals where needed
- Add new drainage capacity to prevent flooding
- Challenges: Due to vehicle volumes, wide medians, and the need to allocate space for high-quality transit stops, it is not recommended to include a dedicated bikeway along Montrose Boulevard. Well-designed bikeways on parallel routes and connections to other bikeways in the Study Area are critical.

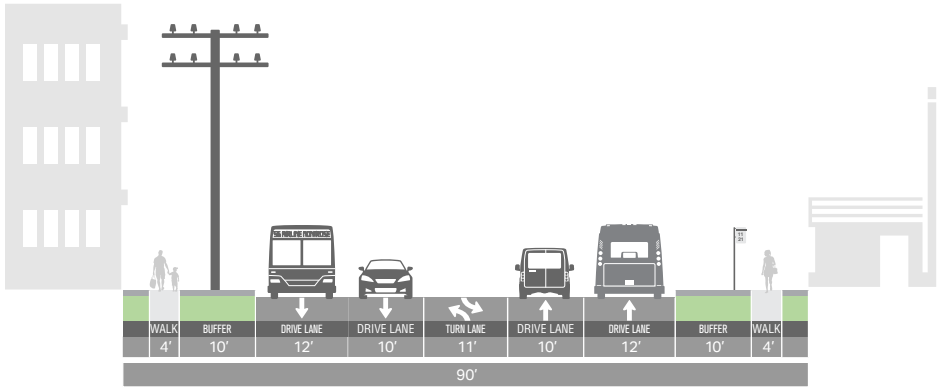
| NETWORK IMPORTANCE | MAGNITUDE OF COST | IMPLEMENTATION & FUNDING | POTENTIAL PARTNERS |
|---|---|---|---|
| 9.1 Tier 1 | $$$$ | | • METRO<br>• City |



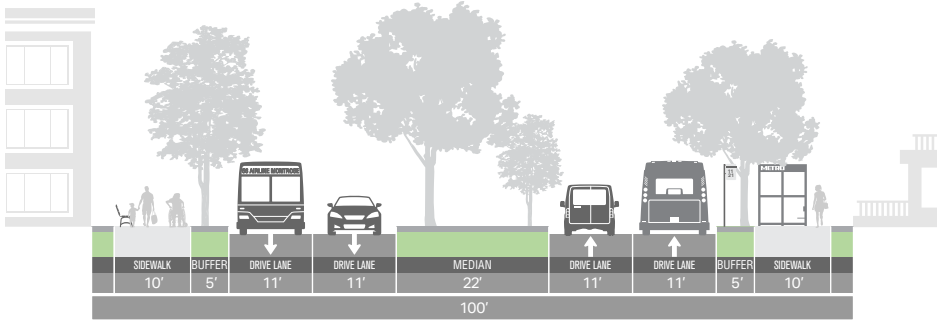

## EXISTING CROSS SECTION NORTH OF WESTHEIMER




## EXISTING CROSS SECTION SOUTH OF WESTHEIMER

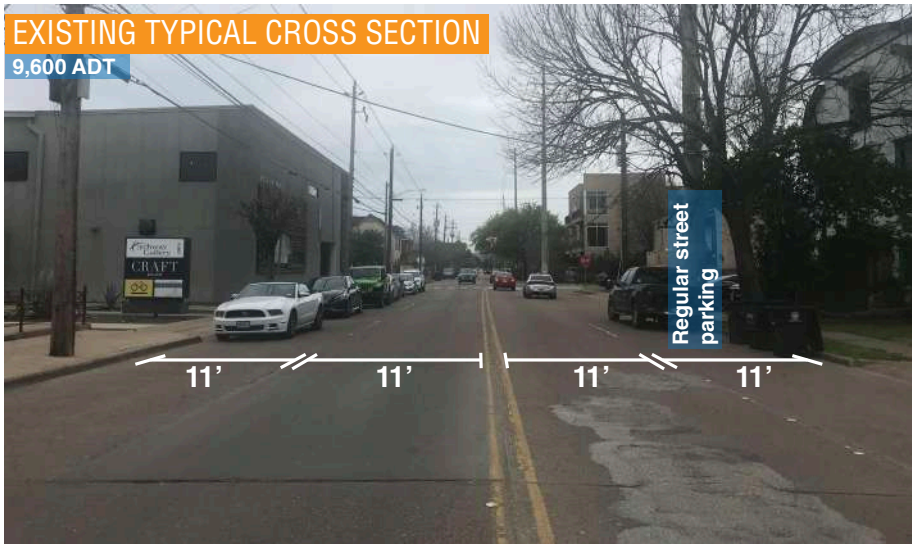



## POTENTIAL TYPICAL CROSS SECTION



# DUNLAVY STREET REDESIGN

## BAYOU GATEWAY + SMALL BUSINESS CORRIDOR

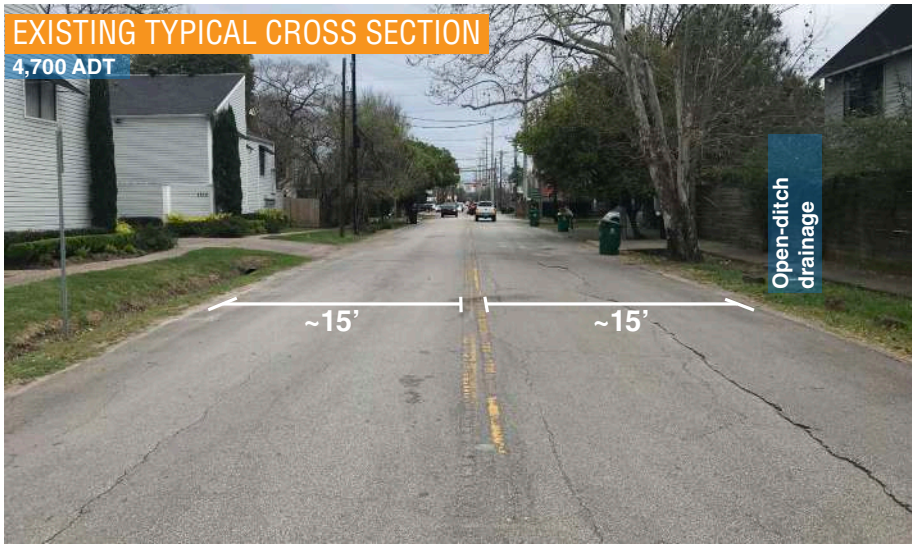



- Rebuild all sidewalks to current standards or better, widen sidewalks in places with more walking activity, and add amenities like seating, shade trees, lighting, and landscaping
- Improve intersections and extend the curbs to improve safety and comfort for people walking and to slow vehicle speeds
- Assess stop sign placement to reduce crashes at intersections
- Right-size the corridor to two travel lanes and formalize street parking for portions of the corridor
- Challenges: Limited right-of-way makes it difficult to include a protected bikeway, and presents challenges at major intersections like at Westheimer Road and West Alabama Street

| NETWORK IMPORTANCE | MAGNITUDE OF COST | IMPLEMENTATION & FUNDING | POTENTIAL PARTNERS |
|---|---|---|---|
| 7.1 Tier 2 | $$$ | | • City<br>• County |

# FAIRVIEW STREET RECONSTRUCTION

## HOUSTON’S LGBTQ MAIN STREET

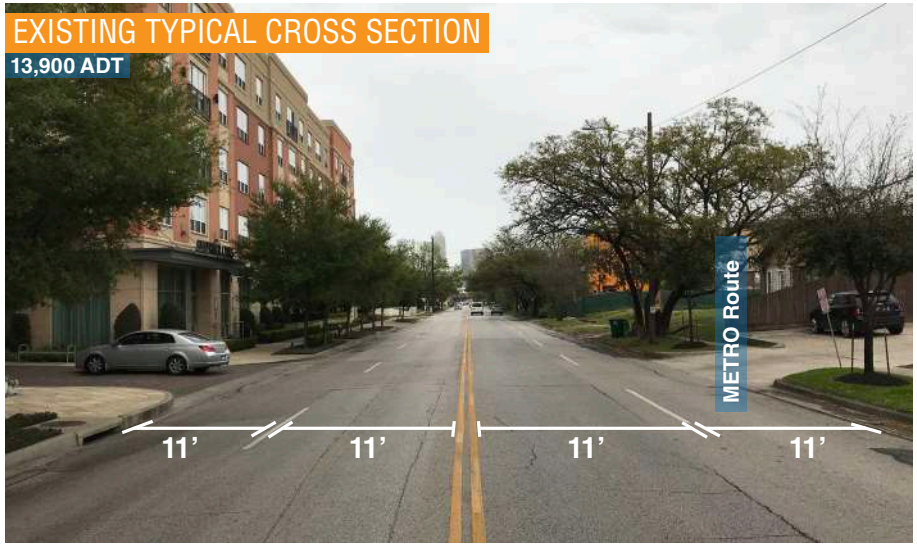



- Rebuild all sidewalks to current standards or better, widen sidewalks in places with more walking activity, and add amenities like seating, shade trees, lighting, and landscaping
- Improve intersections and extend the curbs to improve safety and comfort for people walking and to slow vehicle speeds
- Assess stop sign placement to reduce crashes at intersections
- Right-size the corridor to two travel lanes and formalize street parking for portions of the corridor
- Challenges: Limited right-of-way makes it difficult to include a protected bikeway, and presents challenges at major intersections like at Westheimer Road and West Alabama Street

| NETWORK IMPORTANCE | MAGNITUDE OF COST | IMPLEMENTATION & FUNDING | POTENTIAL PARTNERS |
|---|---|---|---|
| 6.8 Tier 3 | $$$$ | | • City<br>• County<br>• Residents |

# WEST GRAY STREET REDESIGN

## HIGH-DENSITY LUXURY COMMERCIAL STREET

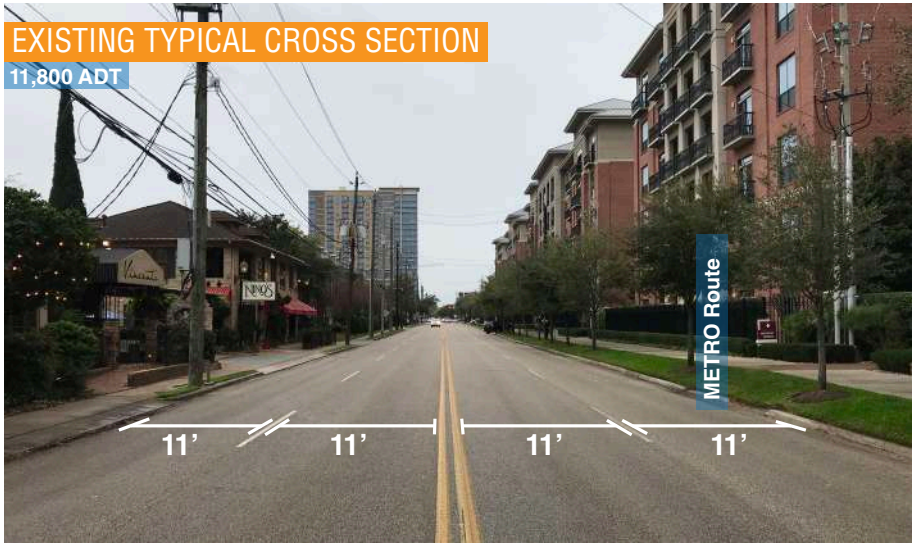



- Rebuild all sidewalks to current standards or better, widen sidewalks in places with more walking activity and west of Waugh Drive, add amenities like seating, shade trees, lighting, and landscaping, and improve crosswalks at all intersections
- Rebuild transit stops and improve stop spacing
- Where possible, reallocate vehicle travel lanes to have two through-lanes and one center turn lane
- Add a Dedicated On-Street bikeway east of Waugh Drive to connect to the existing Gray Street bike lane in Midtown
- Challenges: Right-of-way limits bikeway design options along the whole corridor

| NETWORK IMPORTANCE | MAGNITUDE OF COST | IMPLEMENTATION & FUNDING | POTENTIAL PARTNERS |
|---|---|---|---|
| 7.5 Tier 2 | $$ | | • METRO<br>• City<br>• County |

# WEST DALLAS STREET REDESIGN

## HIGH-DENSITY BAYOUSIDE RESIDENTIAL STREET




- Rebuild all sidewalks to current standards or better, widen sidewalks in places with more walking activity, add amenities like seating, shade trees, lighting, and landscaping, and improve crosswalks at all intersections
- Add a high-comfort bikeway or wide Off-Street path behind the curb on both sides of West Dallas to accommodate people walking and biking
- Rebuild transit stops and improve stop spacing
- Reallocate vehicle travel lanes to have two through-lanes and turn lane at key intersections and driveways
- Challenges: Rebuilding to create a high-quality street for bicyclists, transit users, and people walking will likely require right-of-way acquisition, especially near intersections

| NETWORK IMPORTANCE | MAGNITUDE OF COST | IMPLEMENTATION & FUNDING | POTENTIAL PARTNERS |
|---|---|---|---|
| N/A; prioritized based on partnerships | $$$ | | • METRO<br>• City<br>• County |

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# ADDITIONAL NEIGHBORHOOD SAFE STREETS

## BUILDING ON THE SHORT-TERM NETWORK




- For West Main Street, Harold Street, West Clay Street, Lovett Boulevard, and Graustark Street
- Rebuild all sidewalks to current standards or better, widen sidewalks in places with more walking activity, and add amenities like seating, shade trees, lighting, and landscaping
- Improve intersections and extend the curbs to improve safety and comfort for people walking and to slow vehicle speeds
- Assess stop sign placement to reduce crashes at intersections
- Invest in mini-traffic circles, traffic diverters, speed bumps, and other improvements that support safe driving speeds
- Challenges: Interruptions in the street grid will force the TIRZ to think carefully about direct connections to other bikeways in the network

| NETWORK IMPORTANCE | MAGNITUDE OF COST | IMPLEMENTATION & FUNDING | POTENTIAL PARTNERS |
|---|---|---|---|
| VARIES | $ | | • City<br>• County<br>• Residents |

# REGIONAL CONNECTIONS

## GETTING TO AND FROM MONTROSE




Montrose is a destination for Houstonians and visitors from around the world. Still, it is not easy to access from other parts of the city. Over the long term, the TIRZ can be strategic about funding connections for people traveling to and from Montrose on foot or by bike.

- In the north and south, safe ways to get to Buffalo Bayou Park and Rice University will improve neighborhood access to recreation and employment centers.
- Connections to the east will bring more people to Montrose as the populations of Midtown and Downtown continue to grow
- Westward connections to Upper Kirby and Greenway Plaza will give residents easy ways to get to work in those employment centers

| NETWORK IMPORTANCE | MAGNITUDE OF COST | IMPLEMENTATION & FUNDING | POTENTIAL PARTNERS |
|---|---|---|---|
| VARIES | $$ | | • City<br>• County<br>• Residents |

# CRITICAL CONSIDERATIONS FOR ALL PROJECTS

## Designing for connectivity and safety

## AT THE INTERSECTIONS

As shown in the crash map in **Figure 2.1** in the *Case for Action* chapter, intersections pose a major safety concern and can prevent people from choosing to walk or bike. Intersections should be designed to reduce the possibility for conflicts and should allow enough time for all road users to reach their destinations. The TIRZ can employ a variety of best practices that prioritize safety at all intersections.

### PAINT THE CROSSINGS

The TIRZ can make a big difference with a small amount of funding by clearly marking crosswalks in all projects. Crosswalk stripes will increase visibility for people walking; around schools, continental stripes are recommended to provide greater visibility. Where bike lanes cross intersections, additional green conflict markings through the crossing can make people biking more visible.

### GET THE GEOMETRY RIGHT

The TIRZ can also change intersection design to improve safety for all roadway users. To start, all intersections should have ADA-compliant directional curb ramps. The TIRZ can also review vehicle lane assignments at each intersection to reduce the number of dangerous turning movements. Wherever possible, extending curbs at the intersection will shorten the crossing distance for people crossing and smaller corner radii will slow vehicle speeds. Finally, restricting parking close to intersections will allow drivers and people walking to better see each other at crossings.

### MAKE SIGNALS WORK FOR EVERYONE

Signals should include automatic leading pedestrian/bicycle phases that allow people walking and biking to enter the intersection first, increase their visibility to drivers. Where possible, preventing vehicle right-turns on red will also help prevent crashes at intersections. Signal design can also improve transit speed and reliability. Intersections along METRO routes should be equipped with transit signal priority to alert the signal when a bus is approaching, extending the green phases and shortening the stop phase to get buses through the light.

## ALONG THE TRANSIT ROUTES

### MAKE MORE ROOM

People who ride transit must walk or ride a bicycle to get to and from their transit stops. A safer environment for people walking will encourage more transit use and help current transit riders stay safe.

The most important action for the TIRZ to ensure a better, safer experience for riders is to expand the amount of room behind the curb. METRO's recommended back-of-curb width is 15 feet for their frequent routes like the 56 Airline/Montrose and 82 Westheimer (see **Figure 5.6**). This additional space can accommodate a high-quality bus shelter, wide sidewalks, and more space for new amenities like trees, lighting, seating or even a protected bikeway.

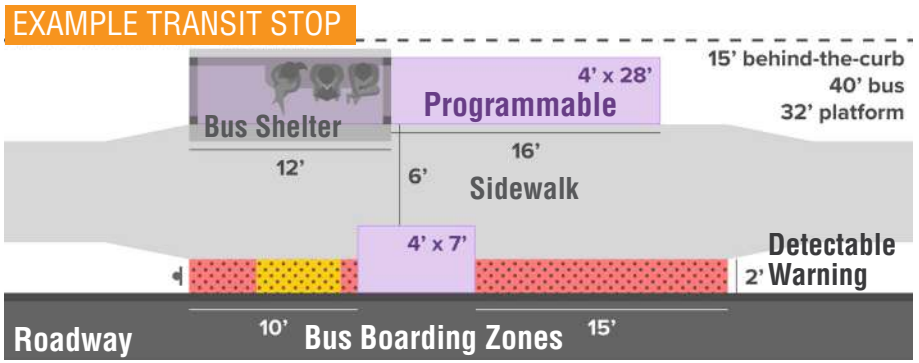



figure 5.7 Expanded Room behind the Curb at Bus Stops

*This diagram shows what is possible with 15 feet . Programmable space can be used for trees, public art, lighting, and other amenities.*

### SAFE CROSSINGS

Many transit stops are at or near intersections, meaning riders cross several lanes of traffic to get to their bus or make a bus transfer. Implementing safe crossing best practices is especially important along METRO routes and can go a long way to ensure safety for people walking in Montrose.

# THROUGHOUT THE NETWORK

## SHADE

Houston's heat can prevent people from leaving their homes in the summer, but many people relying on sidewalks, bikeways, and transit do not have the luxury of air-conditioning for portions of their trips. With each project, the TIRZ Montrose should invest in street trees and shaded bus stops to make walking and biking more pleasant.

The TIRZ can also identify unhealthy street trees causing sidewalk damage and replace them with healthy trees that have root systems that are likely to cause less conflict with sidewalks. New technologies, like Silva Cell, are providing methods to protect tree roots from sidewalks and sidewalks from tree roots by not forcing roots to extend up to the surface for nutrients.

## LIGHTING

A dark walking environment can keep people from seeing tripping hazards, and cause people to avoid walking out of safety concerns. Large portions of Montrose lack lighting, or only have lighting that is intended to illuminate the vehicle travel lanes.

Similar to shade, the TIRZ should use every capital project as an opportunity to invest in people-scaled lighting at intersections and along roadways.

## SEATING AND OTHER AMENITIES

Where possible, the TIRZ can add amenities that give people a better walking and biking experience. Seating, bicycle parking, public art, and other investments are possible with enough room behind the curb.

SHADE TREES PROVIDE REFUGE FROM HEAT AND ADD CHARACTER



LIGHTING CAN BE BOTH ATTRACTIVE AND FUNCTIONAL



# PROGRAMS

The TIRZ should develop a set of programs that complement its capital projects. Programs can take several forms and may include a funding process for smaller, recurring projects or education for residents and businesses about sidewalk and bikeway improvements.

Some agencies, like METRO and the City of Houston, operate programs to fund sidewalk improvements in certain circumstances. The TIRZ should understand and utilize those existing programs where appropriate.

The recommended programs listed here include both new and existing programs and are labeled with appropriate implementation and funding tools for the TIRZ to consider.

### IMPLEMENTATION TOOLBOX

- Key Partnerships
- Do-It-Yourself (DIY)
- Projects by Others

### FUNDING TOOLBOX

- TIRZ Budget & Bonds
- Grant Opportunities
- Funds from Others

## SIDEWALK IMPROVEMENT PROGRAMS

Montrose residents are the first to acknowledge unsafe sidewalks in the neighborhood, but lack a convenient way to improve them. The TIRZ can set up a range of programs to help residents access both funds and information to accelerate sidewalk improvements.

### RESIDENTIAL REBATE PROGRAM

A residential rebate program reimburses property owners for bringing their sidewalks to minimum standards. The TIRZ can create an application-based program that reimburses property owners for sidewalk improvements based on a clear set of criteria. Criteria can be driven by TIRZ sidewalk assessment data like condition and importance, by the number of parcels included in an application, or by other goals of the TIRZ.

To encourage affordability, the TIRZ should explore ways to ensure low- to moderate-income households can participate in the program, and renters have recourse to request improvements. The TIRZ may also work with local civic clubs to identify and prioritize improvements.

Similar programs have been successful in Chicago, Los Angeles, and San Antonio, each with elements that the TIRZ can use to create their own program. Examples of application materials and guidelines for those programs can be found in *Appendix C*.

Funding: To ensure the program lasts, the TIRZ should allocate a dedicated portion of their budget for a rebate program. The TIRZ can be creative with the funding strategy by capping the maximum rebate allowed per property or using grant funds and partnerships with civic clubs to supplement program funding.

## TRUSTED CONTRACTOR PROGRAM

Not all construction companies are experienced with sidewalk repairs and replacements. The TIRZ can develop a list of trusted contractors for residents to use for sidewalk improvements. Contractors may be added to the list using a transparent application or interview process. Trusted contractors can be included in TIRZ educational materials about sidewalk construction. Richardson, Texas uses a similar list to recommend contractors to its residents. Information about Richardson's program can be found in *Appendix C*.

## UNIVERSAL ACCESSIBILITY PROGRAM & METRONEXT

### Existing METRO programs

In 2019, voters in the METRO service area approved the METRONext Plan to expand and improve service throughout the City of Houston and Harris County. In METRONext, the 25 Richmond route will become a METRORapid route with Bus Rapid Transit service. The Plan also calls for service improvements to the 25 Richmond, 82 Westheimer, and 56 Airline/Montrose routes through METRO's BOOST program.

In addition to METRONext, METRO received a $30 million Transportation Improvement Program grant from the Houston-Galveston Area Council for its Universal Accessibility program to improve accessibility for people walking and biking to bus and rail stops across their system.

As METRO launches its strategies for both METRONext and the Universal Accessibility program, the TIRZ should be prepared for a potential partnership to build better sidewalks and safe crossings along the neighborhood's major bus routes: 82 Westheimer, 56 Airline/Montrose, 25 Richmond, 27 Shepherd, 32 Renwick/San Felipe, 41 Kirby/Polk and 40 Telephone/Heights.

## SIDEWALK REQUEST PROGRAM

### Existing City of Houston Program

The City of Houston funds sidewalk, curb ramp, and curb cut improvements with three distinct programs:

- **Pedestrian Accessibility Review**
  Residents can fill out an application to the Mayor's Office of People with Disabilities to improve sidewalks and curbs that will help them access a specific set of destinations like grocery stores, employment, bus stops, place of worship and others. Sidewalks can be improved up to 1500 feet.
- **School Sidewalk Program**
  The city will build new sidewalks on up to four blocks that lead to a school, as long as the sidewalks are used by students and are not on a dead-end street.
- **Major Thoroughfare Sidewalk Program**
  The city will build sidewalks on four blocks along roadways designated as major thoroughfares by the Major Thoroughfare Plan. The area must have no existing sidewalk, must show evidence of pedestrian activity, and must not be included in any upcoming projects that includes sidewalk construction.

The TIRZ should provide support for Montrose residents and organizations accessing these programs. The TIRZ may also explore grants to accelerate implementation in Montrose. Information about Houston's three sidewalk programs can be found in *Appendix C*.

## HIGHWAY SAFETY IMPROVEMENT PROGRAM

### Existing Texas Department of Transportation Program

The Texas Department of Transportation (TxDOT) Houston District can fund improvements to sidewalks with Highway Safety Improvement Program grants, even if they are not on a TxDOT-managed roadway. Grant applications are available periodically and subject to TxDOT eligibility criteria.

# PROGRAMS, CONTINUED

## IMPLEMENTATION TOOLBOX

- Key Partnerships
- Do-It-Yourself (DIY)
- Projects by Others

## FUNDING TOOLBOX

- TIRZ Budget & Bonds
- Grant Opportunities
- Funds from Others

## OTHER INFRASTRUCTURE PROGRAMS

### DEVELOPER "BETTERMENT" AGREEMENTS

As a desirable neighborhood, new developments regularly increase the number of people walking and biking in Montrose. The TIRZ can leverage these developments to build better infrastructure by initiating a new program for developer improvements, or "betterments."

Similar to the residential rebate program, the TIRZ can incentivize improvements by offering to match, or partially reimburse developers for specific investments. These improvements can go beyond sidewalk reconstruction to include more costly infrastructure like lighting, curb ramps, Blue Tile curb signs, shade, safe crossings, and bikeways. This program can also be an easy way to educate developers about sidewalk and bikeway infrastructure, making it more likely that they incorporate similar betterments in future projects.

### SHADE PARTNERSHIP

The TIRZ should coordinate with Trees for Houston to create a plan to plant more native trees in Montrose. Each infrastructure investment is an opportunity to expand shade and plant trees that will not disrupt sidewalks in the future.

### PILOT PROJECT PROGRAM

A well-conceived pilot program can be useful when the TIRZ needs additional community buy-in or wants to test a specific roadway design. Pilot programs are intended to be temporary and low-risk in an attempt to communicate a plan or test an idea. For example, a pilot could include the TIRZ partnering with a civic club to host a block party to demonstrate the use of small traffic circles for a Neighborhood Safe Street implementation. Pilots may also be larger. For example, the TIRZ may partner with the City of Houston to re-stripe a major corridor like Westheimer Road to test lane assignments before fully reconstructing the street.

The TIRZ should identify which project types are best suited for a pilot demonstration. These are often projects that have been untested in the city, or that can spur community momentum in support of rapid implementation. To manage a successful pilot program, the TIRZ should build the expertise to navigate City of Houston regulations for street closures, interim improvements, or other requirements for testing new infrastructure.

## COMMUNICATION & EDUCATION PROGRAMS

### SIDEWALK REPAIR EDUCATION

Since the TIRZ is unable to fully reconstruct every sidewalk in the Study Area, it should offer educational materials for residents and businesses about sidewalk improvements. Materials can accompany an information campaign, like "Five Feet for Me" to help people retain the message. Materials should include:

- A description of the TIRZ and its investments
- Any planned sidewalk improvements in the area
- The reasoning behind 5-feet sidewalk minimums
- City of Houston minimum sidewalk standards
- Methods for reporting poor sidewalk conditions to 3-1-1

## NEW INFRASTRUCTURE COMMUNICATION

The TIRZ should implement a communication plan for each large sidewalk and bikeway project. Materials should describe the nearby improvements and direct residents to information about TIRZ programs.

For bikeways, communication should include a map of bikeways in Montrose, list destinations along the route to encourage more people to bike, and instruct residents about any changes to the way they should park, place trash bins, and generally interact with the new bikeway.

The City of Houston has utilized new infrastructure notifications for the recently completed Hardy Street/Elysian Street and Gray Street on-street bikeways.

## SAFE STREET STEWARDSHIP PROGRAM

The TIRZ can help Montrose residents embrace their new sidewalks and bikeways by sharing information and promoting programs that encourage responsible stewardship of new infrastructure and empathy for people walking and biking. These programs can grow the existing partnerships between the TIRZ and civic clubs throughout Montrose.

Education materials should include basic information about street maintenance, explain the City of Houston 3-1-1 tool, and empower people to talk to their neighbors about safe street design and safe driving.

The TIRZ can also work with civic clubs to create an Adopt-a-Bikeway/Sidewalk/Crosswalk program and promote courses such as BikeHouston's Bicycle-Friendly Driver certification training.






# POLICIES

Policies establish minimum standards and a process to meet those standards. While the TIRZ cannot directly establish policy requirements for infrastructure, it can leverage its expertise and partnerships to encourage the implementation of City of Houston policies in the neighborhood.

### IMPLEMENTATION TOOLBOX

- Key Partnerships
- Do-It-Yourself (DIY)
- Projects by Others

### FUNDING TOOLBOX

- TIRZ Budget & Bonds
- Grant Opportunities
- Funds from Others

## DESIGN PRINCIPLES

### SCENIC HOUSTON STREETSCAPE RESOURCE GUIDE

Scenic Houston released its Streetscape Resource Guide in 2018 for decision makers, developers, and citizens to understand the fundamentals of street design within the context of Houston's existing building standards.

The TIRZ can utilize the Streetscape Resource Guide as the baseline standard for any TIRZ-funded project. For those projects not receiving TIRZ funding, the guide can still serve as an educational tool during meetings with agency staff, developers, and Montrose residents. It is a tool for the TIRZ to communicate the project- and neighborhood-level benefits of well-designed streets.

## CITY OF HOUSTON ORDINANCES

### WALKABLE PLACES ORDINANCE

The City of Houston recently completed a public process to create walking-friendly standards for developments, culminating in the proposed Walkable Places Ordinance. The ordinance standards apply to any new buildings along a designated Walkable Place Street, as well as any properties undergoing significant improvements along those streets. Standards include minimum widths for the pedestrian realm, building design requirements to improve the experience of people walking, and changes to parking minimum rules to encourage more bicycle parking.

The ordinance requirements will not pertain to all streets in Houston. Instead, City of Houston staff may designate a Walkable Place Street, or a majority of property owners along a street can vote to self-designate.

The TIRZ should identify candidate corridors for Walkable Places Streets and encourage property owners to opt-in. Ideal corridors include Walking Priority Streets identified in the Bikeway Vision and streets that are likely to see a large new developments in the near future. As an incentive, the TIRZ could offer at-cost sidewalk, lighting, or other infrastructure investments on corridors that self-designate.

As part of the Walkable Places Committee process, the city designated three Walkable Places pilot areas to test the standards. They include portions of Near Northside, Midtown, and Third Ward. The TIRZ should approach the city to determine if portions of Montrose could be included as a pilot area as well. The TIRZ can also discuss which streets in the neighborhood are candidates for city designation.

## TRANSIT-ORIENTED DEVELOPMENT ORDINANCE

The City of Houston also recently developed a proposed Transit Oriented Development (TOD) Ordinance. These standards will apply to street segments within one-quarter and one-half mile of METRORail and METRORapid stations. Some street segments are designated as Primary TOD Streets (requiring the standards), while others are Secondary TOD Streets, where property owners may opt in. Similar to the Walkable Places Ordinance, the TOD ordinance outlines minimum standards for the pedestrian realm, building design requirements, and reductions in vehicle parking requirements.

The TOD Ordinance does not include any Primary TOD Streets in Montrose, but several street segments in the southern part of the neighborhood are designated as Secondary TOD Streets due to the planned METRORapid route along Richmond Avenue. The Richmond route includes three stops in the TIRZ boundary: at Shepherd Drive, at Mandell Park near the Menil Campus, and at Montrose Boulevard. Streets within one-half mile of these stop locations include all of Richmond Avenue and large portions of other major streets like Alabama Street, Montrose Boulevard, Dunlavy Street and others.

The TIRZ should identify which street segments would make great candidates for TOD Streets and encourage property owners to self-designate. As with the Walkable Places Ordinance, the TIRZ could incentivize adoption of the TOD ordinance by offering at-cost reimbursements for specific infrastructure improvements.

The City of Houston Planning Commission will review both the Walkable Places and Transit-Oriented Development ordinances and, if approved, will advance to the City Council for review and ratification. More details about both ordinances can be found on the City of Houston Walkable Places Committee website.

### PROPOSED TRANSIT-ORIENTED DEVELOPMENT STREETS

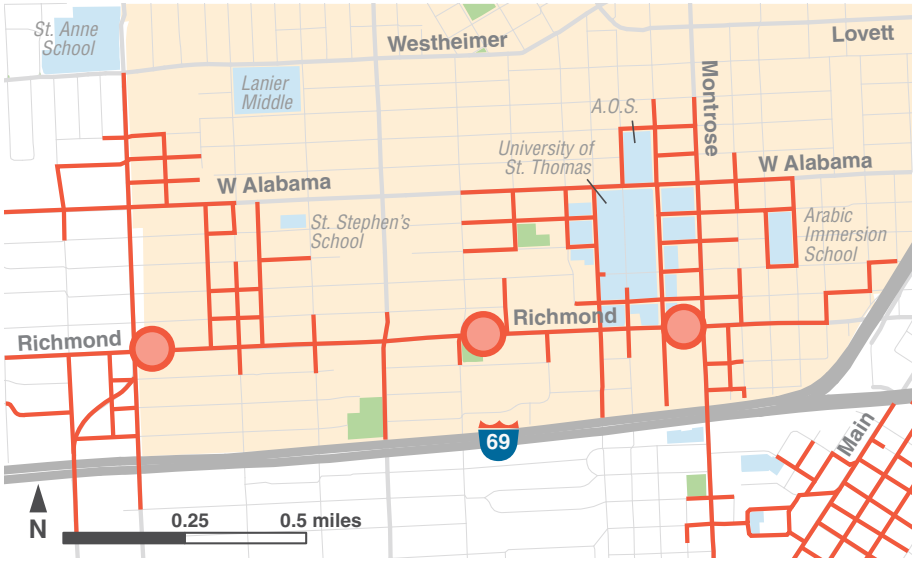



figure 5.6 Transit-Oriented Development Streets

Secondary TOD Street
Proposed METRORapid Station
Roadway
Study Area
School
Park

*Source: City of Houston*

*Note: According to proposed Transit-Oriented Development Ordinance language, these Secondary TOD streets will become Primary TOD streets upon construction of the METRORapid stations.*

# MOVING FORWARD WITH THE ACTION PLAN

The TIRZ is well positioned to reshape Montrose mobility for the better. Its sizable budget can handle the type of large investments needed to overhaul the neighborhood's major streets. Its deep bench of local experts ensures a level of care in the planning process. And its commitment to the principles of a 20-minute neighborhood guarantees quality projects that put people first.

## GUIDING PRINCIPLES

Montrose has the basic foundation of a **20-Minute Neighborhood**, but needs new investments that focus on all modes of travel, not just vehicles.

- **SAFE** places for people to move around (1)
- **CONNECTED** network that offers many choices (2)
- **AFFORDABLE** to ensure access for many people (3)
- **ENDURING** livability that embraces history (4)

## TOOLS

The TIRZ has a robust toolbox of strategies for both funding and implementation that can be tailored to the specific needs of each project.

### IMPLEMENTATION TOOLS

- KEY PARTNERSHIPS
- DO IT YOURSELF
- PROJECTS BY OTHERS

### FUNDING TOOLS

- TIRZ BUDGET & BONDS
- GRANT OPPORTUNITIES
- FUNDS FROM OTHERS

## PROJECT TYPES

The TIRZ can address multiple priorities at once with the appropriate mix of projects (seen in **Figure 5.7**), programs, and policies.

- KNOWN PROJECTS BY OTHERS (1)
- SHORT-TERM CAPITAL PROJECTS (2)
- LONG-TERM CAPITAL PROJECTS (3)
- PROGRAMS AND POLICIES (4)

# THE NEXT STEPS

The *Walk+Bike Montrose* Plan gives the TIRZ a guidebook for implementation, but the exact order of implementation will be the result of careful strategy on the part of TIRZ leadership. The structure of this Plan can serve as a starting point for those major decisions. Two important components to achieving a 20-minute neighborhood will be establishing a yearly strategy and communicating clearly with Montrose residents and businesses.

## QUESTIONS TO START EACH YEAR

The TIRZ will be making major investment decisions in the context of an ever-changing community. *Walk+Bike Montrose* sets a vision for today, but should also be an annual touchstone as Montrose continues to grow and change. Each year, the TIRZ can review the projects, programs, and policies to determine the ideal near-term strategy.

At the beginning of each year, the TIRZ can start by answering these questions:

**Current TIRZ Projects, Programs, and Policies**

- What is the status of current TIRZ projects?
- Are any projects over-budget or over-schedule?

**Projects, Programs, and Policies by Others**

- What new projects by others are in and around the Study Area? How do new projects relate to existing and future TIRZ projects?
- What is the status of projects by others?
- Of new and existing projects by others, are there any that would benefit significantly by TIRZ partnership?

**New Projects, Programs and Policies**

- Given existing commitments and the growth of the TIRZ's increment, what is the available budget for new projects?
- Are the recommended Short- and Long-Term projects still applicable to the needs of Montrose today? Which are most urgent? Most feasible?
- How would selected new projects relate to existing projects? To projects by others?

## CELEBRATING EARLY WINS TOGETHER

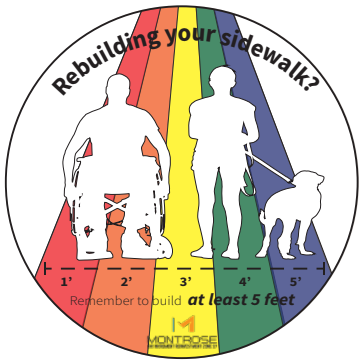
In the first few years of the TIRZ, it is necessary to build the trust of the community and educate residents and businesses about the TIRZ's vision, its capabilities, and the intricacies of infrastructure investment in Houston.

TIRZ leadership has already begun these communication efforts by visiting civic clubs and community meetings. Once projects advance in design and construction, it will be even more critical to maintain regular dialogue.

Sharing information about early wins is one important way to build trust. These projects achieve popular desires that already exist in the neighborhood – flood prevention, safe places to walk, and a comfortable biking experience. As projects like the bikeway on Waugh Drive and Commonwealth Street move forward, the TIRZ should make sure to keep residents in the loop and celebrate its construction as a victory for the nearby neighborhoods and businesses.

## COMMUNICATING BASIC INFRASTRUCTURE FACTS

To bring the community along, it is also imperative to educate them on foundational infrastructure facts. Most Houstonians are not aware of minimum sidewalk standards, best practices in bikeway design, the importance of transit connectivity, or even the definition of a TIRZ. These projects are a great conduit for spreading that important information; reinforcing the virtues of a 20-minute neighborhood so that it becomes an enduring legacy, backed by Montrose.




*Sample communication material for sidewalk construction*

# COVERAGE OF PROPOSED PROJECTS

Recommended projects cover all areas of the neighborhood

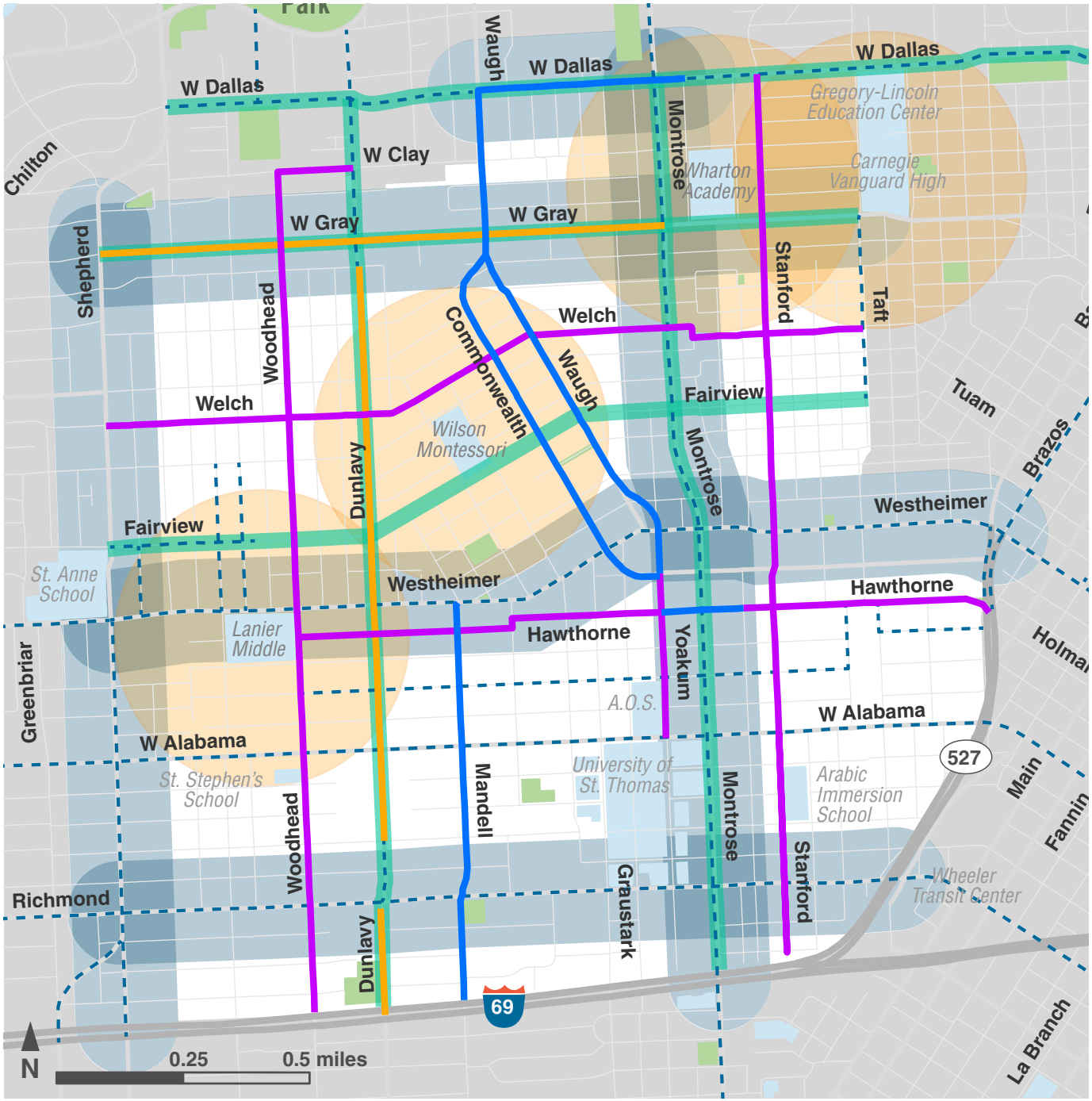



figure 5.7 Coverage of *Walk+Bike Montrose* Plan Recommendations

**Short-Term Projects**
- Neighborhood Safe Street
- Dedicated On-Street Bikeway
- Walkable Street Retrofit
- Safe School Access
- Safe Transit Access

**Long Term Projects**

**Projects by Others**

- Roadway
- Study Area
- School
- Park
- Buffalo Bayou

*Source: Team Analysis 2020*

Action Plan
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METRO




#houston


CHERRYHURST PARK







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# appendix a

# FACTBOOK








# MONTROSE FACTBOOK

## EXISTING CONDITIONS INFORM STRATEGY

Data from local, state, and federal sources shed light on the existing conditions in the Study Area. Specifically, demographic data about residents and workers, place-based data about the community's land use and destinations, and data on how people get around Montrose inform the TIRZ and its plans for new infrastructure in the neighborhood.

This Factbook was developed as a repository for data that was assessed and evaluated during the development of the *Walk+Bike Montrose* Plan. Summary maps and tables are presented within this Appendix in the following order. Much of the information presented here is referenced through out the report and should be used as the TIRZ continues to plan and developed projects within the Study Area.

## PEOPLE

Montrose is a unique place with demographics distinct from the city as a whole. In particular, the age, income, and educational attainment of Montrose residents look much different than the city as a whole. Montrose has far fewer children as a percent of population, residents with higher incomes (alongside a lower poverty rate), and higher on-average educational attainment.

## LAND USE & DESTINATIONS

Montrose is home to a wide variety of businesses, homes, offices, and civic institutions that make the neighborhood vibrant. The Study Area's major streets are commercial corridors serving both community and regional shoppers. Historic residential neighborhoods nest between those corridors with a varying degree of single- and multi-family housing types. Finally, local schools and parks dot the neighborhood with larger institutions like the University of St. Thomas and the Menil Campus acting as community anchors.

## POPULATION & EMPLOYMENT

Montrose continues to grow alongside its surrounding neighborhoods. Growth in the number of jobs will not grow as quickly, with most of the increases expected in the city's existing major employment centers.

## MOBILITY

### COMMUTE CHARACTERISTICS & TRIP DISTANCE

Commute data and data from the Houston-Galveston Area Council show that Montrose residents take much shorter trips than the average Houstonian. The number of these smaller trips taken on foot or by bike would increase with strategic infrastructure investments.

### THE NEIGHBORHOOD'S NETWORK

Montrose has a connected street grid, making it easier to get around - regardless of travel mode. Despite the condition of some streets in the neighborhood, residents still bike. STRAVA data indicates a high number of bicycle trips to get to Buffalo Bayou Park, and along east-west corridors like Fairview Street and Hawthorne Street. By transit, residents and businesses are well connected to METRO's existing lines, with more than 90% of residents within a quarter mile of a transit stop. Vehicle volume data shows the most driven streets in Montrose, including Shepherd Drive, Montrose Boulevard, Waugh Drive, Westheimer Road, and Richmond Avenue, each with more than 18,000 average daily vehicle trips.

### SAFETY

Texas Department of Transportation (TxDOT) data reveals crash hot spots mostly at major intersections in the Study Area. These include the intersection of Montrose Boulevard and Westheimer Road.




figure A.1 TIRZ 27 Boundary

# MONTROSE TIRZ 27

The Montrose Tax Increment Reinvestment Zone (TIRZ 27, or the TIRZ) was established by the City of Houston in November 2015. The TIRZ uses projected future property tax revenue to invest in infrastructure over the next 30 years that will spark private investment in Montrose.

The TIRZ is governed by a Board of Directors and guides investments for transportation infrastructure, drainage, housing, and other neighborhood projects.

The boundaries of TIRZ 27 must contain at least 70% non-residential parcels. That produces the grid-like boundary seen on the map to the left. However, the TIRZ can invest in surrounding areas as long as investments improve the overall value of the TIRZ.

Roadway
TIRZ 27 Boundary
Park
School
Buffalo Bayou

N 0.25 0.5 miles

*Source: City of Houston*

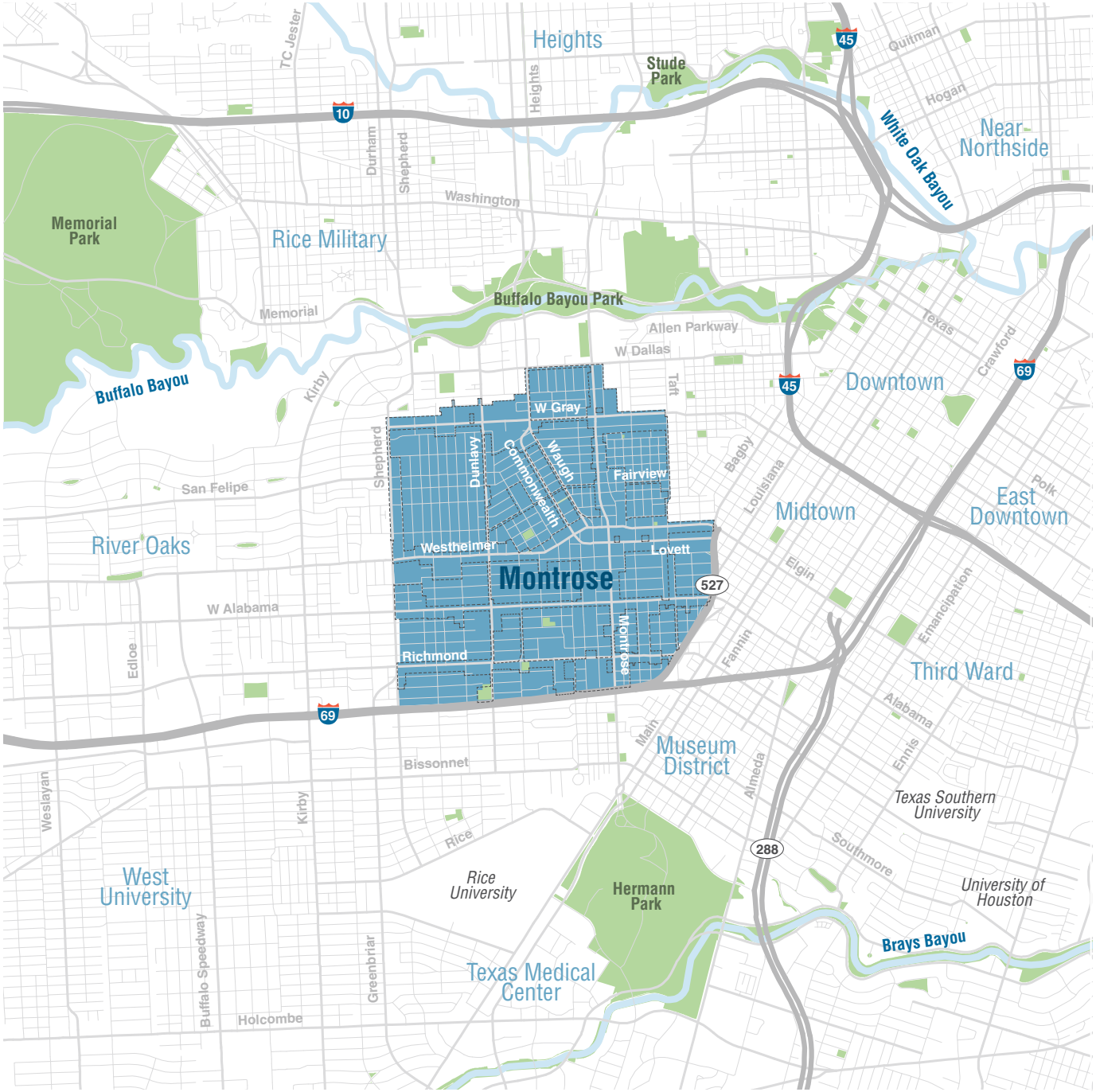



figure A.2 Study Area

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# STUDY AREA

## Heart of Houston

Montrose is the cultural heart of Houston and a place where residents can find most daily needs within a 20-minute walk. The history and location of the neighborhood has attracted new development, but current infrastructure does not meet the needs of residents.

As one of Houston's oldest neighborhoods, Montrose has a street grid that gives it a natural connectivity. Improvements to sidewalks and bikeways in Montrose will have an oversized impact on residents taking short trips for daily tasks or visitors exploring the city. With the right investments, Montrose is poised to be Houston's most walkable and bikeable neighborhood. For the purposes of this report, Montrose refers to the Study Area outlined on this map.

Study Area
TIRZ 27 Boundary
Park
Bayou
Roadway

N 0.5 1 mile

*Source: Team Analysis 2019*

PEOPLE

# DEMOGRAPHICS OF MONTROSE

Montrose has a smaller average household size, about half of the poverty rate, and a slightly lower rate of renters compared to the City of Houston. However, some of the biggest differences are in age, education, and income:

## AGE

A much lower percentage of residents under the age of 21 live in Montrose. This is counterbalanced by the higher-than-average portion of Millennials and people over the age of 50 who reside in the neighborhood.

## EDUCATIONAL ATTAINMENT

Montrose residents tend to have more background in formal education with over two-thirds receiving either a bachelor's or graduate degree.

## HOUSEHOLD INCOME

Around 32% of Montrose households make over $125,000 per year compared to 16% in the city as a whole.

| MONTROSE | HOUSTON | |
|---|---|---|
| 23,220 | 2,267,336 | Population |
| 13,185 | 838,950 | Households |
| 1.8 | 2.7 | Average Household Size |
| 10% | 11% | Housing Vacancy |
| 49% | 57% | Renter-Occupied Households |
| 10% | 18% | Households in Poverty |

table A.1 Study Area Demographics *Source: U.S. Census Bureau*

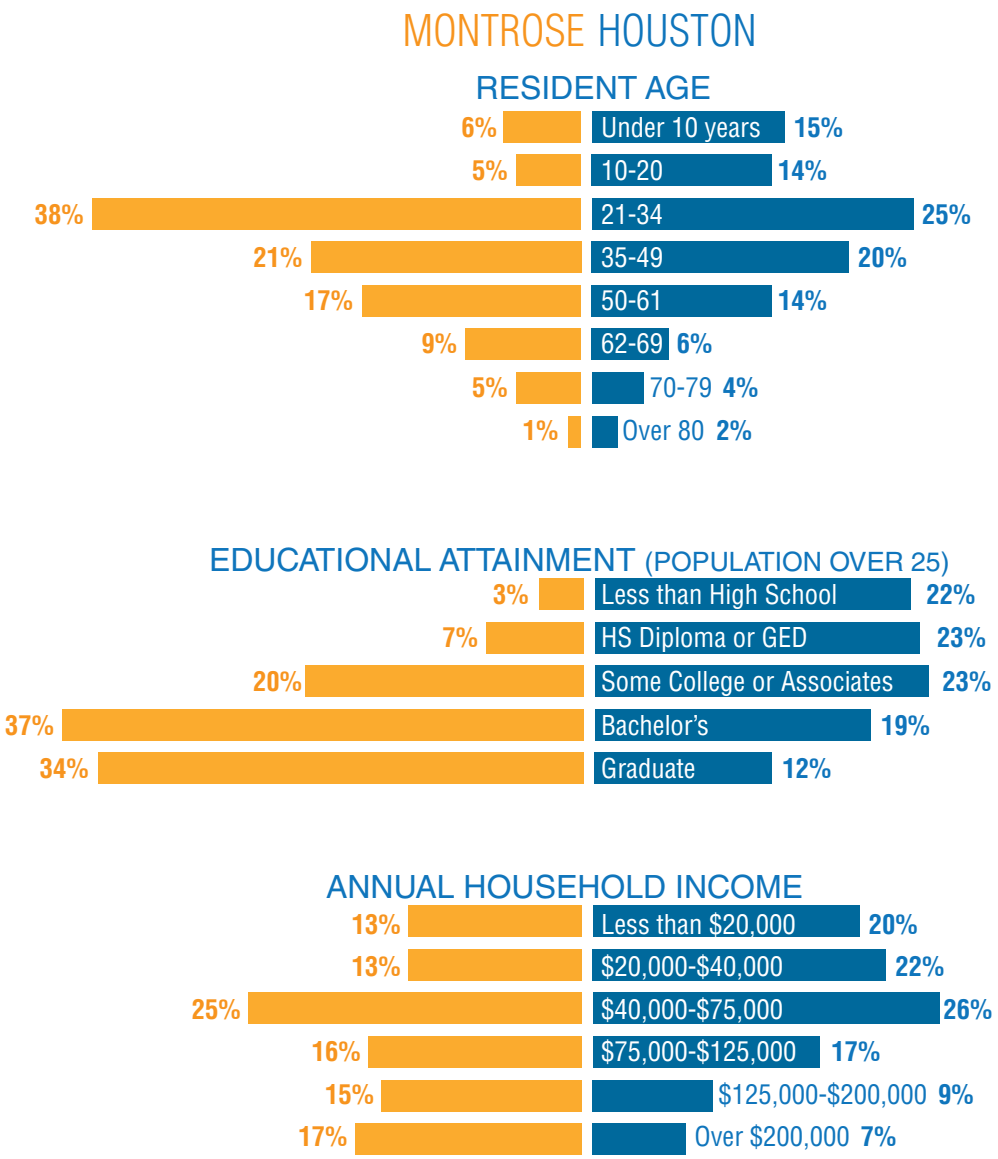
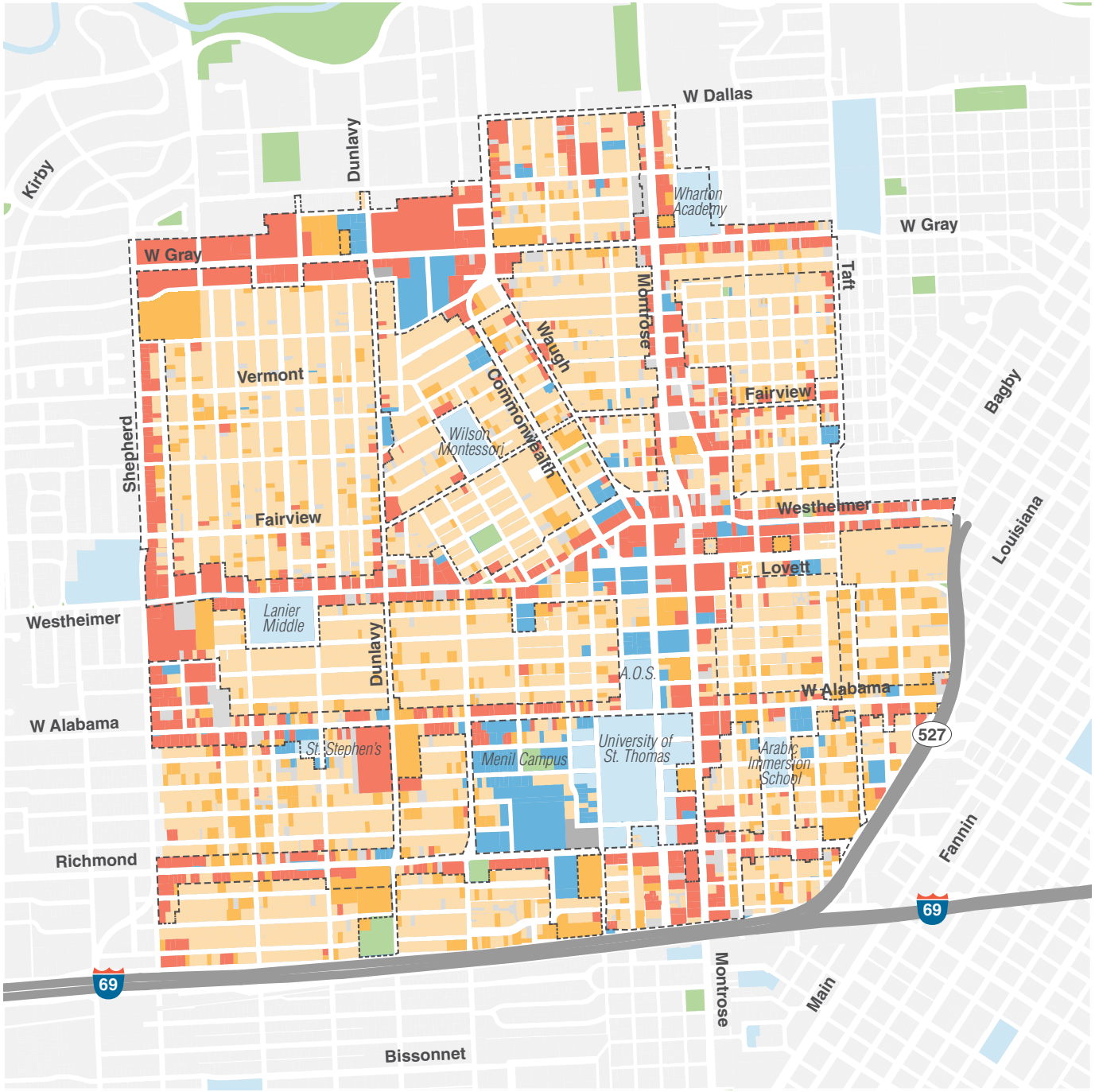



figure A.3 Study Area Demographics *Source: U.S. Census Bureau*

# LAND USE

Montrose contains a healthy mix of residential, commercial, and civic uses. Together, Multi- and Single Family Residential lots make up 64% of the neighborhood.

Westheimer Road, West Gray Street, and other major commercial corridors that cross the Study Area account for 20% of all uses while the Menil Campus, the University of St. Thomas, and several school buildings contribute to the large portion of Montrose categorized as civic and institutional. Only 4% of the neighborhood's lots are currently undeveloped.




| | |
|---|---|
| TIRZ 27 Boundary | |
| Multi-Family Residential | 13% |
| Single Family Residential | 51% |
| Commercial | 20% |
| Utilities | 0.2% |
| Undeveloped | 4% |
| Civic/Institutional | 11% |
| School | |
| Park | |
| Highway | |
| Bayou | |

N 0.25 0.5 miles

figure A.4 Study Area Land Use

*Source: HCAD, 2019*

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# LAND VALUE & IMPROVEMENTS

The total assessed value of land indicates the health of a community. As a desirable place to live with only 4% undeveloped land, Montrose enjoys relatively high land values.

Single-Family residential areas – especially north of Westheimer Road – have a high per square foot value. However, the most valuable lots are recent luxury apartment and condo developments. Several exempt properties, like University of St. Thomas and the Menil Collection add value as community anchors in Montrose and can increase the value of surrounding areas.

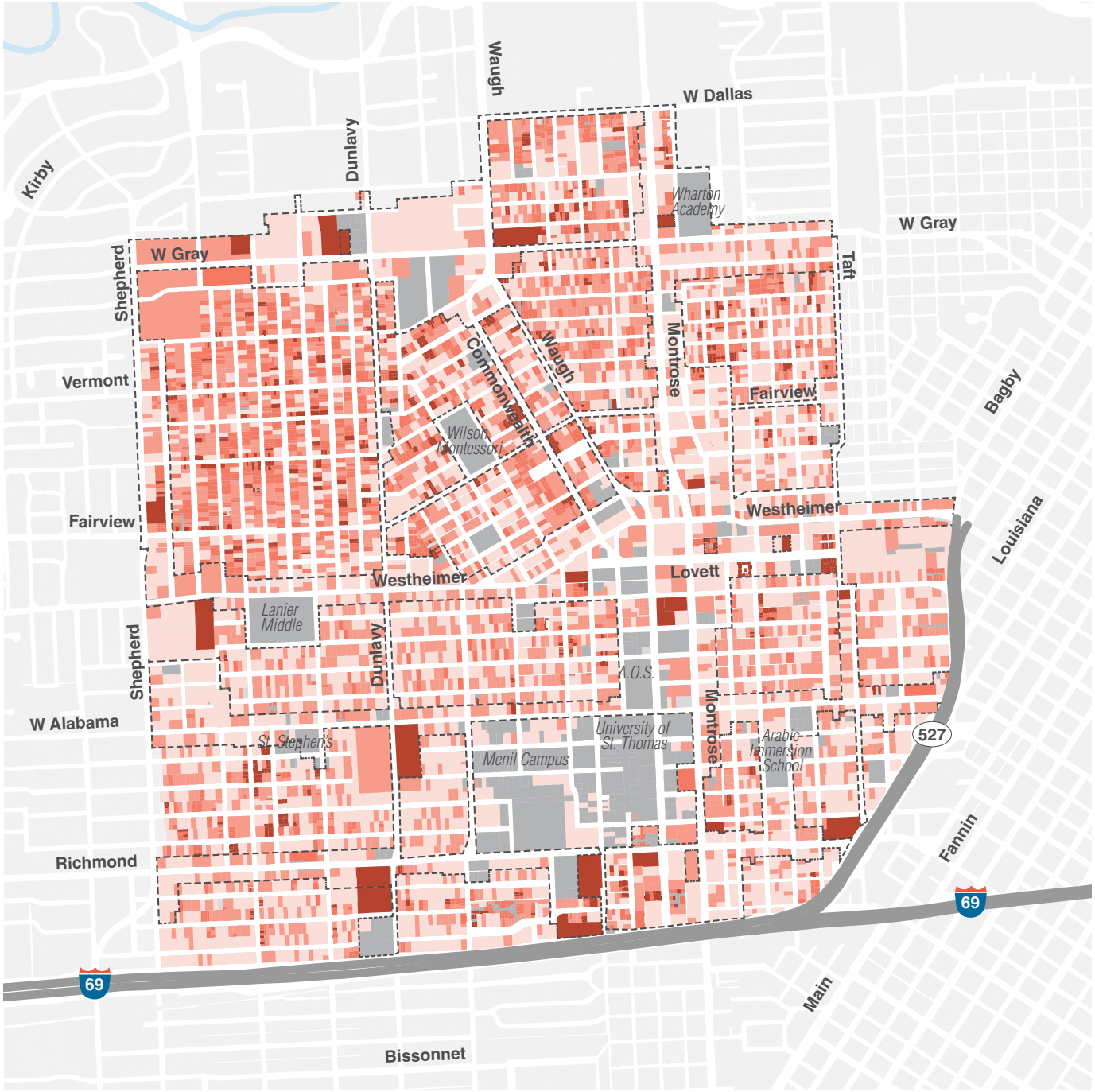



figure A.5 Study Area Land Value

- TIRZ 27 Boundary
- >$300 per sq. ft.
- $200-$300 per sq. ft.
- $100-$200 per sq. ft.
- <$100 per sq. ft.
- Exempt
- Highway
- Bayou

N 0.25 0.5 miles

*Source: HCAD, 2019*

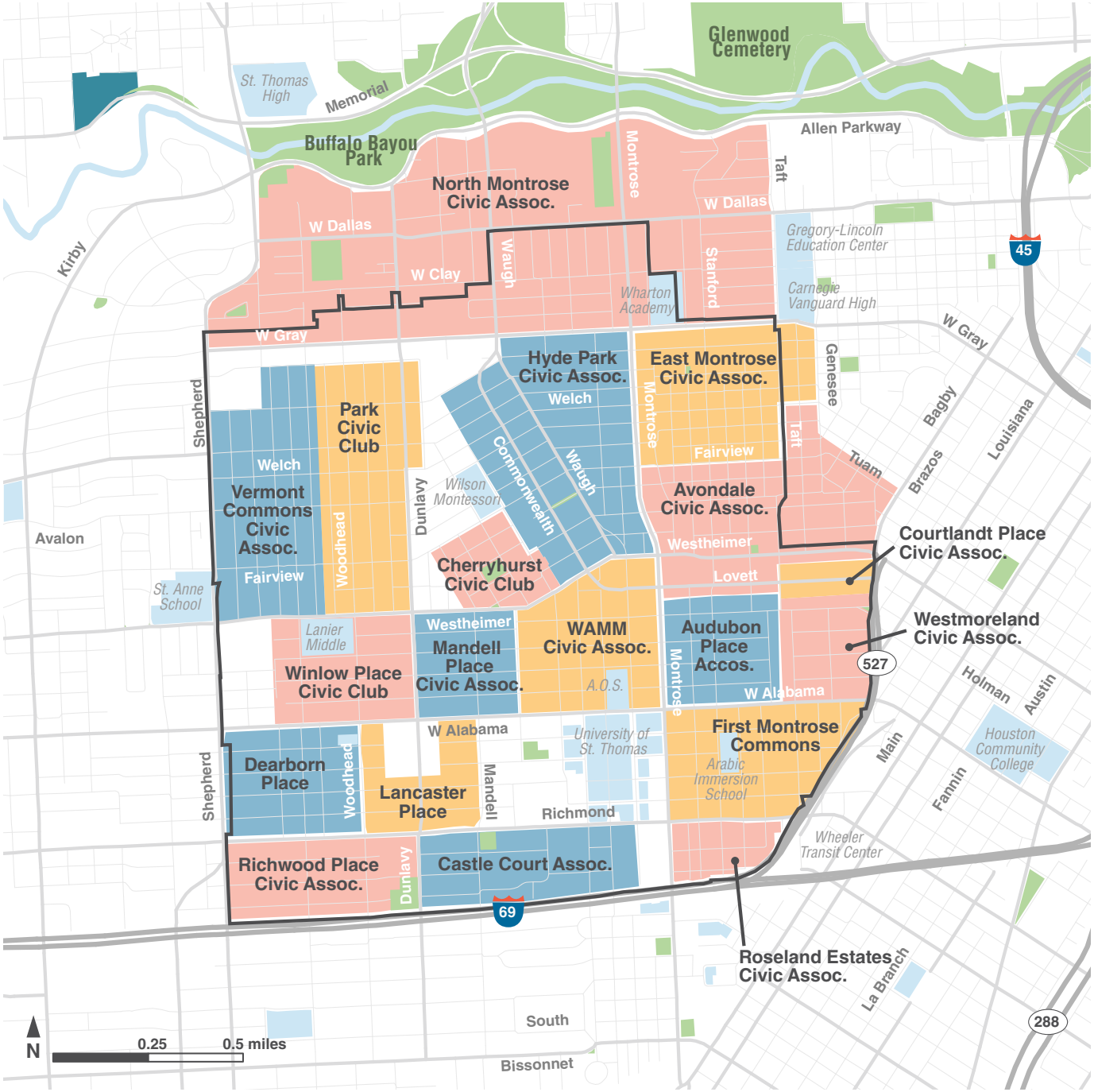



figure A.6 Montrose Civic Clubs

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LAND USE & DESTINATIONS

# CIVIC CLUBS

Typically, Montrose Civic Clubs are active and meet monthly. They are a great resource for engaging the residents of Montrose.

As projects develop and enter the design and implementation phases, engaging residents will be essential for developing enthusiasm and support for a project. Civic clubs should be a partner during these phases of project development.

Civic Associations
Study Area
Park
School
Bayou

*Source: Neartown/Montrose Super Neighborhood*

# COMMUNITY CENTERS & LIBRARIES

There are many civic facilities within the study area that provide a multitude of programming. Access to theses sites for all modes is necessary to ensure access and equity.

These destinations shown were prioritized during the network importance analysis conducted during *Walk Montrose*.




figure A.7 Community Destinations in the Study Area

- Community Center
- Museum/Library
- Grocery Store
- Place of Worship
- School
- Park
- Study Area
- Roadway
- Bayou

*Source: Team Analysis 2020*

# POPULATION TODAY

Although more dense than most of the City of Houston, Montrose does not have as many residents per square mile as some of the surrounding neighborhoods like Midtown, Greenway Plaza, and along Washington Avenue.

The northwest quadrant of the Study Area has the highest density with more than 15,000 residents per square mile. The neighborhoods between Dunlavy Street and Shepherd Drive and the areas near IH69 have 12,000 to 15,000 residents per square mile.

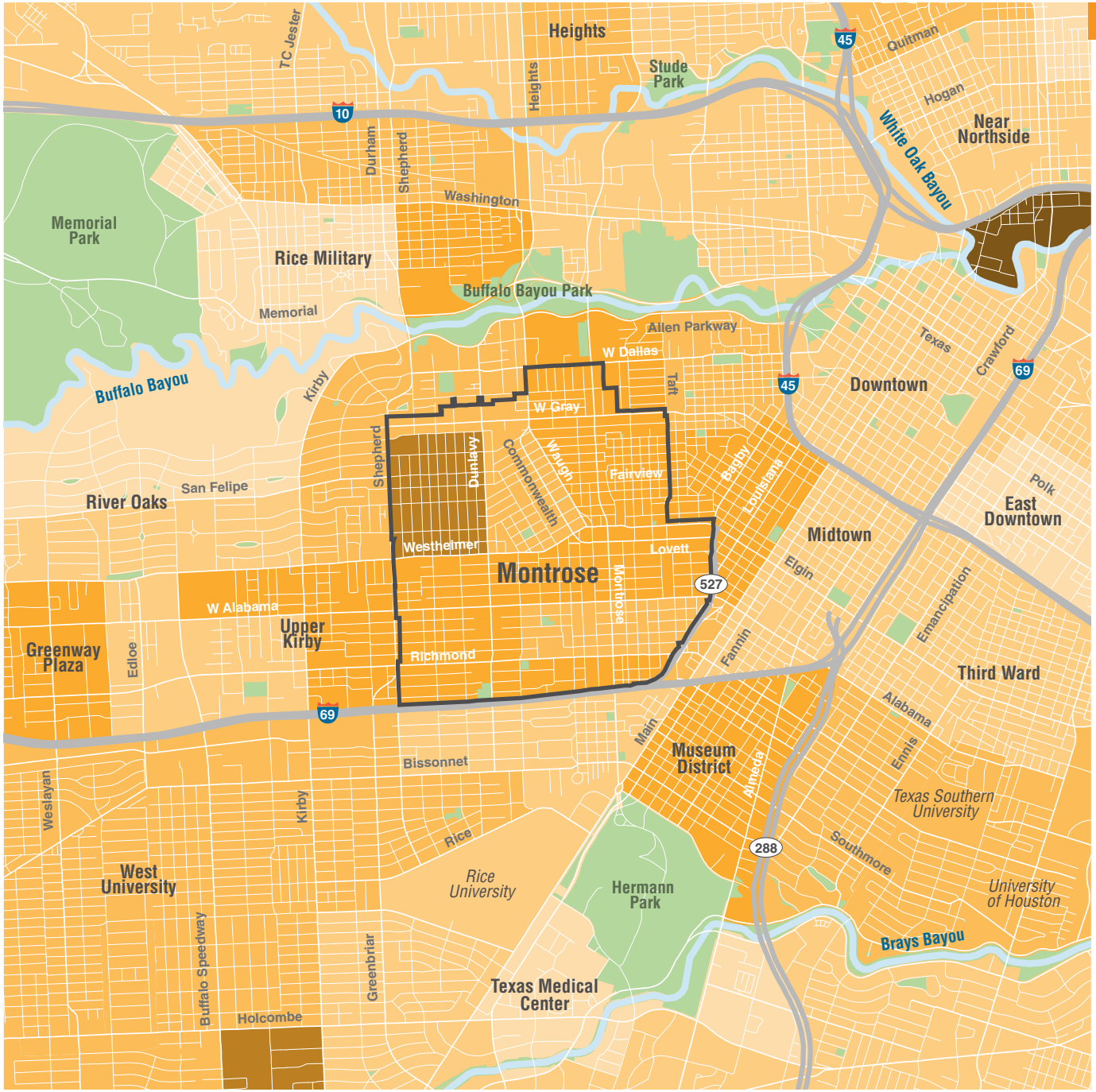



figure A.8 Study Area Population by Census Tract

**Residents per Square Mile**

- > 18,000
- 12,000 to 18,000
- 9,000 to 12,000
- 6,000 to 9,000
- 3,000 to 6,000
- < 3,000
- Study Area Boundary
- Park
- Bayou
- Highway

N 0.5 1 mile

*Source: H-GAC, 2019*

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# POPULATION 2045

Even with a small percentage of undeveloped parcels available in Montrose, the neighborhood is expected to be more dense by 2045. Nearly the entire Study Area will have 12,000 to 15,000 residents per square mile with greater concentrations closer to Buffalo Bayou where large tracts of land can still support major multi-family developments.

The communities surrounding Montrose will also be more dense in the future, particularly Upper Kirby, Downtown, and the Washington Avenue area.

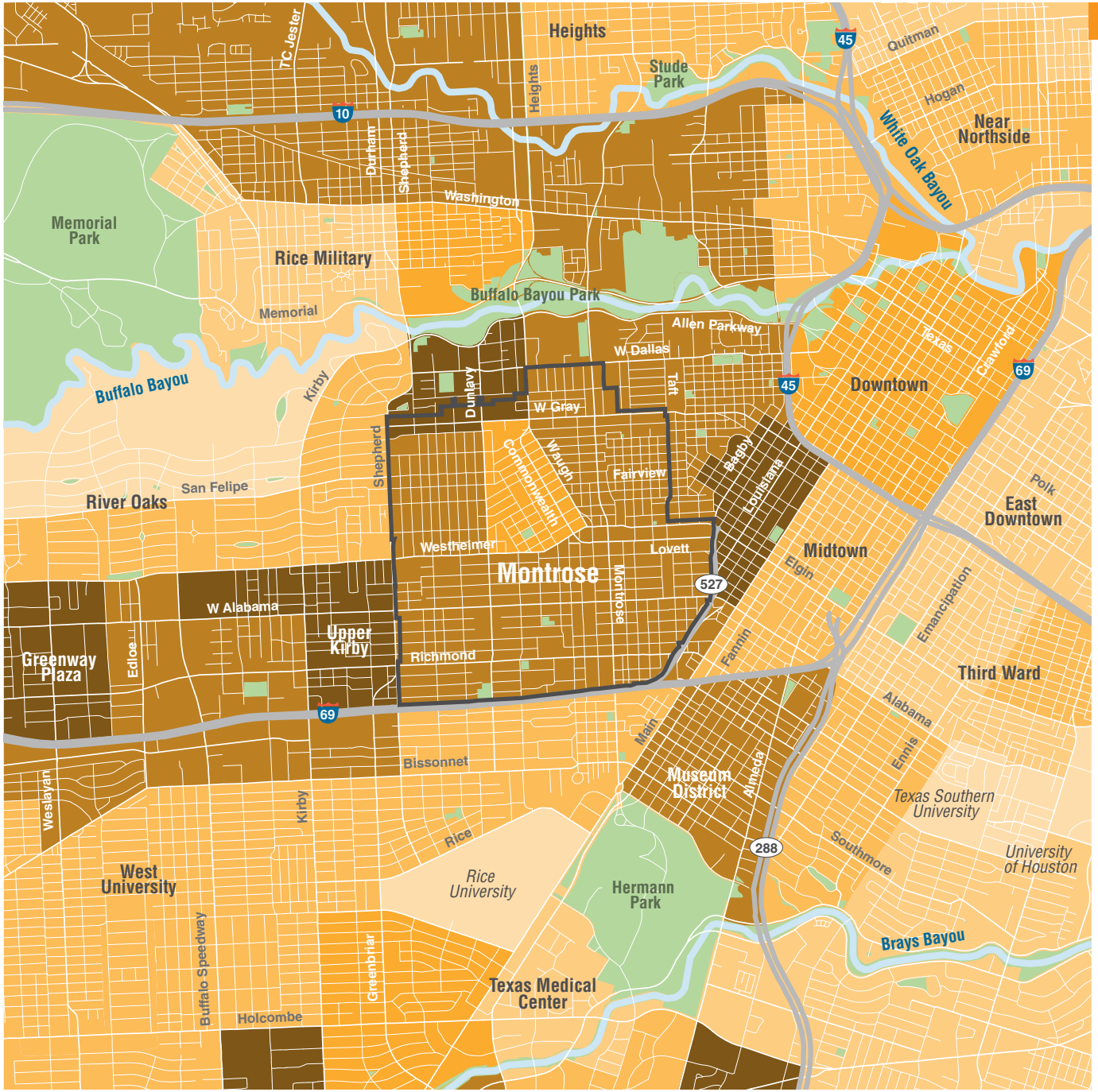



figure A.9 Projected Study Area Population by Census Tract

## Residents per Square Mile

- > 18,000
- 12,000 to 18,000
- 9,000 to 12,000
- 6,000 to 9,000
- 3,000 to 6,000
- < 3,000
- Study Area Boundary
- Park
- Bayou
- Highway

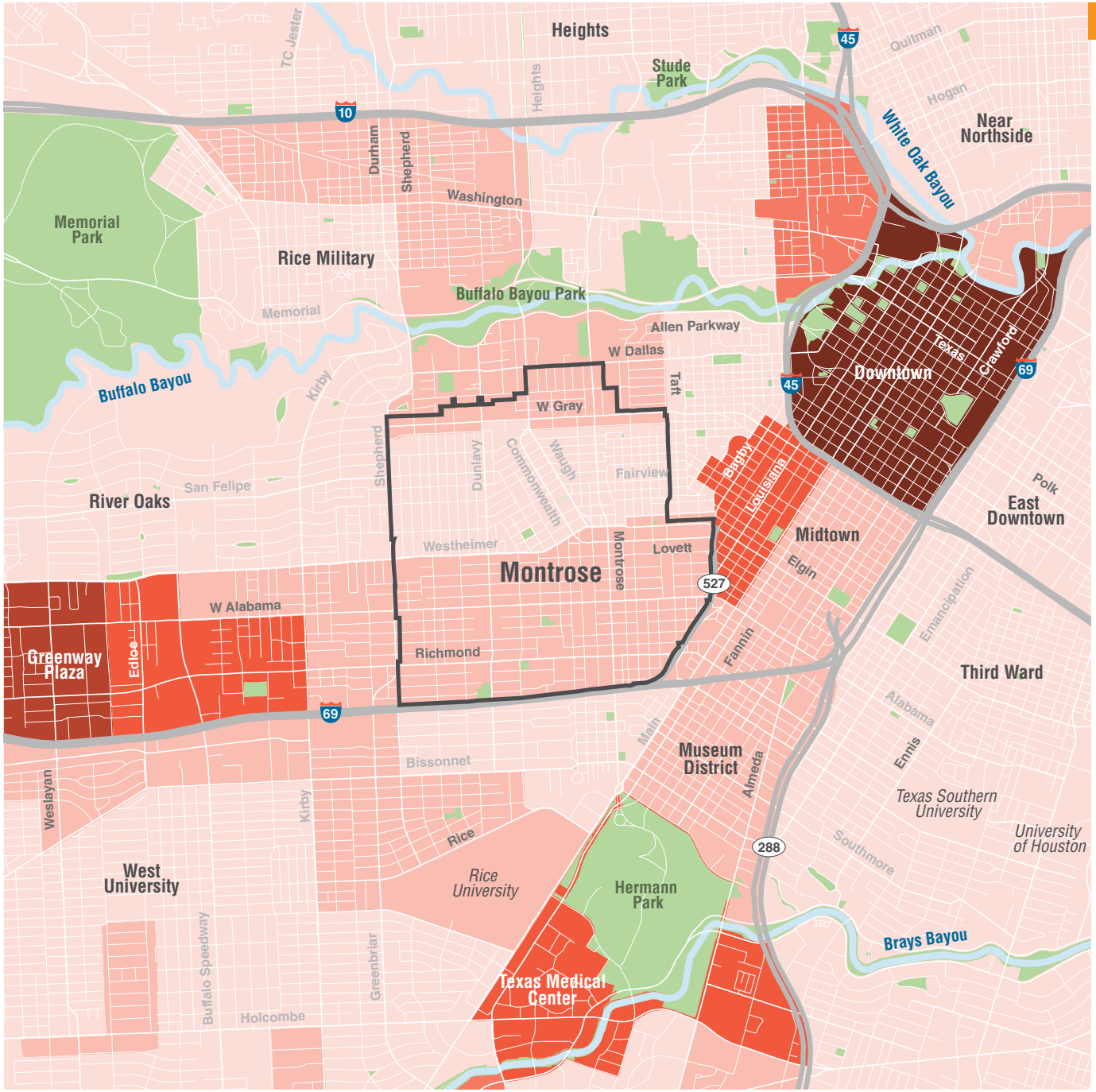
N 0.5 1 mile

*Source: H-GAC, 2019*

# EMPLOYMENT TODAY

Montrose is centrally located near several major employment centers. Downtown, the Texas Medical Center, and Greenway Plaza all have more than 35,000 jobs per square mile.

Montrose has many fewer jobs than those centers with an average of 8,100 jobs per square mile across its Census tracts.




## Jobs per Square Mile

- > 70,000
- 52,500 to 70,000
- 35,000 to 52,500
- 17,500 to 35,000
- 5,000 to 17,500
- < 5,000

- Study Area Boundary
- Park
- Bayou
- Highway

N

0.5 1 mile

*Source: H-GAC, 2019*

figure A.10 Study Area Employment by Census Tract

# EMPLOYMENT 2045

By 2045, the location of major employment centers will remain consistent. Downtown, the Texas Medical Center, and Greenway Plaza will remain key nodes of employment with increased job density for the western half of Midtown and the areas around downtown.

Job density in Montrose will largely stay the same, growing to an average of 8,600 jobs per square mile among its Census Tracts.

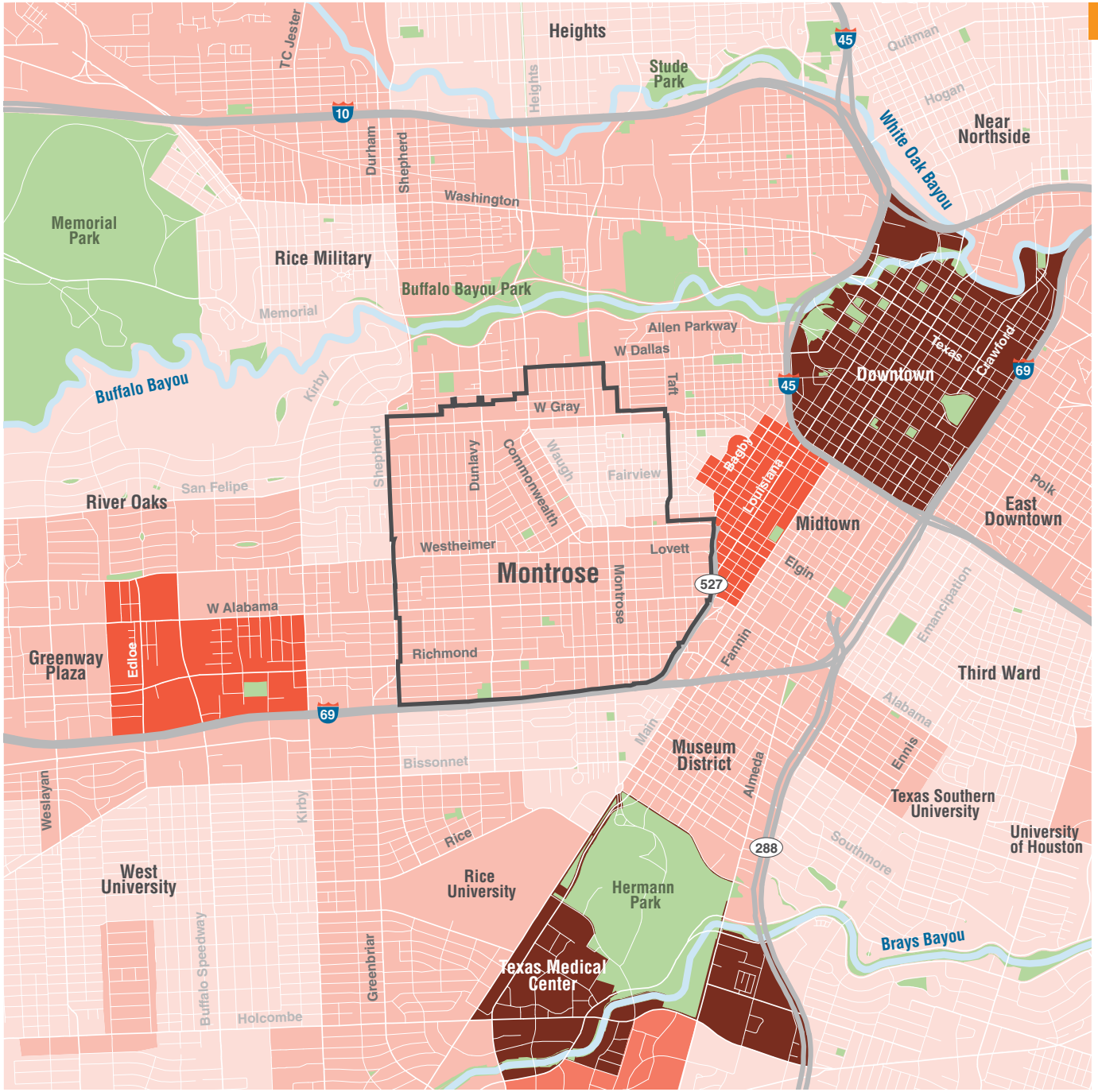



figure A.11 Projected Study Area Employment by Census Tract

## Jobs per Square Mile

- > 70,000
- 52,500 to 70,000
- 35,000 to 52,500
- 17,500 to 35,000
- 5,000 to 17,500
- < 5,000

- Study Area Boundary
- Park
- Bayou
- Highway

N

0.5 1 mile

*Source: H-GAC, 2019*

# ACTIVITY DENSITY TODAY

Activity density is a measure of both population and residential density. The Study Area is an activity center that includes both high density areas of employment and population. The most dense of these areas is along Buffalo Bayou Park where there are multiple multi-family residences and office complexes.

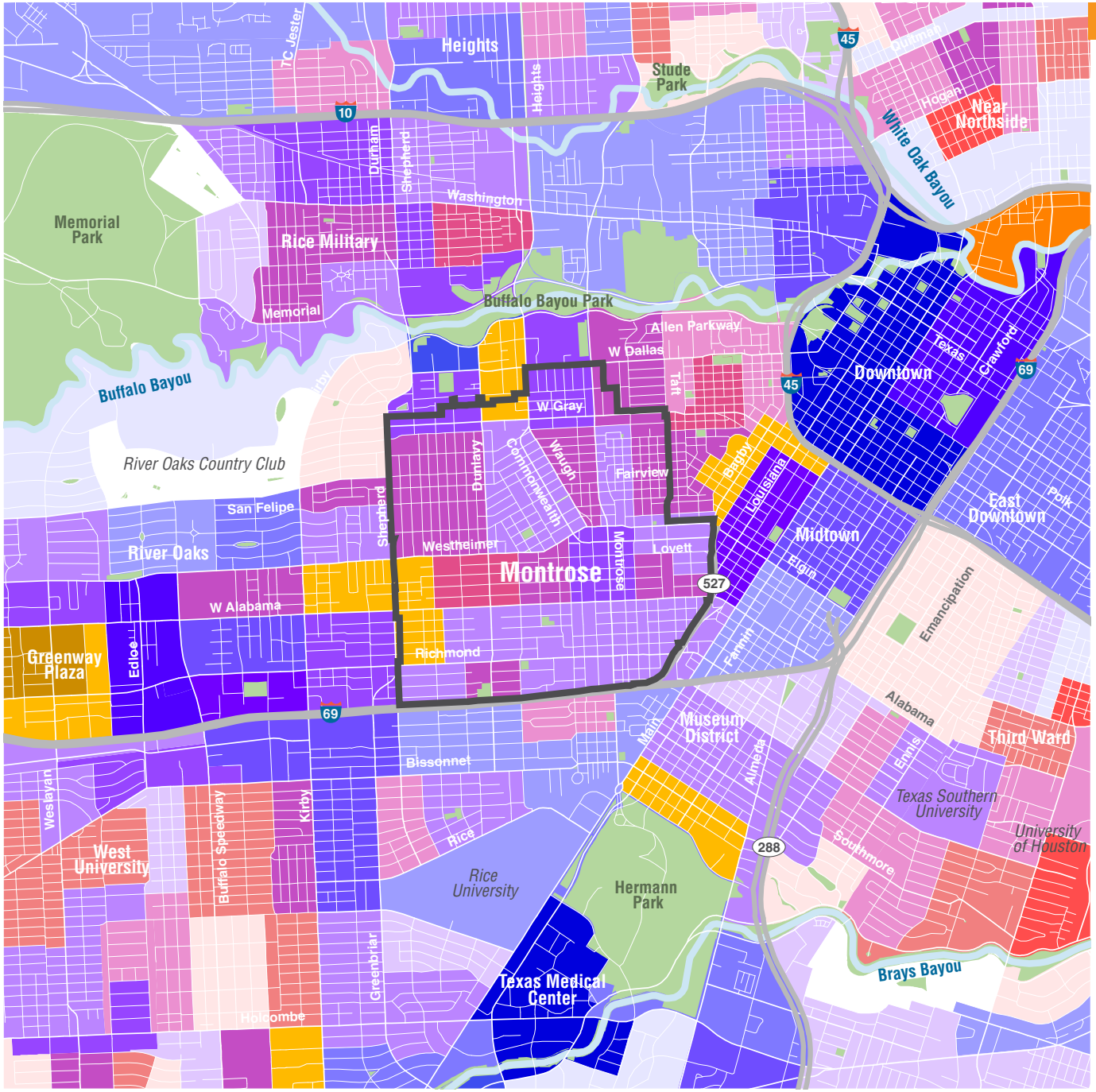



figure A.12 Study Area Activity Density by Census Tract

*Source: U.S. Census Bureau, 2019*

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# ACTIVITY DENSITY 2045

H-GAC projects future population and employment density that can be combined to project future activity density. This map highlights the areas that are expected to see high density of both population and jobs in 2045 in gold tones. Much of the Study Area and the surrounding area become high activity-dense areas in the future which emphasizes the need to develop a mobility network that provides mobility choice.

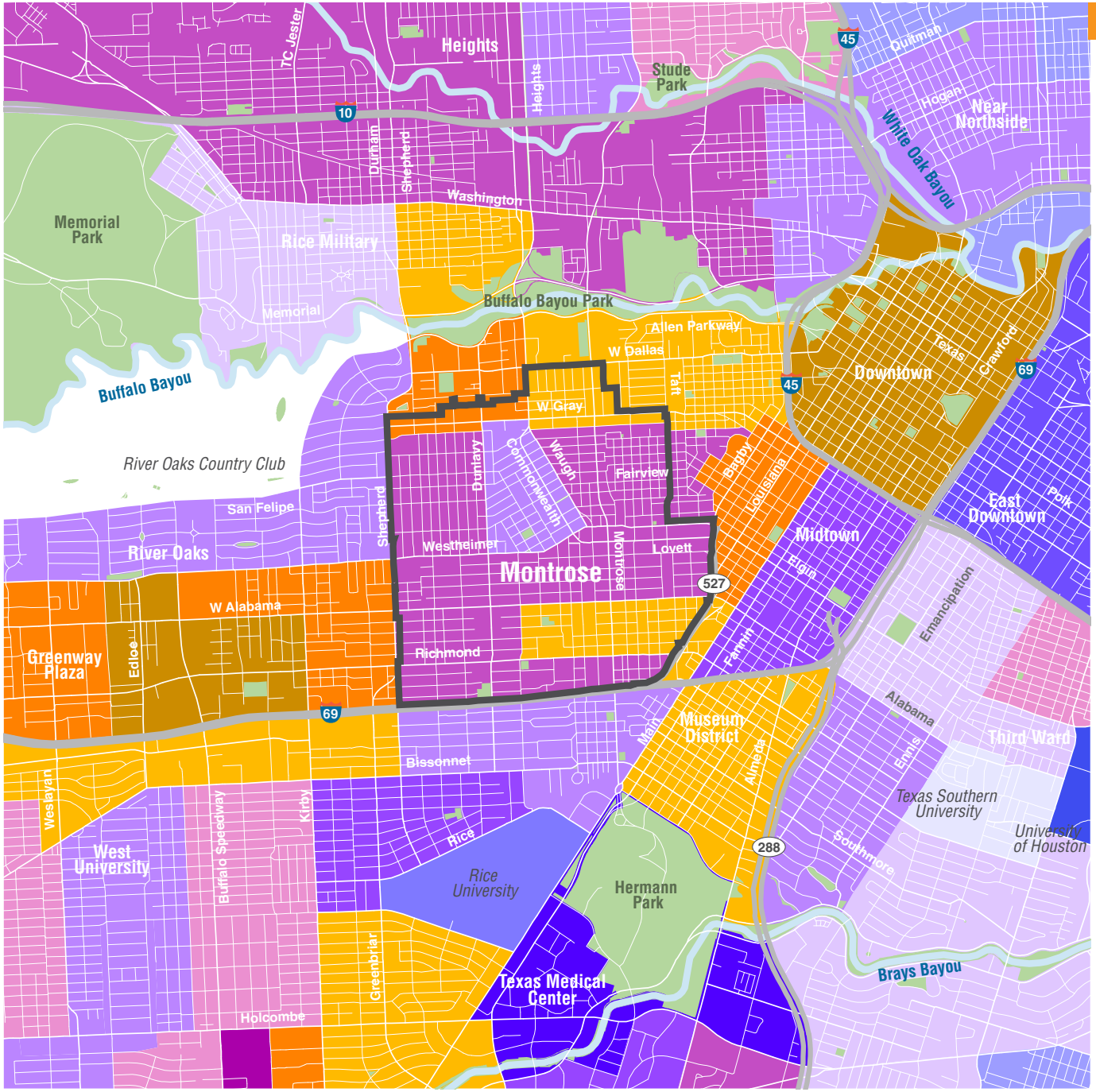



figure A.13 Projected Study Area Activity Density by Census Tract

*Source: U.S. Census Bureau, 2019*

# COMMUTE CHARACTERISTICS

## CENSUS TRANSPORTATION DATA

Census data for Montrose and the City of Houston offers important details about how residents get around on a daily basis. Montrose residents have similar rates of car ownership to the City of Houston, although there are more households in Montrose that only own one vehicle (see **Figure A.14**). As shown in the demographics earlier in the Factbook, a likely cause may be the smaller household size and the prevalence of younger adults likely living alone.

Compared to the City as a whole, a smaller portion of Montrose residents use a car to get to work, while a larger portion work from home. Census data also show a larger portion of Montrose residents walking to work, but a smaller percentage using transit.

Likely due to the neighborhood's central location between major employment centers, Montrose residents enjoy much shorter travel times to work. Around 17% of residents in the neighborhood get to work within 10 minutes, while an additional 39% take fewer than 20 minutes for their commute.

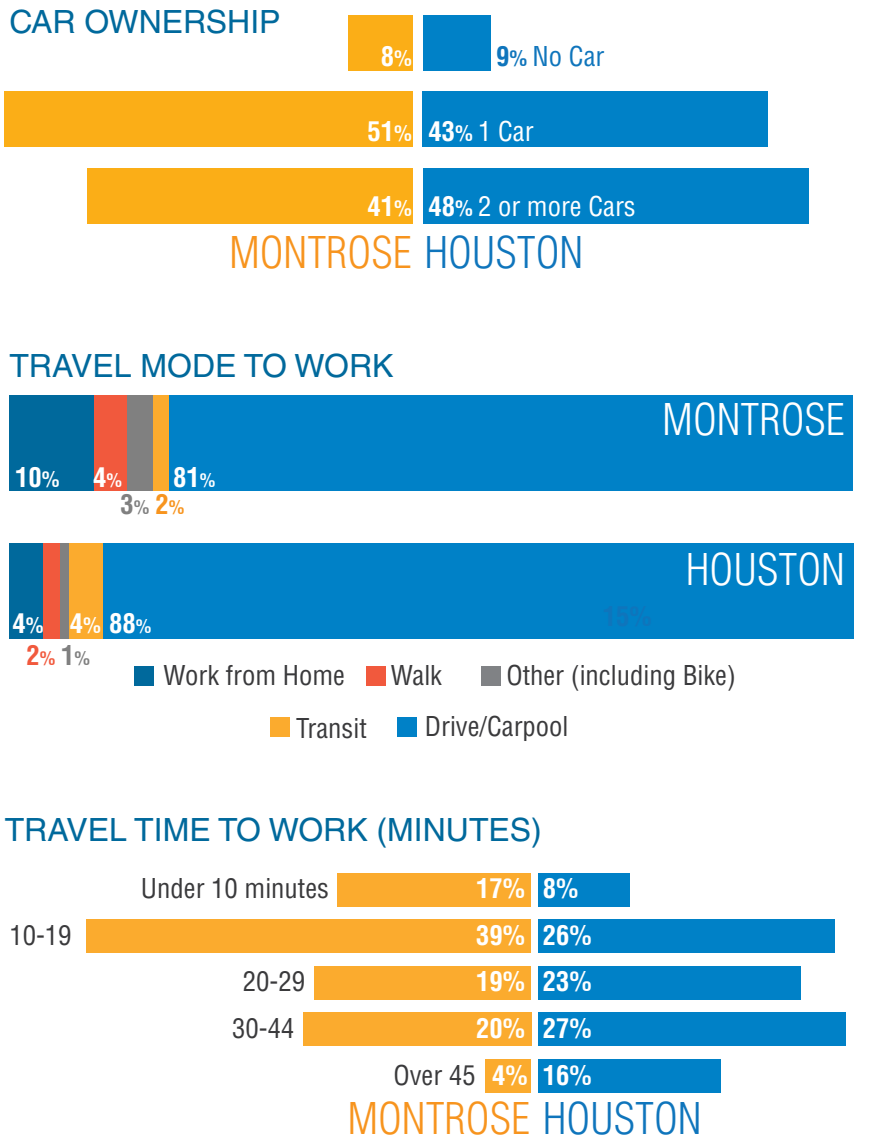



figure A.14 Study Area Mobility Data *Source: U.S. Census Bureau, 2019*

## SHORT TRIP DISTANCES

Census data also show the potential for commuters to walk and bike. Montrose has just over 14,000 working residents. Around 740 of those residents also work within Montrose with nearly **13,400** working outside of the neighborhood (see **Figure A.15**). An additional 49% of those residents work within a 3-mile radius of the Study Area in large nearby employment hubs like Downtown, the Texas Medical Center, and Greenway Plaza.

In addition to the 740 residents living and working in Montrose, another 15,100 commute to the neighborhood for work. Of these, just over 40% come from less than 10 miles away, an easy trip to make via transit.

The prevalence of shorter trips in Montrose is not just true for work trips. Data from the Houston-Galveston Area Council show that half of all trips originating in Montrose are for distances less than three miles. This includes 10% of all trips that are less than one mile. Compared to the City of Houston – where only one-third of all trips are less than 3 miles – Montrose has a large percentage of people who could benefit from sidewalks and bikeways.

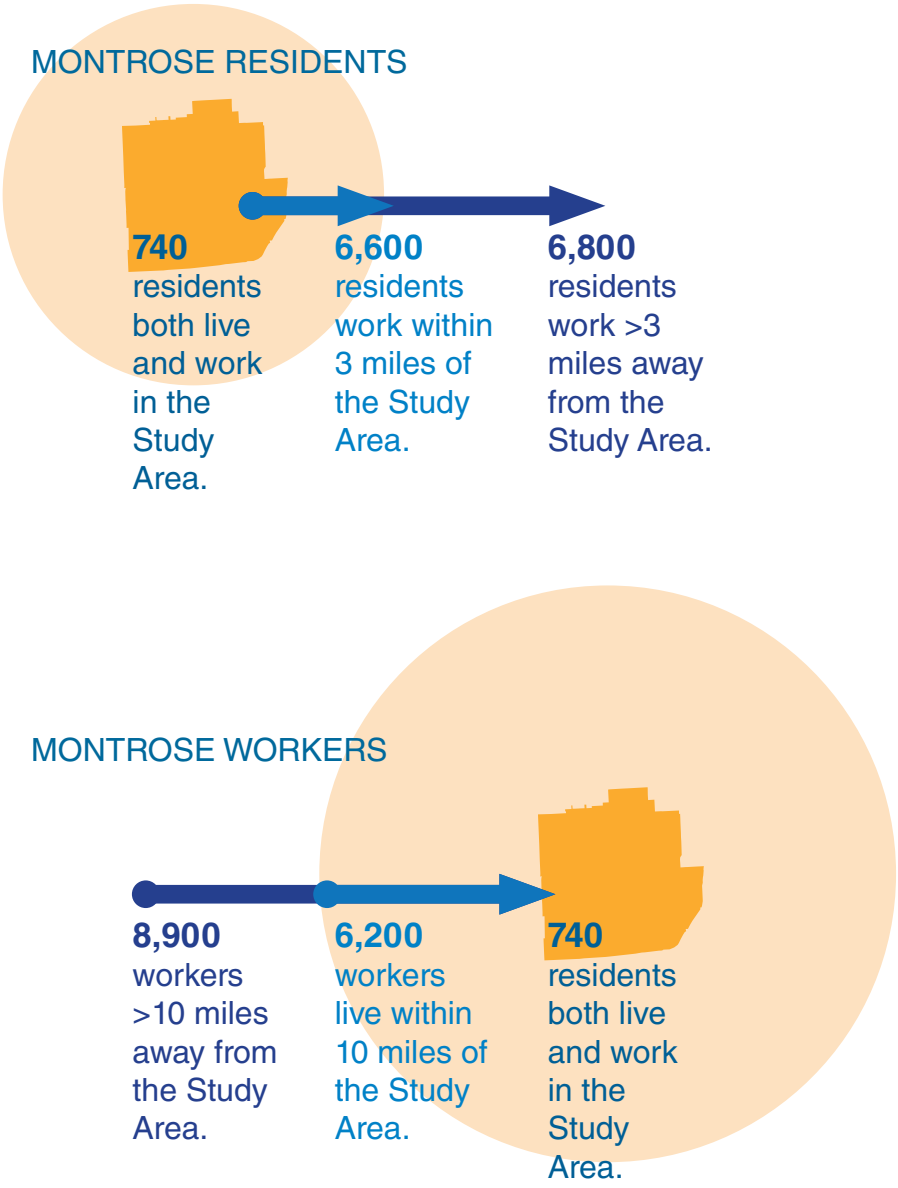
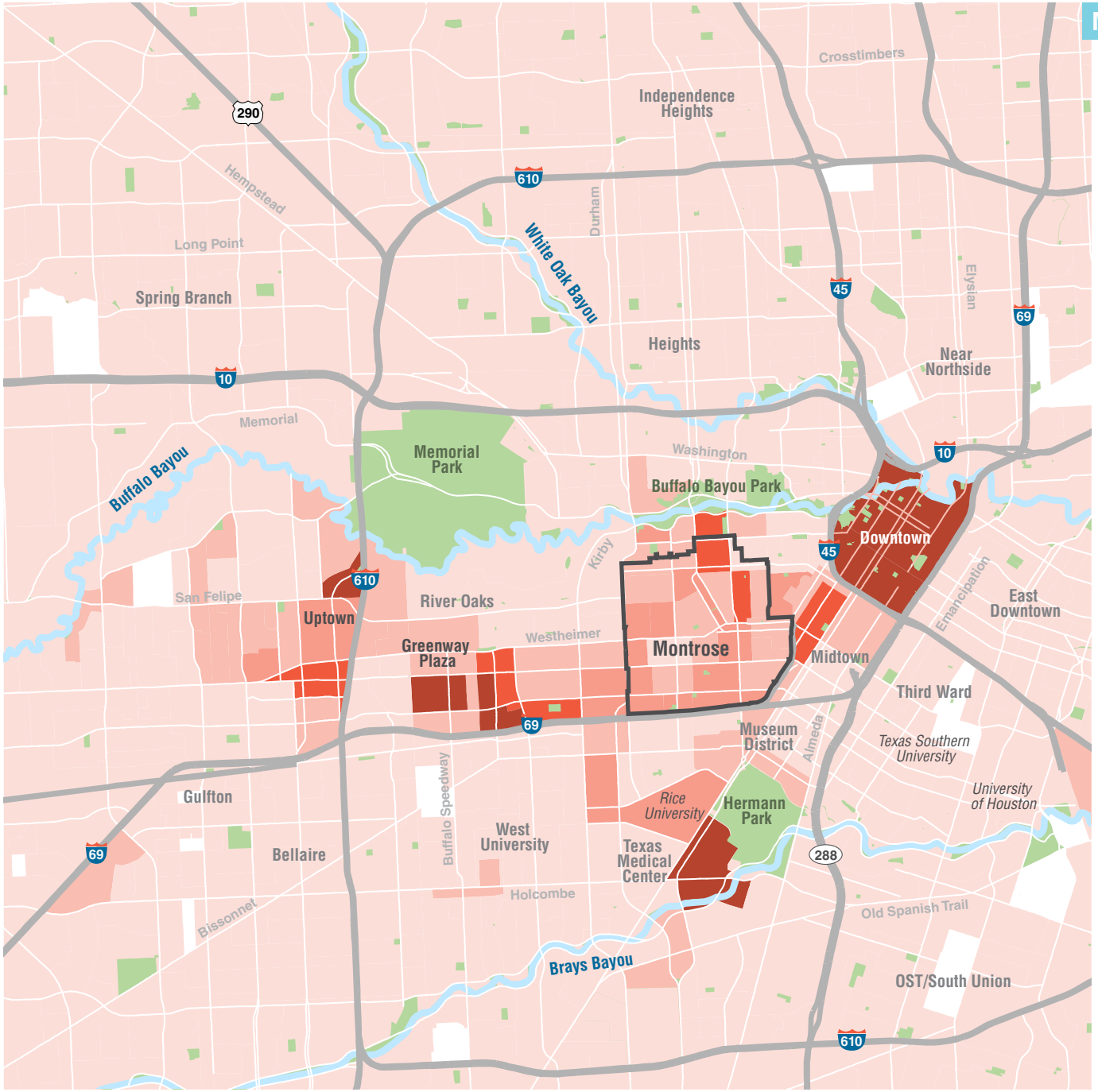



figure A.15 Study Area Mobility Data
*Source: U.S. Census On the Map 2019*

# WHERE RESIDENTS WORK

The largest concentrations of Montrose residents work at major employment centers like Downtown, the Texas Medical Center, Greenway Plaza, and Uptown.

Many Montrose residents also work within the neighborhood, particularly east of Taft Street and near Shepherd Drive and IH69.




**Montrose Residents**
(per Square Mile)

- > 700
- 500 to 700
- 300 to 500
- 100 to 300
- < 100

- Study Area Boundary
- Park
- Bayou
- Highway

N

1 2 miles

*Source: Census LEHD, 2019*

figure A.16 Census Tracts where Montrose Residents Work

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# WHERE WORKERS LIVE

Many employees working in Montrose also live in the neighborhood. Smaller groups of employees live in Gulfton and the Museum District.

This map shows the importance of pedestrian and bicycle infrastructure for the many workers who live within and near Montrose.

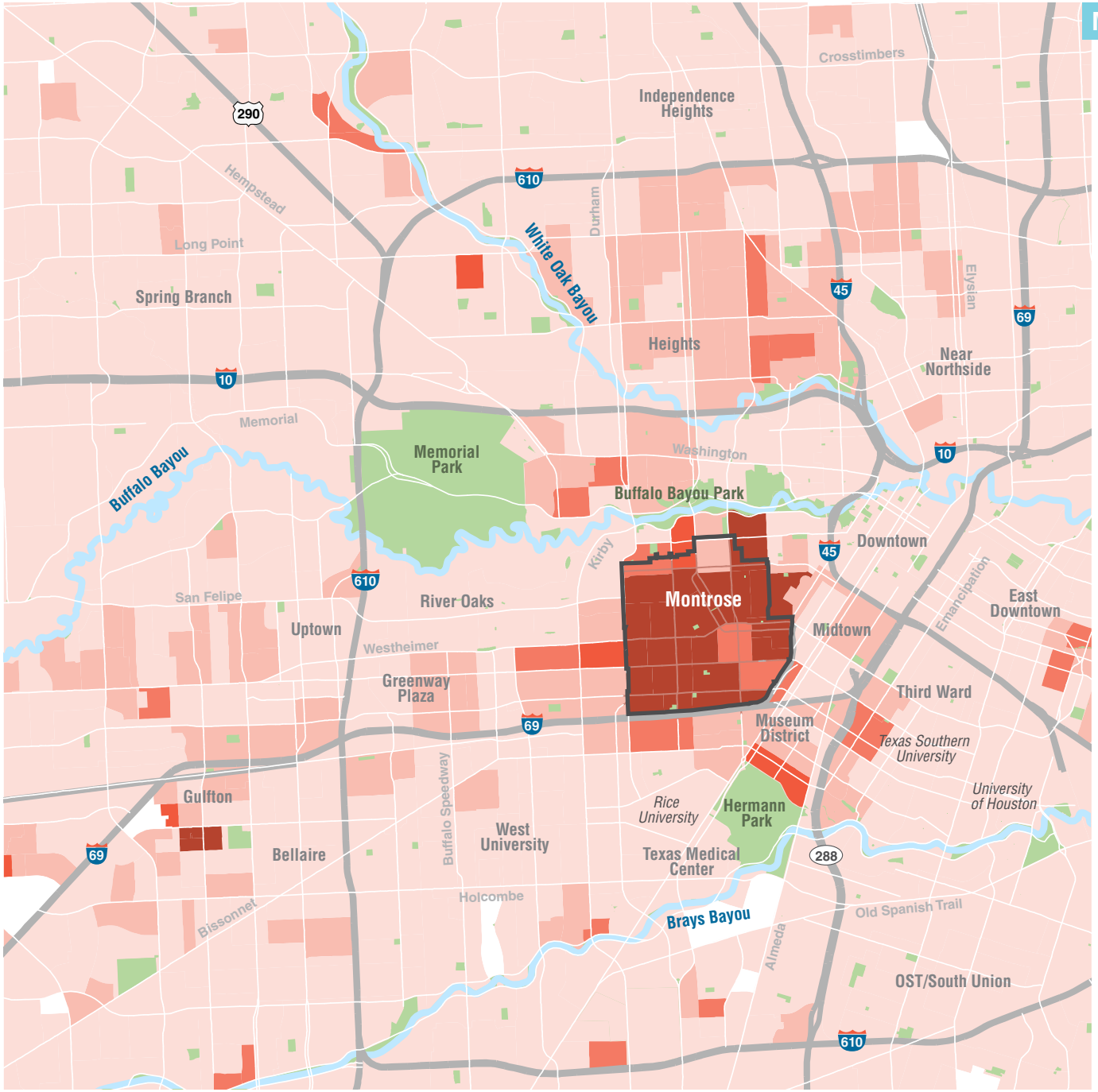



figure A.17 Census Tracts where Montrose Workers Live

**Montrose Employees**
(per Square Mile)

- > 200
- 150 to 200
- 100 to 150
- 50 to 100
- 0 to 50
- 0

- Study Area Boundary
- Park
- Bayou
- Highway

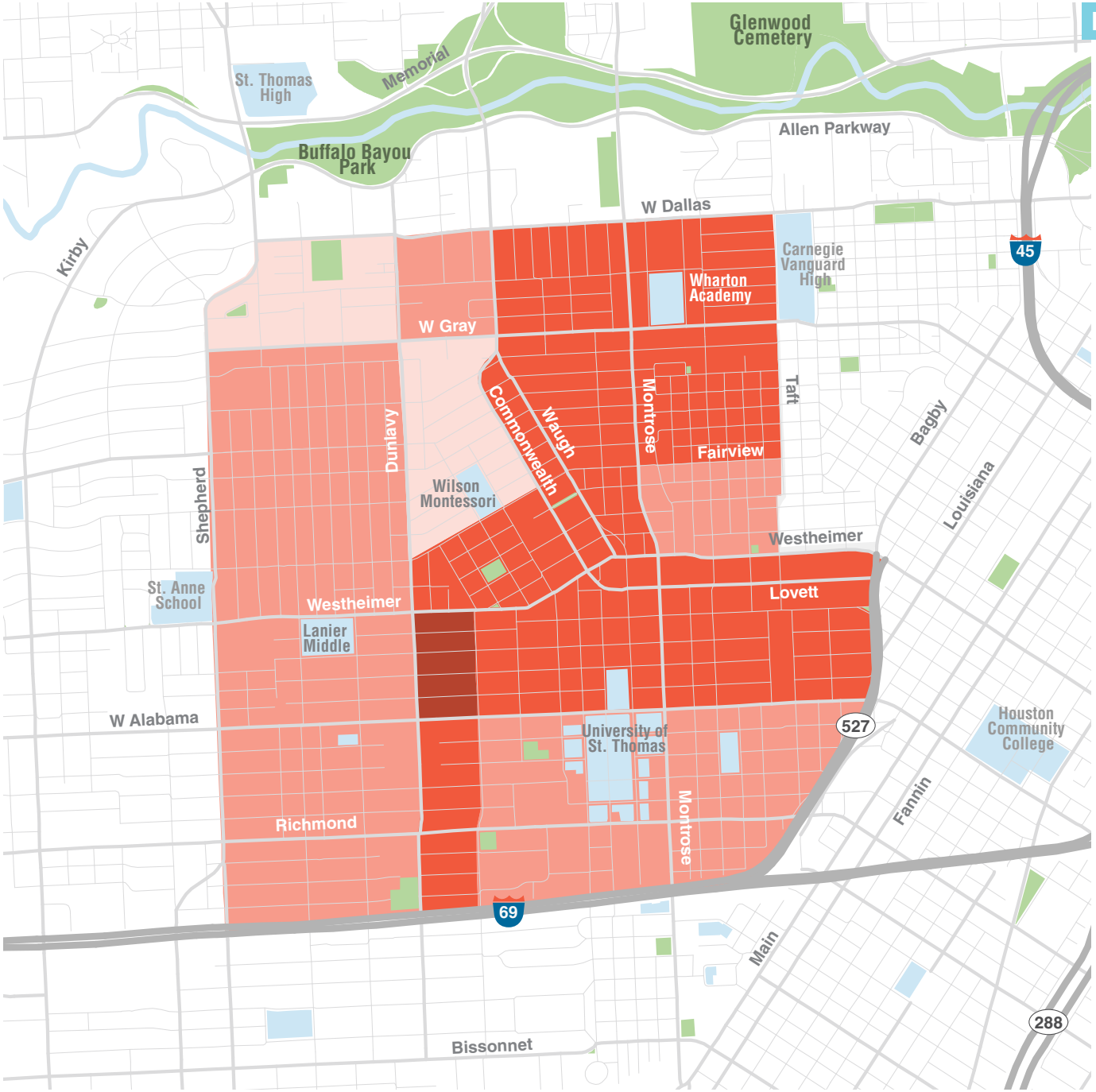
N 1 2 miles

*Source: Census LEHD, 2019*

# TRIP DISTANCE

In 2018, 50% of all trips in the Montrose area were less than 3 miles compared to 33% for the entire City of Houston. That distance is ideal for walking or biking, as long as safe infrastructure exists. The number of short trips increases to nearly 60% for work-based trips from the home.

While the entire neighborhood has a high portion of short trips, the concentrations are in the eastern and central parts of Montrose near Westheimer Road and Montrose Boulevard.




## Percent of Trips 0 to 3 Miles

- Over 55 percent
- 50 to 55 percent
- 45 to 50 percent
- Less than 45 percent
- Park
- Bayou
- Roadway

N 0.25 0.5 miles

figure A.18 Short Trips in the Study Area

*Source: H-GAC, 2018*

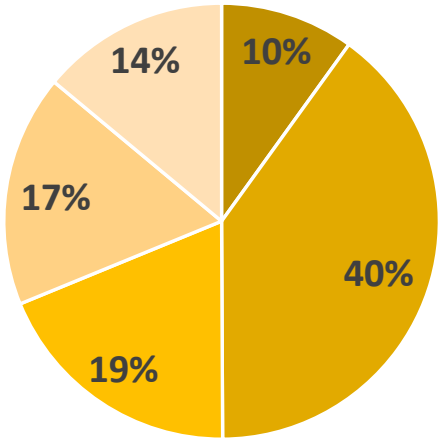
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## TRIP TYPE & TRIP DISTANCE

H-GAC's Travel Demand Model (TDM) estimates trip distance by trip type for different geographical areas. An analysis was done for the Montrose area, as shown in **Figure A.18**. When the tip distance data for Montrose is compared to the City of Houston, as shown in **Figure A.20**, the higher percentage of short trips (less than 3 miles) is evident. The higher number of short trips is likely due to the street network, variety of land uses, and mobility choices offered within and near Montrose.

The trip distance data can also be segmented out by trip type. There are four trip types evaluated by the H-GAC TDM: home to work trips, non home to work trips, home to non work trips, and non home to non work trips. Evaluating these trips types gives a more comprehensive assessment of a resident's travel patterns than just looking at commute characteristics (see **Figure A.14**). **Figure A.19** shows the break down of trip type and trip distance for trips that originate within Montrose.

### TRIP DISTANCE DISTRIBUTION
MONTROSE




### TRIP DISTANCE DISTRIBUTION
CITY OF HOUSTON

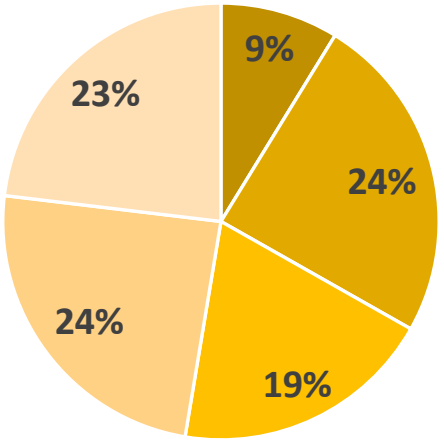



figure A.20 Comparison of Trip Distance for All Trips in Montrose and City of Houston

*Source: H-GAC, 2018*




### TRIP DISTANCE BY TRIP TYPE IN MONTROSE

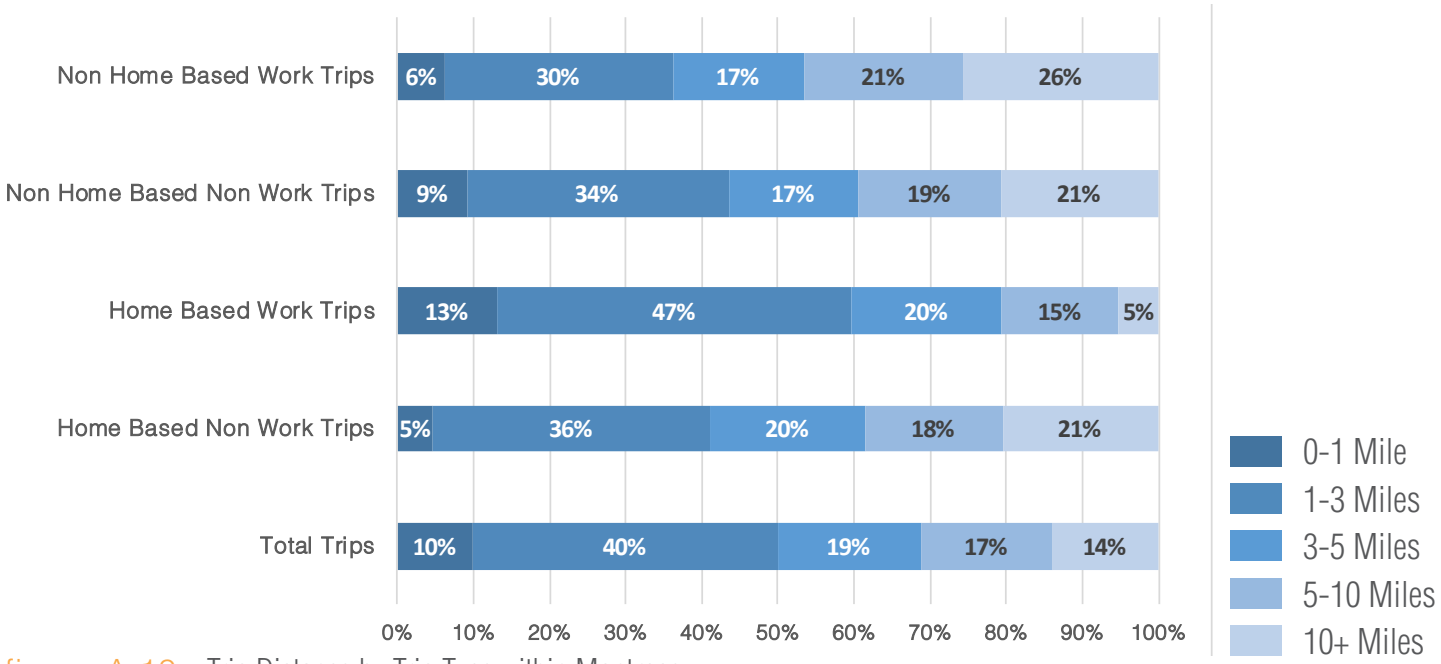



figure A.19 Trip Distance by Trip Type within Montrose

*Source: H-GAC, 2018*

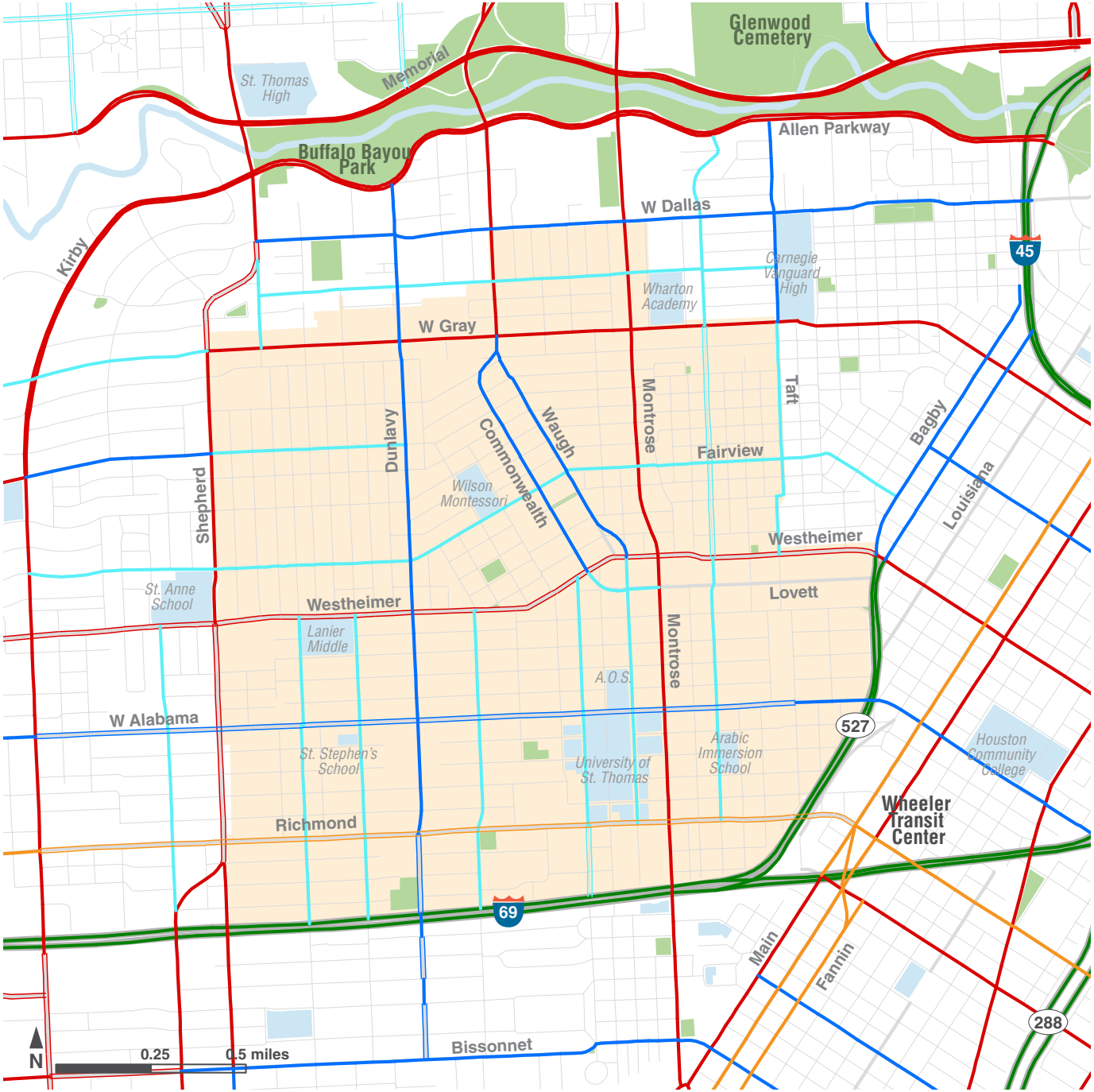



figure A.21 Roadway Network within Study Area

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MOBILITY NETWORKS

# ROADWAY NETWORK

The City of Houston Major Thoroughfare & Freeway Plan is depicted in this map. A detailed road log for many streets within the study area is included in **Table A.2**. This road log was used for corridor planning for this plan.

A few streets are also labeled "to-be-widened," indicating a need for more right-of-way.

## MTFP Classifications

- Minor Collector
- Transit Corridor
- Major Collector
- Major Thoroughfare
- Freeway
  - Sufficient ROW
  - To-Be-Widened

- Study Area
- Park
- School
- Bayou
- Roadway

N 0.25 0.5 miles

*Source: City of Houston, 2015-2019*




figure A.22 Study Area Vehicle Volumes

MOBILITY NETWORKS

# VEHICLE COUNTS

Vehicle counts for major streets in Montrose show heavy vehicle volumes for a few north-south streets like Montrose Boulevard, Shepherd Drive, and Waugh Drive. Westheimer Road and portions of Richmond Avenue have the highest east-west volumes.

## Average Daily Traffic

- > 22,000 vehicles
- 18,000 to 22,000 vehicles
- 14,000 to 18,000 vehicles
- 10,000 to 14,000 vehicles
- 6,000 to 10,000 vehicles
- < 6,000 vehicles

- Study Area
- Park
- School
- Bayou
- Roadway

N 0.25 0.5 miles

*Source: City of Houston, 2015-2019*




figure A.23 Speed Control Infrastructure

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MOBILITY NETWORKS

# SPEED CONTROL

Speed control devices – speed humps and speed cushions – are present in some neighborhoods within the Study Area.

The installation of these devices has been through the City's Neighborhood Traffic Management Program (NTMP).

Historically, the NTMP used speed humps, which are a continuous asphalt hump. Now, they install speed cushions which have slots that make it easier for emergency vehicles. In addition, speed cushions are safer for people biking, as humps were often a hazard for cyclist's stability.

Cushions are a tool that can be used when designing Neighborhood Safe Streets.

- Speed Cushions
- Speed Humps
- Study Area
- Park
- School
- Bayou
- Roadway

*Source: City of Houston*




figure A.24 Intersection Stop Types

MOBILITY NETWORKS

# INTERSECTION TYPES

The Study Area has a wide variety of intersection types. All major streets have signalized intersections at regular intervals with stop-controlled intersections along narrower neighborhood streets.

This map presents the two-way stop-controlled intersections that are east-west or north-south. Knowing the orientation of stop control along a corridor is useful when planning neighborhood bikeway routes for people biking.

- Signalized Intersection
- All-Direction Stop
- One-Direction Stop
  - East-west street stops
  - North-south street stops
- Study Area
- Park
- School
- Bayou
- Roadway

*Source: Team Analysis 2020*

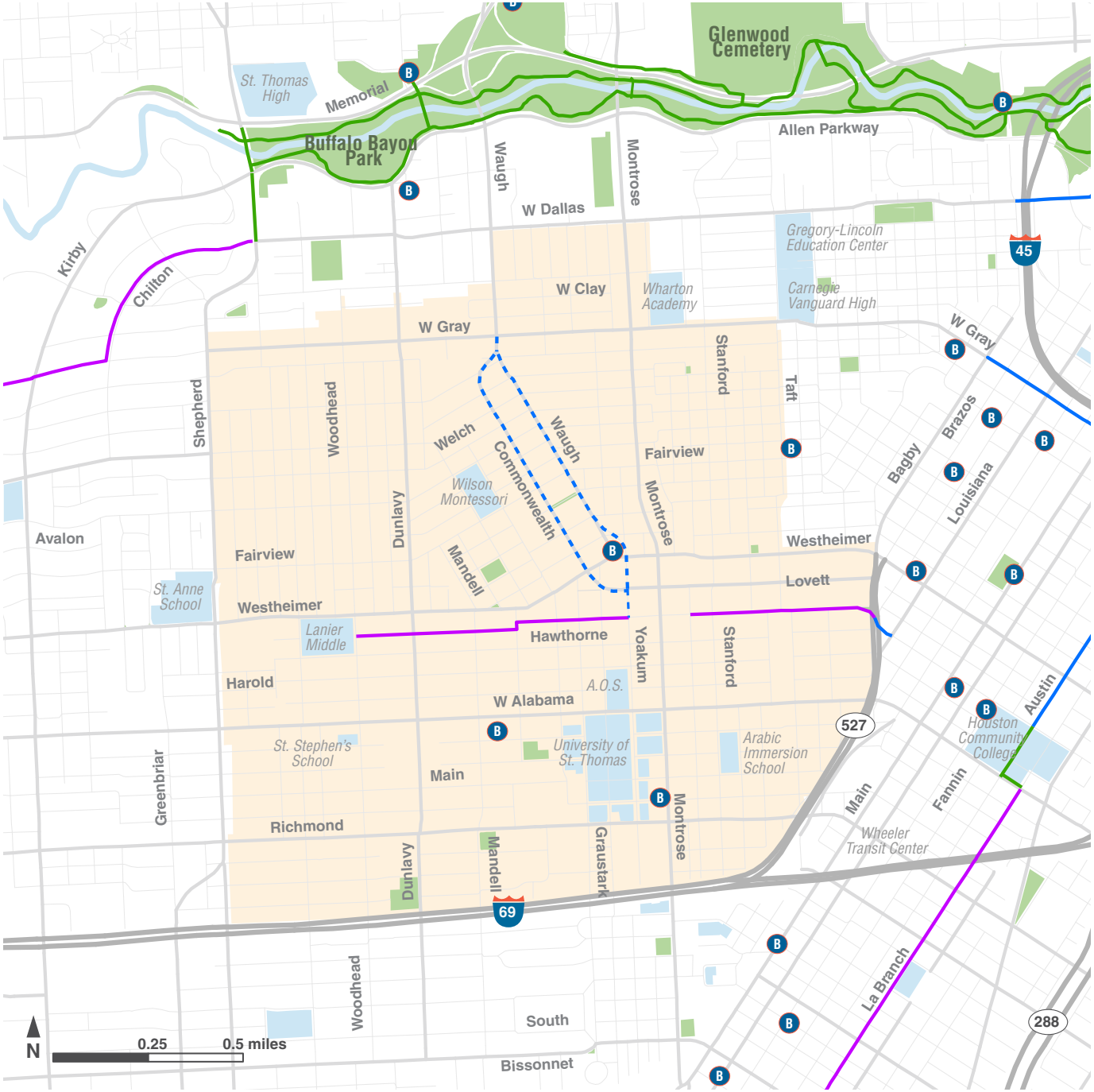



figure A.25 Existing and Programmed Bicycle Facilities

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MOBILITY NETWORKS

# EXISTING & PROGRAMMED BIKEWAY NETWORK

As defined by the Houston Bike Plan, the existing high-comfort bikeway network in the Study Area only includes a disconnected segment of Hawthorne Street.
The TIRZ investment in Waugh Drive and Commonwealth Street will be the first recent addition.

**Facility Type**
- Dedicated On-Street
- Neighborhood Safe Street
- Off-Street
- Programmed Dedicated On-Street

- Roadway
- Houston BCycle Station
- Study Area
- School
- Park
- Buffalo Bayou

*Source: Team Analysis 2020*

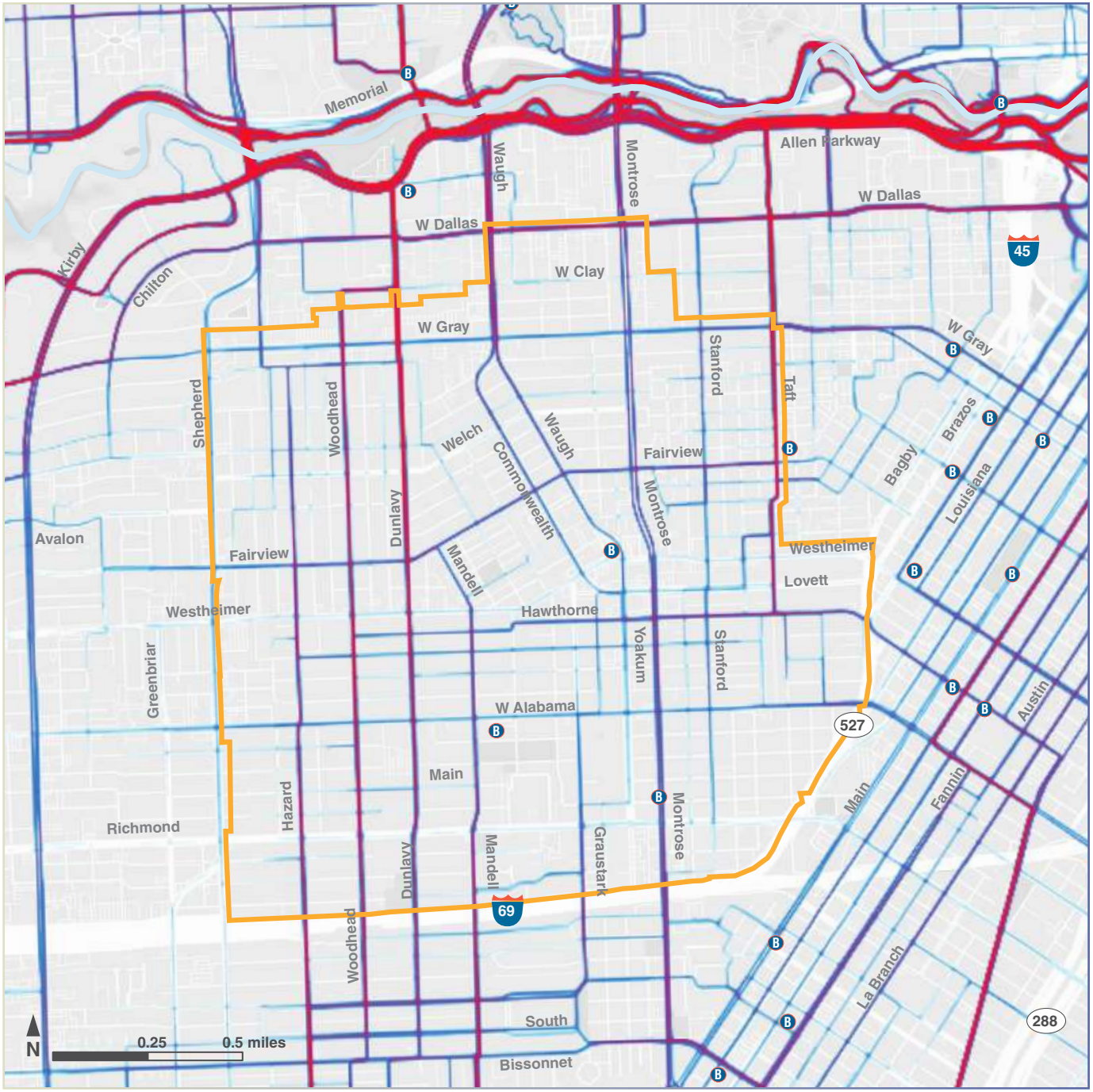



figure A.26 STRAVA Usage in 2018

MOBILITY NETWORKS

# 2018 STRAVA USAGE

The STRAVA application maps the path of its users' bicycle rides, and shares the results in their online mapping platform. The Study Area's STRAVA map shows heavy usage of streets that connect to the Buffalo Bayou Park trail system, as well as Hawthorne Street, Fairview Street, Mandell Street, and West Dallas Street.

**STRAVA Use by Bicyclists**

Fewer Bicyclists — More Bicyclists

Street Name

Houston BCycle Station

Study Area

Buffalo Bayou

*Source: STRAVA*

# BCYCLE STATION ORIGIN & DESTINATION REVIEW

MOBILITY NETWORKS

## DESTINATIONS ANALYSIS FOR BCYCLE STATION IN AND NEAR STUDY AREA

| | LOST LAKE STATION | WESTHEIMER & WAUGH | MENIL/ALABAMA & MULBERRY | FREED LIBRARY | TAFT & FAIRVIEW | ELGIN & SMITH |
|---|---|---|---|---|---|---|
| **Most Popular Destination** | Lost Lake *(Roundtrip)* | Westheimer & Waugh *(Roundtrip)* | Menil/Alabama & Mulberry *(Roundtrip)* | Freed Library *(Roundtrip)* | Taft & Fairview *(Roundtrip)* | Ensemble/HCC |
| **Second Most Popular Destination** | Sabine Bridge | Elgin & Smith | Rice University Gibbs Recreation & Wellness Center | Westheimer & Waugh | Clay & Smith | Elgin & Smith *(Roundtrip)* |
| **Third Most Popular Destination** | Jackson Hill & Memorial Dr. | West Gray & Baldwin | Westheimer & Waugh | Menil Collection/ Alabama & Mulberry | West Gray & Baldwin | Westheimer & Waugh |
| **Fourth Most Popular Destination** | Spotts Park | Taft & Fairview | Freed Library | MFAH/Fannin & Binz | Sabine Bridge | West Gray & Baldwin |

## ORIGINS ANALYSIS FOR BCYCLE STATION IN AND NEAR STUDY AREA

| | LOST LAKE STATION | WESTHEIMER & WAUGH | MENIL/ALABAMA & MULBERRY | FREED LIBRARY | TAFT & FAIRVIEW | ELGIN & SMITH |
|---|---|---|---|---|---|---|
| **Most Popular Origin** | Lost Lake *(Roundtrip)* | Westheimer & Waugh *(Roundtrip)* | Menil/Alabama & Mulberry *(Roundtrip)* | Freed Library *(Roundtrip)* | Taft & Fairview *(Roundtrip)* | Elgin & Smith *(Roundtrip)* |
| **Second Most Popular Origin** | Sabine Bridge | Freed Library | Rice University Gibbs Recreation & Wellness Center | Ensemble/HCC Station | Clay & Smith | Ensemble/HCC Station |
| **Third Most Popular Origin** | Jackson Hill & Memorial Dr. | Elgin & Smith | Freed Library | Menil Collection/ Alabama & Mulberry | City Hall | Westheimer & Waugh |
| **Fourth Most Popular Origin** | Spotts Park | Menil Collection/ Alabama & Mulberry | MFAH/Fannin & Binz | Westheimer & Waugh | Westheimer & Waugh | Milam & Webster |




figure A.27 Study Area Transit Service

## MOBILITY NETWORKS

# TRANSIT

Montrose has a robust network of high-quality transit service. Several local routes cross the neighborhood along major corridors, connecting to other destinations across the county. Residents in Montrose use these routes daily. Within the Study Area, transit riders board and disembark buses along Westheimer Road over 3,000 times a day and Montrose Boulevard over 2,400 times.

**6- to 15-minute headway**
- 25 Richmond
- 27 Shepherd
- 40 Telephone/Heights
- 41 Kirby/Polk
- 56 Airline/Montrose
- 65 Bissonnet
- 82 Westheimer

**30-minute headway**
- 11 Almeda/Lyons
- 32 Renwick/San Felipe
- 41 Kirby/Polk

**60-minute headway**
- 5 Southmore
- 30 Clinton/Ella

> 200 daily boardings and alightings

Study Area
Park
School
Bayou
Roadway

*Source: METRO, 2019*

# TRANSIT ACCESS

## Within 1/4 mile

About 90% of residents in the Study Area are within a quarter mile (5 minute) walk of a transit stop. Nearly 80% are within a quarter mile of a transit stop with high-frequency service.




Within 1/4 mile of a transit stop

**6- to 15-minute headway**
- 25 Richmond
- 27 Shepherd
- 40 Telephone/Heights
- 41 Kirby/Polk
- 56 Airline/Montrose
- 65 Bissonnet
- 82 Westheimer

**30-minute headway**
- 9 Gulfton/Holman
- 11 Almeda/Lyons
- 32 Renwick/San Felipe
- 41 Kirby/Polk

**60-minute headway**
- 5 Southmore
- 30 Clinton/Ella

Study Area
Park
School
Bayou
Roadway

*Source: METRO*

figure A.28 Quarter Mile Transit Stop Coverage

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figure A.29 Study Area Transit Service

MOBILITY NETWORKS

# TRANSIT BOARDINGS

This map shows bus stop location and the typical daily boardings at the stop each day. The larger the circle the higher the number of boardings.

**Daily Weekday Boardings**

- 0-1
- 2-10
- 11-50
- 51-100
- 101-200
- 201-1,000
- > 1,000

**6- to 15-minute headway**

- 25 Richmond
- 27 Shepherd
- 40 Telephone/Heights
- 41 Kirby/Polk
- 56 Airline/Montrose
- 65 Bissonnet
- 82 Westheimer

**30-minute headway**

- 11 Almeda/Lyons
- 32 Renwick/San Felipe
- 41 Kirby/Polk

**60-minute headway**

- 5 Southmore
- 30 Clinton/Ella

Study Area
Park
School
Bayou
Roadway

*Source: METRO, 2019*

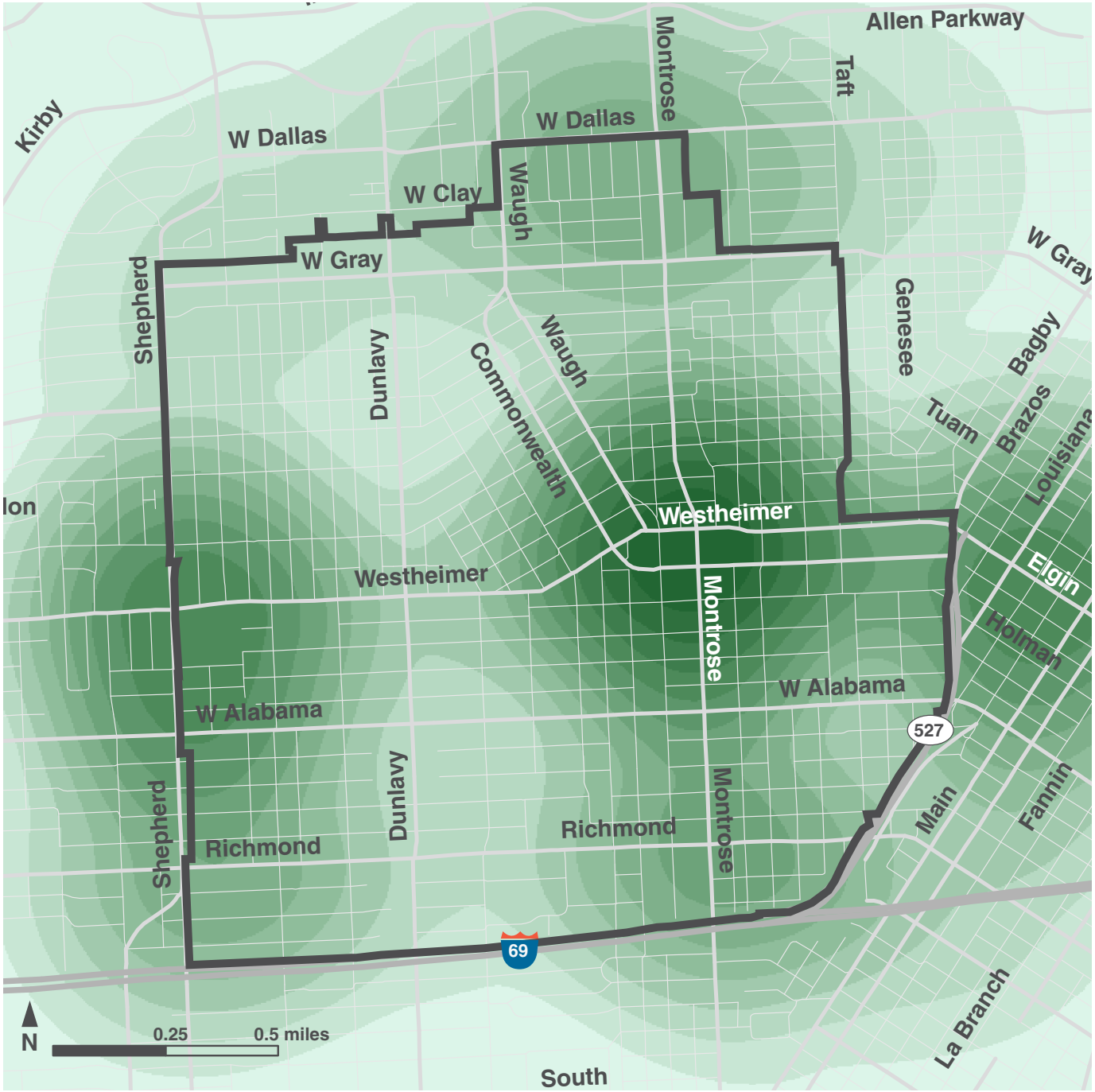



figure A.30 Transit Boarding Density for METRO Routes

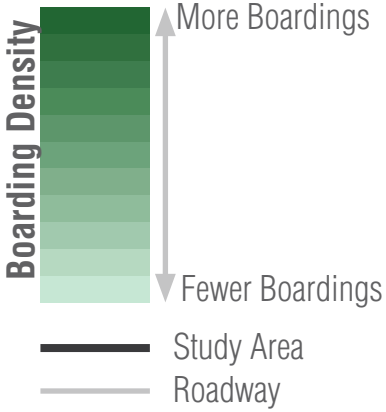
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MOBILITY NETWORKS

# TRANSIT BOARDING DENSITY

Transit stop boarding density shows a concentration of stop usage at the intersections of:

- Westheimer and Montrose
- West Dallas and Montrose
- Westheimer and Shepherd
- Montrose and Richmond
- Richmond and Shepherd




*Source: METRO*

# SAFETY

## CRASH ANALYSIS

A detailed crash analysis was conducted for all crashes within the Study Area between the years of 2014 and 2018. The crash data was collected from the TxDOT CRIS database which catalogs all georeferenced crashes within the State. Approximately 80% of all crashes are georeferenced, so the data summarized on this page is likely an underestimate of all crashes within the assessed time period.

The crash densities developed with this data are presented within **Figure A.32** and **Figure A.33**. The density of all crashes highlights high volume intersections as areas with a higher number of crashes, which is not unexpected. The map also highlights multiple unsignalized intersections along both major and minor roadways with a higher density of crashes. These intersections should be further studied to determine if mitigation measures are possible to improve safety.

The crash density for the all pedestrian and bicycle crashes indicates the high number of crashes that occur in and around the Montrose Boulevard and Westheimer Road intersection. This crash hotspot is oblong and extends along Montrose Boulevard as well as into the surrounding local streets. This area has a high number of destinations and activity of people walking and bicycling. This map also indicates that crashes involving a person walking or bicycling occur through the Study Area and are not concentrated at major intersections or along major roadways, indicating a need to assess all roadways within the study area to improve safety and comfort for all users.

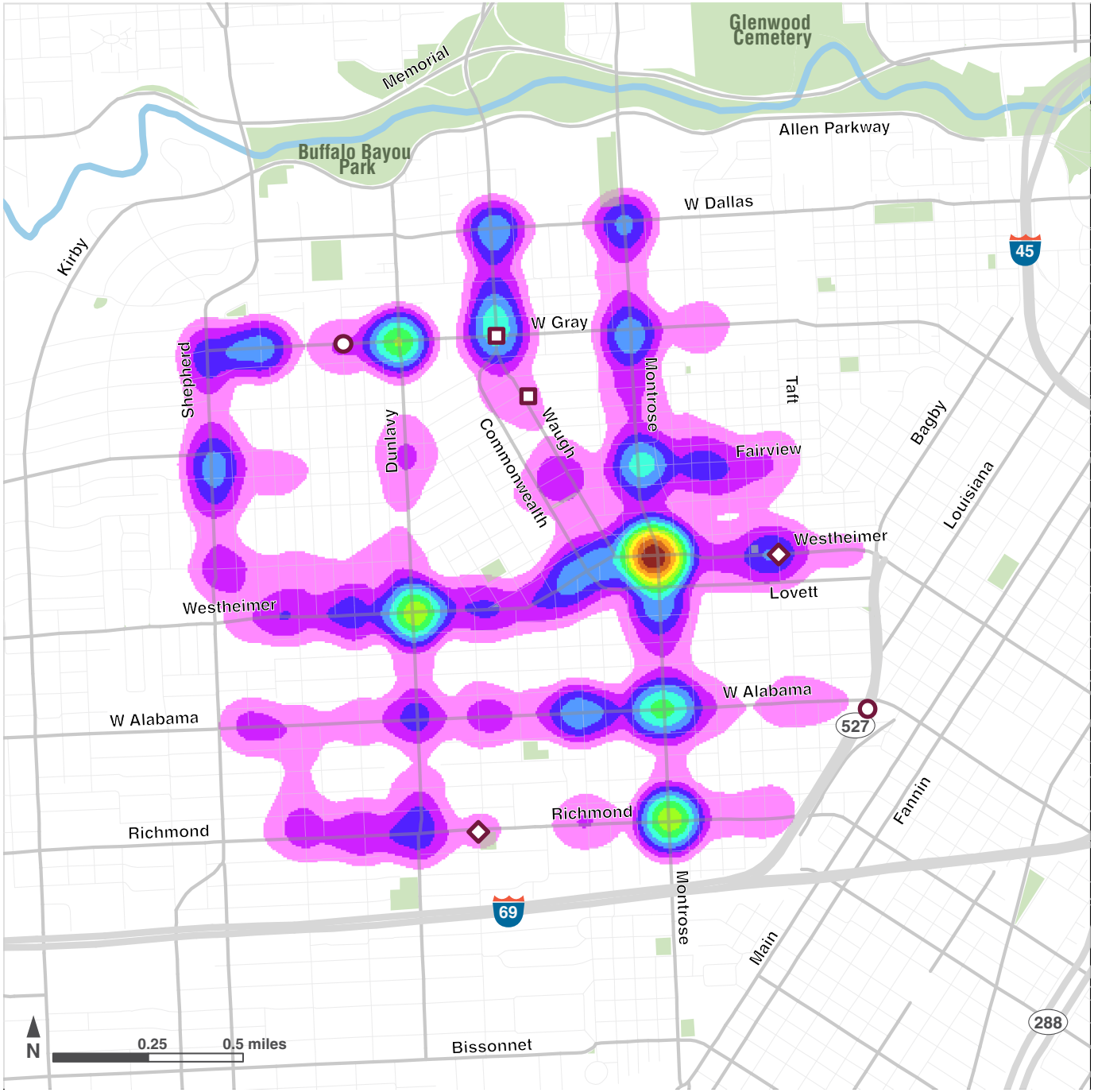
## CRASH ANALYSIS SUMMARY STATISTICS

- Between 2014 and 2018, **3664** crashes were recorded within the Study Area, not including crashes along IH-69 or Spur 527 or their frontage roads.
  - **103** persons walking were involved
  - **60** persons cycling were involved
- Between 2014 and 2018, **4** people were killed and **53** incapacitating injuries occurred.
- The maps in **Figure A.32** and **Figure A.33** also include one fatality that occurred in late 2013 and one fatality that occurred in early 2019, both people biking, as both were events that galvanized residents in a push for building safer and higher quality bicycle infrastructure.

MOBILITY SAFETY

# CRASH DENSITY

## All Crashes




Vehicle Fatality
Bicycle Fatality
Pedestrian Fatality

Crash Density
More Crashes
Less Crashes

Roadway
School
Park

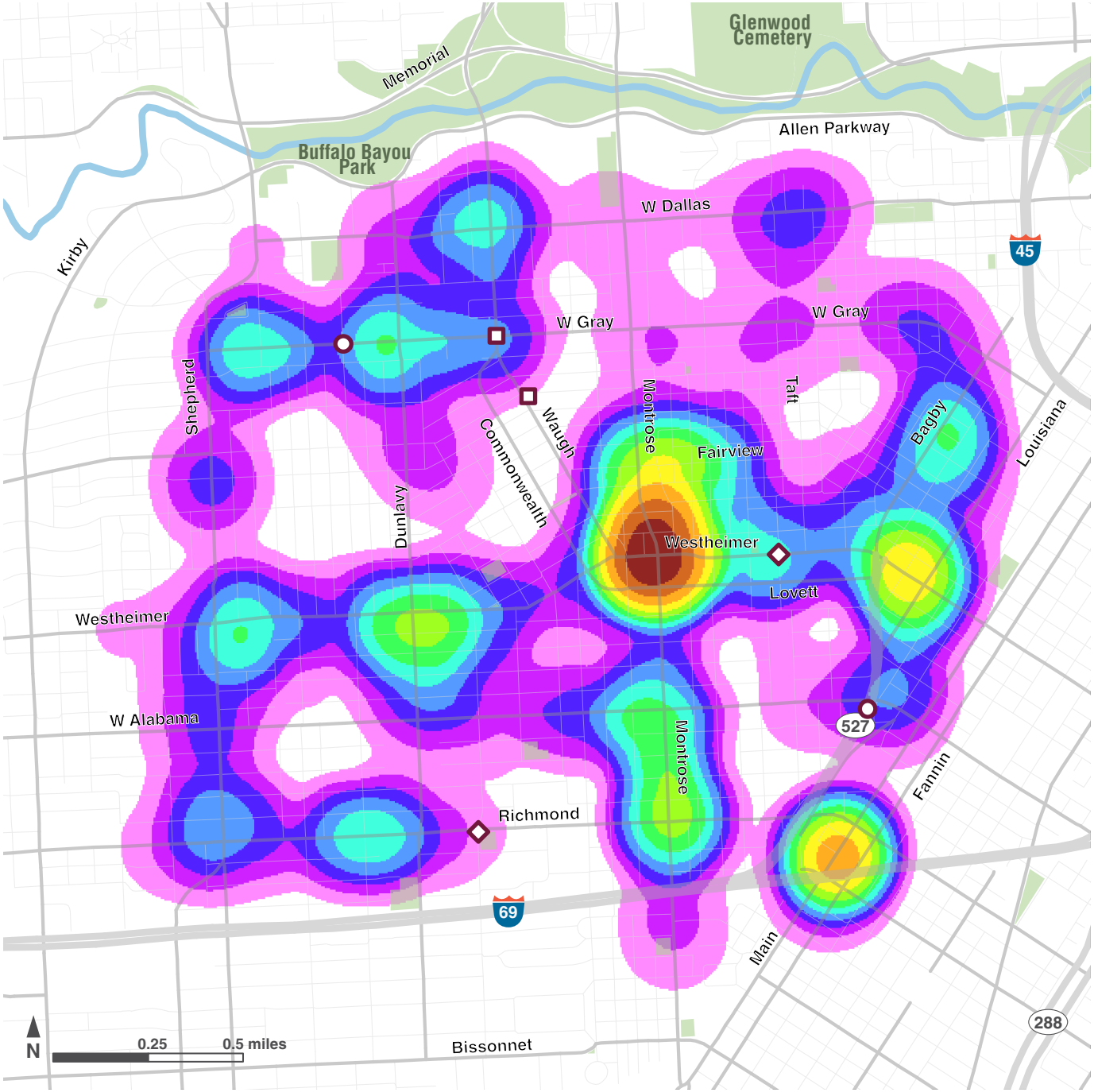
*Source: TxDOT CRIS, 2014-2018*

figure A.32 Crash Density for all Roadway Crashes

Appendix A: Factbook
page 164

# CRASH DENSITY

## Crashes Involving People Walking & Bicycling




Vehicle Fatality
Bicycle Fatality
Pedestrian Fatality

Crash Density
More Crashes
Less Crashes

Roadway
School
Park

figure A.33 Crash Density for Crashes Involving People Walking and Bicycling

*Source: TxDOT CRIS, 2014-2018*

# STUDY AREA ROAD LOG

| Road | Extent | MTFP Classification (numbers in feet) | ROW (feet) | Travel Lanes | Posted Speed Limit (miles/hour) | Roadway Width (feet) | Average Daily Vehicle Trips | Transit Route | Pavement Quality (PCI Average) | Land Use | Street Parking | Drainage Type | Surface Type |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Avondale | Crocker to Bagby | n/a | 70 | 2 | 30 | 40 | | N | 72.2 | residential | Y | curb/gutter | asphalt |
| Clay | McDuffie to Taft | MN-2-60; sufficient width | 60 | 2 | 30 | 30 | | N | 71.9 | mixed-use | Y | curb/gutter | asphalt |
| Colquitt | Yupon to Montrose | n/a | 60 | 2 | 30 | 27 | | N | 91.5 | residential | Y | curb/gutter | asphalt |
| Commonwealth | Gray to Yoakum | MJ-2-80; sufficient width | 80 | 3 car 1 bike | 30 | 44 N of Welch, 36 S of Welch | 2,301 | N | 65.9 | residential | Y | curb/gutter | asphalt |
| Dunlavy | Allen Parkway to Westheimer | MJ-2-60; sufficient width | 70 | 4 Westheimer-Clay; 3 car 2 bike Clay-Dallas; 4 Dallas- Allen Pkwy | 30 | 40 | 9,573 | N | 59.5 | mixed-use | Y | curb/gutter | concrete |
| Dunlavy | Westheimer to Richmond | MJ-2-60; sufficient width | 60 | 2, 3 by HEB; 4 Hawthorne-Clay; 3 car 1 bike N of Clay | 30 | 45 Westheimer -Hawthorne; 35 S of Hawthorne | 9,573 | N | 69.8 | mixed-use | Y | curb/gutter | concrete |
| Dunlavy | Richmond to IH69 | MJ-4-60; to be widened | 60 | 2 | 30 | 35 | 4,093 | N | 92.5 | residential | Y | curb/gutter | concrete |
| Fairview | Shepherd to Taft | MN-2-60; sufficient width | 50 | 2 | 30 | Varies; 25-30; wider at major intersections | 4,721 | N | 48.3 | mixed-use | Y | varies | asphalt |
| Grant | Welch to Welch | n/a | 60 | 2 | 30 | 34 | | N | 64 | commercial | Y | curb/gutter | asphalt |
| Graustark | Westheimer to Richmond | MN-2-60; sufficient width | 60 | 2 | 30 | 30 | | N | 47.4 | residential | Y | curb/gutter | asphalt |
| Graustark | Richmond to IH69 | MN-2-60; to be widened | 60 | 2 | 30 | 26 | | N | 85.5 | mixed-use | Y | curb/gutter | asphalt |
| Harold | Shepherd to McDuffie | n/a | 45 | 2 | 30 | 24 | | N | 67.4 | commercial | N | curb/gutter | asphalt |
| Harold | McDuffie to Hazard | n/a | 60 | 2 | 30 | 26 | | N | 48.4 | residential | Y | curb/gutter | asphalt |
| Hawthorne | Woodhead to Spur 527 | n/a | 60 | 2 | 30 | 30 | 3,205 | N | 44.7 | residential | Y | curb/gutter | asphalt |
| Hazard | Vermont to IH69 | MN-2-60; sufficient width | 50 | 2 | 30 | 30 | 2,177 | N | 63 | residential | Y | curb/gutter | asphalt |
| Hazard | Peden to Vermont | MN-2-60; sufficient width | 50 | 2 | 30 | 24 | | N | 49.4 | residential | Y | curb/gutter | asphalt |
| Lovett | Graustark to Taft | n/a | 110 | 2, 28' median | 30 | 70 | 2,224 | N | 49.4 | mixed-use | Y | curb/gutter | asphalt |
| Mandell | Fairview to Westheimer | n/a | 60 | 2 | 30 | 25 | | N | 54.7 | residential | N | curb/gutter | asphalt |

table A.2 Road Log of Major Streets in the Study Area, page 1 *Source: City of Houston, Team Analysis*

# STUDY AREA ROAD LOG

| Road | Extent | MTFP Classification (numbers in feet) | ROW (feet) | Travel Lanes | Posted Speed Limit (miles/hour) | Roadway Width (feet) | Average Daily Vehicle Trips | Transit Route | Pavement Quality (PCI Average) | Land Use | Street Parking | Drainage Type | Surface Type |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mandell | Westheimer to IH69 | MN-2-60; sufficient width | 50-70 | 2 | 30 | 35 S of Richmond; 40 N of Richmond; 24 N of Westheimer | | N | 73.5 | residential | Y | curb/gutter | concrete |
| McDuffie | Harold to Harold | n/a | 50 | 2 | 30 | 26 | | N | 54 | residential | Y | curb/gutter | asphalt |
| Montrose | Allen Parkway to Dallas | T-4-80; sufficient width | 80 | 4 | 35 | 52 | 23,927 | Y | 92.18 | mixed-use | N | curb/gutter | asphalt |
| Montrose | Dallas to Westheimer | T-4-100; sufficient width | 100 | 4, 30' median | 35 | 78 | 26,217 | Y | 80.2 | mixed-use | N | curb/gutter | asphalt |
| Montrose | Westheimer to Alabama | T-4-100; sufficient width | 100 | 4 | 35 | 56 | 28,029 | Y | 86.3 | mixed-use | N | curb/gutter | asphalt |
| Montrose | Alabama to IH69 | T-4-90; sufficient width | 90 | 4/5 Westheimer to IH69 | 30 | 56 | 26,217 | Y | 84.6 | mixed-use | Y/N | curb/gutter | asphalt |
| Mulberry | Westheimer to West Alabama | n/a | 50 | 2 | 30 | 24 | | N | 14 | residential | Y | curb/gutter | asphalt |
| Pacific | Taft to Taft | n/a | 30 | 2 | 30 | 30 | | N | 33 | residential | Y | curb/gutter | asphalt |
| Peden | Waugh to Taft | n/a | 60 | 2 | 30 | 30 | | N | 73.2 | mixed-use | Y | curb/gutter | asphalt |
| Richmond | Shepherd to Spur 527 | TCS-4-100; to be widened | 80 | 4 | 35 | 60 | 16,862 | Y | 74.9 | mixed-use | Y | curb/gutter | concrete |
| Shepherd | Allen Parkway to Richmond | T-4-70; to be widened | 70-80 | 4 | 30 | 42 | 23,150 | Y | 87.7 | commercial | N | curb/gutter | concrete |
| Stanford | Allen Parkway to Gray | MN-2-60; sufficient width | 60 | 2 | 30 | 30 | 1,905 | N | 77.6 | mixed-use | Y | curb/gutter | asphalt |
| Stanford | Gray to Westheimer | MN-2-60; to be widened | 50-60 | 2 | 30 | 30 | | N | 54.7 | residential | Y | varies | asphalt |
| Stanford | Westheimer to Richmond | MN-2-60; sufficient width | 60 | 2 | 30 | 30 | 1,905 | N | 73.7 | residential | Y | curb/gutter | asphalt |
| Stanford | Richmond to IH69 | n/a | 60 | 2 | 30 | 30 | | N | 86 | residential | Y | curb/gutter | asphalt |
| Taft | Allen Parkway to Gray | MJ-2-80; sufficient width | 90 | 2 | 30 | 40 | | N | 74.5 | mixed-use | Y | curb/gutter | asphalt |
| Taft | Gray to Pacific | MN-2-60; sufficient width | 60 | 2 | 30 | 25-30 | | N | 64.8 | mixed-use | N | open ditch | asphalt |

table A.2 Road Log of Major Streets in the Study Area, page 2 *Source: City of Houston, Team Analysis*

# STUDY AREA ROAD LOG

| Road | Extent | MTFP Classification (numbers in feet) | ROW (feet) | Travel Lanes | Posted Speed Limit (miles/hour) | Roadway Width (feet) | Average Daily Vehicle Trips | Transit Route | Pavement Quality (PCI Average) | Land Use | Street Parking | Drainage Type | Surface Type |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Taft | Pacific to Hawthorne | MN-2-60; sufficient width | 60 | 2 | 30 | 35 | 2,871 | N | 83.8 | mixed-use | Y | curb/gutter | asphalt |
| Van Buren | W Gray to Missouri | n/a | 50 | 2 | 30 | | | N | 46.2 | residential | N | open ditch | asphalt |
| Vermont | Shepherd to Dunlavy | MN-2-60; sufficient width | 60 | 2 | 30 | 20-25 | | N | 21.7 | residential | Y | gutter, ditch | asphalt |
| Vermont | Dunlavy to Waugh | n/a | 50 | 2 | 30 | 20 | 1,448 | N | 70.3 | residential | Y | open ditch | asphalt |
| Waugh | Allen Parkway to Nevada | T-5-100; sufficient width | 100 | 6 | 30 | 60 | 25,372 | Y | 87.9 | mixed-use | N | curb/gutter | asphalt |
| Waugh | Nevada to Westheimer | MJ-2-50; sufficient width | 60 | 2, 1 bike lane Westheimer to Nevada; 4, 1 bike lane Nevada to Gray | 30 | 30-35 | 10,879 | N | 78.9 | mixed-use | N | curb/gutter | asphalt |
| West Alabama | Shepherd to Spur 527 | MJ-2-70; to be widened | 60 | 3 | 30 | 35 | 15,895 | N | 66.6 | mixed-use | N | curb/gutter | asphalt |
| West Gray | Shepherd to Taft | T-4-70; sufficient width | 75 | 4 | 30 | 45 | 13,903 | Y | 61.8 | mixed-use | N | curb/gutter | concrete |
| West Main | Shepherd to Yupon | n/a | 60 | 2 | 30 | 30 | 723 | N | 74.5 | residential | Y | curb/gutter | asphalt |
| West Main | Yoakum to Montrose | n/a | 65 | 2 | 30 | 30 | | N | 88 | mixed-use | Y | curb/gutter | asphalt |
| West Main | Montrose to Spur 527 | n/a | 60 | 2 | 30 | 25 | | N | 74 | residential | Y | curb/gutter | asphalt |
| Westheimer | Shepherd to Bagby | T-4-70; to be widened | 60-70 | 4 | 30 | 35 | 20,357 | Y | 57 | mixed-use | Y/N | curb/gutter | asphalt |
| Willard | Waugh to Grant | n/a | 40 | 2 | 30 | 25 | | N | 80.8 | residential | Y | curb/gutter | asphalt |
| Woodhead | W Clay to IH69 | MN-2-60; sufficient width | 60-70 | 2 | 30 | 30 S of Westheimer; 35 N of Westheimer | 4,174 | N | 55.4 | residential | Y | curb/gutter | asphalt |
| Woodrow | Montrose to Stanford | n/a | 40 | 2 | 30 | 20 | | N | 39.3 | residential | Y | curb/gutter | asphalt |
| Yoakum | Westheimer to IH69 | MN-2-90; sufficient width | 90 | 2, 12' median | 30 | 52 | | N | 51.4 | residential | Y | curb/gutter | asphalt |
| Yupon | West Alabama to Colquitt | n/a | 60 | 2 | 30 | 24 | | N | 51.2 | residential | Y | curb/gutter | asphalt |



table A.2 Road Log of Major Streets in the Study Area, page 3 *Source: City of Houston, Team Analysis*

# appendix b

# COST ESTIMATES








# PROJECT COST ESTIMATES

Project cost estimates are split into two groups: projects on the Priority Bikeway Network and other Short-Term Projects. These costs are estimated construction costs with an additional 30% contingency. They do not include design, construction management, or public engagement. An overview of project costs can be found in the tables below.

Detailed estimates for bikeways on the TIRZ's Priority Bikeway Network are shown in tables on pages 133 to 140. Detailed estimates for all other Short-Term projects are shown in tables on pages 141 to 144. The Priority Bikeway estimates are more detailed due to TIRZ planning for potential early partnerships. Estimates for both projects use the same unit price assumptions where pertinent.

| Priority Bikeway Projects (pages 133-140) | Cost | Rounded* |
|---|---|---|
| **Waugh and Commonwealth Re-Design** | **$2,588,748** | **$2,589,000** |
| Waugh (West Dallas to West Gray) | $537,436 | $538,000 |
| Waugh (West Gray to Westheimer) | $773,868 | $774,000 |
| Commonwealth (Waugh to Yoakum) | $681,858 | $682,000 |
| Yoakum (Lovett to Alabama) | $523,466 | $524,000 |
| Yoakum (Westheimer to Lovett) | $72,120 | $73,000 |
| **Hawthorne Neighborhood Safe Street** | **$1,787,675** | **$1,788,000** |
| Hawthorne (Woodhead to Yoakum) | $938,333 | $939,000 |
| Hawthorne (Yoakum to Roseland) | $215,022 | $216,000 |
| Hawthorne (Roseland to Burlington) | $634,320 | $635,000 |
| **Woodhead Neighborhood Safe Street** | **$2,506,924** | **$2,507,000** |
| West Clay (Woodhead to Dunlavy) | $304,904 | $305,000 |
| Woodhead (West Clay to IH69) | $2,202,020 | $2,203,000 |
| **West Dallas Bikeway** | **$394,698** | **$395,000** |
| **Stanford Neighborhood Safe Street** | **$1,801,045** | **$1,802,000** |
| Stanford (West Dallas to West Gray) | $308,768 | $309,000 |
| Stanford (West Gray to Woodhead) | $1,492,277 | $1,493,000 |
| **Welch Neighborhood Safe Street** | **$2,133,673** | **$2,134,000** |
| **Mandell Bikeway** | **$1,185,134** | **$1,186,000** |
| **Total** | **$12,397,897** | **$12,398,000** |

table B.1 Priority Bikeway Project Costs *Source: Team Analysis 2020*

| Short-Term Projects (pp 141-144) | Cost | Rounded* |
|---|---|---|
| **Safe School Access** | **$5,973,601** | **$5,974,000** |
| Wharton Dual Language Academy | $1,333,704 | $1,334,000 |
| Lanier Middle School | $1,963,676 | $1,964,000 |
| Wilson Montessori School | $2,070,733 | $2,071,000 |
| Carnegie Vanguard High School | $605,488 | $606,000 |
| **Safe Transit Access** | **$20,231,546** | **$20,232,000** |
| Westheimer Road (82 Westheimer) | $4,702,460 | $4,703,000 |
| Richmond Avenue (25 Richmond) | $3,079,831 | $3,080,000 |
| Montrose Boulevard (56 Airline Montrose) | $5,260,606 | $5,261,000 |
| West Gray Street (32 Rewick/San Felipe) | $3,214,987 | $3,215,000 |
| West Dallas Street (40 Telep./Heights and 41 Kirby/Polk) | $1,044,508 | $1,045,000 |
| Shepherd Drive (27 Shepherd) | $2,929,155 | 2,930,000 |
| **Walkable Street Retrofits** | **$1,950,544** | **$1,951,000** |
| Dunlavy Street | $1,062,198 | $1,063,000 |
| Woodhead (West Clay to IH69) | $888,345 | $889,000 |
| **Total** | **$28,155,691** | **$28,156,000** |

table B.2 Short-Term Project Costs *Source: Team Analysis 2020*

**Final project costs are rounded up to the nearest $1,000 in both Priority Bikeway Projects and Short-Term Projects Tables*

# PRIORITY BIKEWAY NETWORK COST ESTIMATES

| | | | **Waugh Drive** (West Dallas to West Gray) 1,500 linear feet | | | **Waugh Drive** (West Gray to Westheimer) 0.68 miles | | |
|---|---|---|---|---|---|---|---|---|
| **Item** | **Unit** | **Unit Price** | **Unit** | **Cost** | **Notes** | **Unit** | **Cost** | **Notes** |
| Mobilization | LS | | 1 | $37,582.89 | | 1 | $50,000.00 | |
| Traffic Control | LS | | 1 | $40,000.00 | | 1 | $20,000.00 | |
| Asphalt Mill & Overlay (2-inches) | SY | $8.00 | 11,356 | $90,844.44 | 1500 LF (1,180 L 60' W. 320' L - 70' W) | 11,922 | $95,377.78 | |
| Excavation | CY | $25.00 | 100 | $2,500.00 | | | $0.00 | |
| Manhole Covers[1] | EA | $500.00 | 20 | $10,000.00 | Assumed | 30 | $15,000.00 | |
| Adjust water meter valve | EA | $200.00 | 10 | $2,000.00 | Assumed | 5 | $1,000.00 | |
| Remove & Replace Existing Curb | LF | $15.00 | 600 | $9,000.00 | 20% Assumed | 400 | $6,000.00 | |
| Curb Ramps[2] | EA | $2,000.00 | 16 | $32,000.00 | 16 ramps | 32 | $64,000.00 | |
| Remove Existing Sidewalk[3] | SY | $5.00 | 1,783 | $8,916.67 | 90% of driveways and sidewalks | 3,321 | $16,603.33 | |
| Sidewalk 4-1/2-inch thick | SF | $8.00 | 13,500 | $108,000.00 | 5' sidewalks | 20,763 | $166,104.00 | |
| Speed Hump Replacement[4] | EA | $2,000.00 | | $0.00 | | | $0.00 | |
| Irrigation System | LS | $10,000.00 | 1 | $4,000.00 | | 1 | $10,000.00 | |
| Grading | SF | $10.00 | 178 | $1,777.78 | | 360 | $3,600.00 | |
| Retaining Wall | LS | $10,000.00 | 1 | $3,000.00 | | 1 | $10,000.00 | |
| Relocate Sign | EA | $310.00 | 14 | $4,340.00 | | 10 | $3,100.00 | |
| Concrete Removal/Replacement[5] | SY | $130.00 | | | | 14 | $1,769.44 | |
| Concrete Driveway[6] | SF | $9.00 | 4,050 | $36,450.00 | 30 driveways (15'x10') | 3,873 | $34,857.00 | |
| Bike Lane Protection Device | EA | $100.00 | | | | 381 | $38,083.33 | |
| Striping | LS | | 1 | $5,000.00 | | | $0.00 | |
| REFL PAV MRK TY I (W) (6") (SLD) | LF | $1.75 | | $0.00 | | 9,448 | $16,533.13 | |
| REFL PAV MRK TY I (W) (4") (BRK) | LF | $0.50 | | $0.00 | | 3,555 | $1,777.50 | |
| REFL PAV MRK TY I (W) (12") (SLD) | LF | $2.00 | | $0.00 | | 760 | $1,520.00 | |
| REFL PAV MRK TY I (W) (24") (SLD) | LF | $7.00 | | $0.00 | | 226 | $1,582.00 | |
| Thermoplastic Pav. Markings Solid[7] | LF | $0.50 | | $0.00 | | | $0.00 | |
| Thermoplastic Pav. Markings Break[8] | LF | $0.50 | | $0.00 | | | $0.00 | |
| REFL PAV MRK TY I (W) (ARROW) | EA | $250.00 | | $0.00 | | 1 | $250.00 | |
| REFL PAV MRK TY B (W) (SYMBOL) | EA | $300.00 | | $0.00 | | 74 | $22,200.00 | |
| Bike Arrow Markings[9] | EA | $200.00 | | $0.00 | | 74 | $14,800.00 | |
| Solid Green Thermoplastic Block[10] | SF | $2.50 | | $0.00 | | 450 | $1,125.00 | |
| SW3P | LS | | 1 | $8,000.00 | | | | |
| Landscaping Removal with trees | | | 1 | $10,000.00 | | | | |
| (Subtotal) **Total with 30% Contingency** | | | ($413,411.78) **$537,436.00** | | | ($595,282.51) **$773,868.00** | | |

**1** - Adjust Manhole Frame & Cover/valve boxes to Match Prop Elevations And Grades; **2** - Construct ADA Complaint Wheelchair Ramp, Including ADA Truncated Domes (complete in place); **3** - Remove & Dispose Conc Sidewalk, driveway and Ramp, all thickness; **4** - Remove & Replace Asphalt Speed Bump; **5** - Remove And Replace Concrete Pavement; **6** - 7 Inch High Early Strength Concrete Driveway, Including Excavation And Base; **7** - THERMOPLASTIC PAVEMENT MARKINGS (Y) 4" (SLD); **8** - THERMOPLASTIC PAVEMENT MARKINGS (Y) 4" (BRK); **9** - REFL PAV MRK TY C (W) (BIKE ARROW); **10** - SOLID GREEN THERMOPLASTIC BLOCK

table B.3 Priority Bikeway Project Cost Details, page 3 *Source: Team Analysis 2020*

# PRIORITY BIKEWAY NETWORK COST ESTIMATES

| Item | Unit | Unit Price | **Commonwealth Street** (Waugh to Yoakum) 0.80 miles | | | **Hawthorne Street** (Woodhead to Yoakum) 0.72 miles | | |
|---|---|---|---|---|---|---|---|---|
| | | | Unit | Cost | Notes | Unit | Cost | Notes |
| Mobilization | LS | | 1 | $50,000.00 | | 1 | $65,617.60 | |
| Traffic Control | LS | | 1 | $20,000.00 | | 1 | $25,000.00 | |
| Asphalt Mill & Overlay (2-inches) | SY | $8.00 | 9,333 | $74,666.67 | | 13,172 | $105,376.00 | (0.72 M Length) x (30' W) + intersections |
| Excavation | CY | $25.00 | | $0.00 | | 231 | $5,762.96 | |
| Manhole Covers[1] | EA | $500.00 | 25 | $12,500.00 | | 10 | $5,000.00 | Assumed |
| Adjust water meter valve | EA | $200.00 | 10 | $2,000.00 | | 20 | $4,000.00 | Assumed |
| Remove & Replace Existing Curb | LF | $15.00 | 80 | $1,200.00 | | 1,520 | $22,800.00 | 20% Assumed |
| Curb Ramps[2] | EA | $2,000.00 | 20 | $40,000.00 | | 26 | $52,000.00 | 26 assumed |
| Remove Existing Sidewalk[3] | SY | $5.00 | 2,687 | $13,433.89 | | 4,366 | $21,831.11 | All sidewalks removed; 4' of concrete |
| Sidewalk 4-1/2-inch thick | SF | $8.00 | 14,288 | $114,304.00 | | 31,120 | $248,960.00 | 5' sidewalks |
| Speed Hump Replacement[4] | EA | $2,000.00 | | $0.00 | | | | |
| Irrigation System | LS | $10,000.00 | 1 | $10,000.00 | | 1 | $10,000.00 | |
| Grading | SF | $10.00 | 36 | $360.00 | | 289 | $2,888.89 | |
| Retaining Wall | LS | $10,000.00 | 1 | $10,000.00 | | 1 | $10,000.00 | |
| Relocate Sign | EA | $310.00 | 5 | $1,550.00 | | 16 | $4,960.00 | |
| Concrete Removal/Replacement[5] | SY | $130.00 | | $0.00 | | | $0.00 | |
| Concrete Driveway[6] | SF | $9.00 | 6,596 | $59,364.00 | | 14,400 | $129,600.00 | 120 driveways (12'x10') |
| Bike Lane Protection Device | EA | $100.00 | 538 | $53,800.00 | | | $0.00 | |
| Striping | LS | | | $0.00 | | 1 | $1,000.00 | |
| REFL PAV MRK TY I (W) (6") (SLD) | LF | $1.75 | 14,460 | $25,305.00 | | | $0.00 | |
| REFL PAV MRK TY I (W) (4") (BRK) | LF | $0.50 | 2,920 | $1,460.00 | | | $0.00 | |
| REFL PAV MRK TY I (W) (12") (SLD) | LF | $2.00 | 558 | $1,116.00 | | 396 | $792.00 | |
| REFL PAV MRK TY I (W) (24") (SLD) | LF | $7.00 | 147 | $1,029.00 | | 315 | $2,205.00 | |
| Thermoplastic Pav. Markings Solid[7] | LF | $0.50 | | $0.00 | | | | |
| Thermoplastic Pav. Markings Break[8] | LF | $0.50 | | $0.00 | | | | |
| REFL PAV MRK TY I (W) (ARROW) | EA | $250.00 | 2 | $500.00 | | | $0.00 | |
| REFL PAV MRK TY B (W) (SYMBOL) | EA | $300.00 | 61 | $18,250.00 | | | $0.00 | |
| Bike Arrow Markings[9] | EA | $200.00 | 61 | $12,166.67 | | | $0.00 | |
| Solid Green Thermoplastic Block[10] | SF | $2.50 | 600 | $1,500.00 | | | $0.00 | |
| SW3P | LS | | | | | 1 | $4,000.00 | |
| Landscaping Removal with trees | | | | | | | | |
| (Subtotal) **Total with 30% Contingency** | | | ($524,505.22) **$681,858.00** | | | ($721,793.56) **$938,333.00** | | |

**1** - Adjust Manhole Frame & Cover/valve boxes to Match Prop Elevations And Grades; **2** - Construct ADA Complaint Wheelchair Ramp, Including ADA Truncated Domes (complete in place); **3** - Remove & Dispose Conc Sidewalk, driveway and Ramp, all thickness; **4** - Remove & Replace Asphalt Speed Bump; **5** - Remove And Replace Concrete Pavement; **6** - 7 Inch High Early Strength Concrete Driveway, Including Excavation And Base; **7** - THERMOPLASTIC PAVEMENT MARKINGS (Y) 4" (SLD); **8** - THERMOPLASTIC PAVEMENT MARKINGS (Y) 4" (BRK); **9** - REFL PAV MRK TY C (W) (BIKE ARROW); **10** - SOLID GREEN THERMOPLASTIC BLOCK

Appendix B: Cost Estimates
page 172

table B.3 Priority Bikeway Project Cost Details, page 2 *Source: Team Analysis 2020*

# PRIORITY BIKEWAY NETWORK COST ESTIMATES

| Item | Unit | Unit Price | **Hawthorne Street** (Yoakum to Roseland) 0.16 miles Unit | Cost | Notes | **Hawthorne Street** (Roseland to Burlington) 0.47 miles Unit | Cost | Notes |
|---|---|---|---|---|---|---|---|---|
| Mobilization | LS | | 1 | $15,036.36 | | 1 | $44,357.98 | |
| Traffic Control | LS | | 1 | $7,000.00 | | 1 | $20,000.00 | |
| Asphalt Mill & Overlay (2-inches) | SY | $8.00 | 1,500 | $12,000.00 | (0.08 M Length) x (30' W) | 8,500 | $68,000.00 | (0.47 M Length) x (30' W) |
| Excavation | CY | $25.00 | 51 | $1,280.56 | | 150 | $3,762.04 | |
| Manhole Covers[1] | EA | $500.00 | 10 | $5,000.00 | Assumed | 15 | $7,500.00 | Assumed |
| Adjust water meter valve | EA | $200.00 | 10 | $2,000.00 | Assumed | 15 | $3,000.00 | Assumed |
| Remove & Replace Existing Curb | LF | $15.00 | 350 | $5,250.00 | 20% Assumed | 1,000 | $15,000.00 | 20% Assumed |
| Curb Ramps[2] | EA | $2,000.00 | 6 | $12,000.00 | | 20 | $40,000.00 | |
| Remove Existing Sidewalk[3] | SY | $5.00 | 881 | $4,406.67 | All sidewalks removed; 4' of concrete | 2,739 | $13,695.56 | All sidewalks removed; 4' of concrete |
| Sidewalk 4-1/2-inch thick | SF | $8.00 | 5,532 | $44,256.00 | 5' sidewalks | 20,315 | $162,520.00 | 5' sidewalks |
| Speed Hump Replacement[4] | EA | $2,000.00 | | | | | | |
| Irrigation System | LS | $10,000.00 | 1 | $5,000.00 | | 1 | $10,000.00 | |
| Grading | SF | $10.00 | 67 | $666.67 | | 222 | $2,222.22 | |
| Retaining Wall | LS | $10,000.00 | 1 | $5,000.00 | | 1 | $10,000.00 | |
| Relocate Sign | EA | $310.00 | 4 | $1,240.00 | | 10 | $3,100.00 | |
| Concrete Removal/Replacement[5] | SY | $130.00 | | | | | $0.00 | |
| Concrete Driveway[6] | SF | $9.00 | 2,400 | $21,600.00 | 20 driveways (12'x10') | 8,400 | $75,600.00 | 70 driveways (12'x10') |
| Bike Lane Protection Device | EA | $100.00 | 118 | $11,800.00 | | | $0.00 | |
| Striping | LS | | 1 | $6,000.00 | | 1 | $4,000.00 | |
| REFL PAV MRK TY I (W) (6") (SLD) | LF | $1.75 | 705 | $1,233.75 | | | $0.00 | |
| REFL PAV MRK TY I (W) (4") (BRK) | LF | $0.50 | | $0.00 | | | $0.00 | |
| REFL PAV MRK TY I (W) (12") (SLD) | LF | $2.00 | 140 | $280.00 | | 50 | $100.00 | |
| REFL PAV MRK TY I (W) (24") (SLD) | LF | $7.00 | 75 | $525.00 | | 135 | $945.00 | |
| Thermoplastic Pav. Markings Solid[7] | LF | $0.50 | | $0.00 | | 270 | $135.00 | |
| Thermoplastic Pav. Markings Break[8] | LF | $0.50 | | | | | | |
| REFL PAV MRK TY I (W) (ARROW) | EA | $250.00 | | $0.00 | | | $0.00 | |
| REFL PAV MRK TY B (W) (SYMBOL) | EA | $300.00 | 2 | $600.00 | | | $0.00 | |
| Bike Arrow Markings[9] | EA | $200.00 | 2 | $400.00 | | | $0.00 | |
| Solid Green Thermoplastic Block[10] | SF | $2.50 | 330 | $825.00 | Assumed bike lane 6FT width | | $0.00 | |
| SW3P | LS | | 1 | $2,000.00 | | 1 | $4,000.00 | |
| Landscaping Removal with trees | | | | | | | | |
| (Subtotal) **Total with 30% Contingency** | | | ($165,400.00) **$215,022.00** | | | ($487,937.80) **$634,320.00** | | |

**1** - Adjust Manhole Frame & Cover/valve boxes to Match Prop Elevations And Grades; **2** - Construct ADA Complaint Wheelchair Ramp, Including ADA Truncated Domes (complete in place); **3** - Remove & Dispose Conc Sidewalk, driveway and Ramp, all thickness; **4** - Remove & Replace Asphalt Speed Bump; **5** - Remove And Replace Concrete Pavement; **6** - 7 Inch High Early Strength Concrete Driveway, Including Excavation And Base; **7** - THERMOPLASTIC PAVEMENT MARKINGS (Y) 4" (SLD); **8** - THERMOPLASTIC PAVEMENT MARKINGS (Y) 4" (BRK); **9** - REFL PAV MRK TY C (W) (BIKE ARROW); **10** - SOLID GREEN THERMOPLASTIC BLOCK

table B.3 Priority Bikeway Project Cost Details, page 3 *Source: Team Analysis 2020*

# PRIORITY BIKEWAY NETWORK COST ESTIMATES

| Item | Unit | Unit Price | **West Clay Street** (Woodhead to Dunlavy) 0.15 miles Unit | Cost | Notes | **Woodhead Street** (West Clay Street to IH69) 1.64 miles Unit | Cost | Notes |
|---|---|---|---|---|---|---|---|---|
| Mobilization | LS | | 1 | $21,321.91 | | 1 | $153,987.31 | |
| Traffic Control | LS | | 1 | $10,000.00 | | 1 | $70,000.00 | |
| Asphalt Mill & Overlay (2-inches) | SY | $8.00 | 2,700 | $21,600.00 | (0.15 M Length) x (30' W) | 32,181 | $257,450.67 | (1.64 M Length) (0.85 M x 30' N of Westheimer,0.79 x 35' S of Westheimer) |
| Excavation | CY | $25.00 | 30 | $740.74 | | 513 | $12,828.44 | |
| Manhole Covers[1] | EA | $500.00 | 6 | $3,000.00 | Assumed | 50 | $25,000.00 | Assumed |
| Adjust water meter valve | EA | $200.00 | 6 | $1,200.00 | Assumed | 20 | $4,000.00 | Assumed |
| Remove & Replace Existing Curb | LF | $15.00 | 320 | $4,800.00 | 20% Assumed | 3,464 | $51,955.20 | 20% Assumed |
| Curb Ramps[2] | EA | $2,000.00 | 4 | $8,000.00 | | 72 | $144,000.00 | 90 ramps; 80% assumed to be replaced |
| Remove Existing Sidewalk[3] | SY | $5.00 | 1,298 | $6,488.89 | All sidewalks removed; 4' of concrete | 10,630 | $53,152.00 | 80% sidewalks removed; 4' of concrete |
| Sidewalk 4-1/2-inch thick | SF | $8.00 | 8,000 | $64,000.00 | 5' sidewalks | 69,274 | $554,188.80 | 5' sidewalks (assumed 80% replaced) |
| Speed Hump Replacement[4] | EA | $2,000.00 | | | | 9 | $18,000.00 | |
| Irrigation System | LS | $10,000.00 | 1 | $3,000.00 | | 1 | $15,000.00 | |
| Grading | SF | $10.00 | 44 | $444.44 | | 800 | $8,000.00 | |
| Retaining Wall | LS | $10,000.00 | 1 | $2,000.00 | | 1 | $10,000.00 | |
| Relocate Sign | EA | $310.00 | 4 | $1,240.00 | | 30 | $9,300.00 | |
| Concrete Removal/Replacement[5] | SY | $130.00 | | $0.00 | | | $0.00 | |
| Concrete Driveway[6] | SF | $9.00 | 8,400 | $75,600.00 | 70 driveways (12'x10') | 26,400 | $237,600.00 | 220 driveways (15'x10') |
| Bike Lane Protection Device | EA | $100.00 | | $0.00 | | | $0.00 | |
| Striping | LS | | 1 | $1,000.00 | | 1 | $40,000.00 | |
| REFL PAV MRK TY I (W) (6") (SLD) | LF | $1.75 | | $0.00 | | 290 | $507.50 | |
| REFL PAV MRK TY I (W) (4") (BRK) | LF | $0.50 | | $0.00 | | | $0.00 | |
| REFL PAV MRK TY I (W) (12") (SLD) | LF | $2.00 | | $0.00 | | 914 | $1,828.00 | |
| REFL PAV MRK TY I (W) (24") (SLD) | LF | $7.00 | 15 | $105.00 | | 835 | $5,845.00 | |
| Thermoplastic Pav. Markings Solid[7] | LF | $0.50 | | $0.00 | | 4,770 | $2,385.00 | |
| Thermoplastic Pav. Markings Break[8] | LF | $0.50 | | | | 5,665 | $2,832.50 | |
| REFL PAV MRK TY I (W) (ARROW) | EA | $250.00 | | $0.00 | | | $0.00 | |
| REFL PAV MRK TY B (W) (SYMBOL) | EA | $300.00 | | $0.00 | | 2 | $600.00 | |
| Bike Arrow Markings[9] | EA | $200.00 | | $0.00 | | 2 | $400.00 | |
| Solid Green Thermoplastic Block[10] | SF | $2.50 | | $0.00 | | | $0.00 | |
| SW3P | LS | | 1 | $4,000.00 | | 1 | $5,000.00 | |
| Landscaping Removal with trees | | | 1 | $6,000.00 | | 1 | $10,000.00 | |
| (Subtotal) **Total with 30% Contingency** | | | ($234,540.98) **$304,904.00** | | | ($1,693,860.42) **$2,202,020.00** | | |

**1** - Adjust Manhole Frame & Cover/valve boxes to Match Prop Elevations And Grades; **2** - Construct ADA Complaint Wheelchair Ramp, Including ADA Truncated Domes (complete in place); **3** - Remove & Dispose Conc Sidewalk, driveway and Ramp, all thickness; **4** - Remove & Replace Asphalt Speed Bump; **5** - Remove And Replace Concrete Pavement; **6** - 7 Inch High Early Strength Concrete Driveway, Including Excavation And Base; **7** - THERMOPLASTIC PAVEMENT MARKINGS (Y) 4" (SLD); **8** - THERMOPLASTIC PAVEMENT MARKINGS (Y) 4" (BRK); **9** - REFL PAV MRK TY C (W) (BIKE ARROW); **10** - SOLID GREEN THERMOPLASTIC BLOCK

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table B.3 Priority Bikeway Project Cost Details, page 4 *Source: Team Analysis 2020*

# PRIORITY BIKEWAY NETWORK COST ESTIMATES

| Item | Unit | Unit Price | **West Dallas Street** (Waugh to Columbus) 0.42 miles Unit | Cost | Notes | **Stanford Street (north of Study Area)** (West Dallas to West Gray) 0.26 miles Unit | Cost | Notes |
|---|---|---|---|---|---|---|---|---|
| Mobilization | LS | | 1 | $27,601.18 | | 1 | $21,592.10 | |
| Traffic Control | LS | | 1 | $10,000.00 | | 1 | $10,000.00 | |
| Asphalt Mill & Overlay (2-inches) | SY | $8.00 | | $0.00 | Pavement in good condition | | $0.00 | Pavement in fair condition |
| Excavation | CY | $25.00 | 131 | $3,285.33 | | 50 | $1,242.59 | |
| Manhole Covers[1] | EA | $500.00 | 40 | $20,000.00 | | 10 | $5,000.00 | |
| Adjust water meter valve | EA | $200.00 | 20 | $4,000.00 | Assumed | 10 | $2,000.00 | Assumed |
| Remove & Replace Existing Curb | LF | $15.00 | 444 | $6,652.80 | 10% Assumed | 275 | $4,118.40 | 10% Assumed |
| Curb Ramps[2] | EA | $2,000.00 | 8 | $16,000.00 | 9 ramps;80% assumed to be replaced | 16 | $32,000.00 | 16 ramps assumed to be replaced |
| Remove Existing Sidewalk[3] | SY | $5.00 | 2,105 | $10,522.67 | 80% sidewalks removed; 4' of concrete | 1,346 | $6,732.22 | 90% sidewalks removed; 4' of concrete |
| Sidewalk 4-1/2-inch thick | SF | $8.00 | 17,741 | $141,926.40 | 5' sidewalks (assumed 80% replaced) | 6,710 | $53,680.00 | 5' sidewalks (assumed 90% replaced) |
| Speed Hump Replacement[4] | EA | $2,000.00 | 9 | $0.00 | | | $0.00 | |
| Irrigation System | LS | $10,000.00 | 1 | $5,000.00 | | 1 | $2,000.00 | |
| Grading | SF | $10.00 | 89 | $888.89 | | 178 | $1,777.78 | |
| Retaining Wall | LS | $10,000.00 | 1 | $6,000.00 | | 1 | $3,000.00 | |
| Relocate Sign | EA | $310.00 | 10 | $3,100.00 | | 6 | $1,860.00 | |
| Concrete Removal/Replacement[5] | SY | $130.00 | | $0.00 | | | $0.00 | |
| Concrete Driveway[6] | SF | $9.00 | 1,200 | $10,800.00 | 8 driveways (15'x10') | 7,500 | $67,500.00 | 8 driveways (15'x10') |
| Bike Lane Protection Device | EA | $100.00 | | $0.00 | | | $0.00 | |
| Striping | LS | | 1 | $15,000.00 | | 1 | $15,000.00 | |
| REFL PAV MRK TY I (W) (6") (SLD) | LF | $1.75 | 2,065 | $3,613.75 | | | $0.00 | |
| REFL PAV MRK TY I (W) (4") (BRK) | LF | $0.50 | 3,980 | $1,990.00 | | | $0.00 | |
| REFL PAV MRK TY I (W) (12") (SLD) | LF | $2.00 | 285 | $570.00 | | 120 | $240.00 | |
| REFL PAV MRK TY I (W) (24") (SLD) | LF | $7.00 | 66 | $462.00 | | 110 | $770.00 | |
| Thermoplastic Pav. Markings Solid[7] | LF | $0.50 | 3,980 | $1,990.00 | | | $0.00 | |
| Thermoplastic Pav. Markings Break[8] | LF | $0.50 | | $0.00 | | | $0.00 | |
| REFL PAV MRK TY I (W) (ARROW) | EA | $250.00 | | $0.00 | | | $0.00 | |
| REFL PAV MRK TY B (W) (SYMBOL) | EA | $300.00 | 9 | $2,700.00 | | | $0.00 | |
| Bike Arrow Markings[9] | EA | $200.00 | 8 | $1,600.00 | | | $0.00 | |
| Solid Green Thermoplastic Block[10] | SF | $2.50 | 364 | $910.00 | Assumed bike lane 4FT width | | $0.00 | |
| SW3P | LS | | 1 | $4,000.00 | | 1 | $4,000.00 | |
| Landscaping Removal with trees | | | 1 | $5,000.00 | | 1 | $5,000.00 | |
| (Subtotal) **Total with 30% Contingency** | | | ($303,613.02) **$394,698.00** | | | ($237,513.09) **$308,768.00** | | |

**1** - Adjust Manhole Frame & Cover/valve boxes to Match Prop Elevations And Grades; **2** - Construct ADA Complaint Wheelchair Ramp, Including ADA Truncated Domes (complete in place); **3** - Remove & Dispose Conc Sidewalk, driveway and Ramp, all thickness; **4** - Remove & Replace Asphalt Speed Bump; **5** - Remove And Replace Concrete Pavement; **6** - 7 Inch High Early Strength Concrete Driveway, Including Excavation And Base; **7** - THERMOPLASTIC PAVEMENT MARKINGS (Y) 4" (SLD); **8** - THERMOPLASTIC PAVEMENT MARKINGS (Y) 4" (BRK); **9** - REFL PAV MRK TY C (W) (BIKE ARROW); **10** - SOLID GREEN THERMOPLASTIC BLOCK

table B.3 Priority Bikeway Project Cost Details, page 5 *Source: Team Analysis 2020*

# PRIORITY BIKEWAY NETWORK COST ESTIMATES

| | | | **Stanford Street** (West Gray to Woodrow) 1.45 miles | | | **Welch Street** (Shepherd to Taft) 1.55 miles | | |
|---|---|---|---|---|---|---|---|---|
| **Item** | **Unit** | **Unit Price** | **Unit** | **Cost** | **Notes** | **Unit** | **Cost** | **Notes** |
| Mobilization | LS | | 1 | $104,354.96 | | 1 | $149,207.87 | |
| Traffic Control | LS | | 1 | $40,000.00 | | 1 | $50,000.00 | |
| Asphalt Mill & Overlay (2-inches) | SY | $8.00 | 21,300 | $170,400.00 | Richmond to Alabama;1,570 LF concrete | 23,733 | $189,866.67 | Richmond to Alabama;1,570 LF concrete |
| Excavation | CY | $25.00 | 277 | $6,925.93 | | 546 | $13,640.00 | |
| Manhole Covers[1] | EA | $500.00 | 40 | $20,000.00 | Assumed | 60 | $30,000.00 | Assumed |
| Adjust water meter valve | EA | $200.00 | 30 | $6,000.00 | Assumed | 30 | $6,000.00 | Assumed |
| Remove & Replace Existing Curb | LF | $15.00 | 1,531 | $22,968.00 | 10% Assumed | 1,637 | $24,552.00 | 10% Assumed |
| Curb Ramps[2] | EA | $2,000.00 | 76 | $152,000.00 | 76 ramps assumed to be replaced | 85 | $169,200.00 | 94 ramps; 90% assumed replaced |
| Remove Existing Sidewalk[3] | SY | $5.00 | 5,874 | $29,372.22 | 90% sidewalks removed; 4' of concrete | 10,297 | $51,486.00 | 90% sidewalks removed |
| Sidewalk 4-1/2-inch thick | SF | $8.00 | 37,400 | $299,200.00 | 5' sidewalks | 73,656 | $589,248.00 | 5' sidewalks (90% assumed replaced) |
| Speed Hump Replacement[4] | EA | $2,000.00 | 2 | $4,000.00 | | 2 | $4,000.00 | |
| Irrigation System | LS | $10,000.00 | 1 | $10,000.00 | | 1 | $10,000.00 | |
| Grading | SF | $10.00 | 844 | $8,444.44 | | 940 | $9,400.00 | |
| Retaining Wall | LS | $10,000.00 | 1 | $10,000.00 | | 1 | $10,000.00 | |
| Relocate Sign | EA | $310.00 | 20 | $6,200.00 | | 20 | $6,200.00 | |
| Concrete Removal/Replacement[5] | SY | $130.00 | | $0.00 | | | $0.00 | |
| Concrete Driveway[6] | SF | $9.00 | 25,500 | $229,500.00 | 170 driveways (15'x10') | 33,750 | $303,750.00 | 250 driveways; 15'x10'; 90% assumed |
| Bike Lane Protection Device | EA | $100.00 | | $0.00 | | | $0.00 | |
| Striping | LS | | 1 | $5,000.00 | | 1 | $5,000.00 | |
| REFL PAV MRK TY I (W) (6") (SLD) | LF | $1.75 | | $0.00 | | | $0.00 | |
| REFL PAV MRK TY I (W) (4") (BRK) | LF | $0.50 | | $0.00 | | | $0.00 | |
| REFL PAV MRK TY I (W) (12") (SLD) | LF | $2.00 | 547 | $1,094.00 | | 240 | $480.00 | |
| REFL PAV MRK TY I (W) (24") (SLD) | LF | $7.00 | 635 | $4,445.00 | | 168 | $1,176.00 | |
| Thermoplastic Pav. Markings Solid[7] | LF | $0.50 | | $0.00 | | 160 | $80.00 | |
| Thermoplastic Pav. Markings Break[8] | LF | $0.50 | | $0.00 | | | $0.00 | |
| REFL PAV MRK TY I (W) (ARROW) | EA | $250.00 | | $0.00 | | | $0.00 | |
| REFL PAV MRK TY B (W) (SYMBOL) | EA | $300.00 | | $0.00 | | | $0.00 | |
| Bike Arrow Markings[9] | EA | $200.00 | | $0.00 | | | $0.00 | |
| Solid Green Thermoplastic Block[10] | SF | $2.50 | | $0.00 | | | $0.00 | |
| SW3P | LS | | 1 | $8,000.00 | | 1 | $8,000.00 | |
| Landscaping Removal with trees | | | 1 | $10,000.00 | | 1 | $10,000.00 | |
| (Subtotal) **Total with 30% Contingency** | | | ($1,147,904.55) **$1,492,277.00** | | | ($1,641,286.53) **$2,133,673.00** | | |

**1** - Adjust Manhole Frame & Cover/valve boxes to Match Prop Elevations And Grades; **2** - Construct ADA Complaint Wheelchair Ramp, Including ADA Truncated Domes (complete in place); **3** - Remove & Dispose Conc Sidewalk, driveway and Ramp, all thickness; **4** - Remove & Replace Asphalt Speed Bump; **5** - Remove And Replace Concrete Pavement; **6** - 7 Inch High Early Strength Concrete Driveway, Including Excavation And Base; **7** - THERMOPLASTIC PAVEMENT MARKINGS (Y) 4" (SLD); **8** - THERMOPLASTIC PAVEMENT MARKINGS (Y) 4" (BRK); **9** - REFL PAV MRK TY C (W) (BIKE ARROW); **10** - SOLID GREEN THERMOPLASTIC BLOCK

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table B.3 Priority Bikeway Project Cost Details, page 6 *Source: Team Analysis 2020*

# PRIORITY BIKEWAY NETWORK COST ESTIMATES

| | | | **Mandell Street** (Westheimer to IH69) 0.78 miles | | | **Yoakum Boulevard** (Lovett to Alabama) 0.33 miles | | |
|---|---|---|---|---|---|---|---|---|
| **Item** | **Unit** | **Unit Price** | **Unit** | **Cost** | **Notes** | **Unit** | **Cost** | **Notes** |
| Mobilization | LS | | 1 | $82,876.41 | | 1 | $36,605.92 | |
| Traffic Control | LS | | 1 | $50,000.00 | | 1 | $40,000.00 | |
| Asphalt Mill & Overlay (2-inches) | SY | $8.00 | 12,040 | $96,320.00 | 36' N of Richmond; concrete Colquitt to IH69 | 6,808 | $54,464.00 | 20' in each way (total 40') |
| Excavation | CY | $25.00 | 275 | $6,864.00 | | 116 | $2,904.00 | |
| Manhole Covers[1] | EA | $500.00 | 40 | $20,000.00 | Assumed | 30 | $15,000.00 | Assumed |
| Adjust water meter valve | EA | $200.00 | 20 | $4,000.00 | Assumed | 20 | $4,000.00 | Assumed |
| Remove & Replace Existing Curb | LF | $15.00 | 824 | $12,355.20 | 10% Assumed | 697 | $10,454.40 | 20% Assumed |
| Curb Ramps[2] | EA | $2,000.00 | 47 | $93,600.00 | 52 ramps; 90%assumed replaced | 18 | $36,000.00 | 18 ramps assumed to be replaced |
| Remove Existing Sidewalk[3] | SY | $5.00 | 5,170 | $25,848.60 | 90% sidewalks removed | 1,999 | $9,994.00 | 90% sidewalks removed |
| Sidewalk 4-1/2-inch thick | SF | $8.00 | 37,066 | $296,524.80 | 5' sidewalks (90% assumed replaced) | 15,682 | $125,452.80 | 5' sidewalks (90% assumed replaced) |
| Speed Hump Replacement[4] | EA | $2,000.00 | 2 | $4,000.00 | | | $0.00 | |
| Irrigation System | LS | $10,000.00 | 1 | $8,000.00 | | 1 | $4,000.00 | |
| Grading | SF | $10.00 | 520 | $5,200.00 | | 200 | $2,000.00 | |
| Retaining Wall | LS | $10,000.00 | 1 | $6,000.00 | | 1 | $3,000.00 | |
| Relocate Sign | EA | $310.00 | 15 | $4,650.00 | | 14 | $4,340.00 | |
| Concrete Removal/Replacement[5] | SY | $130.00 | | $0.00 | | | $0.00 | |
| Concrete Driveway[6] | SF | $9.00 | 16,875 | $151,875.00 | 125 driveways; 15'x10'; 90%assumed | 4,050 | $36,450.00 | 30 driveways (15'x10') |
| Bike Lane Protection Device | EA | $100.00 | | $0.00 | | | $0.00 | |
| Striping | LS | | 1 | $5,000.00 | | 1 | $5,000.00 | |
| REFL PAV MRK TY I (W) (6") (SLD) | LF | $1.75 | 3,650 | $6,387.50 | | | $0.00 | |
| REFL PAV MRK TY I (W) (4") (BRK) | LF | $0.50 | | $0.00 | | | $0.00 | |
| REFL PAV MRK TY I (W) (12") (SLD) | LF | $2.00 | 443 | $886.00 | | | $0.00 | |
| REFL PAV MRK TY I (W) (24") (SLD) | LF | $7.00 | 126 | $882.00 | | | $0.00 | |
| Thermoplastic Pav. Markings Solid[7] | LF | $0.50 | 1,312 | $656.00 | | | $0.00 | |
| Thermoplastic Pav. Markings Break[8] | LF | $0.50 | 3,215 | $1,607.50 | | | $0.00 | |
| REFL PAV MRK TY I (W) (ARROW) | EA | $250.00 | 19 | $4,750.00 | | | $0.00 | |
| REFL PAV MRK TY B (W) (SYMBOL) | EA | $300.00 | 16 | $4,800.00 | | | $0.00 | |
| Bike Arrow Markings[9] | EA | $200.00 | | $0.00 | | | $0.00 | |
| Solid Green Thermoplastic Block[10] | SF | $2.50 | 1,023 | $2,557.50 | Assumed bike lane 5FT width | | $0.00 | |
| SW3P | LS | | 1 | $6,000.00 | | 1 | $3,000.00 | |
| Landscaping Removal with trees | | | 1 | $10,000.00 | | 1 | $10,000.00 | |
| (Subtotal) **Total with 30% Contingency** | | | ($911,640.51) **$1,185,134.00** | | | ($402,665.12) **$523,466.00** | | |

**1** - Adjust Manhole Frame & Cover/valve boxes to Match Prop Elevations And Grades; **2** - Construct ADA Complaint Wheelchair Ramp, Including ADA Truncated Domes (complete in place); **3** - Remove & Dispose Conc Sidewalk, driveway and Ramp, all thickness; **4** - Remove & Replace Asphalt Speed Bump; **5** - Remove And Replace Concrete Pavement; **6** - 7 Inch High Early Strength Concrete Driveway, Including Excavation And Base; **7** - THERMOPLASTIC PAVEMENT MARKINGS (Y) 4" (SLD); **8** - THERMOPLASTIC PAVEMENT MARKINGS (Y) 4" (BRK); **9** - REFL PAV MRK TY C (W) (BIKE ARROW); **10** - SOLID GREEN THERMOPLASTIC BLOCK

table B.3 Priority Bikeway Project Cost Details, page 7 *Source: Team Analysis 2020*

# PRIORITY BIKEWAY NETWORK COST ESTIMATES

**Yoakum Boulevard**
(Westheimer to Lovett)
445 linear feet

| Item | Unit | Unit Price | Unit | Cost | Notes |
|---|---|---|---|---|---|
| Mobilization | LS | | 1 | $15,000.00 | |
| Traffic Control | LS | | 1 | $5,000.00 | |
| Asphalt Mill & Overlay (2-inches) | SY | $8.00 | 2,738 | $21,906.67 | |
| Excavation | CY | $25.00 | | $0.00 | |
| Manhole Covers[1] | EA | $500.00 | 5 | $2,500.00 | |
| Adjust water meter valve | EA | $200.00 | | $0.00 | |
| Remove & Replace Existing Curb | LF | $15.00 | 150 | $2,250.00 | |
| Curb Ramps[2] | EA | $2,000.00 | | $0.00 | |
| Remove Existing Sidewalk[3] | SY | $5.00 | | $0.00 | |
| Sidewalk 4-1/2-inch thick | SF | $8.00 | | $0.00 | |
| Speed Hump Replacement[4] | EA | $2,000.00 | | $0.00 | |
| Irrigation System | LS | $10,000.00 | | $0.00 | |
| Grading | SF | $10.00 | | $0.00 | |
| Retaining Wall | LS | $10,000.00 | | $0.00 | |
| Relocate Sign | EA | $310.00 | | $0.00 | |
| Concrete Removal/Replacement[5] | SY | $130.00 | | $0.00 | |
| Concrete Driveway[6] | SF | $9.00 | | $0.00 | |
| Bike Lane Protection Device | EA | $100.00 | | $0.00 | |
| Striping | LS | | | $0.00 | |
| REFL PAV MRK TY I (W) (6") (SLD) | LF | $1.75 | 2,160 | $3,780.00 | |
| REFL PAV MRK TY I (W) (4") (BRK) | LF | $0.50 | 360 | $180.00 | |
| REFL PAV MRK TY I (W) (12") (SLD) | LF | $2.00 | 110 | $220.00 | |
| REFL PAV MRK TY I (W) (24") (SLD) | LF | $7.00 | 31 | $217.00 | |
| Thermoplastic Pav. Markings Solid[7] | LF | $0.50 | 720 | $360.00 | |
| Thermoplastic Pav. Markings Break[8] | LF | $0.50 | | $0.00 | |
| REFL PAV MRK TY I (W) (ARROW) | EA | $250.00 | | $0.00 | |
| REFL PAV MRK TY B (W) (SYMBOL) | EA | $300.00 | 8 | $2,250.00 | |
| Bike Arrow Markings[9] | EA | $200.00 | 8 | $1,500.00 | |
| Solid Green Thermoplastic Block[10] | SF | $2.50 | 125 | $312.50 | |
| SW3P | LS | | | $0.00 | |
| Landscaping Removal with trees | | | | $0.00 | |
| (Subtotal) **Total with 30% Contingency** | | | | ($55,476.17) **$72,120.00** | |

**1** - Adjust Manhole Frame & Cover/valve boxes to Match Prop Elevations And Grades; **2** - Construct ADA Complaint Wheelchair Ramp, Including ADA Truncated Domes (complete in place); **3** - Remove & Dispose Conc Sidewalk, driveway and Ramp, all thickness; **4** - Remove & Replace Asphalt Speed Bump; **5** - Remove And Replace Concrete Pavement; **6** - 7 Inch High Early Strength Concrete Driveway, Including Excavation And Base; **7** - THERMOPLASTIC PAVEMENT MARKINGS (Y) 4" (SLD); **8** - THERMOPLASTIC PAVEMENT MARKINGS (Y) 4" (BRK); **9** - REFL PAV MRK TY C (W) (BIKE ARROW); **10** - SOLID GREEN THERMOPLASTIC BLOCK

table B.3 Priority Bikeway Project Cost Details, page 8 *Source: Team Analysis 2020*

# SHORT-TERM PROJECT COST ESTIMATES

## Safe School Access

| | | | **Wharton Dual Language Academy**<br>Safe Sidewalks<br>Assuming 5' sidewalks | | **Lanier Middle School**<br>Safe Sidewalks<br>Assuming 5' sidewalks | | **Wilson Montessori School**<br>Safe Sidewalks<br>Assuming 5' sidewalks | |
|---|---|---|---|---|---|---|---|---|
| **Item** | **Unit** | **Unit Price** | **Unit** | **Cost** | **Unit** | **Cost** | **Unit** | **Cost** |
| Mobilization | 5% | | | $41,330 | | $60,261 | | $64,393 |
| Traffic Control | LS | | | $10,000 | | $20,000 | | $20,000 |
| Excavation | CY | $25.00 | 1,728.16 | $43,204 | 2,706.11 | $67,653 | 2,658.5 | $66,461 |
| Curb Ramps[1] | EA | $2,000.00 | 128 | $256,000 | 152 | $304,000 | 201 | $402,000 |
| Remove Existing Sidewalk[2] | SY | $5.00 | 8,640.8 | $43,204 | 13,530.5 | $67,653 | 13,292.3 | $66,461 |
| Sidewalk (4.5" thick) | SF | $8.00 | 75,240 | $601,920 | 116,688 | $933,504 | 114,576.0 | $916,608 |
| Driveway Replacement[3] | SF | $9.00 | 2,527.2 | $22,745 | 5,086.8 | $45,781 | 5,054.4 | $45,490 |
| Subtotal | | | | $867,922 | | $1,265,475 | | $1,352,262 |
| Contingency | | 30% | | $307,778 | | $453,156 | | $477,861 |
| | | **Total** | | $1,333,704 | | $1,963,676 | | $2,070,733 |

*1 - Construct ADA Complaint Wheelchair Ramp, including ADA Truncated Domes (complete in place)*

*2 - Remove & Dispose Conc Sidewalk, driveway and Ramp, all thickness*

*3 - 7 Inch High Early Strength Concrete Driveway, including Excavation And Base*

table B.4 Short-Term Project Cost Details, page 1 *Source: Team Analysis 2020*

# SHORT-TERM PROJECT COST ESTIMATES

## Safe Transit Access

| | | | **Westheimer Road**<br>Safe Transit Access<br><br>Assuming 5' sidewalks | | **Richmond Avenue**<br>Safe Transit Access<br><br>Assuming 5' sidewalks | | **Montrose Boulevard**<br>Safe Transit Access<br><br>Assuming 5' sidewalks | |
|---|---|---|---|---|---|---|---|---|
| **Item** | **Unit** | **Unit Price** | **Unit** | **Cost** | **Unit** | **Cost** | **Unit** | **Cost** |
| Mobilization | 5% | | | $148,861 | | $97,423 | | $166,270 |
| Traffic Control | LS | | | $20,000 | | $20,000 | | $20,000 |
| Excavation | CY | $25.00 | 5,377.87 | $134,447 | 3,569.67 | $89,242 | 6,079.53 | $151,988 |
| Curb Ramps[1] | EA | $2,000.00 | 606 | $1,212,000 | 383 | $766,000 | 666 | $1,332,000 |
| Remove Existing Sidewalk[2] | SY | $5.00 | 26,889.33 | $134,447 | 17,848.3 | $89,242 | 30,397.67 | $151,988 |
| Sidewalk (4.5" thick) | SF | $8.00 | 233,904 | $1,871,232 | 153,912 | $1,231,296 | 264,264 | $2,114,112 |
| Driveway Replacement[3] | SF | $9.00 | 8,100 | $72,900 | 6,723 | $60,507 | 9,315 | $83,835 |
| Subtotal | | | | $3,126,078 | | $2,045,885 | | $3,491,665 |
| Contingency | | 30% | | $1,085,183 | | $710,730 | | $1,213,986 |
| | | **Total** | | $4,702,460 | | $3,079,831 | | $5,260,606 |

*1 - Construct ADA Complaint Wheelchair Ramp, including ADA Truncated Domes (complete in place)*

*2 - Remove & Dispose Conc Sidewalk, driveway and Ramp, all thickness*

*3 - 7 Inch High Early Strength Concrete Driveway, including Excavation And Base*

table B.4 Short-Term Project Cost Details, page 2 *Source: Team Analysis 2020*

# SHORT-TERM PROJECT COST ESTIMATES

## Safe Transit Access, Continued

| | | | **West Gray Street**<br>Safe Transit Access<br><br>Assuming 5' sidewalks | | **West Dallas Street**<br>Safe Transit Access<br><br>Assuming 5' sidewalks | | **Shepherd Drive**<br>Safe Transit Access<br><br>Assuming 5' sidewalks | |
|---|---|---|---|---|---|---|---|---|
| **Item** | **Unit** | **Unit Price** | **Unit** | **Cost** | **Unit** | **Cost** | **Unit** | **Cost** |
| Mobilization | 5% | | | $101,212 | | $32,637 | | $91,455 |
| Traffic Control | LS | | | $20,000 | | $20,000 | | $20,000 |
| Excavation | CY | $25.00 | 3,826 | $95,650 | 1,286.68 | $32,167 | 3,662.2 | $91,555 |
| Curb Ramps[1] | EA | $2,000.00 | 380 | $760,000 | 108 | $216,000 | 309 | $618,000 |
| Remove Existing Sidewalk[2] | SY | $5.00 | 19,130 | $95,650 | 6,433.4 | $32,167 | 18,311 | $91,555 |
| Sidewalk (4.5" thick) | SF | $8.00 | 165,528 | $1,324,224 | 56,232 | $449,856 | 158,400 | $1,267,200 |
| Driveway Replacement[3] | SF | $9.00 | 6,642 | $59,778 | 1,668.6 | $15,017 | 6,399 | $57,591 |
| Subtotal | | | | $2,125,458 | | $685,381 | | $1,920,556 |
| Contingency | | 30% | | $741,920 | | $241,040 | | $675,959 |
| | | **Total** | | $3,214,987 | | $1,044,508 | | $2,929,155 |

*1 - Construct ADA Complaint Wheelchair Ramp, including ADA Truncated Domes (complete in place)*

*2 - Remove & Dispose Conc Sidewalk, driveway and Ramp, all thickness*

*3 - 7 Inch High Early Strength Concrete Driveway, including Excavation And Base*

table B.4 Short-Term Project Cost Details, page 3 *Source: Team Analysis 2020*

# SHORT-TERM PROJECT COST ESTIMATES

## Walkable Street Retrofits

| | | | **Dunlavy Street** (S. of Peden Street) Walkable Street Retrofit Assuming 6' sidewalks | | **West Gray Street** Walkable Street Retrofit Assuming 6' sidewalks | | **Carnegie Vanguard School** Safe Sidewalks Assuming 5' sidewalks | |
|---|---|---|---|---|---|---|---|---|
| **Item** | **Unit** | **Unit Price** | **Unit** | **Cost** | **Unit** | **Cost** | **Unit** | **Cost** |
| Mobilization | 5% | | | $33,554 | | $27,186 | | $22,179 |
| Traffic Control | LS | | | $20,000 | | $20,000 | | $20,000 |
| Excavation | CY | $25.00 | 1,538.5 | $38,463 | 1,231.5 | $30,788 | 756.16 | $18,904 |
| Curb Ramps[1] | EA | $2,000.00 | 122 | $244,000 | 62 | $124,000 | 56 | $112,000 |
| Remove Existing Sidewalk[2] | SY | $5.00 | 6,154 | $30,770 | 6,157.6 | $30,788 | 3780.8 | $18,904 |
| Sidewalk (4.5" thick) | SF | $8.00 | 53,539.2 | $428,314 | 53,539.2 | $428,314 | 32472 | $259,776 |
| Driveway Replacement[3] | SF | $9.00 | 1,846.8 | $16,621 | 1,879.2 | $16,913 | 1555.2 | $13,997 |
| Subtotal | | | | $704,643 | | $570,910 | | $465,760 |
| Contingency | | 30% | | $245,123 | | $205,003 | | $139,728 |
| | | **Total** | | $1,062,198 | | $888,345 | | $605,488 |

*1 - Construct ADA Complaint Wheelchair Ramp, including ADA Truncated Domes (complete in place)*

*2 - Remove & Dispose Conc Sidewalk, driveway and Ramp, all thickness*

*3 - 7 Inch High Early Strength Concrete Driveway, including Excavation And Base*

table B.4 Short-Term Project Cost Details, page 4 *Source: Team Analysis 2020*

# SHORT-TERM PROJECT EXTENTS

## Safe School Access

| **Wilson Montessori School**<br>Safe Sidewalks |
|---|
| Welch St *(Dunlavy St to Waugh Dr)* |
| Indiana St *(Dunlavy St to Waugh Dr)* |
| Michigan St *(Yupon St to Waugh Dr)* |
| Maryland St *(Yupon St to Waugh Dr)* |
| Fairview St *(Dunlavy St to Waugh Dr)* |
| Yupon St *(Welch St to Westheimer Rd)* |
| Windsor St *(Welch St to Westheimer Rd)* |

| **Wharton Dual Language Academy**<br>Safe Sidewalks |
|---|
| W Clay St *(Eberhard St to school driveway)* |
| W Bell St *(Eberhard St to Marconi St)* |
| W Pierce St *(Eberhard St to Marconi St)* |
| W Gray St *(Eberhard St to Taft St)* |
| Peden St *(Montrose Blvd to Stanford St)* |
| Marconi St *(W Clay St to W Gray St)* |
| Columbus St *(W Dallas St to W Gray St)* |
| Montrose Blvd *(W Gray St to Bomar St)* |
| Stanford St *(W Gray St to Peden St)* |

| **Lanier Middle School**<br>Safe Sidewalks |
|---|
| McDuffie St *(Fairview St to Westheimer Rd)* |
| Hazard St *(Fairview St to W Alabama St)* |
| Driscoll St *(Fairview St to Westheimer Rd)* |
| Morse St *(Fairview St to Westheimer Rd)* |
| Woodhead St *(Fairview St to W Alabama St)* |
| Elmen St *(Fairview St to Westheimer Rd)* |
| Missouri St *(Morse St to Elmen St)* |
| Westheimer Rd *(McDuffie St to Dunlavy St)* |
| Harold St *(Huldy St to Dunlavy St)* |

| **Carnegie Vanguard School**<br>Safe Sidewalks |
|---|
| Taft St *(W Gray St to Fairview St)* |
| Peden St *(Stanford St to Taft St)* |
| Bomar St *(Stanford St to Taft St)* |

# SHORT-TERM PROJECT EXTENTS

## Safe Transit Access

| **Westheimer Road**<br>Safe Transit Access |
|---|
| Hopkins St *(Pacific St to Avondale St)* |
| Whitney St *(Pacific St to Hawthorne St)* |
| Taft St *(Pacific St to Hawthorne St)* |
| McDuffie St *(Fairview St to Westheimer Rd)* |
| Hazard St *(Fairview St to Harold Rd)* |
| Driscoll St *(Fairview St to Westheimer Rd)* |
| Morse St *(Fairview St to Westheimer Rd)* |
| Woodhead St *(Fairview St to Westheimer Rd)* |
| Elmen St *(Fairview St to Westheimer Rd)* |
| Park St *(Fairview St to Westheimer Rd)* |
| Dunlavy St *(Fairview St to Harold Rd)* |
| Ralph St *(Fairview St to Westheimer Rd)* |
| Kuester St *(Missouri Pl to Westheimer Rd)* |
| Mandell St *(Fairview St to Harold Rd)* |
| California St *(Ridgewood St to Westheimer Rd)* |
| Ridgewood St *(Cherryhurst St to Westheimer Rd)* |
| Windsor St *(Cherryhurst St to Westheimer Rd)* |
| Yupon St *(Cherryhurst St to Hawthorne St)* |
| Mulberry St *(Westheimer St to Harold St)* |
| Graustark St *(Westheimer St to Hawthorne St)* |
| Commonwealth St *(Missouri St to Westheimer Rd)* |
| Waugh Dr *(Missouri St to Westheimer Rd)* |
| Yoakum Blvd *(Missouri St to Hawthorne St)* |
| Lincoln St *(California St to Westheimer Rd)* |
| Grant St *(Missouri St to Westheimer Rd)* |
| Roseland St *(Lovett Blvd to Hawthorne St)* |
| Hopkins St *(Pacific St to Avondale St)* |
| Whitney St *(Pacific St to Hawthorne St)* |
| Taft St *(Pacific St to Hawthorne St)* |

| **Richmond Avenue**<br>Safe Transit Access |
|---|
| McDuffie St *(Branard St to Richmond Ave)* |
| Hazard St *(Branard St to Lexington St)* |
| Driscoll St *(Branard St to Richmond Ave)* |
| Woodhead St *(Branard St to Lexington St)* |
| Dunlavy St *(W Main St to IH 69)* |
| Mandell St *(Branard St to Castle Ct)* |
| Loretto Dr *(W Main St to Richmond Ave)* |
| Yupon St *(Richmond Ave to Castle Ct)* |
| Graustark St *(Branard St to Castle Ct)* |
| Mt. Vernon St *(Colquitt St to IH 69)* |
| Yoakum Blvd *(Branard St to IH 69)* |
| Kyle St *(Richmond Ave to Woodrow St)* |
| Roseland St *(Branard St to Woodrow St)* |
| Stanford St *(W Main St to Woodrow St)* |
| Greeley St *(Branard St to Woodrow St)* |
| Jack St *(Branard St to Oakley St)* |
| Garrott St *(Branard St to Milam St)* |

| **Montrose Boulevard**<br>Safe Transit Access |
|---|
| W Clay St *(Eberhard St to school driveway)* |
| W Bell St *(Eberhard St to Marconi St)* |
| W Pierce St *(Eberhard St to Marconi St)* |
| W Gray St *(Eberhard St to Marconi St)* |
| Peden St *(Van Buren St to Montrose Blvd)* |
| Bomar St *(Van Buren St to Crocker St)* |
| Grant St *(Damon Ct to Willard St)* |
| Willard St *(Van Buren St to Crocker St)* |
| W Drew St *(Van Buren St to Crocker St)* |
| Jackson Blvd *(Waugh Dr to Crocker St)* |
| Fargo St *(Converse St to Crocker St)* |
| Fairview St *(Van Buren St to Crocker St)* |
| Hyde Park Blvd *(Waugh Dr to Crocker St)* |
| Missouri St *(Waugh Dr to Grant St)* |
| California St *(Waugh Dr to Grant St)* |
| Lovett Blvd *(Mt. Vernon St to Stanford St)* |
| Hawthorne St *(Mt. Vernon St to Roseland St)* |
| Harold St *(Mt. Vernon St to Stanford St)* |
| Kipling St *(Mt. Vernon St to Stanford St)* |
| Marshall St *(Yoakum Blvd to Stanford St)* |
| W Alabama St *(Mt. Vernon St to Stanford St)* |
| Sul Ross St *(Yoakum Blvd to Stanford St)* |
| Branard St *(Yoakum Blvd to Stanford St)* |
| W Main St *(Yoakum Blvd to Stanford St)* |
| Colquitt St *(Mt. Vernon St to Stanford St)* |
| Oakley St *(Montrose Blvd to Jack St)* |
| Woodrow St *(Montrose Blvd to Greeley St)* |

# SHORT-TERM PROJECT EXTENTS

## Safe Transit Access

| **West Gray Street**<br>Safe Transit Access |
|---|
| McDuffie St *(North of shopping center to Haddon St)* |
| Driscoll St *(W Gray St to Haddon St)* |
| Woodhead St *(W Clay St to Haddon St)* |
| Dunlavy St *(W Clay St to Haddon St)* |
| Waugh Dr *(W Clay St to Bomar St)* |
| Commonwealth St *(Waugh Dr to Nevada St)* |
| Hazel St *(Peden St to W Clay St)* |
| Eberhard St *(W Clay St to W Gray St)* |
| Van Buren St *(W Gray St to Bomar St)* |
| Marconi St *(W Clay St to W Gray St)* |
| Columbus St *(W Clay St to W Gray St)* |
| Crocker St *(Two blocks north to W Gray St)* |
| Stanford St *(Two block north to Bomar St)* |
| Taft St *(W Gray St to Bomar St)* |

| **West Dallas Street**<br>Safe Transit Access |
|---|
| Waugh Dr *(W Dallas St to W Clay St)* |
| Peveto St *(W Dallas St to W Clay St)* |
| Joe Annie St *(W Dallas St to W Clay St)* |
| La Rue St *(W Dallas St to W Clay St)* |
| Eberhard St *(W Dallas St to W Clay St)* |
| Van Buren St *(W Dallas St to W Clay St)* |
| Marconi St *(W Dallas St to W Clay St)* |
| Columbus St *(W Dallas St to W Clay St)* |

| **Shepherd Drive**<br>Safe Transit Access |
|---|
| Peden St *(Shepherd Dr to Ridgewood St)* |
| Haddon St *(Shepherd Dr to McDuffie St)* |
| Vermont St *(Shepherd Dr to McDuffie St)* |
| Welch St *(Shepherd Dr to McDuffie St)* |
| Indiana St *(Shepherd Dr to McDuffie St)* |
| Fairview St *(Shepherd Dr to McDuffie St)* |
| Harold St *(Shepherd Dr to Huldy St)* |
| Kipling St *(Shepherd Dr to Harold St)* |
| Marshall St *(Shepherd Dr to McDuffie St)* |
| W Alabama St *(Shepherd Dr to McDuffie St)* |
| Sul Ross St *(Shepherd Dr to McDuffie St)* |
| Branard St *(Shepherd Dr to McDuffie St)* |
| W Main St *(Shepherd Dr to McDuffie St)* |
| Colquitt St *(Shepherd Dr to McDuffie St)* |
| Portsmouth St *(Shepherd Dr to Hazard St)* |
| Norfolk St *(Shepherd Dr to Hazard St)* |
| Lexington St *(Shepherd Dr to Hazard St)* |

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# appendix c

# SIDEWALK PROGRAMS








# SIDEWALK PROGRAMS

The TIRZ can look to programs in other cities for ideas and inspiration on sidewalk programs. This appendix includes brief descriptions and documents associated with four programs in Richardson, Texas; San Antonio, Texas; Los Angeles, California; and Chicago, Illinois. Each program tackles a unique problem or takes a different approach to the same problem.

## CITY OF RICHARDSON, TEXAS

### SIDEWALK REHABILITATION PROGRAM

The City of Richardson, north of Dallas, runs a Sidewalk Rehabilitation Program to help residents repair sidewalks on their property thanks to a 2015 Bond Program. Richardson split the city into 27 "regions" and addresses sidewalks in the order of need. Sidewalks to be repaired must have vertical separations exceeding one inch, or surface spalling that exceeds 40% of the panel's surface. If a property owner wants to improve their sidewalk outside of the bond program, the city will waive the permit fee.

Trusted Contractor Component: The City also provides contact information for contractors familiar with the City's sidewalk construction specifications and permitting process. Residents can request a list of trusted contractors from the City, and contractors can contact the City to be added to the list.

## CITY OF SAN ANTONIO, TEXAS

### SIDEWALK REBATE PROGRAM

The City of San Antonio operates a Sidewalk Rebate Program using Community Development Block Grant (CDBG) funds. The program includes partial discounts for all residents, with heavier discounts for residents living in CDBG communities (see page 187). Applications for the program are only taken for a one-year window.

To take advantage of the program, residents follow a series of steps:

- Resident reports sidewalk issues to 3-1-1
- City staff will review the sidewalk, determine the need for repair, and develop a cost estimate
- Resident has 15 days to accept the estimate
- Upon accepting the estimate, resident has 60 days to hire a contractor to complete the repairs
- Resident completes rebate form, sends form and invoice to city
- City will inspect the sidewalk and send a check of up to $3,000 within 30 days of approval

Source: City of San Antonio




The City of San Antonio offers financial assistance through the Sidewalk Rebate Program. This program allows homeowners to apply for financial assistance in the form of partial rebates to help reduce the expense of sidewalk/curb repairs and replacements. The Sidewalk Rebate Program runs through October 1, 2018 – September 30, 2019 so you are encouraged to apply early.

## COST:

The eligible rebate that residents can receive range from 50-70% of the repair cost. The City will determine the total rebate estimate for which you are eligible according to whether or not your property is located in a federally-designated Community Development Block Grant (CDBG) geographic area. An example of the required match amounts are shown below:

**Table 1:** Financial Commitment for Sidewalk Repair detached from curb

50' Length, 4' Width = $60 per linear foot (based on City-determined Cost of Service)

| LAND USE TYPE | CITIZEN SHARE | CITY REBATE | CITIZEN SHARE | CITY REBATE | TOTAL COST |
|---|---|---|---|---|---|
| Residential (Non-CDBG) | 50% | 50% | $1,500 | $1,500 | $3,000 |
| Residential (CDBG) | 30% | 70% | $900 | $2,100 | $3,000 |

**Table 2:** Financial Commitment for Sidewalk Repair attached to curb

50' Length, 4' Width = $68 per linear foot (based on City-determined Cost of Service)

| LAND USE TYPE | CITIZEN SHARE | CITY REBATE | CITIZEN SHARE | CITY REBATE | TOTAL COST |
|---|---|---|---|---|---|
| Residential (Non-CDBG) | 50% | 50% | $1,700 | $1,700 | $3,400 |
| Residential (CDBG) | 30% | 70% | $1,020 | $2,380 | $3,400 |

## GETTING STARTED:

Measure the existing linear feet of sidewalk along your property line, then call 311 to determine the possible rebate amount pending eligibility confirmation. 311 will submit all service requests to Transportation & Capital Improvements (TCI) for investigation and a formal cost estimate.

# SIDEWALK REBATE PROGRAM!

## San Antonio Homeowners,

Sidewalks are important for ensuring safe pedestrian access on your property. So what happens when your sidewalk cracks, breaks or erodes due to wear-and-tear, bad weather or unexpected damage?

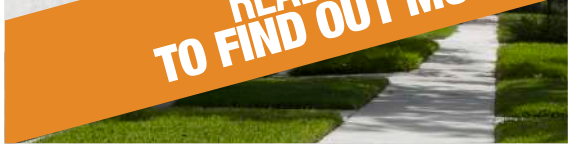
**Did you know by City law* that property owners are responsible for repairing and maintaining any sidewalks adjoining their properties?**

The City of San Antonio offers financial assistance through the **Sidewalk Rebate Program**. This program allows homeowners to apply for financial assistance in the form of partial rebates to help reduce the expense of sidewalk/curb repairs and replacements.

***29-11. Maintenance of sidewalks, parkways, curbs and driveways by abutting owners***

*(b) It shall be the duty of the owner of abutting property or any special user, upon receipt of written notification by the director of public works or any of his subordinates, of any defects or dangerous condition of any unsafe and dangerous defect in any sidewalk, curb, gutter, parkway or driveway to repair the same and put it in a safe condition, free from defect and hazard, within thirty (30) days from date of receipt of such notice.*

**READ INSIDE TO FIND OUT MORE!**



Transportation & Capital Improvements
Northwest Service Center
6939 W. Loop 1604 N
San Antonio TX, 78254

**(ADDRESS LABEL HERE)**




Source: City of San Antonio

SIDEWALK REBATE PROGRAM!

## HERE IS HOW THE REBATE PROGRAM WORKS:

**1.** Call the City's 3-1-1 Customer Service Line and ask to sign up and participate in the City's **Sidewalk Rebate Program**.

**2.** Transportation & Capital Improvements (TCI) staff will receive your request and examine your sidewalk condition. We will then provide you an assessment of required repairs along with an estimate and the amount that will be rebated. You will have 15 business days to accept or reject this estimate.

**3.** If you accept the estimate, you can then select and hire a licensed contractor of your choice to complete all necessary sidewalk repairs within 60 business days.

**4.** In order to be eligible for the rebate, when repairs are complete, submit your completed rebate forms and copy of the invoice (or receipt) from the contractor itemizing work and costs.

**5.** Once repairs have been inspected and approved, you will receive a rebate check by mail for the eligible amount of the repair cost, not to exceed $3,000. Your check will be mailed to you within 30 business days of the inspection.

## AM I ELIGIBLE FOR THE PROGRAM?

**ANY** homeowner living within the City of San Antonio city limits can request to participate in the program! However, the City determines which sidewalk repair requests are eligible for rebates based on the following criteria:

1. Location of the sidewalk and the assessed condition for repair
2. Completed request submitted by homeowner to 311
3. Initial repair costs paid by the homeowner or by the homeowner's Neighborhood Association
4. Completed rebate forms and successful inspection





The City will determine the total rebate estimate for which you are eligible according to whether or not your property is located in a federally-designated Community Development Block Grant (CDBG) geographic area.

**Find out more about CDBG's at:**

www.sanantonio.gov/TCI/Projects/Sidewalk-Rebate-Program

Any resident who participates in the program will not be expected to pay for pre-repair and post-repair sidewalk inspections or permit fees as these will be done free of charge by City staff.

## CALL 311 TO GET STARTED!

CITY OF SAN ANTONIO
TRANSPORTATION & CAPITAL IMPROVEMENTS

CONNECT WITH US!

#TCIbuildsSA | @SanAntonioTCI | www.sanantonio.gov/tci

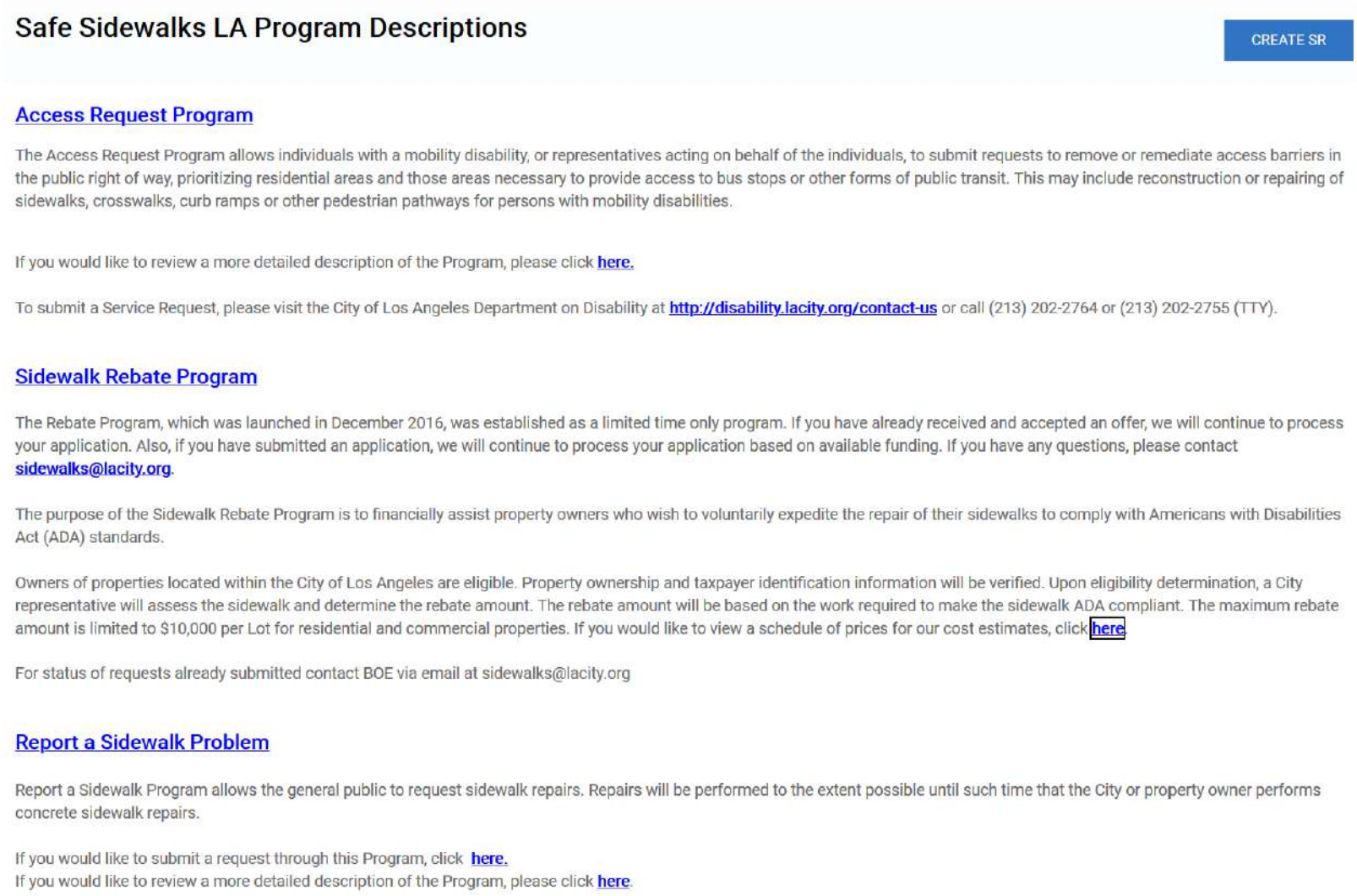
*Source: City of San Antonio*

# CITY OF LOS ANGELES, CALIFORNIA

## SAFE SIDEWALKS LA PROGRAM

In 2016, the City of Los Angeles pledged $1.4 billion to build and repair sidewalks in the City over the course of 30 years. The City offers three programs for sidewalk repair: (1) assistance for residents with disabilities, (2) sidewalk repair reporting via 3-1-1, and (3) a sidewalk rebate program for property owners wishing to repair their own sidewalks for a refund of half the cost. The rebate program will reimburse residents up to $2,000 and non-residential property owners up to $4,000.

The program operates similar to the one in the City of San Antonio, with an initial request, city review, resident construction, and then reimbursement.



**Safe Sidewalks LA Program Descriptions**

CREATE SR

**Access Request Program**

The Access Request Program allows individuals with a mobility disability, or representatives acting on behalf of the individuals, to submit requests to remove or remediate access barriers in the public right of way, prioritizing residential areas and those areas necessary to provide access to bus stops or other forms of public transit. This may include reconstruction or repairing of sidewalks, crosswalks, curb ramps or other pedestrian pathways for persons with mobility disabilities.

If you would like to review a more detailed description of the Program, please click here.

To submit a Service Request, please visit the City of Los Angeles Department on Disability at http://disability.lacity.org/contact-us or call (213) 202-2764 or (213) 202-2755 (TTY).

**Sidewalk Rebate Program**

The Rebate Program, which was launched in December 2016, was established as a limited time only program. If you have already received and accepted an offer, we will continue to process your application. Also, if you have submitted an application, we will continue to process your application based on available funding. If you have any questions, please contact sidewalks@lacity.org.

The purpose of the Sidewalk Rebate Program is to financially assist property owners who wish to voluntarily expedite the repair of their sidewalks to comply with Americans with Disabilities Act (ADA) standards.

Owners of properties located within the City of Los Angeles are eligible. Property ownership and taxpayer identification information will be verified. Upon eligibility determination, a City representative will assess the sidewalk and determine the rebate amount. The rebate amount will be based on the work required to make the sidewalk ADA compliant. The maximum rebate amount is limited to $10,000 per Lot for residential and commercial properties. If you would like to view a schedule of prices for our cost estimates, click here.

For status of requests already submitted contact BOE via email at sidewalks@lacity.org

**Report a Sidewalk Problem**

Report a Sidewalk Program allows the general public to request sidewalk repairs. Repairs will be performed to the extent possible until such time that the City or property owner performs concrete sidewalk repairs.

If you would like to submit a request through this Program, click here.
If you would like to review a more detailed description of the Program, please click here.

*Source: City of Los Angeles*

# How is my Sidewalk Rebate Calculated?

Rebate offers will be calculated based on the amount of sidewalk adjacent to the property that is in need of repair. A trained City representative will visit the eligible site to determine which elements of the sidewalk are in need of repair and the cost to bring it into compliance with City requirements. Based upon ADA criteria, the representative will determine the required scope of work and corresponding rebate offer. Transition panels may be required on neighboring lots to join new sidewalk to existing, the city will provide the full cost to install transition panels up to the rebate cap.

**The rebate offer will be approximately half of the estimated cost to repair, up to a cap of $2,000 per Lot for residential (R5 or more restrictive) properties and $4,000 per Lot for all other properties.**

The rebate amount is based on the following Rebate Price List:

| Item | Unit | Potential Rebate Unit Price |
|---|---|---|
| Sidewalk Repair and Replacement | Square Foot | $ 7.00 |
| Sidewalk Transition Panel | Square Foot | $ 14.00 |
| Driveway Repair and Replacement | Square Foot | $ 11.00 |
| Driveway Transition Panel | Square Foot | $ 22.00 |
| Curb and Gutter Remove and Replace | Lineal Foot | $ 70.00 |
| Catch Basin Concrete Cover Remove and Replace | Square Foot | $ 24.00 |
| Parkway Drain Remove and Replace | Lineal Foot | $ 40.00 |
| Utility Pullbox Remove and Replace | Each | $ 275.00 |
| Tree Root Pruning | Lineal Foot | $ 8.00 |
| Existing Tree Stump Removal | Each | $ 100.00 |
| Tree Remove and Replace | Each | $ 500.00 |

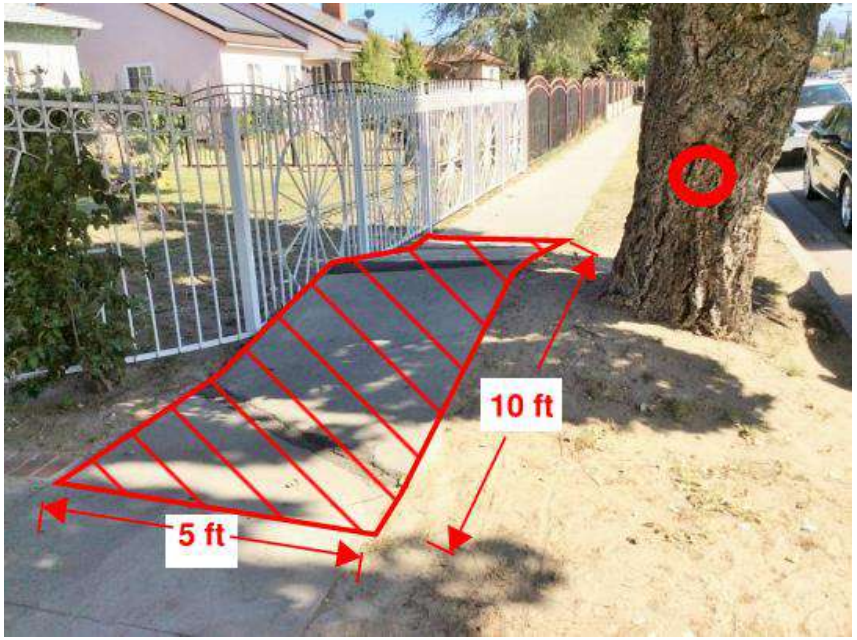
Effective: December 14, 2016

*Source: City of Los Angeles*

Example 1



**Example 1 – Existing Conditions**




**Example 1 – Field Assessment**

In this example the section of sidewalk shown in the red cross-hatched area, measuring 5ft x 10ft, does not meet City requirements and is in need of repair. A City Arborist has also determined that a tree removal is required at this location. The estimate to perform the construction necessary to bring the sidewalk into compliance with City requirements is calculated as follows:

Sidewalk = 5ft x 10ft = 50ft² of sidewalk in need of replacement

| Item | Unit | Potential Rebate Unit Price | Quantity | Potential Rebate Subtotal |
|---|---|---|---|---|
| Sidewalk Remove and Replace | Square Foot | $ 7.00 | 50 | $ 350.00 |
| Tree Remove and Replace | Each | $ 500.00 | 1 | $ 500.00 |
| | | | Total = | **$ 850.00** |

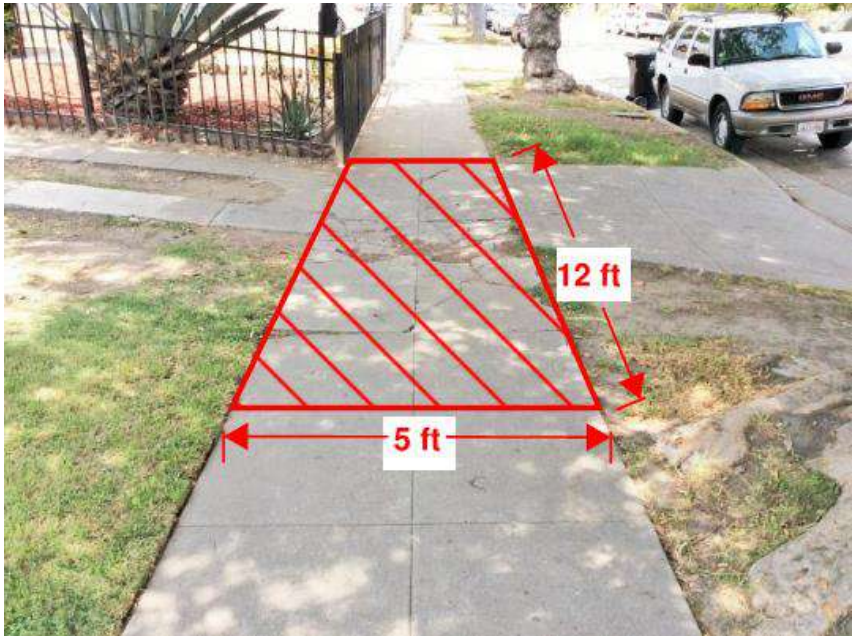
**$850.00 Total Rebate Offer**

*Source: City of Los Angeles*

Example 2



**Example 2 – Existing Conditions**




**Example 2 – Field Assessment**

In this example the section of sidewalk shown in the red cross-hatched area, measuring 5ft x 12ft, does not meet City requirements and is in need of repair. The estimate to perform the construction necessary to bring the sidewalk into compliance with City requirements is calculated as follows:

Sidewalk = 5ft x 12ft = 60ft² of sidewalk in need of replacement

| Item | Unit | Potential Rebate Unit Price | Quantity | Potential Rebate Subtotal |
|---|---|---|---|---|
| Sidewalk Remove and Replace | Square Foot | $ 7.00 | 60 | $ 420.00 |
| | | | Total = | **$ 420.00** |

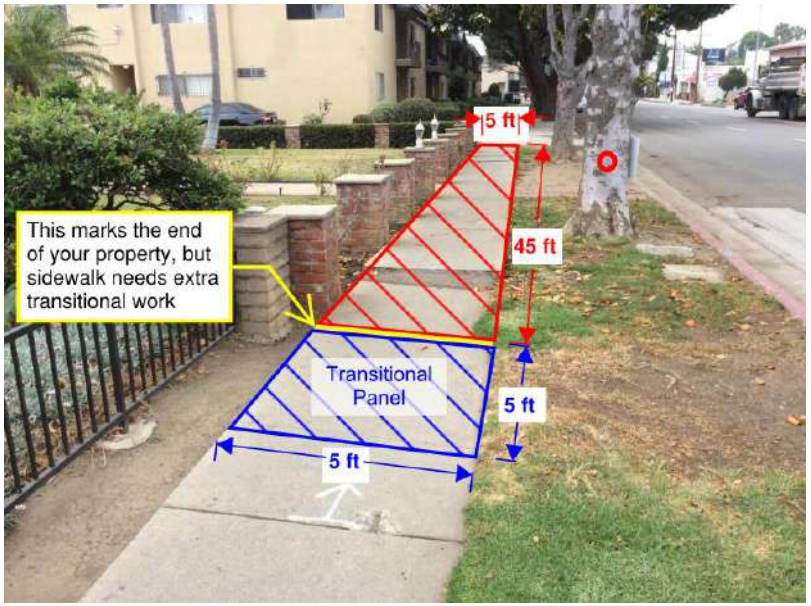
**$420.00 Total Rebate Offer**

*Source: City of Los Angeles*

Example 3 – Cap is exceeded



**Example 3 – Existing Conditions**




**Example 3 – Field Assessment**

In this example the sidewalk shown in the red cross-hatched area, measuring 5ft x 45ft, is in need of repair. There will be instances where the new sidewalk will not match exactly with the surrounding existing sidewalk. In those cases, a transition panel will be required to join the new sidewalk to the existing walkway. For these transitional panels, the rebate amount is double that of the sidewalk in front of your property. In this instance, the transitional panel is 5ft x 5ft. A City Arborist has determined that one tree removal and 10 lineal feet of root pruning is required at this location. The estimate to perform the construction necessary to bring the sidewalk into compliance with City requirements is calculated as follows:

| Item | Unit | Potential Rebate Unit Price | Quantity | Potential Rebate Subtotal |
|---|---|---|---|---|
| Sidewalk Remove and Replace | Square Foot | $ 7.00 | 225 | $ 1,575.00 |
| Sidewalk Transition Panel | Square Foot | $14.00 | 25 | $ 350.00 |
| Tree Remove and Replace | Each | $ 500.00 | 1 | $ 500.00 |
| Tree Root Pruning | Lineal Foot | $ 8.00 | 10 | 80.00 |
| | | | Total = | $ 2,505.00* |

*This calculated offer has exceeded the cap for a residential property. The final rebate offered will be the cap amount of $2,000.00

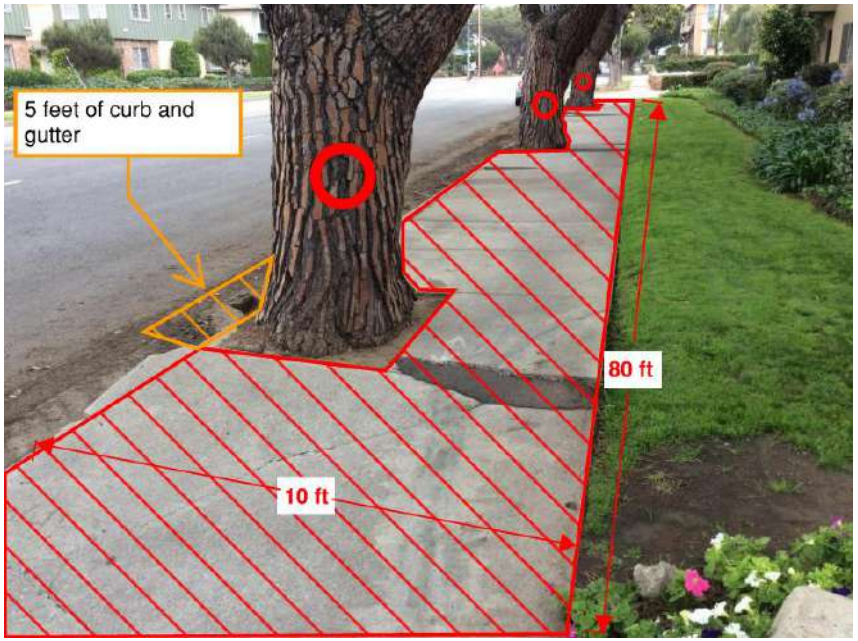
**$2,000.00 Total Rebate Offer**

*Source: City of Los Angeles*

Example 4 – Cap is exceeded significantly



**Example 4 – Existing Conditions**




**Example 4 – Field Assessment**

In this example the entire sidewalk shown in the red cross-hatched area, measuring 10ft x 80ft, does not meet City requirements and is in need of repair. In addition, 5 lineal feet of curb and gutter has been damaged by tree roots and is also in need of repair. A City Arborist has determined that three tree removals are required at this location. The estimate to perform the construction necessary to bring the sidewalk into compliance with City requirements is calculated as follows:

| Item | Unit | Potential Rebate Unit Price | Quantity | Potential Rebate Subtotal |
|---|---|---|---|---|
| Sidewalk Remove and Replace | Square Foot | $ 7.00 | 728 | $ 5,096.00 |
| Curb and Gutter Remove and Replace | Lineal Foot | $ 70.00 | 5 | $ 350.00 |
| Tree Remove and Replace | Each | $ 500.00 | 3 | $ 1,500.00 |
| | | | Total = | $ 6,946.00* |

* This calculated offer has exceeded the cap for a residential property. The final rebate offered will be the cap amount of $2,000.00

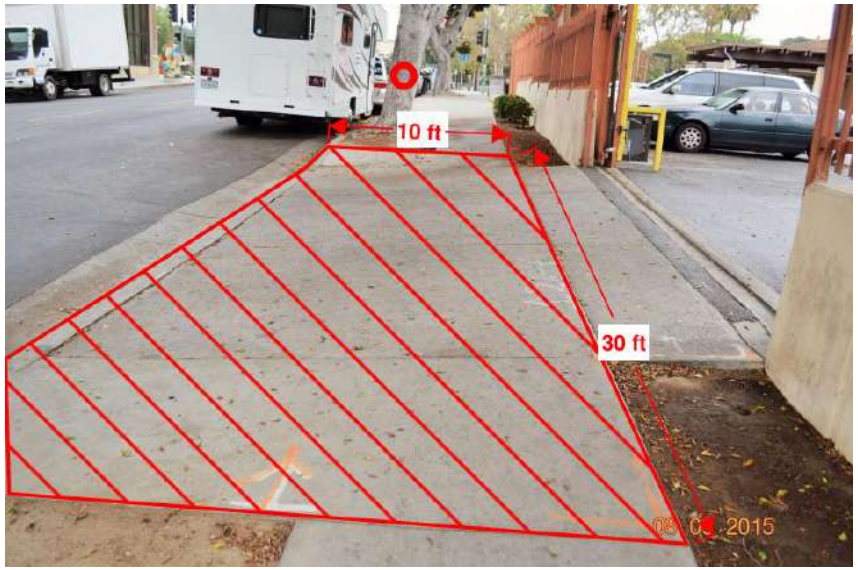
**$2,000.00 Total Rebate Offer**

*Source: City of Los Angeles*

Example 5 – Non-Residential property



**Example 5 – Existing Conditions**




**Example 5 – Field Assessment**

In this example the driveway shown in the red cross-hatched area, measuring 10ft x 30ft, does not have an ADA accessible crossing and needs repair to meet City requirements. A City Arborist has also determined that 10 lineal feet of root pruning is required. The estimate to perform the construction necessary to bring the sidewalk into compliance with City requirements is calculated as follows:

| Item | Unit | Potential Rebate Unit Price | Quantity | Potential Rebate Subtotal |
|---|---|---|---|---|
| Driveway Remove and Replace | Square Foot | $ 11.00 | 300 | $ 3,300.00 |
| Tree Root Pruning | Lineal Foot | $ 8.00 | 10 | 80.00 |
| | | | Total = | $ 3,380.00 |

Since this property is not in a residential zoning the rebate cap is $4,000 and the full rebate calculation can be offered.

**$3,380.00 Total Rebate Offer**

*Source: City of Los Angeles*

Example 6 – Non-Residential property, cap is exceeded




**Example 6 – Existing Conditions**




**Example 6 – Field Assessment**

In this example there are two sidewalk sections shown in the red cross-hatched areas that do not meet City requirements and are in need of repair. The larger sidewalk section measures 80ft x 12ft and contains two tree wells. The smaller sidewalk section measures 10ft x 14ft and contains one tree well. A City Arborist has determined that two tree removals and 10 lineal feet of root pruning are required at this location. There are also two utility boxes in the sidewalk that will need replacement. The estimate to perform the construction necessary to bring the sidewalk into compliance with City requirements is calculated as follows:

| Item | Unit | Potential Rebate Unit Price | Quantity | Potential Rebate Subtotal |
|---|---|---|---|---|
| Sidewalk Remove and Replace | Square Foot | $ 7.00 | 1028 | $ 7,196.00 |
| Utility Pullbox Remove and Replace | Each | $ 275.00 | 2 | $ 550.00 |
| Tree Root Pruning | Lineal Foot | $ 8.00 | 10 | $ 80.00 |
| Tree Remove and Replace | Each | $ 500.00 | 2 | $ 1,000.00 |
| | | | Total = | $ 8,799.00* |

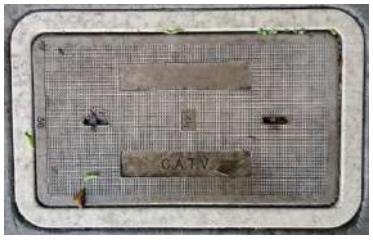
* This calculated offer has exceeded the cap for a non-residential property. The final rebate offered will be the cap amount of $4,000.00

**$4,000.00 Total Rebate Offer**

*Source: City of Los Angeles*

Examples of Typical Utility Boxes









Examples of Typical Parkway Drains




Example of a Typical Catch Basin




*Source: City of Los Angeles*

# CITY OF CHICAGO, ILLINOIS

## SHARED COST SIDEWALK PROGRAM

The City of Chicago operates a Shared Cost Sidewalk Program. Unlike the rebate programs in San Antonio and Los Angeles, the Shared Cost Program is a request program for sidewalks constructed by the City. Residents request a new sidewalk through 3-1-1, then City staff will assess the sidewalk to determine if it needs to be repaired. If accepted, the resident then pays the City the amount of sidewalk repair. The City maintains a lower cost than contractors, and offers 50% discounts for older adults and people with disabilities. Repairs occur between June and December.

# Shared Cost Sidewalk Program

## *Program Overview*

**The 2020 Shared Cost Sidewalk Program will open to new applicants starting at 6 a.m. on January 7, 2020.**

The Shared Cost Sidewalk Program cost per square foot charged to property owners is well below what a private contractor would charge. Senior citizens and persons with disabilities may qualify to receive an additional discount.

The scope of a Shared Cost Sidewalk Program project is limited to sidewalk within the public right-of-way, and may include the main walk, the sidewalk thru a driveway, the existing courtesy walk (which runs perpendicular from the main sidewalk to the curb), and existing landing steps (the small strip of concrete sometimes found adjacent to the curb). Sidewalk on private property will only be included if needed for transition purposes; otherwise it is **NOT** eligible for replacement under the Shared Cost Sidewalk Program. Owners of corner properties will be charged for sidewalk on both the main (address) side and the non-address side of the property. However, these property owners can contact CDOT and elect to have only one side of their property surveyed for the program. CDOT will continue to build ADA-compliant corner ramps where applicable, with the City paying the entire cost of the ramps.

Replacement of sidewalk is based on engineering considerations. In order to minimize the cost to property owners and increase the number of Shared Cost Sidewalk Program participants, only the portion of sidewalk in need of replacement as determined by CDOT is eligible for the Shared Cost Sidewalk Program pricing. The property owner does have the option to replace the entire sidewalk in front of the property. However, the entire cost to remove and replace the portion of sidewalk determined by CDOT to be in good condition will be charged to the property owner. **NO** senior or persons with disabilities discount will be applied to this work. To clarify, the City will not pay for removal and replacement of sidewalk in good condition.

Due to significant participant interest, the removal and replacement of **permitted** driveway aprons (the portion of driveway between the sidewalk and curb) can be added to the project. However, the entire cost to remove and replace the driveway apron will be charged to the property owner. **No** senior or persons with disabilities discount will apply to this work. To clarify, the City will not share the cost for removal and replacement of driveway aprons.

For the 2020 program, applications were taken on a **first-come, first-served basis starting at 6 a.m. on January 7, 2020**. The number of participants is based on availability of funds.

**Applications will only be accepted through the City's 311 system by calling 311 or through the City's service request website www.311.chicago.gov-**

- Make sure to specify that you want to participate in the Shared Cost Sidewalk Program.
- If you currently do not have a courtesy walk or landing step and would like one installed, this should be mentioned at the time of request. Installation is subject to engineering recommendation.
- If you are interested in removal and replacement of the driveway apron, this should be mentioned at the time of request.

*Source: City of Chicago*

- You must give the property owner's complete name, a contact phone number, email address if available, and the property's complete address. **Please note that Shared Cost Sidewalk Program applications that are missing any of the requested information may not be processed.**

Once the program budget amount is met, the program will close for the year. Applicants will be notified via U.S. mail indicating whether they have been included into the 2020 Shared Cost Sidewalk Program. Applicants included in the program will receive a bill in the spring indicating the property owner amount due. Payment in full must be made to the City's Department of Finance within the timeframe indicated on the bill in order for work to proceed.

The Shared Cost Sidewalk Program continues to provide great value to property owners while helping improve neighborhoods. Should you have any questions, please contact CDOT at (312) 744-1746 or e-mail cdotsharedcost@cityofchicago.org.

*Source: City of Chicago*

# Shared Cost Sidewalk Program
## Frequently Asked Questions

The Shared Cost Sidewalk Program is a voluntary program in which owner-occupants and the City of Chicago share the cost of replacing sidewalks.

The Shared Cost Sidewalk Program cost per square foot charged to property owners is well below what a private contractor would charge. Senior citizens and persons with disabilities may qualify to receive an additional discount. The approximate cost to a property owner of an average mid-block property will range from $600 to $1,500. Those prices are significantly below what a private contractor would charge. The City can offer that attractive price because of the volume of work performed by the City.

**How does the process work?**

1. Applicants for the Shared Cost Sidewalk Program will only be accepted through the City's 311 system by calling 311 or through the City's service request website **www.311.chicago.gov** Note the following:
    - Make sure to specify that you want to participate in the Shared Cost Sidewalk Program.
    - Specify if you (the owner) are a senior or disabled citizen. Seniors and/or disabled citizens may qualify for a 50 percent discount on the Shared Cost Sidewalk Program cost.
    - If you currently do not have a courtesy walk (which runs perpendicular from the main sidewalk to the curb) or landing step (the small strip of concrete sometimes found adjacent to the curb) and would like one installed, this should be mentioned at the time of request. Installation is subject to engineering recommendation.
    - If you are interested in removal and replacement of the driveway apron (the portion of driveway between the sidewalk and curb), this should be mentioned at the time of request.
    - You must give the property owner's complete name, a contact phone number, email, address if available, and the property's complete address. **Please note that Shared Cost Sidewalk Program applications that are missing any of the requested information will not be processed.**
2. Applications will be taken on a first-come, first served basis. The number of participants is based on availability of funds. Once capacity is reached, requests for participation in the program will no longer be accepted and property owners will have to apply to the program the following year. Applicants will be notified via U.S. mail indicating whether they have been included into the Shared Cost Sidewalk Program. Also check our website (www.cityofchicago.org/transportation) for program updates.
3. CDOT will survey the area to determine the scope and cost of reconstruction. Sidewalk replacement is based on engineering considerations. CDOT may determine that some locations meet City standards and do not require reconstruction.
4. If CDOT determines that the property is eligible for the Shared Cost Sidewalk Program, CDOT will send a cost estimate for the work to the property owner in the spring. If interested, payment in full must be made to the City's Department of Finance **within the timeframe indicated on the cost estimate (approximately 45 days).**

Payment can also be made in person at one of the Department of Finance payment locations:

- 121 N LaSalle St Room 107
- 400 W. Superior St
- 4445 N. Pulaski Rd
- 4770 S Kedzie Ave
- 2006 E 95th St

**Once payment is submitted, you may contact CDOT at 312-744-1746 to verify payment has been received.**

5. If you are eligible for a senior citizen or persons with disability rate that was not applied to your estimate, contact CDOT at 312-744-1746. A revised cost estimate will be issued to the property owner reflecting the discount once the required documentation has been received and verified. Payment must be submitted within the timeframe indicated **on the original cost estimate.**
6. **Cost estimates are only valid for the timeframe indicated on the estimate (approximately 45 days). Payment in full must be made to the City's Department of Finance within this timeframe in order for work to proceed.**
7. The work will begin as soon as possible. The construction season runs approximately from June to December.

**Who is eligible to participate?**

All property owners with **non**-vaulted sidewalks are eligible to participate. Custom sidewalks (e.g., granite, colored, custom designs, etc.) vaulted sidewalks, and private property sidewalks are **not eligible** to be included in the program.

**Who is eligible for the senior or disabled discount?**

Seniors (age 65 or older) or disabled owner-occupants of non-commercial properties of four units or less.

**What information is required to receive the senior or disabled rate?**

Seniors age 65 or older must provide proof of age, ownership, and occupancy:

- Ownership: tax bill (2nd installment) or title deed
- Age: birth certificate or driver's license, CityKey ID, or 2nd installment tax bill showing senior exemption
- Occupancy: voter's card or utility bill

Persons with disabilities must provide proof of ownership, occupancy, and disability:

- Ownership: tax bill (2nd installment) or title deed
- Occupancy: voter's card or utility bill
- Disability: Must provide one of the following:
  - Disability benefits received from Social Security Administration, Veterans Administration, Civil Service, or Railroad Retirement
  - Class 2 disability card from the Illinois Secretary of State's Office

*Source: City of Chicago*

Documentation verifying the senior citizen or persons with disabilities rate should be submitted by one of the following options:

- Fax to (312) 744-6438, ATTN: Shared Cost Sidewalk Program
- Email to: cdotsharedcost@cityofchicago.org
- Mail to :

Shared Cost Sidewalk Program
Chicago Department of Transportation
30 N. LaSalle St., Suite 400
Chicago, Illinois 60602

For any assistance with or questions regarding the senior citizen or persons with disabilities rate, please contact CDOT at 312-744-1746 or email us at **cdotsharedcost@cityofchicago.org.**

**What does the scope of work include?**

The scope of a Shared Cost Sidewalk Program project is limited to sidewalk within the public right-of-way and may include replacing the main sidewalk in front of the property, the sidewalk thru a driveway, the existing courtesy walk (the smaller walkway that runs perpendicular to the main walk, from the main walk to the curb) and existing landing steps (the small strip of concrete sometimes found adjacent to the curb). Sidewalk on private property will only be included if needed for transition purposes; otherwise it is **NOT** eligible for replacement under the Shared Cost Sidewalk Program. Owners of corner properties will be charged for sidewalk on both the main (address) side and non-address side of the property.

Replacement is based on engineering considerations. In order to minimize the cost to property owners and increase the number of Shared Cost Sidewalk Program Participants, only the portion of sidewalk in need of replacement as determined by CDOT is eligible for the Shared Cost Sidewalk Program pricing. The property owner does have the option to replace the entire sidewalk in front of the property. However, the entire cost to remove and replace the portion of sidewalk determined by CDOT to be in good condition will be charged to the property owner. **NO** senior or persons with disabilities discount will apply to this work. To clarify, the City will not pay for removal and replacement of sidewalk in good condition.

**Will the driveway apron be replaced?**

If your driveway crosses the sidewalk, the Shared Cost Sidewalk Program scope of work may include the sidewalk through the driveway. Abandoned driveway aprons no longer in use will be removed and replaced with topsoil. Grass seed or sod will not be placed in these areas. Removing abandoned driveway aprons and replacing with topsoil will be charged to the property owner.

Due to significant participant interest, the removal and replacement of **permitted** driveway aprons (the portion of driveway between the sidewalk and curb) can be added to the project. However, the entire cost to remove and replace the driveway apron will be charged to the property owner. **No** senior citizen or persons with disabilities discount will apply to this work. To clarify, the City will not pay for removal and replacement of driveway aprons.

**Will the area receive grass seed?**

No. Crews will not seed the area around the main walk, courtesy walk, and landing step if the soil is disrupted during construction.

**Will pavers or other structures in the parkway be reset when work is completed?**

Brick pavers, fencing, and planters or any other obstructions in the parkway may be removed during construction and will be loosely reset when construction is completed. Reinstallation of removed elements is the homeowner's responsibility.

**What if tree roots have damaged the existing courtesy walk or landing step?**

If necessary, the existing courtesy walk or landing step will be removed and replaced further away from the tree to help avoid future damage. If it is determined the courtesy walk or landing step cannot be either replaced in the current location or relocated, it will be replaced with topsoil. Grass seed or sod will not be placed on these areas. Removing courtesy walks or landing steps and replacing with topsoil will be charged to the property owner.

**What if there is a sprinkler system at the property?**

The City is **NOT** responsible for sprinkler systems in the parkway or adjacent to the sidewalk. Property owners are advised to cut and cap the lines and remove any sprinkler heads that may be damaged during the Shared Cost Sidewalk Program work. Property owners should notify the City of an existing sprinkler system in order to minimize any potential damage.

**Is there any warranty for the work?**

Yes. Sidewalk construction has a warranty of one year from the date of construction, covering significant deterioration of the sidewalk. (Note: Some small cracks, especially in sidewalk joints, are common. Since they are not caused by construction, they are not covered by the warranty).

**Is this bill final?**

This bill is based on measurements and is considered final. If it is later determined that more work is needed you will **NOT** be billed for that additional work. Furthermore, if the amount of work is reduced for any reason, your money will be refunded if the difference is $100 or greater.

Please contact our office at 312-744-1746 before sending your payment if you would like to request any changes to the scope of work represented on this bill.

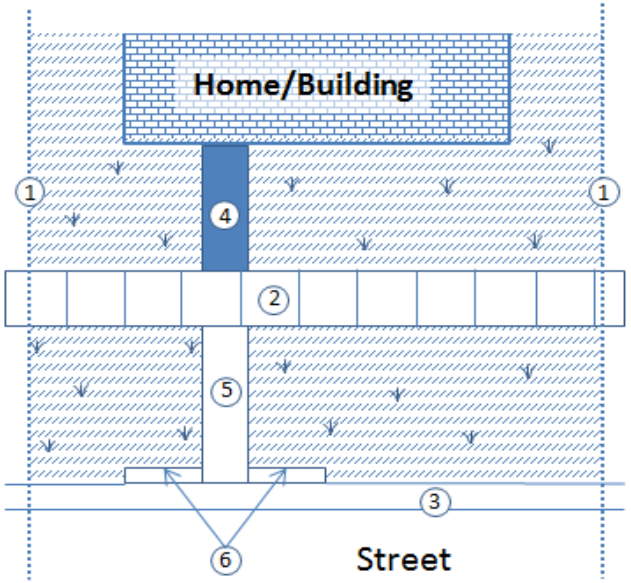
***If you have any additional questions, please contact CDOT at 312-744-1746 or email us at cdotsharedcost@cityofchicago.org.***

*Source: City of Chicago*

# SHARED COST SIDEWALK PROGRAM EXAMPLE DIAGRAMS

(NOT TO SCALE)

## MID-BLOCK PROPERTY: SIDEWALK WITH PARKWAY



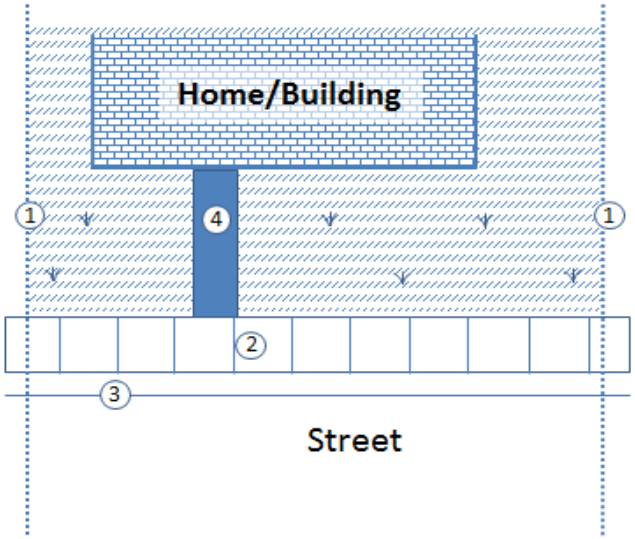

LEGEND:

1. Property Lines
2. Main Sidewalk
3. Curb and gutter *(entirely City cost, when applicable)*
4. **PRIVATE PROPERTY Sidewalk**
5. Courtesy Walk
6. Landing Step

Grass / Landscaping

***Note: Item #4 is private property and not eligible for the Shared Cost Sidewalk Program.***

## MID-BLOCK PROPERTY: CURB ATTACHED SIDEWALK




LEGEND:

1. Property Lines
2. Main Sidewalk
3. Curb and gutter *(entirely City cost, when applicable)*

**PRIVATE PROPERTY Sidewalk**

Grass / Landscaping

***Note: Item #4 is private property and not eligible for the Shared Cost Sidewalk Program.***

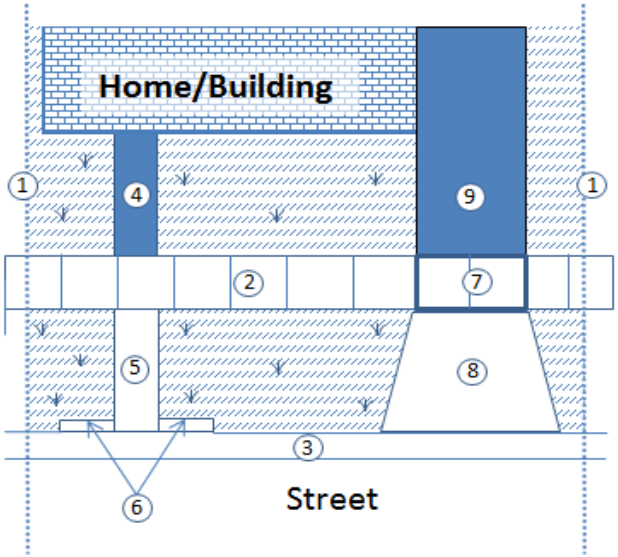
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*Source: City of Chicago*

# SHARED COST SIDEWALK PROGRAM EXAMPLE DIAGRAMS

(NOT TO SCALE)

## MID-BLOCK PROPERTY WITH DRIVEWAY: SIDEWALK WITH PARKWAY



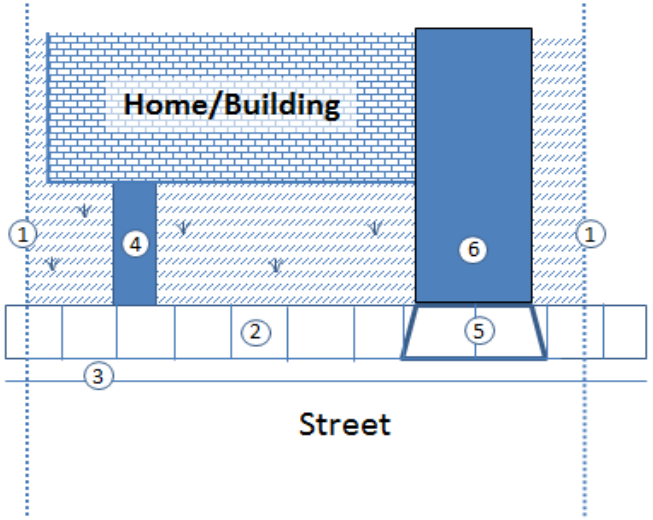

LEGEND

1. Property Lines
2. Main Sidewalk
3. Curb and gutter *(entirely City cost, when applicable)*
4. **PRIVATE PROPERTY Sidewalk**
5. Courtesy Walk
6. Landing Step
7. Sidewalk thru driveway
8. Driveway Apron
9. **Driveway - PRIVATE PROPERTY**

Grass / Landscaping

***Note: Items 4 & 9 are private property and not eligible for the Shared Cost Sidewalk Program***

## MID-BLOCK PROPERTY WITH DRIVEWAY: CURB ATTACHED SIDEWALK




LEGEND:

1. Property Lines
2. Main Sidewalk
3. Curb and gutter *(entirely City cost, when applicable)*
4. **PRIVATE PROPERTY Sidewalk**
5. Sidewalk thru driveway
6. **Driveway – PRIVATE PROPERTY**

Grass / Landscaping

***Note: Items 4 & 6 are private property and not eligible for the Shared Cost Sidewalk Program***

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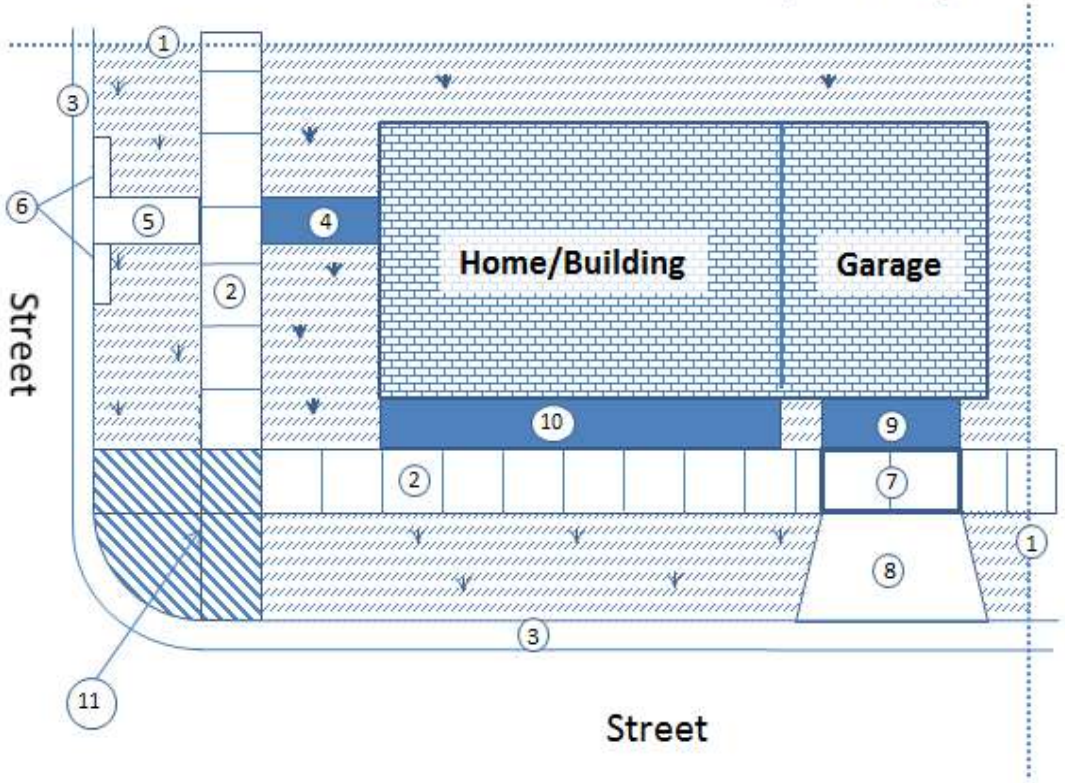


*Source: City of Chicago*

# SHARED COST SIDEWALK PROGRAM EXAMPLE DIAGRAM

## CORNER PROPERTY

(NOT TO SCALE)




LEGEND:

1. Property Lines
2. Main Sidewalk
3. Curb and gutter *(entirely City cost, when applicable)*
4. **PRIVATE PROPERTY Sidewalk**
5. Courtesy Walk
6. Landing Step
7. Sidewalk thru driveway
8. Driveway Apron
9. **Driveway - PRIVATE PROPERTY**
10. **Building Apron – PRIVATE PROPERTY**
11. ADA Ramps *(entirely City cost, when applicable)*

Grass / Landscaping

***Note: Items 4, 9, & 10 are private property and not eligible for the Shared Cost Sidewalk Program.***

6

*Source: City of Chicago*

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# appendix d

# WALK BIKE NETWORK TOOL







# CONTINUING TO USE THE WALK+BIKE NETWORK TOOL

## TOOL DEVELOPMENT

The Walk+Bike Network Tool was developed within GIS software as a method to catalogue, visualize, and assess the existing walking and biking network within the Study Area. GIS software allows attribute tables with a variety of information and data to be tied to a geographical element, like a street. The Walk+Bike Network Tool consists of three key components, all of which were developed within GIS software.

- Sidewalk Inventory
- Bikeway Inventory
- Network Analysis

The sidewalk inventory and the network analysis files are based on parcel boundaries for every parcel within the study area, and intersections. For the bikeway analysis, the attributes tables developed were based on roadway centerlines.

### SIDEWALK INVENTORY

The sidewalk inventory files include the following data for every parcel:

- Condition and width for that parcel
- Special notes/considerations for that parcel including items such as width pinched at tree roots, metal grates, gravel sidewalk, pebble sidewalk, cars blocking sidewalk, etc.
- Safety/Comfort assessment for that block
- Attractiveness assessment for that block
- Sidewalk reconstruction feasibility for that block

The intersection assessment files include the following data for each intersection:

- The ramp condition and type for each of the eight ramp locations for that intersection
- Safety/Comfort assessment for that intersection
- Attractiveness assessment for that intersection

### BIKEWAY INVENTORY

The bikeway inventory includes the following data for existing and proposed bikeway corridors:

- Facility type & recommended type from Bike Montrose analysis
- Houston Bike Plan classifications
- Proposed timeline for construction
- Key roadway characteristics that align with the Road Log in Appendix A (see **Table A.2**)

### NETWORK ANALYSIS

The network analysis files include the scoring assessment for each block based on the proximity (walk shed calculations) to destinations listed in **Table 3.2**, and the importance values assigned to each of those destination types. The georeferenced destinations file was based on the collected sales tax data sourced from the State of Texas.

This analysis was set up to modify scoring methodology based on new developments that occur within the area.

## TOOL UTILITY FOR FUTURE

Each of the three components of the Walk+Bike Network Tool should be maintained and updated regularly. These tools can be a method for assessment management, used in defining future projects, and as a method for public engagement.

The sidewalk inventory should be updated regularly. Below are guidelines for updating the sidewalk inventory to ensure the most up-to-date data is available for analysis by The TIRZ:

- TIRZ should monitor/review permitting requests made to the City of Houston to know when new development, residential or private, is to occur within the study area.
- When new development is completed, the Sidewalk Inventory should be updated
- A bi-yearly assessment for the entire Study Area; assessment to

include review of new developments and windshield surveys of areas with likely changes to sidewalk condition

- When roadway construction occurs, the Sidewalk Inventory should be updated
- If the inventory becomes public facing, public input can be used to update the inventory

The bikeway inventory should be updated when a new bikeway is constructed, or for any roadway reconstruction within the Study Area.

The network analysis should be updated only when there is a substantial change to destinations, specifically Category 1 destinations, within the Study Area or there is a need to modify the scoring methodology.

### PROJECT DEVELOPMENT

Walk+Bike Network Tool should continually be used for project development. The tool allows for data-driven and visual analysis of opportunities. As the TIRZ prioritizes projects each year, the tool can be used to right-size projects for the available funds at the time as well as to prioritize projects based on feasibility and network importance.

The tool is also an asset for grant writing. As each grant application will require an assessment of the proposed projects and their projected benefit, this tool can used to communicate the existing need for improvements, and the TIRZ's overall progress, two criteria often necessary in successful grant submissions.

### PUBLIC ENGAGEMENT

The Walk+Bike Network Tool can be used as a public information and public engagement platform to inform the public about upcoming projects. The tool can be converted to an interactive online GIS resource, adding to the ways the TIRZ can gather input from the public about their needs and priorities to inform project development.

As the TIRZ builds out the walking and biking networks within the Study Area, an online resource can be developed to share planned projects and updates for projects in development. This will be a useful tool for organizing and sharing information, including the methodology used for project prioritization. Sharing all three elements of the Walk+Bike Network Tool allows for transparency in the project development process and for residents and business owners to understand why projects in one area are being prioritized over another area.

Using the tool to gather input from the public can also be a helpful way to define projects, prioritize projects, and to build project momentum for future projects. Public input can also be a useful input for grant applications for project funding.

An online tool that gathers data from the public can also be a method for continually updating the Sidewalk Inventory. Development is constantly occurring within the Study Area, so having an up to date inventory can be challenging. Crowd sourcing data can help the TIRZ keep the Walk+Bike Network Tool updated.

Crowd sourcing information from the public can also be used to assess other characteristics that were not included within this assessment, like areas where lighting is good or poor or areas in need of more shade trees.

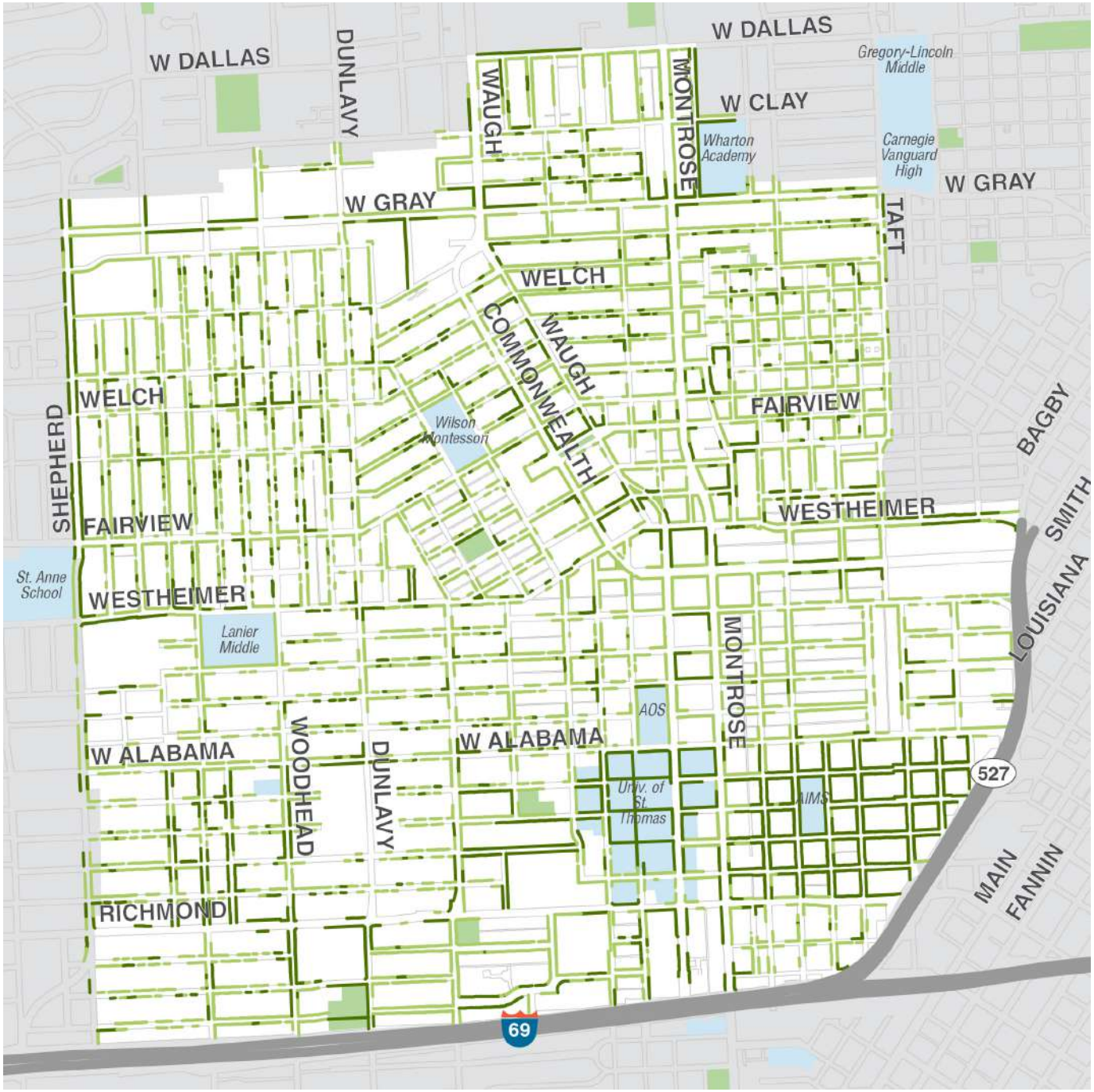
The residents and business owners of the Study Area are invested in the community and can be an asset as the TIRZ improves the quality and connectivity of the walking an biking networks for the community.

## ADDITIONAL MAPS

The following pages include maps that were developed during this planning process. Some maps were included in report chapters but not at a large scale, while others were not included for brevity. They were placed here for visual convenience.

# ACCESSING WALKABLE AREAS

## Flat sidewalks (Condition A & B)



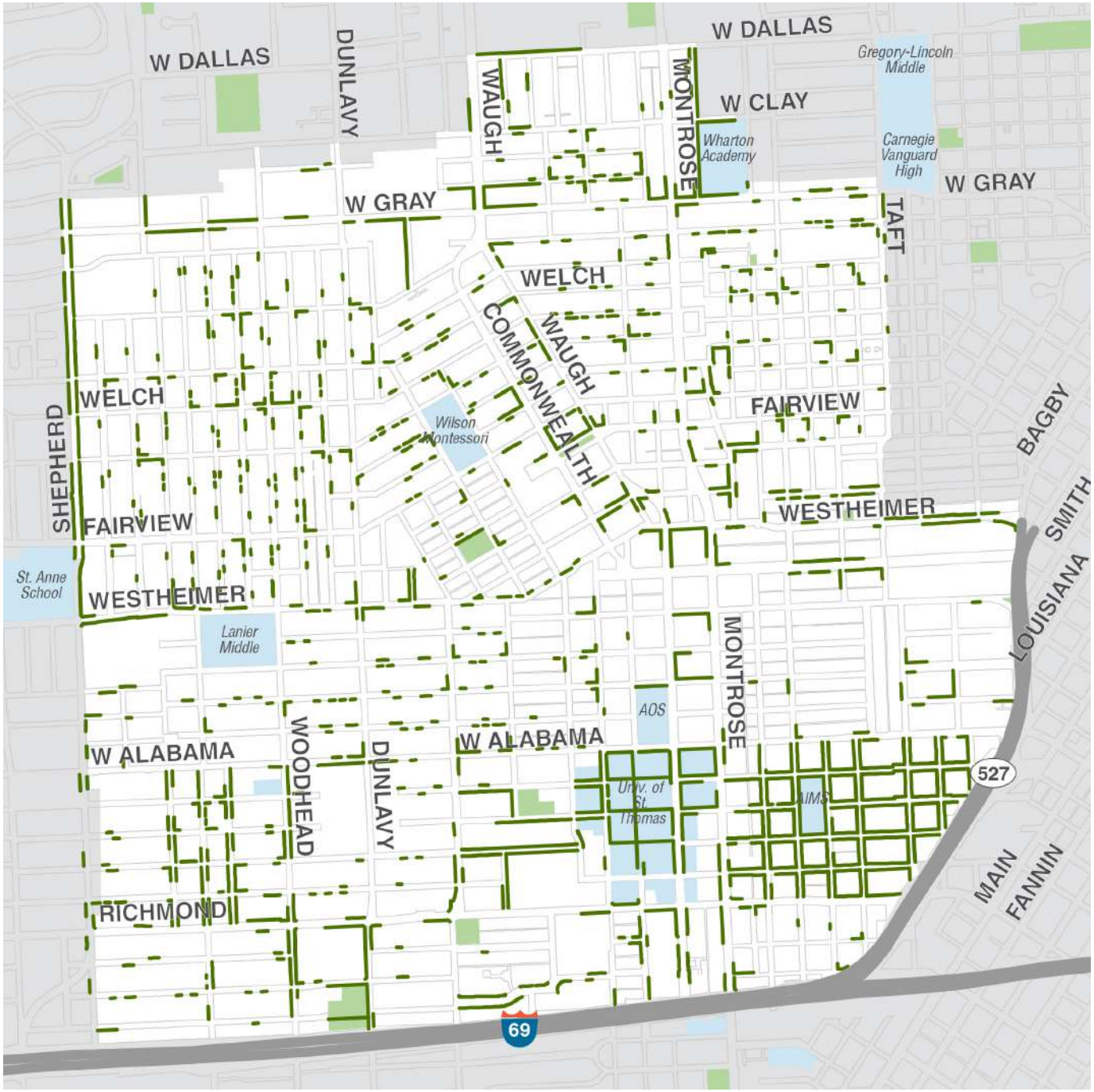

**Sidewalk Condition by Parcel**

- Flat - 5'+
- Flat - Less than 5'

- Highway
- Study Area
- School
- Park

# ACCESSING WALKABLE AREAS

Flat sidewalks that are 5'+ wide (Condition A only)




**Sidewalk Condition by Parcel**

- Flat - 5'+

- Highway
- Study Area
- School
- Park

*Source: Team Analysis, 2019*

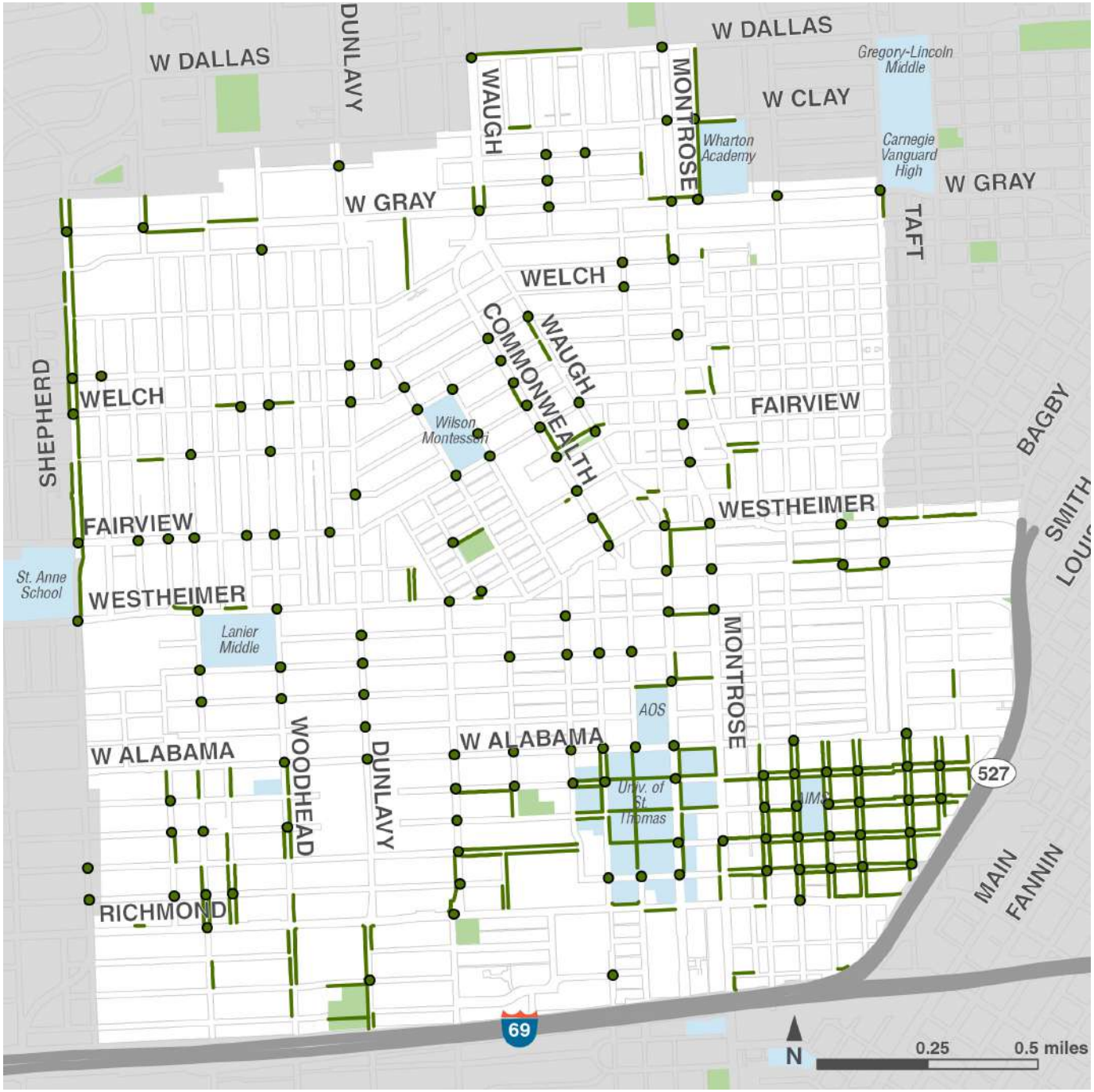



figure D.3 Walkable Areas by Block, Condition A and Accessible Intersections Only

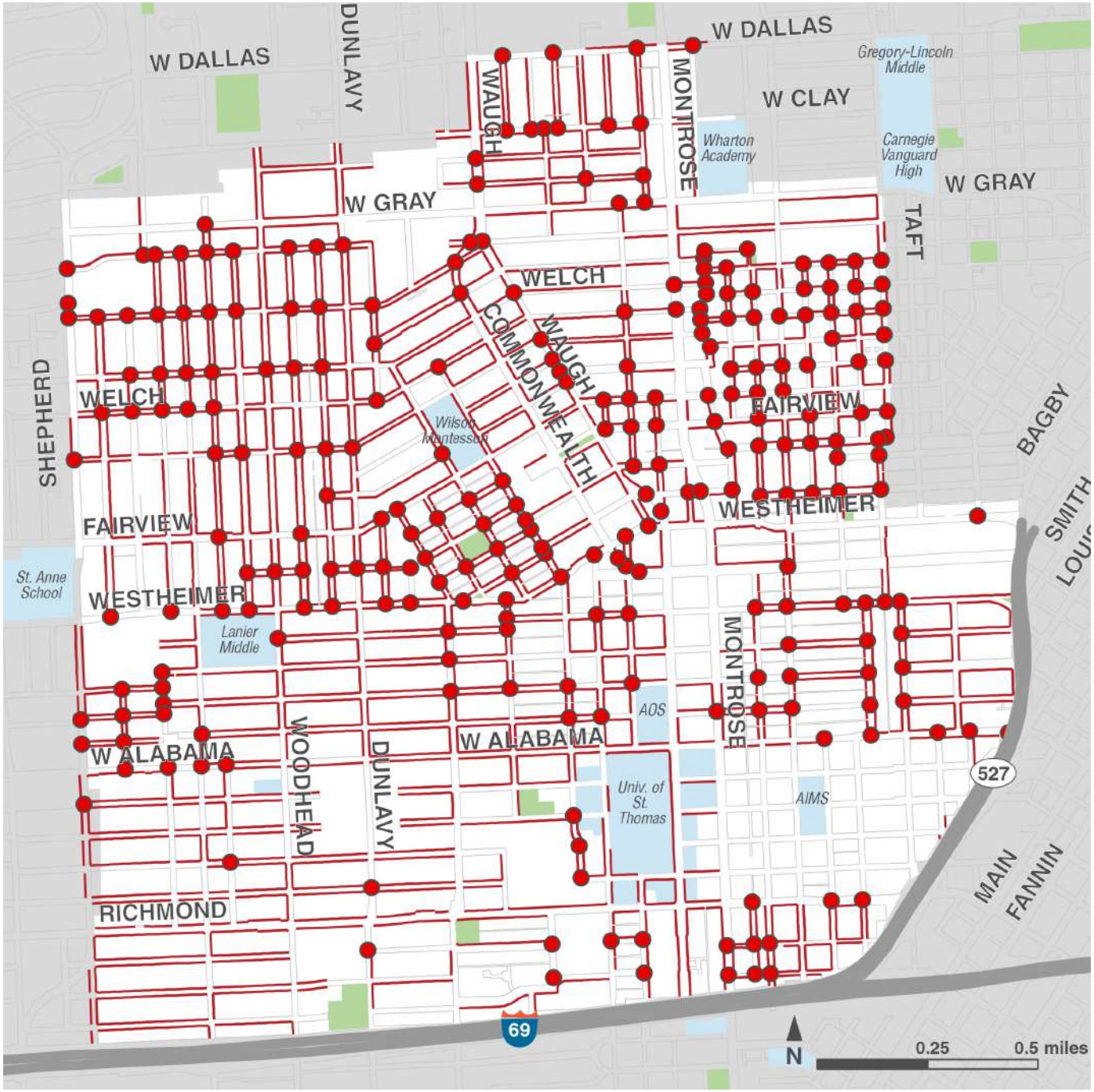
# COMPLETE BLOCKS

Flat sidewalks, 5'+ wide for a full block + Accessible intersections

**Sidewalk Condition by Block**

- A | Flat - 5'+
- Accessible Intersection
- Highway
- Study Area
- School
- Park

*Source: Team Analysis, 2019*




# INCOMPLETE BLOCKS

Blocks with poor condition for at least one parcel + Inaccessible Intersections

**Sidewalk Condition by Block**

- Incomplete Block Face
- Inaccessible Intersection

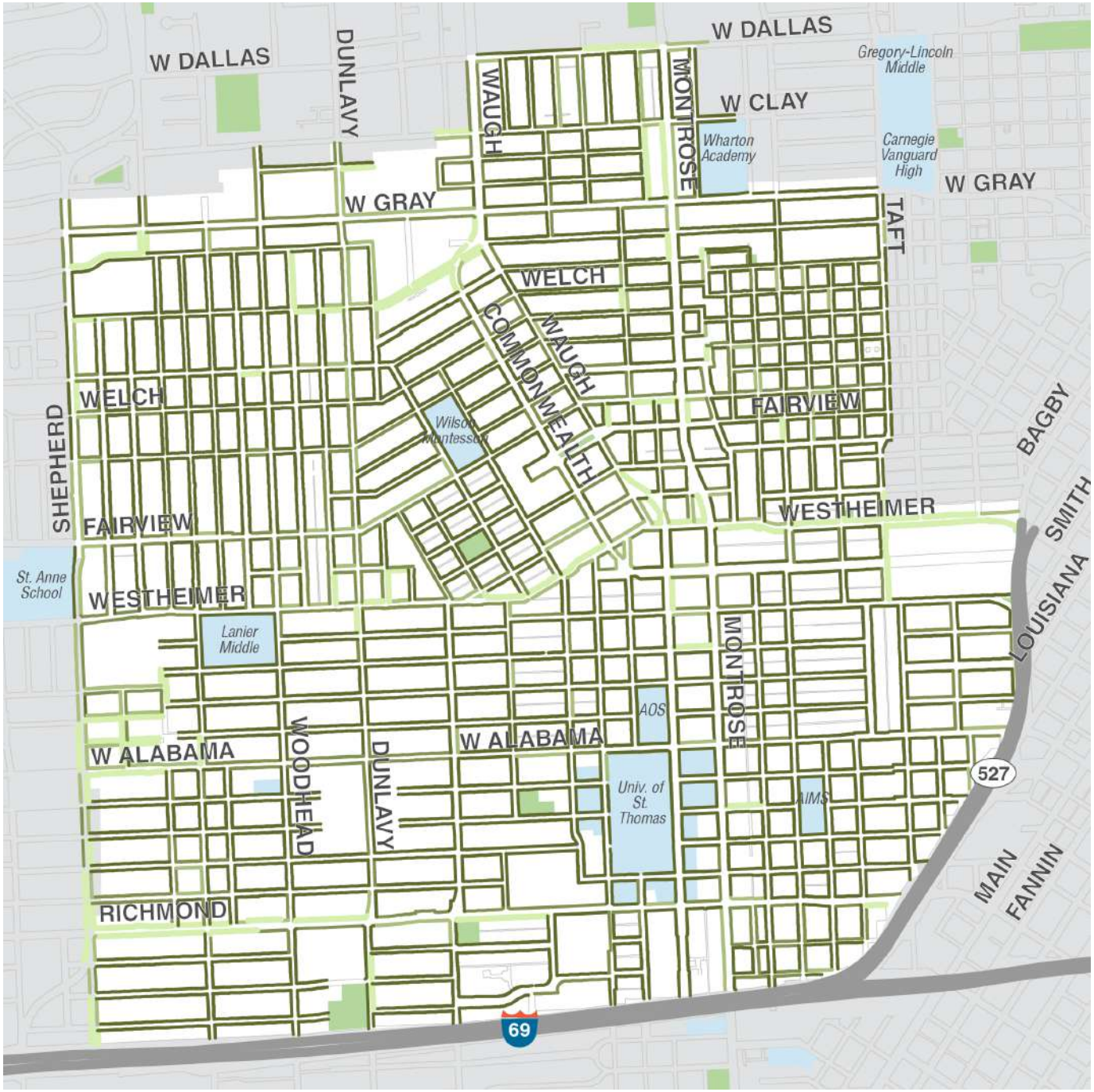
- Highway
- Study Area
- School
- Park

figure D.4 Incomplete Blocks where the Block is less than Condition A and has an Inaccessible Intersections

*Source: Team Analysis, 2019*

# SAFETY

"I feel safe walking along this block"




**Safety Assessment by Block**

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

- Highway
- Study Area
- School
- Park

*Source: Team Analysis, 2019*

figure D.5 Perceived Safety by Block

Appendix D: Walk+Bike Network Tool
page 218

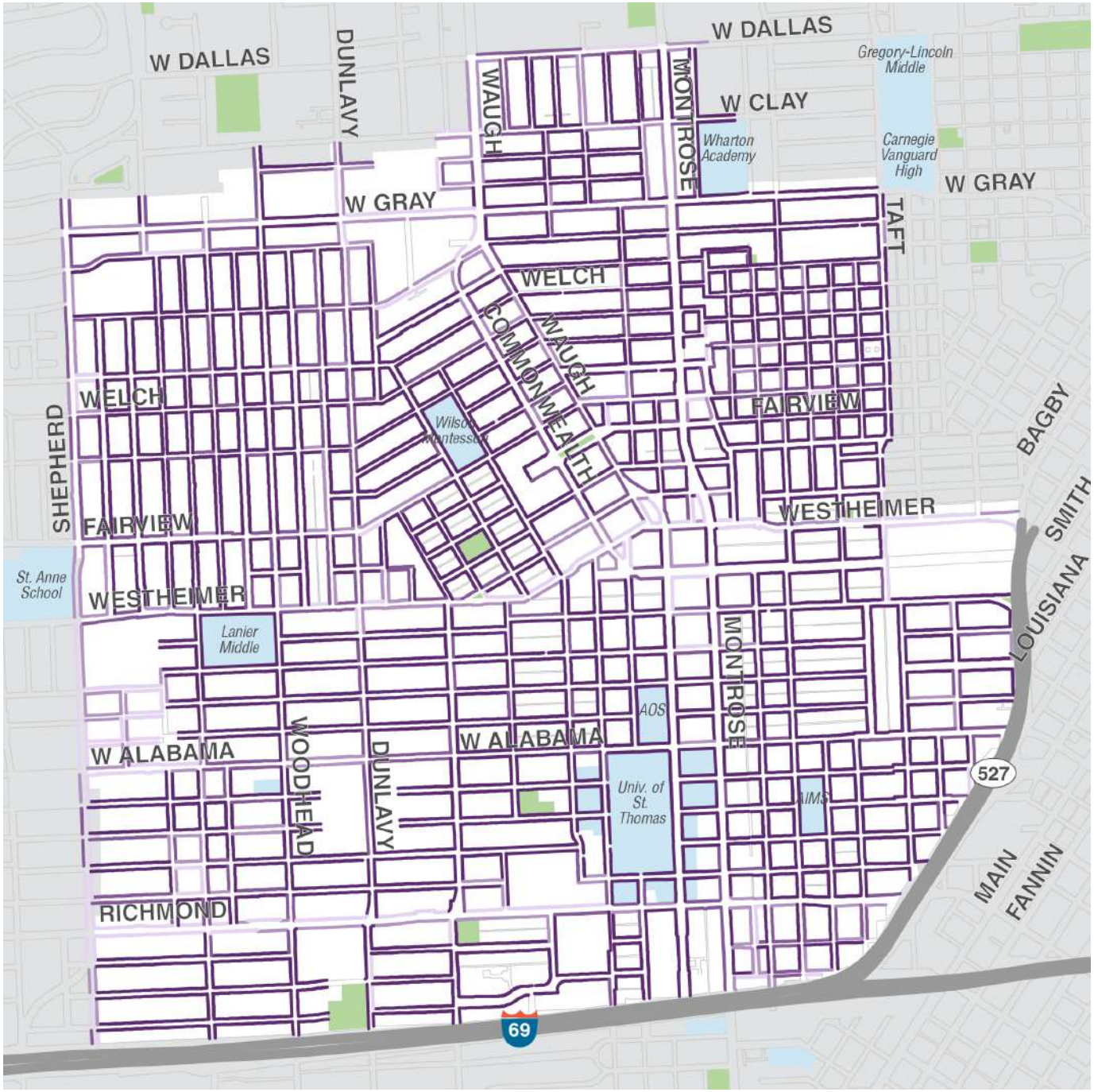



figure D.6 Perceived Attractiveness by Block

# ATTRACTIVE BLOCK

"This block is attractive for walking"

**Block Attractiveness**

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

- Highway
- Study Area
- School
- Park

*Source: Team Analysis, 2019*