

NORTH HOUSTON / GREENSPPOINT

LIVABLE CENTERS STUDY



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a Sakura
robinson





Livable Centers Study for North Houston Management District



North Houston District

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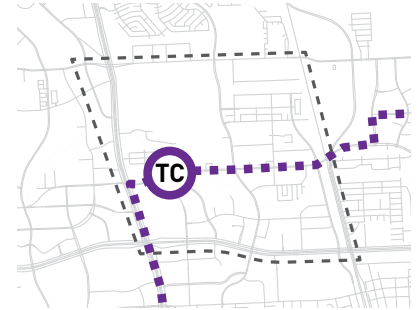
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Housing Choices, Parks,
and Open Spaces

TEI | Traffic Engineers, Inc.

Mobility and Transportation

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NORTH HOUSTON / GREENSPPOINT

LIVABLE CENTERS STUDY

**Report
March 2020**

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Introduction

Executive Summary

The North Houston District is a uniquely Houston place, with specific Houston challenges and opportunities. It is both a major employment center and a major residential area, built in a suburban development-style with urban densities. It is one of the original “edge cities,” located at the intersections of major highways, but also a major transit hub. Its typical suburban strip malls and apartments offer an international variety of food and a diverse community. It is bisected by a bayou that offers spectacular open space and threatens another flood.

The North Houston Livable Centers Study proposes a vision for Greenspoint and a series of projects that will make it a better place to live, a better place to do business, and a stronger center for the surrounding neighborhoods. All four of these vision statements build on Greenpoint’s existing strengths, but all propose significant transformations.

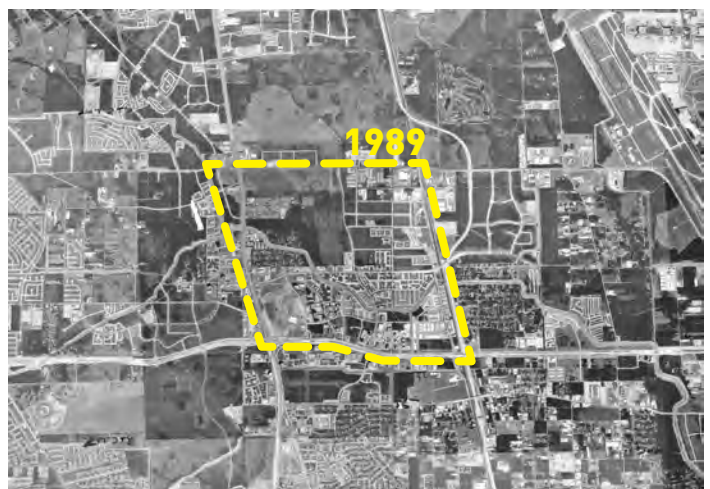
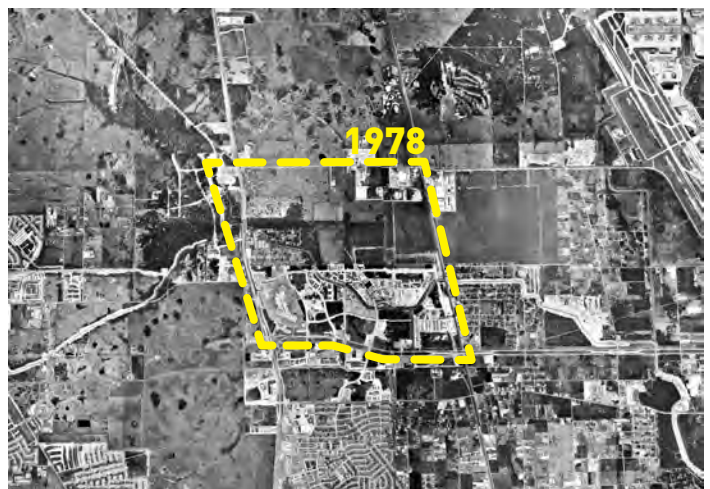
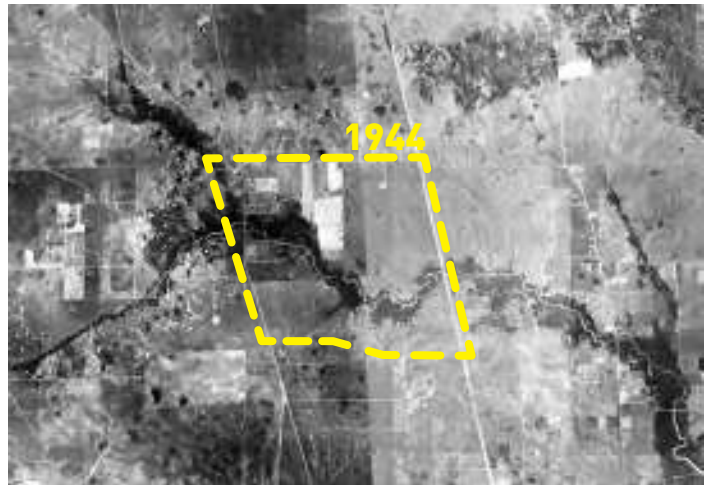
Be the Local / Regional / International Hub of Houston

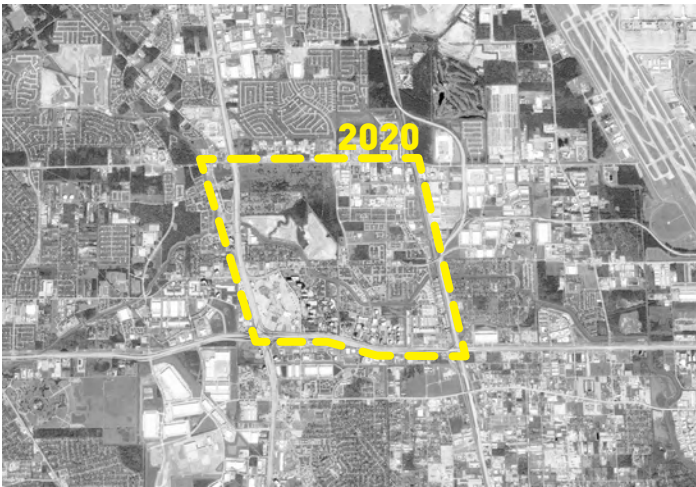
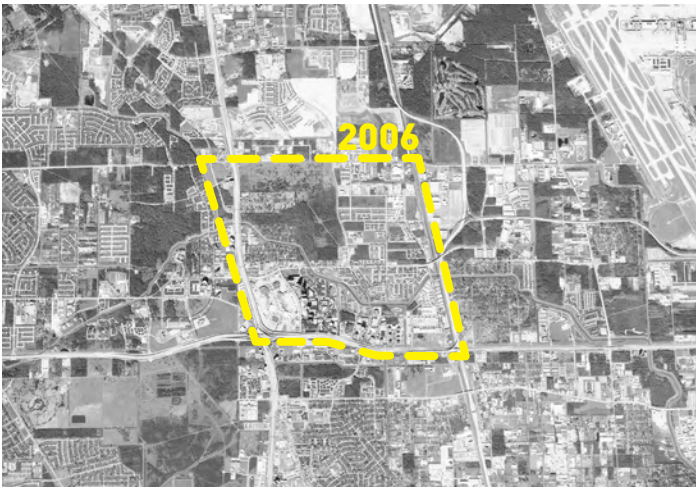
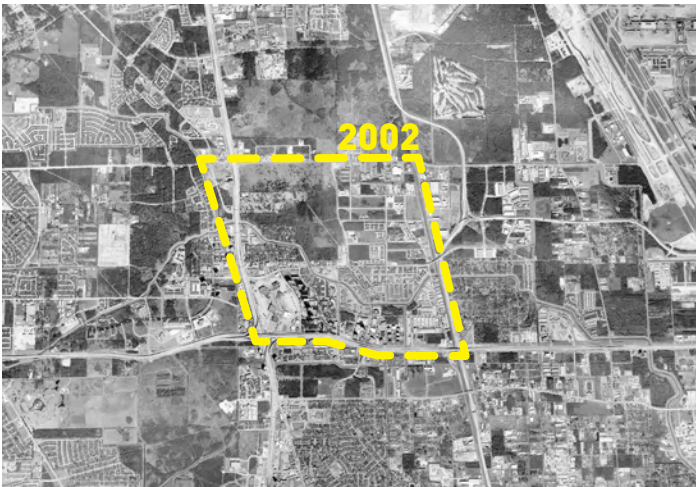
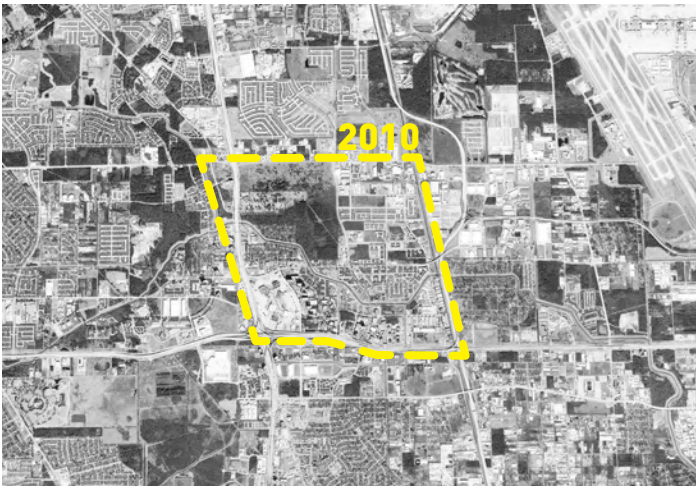
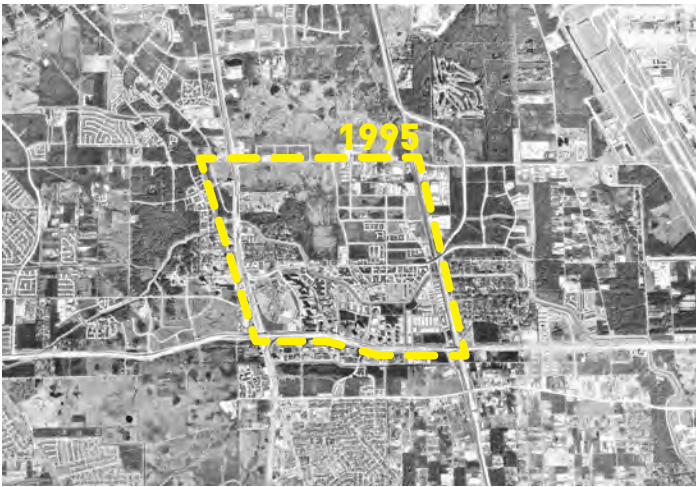
Greenspoint is one of Houston’s major employment centers. Census data shows that people are commuting here from all over Houston. That data also shows that residents of North Houston are commuting to other centers like Downtown and Uptown. This is due to North Houston’s location at the junction of I-45, Beltway 8, and the Hardy Toll Road – giving it excellent roadway connectivity to the region – as well as its role as a hub in METRO’s bus network, with local routes radiating from Greenpoint Transit Center and express service to Downtown Houston.

Greenspoint can strengthen its role as a hub at three scales. It can be a stronger local hub, with retail and services for the residents of the surrounding areas, and offer stronger transit connections (in addition to the already strong roadway connectivity) to get them there. It can be a regional hub, linked to the rest of the metropolitan area with freeway and regional transit, where companies locate for the easy access and where people live because of the opportunities they can access across the region. It can also be an international hub, drawing on its proximity to the Houston Intercontinental Airport to attract firms that want to be connected to the entire world.

The plan proposes 4 projects to strengthen Greenspoint as a hub.

Recommendation 1 is Bus Rapid Transit (BRT) service from Downtown to Greenspoint to IAH, along with a new transit center that connects it to local bus service. This project was included in the METRONext Plan





Introduction

passed by voters in 2019. It would use the managed lanes included in TxDOT's reconstruction plan for I-45, providing high-speed service from Downtown to Greenspoint. In Greenspoint, a new ramp would allow the line to leave the freeway and connect directly into a new transit center. The plan shows two options. One, on the site of Greenspoint Mall, would anchor the mall redevelopment. Because of its proximity to the freeway, it would be able to serve regional express buses, including the current Park-and-Ride routes – as well as local buses and BRT. That means, for example, that Woodlands Express buses could stop here on their way Downtown, allowing those riders to access jobs in Greenspoint or connect them to the airport. The second option, on Green Road, does not require redevelopment of the mall site and offers the same BRT and local bus connectivity. The transit center would offer connectivity to an improved local bus network, with new routes into the surrounding employment areas. Past the transit center, the BRT would follow the center of Greens Road. Here, an additional BRT station would serve as the heart of Greenspoint apartment core, giving those residents access to jobs in Downtown, to the airport, and a connection to the transit center. The new transit lanes on Greens Road would be a part of a complete reconstruction of the roadway that the BRT would follow to access the Hardy Toll Road Airport Connector, creating a very fast trip into the airport. BRT service would be frequent – every 12 minutes or better – all-day, 7 days a week, and stations would have platforms at bus-floor height, comfortable seating, generous canopies, ticket vending machines, and real-time passenger information,

Recommendation 2 is completing the Bayou Greenways. The City of Houston and Houston Parks Board's Bayou Greenways 2020 is completing linear parks and trails along the city's major bayous, enclosing Greens Bayou through the heart of North Houston. These greenways create pedestrian and bike connections to jobs, education, parks, and transit, creating safe, comfortable routes across major barriers like freeways. They also create recreational space for local residents. Because of the shape of Houston's city limits, though, North Houston's piece of the Bayou Greenways is isolated; Greens Bayou upstream and downstream is in unincorporated areas and thus not funded by the city initiative. These gaps should be filled with county and philanthropic funding. Furthermore, off-street greenways in drainage easements and utility corridors can connect Greens Bayou to Halls Bayou, Spring Creek, and the rest of the region.

Recommendation 3 is the redevelopment of Greenspoint Mall. If Greenspoint is to be a hub, this critical site at its center must be revitalized. A developer now has the site under contract; public agencies can work with them to make sure the development integrates with and strengthens the surrounding area. This is a good site for residential (including affordable housing to replace some of the flood-prone complexes to the east), retail, like a grocery store, and new employment. All this should be integrated with transit, walkable streets, a network of bike connections, and new neighborhood scale park space.

Recommendation 4 is an airport economic development plan. North Houston already benefits from its proximity to IAH, one of the few airports in the world with direct flights to all 6 inhabited continents. An economic development plan can be the roadmap for strategies to draw more firms, including recruitment and incentives.

Be a Model for Safe Places to Walk and Bike

Greenspoint is already a place where many people walk and bike. Overall non-car commute mode share is 20%, compared to 14% for the city as a whole. This is due to above average use of transit (which people are walking to) and biking. Notably, this is despite the fact that none of the infrastructure here was designed to be comfortable (or even safe) for people on foot or on a bike. There is a major opportunity to improve the experience of people already walking and biking, and to allow more people to feel like that's a viable option.

Recommendation 5 is a district-wide bikeway network, consisting of both off-street trails and on-street paths, lanes, and designated routes. Other than the one designed for Greens Road – which must be reconstructed for BRT – these can be built within existing street configurations without rebuilding curbs. In addition to the lanes, trails, and paths, safe intersections are critical.

Recommendation 6 is a set of pedestrian improvements, including new sidewalks to fill gaps, improvements to existing sidewalks, and improvement to intersections. One set of these is targeted to create safe routes to schools.

Recommendation 7 is a new set of design standards that will guide the construction of new sidewalks to create safe, attractive streets and paths that integrate green infrastructure. These standards would also guide private development (both new construction and rehabilitation) to ensure connected paths all the way to the front door of apartments, office buildings, and hotels.

Be Defined by a Central Park that Holds Floodwater

Greens Bayou flows – and often overflows – through the center of Greenspoint. The bayou has flooded several times in the last decade, and several apartment complexes are directly in the floodway. This is a problem to be solved; it is also an opportunity. A park built where those flood-prone complexes are now, designed to function like a natural floodplain does, can hold floodwater, and keep it out of the rest of the neighborhood. That park can also become a new heart for the neighborhood, creating space for playgrounds, sports fields, events spaces, trails, and nature. All this can be coordinated with a housing program that rebuilds apartments close to the new park and on higher ground (and thus dramatically less likely to flood) and adds the new units to replace those that are in the floodplain.

Recommendation 8 is this new park.

Be a Place that Offers Accessible, Affordable Housing for the Region

Greenspoint is a major source of affordable housing for the Houston region. There are close to 7,000 rental units in the study area, generally renting for approximately \$500 to \$1,000 a month depending on number of bedrooms. As the region continues to grow and 1970's and 1980's complexes age, Houston is increasingly facing an affordable housing crisis. Greenspoint, with its well-connected location, is a good place for affordable housing. But, the housing that exists today is often not in good condition. The study recommends initiatives to maintain and expand the housing supply while increasing its quality.

Recommendation 9 is a buyout / buy-in program that ensures that residents in complexes that currently flood or that are in disrepair can move to alternate housing that is equally accessible.

Recommendation 10 is a program to support the development of new housing near transit.

Implementation

The BRT, the mall redevelopment, and the new park in particular, are projects that could completely transform North Houston. These projects, like the other recommendations, will require multiple sources to fund them and multiple entities (public and private) to implement them. They will also require a vision to see them through.

The North Houston District would not be the lead implementation agency for these major projects. But, it can be an advocate, communicating the vision and

continuing to keep agencies focused on it. It can be a coordinator that ensures agencies work together to create projects that add up to more than their part. It can help operate the completed projects. Each of the recommendations and the summaries in the implementation section show how different entities can work together.

Greenspoint is at the brink of enormous opportunities that could redefine the area for the decades to come. We can imagine the heart of the district transformed from a dying mall to an active center of retail, offering services, employment, and residential. We can imagine a park filled with families and nature, bustling on a sunny day, but ready to absorb and constrain floods when the rain starts falling. We can imagine fast, reliable transit to Downtown, the airport, and the rest of the region. We can imagine a place that people of all income levels are proud of. The plan can be the beginning of a new North Houston.

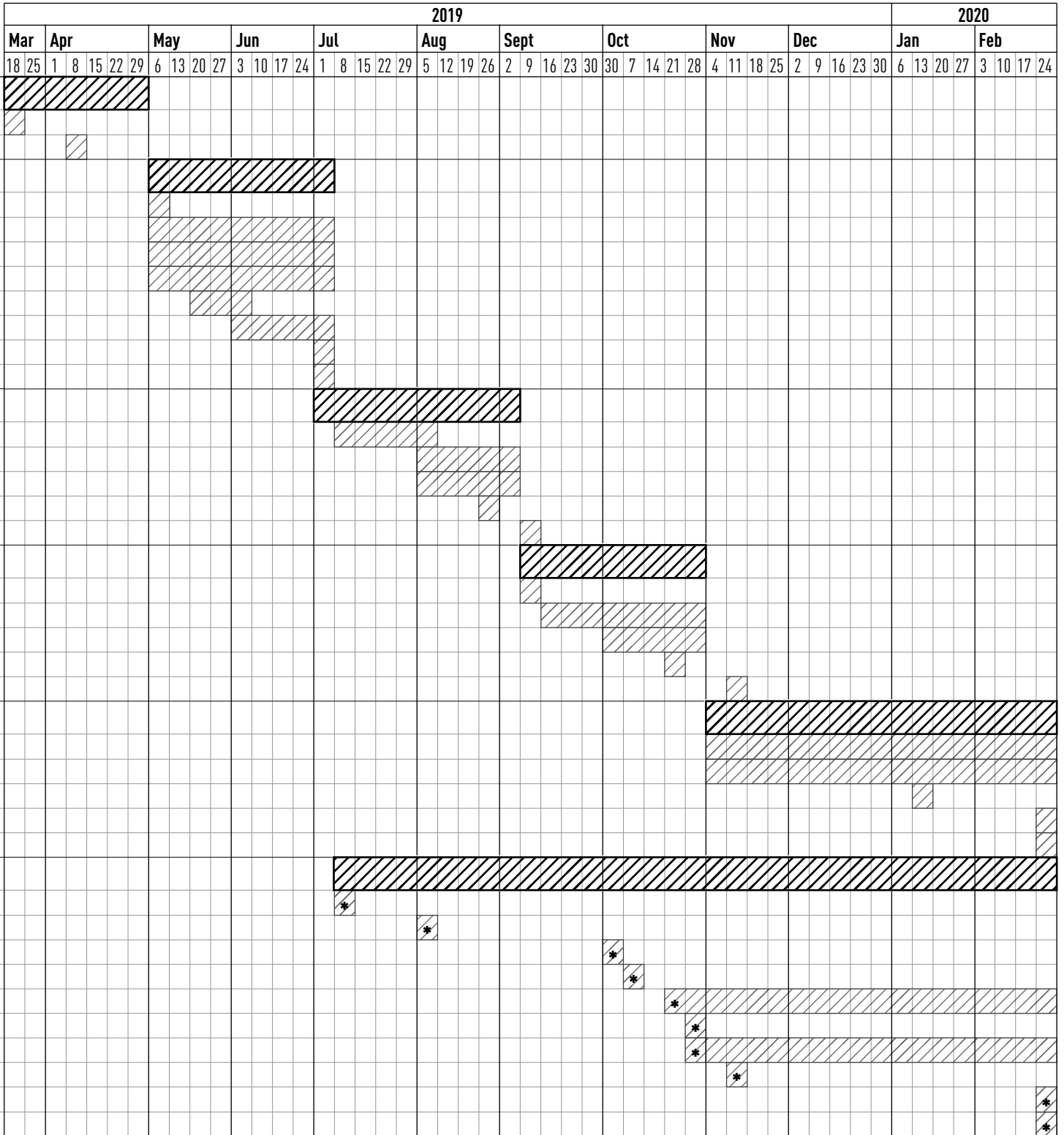
Introduction

Process and Timeline

The project process began in May 2019. Shortly after the kick-off meeting, a stakeholder group composed of employers in the area, agencies, local jurisdictions and organizations invested in the area was identified. This group was present at every client meeting since the beginning of this process. They helped identify and vet the goals and projects in this plan. The nine-month process also included public outreach. Two public meetings were held and the attendees had the opportunity to give feedback on the goals and the projects. Other ways the team reached people that live, work, and visit North Houston was through on-line surveys, door-to-door surveying, and attendance to on-site North Houston events.



0 Pre-project		
Pre-meeting		
Scope Meeting		
1 Needs Assessment		
Kick-off Meeting		
Review Recommendations and Outcomes from Previous Studies and Reports		
Gather Available Economic Data from Previous Studies		
Map and Document Information from Existing Sources or from Field Visits		
Site Visit		
Summarize Information		
Draft Presentation to Client for Review		
Draft Report to Client for Review and Comment		
2 Conceptual Plan and Recommendations		
Prepare for Workshop		
Develop and Document Concepts and Strategies of Conceptual Plan		
Summarize Information		
Draft Presentation to Client for Review		
Draft Report to Client for Review and Comment		
3 Conceptual Designs for Specific Recommendations		
Internal Workshop to Develop Recommendations		
Document Recommendations with Graphics and Text		
Summarize Information		
Draft Presentation to Client for Review		
Draft Report to Client for Review and Comment		
4 Implementation Plan for Proposed Recommendations		
Refine Ideas for Projects, Policies, and Programs		
Create Implementation Plan Matrix		
Draft Report to Client for Review and Comment		
Final Client Meeting		
Final Report to Client		
5 Public Engagement	Location	Dates
Kick-off Meeting with Study Stakeholders	City North Conf. Center	Jul 11
Stakeholder Workshop	City North Conf. Center	Aug 6
Meeting Promotion at National Night Out	Tom Wussow Park	Oct 1
Public Meeting No. 1	Greenspoint Elementary	Oct 7
Online Survey		Oct 21
NHD Fall Business Community Breakfast	Hyatt Regency Hotel	Oct 31
Survey Handout		Nov 1
Stakeholder Workshop	Hilton Houston North	Nov 15
Public Meeting No. 2	City North Conf. Center	Feb 25
Launch Event	City North	Feb 27



Introduction

Results

Public Engagement

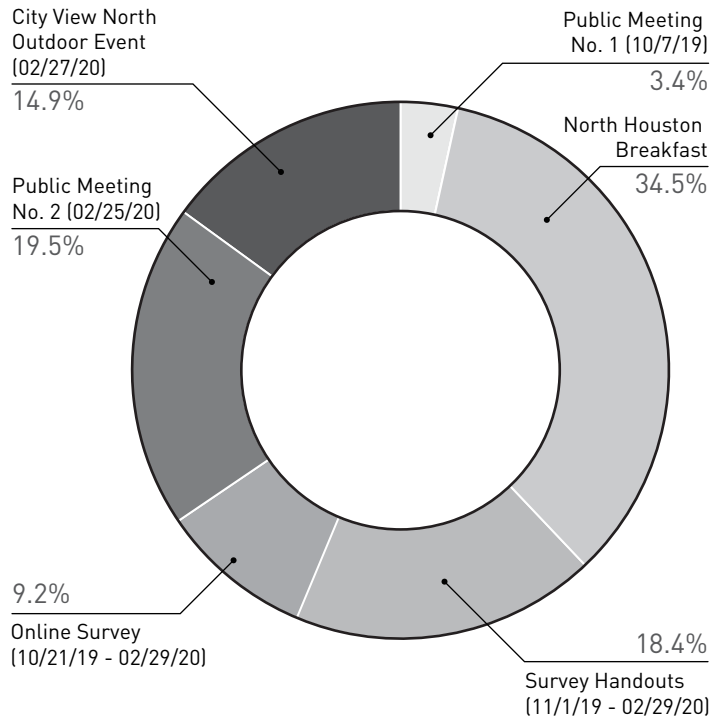
The public engagement process occurred concurrently with the development of the plan. The plan sought to actively involve the public in the decision-making process, allowing anyone to weigh-in on the vision for the area. To do so, it was necessary to provide a clear and objective representation of all goal and recommendation options, and to allow for alternate ideas and aspirations.

A core group of local stakeholders and community leaders were identified to provide guidance for the research, development, and future implementation of the plan. This group helped with gathering resources, data, expertise, and public attendance.

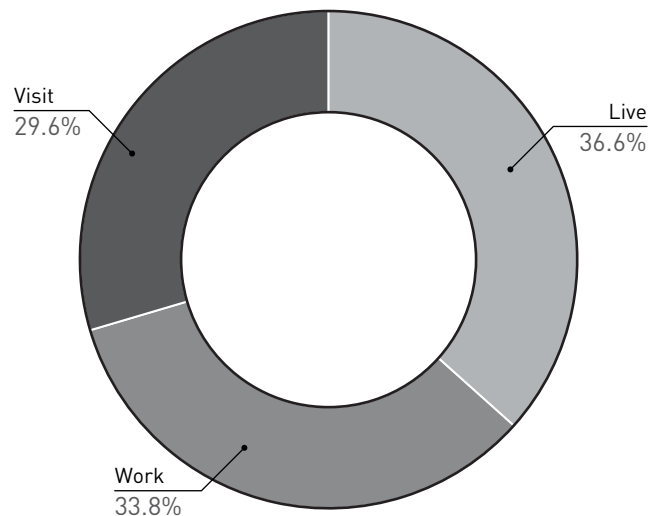
Three groups of the public were targeted for further input on this study:

- People that live in or near the study area.
- People that work in on near the study area.
- People who visit the area consistently (e.g., for places of worship, visiting friends or family members, or attending the skate park).

Public Outreach



Live, Work, & Visit



Make all commercial development sustainable



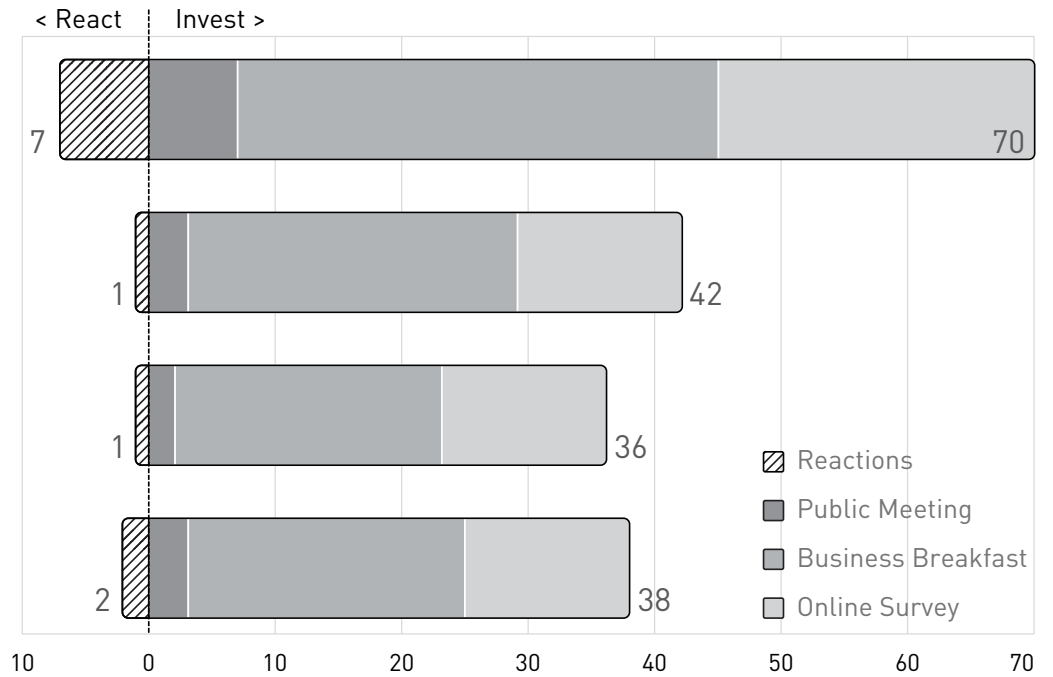
Goals

Be the Local / Regional / International Hub of Houston

Be a Model for Safe Places to Walk and Bike

Be a Place That Offers Accessible, Affordable Housing for the Region

Be Defined by a Central Park That Holds Flood Water



Recommendations

1 Build Downtown-Greenspoint-Airport BRT with new transit center & reconstruction of Greens Road

2 Complete the Bayou Greenways

3 Redevelop Greenspoint Mall

4 Create an Airport Based Economic Development Plan

5 Create a Comprehensive North Houston Bikeways Network

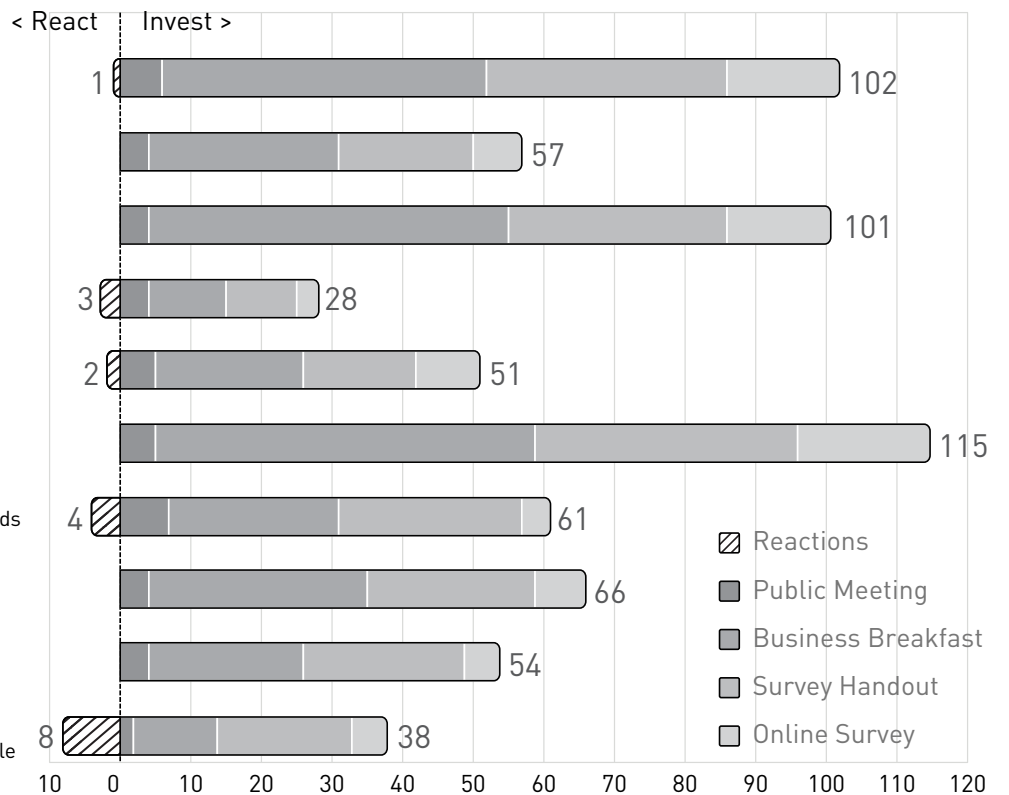
6 Upgrade Priority Sidewalks Including Safe Routes to School

7 Create Green Streets | Urban Design Standards

8 Create a Central Park along Greens Bayou

9 Implement Buyout / Buy-In Program That Helps Residents Who Undergo Buyouts Transition to More Resilient Housing Options

10 Implement Programs that Encourage rehabilitation & new development of affordable units near transit corridors and centers



Results

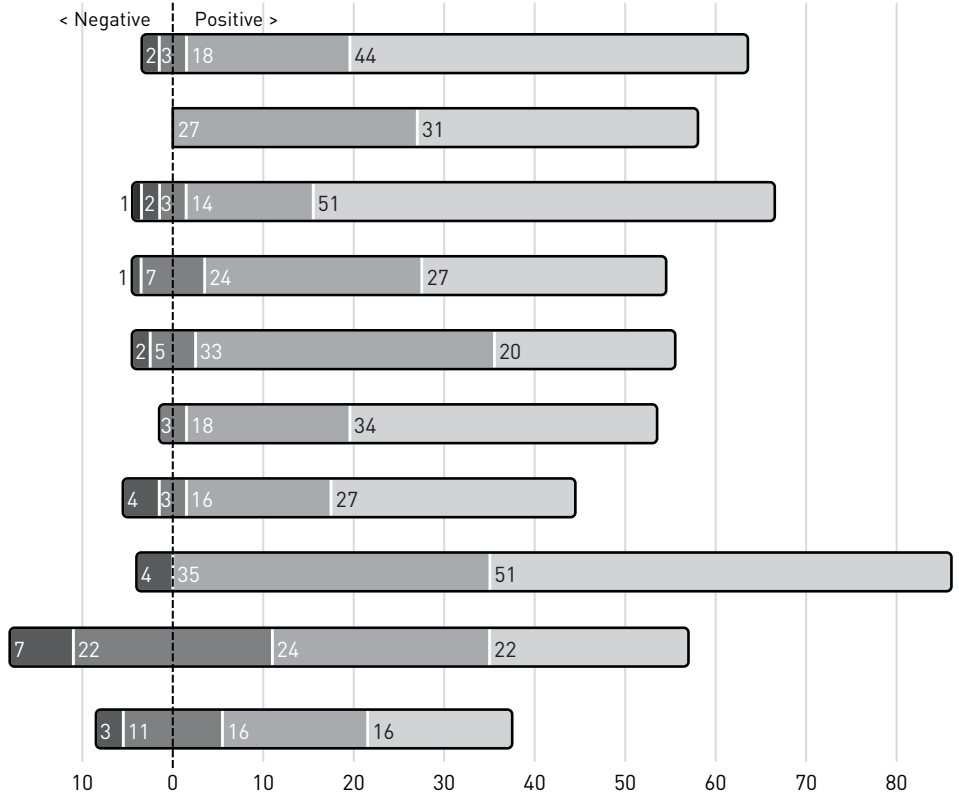
The consultant team took multiple avenues to engage these three groups during the nine-month process. Two public meetings were held in the study area, a presentation to employers and employees and the opportunity for them to weigh in on the study's goals and projects, two survey-monkey polls were available on North Houston District website, and door-to-door surveying was done in dense neighborhoods in the study area. All groups were presented with various activities for them to weigh in on how the study area could improve for them and then were asked to prioritize the goals and recommendations, discuss their initial reactions, let us know of their concerns, and also provide other ideas.



Recommendations

I disagree with it
 I'm concerned
 I'm neutral
 I support it
 I'm excited

- 1 Build Downtown-Greenspoint-Airport BRT with new transit center & reconstruction of Greens Road
- 2 Complete the Bayou Greenways
- 3 Redevelop Greenspoint Mall
- 4 Create an Airport Based Economic Development Plan
- 5 Create a Comprehensive North Houston Bikeways Network
- 6 Upgrade Priority Sidewalks Including Safe Routes to School
- 7 Create Green Streets | Urban Design Standards
- 8 Create a Central Park along Greens Bayou
- 9 Implement Buyout / Buy-In Program That Helps Residents Who Undergo Buyouts Transition to More Resilient Housing Options
- 10 Implement Programs that Encourage rehabilitation & new development of affordable units near transit corridors and centers



Introduction

Project Goals and Recommendations

The Framework

Early in the project, four project goals were developed to set a vision for the District, the goals came out of looking deeply at existing conditions and finding the gaps, looking at work that is already being done here, and building on the District's strengths. A series of recommendations were identified to support this vision.

Goals

The project goals represent a long-term vision for the project area with the intent to create a better place for the residents, workers, and visitors:

- Be the Local | Regional | International Hub of Houston
- Be a Model for Safe Places to Walk and Bike
- Be Defined by a Central Park that Holds Floodwater
- Be a Place that Offers Accessible, Affordable Housing for the Region

Existing Conditions

The team did a deep dive into the historical context, existing resources, gaps, and areas of opportunity. The study of the area involved collecting data from various sources, then consolidating and analyzing the information. Additionally, field research and feedback from community members and local experts helped identify missing information.

Recommendations

Ten ambitions, yet possible projects that support the project goals and will make it a better place to live, a better place to do business, and a stronger center for the surrounding neighborhoods are outlined in detail.

Type

The recommended projects are either a "Program" or a "Project". Programs are non-physical actions (develop a plan, create standards, implement policies) whereas projects are built changes (Create a park, fix sidewalks, build bike lanes).

Timeline

All ten recommendations have a timeline. Short-term" refers to projects or programs that can be started within the next 1 to 5 years. "Medium-term"

projects or programs are identified as 5 to 10 year projects. These recommendations may take longer to commence due to their complexity or their reliance on other recommendations being completed. "Long-term" recommendations require more coordination and more funding and can take more than 10 years.

District's Role

In this plan, the District is assigned a roll for each of the projects. "Advocate" means that the district acts as a stakeholder, offering public support for a project and providing input to shape it so that it best supports the district's goals. "Initiate" means the district helps define a project and get it started. "Participate" means that the district manages, funds, builds, or operates a project, perhaps in conjunction with other entities. In some cases, the district may have more than one role for a given recommendation.

Lead Agency

The "Lead Agency" speaks to the entity(s) with the responsibility of directorial duties. The agencies include:

- City of Houston
- Harris County
- Houston Airport System
- Houston Parks Board
- North Houston District
- METRO
- Private Developer

Livability Principles Supported

As a means of fostering stronger, more sustainable local economies, the U.S. Department of Housing and Urban Development (HUD), U.S. Department of Transportation (DOT), and U.S. Environmental Protection Agency (EPA) worked together to develop six "Livability Principals". These principals are as follows:

1. Provide More Transportation Choices
2. Promote Equitable, Affordable Housing
3. Enhance Economic Competitiveness
4. Support Existing Communities
5. Coordinate Policies and Leverage Investment
6. Value Communities and Neighborhoods

Jump Start Action Steps

The “Jump Start Action Steps” outline the initial actions required to get a project going for each recommendation. This includes coordination between different organizations, developing goals for new initiatives, and discussing opportunities with community leaders.

The following list represents the project goals and the recommendations that support them. The goals and recommendations were developed with guidance from study area representatives, community members, stakeholders, and the consulting team.

Be the Local | Regional | International Hub of Houston

01 Build Downtown-Greenspoint-Airport Bus Rapid Transit with New Transit Center and with the Reconstruction of Greens Road

02 Complete the Bayou Greenways

03 Redevelop Greenspoint Mall

04 Create an Airport Based Economic Development Plan

Be a Model for Safe Places to Walk and Bike

05 Create a Comprehensive North Houston Bikeways Network

06 Upgrade Priority Sidewalks Including Safe Routes to School

07 Create Green Streets / Urban Design Standards

Be Defined by a Central Park that Holds Floodwater

08 Create a Central Park along Greens Bayou

Be a Place that Offers Accessible, Affordable Housing for the Region

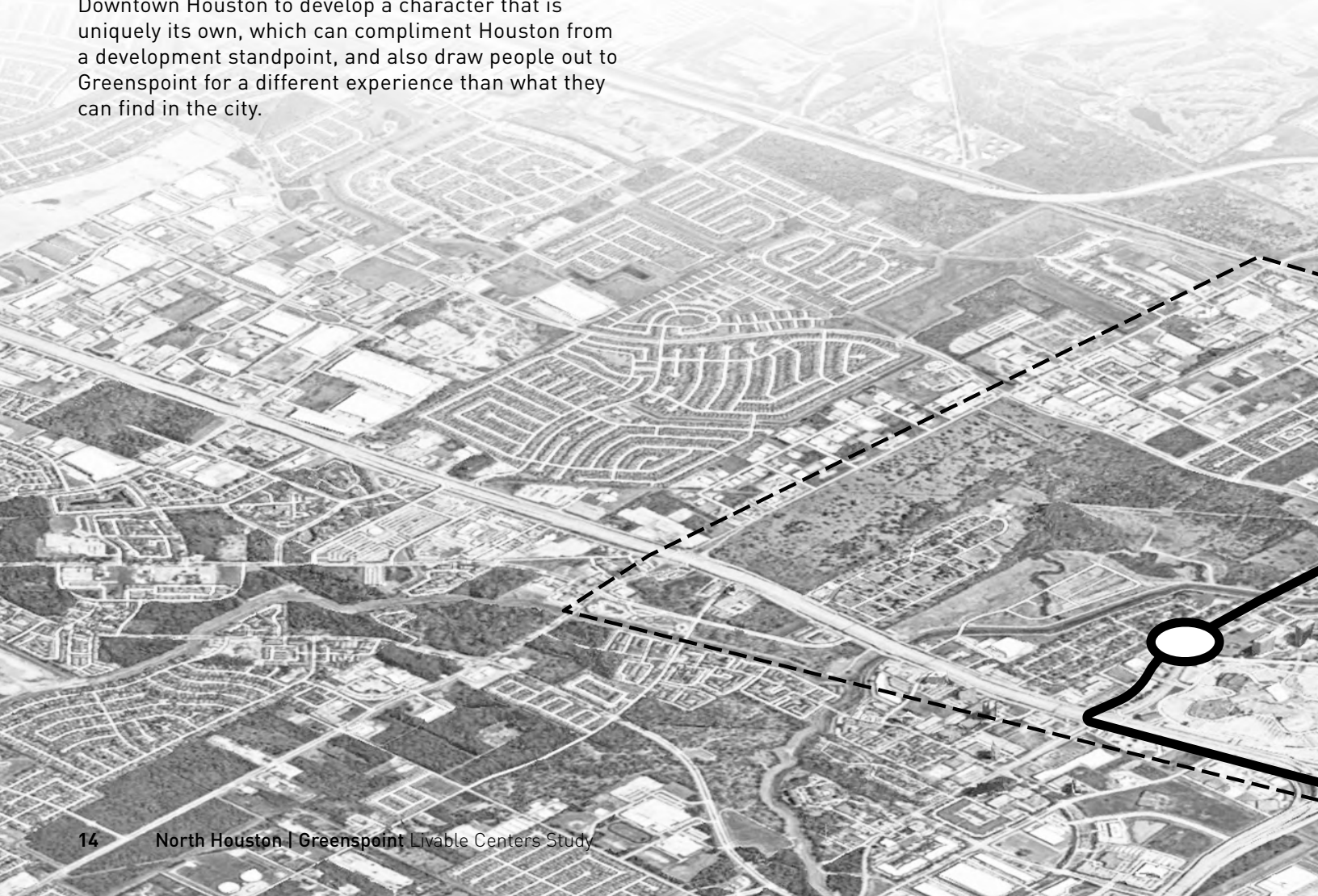
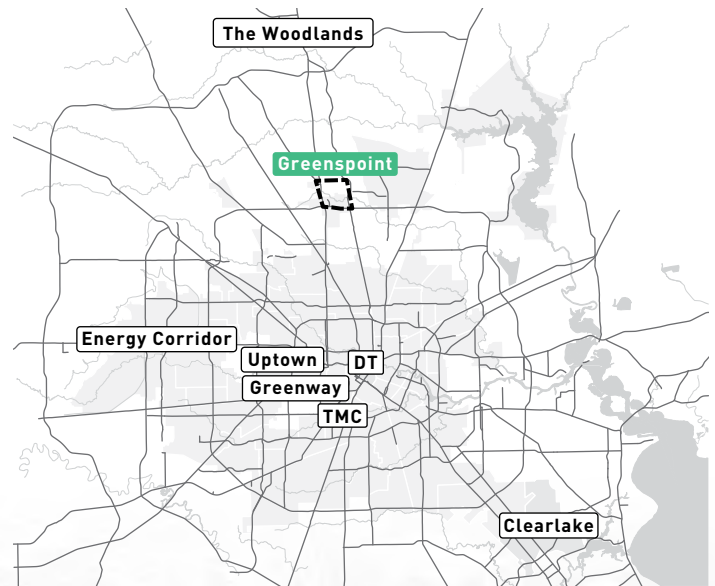
09 Implement Buyout / Buy-In Program That Helps Residents Who Undergo Buyouts Transition to More Resilient Housing Options

10 Implement Programs That Encourage Rehabilitation and New Development of Affordable Units near Transit Corridors and Centers

BE THE LOCAL | REGIONAL | INTERNATIONAL HUB OF HOUSTON

Greenspoint is well located. It offers jobs to people from all over the Houston region, it is located at the junction of several major regional freeways — I-45, Beltway 8, and the Hardy Toll Road — which provide quick access to Downtown Houston and the region, it is serviced by multiple bus routes that connect it regionally to most of the major employment centers including Downtown, Aldine, Greenway, TMC, and the airport, it has connections to Houston's bike trail network, and it is connected ecologically to the region through the bayous.

Greenspoint is over 13 miles away from the center of Downtown Houston, but the highways, bike routes, transit, and bayous are important in keeping Greenspoint connected and relevant to the rest of Houston. This distance and proximity to the airport also give Greenspoint a unique opportunity to develop somewhat independently as well. While it partially lies within the city limits, it is far enough away from Downtown Houston to develop a character that is uniquely its own, which can compliment Houston from a development standpoint, and also draw people out to Greenspoint for a different experience than what they can find in the city.



EXISTING CONDITIONS

Employment	16
Regional Transit Connections	18
Airport Centric Development	20
Mall Vacancy	24
Office Vacancy	26
Regional Ecology	28

RECOMMENDATIONS

1	Build Downtown-Greenspoint-Airport Bus Rapid Transit with New Transit Center and with the Reconstruction of Greens Road	30
2	Complete the Bayou Greenways	42
3	Redevelop Greenspoint Mall	46
4	Create an Airport Based Economic Development Plan	50



Existing Conditions

Employment

People who work in Greenspoint commute there from all over the region, with forty-seven percent traveling 10 to 20 miles to get to work and nineteen and a half percent traveling more than 50 miles to work. However, the largest concentrations of Greenspoint workers live north of Downtown between I-45 and US 290. The most concentrated areas where Greenspoint workers live are Greenspoint, Spring, and Montrose, followed by Heights and The Woodlands.

In 2015, Greenspoint had a population of 6,600 people and employed over 25,600 people. Of the people who lived there, only 250 (3.7 percent) of the residents of Greenspoint worked there. That means that ninety-eight percent of the people who work in Greenspoint don't actually live there. Although the majority of Greenspoint residents are Hispanic or Latino, seventy-eight percent of the workers in Greenspoint are White and Not Hispanic or Latino, and sixty-eight percent make over \$50,000 a year.

This indicates that the majority of jobs in Greenspoint are white-collar, high-paying jobs that likely require a higher skill or educational level than the residents of Greenspoint currently have, and that there are not enough lower-wage jobs or educational institutions for residents who are entering or currently in the workforce.

Increasing access to Lone Star College - Greenspoint Center and the Tulsa Welding School & Technology Center, both of which are located just outside the study area, could help increase the number of people who are eligible for the jobs that are currently offered. Increasing the number of lower-wage jobs in the area could also allow the residents to work closer to where they live and help give the area a better sense of community and walkability.

US Census Bureau, OnTheMap Application, 2015.

Distance Traveled to Work in 2015

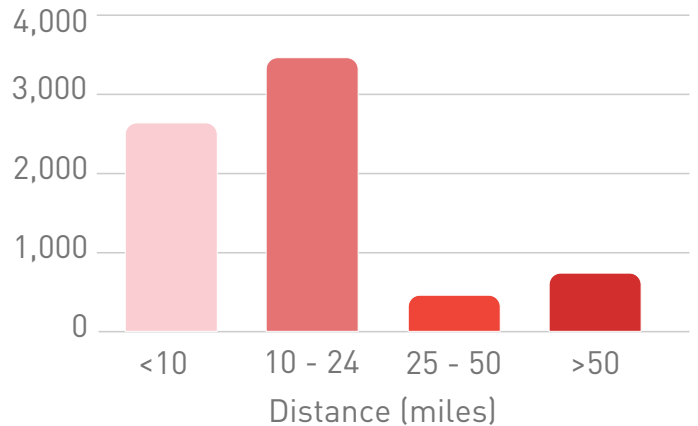


Figure 1.2 Residence of Greenspoint Workers
U.S. Census Bureau, OnTheMap Application, 2015.

Inflow / Outflow for Jobs in Greenspoint

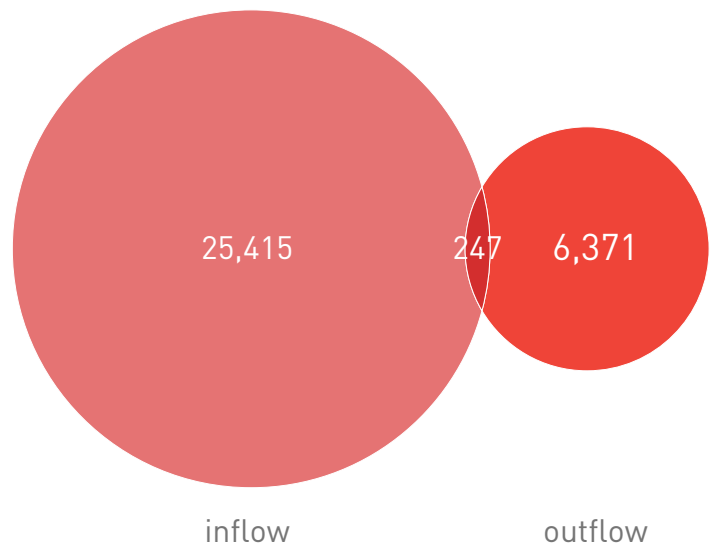


Figure 1.3 Residence of Greenspoint Workers
The Venn diagram represents from left to right: the inflow (the number people who commute to Greenspoint for work), the number of people who live and work in Greenspoint, and the outflow (the number of people who live in Greenspoint, but leave to go to work)

U.S. Census Bureau, OnTheMap Application, 2015.

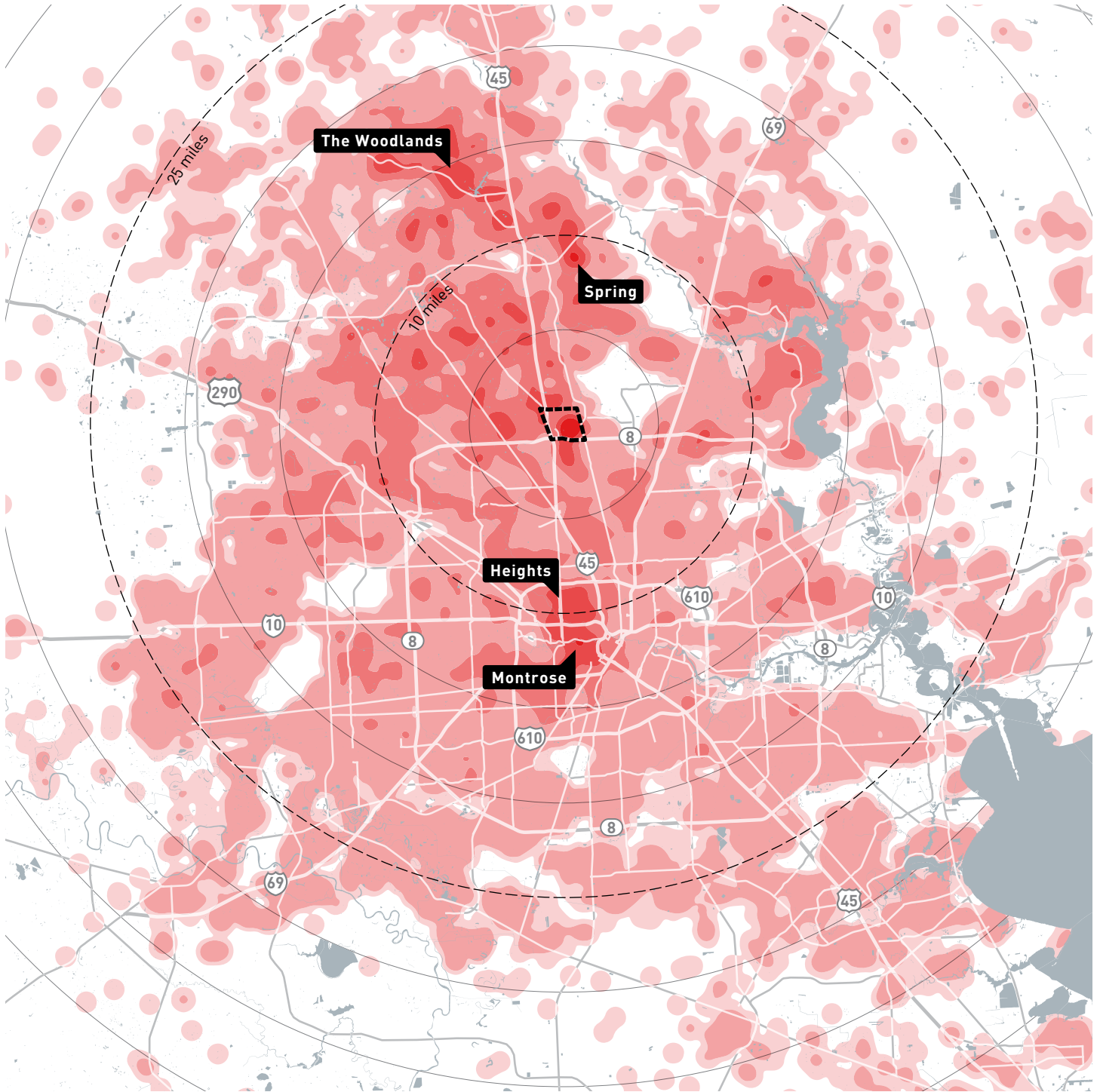
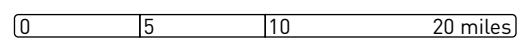
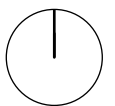


Figure 1.4 Residence of Greenspoint Workers
 Heat map of the place of residence by census block for all Greenspoint workers in 2015. The most concentrated areas where Greenspoint workers live are Greenspoint, Spring, and Montrose, followed by Heights and The Woodlands.

Residences of Workers

- More Residents
- Less Residents
- Streets
- Water
- Site



Existing Conditions

Regional Transit Connections

Six bus routes, both local and express, service Greenspoint and connect it to other major employment centers. As Figure 1.4 showed, the most concentrated areas where Greenspoint workers live are Greenspoint, Spring, and Montrose, followed by Heights and The Woodlands. Buses running to Greenspoint stop in both Montrose and Heights, but those areas could use some additional service to provide better non-car transportation for commuters to Greenspoint. Spring and The Woodlands are not served at all by the buses that stop in Greenspoint.

On the other hand, the residents who live in Greenspoint and leave to go to work most commonly work in Aldine Education Center, IAH, and Downtown (see Figure 1.1 in the affordable housing section of this document). These employment centers are all well covered by the transit routes that stop in Greenspoint, making it very convenient for Greenspoint residents to get to work, but less so for those trying to commute to Greenspoint to work. Overall, for being as far away from Downtown as Greenspoint is, it is surprising well served by transit.

There are also plans for a Bus Rapid Transit (BRT) system to follow I-45 from Downtown to the airport with a stop at the transit center in Greenspoint, which will strengthen transit connectivity to Downtown and decrease travel times.

Travel Time from Greenspoint Transit Center to Key Destinations

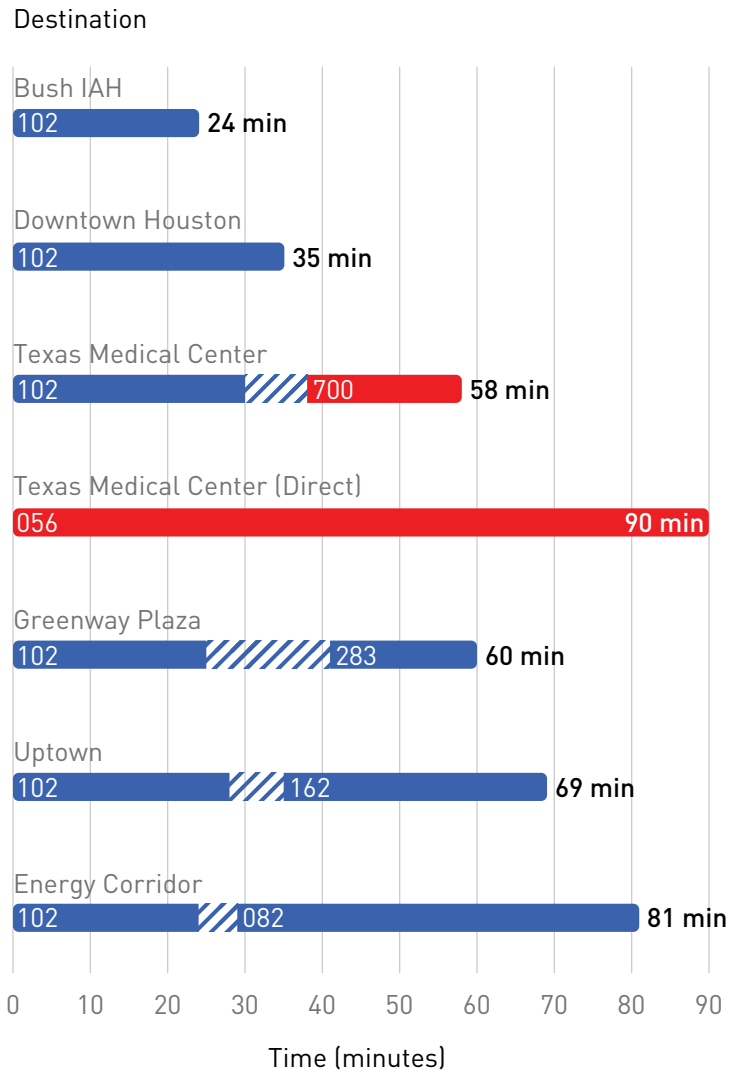


Figure 1.5 Transit Travel Times

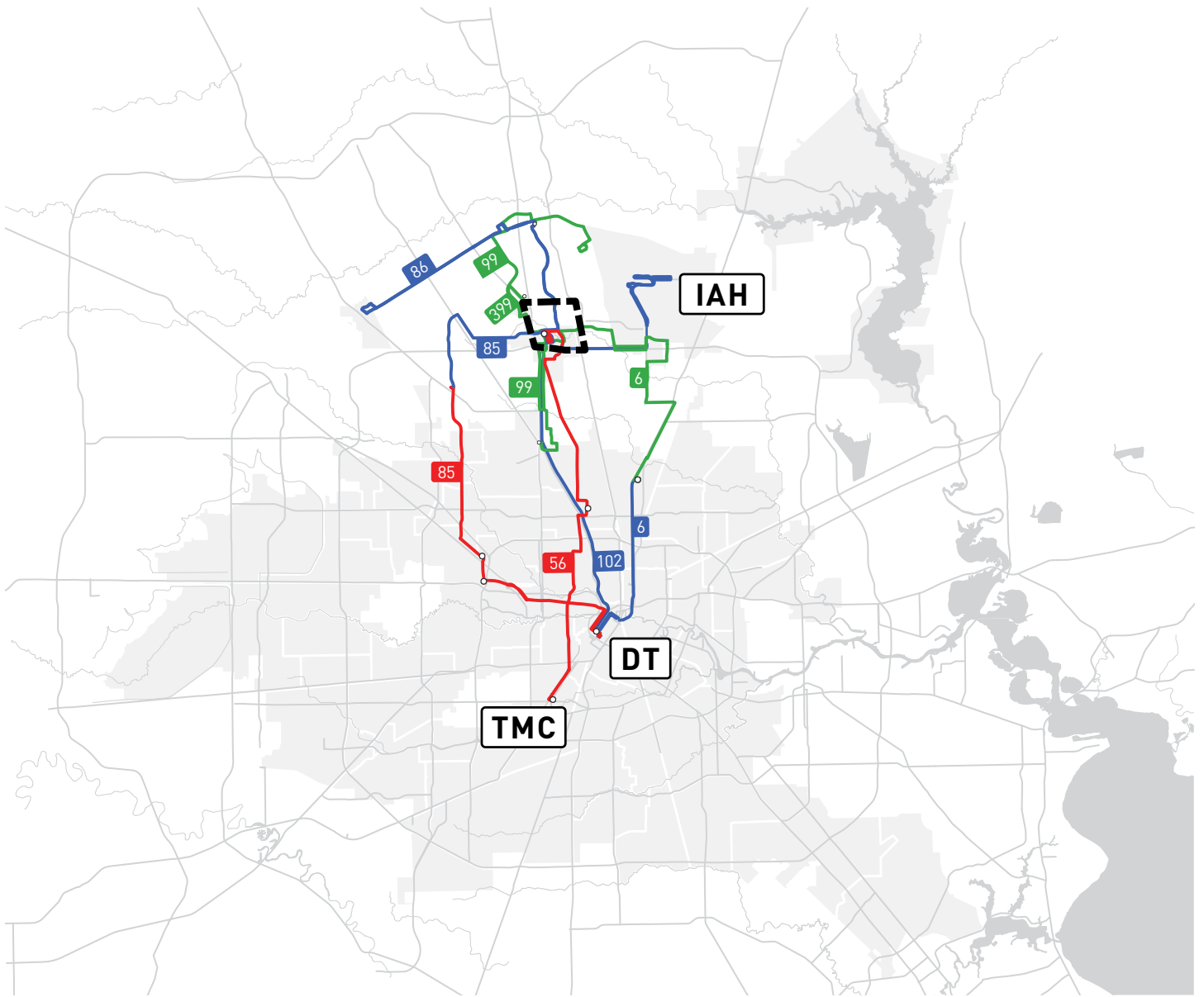


Figure 1.6 Transit Connections to Greenspoint
 Greenspoint bus routes connect Greenspoint to other major employment centers.

Existing Conditions

Airport Centric Development

Greenspoint is located within four miles of George Bush Intercontinental Airport (IAH), and is connected to IAH easily by car via the Beltway 8, by bus, and will be connected to the airport by a proposed BRT in the future. Greenspoint's proximity and multi-modal connectivity to the airport places it in a great position to become an airport-centric development.

An airport-centric development, also called an "aerotropolis," is a fully functional city located near or around an airport, focused on the idea of international connectivity.

DFW Airport

The Dallas/Fort Worth (DFW) airport (Figure 1.10) is a good example of this kind of development. The airport is located at the midway point between Dallas and Fort Worth—approximately 17 miles away from either city—and has drawn businesses and corporations to develop there because of the access to the airport. Development started when American Airlines located a hub near DFW to reduce costs, and other corporations followed suit and eventually so did developers of mixed-use commercial space, including retail, recreation, hotels, convention centers, and rent-able office space. The airport is also connected to both major cities by light rail and BRT, as well as major highways. In 2013, a study revealed that DFW had added 148,000 new jobs and contributed \$31.6 billion to the economy of the region. DFW also originally bought more land than they ended up needing and recently began developing that land themselves. The airport currently has plans for new mixed-use commercial, retail, and industrial development.

Amsterdam Schiphol Airport

Amsterdam Schiphol Airport (AMS) (Figure 1.11) is one of the first airports to focus on the idea of the aerotropolis. The airport is located outside of Amsterdam in an area that was primarily agricultural, but is connected to Amsterdam via high speed rail and to surrounding areas via BRT. Schiphol recognized an opportunity to become a business city when it gained financial independence from the government in the early 1990s. In conjunction with a large airport remodel and expansion, the airport took on the role of developer and built several office buildings which became corporate headquarters and a World Trade Center, a hotel, and a convention center above its new parking garages, and successfully integrated them with the airport itself.

This move set the area around the airport up for additional development, including several corporate offices and business parks along the major transportation routes. The most notable of these developments is Zuidas, which is located approximately two miles from the airport or a six-minute train ride and provides a large portion of the housing for the airport developments as well as additional office, hotel, and commercial space.

Greenspoint

Similar to DFW and Schiphol, IAH is located 16 miles from Downtown Houston. Greenspoint is one of three areas within four miles of the airport—the other two being Humble and Aldine, but has yet to capitalize on the potential of its location and connectivity to the airport. Like other airport developments, Greenspoint is located far enough away from Houston's Central Business District that it could compliment Houston's Downtown rather than compete against it, and could cater to visitors who value proximity to the airport and who don't necessarily need to travel all the way in to Houston to do their business. This type of development could include hotels, rent-able office space, worker housing, retail, dining options, and recreational activities and outdoor space which could benefit visitors as well as residents.

Greenspoint already has some hotels and a large amount of rent-able office and warehouse space, but it could do a better job of updating those spaces and marketing their value and availability by adding amenities such as shopping, restaurants, and recreational activities along a network of walking and biking paths for easy access. Many developers and property owners have taken the initiative to implement these already. This would make new and existing hotels and office space more desirable and help attract people and businesses to the area and allow Greenspoint to capitalize on its proximity to the airport area.

Kiger, Urban Land Magazine, "Evolution of and Aerotropolis," Oct. 27, 2016.

Kloos and Maar, "Schiphol Architecture: Innovative Airport Design," 1996.

Banai, The Journal of Transport and Land Use, "The Aerotropolis: Urban sustainability perspectives from the Regional City," 363-364, v10, no 1, 2017.

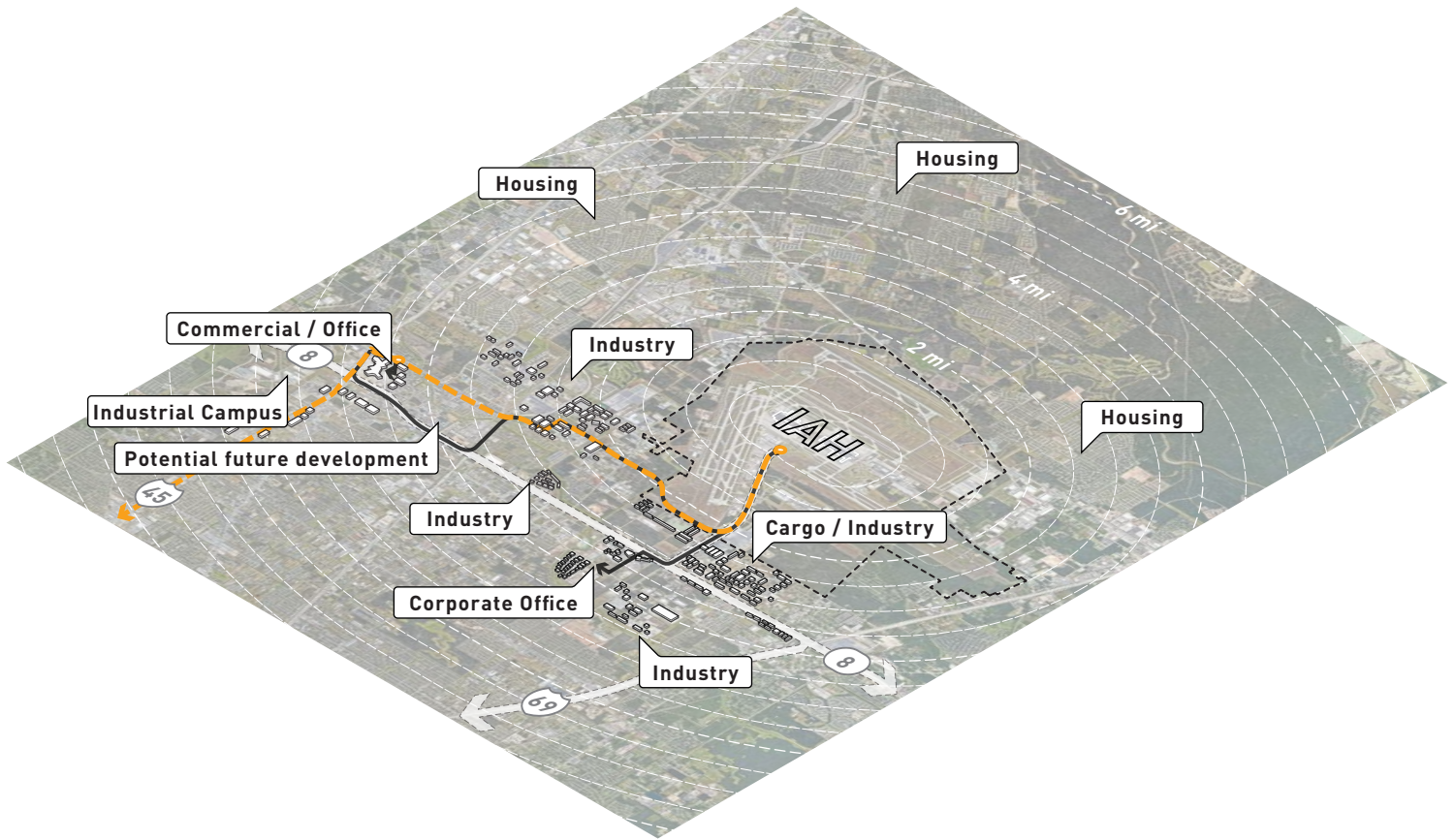
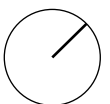


Figure 1.7 IAH Airport Development

Greenspoint is located near IAH and has the potential to develop and attract airport-centric economic development and urban growth.

Airport Connectivity

- ⋯ Routes from airport to region
- Routes from airport to developments
- Proposed BRT routes
- Proposed BRT stop / station
- Airport boundary



0 1/2 1 2 miles

Existing Conditions

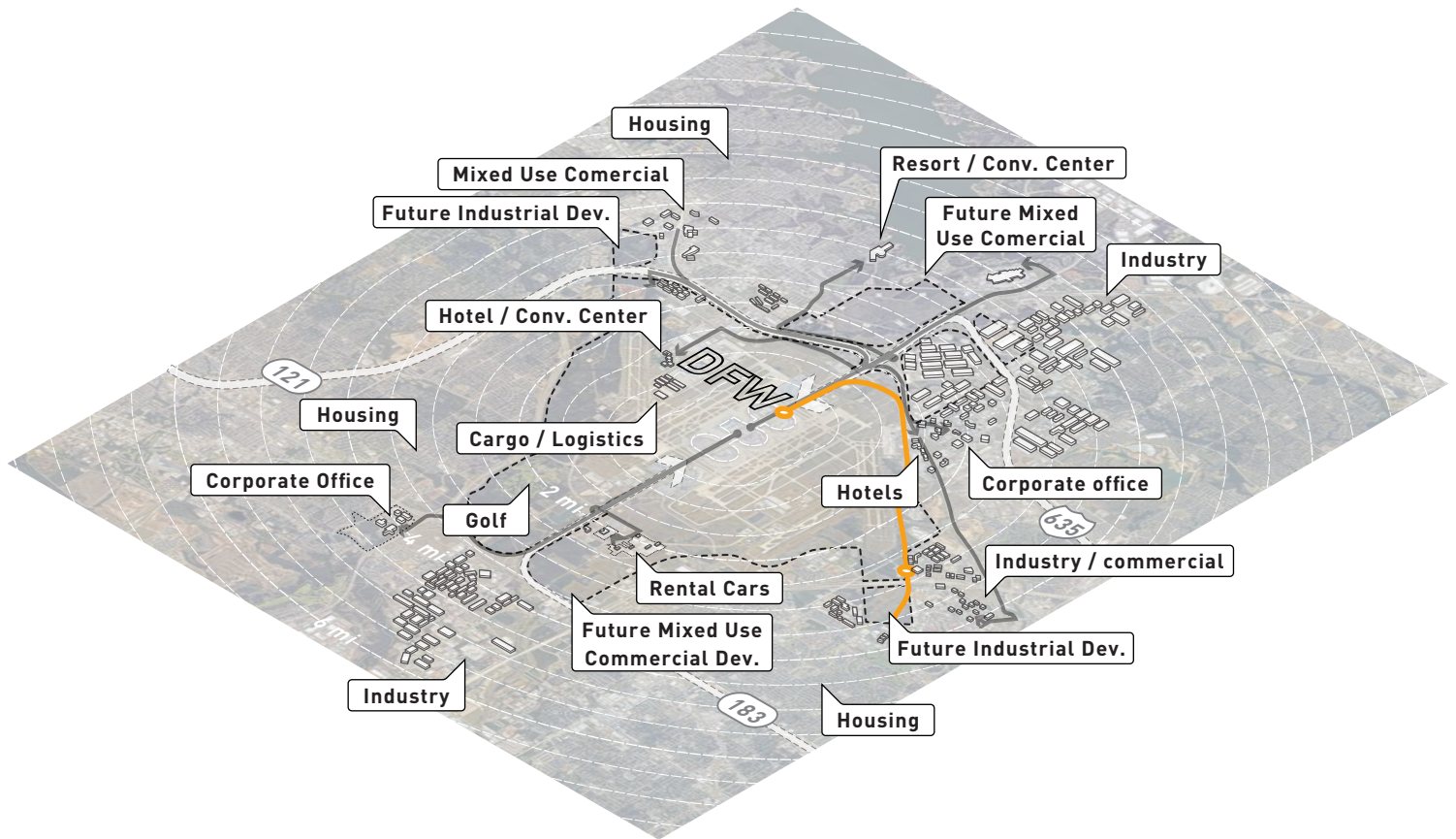
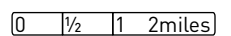
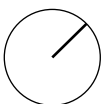


Figure 1.8 DFW Airport Development

DFW Airport is a particularly successful example of an aerotropolis which acts as its own city and continues to be a strong source of jobs and economic wealth for the region.

Airport Connectivity

- Routes from airport to region
- Routes from airport to developments
- Rail and BRT routes
- Rail and BRT stop / station
- Airport boundary



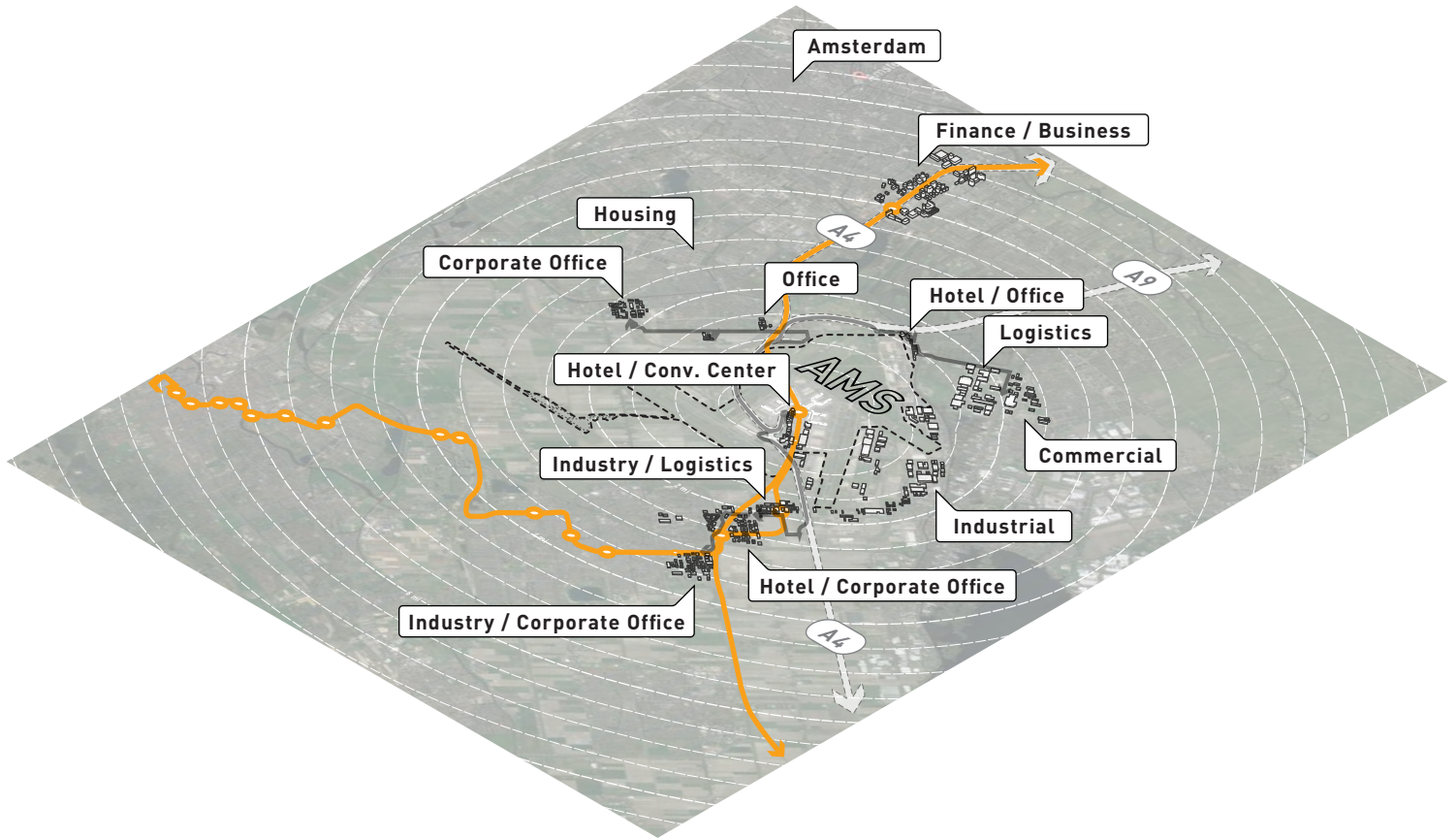
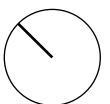


Figure 1.9 AMS Airport Development

The Amsterdam Schiphol Airport is one of the first airports to embrace airport-centric development, starting at the airport itself and developing outward along major transit routes.

Airport Connectivity

- Routes from airport to region
- Routes from airport to developments
- Rail and BRT routes
- Rail and BRT stop / station
- Airport boundary



0 1/2 1 2 miles

Existing Conditions

Mall Vacancy

At one point, Greenspoint Mall was the center of Greenspoint's activity, and despite its downfall, is still part of the core of Greenspoint and is surrounded by the most successful commercial and office centers in the region. The mall began its decline in the 1980s when other malls were built nearby and people started moving away.

The mall has been declining since then and is now only forty-five percent occupied. Of the almost 1,000,000 square feet of retail space in the mall, 670,000 square feet is vacant, including four of the original six anchors. In one of the anchors, what used to be a JC Penny's is now a Premiere Cinema, and a Fitness Connection took the place of the former Mervyn's anchor. The cinema is now a rather common type of anchor, but is still not a traditional anchor-type store, and the fitness connection is definitely not a typical anchor, which really shows how much the mall is struggling. The other factor is that the majority of the stores in the mall are not the types of stores that are generally found in a mall. There are still several kiosks in the mall, but the rest of the stores are mostly local, mom-and-pop stores rather than chain stores.

There have been a few plans to try to revive the mall, but the reality is that the mall is becoming one of the many dead malls in the U.S.. The site is currently being studied by a private developer who plans to redevelop the mall site for office, residential, mixed-use, and transit oriented development.



Figure 1.10 Mall Conditions

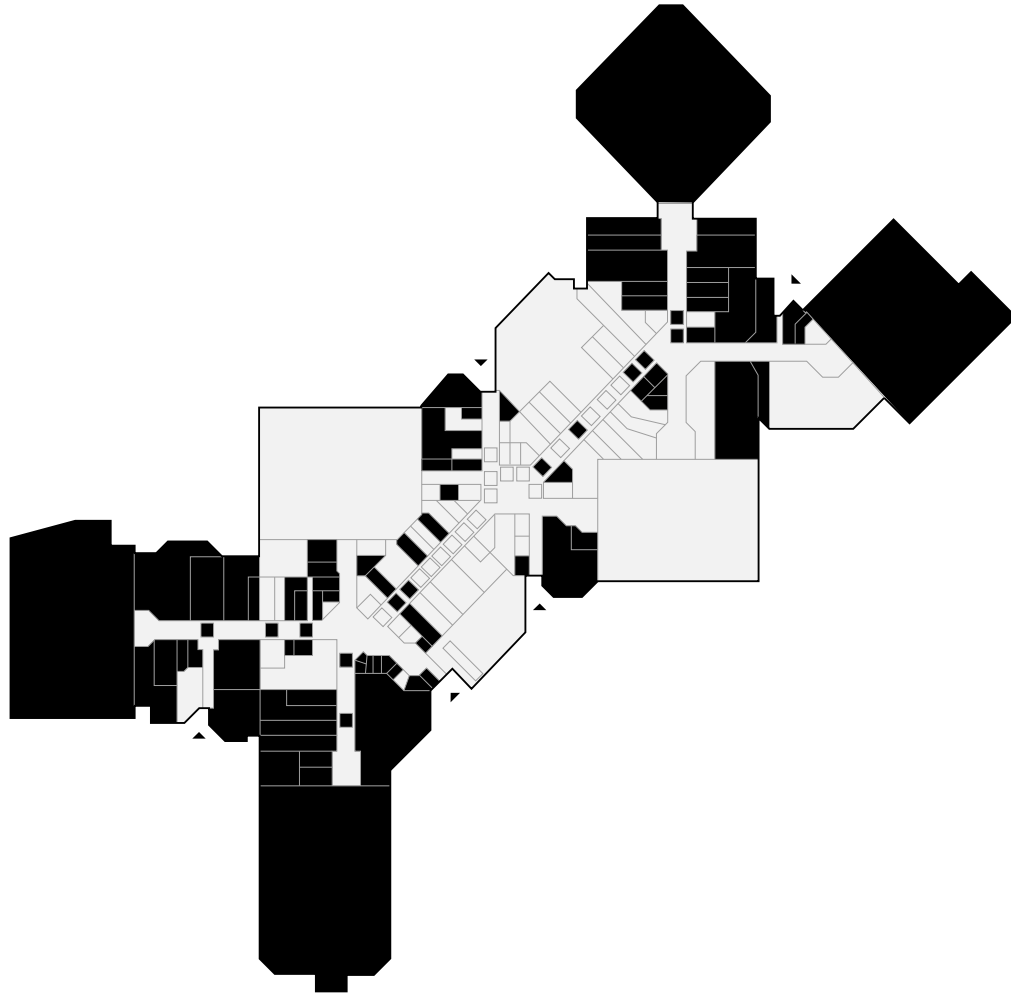
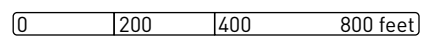


Figure 1.11 High Mall Vacancy Rates

Greenspoint mall is currently only 59% occupied. Of its over 1 million square feet of available retail space, more than 450,000 square feet is vacant, including two of its five anchor store spaces.

Mall Vacancy

- Occupied
- Vacant
- ▲ Mall entrance



Existing Conditions

Office Vacancy Rates

Office vacancy in the North Belt / Greenspoint subregion is very high compared to the rest of the region, with forty-five percent office vacancy. This is nearly double the office vacancy of the other subregions in the region, most of which are under twenty-five percent vacant.

Greenspoint is a major player in the North Belt / Greenspoint subregion, which includes the other three quadrants of the North Houston District, parts of North Aldine, some unincorporated land with very little office development, and the airport. The majority of the area included in the North Belt / Greenspoint Subregion doesn't have very much office space; therefore, the majority of the office vacancy for the subregion represents the office vacancy in Greenspoint itself. This presents opportunity for the offices in Greenspoint to be converted to some other use, like housing, or for Greenspoint to capitalize on the airport-centric development discussed in the first section of this document.

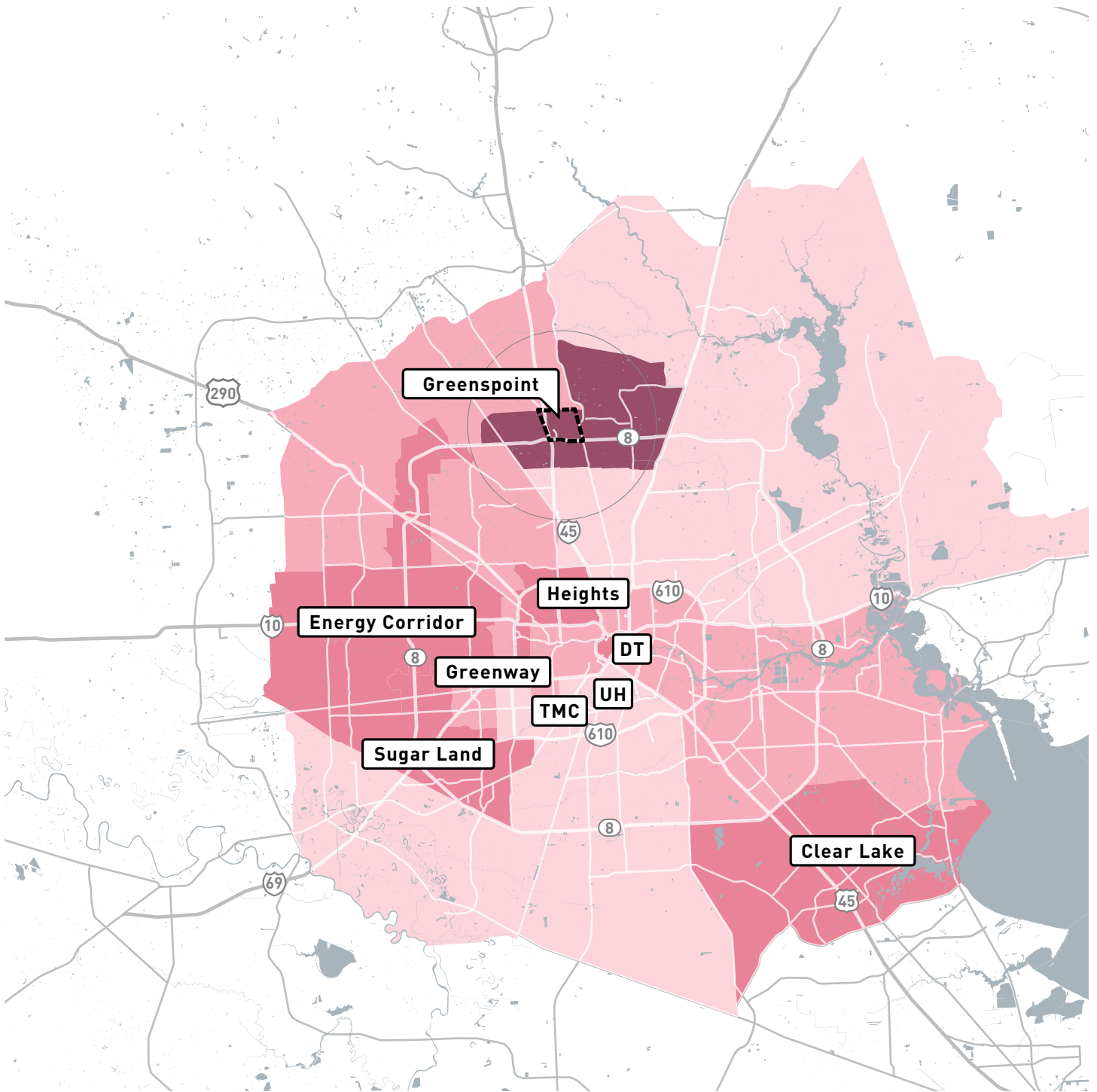
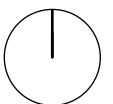
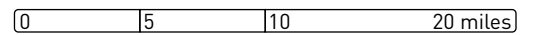
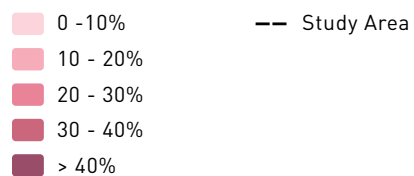


Figure 1.12 Regional Office Vacancy by Subregion

Office vacancy in the North Belt / Greenspoint subregion is significantly higher than any other Houston subregion.

Office Vacancy by Subregion



Existing Conditions

Regional Ecology

Greenspoint is surrounded by wetlands, parks, and detention basins. Greens Bayou, which runs through the site, and Halls Bayou, which runs to the south of the site, connect many of these wetlands and parks. Figure 1.4 shows a variety of species that make use of these connections. The Regional Ecology Map provides the larger context for these connections. Greenspoint is on the edge of the Piney Woods Ecoregion and sits inside of the Greens Bayou Watershed. Keith Weiss Park and Greens Bayou Wetlands Mitigation Bank are examples of larger ecological sites that are connected to other wetlands, detention basins, and parks because of the two bayous.

Ecoregion Context

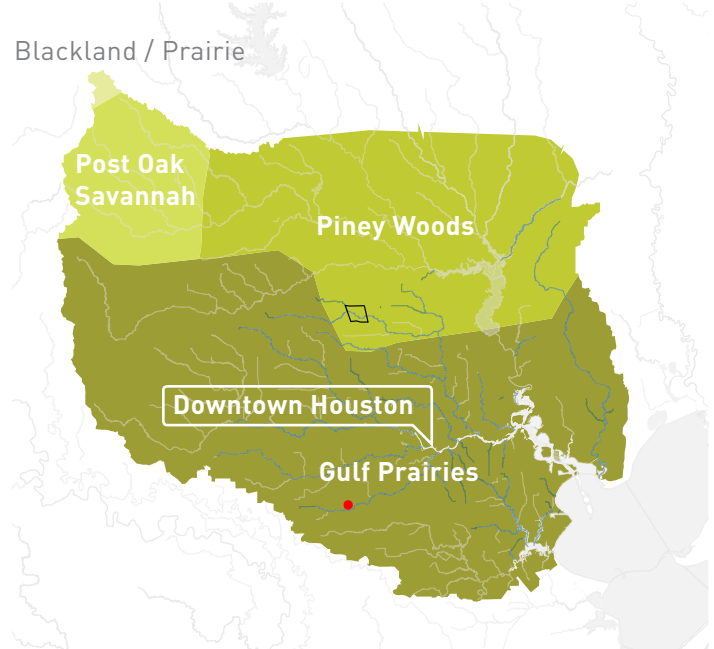


Figure 1.13 Greenspoint Ecoregion Context



Figure 1.14 Keith Weiss Loop Trail

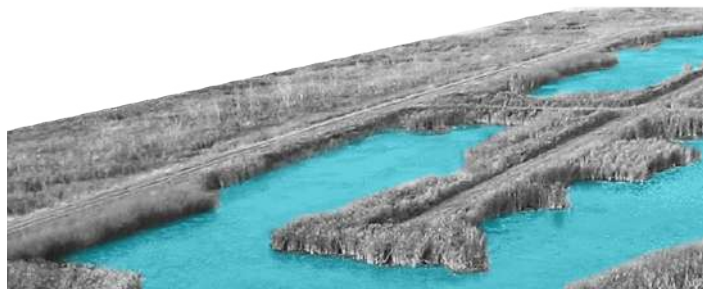


Figure 1.15 Greens Bayou Wetlands Mitigation Bank

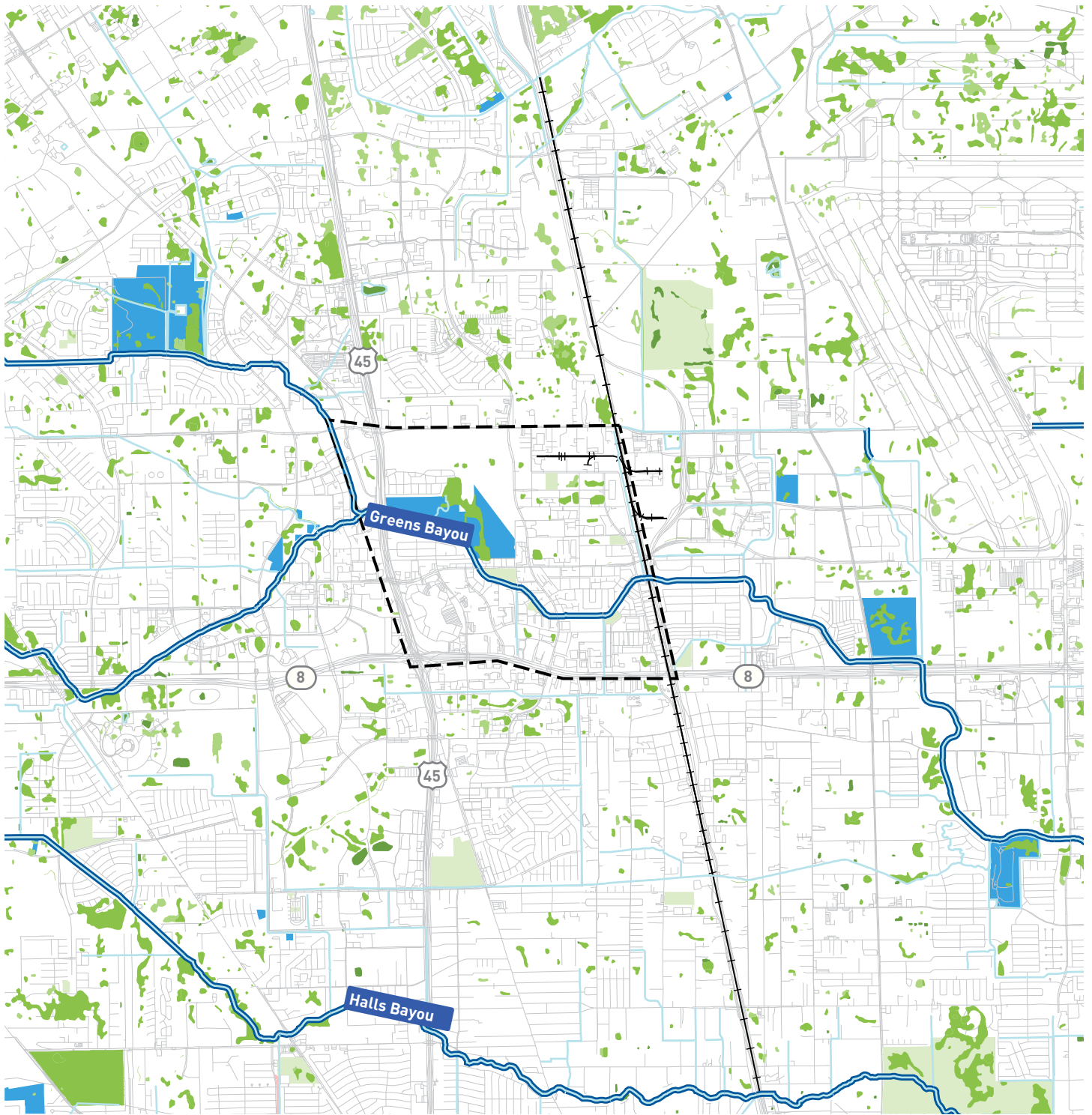


Figure 1.16 Regional Ecology

Existing wetlands, bayous, detention basins, and parks that surround Greenspoint.

Legend

- Park
- Water
- Detention Basin
- Freshwater Pond
- Shrub Wetland
- Freshwater Emergent Wetland
- Roads
- Railroad
- Study Area
- Bayous

0 | 1/2 | 1 | 2 miles

Recommendations

01 Build Downtown-Greenspoint-Airport Bus Rapid Transit with New Transit Center and with the Reconstruction of Greens Road

Summary

Support METRO’s plans for Bus Rapid Transit (BRT) and expanded regional transit service that can profoundly affect mobility within Greenspoint. Improved transit will provide access to all the opportunities brought from the redevelopment and rejuvenation of the North Houston District area. The district should participate and coordinate with the agency and its partners to ensure that the design of the facilities, including a new transit center and a BRT guideway, support the long-term vision of the study area.

Recommendation Characteristics

Type	Project
Timeline	Medium-term (5-10 years)
District’s Role	Participate
Lead Agencies	METRO City of Houston

Livability Principles Supported

- 3. Enhance Economic Competitiveness
- 4. Support Existing Communities
- 5. Coordinate Policies and Leverage Investment

Partners

Approval From

TxDOT, City of Houston, Private Developers, and IAH

Capital Funding

METRO, H-GAC call for projects, City of Houston, TxDOT, Harris County, TIRZ 11, and IAH

Operational Funding

METRO

Description

METRONext, the transit agency’s long-range plan approved by voters in November 2019, calls for the construction of a METRORapid (Bus Rapid Transit) line running from Downtown to Bush IAH Airport via I-45 and Greens Road. The service will operate every fifteen minutes or better and will provide the same level of service as the Uptown METRORapid line, including all-door boarding, off-board fare collection, and a dedicated guideway. Given the large level of transit investment that will impact the Greens Road corridor, the district should actively participate and coordinate with METRO, TxDOT, and adjacent developers to ensure that the design of the service will best compliment the other actions the district may undertake to improve the road.

Transit Center Location

METRONext also calls for the construction of a new transit facility to replace the current Greenspoint Transit Center, which is currently comprised of a collection of standard bus shelters along the southbound edge of Greenspoint Drive south of Greens Road. The reconstruction paired with investments in Bus Rapid Transit, improvements for local bus, and the enhancement of regional transit service, the site selection should factor in a number of considerations:

- Facilitate the transition of Bus Rapid Transit from a future two-way guideway along I-45 to Greens Road. The transition of the elevated Bus Rapid Transit guideway along I-45 to the at-grade section along Greens Road is complicated by the multilevel direct-connector ramps at the I-45/Beltway 8 interchange, as well as an existing underpass constructed along Greens Road. The new transit center can address this issue by receiving connecting ramps from the two-way HOV facility and providing a transition zone from elevated to at-grade, all while providing direct and comfortable connections to the local bus network.
- Accommodate regional transit connections, if feasible METRONext calls for a bidirectional, all-day regional transit network operating seven days a week, but despite its relatively close proximity to I-45 and the numerous express trips passing by between Spring, The Woodlands, and Downtown, the existing Greenspoint Transit Center site is unsuitable to offer connections from the regional network to Greenspoint. To gain these key connections and to allow enhanced transit access on top of the connections provided by the proposed bus rapid transit line, the transit center site location should be placed in proximity to I-45 to allow for the fast circulation of regional services by way of a direct connection ramp.

- Position the transit center to allow for the most dense, conducive land-uses within walking distance. Ideal site location requires a thoughtful balance between speed and access. Placing the facility too far away from I-45 will eliminate connections to regional transit and too far away from Greens Road will affect the speed of the METRORapid line. Conversely, locating the facility along the highway removes existing commercial and residential land-use from walking distance of the facility.

Recommended Location

With these criteria, this plan recommends locating the new transit center on one of two identified locations: the future mall redevelopment site (1) or an undeveloped parcel at the intersection of Greens Road and Greenspoint Drive (2).

1. Mall Development Site

One potential option is to facilitate transit-oriented development in coordination with the redevelopment of Greenspoint Mall (Figure 1.16). In this scenario, the transit center is placed towards the northeast quadrant of the redevelopment. While the site is large enough to accommodate a mix of land uses, the transit center would serve as a 'hub' to the redevelopment and would pair best with residential and commercial uses, such as a grocery store. An elevated direct-connector transitway connects a two-way HOV facility in the center of I-45 directly to the transit center without interruption from mixed-traffic or signal delay.

A two-story transit facility would accommodate bays for local service on the first level with bays and station platforms for regional transit and METRORapid on the second story. A transitional ramp down to level one would allow for the transition of Bus Rapid Transit to at-grade, where design treatments such as bus-only lanes and transit signal priority preserves the speed of the METRORapid line.

2. Greens Road at Greenspoint Drive

Another option is to locate the new transit center at the undeveloped parcel on the southeastern corner of Greens Road at Greenspoint Drive (Figure 1.17). Bus circulation would be provided by the construction of an east-west access road connecting Greenspoint and Northchase Drives. Given the existing structures immediately adjacent to the transit center, transit-oriented development might be best constructed concurrently above the facility. This option would be a slightly slower route for the BRT bus as it would have to route onto surface streets before reaching the Transit Center.

Transit Center Amenities and Design

The district should participate in the design process of the new transit facility to ensure that it fits within the vision of the Livable Center. Design considerations for the facility include:

- **Optimized size for expected transit growth:** the transit center should be designed to facilitate future expected investment in the local bus network serving Greenspoint. Conversely, the structure should be thoughtfully planned to avoid overbuilding too many bus bays from current projections; unused transit space detracts from the desire to incorporate other amenities within the limited footprint.
- **Secure Bicycle Storage:** the facility should provide end-of-trip facilities for bicycle users, including lockers or access-controlled bike room for routine riders and ample racks for transient riders or short-term bicycle parking.
- **Transit-supportive ground floor commercial:** Uses such as concessionaires, retail, day care facilities could all compliment the transit hub and benefit from the large level of regional access that the facility will provide.

Jump Start Action Steps

- Work with Private Developer to develop design for transit center to fit with mall redevelopment land uses and circulation.
- Work with City of Houston to develop design for Bus Rapid Transit on Greens Road.
- Coordinate with TxDOT on design for Bus Rapid Transit on the North Houston Highway Improvement Project.
- Coordinate with IAH on design for Bus Rapid Transit station and its integration with Terminal C.

Recommendations

01

Station Placement

METRO's preliminary costing and operating plan for the BRT line calls for three stations between North Shepherd Park and Ride and Terminal C within the North Houston District: Greenspoint Transit Center, Greens Road at Northchase Drive, and Greens Road at Imperial Valley Drive. While these stations provide more than adequate coverage for the western portion of Greens Road, the proposed locations do not provide access to future and current housing along Greens Road east of Imperial Valley. The district should participate in METRO's future planning and public engagement process – which will determine the final design and station placement.

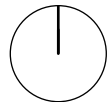
This plan recommends shifting the proposed station on Northchase Drive east to Wayforest Drive. This movement would both increase the geographic coverage of the BRT line and provide service to an area of the study area that is proposed to increase in residential density and commercial activity. Maintaining the Imperial Valley station facilitates a connection between passengers traveling from the north and south to transfer to the BRT eastbound without having to backtrack to the transit center. The resulting stop spacing is more aligned with METRO's current vision for BRT corridors.



Figure 1.17 BRT Station Placement Greenspoint Mall Site
 This map is showing recommended station locations balance spacing, access, and land-use considerations. Orange shading represents a quarter-mile walkshed and yellow represents a half-mile walkshed, both based on a conceptual orthogonal street grid.

Office Vacancy by Subregion

- 1/4 mile Walk Distance
- 1/2 mile Walk Distance
- Proposed Regional Express service
- Proposed METRORapid Line



Recommendations

01

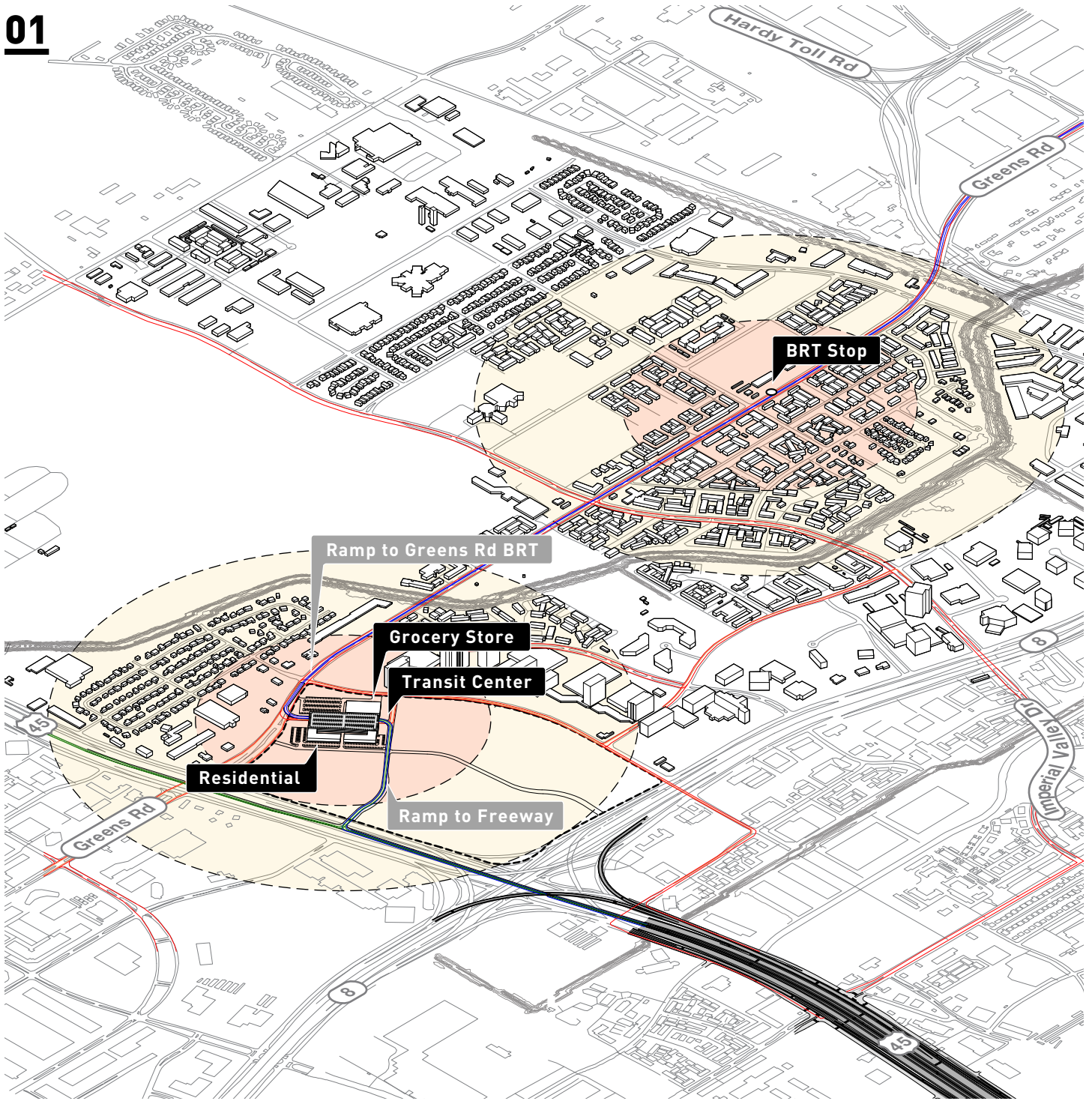
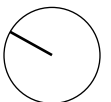


Figure 1.18 Option 1
Transit Center located on Greenspoint Mall Site

Transit Center on Mall Site

- Downtown - IAH BRT
- Local Bus Service
- Proposed Circulator Bus
- Regional Express Bus
- 1/4 Mile Walking Radius
- 1/2 Mile Walking Radius
- Mall Site



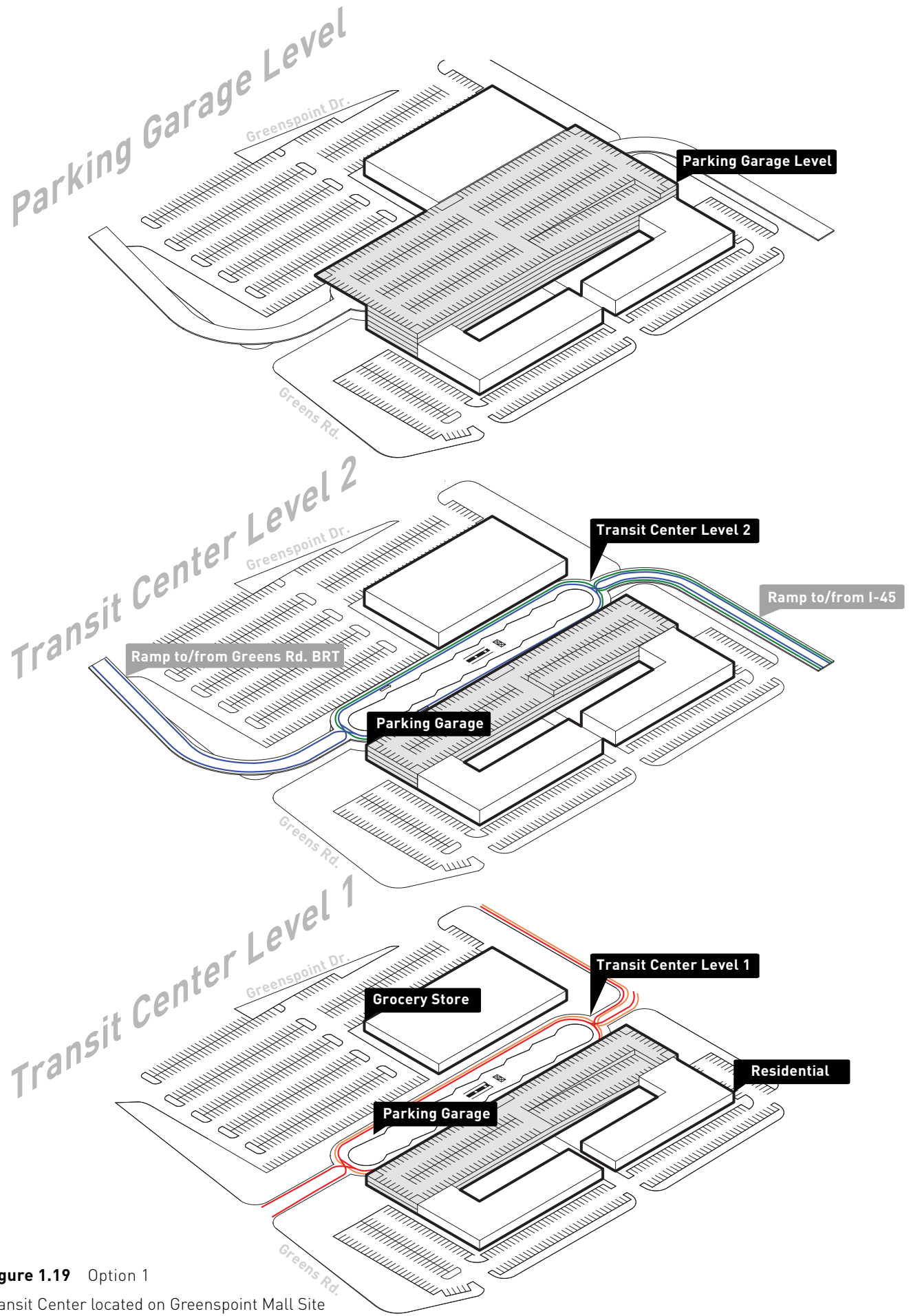


Figure 1.19 Option 1
Transit Center located on Greenspoint Mall Site

Recommendations

01

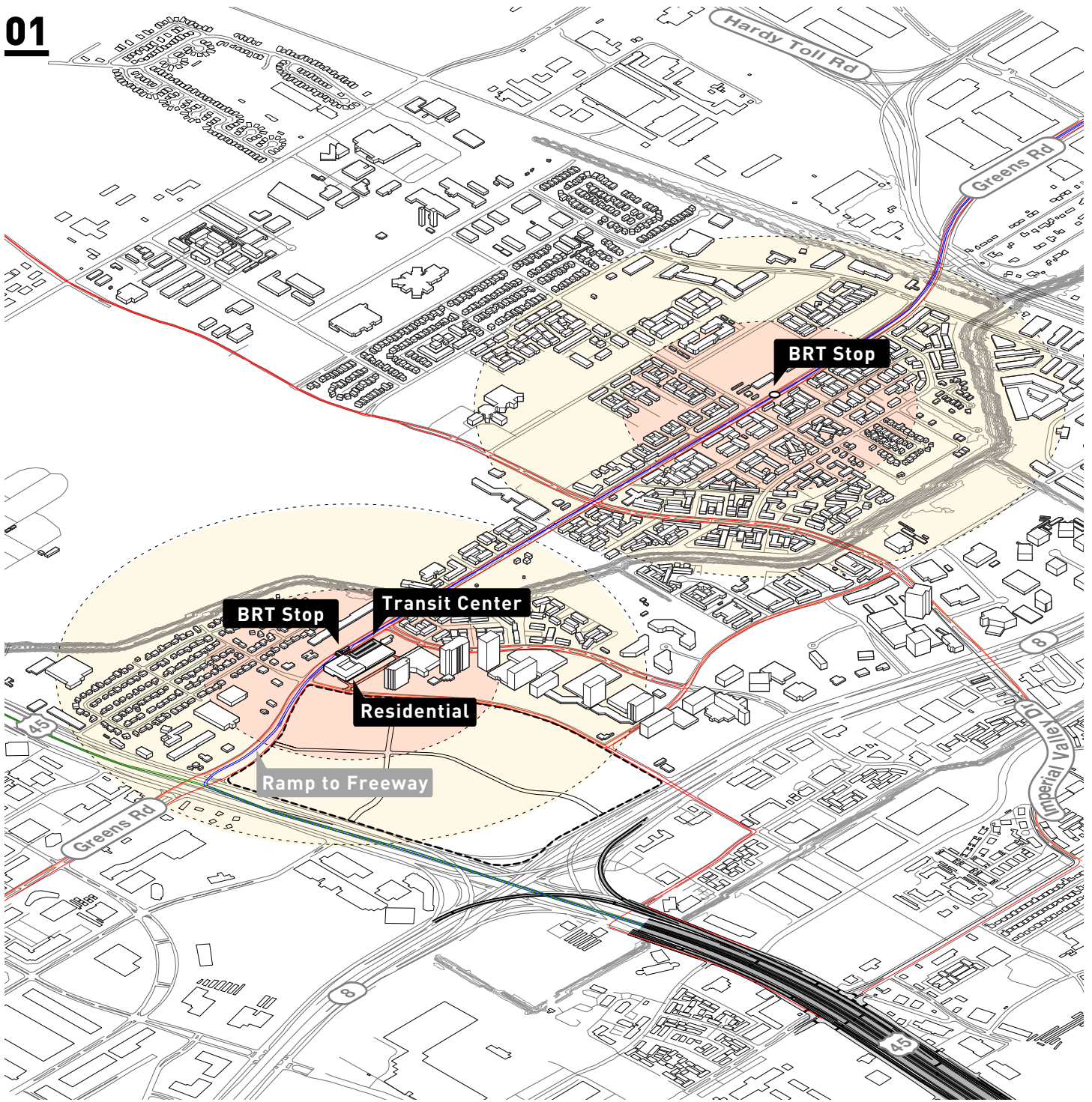


Figure 1.20 Option 2

Transit Center located on Hines Site on the south-east corner of the intersection of Greenspoint Drive and Greens Road.

Transit Center on Hines Site

- Downtown - IAH BRT
- Local Bus Service
- Proposed Circulator Bus
- Regional Express Bus
- 1/4 Mile Walking Radius
- 1/2 Mile Walking Radius
- - Mall Site

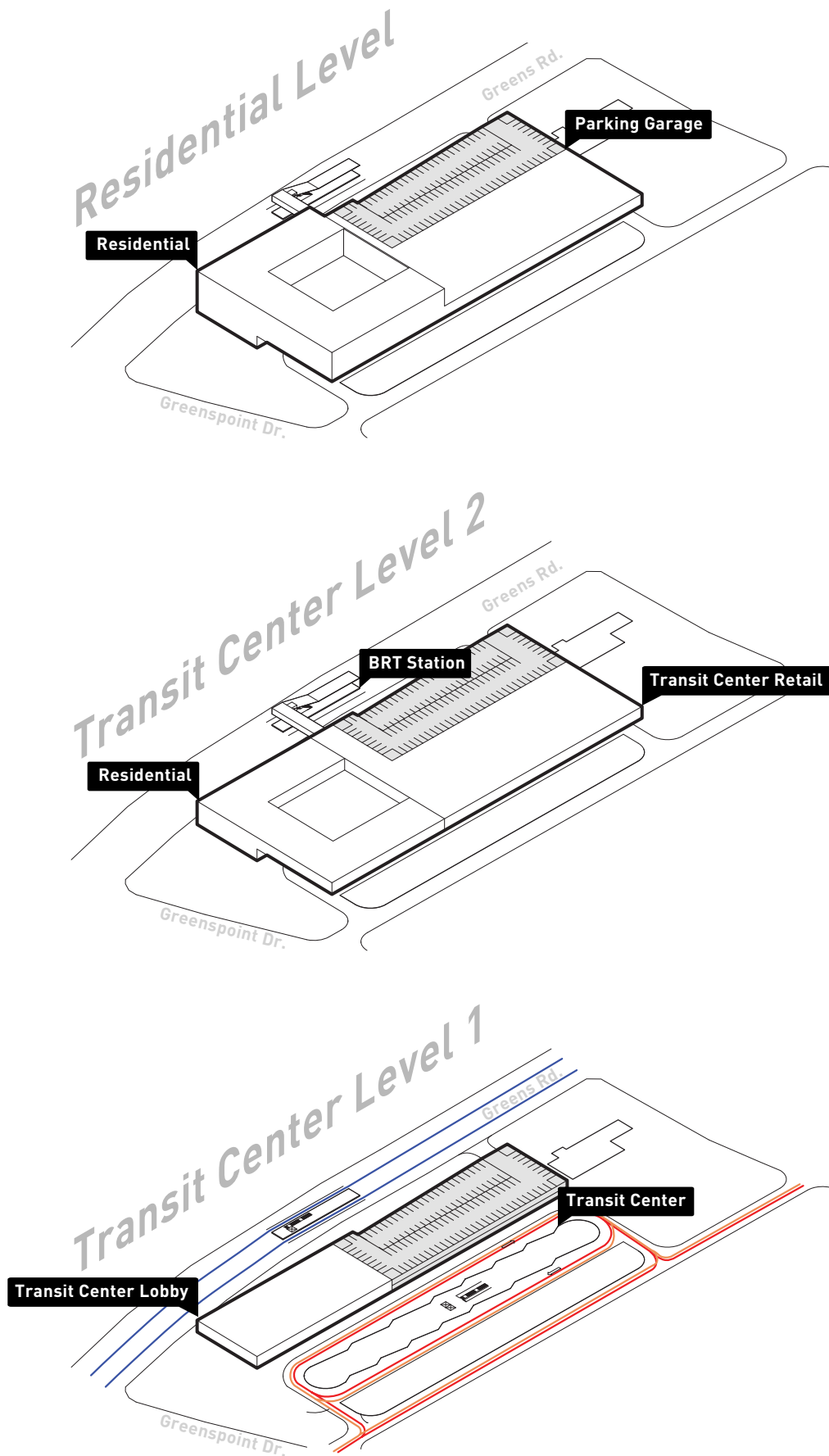


Figure 1.21 Option 2
Transit Center located on Hines Site on the south-east corner of the intersection of Greenspoint Drive and Greens Road.

Recommendations

01

Local Bus Improvements

METRONext included recommended improvements to many of the local bus routes in North Houston. Given that the district and its residents and employees will benefit from the enhancements, the district should begin to coordinate and advocate with METRO for the plan's implementation as it relates to the study area. The proposed changes are shown in Figure 1.17 and listed below in order of planned implementation with the corresponding base frequency color (Red - every 15 minutes or less; Blue - every 30 minutes; Green - every 60 minutes):

METRONext Moving Forward - Priority Improvements

The southern end of the 99 Ella - FM 1960 (Blue) will be realigned along the I-45 service roads for a more direct connection to North Shepherd Park & Ride.

A new service, the 57 Greens (Green), will connect Greenspoint TC to Bush IAH via Greens Road, North Beltway 8, and JFK Boulevard.

The 102 Bush IAH Express (Blue) will be revised to a limited-stop service along Greens Road and realign route to use the Hardy Tollway Connector to IAH. The existing coverage will be maintained by the new 57 Greens.

The northern terminus of the 6 Jensen/Greens is modified to Bush IAH from Greenspoint TC with service along Greens Road, maintained by the new 57 Greens.

The 399 Kuykendahl Shuttle (Green) is extended to the Pinto Business Park across I-45.

The 57 Greens is later extended from IAH to the Townsen P&R in Humble via Will Clayton Parkway and FM 1960.

Frequency is improved during peak periods on the 56 Airline/Montrose (Red).

Long-term Service Enhancements

Frequency is increased on 399 Kuykendahl Shuttle to every 30-minutes (Blue), which is coordinated with the 99 Ella - FM 1960 to provide frequent service along comment segment of Ella Boulevard.

- Increase frequency on 99 Ella - FM 1960 to every 15-minutes (Red) between Greenspoint TC and North Shepherd Park & Ride, with every other trip extending to Lone Star College (Blue). Reassign segment from Greenspoint TC to North Shepherd Park & Ride to the 399 Kuykendahl Shuttle, renamed and renumbered to the 39 Kuykendahl - North Freeway.

- Study for potential East-West service from future Willowbrook TC to Eastex Park and Ride, potentially along Gears and Greens Roads.

Recommendations

1. Advocate for planned transit improvements, especially those that may positively affect the district in the short-term.

While all of the aforementioned service changes would positively affect mobility within Greenspoint, the district should advocate for the expedited implementation of the enhancements that could provide the largest impact in the near-term.

Converting the 102 Bush IAH Express into a limited-stop service within Greenspoint should be a priority, both in preparation for the service pattern of the future Bus Rapid Transit line and that the 102 serves as the primary link between Downtown, the district, and the airport. This revision comes with the addition of the new 57 Greens, which will create two links – one express and one local – between North Houston and the airport. Another priority should be advocating for the extension of the 399 Kuykendahl Shuttle to the Pinto Business Park; the concentration of employment in relatively-close proximity to the district makes providing transit coverage an enticing opportunity.

2. Monitor residential, employment, and development patterns to continually ensure that future growth is addressed by transit service expansion.

As new businesses and residents move to the Greenspoint area and the surrounding areas, the district should actively monitor development to ensure that transit is adequately provided. One such example in the service plan is to study the feasibility of an additional East-West service between Willowbrook and the Eastex Freeway. As the district follows its vision, it should contribute to the future conversation on how its residents and employees would be best benefited from service investment outside of the enumerated additions.

3. Leverage the high quality of transit service that will be provided by 56 Airline/Montrose and encourage high activity and development along its routing within the study area.

As a part of the Bus Operations Optimized Service Treatments (BOOST) program, the 56 Airline/Montrose will not only possess high-frequency service, but will also provide faster, more reliable service by way of bus stop location optimization, transit-signal priority treatments at key intersections, and a detailed capacity and timetable analysis. Given the high quality of service the line will provide, the district should give special location consideration to future projects and investments so that they are either placed within walking distance of bus rapid transit or frequent local bus.

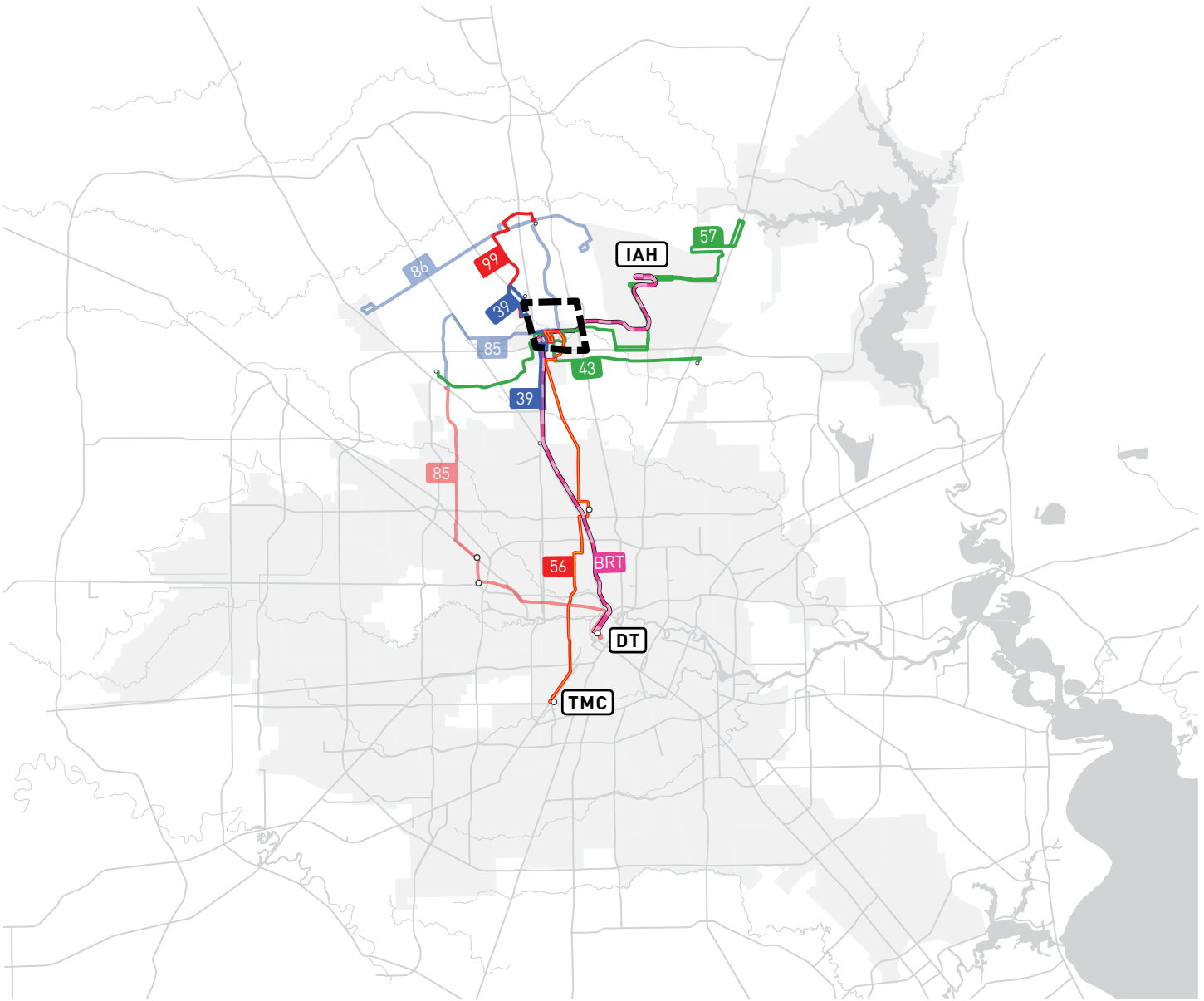


Figure 1.22 Future Transit Connections to Greenspoint
METRO’s funded and planned service improvements for local bus will expanded access and mobility for Greenspoint residents and employees, alike. The highlighted lines above are proposed to be realigned and/or provided with enhanced frequency or span of service. The 56 Airline/Montrose is a part of the Bus Operations Optimized Service Treatments (BOOST) program.

Recommendations

01

Transit Guideway and Greens Road

A core feature of Bus Rapid Transit is the provision of dedicated lanes to allow transit vehicles to be insulated from mixed-traffic, akin to existing METRORail lines. Careful consideration must be given to ensure the best possible allocation of constrained right-of-way as a part of the street reconstruction and retrofit.

Pedestrian Realm

Sidewalks next to through-streets without any meaningful buffer discourages pedestrian use. The current median trees do not provide any shade for pedestrians or traffic-calming measures as they are far from the edge of the lanes. Many properties have continuous fencing between the housing and public realm. This creates an unproductive separation and discourages use of sidewalks.

We recommend trees, light posts, and benches to be frequent along the road to create a comfortable experience for pedestrians. The pedestrian realm should be expanded to 6 feet minimum if acquisition is increased.

Buildings should create an inviting and open face towards the street to encourage civic life.

Bicycle Facility

Light posts also act as bollards to protect pedestrians and bicyclists. A 6.5 foot minimum separation between bike facilities will follow AASHTO recommendations and encourage safe and active travel as well as provide a multi-modal connection to the BRT and other bus lanes. A shared path is not desirable, but must have corresponding intersection treatment to provide safe access to and from destinations and be wider than 8 feet.

Transitway

Greens Road currently serves nearly 10 different bus routes and serves as a connection point for many riders. Bus Only lanes prioritize transit and keep buses on schedule.

Green Features and Stormwater Mitigation

Bioswales slow runoff while providing traffic calming, visual interest, and native vegetation. Trees near the open traffic lanes are documented to reduce speeds and provide a safer environment

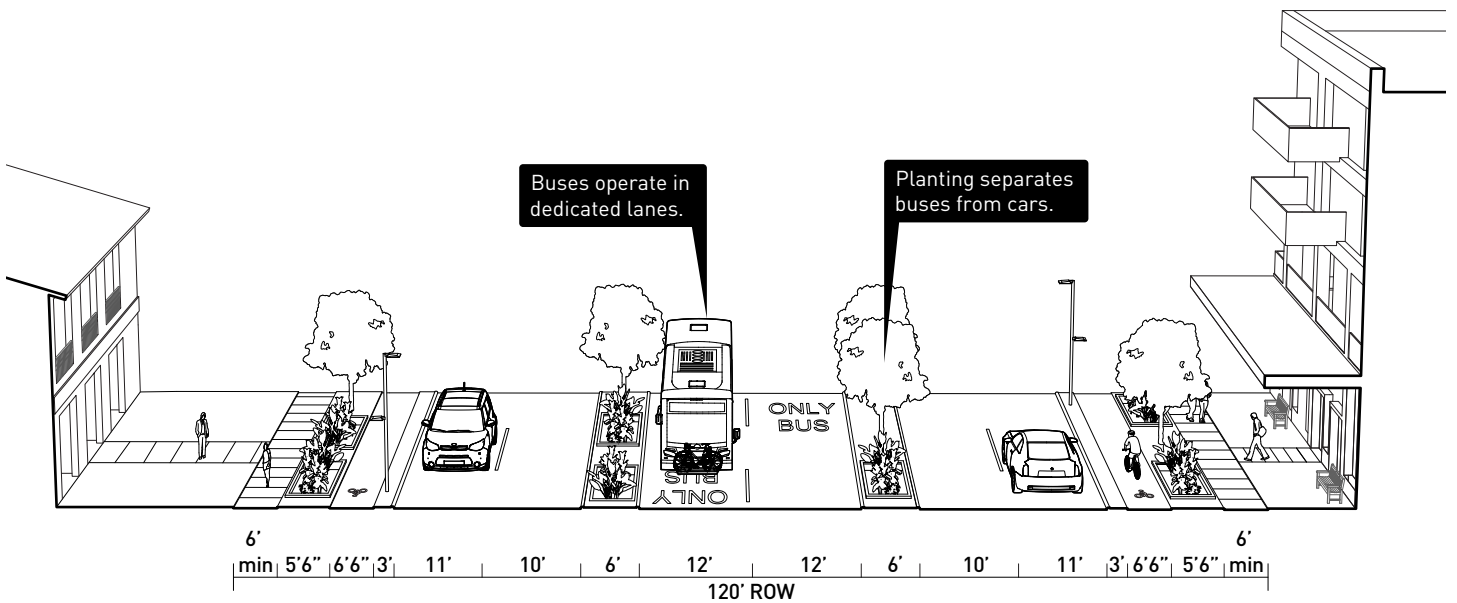
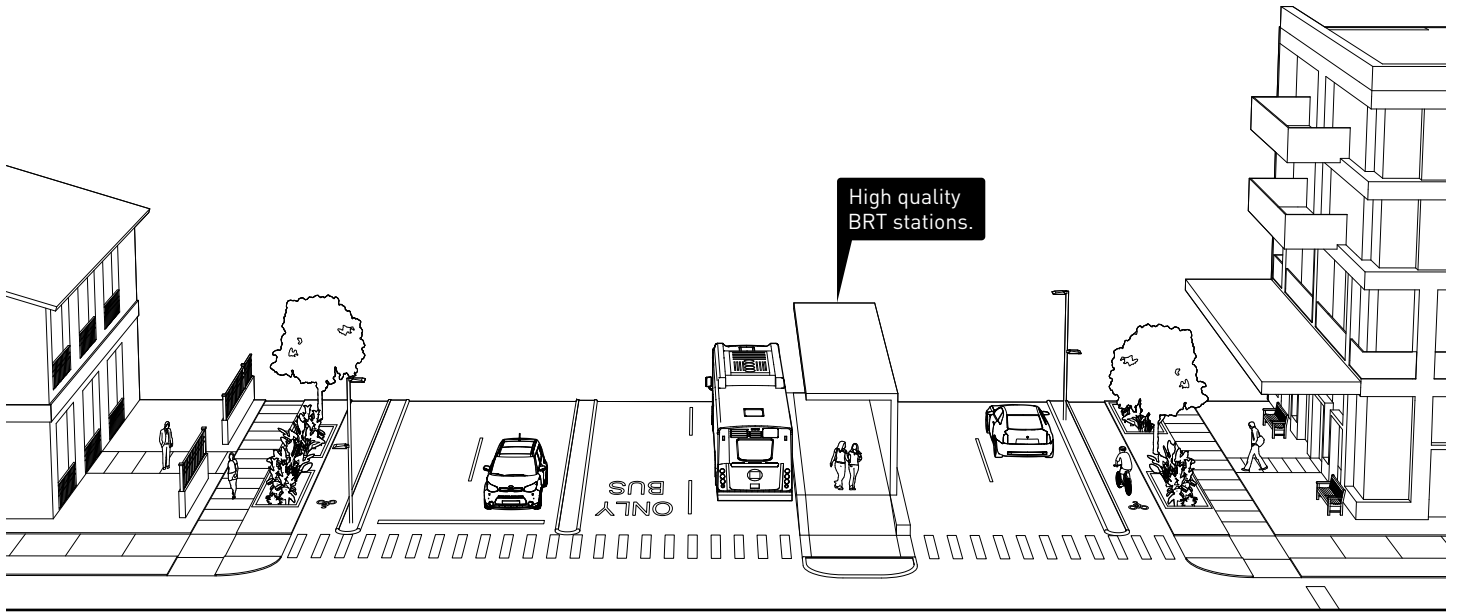


Figure 1.23 Greens Road Transit Corridor Cross-Sections
The vision of Greens Road will require right-of-way acquisition at locations where shared-use paths, transitways, and station platforms exist together at intersections. See Recommendation 07 Create Green Streets / Urban Design Standards.

Recommendations

02 Complete the Bayou Greenways

Summary

Bridge the gap of Bayou Greenways 2020, by building on work that is already underway and coordinating and working with the different agencies and organizations to provide park space, local connectivity, regional greenways, and flood mitigation to Houstonians. The district can advocate to the City of Houston, Harris County, and Houston Parks Board to complete trails linking North Houston to the rest of the region and can participate in building trail links within the district.

Recommendation Characteristics

Type	Project
Timeline	Medium-term (5-10 years)
District's Role	Advocate Participate
Lead Agencies	Houston Parks Board Harris County North Houston District

Livability Principles Supported

1. Provide More Transportation Choices
3. Enhance Economic Competitiveness
4. Support Existing Communities
6. Value Communities and Neighborhoods

Partners

Approval From

Houston Parks Board, Houston Parks and Recreation Department, Harris County Flood Control District, North Houston District, TxDOT, and Union Pacific

Capital Funding

Houston Parks Board, Harris County, Houston Parks & Recreation Department, TIRZ 11, and North Houston District

Operational Funding

Houston Parks Board, Houston Parks & Recreation Department, and North Houston District

Description

The Bayou Greenways 2020, is a vision for providing Houstonians with a network of quality park spaces, creating greater access to the city as a whole and leveraging the assets that currently exist.

The bayou trail in Greenspoint is part of the Bayou Greenways system, but is isolated from the rest of the bayou system at both ends. Bayou Greenways 2020, funded greenways within the City of Houston. Because Greens and Halls Bayou run in and out of city limits, this does not result in a connected network. The greenway and accompanying trail should be completed so that there is no gap across I-45 between the skate and bike park, where the city limits ends, and where the city limits pick back up again near the intersection of Greens Road and Greens Bayou. This will require specific coordination with the Houston Parks Board.

Ideally, the Bayou Greenways should be continuous from the Ship Channel through North Houston, which would include Greenspoint, and design features should be developed for amenities along the Bayou Greenways trails which could include things like water stations, trail markers, and emergency location information. Within Greenspoint specifically, the bayou trail should be continued at least to the edge of the site, where it can meet up with future trails in the proposed buyout section east of the site.

Jump Start Action Steps

- Develop advocacy program to build momentum to complete Bayou Greenway through North Houston (Greens Bayou Coalition, North Houston District, North Houston Association).
- Hold specific meeting / event to specifically address closing gap across I-45 to connect Skate and Bike Parks.
- Coordinate with Harris County commissioners in area not in City of Houston / Bayou Greenways 2020 (Primarily Pct 1 and include Pct 4 west of North-borough Road).
- Develop design features for Greenway including trail marker / emergency location information, water stations and other amenities.

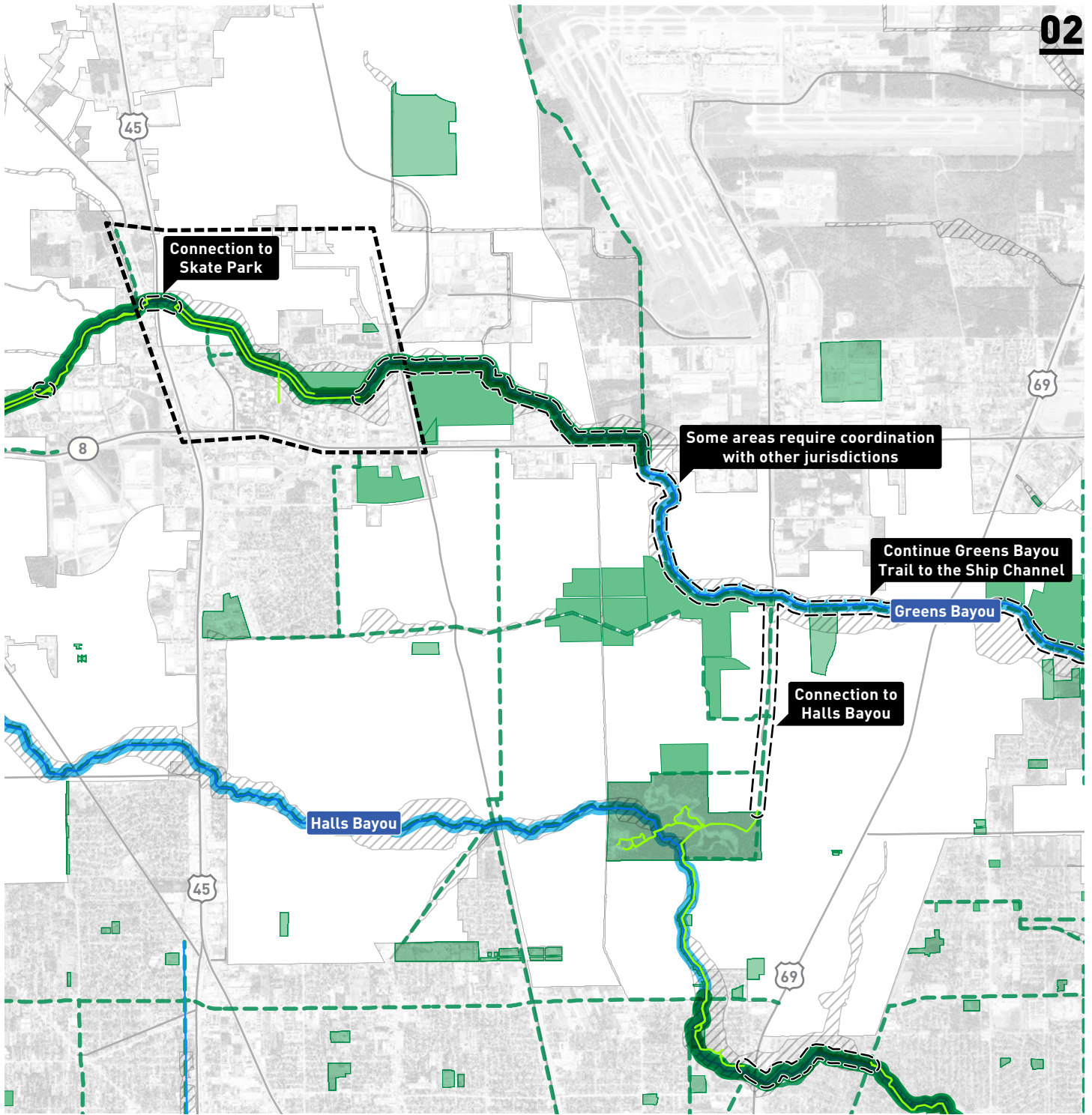
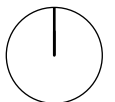
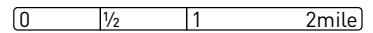


Figure 1.24 Bayou Greenways

Greens Bayou extends down to the Houston Ship Channel, connecting to Halls Bayou as well as various other park spaces along the way.

Park Connectivity

- Park Spaces
- Existing Bayou Greenways / Trails
- Bayou Greenways 2020
- Future Bayou Greenways Not Funded
- Site
- Waterways
- NH Focus Area
- City of Houston City Limits



02

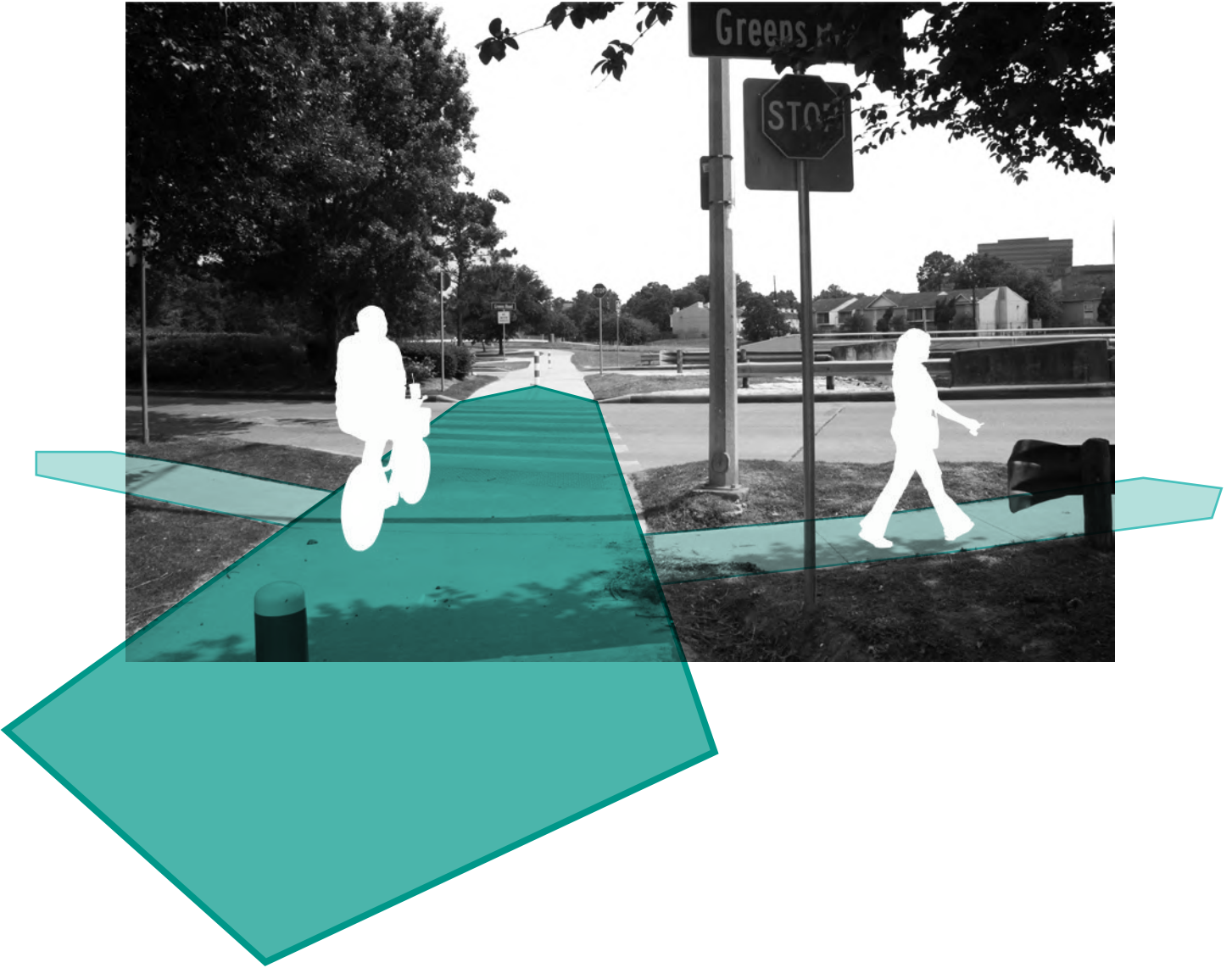


Figure 1.25 Trails and Connections

Providing quality trails and proper access to those trails encourages the use of the Bayou Greenways for recreational activities, to experience nature, and for an alternative form of transportation.

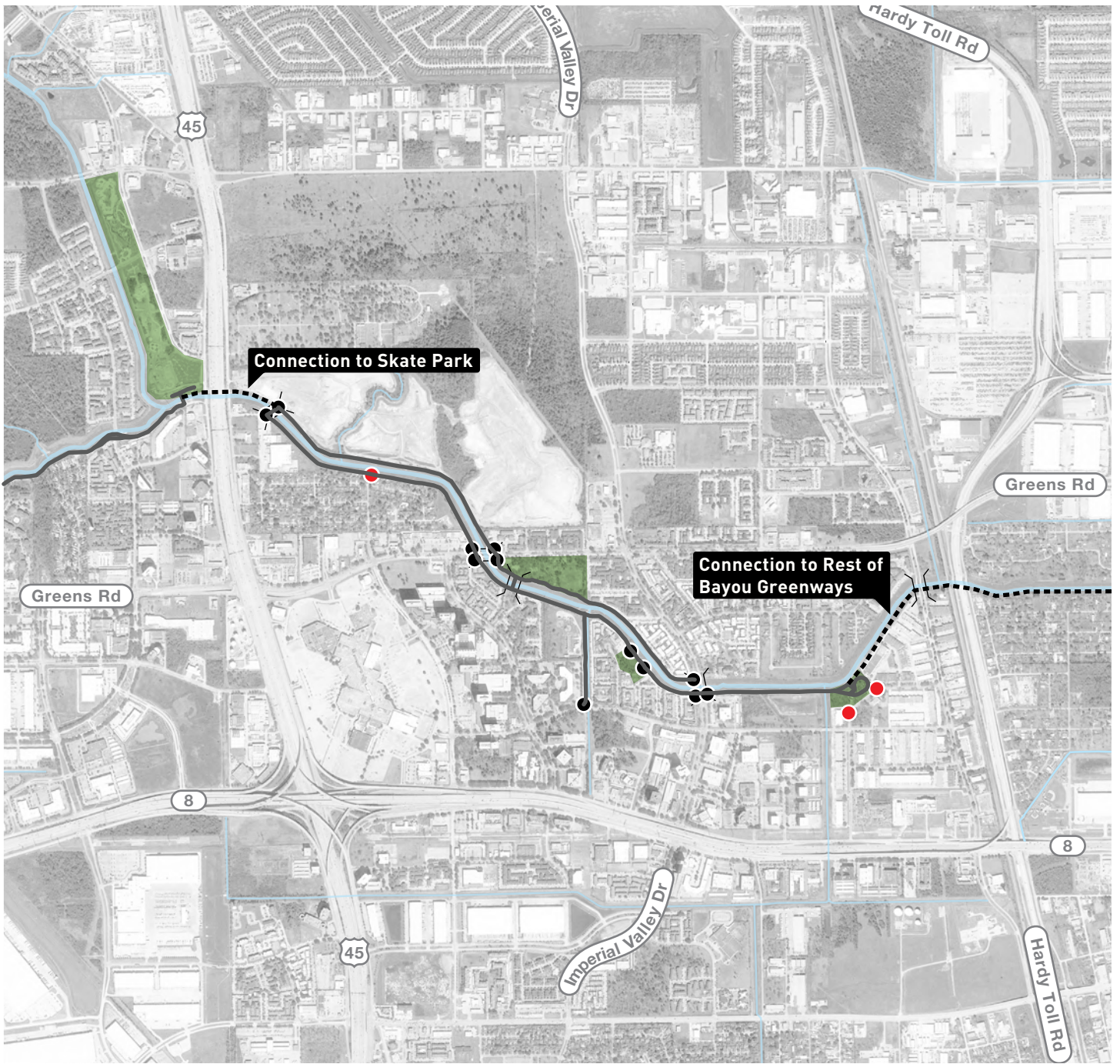
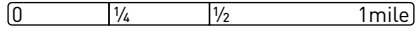


Figure 1.26 Greenspoint Trails

Two key connections are needed to complete the Bayou Greenways 2020. Improving existing access point and creating additional areas of access should also be prioritized.

Sidewalk Priorities

- Existing Trails
- - - Missing Connections
- Parks
- Greenway Access
- Needs Access



Recommendations

03 Redevelop Greenspoint Mall

Summary

Support a well-planned vision for the Greenspoint Mall site, that will transform and focus energy and become a major employment and destination center for North Houston District. The district can continue to participate in the site planning and can help fund and build infrastructure and can operate public spaces that may be created as part of the development.

Recommendation Characteristics

Type	Project
Timeline	Medium-term (5-10 years)
District's Role	Advocate
Lead Agencies	Private Developer, City of Houston, METRO, North Houston District

Livability Principles Supported

1. Provide More Transportation Choices
2. Promote Equitable, Affordable Housing
3. Enhance Economic Competitiveness
6. Value Communities and Neighborhoods

Partners

Approval From

Private Developer

Capital Funding

Private Developer, City of Houston, Houston Parks Board, and TIRZ 11

Operational Funding

Private Developer, City of Houston, and METRO

Description

The huge, mostly vacant site of the Greenspoint Mall is expected to be redeveloped. Being a major portion of the study area, it will serve as a catalyst project for redevelopment in the North Houston District.

The mall site is one of the few big areas of Greenspoint which doesn't flood because of its higher altitude. This makes it an ideal place for new affordable housing and new neighboring amenities like a grocery store (an Aldi or Joe V's model could be a good grocer model for this site) and retail. Its easy access to I-45, via a direct ramp from the interstate, and its history as Greenspoint's bus transfer center also make it a great location for a large transit center for the new airport-Downtown BRT, express bus, and local buses, as well as structured garage that can be used for Park and Ride.

The remainder of the land on the mall site could be used for mixed-used development, which will support the adjacent uses in this area, and a circulator bus can connect to near-by campuses and employees.

Greenspoint already has a large amount of office space and plenty of hotels, and mixed-use development is in demand. With its proximity to the freeway and its placement on Greens Road and Greenspoint Drive, if designed correctly with good connectivity, walkable streets, and amenities that the community can access and use, the new development can be a model for how future redevelopment in the district should be done.

The infrastructure of the redevelopment should be walkable, with new privately-owned streets which connect Greenspoint Drive to the businesses along the I-45 feeder road and give direct access to the site from Greens Road. The new streets should also have street amenities that help slow down traffic and keep pedestrians and cyclists safe and comfortable, such as street trees, benches, wide sidewalks, protected bike lanes, bike parking, and consistent street and pedestrian lighting.

Jump Start Action Steps

- Continue to work with Private Developer to ensure land uses and circulation align with existing buildings, streets, and local transit.
- Work with Private Developer and METRO to develop design for transit center.
- Work with Private Developer and the City to identify opportunities for affordable housing and funding.
- Ensure that public funding is linked to design standards.



Figure 1.27 Mall Site Redevelopment with BRT

03

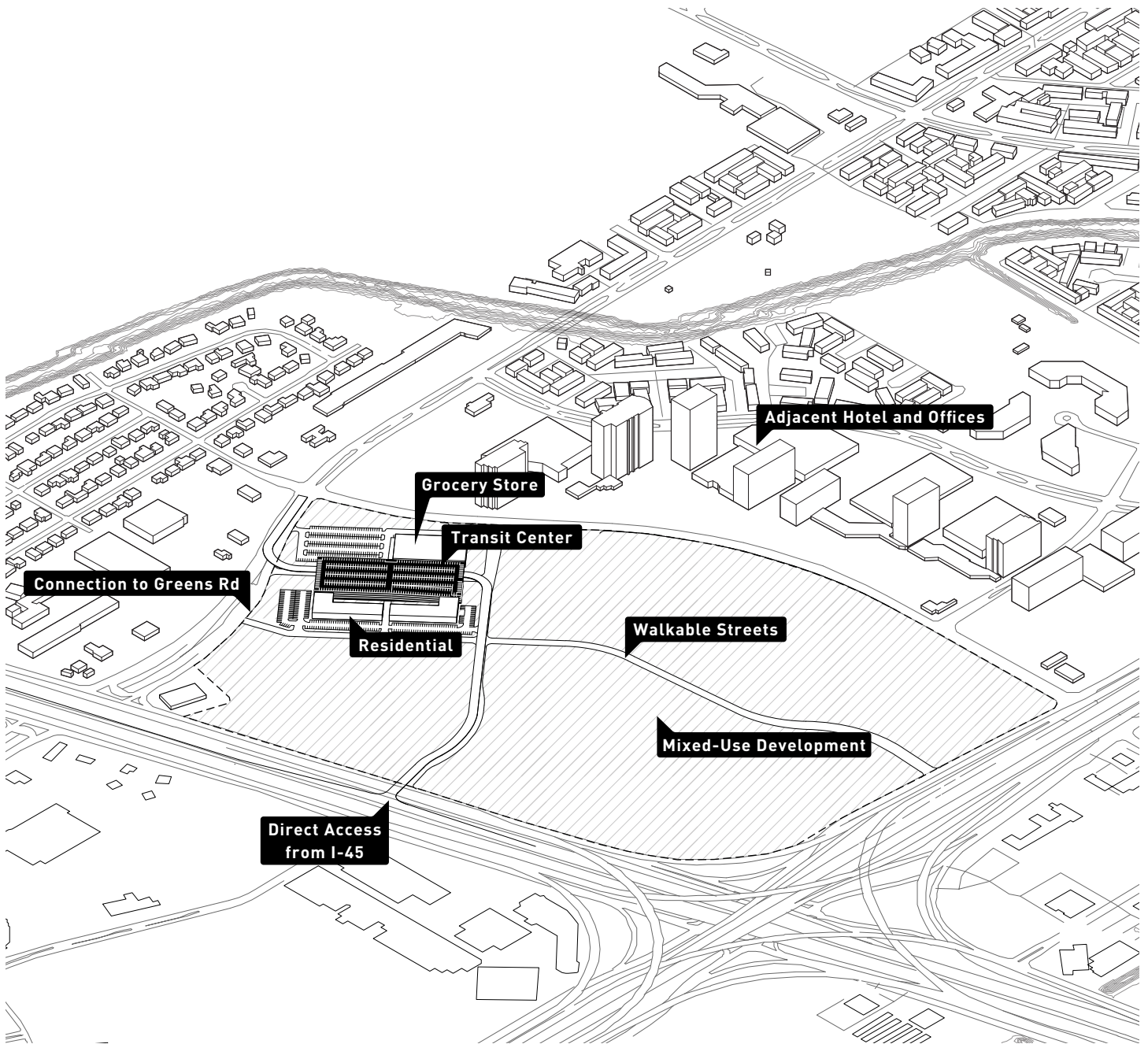
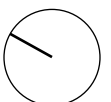


Figure 1.28 Greenspoint Mall Redevelopment

Key Elements for the success of the site are; a walkable network, a well-located Transit Center, and a vibrant mix of uses including affordable housing and a grocery store.

Mall Redevelopment

- Mall Site
- Transit Center



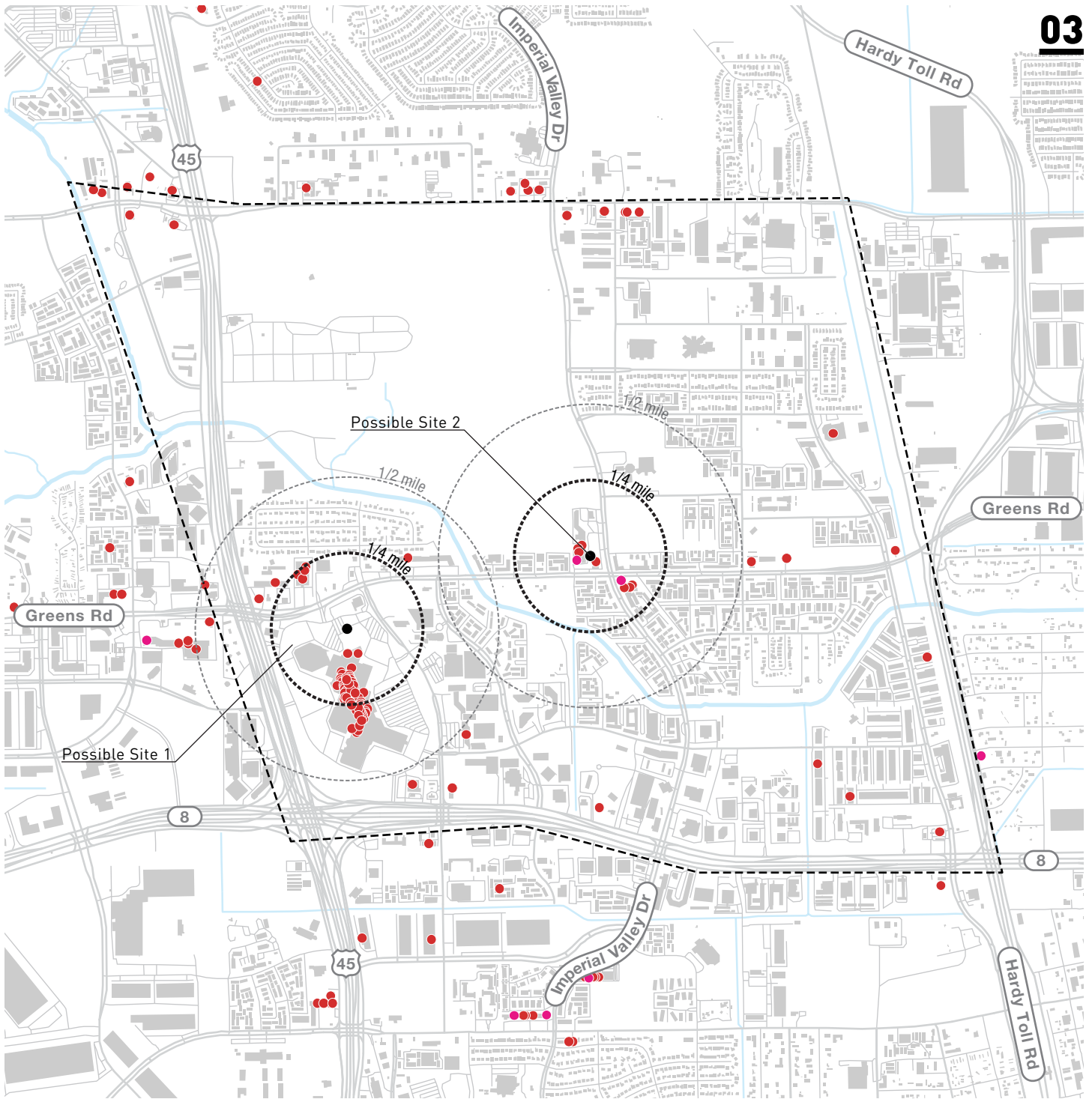


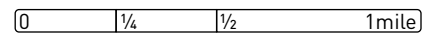
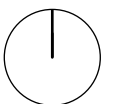
Figure 1.29 Grocery Store Locations

Two possible grocery store locations. Site 1 offers visibility and quick access from I-45. This site may work well with medium to large sized grocery stores. Site 2 offers close, walkable access to a large number of residents in the area. This site may work well for smaller grocery store models and could be part of the redevelopment of the Greenspoint Mall Site.

Amenity Types

- Food Retail
- Grocery
- ⋯⋯⋯ 1/4 mile Proximity
- ⋯⋯⋯ 1/2 mile Proximity

- Site
- Streets
- Buildings



Recommendations

04 Create an Airport Based Economic Development Plan

Summary

Support George Bush Intercontinental Airport as an engine of economic development so that this community emerges as an international metropolitan center of the 21st century. The district can encourage the City of Houston and the Houston Airport System to create a plan and should be a stakeholder in the planning process.

Recommendation Characteristics

Type	Program
Timeline	Short-term (1-5 years)
District's Role	Advocate
Lead Agencies	Houston Airport System City of Houston

Livability Principles Supported

- 3. Enhance Economic Competitiveness
- 5. Coordinate Policies and Leverage Investment

Partners

Approval From

City of Houston, Houston Airport System, North Houston District, Houston First, IAH, and Tourism Board

Capital Funding

City of Houston, Houston Airport System, North Houston District, TIRZ 11, Economic Development Administration, and Greater Houston Partnership

Description

The existing conditions study showed that the Greenspoint area has a lot of potential for successful airport development due to its proximity to the airport, distance from Downtown, and easy access to George Bush Intercontinental Airport (IAH) via the proposed METRO plan for Bus Rapid Transit (BRT). However, this type of large-scale airport development will require a clear strategy, which should include all aspects of the development such as plans for recruitment, coordination, funding, and incentives. Since the airport will become the center of the development, the plan will require the lead of the City of Houston and IAH and the support of the North Houston District. The plan will also need to pull in all of the other stakeholders and will require research into what types of services and amenities will be most successful for this area and which will provide the community with both quality of life and jobs.

The actual development must be focused within the city limits, which leaves a horizontally oriented development area along Beltway 8 between Greenspoint and the western edge of the airport, which can be further zoned for different airport-related development. The surrounding area around IAH already has some of this development happening, which further indicates the potential for airport-based economic development and urban growth.

Jump Start Action Steps

- Ensure there is buy-in and support from leaders of IAH, economic development agency, neighboring municipalities, METRO, and the private sector for potential development.
- Hire a Site Locator to identify services and amenities that people and business value near this airport so that these can be clearly identified in the Plan.
- Commission an Airport Development Model to assess current services and operations and to identify potential business attraction based on the existing airport and plan for future needs.
- Support the reconstruction of Greens Road with Bus Rapid Transit that links IAH to Downtown Houston.

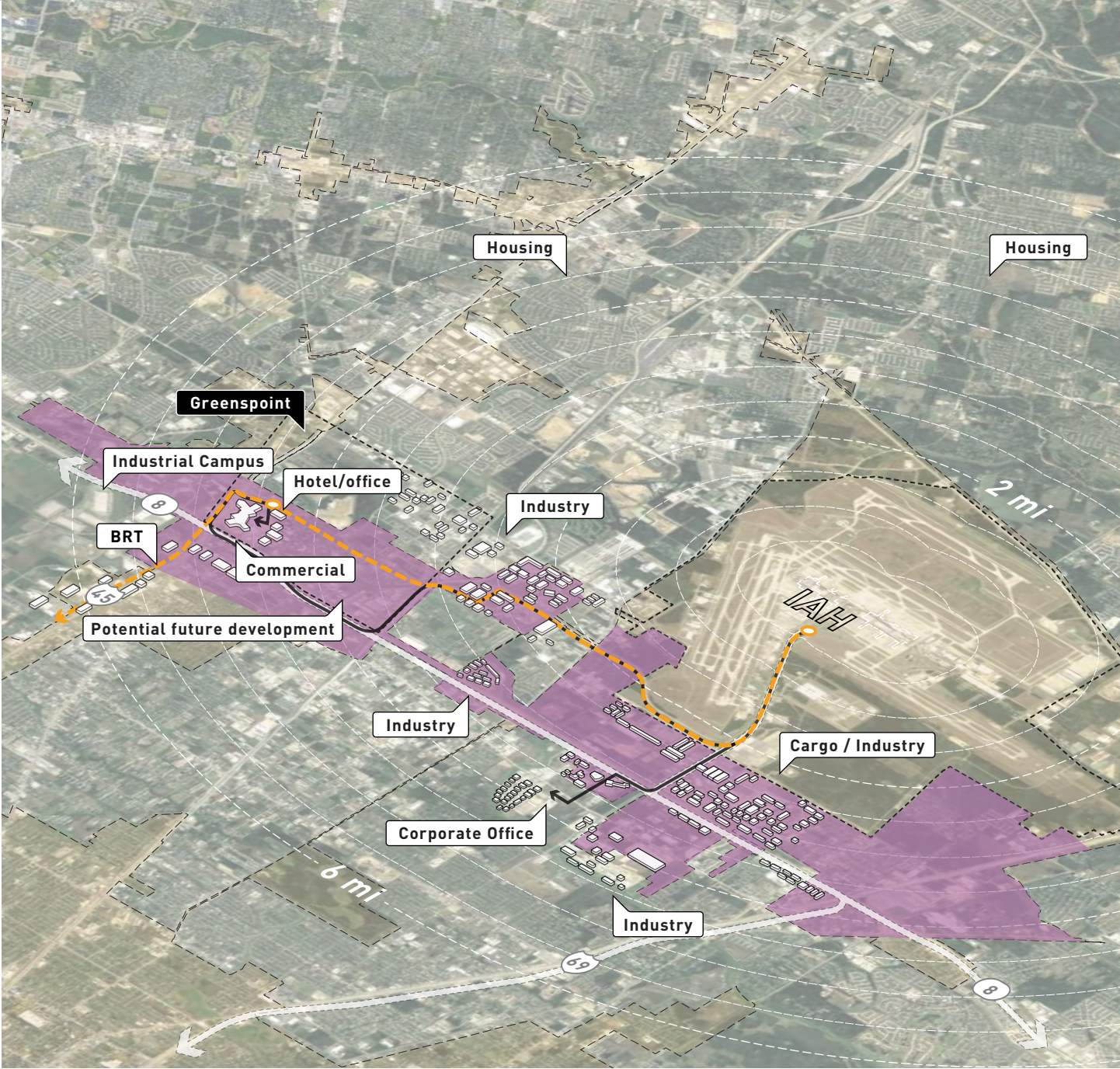



Figure 1.30 Airport Based Economic Development
 Potential economic development zone within the City of Houston, which includes a large portion of Greenspoint and continues along Beltway 8 to the Airport.

Airport Development

- Airport Economic Development Zone
- City of Houston limits
- Routes from airport to region
- Routes from airport to developments
- Proposed BRT routes
- Proposed BRT stop / station
- Airport boundary



0	1/2	1	2 miles
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BE A MODEL FOR SAFE PLACES TO WALK AND BIKE

The majority of Greenspoint residents drive to work. That's seventy-eight percent. However, compared to the rest of Houston, the percentage of people who drive to work in Greenspoint is relatively low. Eighty-seven percent of Houston's population drives to work, only four percent takes transit, almost nobody bikes, and only two percent of the population walks.

Greenspoint has over three times the number of people who take transit to work -- slightly under thirteen percent -- and almost 6 times the bike use of Houston, just under six percent biking to work compared to Houston's zero-point-three percent. The number of people who walk to work in Greenspoint is actually less than that of Houston, but it's important to note that this is the number of people whose primary mode of transit is walking and does not include the people who walk to get to their bus stop.

The majority of the population of Greenspoint is Hispanic, with other minorities falling closely behind. It is also considered a low to moderate income area, which is often directly related to high transit use, as is the case in Greenspoint. In addition to factors like demographics, Greenspoint's location, connectivity to the region and to places of employment, and the number of people who both live and work in Greenspoint influence how people get to work. Greenspoint is well served by transit, and has bus routes which take people to the to the largest areas of employment. Several buses service Aldine Education Center, IAH, Downtown, and residents can easily get to some of the Houston's employment centers like Greenway Plaza, Uptown, and TMC by transferring in Downtown. Walking and biking reflects the high

number of people in Greenspoint who live close to where they work, the presence and condition of sidewalks and crosswalks, and the accessibility of bus stops.

Greenspoint residents do walk, bike, and take transit, but there are some gaps where improvements to the existing infrastructure would make it easier, safer, and more comfortable for Greenspoint residents to walk and bike.

North Houston District, "Greenspoint/North Houston Livable Centers Study Application," Aug. 2017.

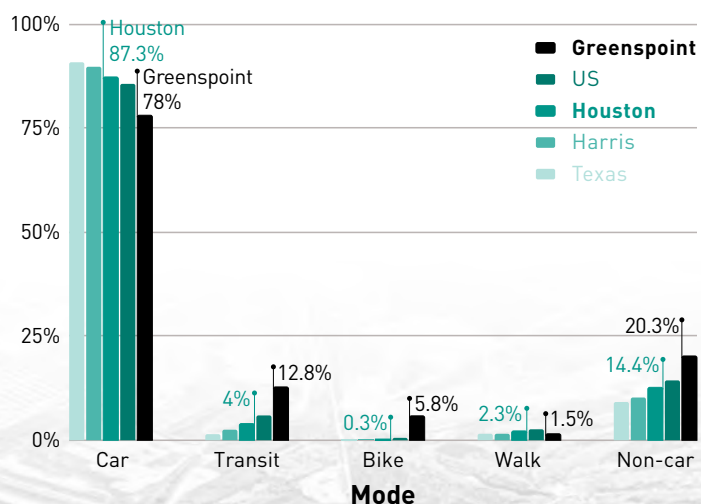
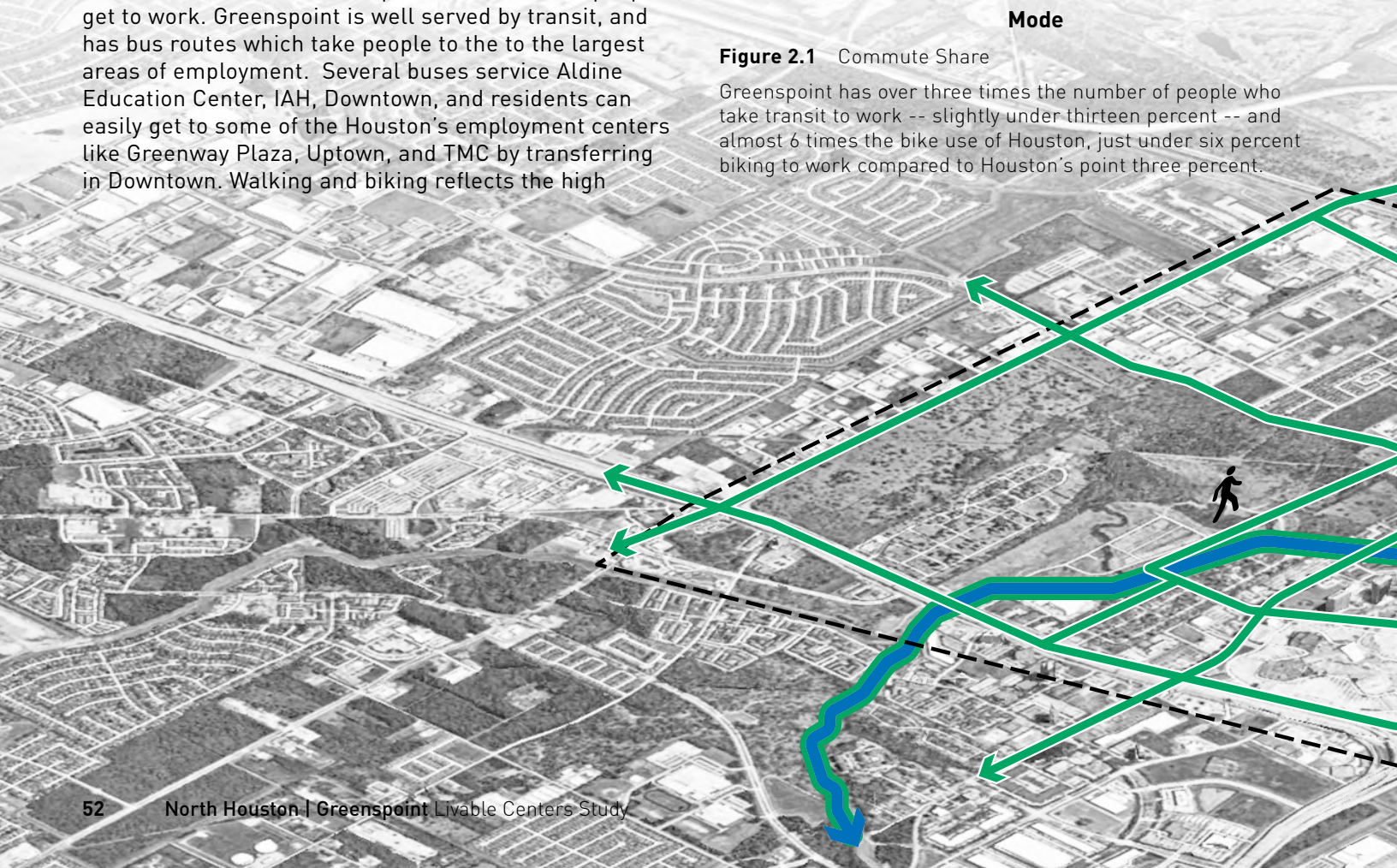


Figure 2.1 Commute Share

Greenspoint has over three times the number of people who take transit to work -- slightly under thirteen percent -- and almost 6 times the bike use of Houston, just under six percent biking to work compared to Houston's point three percent.

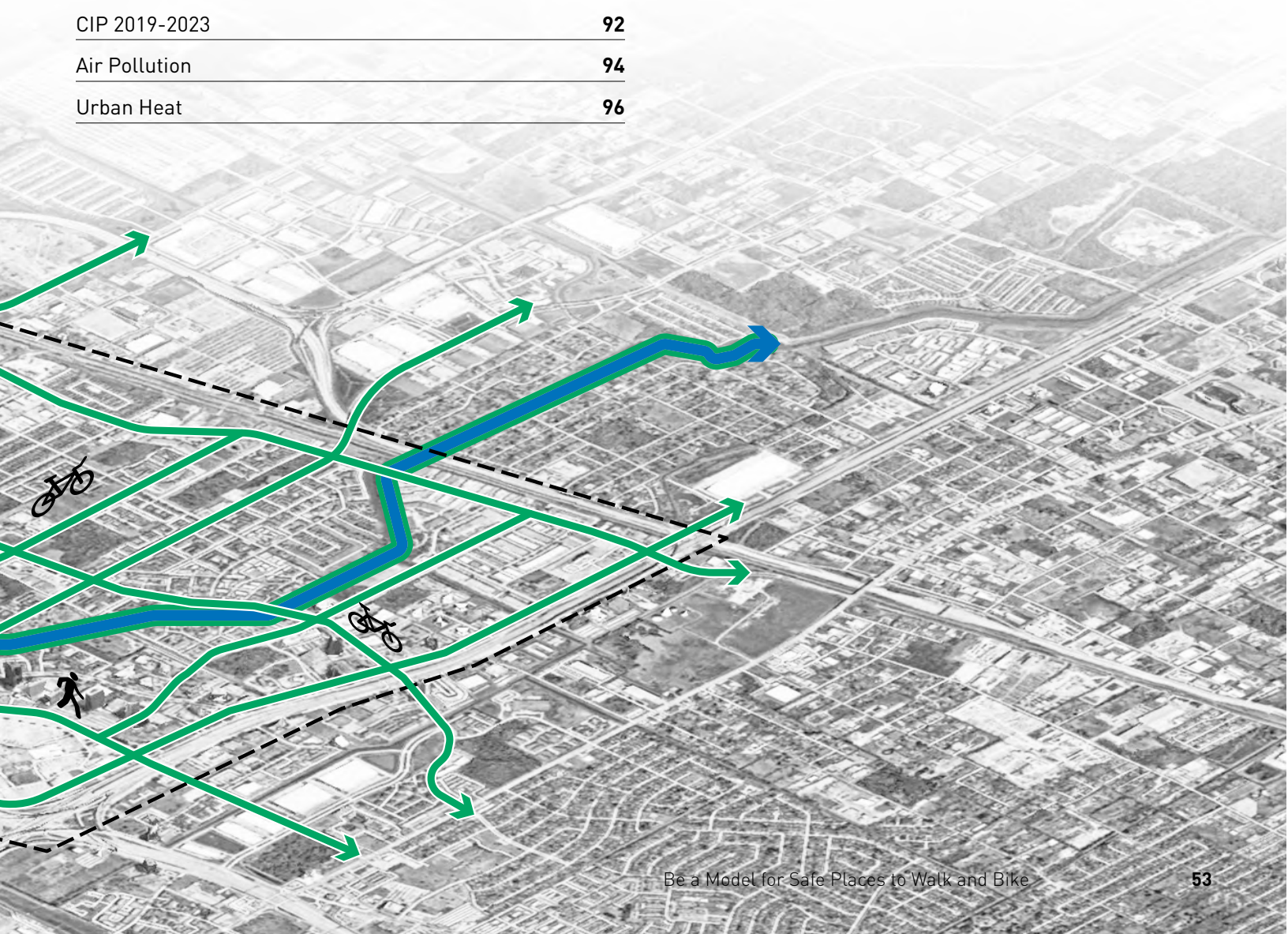


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Existing Conditions

Building Use

Greenspoint started off well with the offices and housing within walking distance of each other and of the mall. As Greenspoint Mall declined, the housing has become more and more separated from the offices and shopping centers. The majority of the commercial buildings are located in the Southwest portion of the study area near the mall, along Greens road and Greenspoint Drive. The offices are also clustered, with the majority of them sharing a common dead-end road just east of Imperial Valley Drive, almost completely cut off from the rest of the area. As is typical, industrial buildings are also clustered along the Eastern edge of the site closer to the airport and the Hardy Toll Road. Even the schools are somewhat clustered.

Perhaps the most notable cluster though is the residential cluster located near the center of the study area intersected by Greens Road and Greens Bayou.

This type of defined clustering severely limits walkability. It makes walking times from homes or apartments to commercial or office destinations long and inconvenient and likely deters many people from walking or biking in Greenspoint. Greenspoint also doesn't offer much in the way of retail, food, and other commercial and city services (see Figure 6.2 on amenities in the area), so once residents decide to drive to their destinations, its easy to rationalize going further and taking their business out of Greenspoint entirely. Mixing building uses would help encourage more people to walk and would likely help the economy of Greenspoint by increasing the number of people who walk, therefore increasing the number of people who decide to eat and shop locally.

North Houston District, "Greenspoint/North Houston Livable Centers Study Application," Aug. 2017.

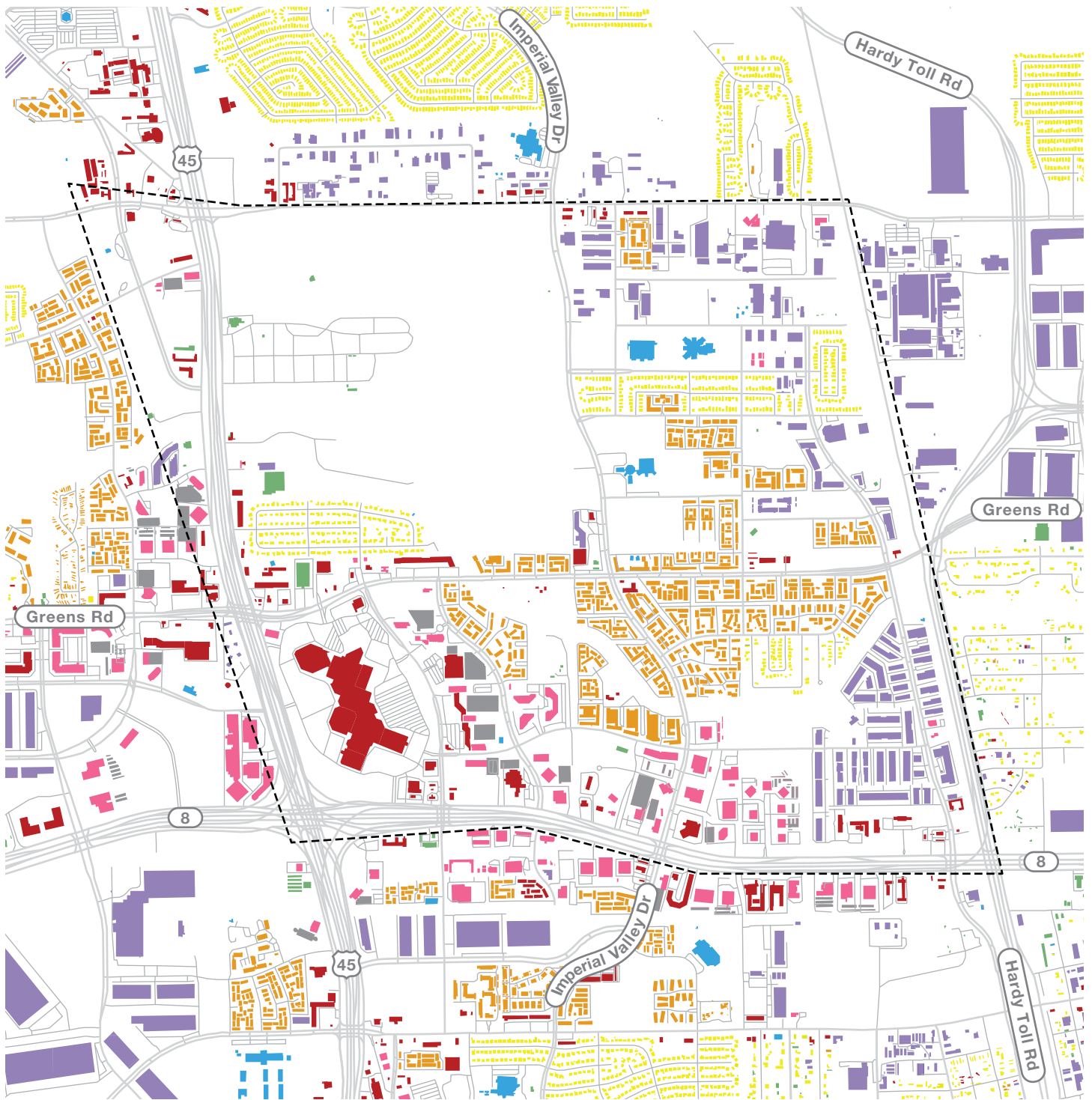
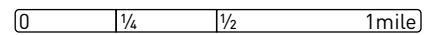
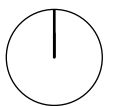


Figure 2.2 Building Use

Existing retail, offices, and industrial uses, along major vehicular corridors, encompass residential clusters.

Building Use

- Commercial
- Office
- Residential
- Institutional
- Industrial
- Parking
- Site
- Streets



Existing Conditions

Vacant Land

Despite the fact that Greenspoint appears rather sprawled out, with the exception of the large vacant area in the Northwest quadrant of the study area, there is surprisingly little vacant land in the area. The large surface parking lots, especially the one surrounding the mall, are what give Greenspoint the feeling of openness. The presence of parking lots in front of office and retail centers and the building-in-a-parking lot style of office building that is common along the Southern edge of the study area North of Beltway 8 and South of the bayou also add to this impression.

It is also impossible to ignore the large vacant parcel in the northwestern portion of the site. It has potential to provide valuable detention, parks, or additional development.

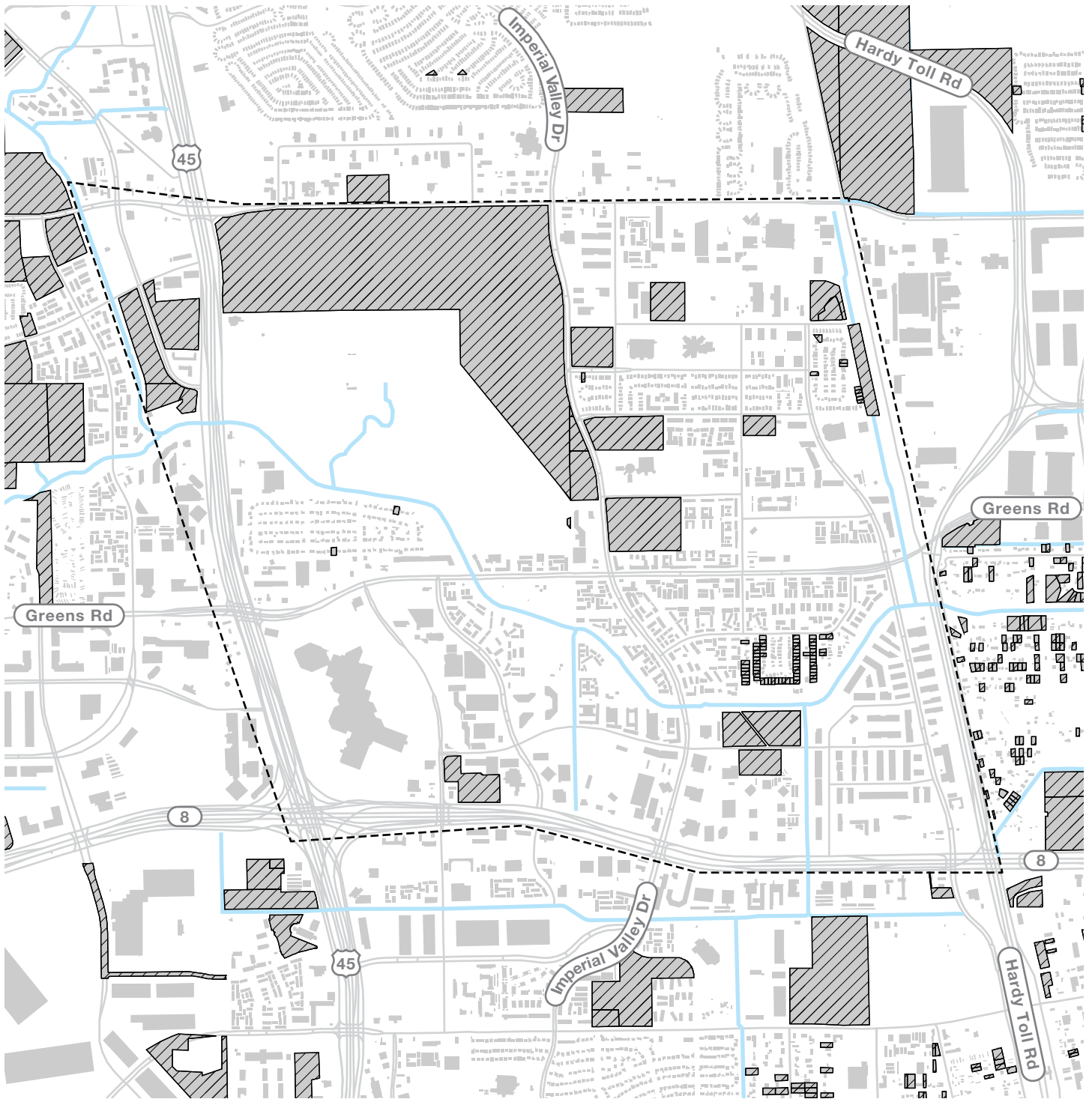




Figure 2.3 Vacant Parcels

Vacancy

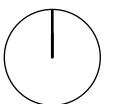
 Vacant Land

 Site

 Streets

 Bayous

 Buildings



0 1/4 1/2 1mile

Existing Conditions

Services and Amenities

Part of the reason for Greenspoint's decline was that there were never any city or county services built in the area and few amenities beyond the mall.

The study area still lacks city and county services. There are a variety of social services such as immigration services that are located just south of Beltway 8, but not much beyond that. There is no post office within the study area. The nearest one is over half a mile away to the west and requires crossing the freeway, which is inconvenient and dangerous for people who are walking or biking.

The number of retail outlets in the study area are also low and are still limited to a few small, local stores and kiosks in the mall, and along Greens Road, Greenspoint Drive, and Imperial Valley Drive. The majority of the retail, food, and services in the study area are local shops or restaurants. There are no large supermarkets in Greenspoint, with only one small local corner store/market along Greens Road. There is one supermarket south of the study area off of I-45, and three supermarkets along West Road and Airline Drive, but like the post office, they are not easily accessible by walking or biking.

The map in Figure 6.2 also clearly identifies the lack of food and retail near the cluster of multi-family housing north and just south of the bayou. Having more amenities near the majority of the housing would improve walkability and encourage more people to walk and bike and would increase convenience for everyone.

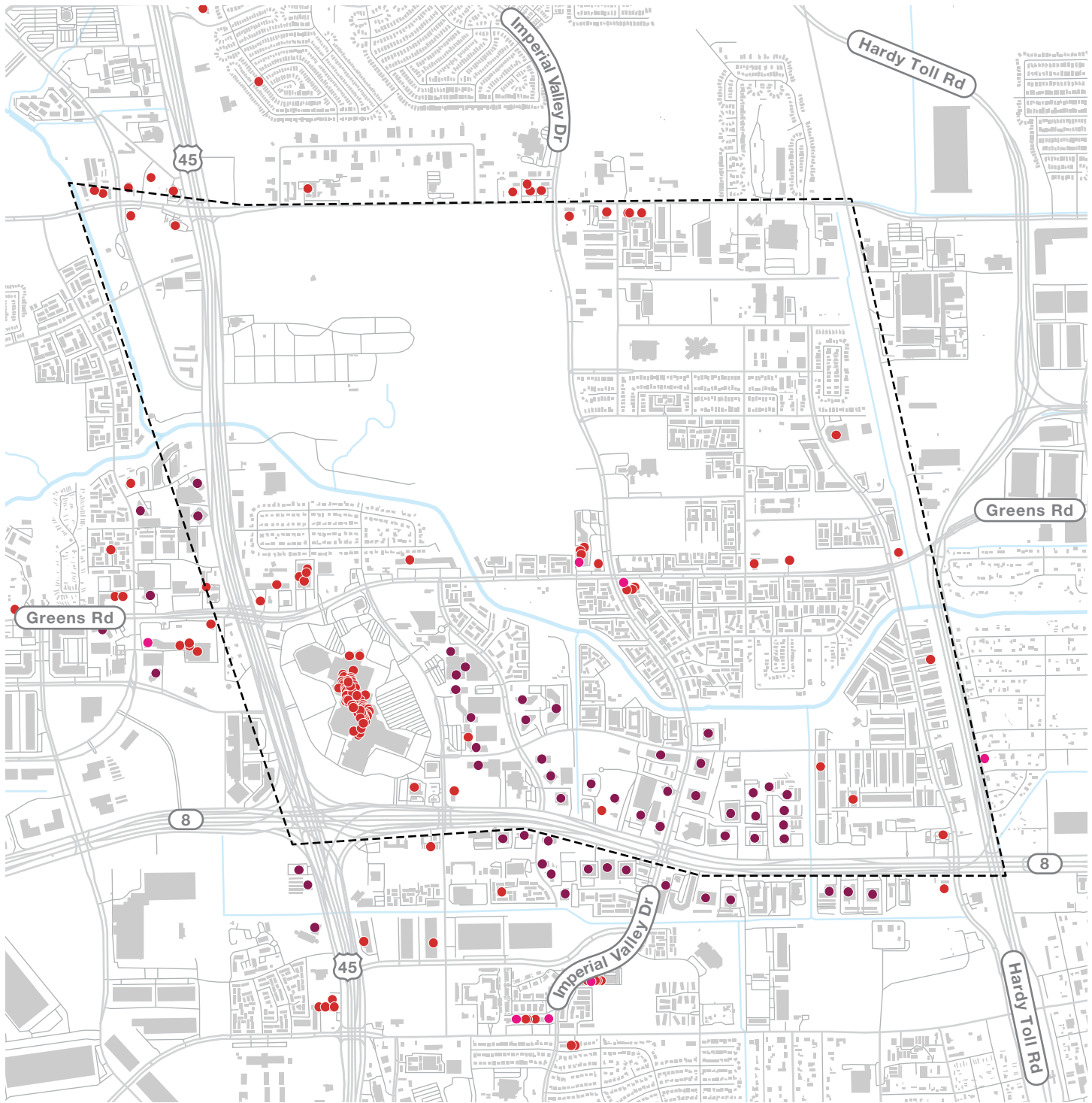


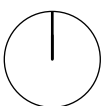
Figure 2.4 Amenities in the study area

Amenity Types

- Food Retail
- Community Serving Retail
- Grocery

- Site
- Streets
- Buildings

0 1/4 1/2 1mile



Existing Conditions

Transit Service Today

The North Houston District falls within the service area of the Metropolitan Transit Authority of Harris County, Texas (Houston METRO), and is served by seven local, express, and shuttle bus lines (Figure 1.1).

All seven routes converge upon the Greenspoint Transit Center where buses stage along the southbound side of Greenspoint Drive throughout the day and night, as the location serves as a terminus for five of the seven lines. Five routes operate in a loop pattern via Greenspoint, Benmar, and Northchase drives when departing the transit center. Despite its name, the facility is comprised of just a few standard-sized bus shelters with bus stop flagpoles and trash receptacles. Bus operators tend to utilize the mall, when open, for restroom facilities.

Routes originating and passing-through the study area travel many places within the Houston Region:

- The **6 Jensen/Greens** begins at the transit center and travels along Benmar Drive, Imperial Valley Drive, and Greens Road before continuing down Jensen Drive to Downtown.
- The **56 Airline/Montrose** originates at the transit center and follows the one-way loop before heading east along Greens Road and then south along Imperial Valley Drive. The route continues towards the Texas Medical Center via the Northline Transit Center.
- The **85 Antoine/Washington** exits at the transit loop and proceeds westbound along Greens Road before continuing along its namesake streets to Downtown.
- The **86 FM 1960 - Imperial Valley** exits at the transit loop and travels east along Greens Road before heading north along Imperial Valley Drive. Buses turn left at FM 1960 and travel to Willowbrook Mall.
- The **99 Ella - FM 1960** starts at the Lone Star College North Houston campus and travels along its namesake streets before entering the study area along Northborough Drive and Greens Road. It passes through the transit center before continuing to the I-45 frontage roads.
- The **102 Bush IAH Express**, coming from the airport, enters North Houston from Beltway 8 and begins making local stops along Imperial Valley Drive and Greens Road before servicing the transit center. The line then runs express down I-45 to Downtown.
- The **399 Kuykendahl Shuttle** provides service from the Kuykendahl Park & Ride and Kuykendahl Road before following the path of the 99 Ella - FM 1960 along Ella Boulevard/Greens Road and ending at the transit center.

Transit Ridership & Future Plans

Transit Ridership within the study area correlates with both land-use and the connections facilitated between different transit lines (Figure 1.2). Greenspoint Transit Center averaged over 1,800 daily boardings each weekday between both northbound and southbound stops. Both connecting passengers and trips to/from Greenspoint Mall and the other destinations across Greenspoint Drive account for this high activity.

Four of the seven other highest-ridership stops within North Houston occur at the intersection of Greens Road and Imperial Valley Drive. Four bus routes (6, 56, 86, and 102) serve the intersection, and many passengers can make more direct connections here rather than riding out of the way to the transit center. Ridership here can also be contributed to the dense multi-family housing that lines both streets.

Other factors contribute to expected ridership patterns. The 56 Airline/Montrose offers frequent service seven days a week and a span of service from 4:22 a.m. to 1:18 a.m. on weekdays; this investment in service yields high-performing bus stops along Imperial Valley Drive. The 102 Bush IAH Express serves the dual purpose of connecting many area residents to employment at Bush Intercontinental Airport as well as offering an express, one-seat ride to Downtown. Ridership is correspondingly high.

The transit agency is finalizing a long-range transit plan – named the METRONext Moving Forward plan – and preparing to present it to voters as a part of a bond referendum in November 2019. The plan contains projects that both reduce travel time for existing trips as well as add capacity for future regional transit needs. North Houston is proposed to receive significant transit investment (Figure 1.3).

The long-range plan includes a Bus Rapid Transit (BRT) line from Downtown to IAH by way of North Houston. The rail-like service would feature dedicated lanes and large station platforms with canopies at three station pairs along Greens Road. The plan also calls for the construction of a new transit center within the general proximity of the existing location. Finally, the plan proposes two local bus routes (56 and 85) to be designated as ‘BOOST Corridors’, which will involve an investment in stop optimization and transit signal priority as well as the construction of enhanced bus stops throughout the corridors.

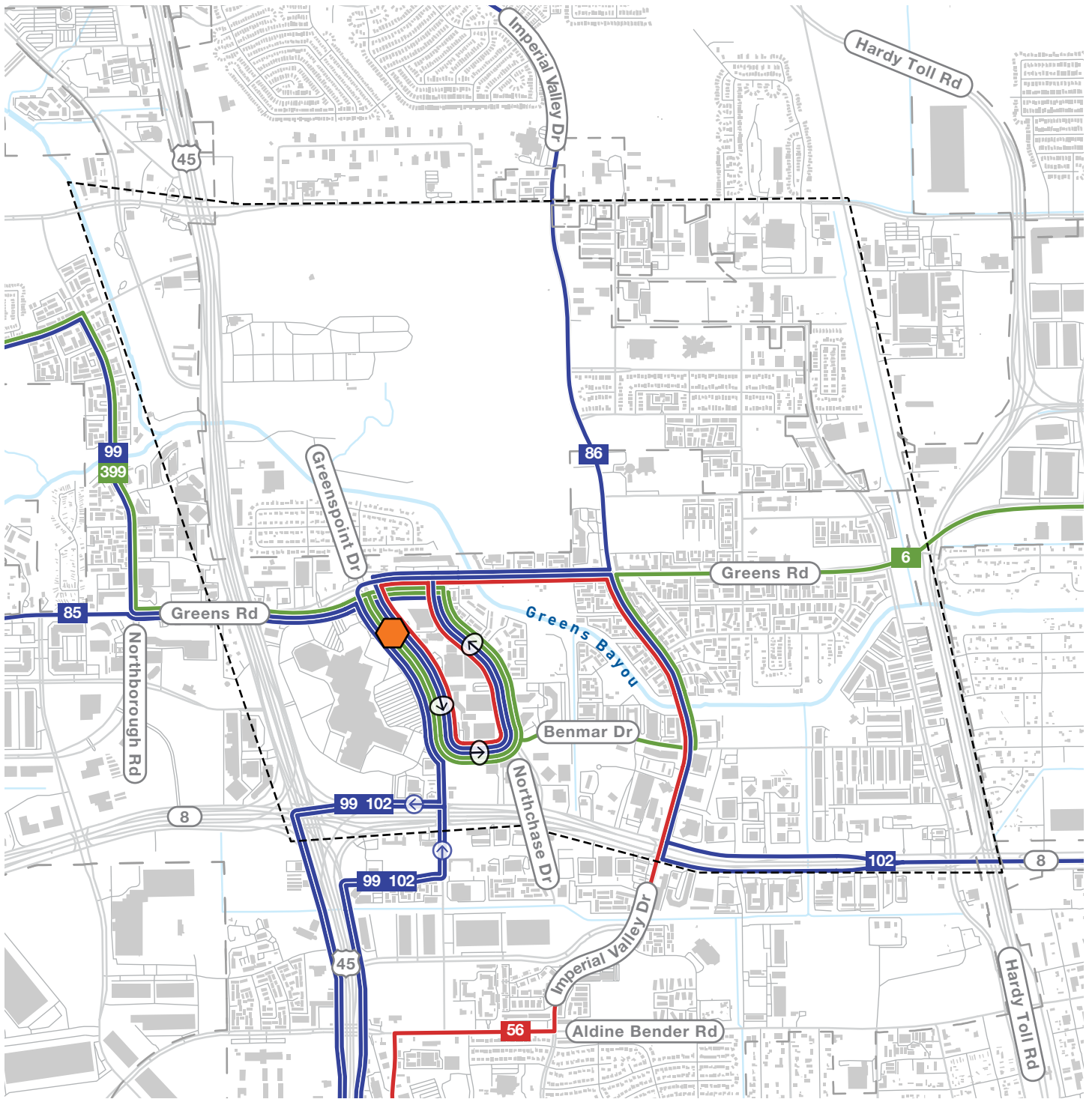


Figure 2.5 Existing Transit Service

The North Houston District is well-covered by transit with seven routes – one offering all-day frequent service – converging at the Greenspoint Transit Center located on Greenspoint Drive just east of Greenspoint Mall. Many routes circulate along Northchase Drive before embarking to points across the Houston region.

Existing Transit

Local, Express, & Shuttle Routes

Route Frequency

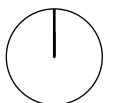
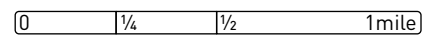
(Midday/Weekend)

- every 15 minutes
- every 30 minutes
- every 60 minutes

⤴ One-Way Service

⬡ Transit Center

- - - Site
- Streets
- - - City Limit



Existing Conditions

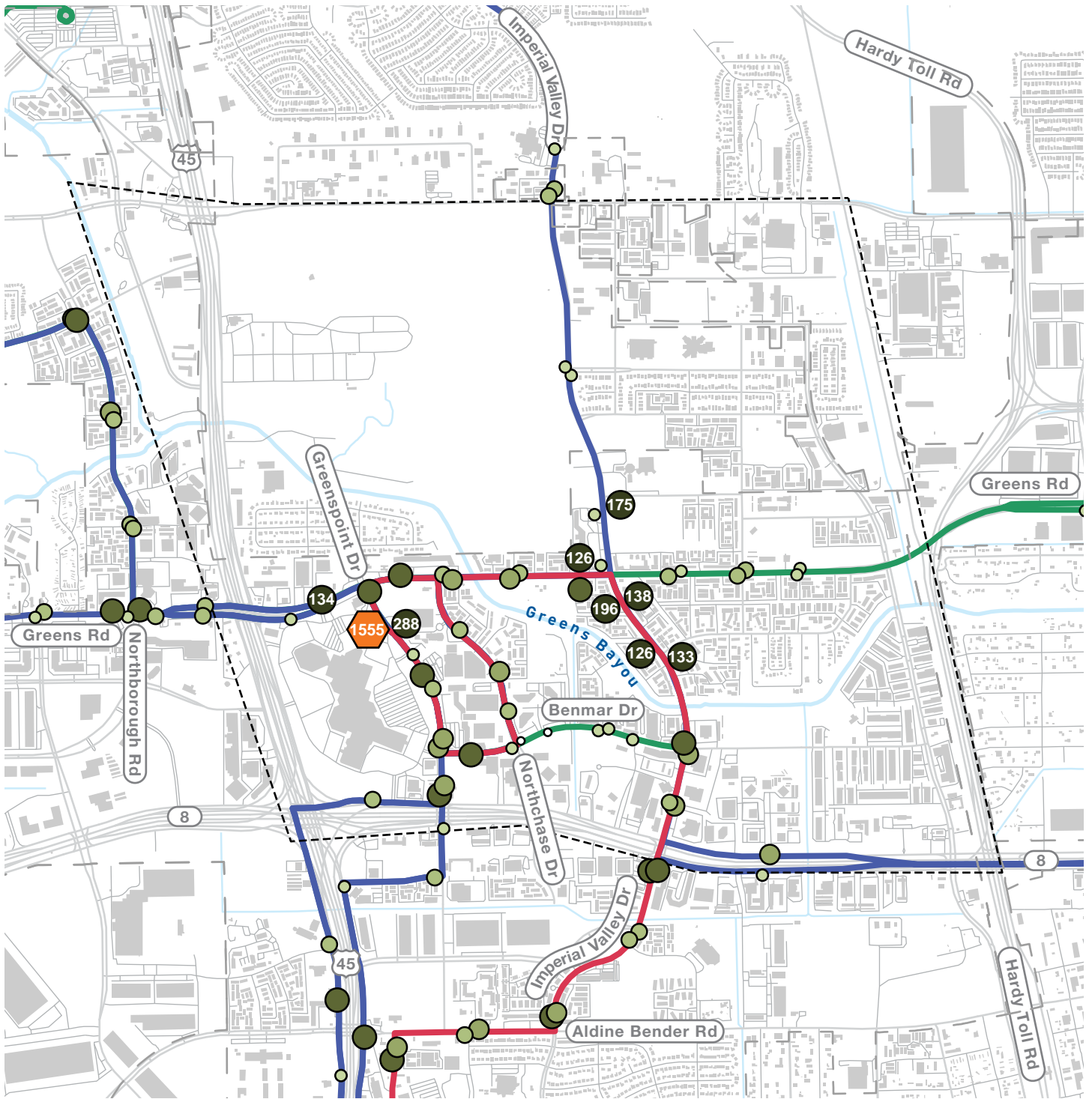


Figure 2.6 Existing Transit Ridership

The highest transit ridership within the North Houston District is fueled both by the existing Greenspoint Transit Center as well as the dense multi-family housing located along Greens Road and Imperial Valley Drive. Stops at the intersection of the two streets facilitate many connections between four routes.

Note: Some stop locations were slightly shifted on this map to preserve legibility

Existing Transit

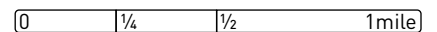
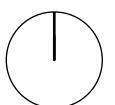
Average Weekday Boardings (Oct 2018)

- 1 or fewer
- 2 - 10
- 11 - 25
- 26 - 50
- 51 - 100
- # More than 100
- # Transit Center

Route Frequency (Midday/Weekend)

- every 15 minutes
- every 30 minutes
- every 60 minutes

- - Site
- Streets
- - City Limit



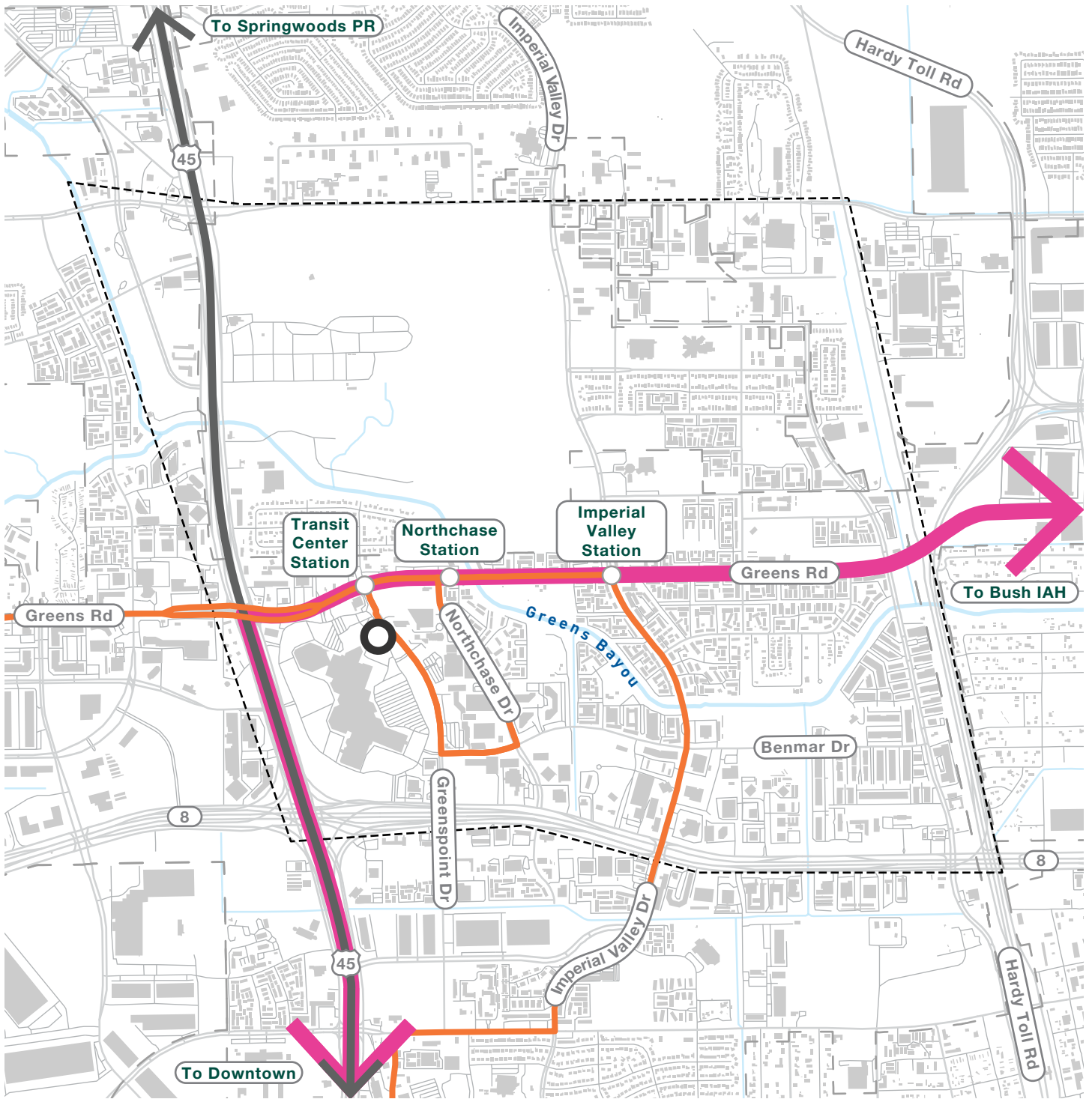
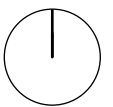
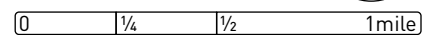


Figure 2.7 'METRONext Moving Forward' Long-Range Plan

METRO's comprehensive transit plan, which goes to voters in November 2019, is comprised of a long list of projects; Bus Rapid Transit and Bus Operations Optimization and System Treatments (BOOST) are proposed within the North Houston District.

METRONext Moving Forward Plan - Capital Projects

- Downtown — Bush IAH Bus Rapid Transit (BRT)
- IH-45 Regional Express Service
- Bus Operations Optimization and Systems Treatments (BOOST) Corridor
- Existing Transit Center (to be upgraded)
- Site
- Streets
- City Limit



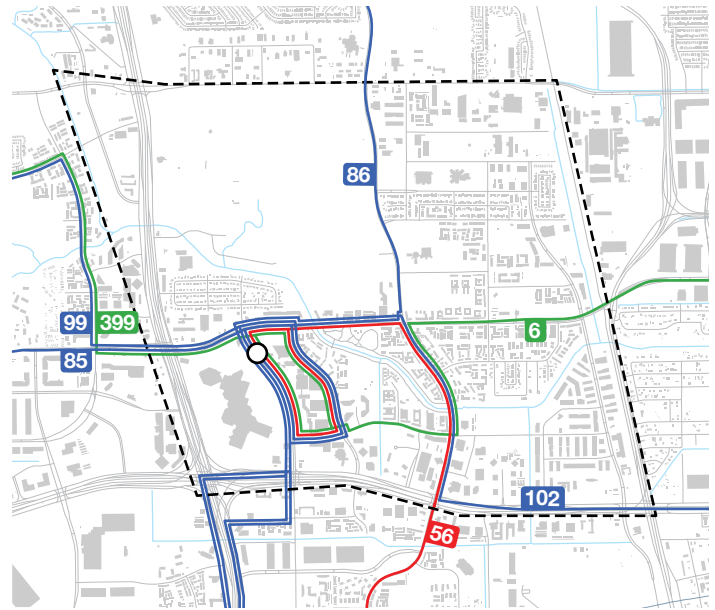
Existing Conditions

Walking Distances to Bus Stops

The majority of Greenspoint is within a half-mile walk from a bus stop. Walking distances in Figure 1.4 were calculated by measuring the actual walking distance from a bus stop and takes into account winding neighborhood or apartment complex pathways for a more accurate representation of actual walking distance. There are some areas near the eastern edge of the study area that are further than a half-mile to a bus stop, but these areas are also less populated than the rest of the study area and are primarily industrial areas. The northeastern edge of the study area does have some single-family neighborhoods which do not have easy access to a bus stop.

The bus routes also serve the surrounding area well, providing residents with access to amenities outside the study area along Greens Road to the west and Imperial Valley Drive to the south, and the locations of bus stops in these areas provide good coverage for neighborhoods, retail centers, and services just outside of Greenspoint.

The ease of access to transit in and around Greenspoint is likely part of the reason why so many of the residents chose to ride the bus to work.



Route Frequency

- 15 min or better
- 20 or 30 min
- 60 min
- Transit Center

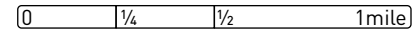


Figure 2.8 METRO Bus Routes

Greenspoint is serviced by seven routes:

- 6 Jensen / Greens
- 56 Airline / Montrose
- 85 Antoine / Washington
- 86 FM 1960 / Imperial Valley
- 99 Ella - FM 1960
- 102 Bush IAH Express
- 399 Kuykendahl

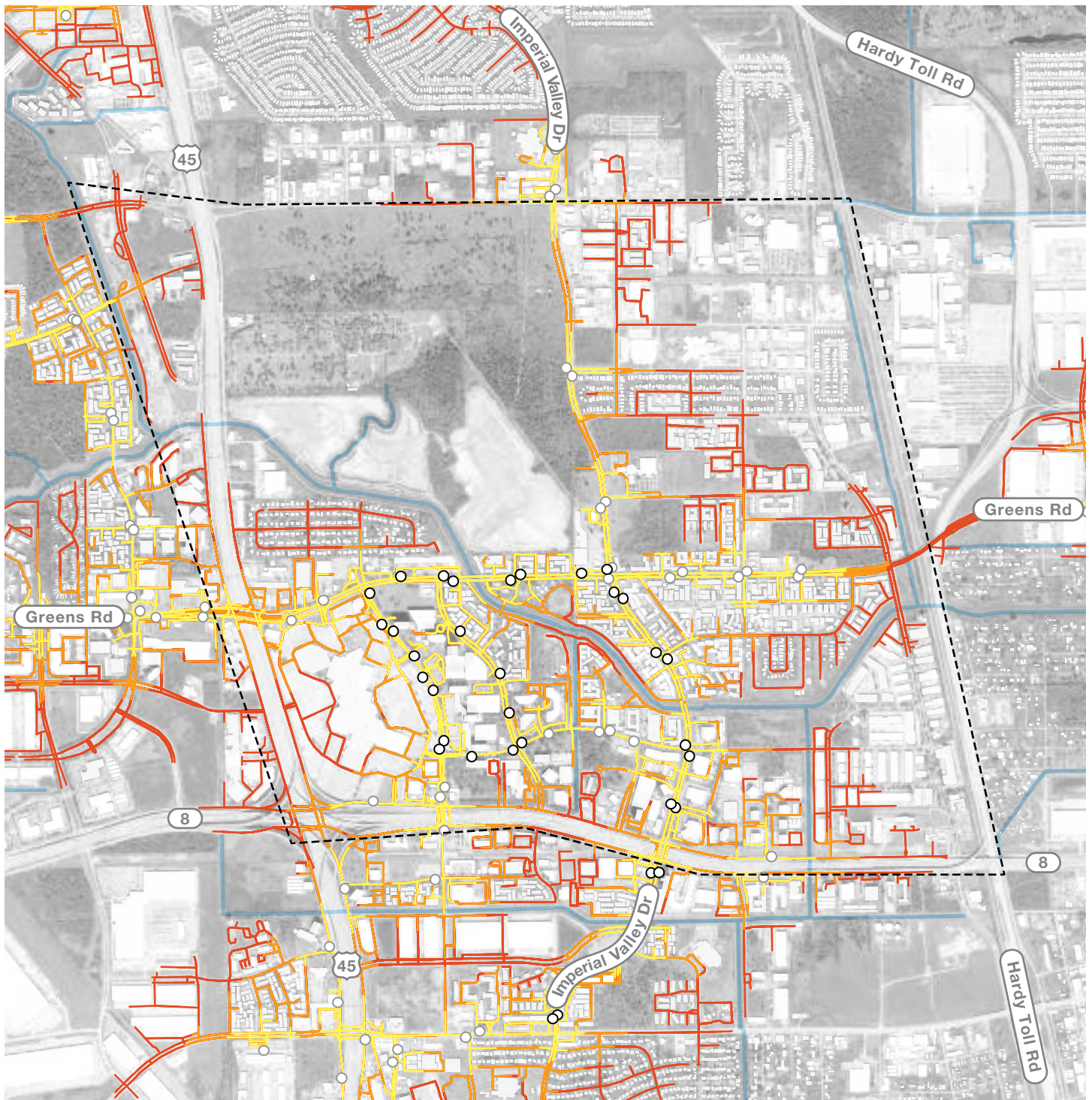
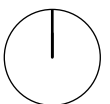
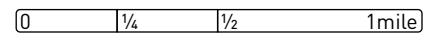


Figure 2.9 Proximity to Bus Stops

The majority of Greenspoint is within a half-mile walk from a bus stop. Areas on the northern- and eastern-most edges of the site are the furthest to a stop, but are also less populated.

Bus Stops and Walking Distances

- 1/8 mile
- 1/4 mile
- 1/2 mile
- Frequent Stop (15 min or better)
- Bus Stop
- - Site



Existing Conditions

Bikeways

The current high-comfort bikeways in the North Houston District are limited to the Greens Bayou corridor. These shared use paths provide an off-street place for Greenspoint residents and workers to walk and bike. The existing trail east of I-45 that runs along the south side of Greens Bayou is nearly two miles (will be at least 2.25 once extended to the Hardy Toll Road) with trails along most of the north side of the bayou as well. The existing trail along Greens Bayou west of I-45, makes a direct connection to the North Houston Bike Park and the North Houston Skate Park and continues west for a few miles. Through the Houston Parks Board, there are near-term plans to make the trail along the bayou connect under I-45 to make a more continuous trail between the skate and bike parks to the rest of the North Houston District.

Many streets are wide and have high-speed traffic, making cycling on the roadways uncomfortable. There are opportunities to recommend high-comfort bikeway connections within the study area that could be coordinated with other transportation-related recommendations. In addition to the existing high-comfort bikeways along the bayou, the map illustrates the proposed future bikeways identified through the Houston Bike Plan. The future network of bikeways connects the North Houston District study area well. Unfortunately, none of the future lines are funded or programmed for near-term implementation. Through this planning effort, there are opportunities to prioritize future bikeways for implementation in coordination with other projects.

It is important to note that a portion of the North Houston District is outside of City of Houston city limits, but still within Harris County. Some of the Houston Bike Plan lines appear to stop mid-corridor, showing where the city limits end within Harris County. This will be important as recommendations are created to ensure buy-in and coordination from the appropriate governing body (City or County).

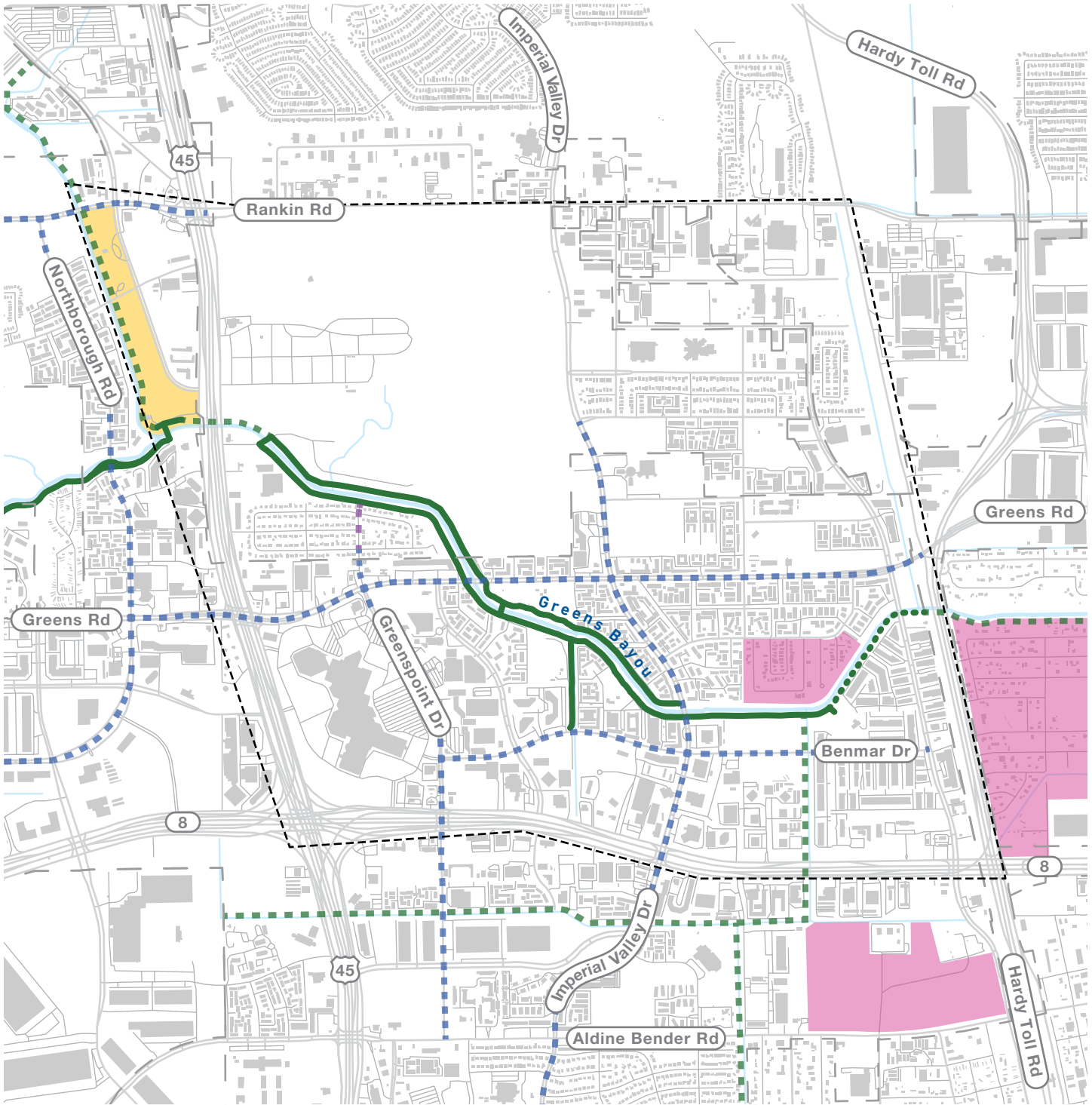


Figure 2.10 Existing High-Comfort Bikeways

The North Houston District currently has a large spine of existing high-comfort bikeways along the Greens Bayou Greenway that provides walking and biking connections to multiple residential areas and some retail.

Long-Term Vision High-Comfort Bikeways

- Shared On-Street
- Dedicated On-Street
- Off-Street
- 'Beyond the Bayous' Proposed Neighborhood Network
- North Houston Bikepark
- Existing Bikeway
- Programmed Bikeway
- - - Planned/Long-Term Bikeway
- - - Site
- Streets
- - - City Limit



Existing Conditions

Barriers

Walking and biking in the Greenspoint area can be challenging. There are sidewalks along most of the major corridors, but there are places where sidewalks are narrow, in poor condition, or have gaps preventing connectivity. The existing block lengths are long, which present challenges when walking or bicycling due to limited safe crossing locations and limitations when trying to travel to an adjacent corridor due to the existing land uses such as large fenced-in apartment complexes or businesses. There are multiple stretches of roadway over half a mile long, that do not provide safe and visible crossings for people walking and bicycling. The overall street grid is lacking and the large block sizes put all vehicular traffic (including people walking and biking) mostly on the major thoroughfares instead of having traffic dispersed on a network of roadways.

Other major physical barriers to walking and biking connectivity include the major highways as well as Greens Bayou. The map identifies locations where cars, pedestrians, and bicyclists may cross a barrier, as well as places where only cars or only walkers/bikers can cross. This illustrates the limited access and connection opportunities to, within, and outside of the study area.

Signalized intersections are shown on the map to indicate where safe crossings may exist today. This may present opportunities to consider additional safe crossing locations to allow people walking and biking a designated place to cross a busy corridor.

Although the Greens Bayou trails are an asset for people walking or biking, the opportunities to cross to get to something on the other side are very limited, creating a barrier for community connectedness. Through this planning effort, opportunities for safer and logical connections for all modes of transportation will be identified.

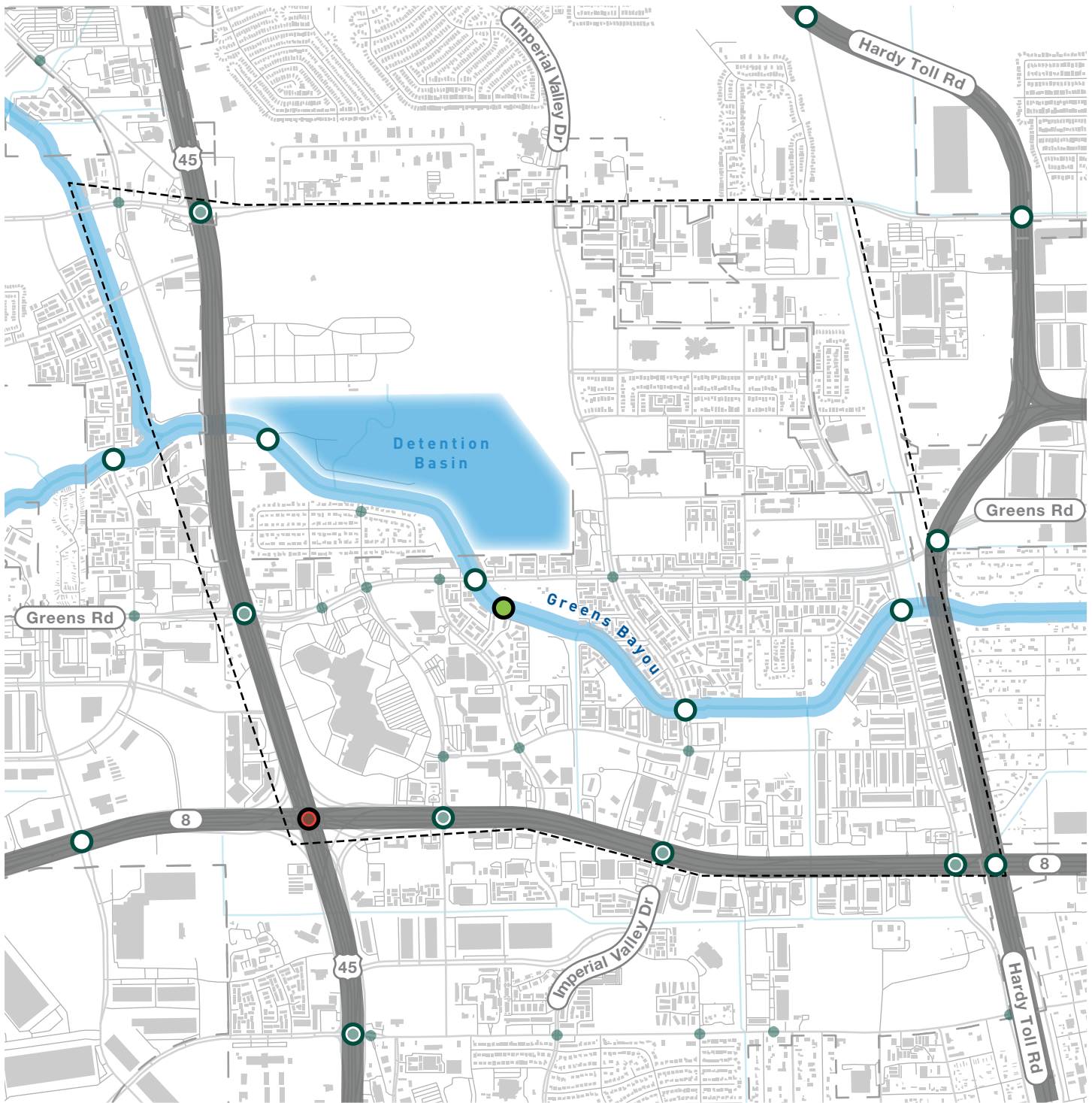


Figure 2.11 Barriers to Connectivity

There are major physical barriers to overall connectivity within the North Houston District that include the major highways as well as Greens Bayou. The street grid (or lack thereof) within the District can also be a barrier to connectivity.

Barriers

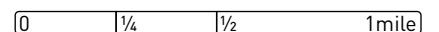
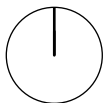
- Freeway
- Water/Bayou

Crossing Points

- Pedestrians + Bicycles Only
- Vehicles Only
- Pedestrians + Bicycles + Vehicles

- Signalized Intersection

- - Site
- Streets
- - City Limit



Existing Conditions

Speeds, Volumes, and Major Thoroughfares

The key transportation corridors in the study area included in the City of Houston's Major Thoroughfare and Freeway Plan (MTFP) include four major thoroughfares, Rankin Road, Greens Road, Imperial Valley Drive, West Hardy Road, East Hardy Road, and one major collector, Greenspoint Drive. The majority of the MTFP lines shown on this map are corridors that have sufficient width today, meaning no additional right-of-way would need to be acquired to accommodate for existing and projected traffic volumes. There is a small section on West Hardy Road near the intersection of Rankin Road that does not currently exist, but is included on the MTFP map as "to be acquired" indicating the City may plan to acquire land to make the West Hardy Road connection to Rankin Road. East Hardy Road is on the MTFP to be widened, north of Greens Road. It is important to note that Rankin Road east of I-45 is owned by Harris County, and west of I-45 is within the City of Houston. More MTFP details are described in the cross-sections below by corridor.

The posted speed limit on Greens Road, Imperial Valley Drive, and Greenspoint Drive is 35 miles per hour, 40 miles per hour on Rankin Road west of I-45, and 45 miles per hour along the east side Rankin Road and West Hardy Road corridors. According to speed data collected by the City of Houston, the 85th percentile speeds are shown on the map, clearly indicating locations where speeding is prevalent (ie: Greens Road east of Greenspoint Drive). Many of these corridors are wide with minimal congestion, providing an environment that encourages vehicles to speed, creating hazardous environments for people walking or bicycling within the same corridors.

The traffic volumes are noted on the map as well. All of the transportation characteristics illustrated here such as the width of the road, speeds, and volume can all provide meaningful baseline data to guide recommendations for this plan.

To better understand existing roadway characteristics and operations, key corridors within the study area were reviewed. Cross-section for key corridors are depicted on the following pages. Existing cross-sections, adjacent land uses, vehicular volumes, transit usage, travel paths of people walking and bicycling along each of these corridors were assessed.

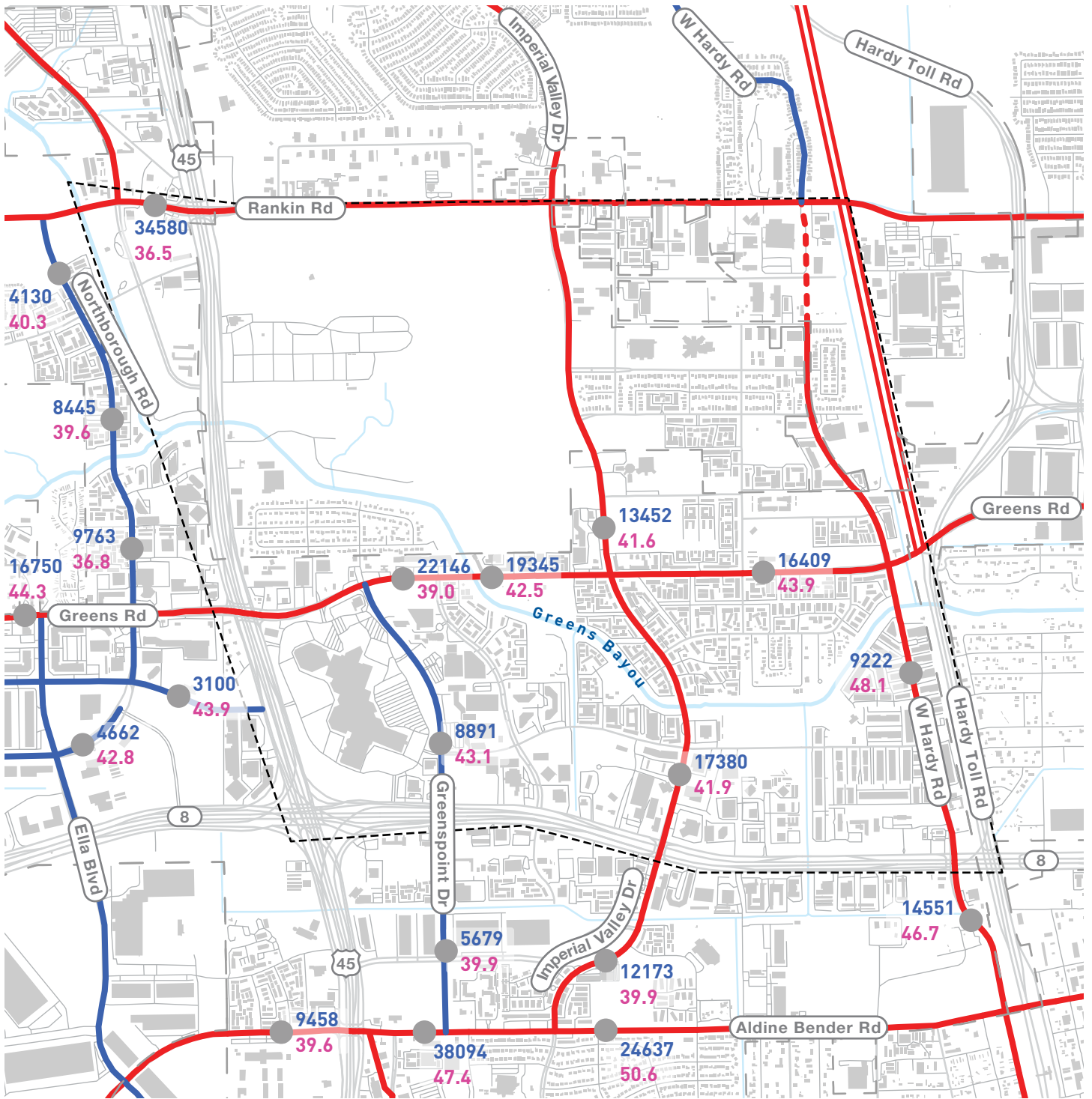


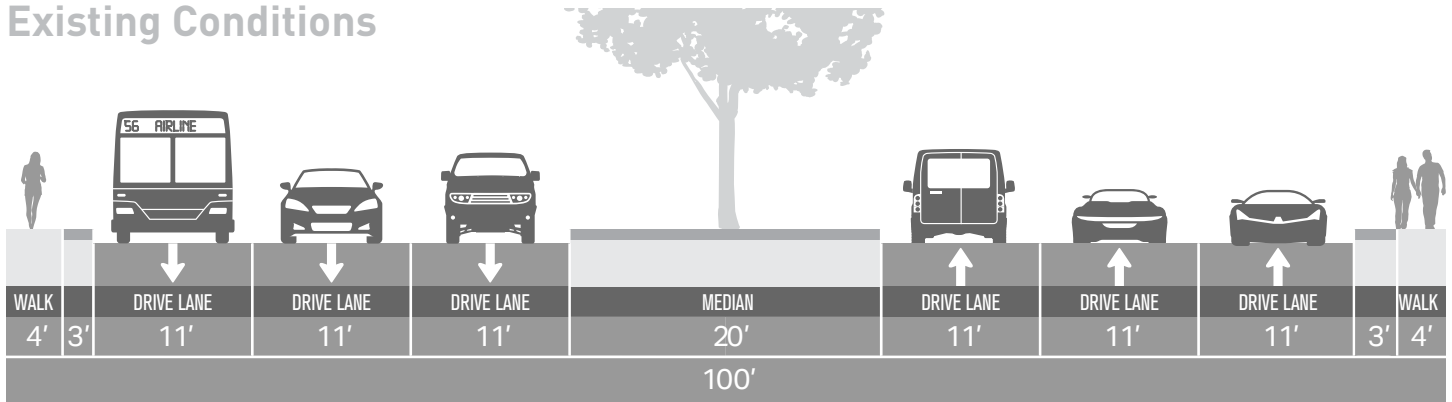
Figure 2.12 Speeds, Volumes, and Major Thoroughfares
 The key transportation corridors aside from I-45, Beltway 8, and Hardy Toll Road include Rankin Road, Greens Road, Imperial Valley Drive, West Hardy Road, and Greenspoint Drive. The 85th percentile speeds along Greens Road, Greenspoint Drive, and Imperial Valley Drive are high, making an unsafe and unfriendly environment for people walking or biking within those corridors.

Speed, Volume, and Thoroughfares - City of Houston Data

Major Thoroughfare and Freeway Plan (MTFP) classifications

- Principal Thoroughfare/Thoroughfare
 - Major Collector
 - To be acquired
 - ▬ To be widened
 - Site
 - Streets
 - - - City Limit
- Data Points (2017-2019)**
● Average Daily Traffic
● 85th Percentile Speed (mph)
- 0 1/4 1/2 mile

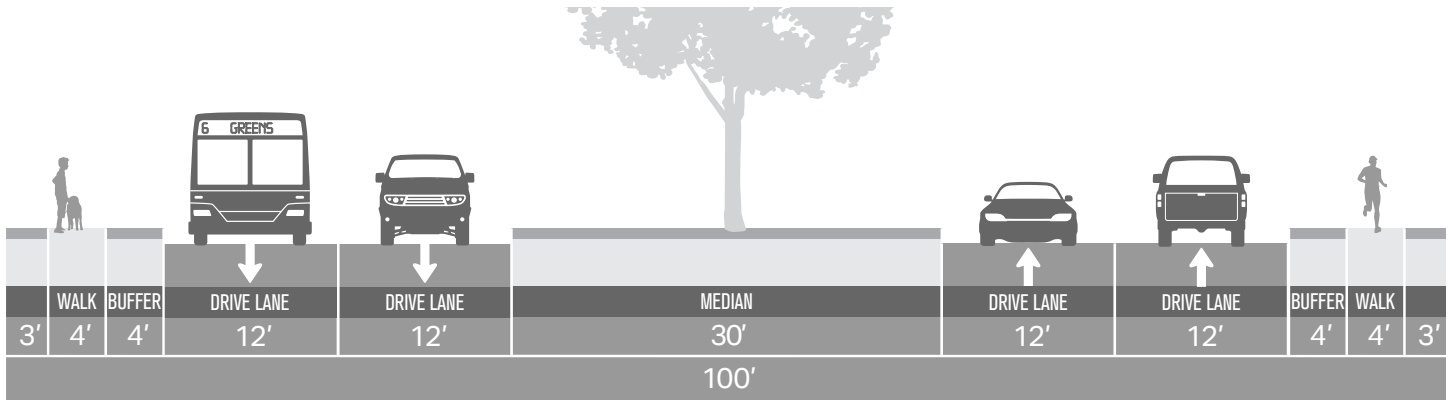
Existing Conditions



Greens Road between IH-45 and Greens Bayou

Greens Road between I-45 and Greens Bayou is classified as a T-6-100. At I-45, through movements along Greens Road are depressed and turning movements intersect I-45 frontage road at-grade. Between I-45 and Greenspoint Drive, the depressed lanes merge with the at-grade lanes, resulting in four through

lanes in each direction with additional turn lanes. For this segment weaving distances are short and vehicular speeds are high. Along this section there are 4-foot sidewalks. The typical cross-section for the segment between Greens Bayou and Greenspoint Drive is shown above.



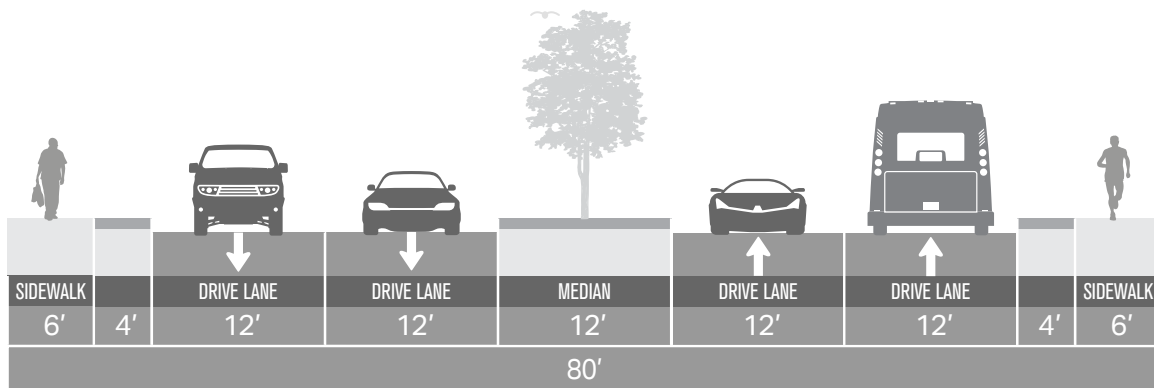
Greens Road between Greens Bayou and West Hardy

East of Greens Bayou, Greens Road is a four-lane divided roadway that is classified as a T-4-100 with sufficient width. Sidewalks are present along this segment and are 4 feet wide.

high along Greens Road and visits to the field indicate a high number of people walking and bicycling.

The land uses along this segment of Greens Road are primarily multi-family residential and commercial. Transit usage is

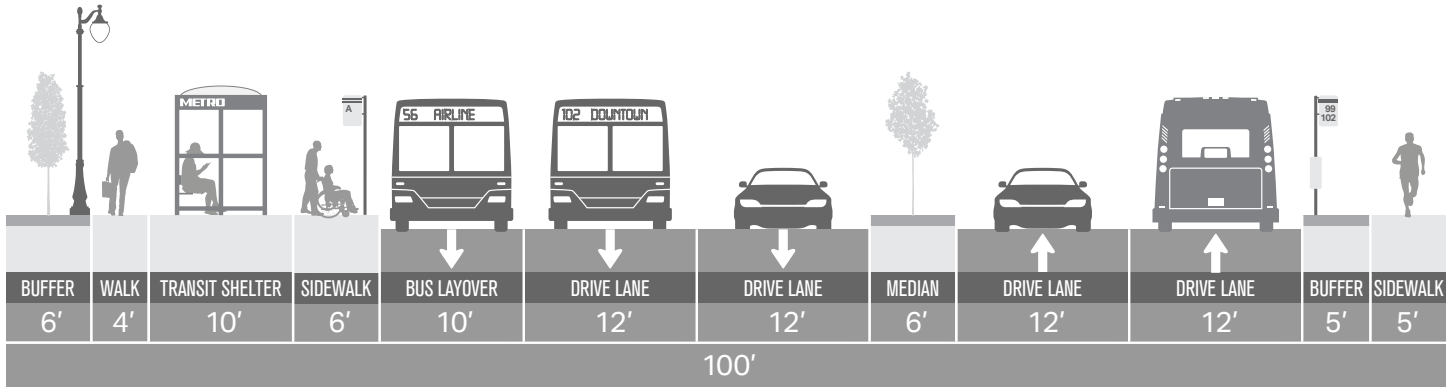
At West Hardy Road, Greens Road is elevated. The elevated segment of Greens Road extends over East Hardy and Hardy Toll Road.



Greenspoint Drive

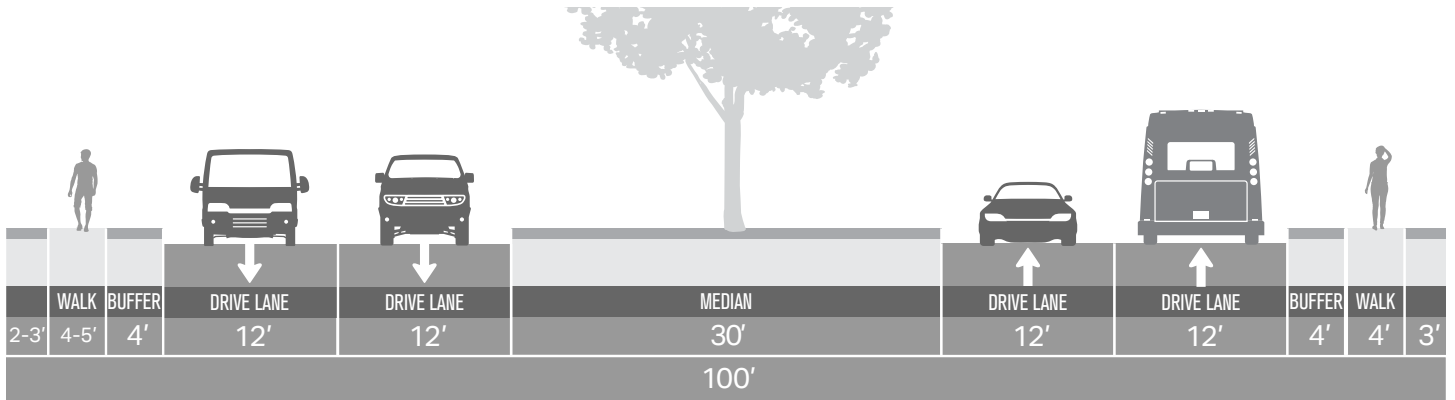
Between Greens Road and Beltway 8 Greenspoint Drive is a four-lane, divided major collector, classified as a MJ-4-80 with sufficient width. It travels along the eastern edge of Greenspoint Mall and is one of the main access points to the Mall. Land uses along the eastern edge of Greenspoint

Drive are primarily office towers with some restaurants and retail. The Hilton Houston North is located along this corridor. Sidewalks are a minimum of 6 feet along the corridor, with wider sidewalks present near the Greenspoint Transit Center.



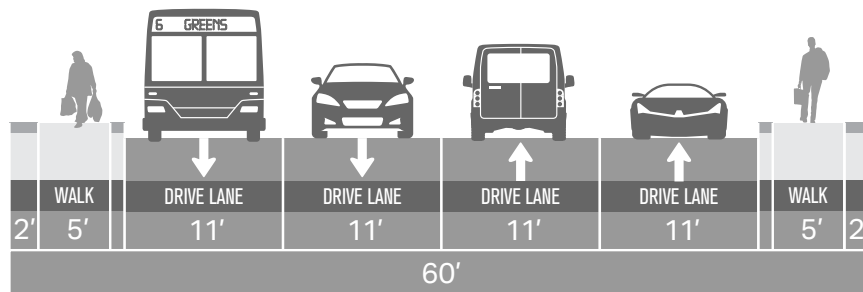
Greenspoint Drive at Greenspoint TC

The Greenspoint Transit Center is located along Greenspoint Drive, near the Greens Drive intersection. At the Greenspoint Transit Center, there is an additional southbound bus lane along Greenspoint Drive to provide refuge for buses that terminate at the Transit Center.



Northchase Drive

Between Greens Road and Beltway 8 Northchase is a north-south four-lane divided roadway with a 30' median. While not on the MTFP, Northchase operates as a collector within the North Houston District providing access to multiple multi-family residential complexes and mid-rise office towers.

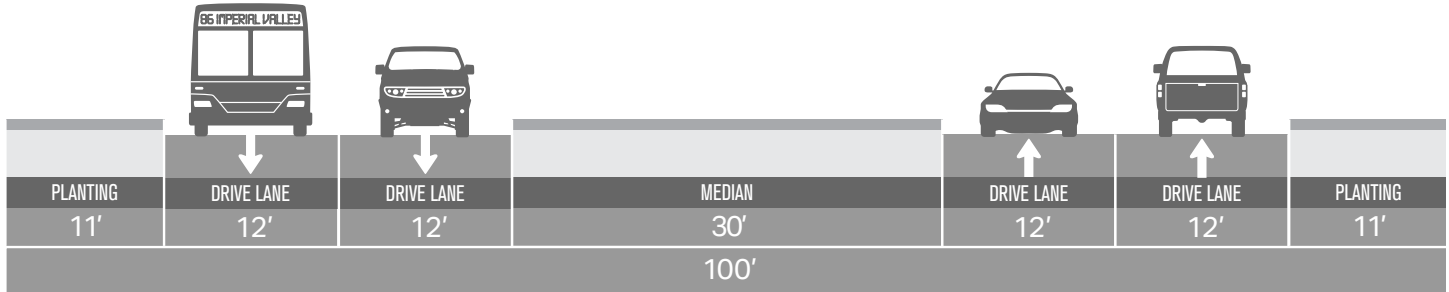


Benmar Drive

Between Greens Road to West Hardy Road, Benmar Drive is a four-lane, undivided roadway, that is approximately 44' feet wide and operates as a collector within the North Houston District. ROW is a minimum of 60' with some sections having wider ROW. West of Imperial Valley there are sidewalks

present along both side of the corridor, east of Imperial Valley sidewalks are only present along the north-side. At the western terminus, sidewalks vary from 4' to over 6'. Land uses along the corridor vary from mid-rise office tower and multi-family in the west to light industrial in the east.

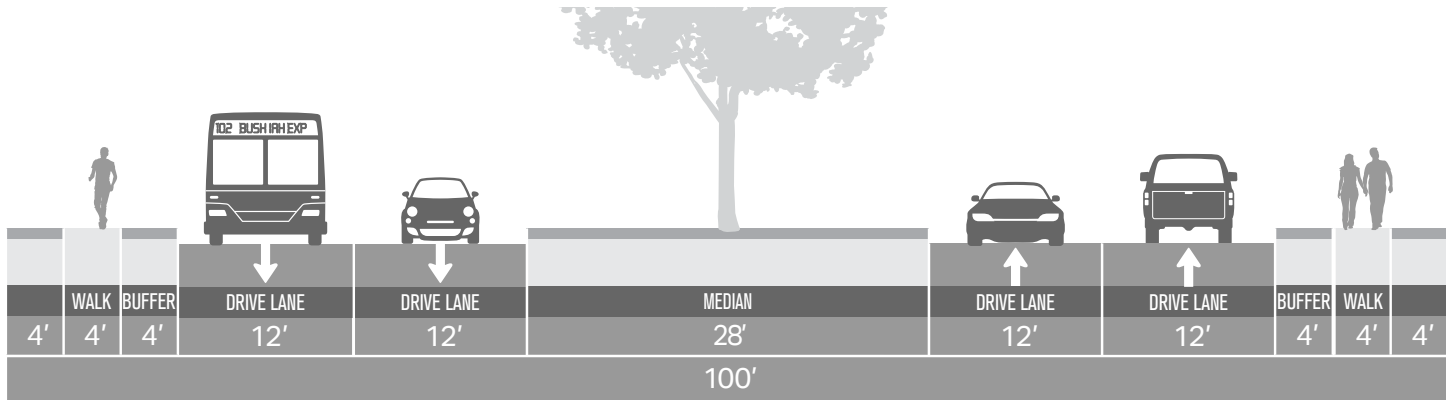
Existing Conditions



Imperial Valley Drive, north of Greens Road

Imperial Valley is a north-south corridor classified as a T-4-100 with sufficient width. North of Greens Road the median is approximately 30-foot wide and there are no sidewalks present. The segment north of Richcrest is owned and maintained by Harris County, while the segment south is owned and

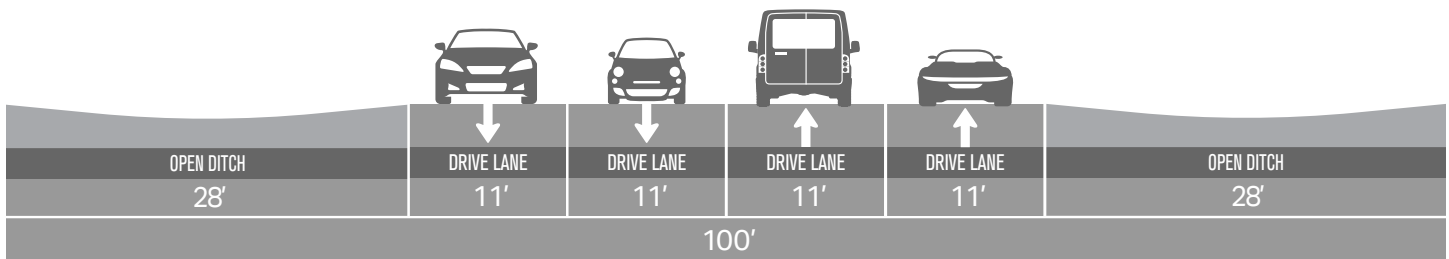
maintained by the City of Houston. There are no sidewalks present long Imperial Valley north of Greens Road.



Imperial Valley Drive, south of Greens Road

Imperial Valley is classified as a T-4-100 with sufficient width, however, field inspections indicate ROW may vary between 94 and 100 feet. Narrow sidewalks are present along this segment of Imperial Valley. Imperial Valley is a key crossing of Greens Bayou which is critical for both people driving and walking

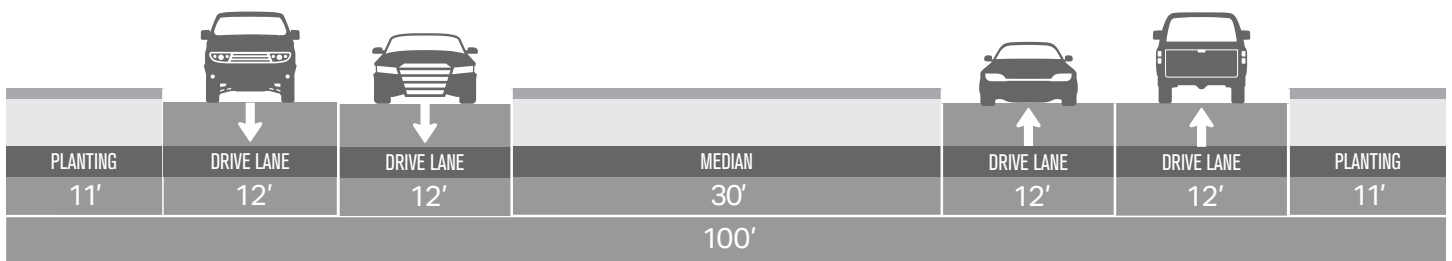
Land uses along this segment are primarily multi-family residential north of Greens Bayou, and mid-rise and low-rise office and commercial developments south of Greens Bayou. The Hyatt North Houston is located along Imperial Valley at Beltway 8.



Rankin Road

Rankin Road within the study area is classified as a T-4-100 on the MTFP. East of IH-45, Rankin Road is a four-lane, undivided roadway, with open ditch drainage. This segment is owned by Harris County. The roadway width is only 44 feet. Sidewalks are not present along Rankin Road.

Land uses along Rankin Road are primarily commercial and multi-family residential. Field visits indicate a demand for sidewalks as people were walking within the ditch along Rankin Road.

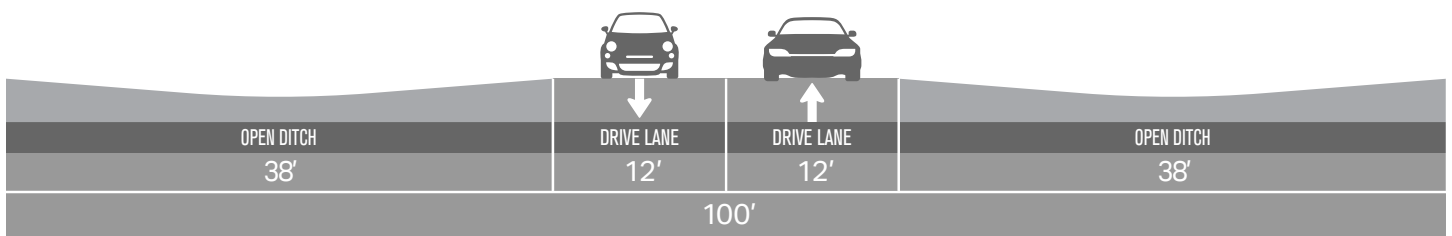


West Hardy Road

West Hardy Road is a north-south four-lane divided roadway and is classified as a T-4-100. North of Langwick West Hardy Road is owned and maintained by Harris County. West Hardy is a key connection over Greens Bayou. Narrow sidewalks are present along West Hardy Road for short segments, but there is no sidewalk continuity along the

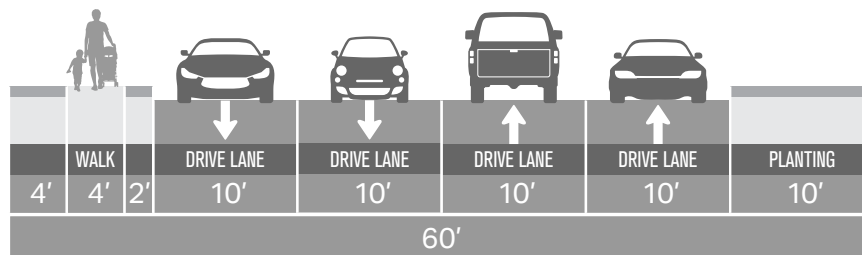
corridor. Land uses along the corridor are primarily light industrial.

The MTFP include a proposed extension of West Hardy Road from Goodnight Trail to Rankin Road.



East Hardy Road

East Hardy Road is a two-lane undivided roadway with open ditch drainage along the far eastern edge of the study area. On the MTFP, East Hardy Road north of Greens Road is classified as a T-4-100 to be widened. East Hardy Road travels parallel to the existing Union Pacific Rail Road.

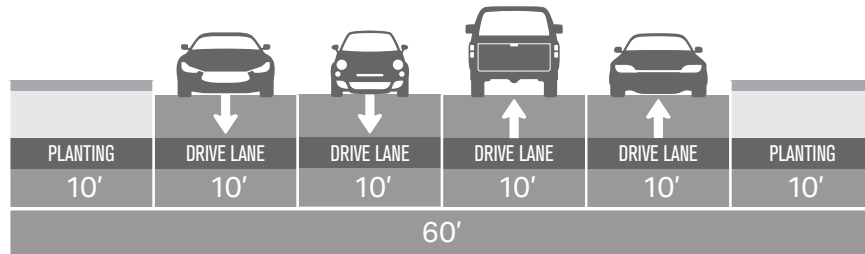


Wayforest Drive

Wayforest Dr. between Seminar Dr. and Goodnight Trail is a four-lane, undivided roadway, that is 40-foot wide. Wayforest operates as a collector within the study area by providing connections to multi-family residential and single-family residential. On-street parking is permitted along the corridor.

The presence of sidewalks varies along the corridors with some segments having sidewalks along both sides, and some segments with a sidewalk only along one side. Where present, they are typically less than 5 feet, however there are segments of 5-foot sidewalk along the north end of Wayforest.

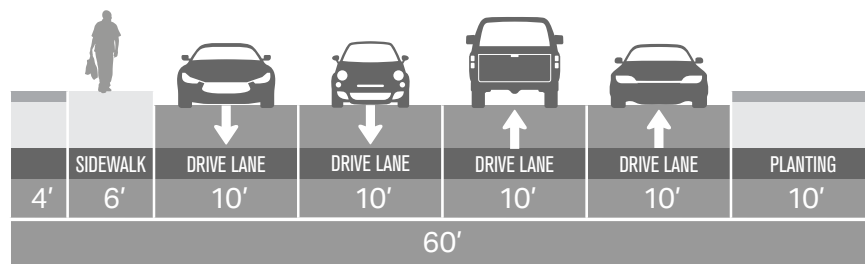
Existing Conditions



Seminar Drive

Between Imperial Valley Drive and Greens Road, Seminar Drive is a four-lane undivided roadway that is 40-foot wide. At Greens Road, Seminar Drive only has right-in-right-out access due to the elevated segment of Greens Road.

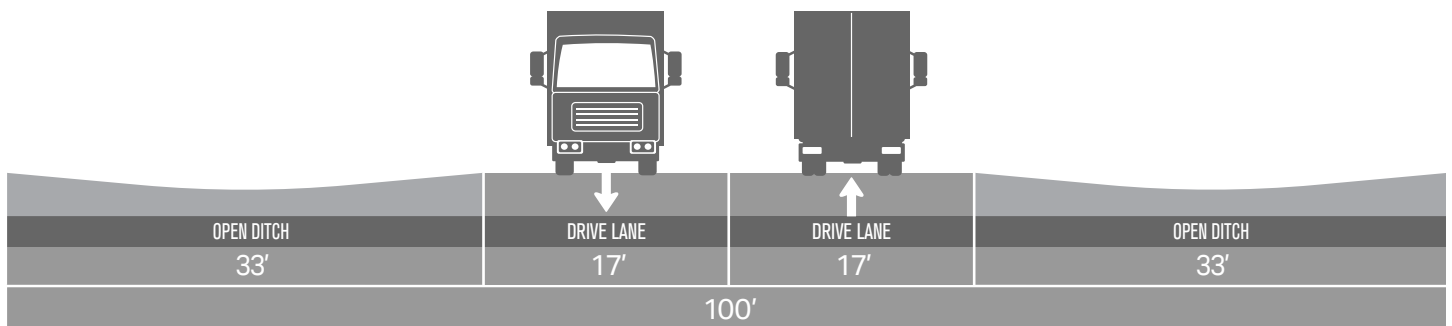
Sidewalks are primarily absent along the corridor, however there are short segments where sidewalks are present. Parking is permitted along Seminar Drive, however, field visits indicate low demand for on-street parking. Land uses along the corridor are multi-family residential. There is one community of single-family residential that is accessible from Seminar.



Regional Park Drive

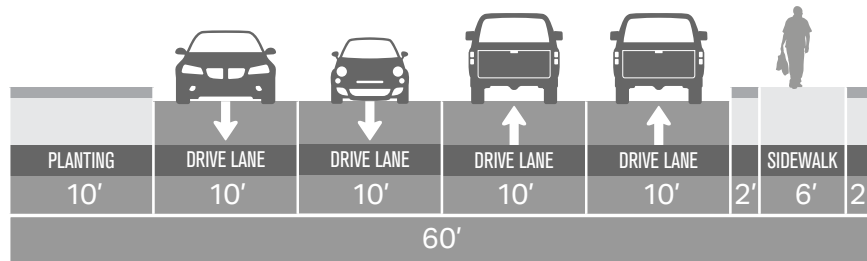
Regional Park Drive, between Imperial Valley Drive School and West Hardy Street, is a four-lane, undivided roadway, that is 40-foot wide. On-street parking is permitted, however, field visits indicate on-street parking demand is low.

The southern edge of Regional Park Drive is lined by single-family residential homes. Greenspoint Elementary School and Griggs EC/PK/K School are located along Regional Park Drive. Adjacent to the schools, sidewalk are six feet.



Goodnight Trail

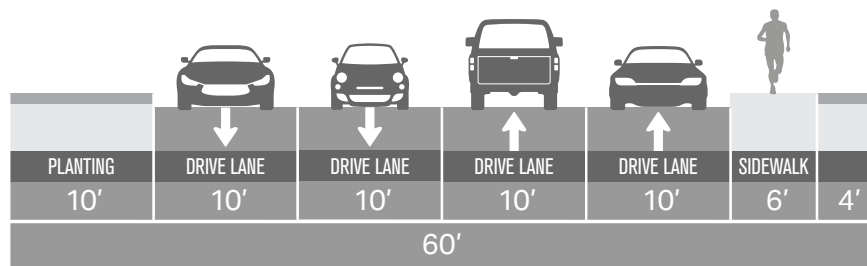
Goodnight Trail, between Chisholm Trail and West Hardy Road, is a two-lane roadway with open ditch drainage. Land uses along the corridor are primarily light-industrial and the percentage of large trucks is high.



Richcrest Drive

Richcrest Drive, between Imperial Valley Drive School and West Hardy Street, is a four-lane, undivided roadway, that is 40-foot wide. On-street parking is permitted along Richcrest Drive and field visits indicate demand for on-street parking is high.

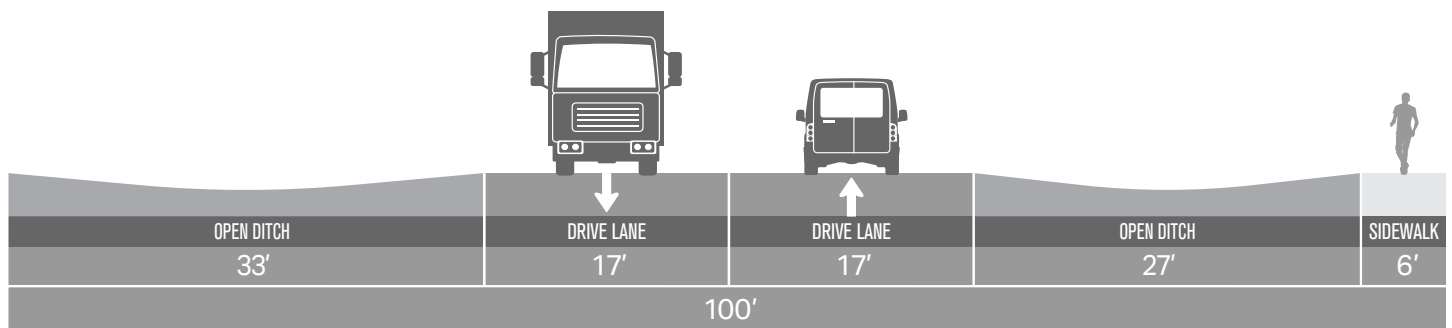
The land uses along the corridor are single-family residential. Sidewalks are present along the southern edge of the street.



Chisholm Trail, south of Goodnight Trail

Chisholm Trail between Goodnight Trail and Richcrest Drive, is a four-lane, undivided roadway, that is 40-foot wide. Land uses are primarily single-family residential and Greenspoint Elementary.

On-street parking is permitted.



Chisholm Trail, north of Goodnight Trail

Chisholm Trail between Goodnight Trail and Rankin Road is a two-lane, undivided roadway with open ditch drainage. Land uses are primarily light-industrial.

Existing Conditions

Crashes from 2014-2018

Crash data was collected from the TxDOT Crash Records Information System (CRIS) database for the years 2014 through 2018. Crashes that occur on either the I-45 or Sam Houston Tollway mainlines were excluded from the crash analysis. However, frontage road crashes were included.

Within the five year analysis period, 3,292 crashes occurred within the study area. Of the 3,292 total number of crashes, 37 crashes involved a person walking and 15 involved a person bicycling. Seven of the crashes resulted in a fatality, four fatalities were people walking.

Crashes were categorized by corridor and intersection (if the crash was intersection-related). The summary of total crashes at intersections and corridors is shown in Figure 1.7. The table in Figure 1.7 only includes the top fifteen intersections and top ten corridors by total number of crashes.

All crash data was mapped, and density maps were developed to identify crash hotspots. Due to the high number of daily traffic along both the I-45 and Beltway 8 frontage roads, Fifty-one percent of total crashes occur along the frontage roads. The majority of frontage road crashes occur at intersections. Therefore, to better understand crash impacts on corridors that were not a frontage road, a crash density for non-frontage road crashes was developed and is included in Figure 1.8. Figure 1.8 indicates crash hotspots within the study area. A density of only pedestrian and bicycle related crashes is shown in Figure 1.9. Both figures also identify locations where a crash resulted in a fatality.

Hotspots on Figure 1.8 indicate high density of crashes at intersection which is expected due to the high number of conflict points that occur at intersections. In addition, there is a high density of crashes along Greens Road between I-45 and Greenspoint Drive where the depressed main-lanes of Greens Road merge with the lanes that intersect the I-45 frontage road intersections at-grade.

Two key intersection hotspots of interest highlighted on both crash density figures are the intersections of Greens Road at Wayforest Drive and Greens Road at Imperial Valley Drive.

For corridors where traffic data is known, corridor crash rates were calculated. Crashes along a corridor are calculated per 100 million vehicle miles traveled (vmt). For a four-lane, urban, divided roadway, the Texas statewide average corridor crash rate is 187.46 crashes per 100 million vmt. The following bullets present the calculated corridor crash rates along four corridors:

Greens Road is 578 crashes per 100 million vmt (3x the state average)

Greenspoint Drive is 462 crashes per 100 million vmt (2.5x the state average)

Imperial Valley is 383 crashers per 100 million vmt (2x the state average)

West Hardy Road is 420 crashes per 100 million vmt (2.3x the state average)

The calculated crash rates and total crash numbers included in Figure 1.7 indicate high crash rates throughout the study area and highlight the need for safety-focused design solutions for both corridors and intersections within the North Houston District.

	Total Number of Crashes	Fatalities	Incapacitating Injuries	Involving Person Walking	Involving Person Bicycling
Intersections					
Beltway 8 & Interstate 45	812	0	28	0	9
Beltway 8 & West Hardy Rd	281	0	4	0	9
Beltway 8 & East Hardy Rd	101	0	0	8	9
Rankin Road & Kuykendahl Rd	49	0	1	3	9
Beltway 8 & Greenspoint Dr	42	0	1	3	9
Greens Rd & West Hardy Rd	41	2	0	8	0
Greens Rd & Wayforest Dr	40	0	0	8	9
Greens Rd & Imperial Valley Dr	39	0	2	0	9
Greens Rd & Northchase Dr	39	0	1	3	9
Greens Rd & Greenspoint Mall Dr	35	0	0	8	9
Imperial Valley Dr & Benmar Dr	34	0	0	8	9
Rankin Rd & E Hardy Rd	33	0	0	8	9
Beltway 8 & Imperial Valley Dr	28	0	0	8	9
Imperial Valley Dr & Rankin Rd	28	0	0	8	9
Imperial Valley Dr & Seminar Dr	26	0	0	8	9
Corridors					
Interstate 45 - Both Frontage Rds	991	4	31	5	2
Beltway 8- Both Frontage Rds	600	0	10	0	2
Rankin Rd	442	0	6	2	0
Greens Rd	390	1	4	11	6
Imperial Valley Dr	199	0	3	4	1
West Hardy Rd	113	1	0	0	1
East Hardy Rd	109	1	1	0	0
Greenspoint Dr	60	0	3	5	0
Wayforest Dr	55	0	1	2	3
Richcrest Dr	51	0	1	1	0
Benmar Dr	51	0	0	1	0
Northchase Dr	47	0	0	1	0
Seminar Dr	34	0	0	2	0
Chisholm Trail	20	0	0	0	0
Regional Park Dr	10	0	0	1	0

Figure 2.13 2014-18 Crash Data by Intersection and Corridor

Existing Conditions



Figure 2.14 Crash Density of All Crashes
 Wide, straight roads with high volumes – which in this case includes Greens Road and Imperial Valley Drive – often correlate to a higher volume of crashes.

All Crashes (excluding freeways/frontage roads) from 2014-2018

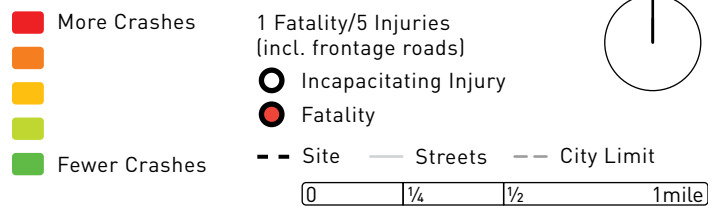
■ More Crashes	7 Fatalities (incl. frontage roads)	 Site	
■	 Vehicular	 Streets	
■	 Person Walking	 City Limit	
■ Fewer Crashes			

0 1/4 1/2 1mile



Figure 2.15 Crash Density of Pedestrian and Bicycle Crashes
 The combination of dense housing, high transit ridership, and large, multi-lane roadways with high speeds could be used to explain the density of crashes involving persons walking or bicycling along Greens Road near Imperial Valley Drive. In this map, there are not any bicyclist fatalities.

All Crashes Involving Persons Walking or Bicycling from 2014-2018



Existing Conditions

Office Building Entrances

There are two main clusters of office buildings in Greenspoint. One of the clusters is located along Greenspoint Drive and the other is located along Imperial Valley Drive, between Brennar Drive and Beltway 8.

The office buildings on Greenspoint Drive have pedestrian entrances at both the front and the back. This maximizes the connectivity of these offices by allowing pedestrians to access the buildings from Greenway Drive or Northchase Drive.

Most of the offices in the other cluster have only one main pedestrian entrance, accessed through the parking lot, and usually another smaller entrance accessed from the parking garage. This layout is less conducive to connectivity, as it prescribes a specific, car-oriented approach.

In both clusters, the offices are set back from the street and separated or surrounded by parking lots, which can be barriers for pedestrians and bicyclists. Unlike the office cluster on Imperial Drive, the offices along Greenspoint Drive do provide pedestrian paths as an alternative to walking through the parking lot, and the access from Northchase Drive is much closer to the street and protected from cars.

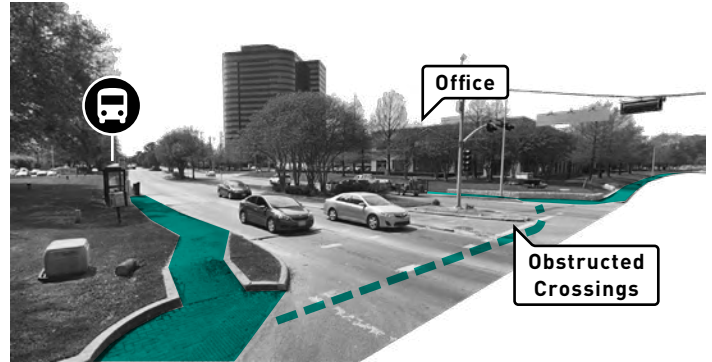
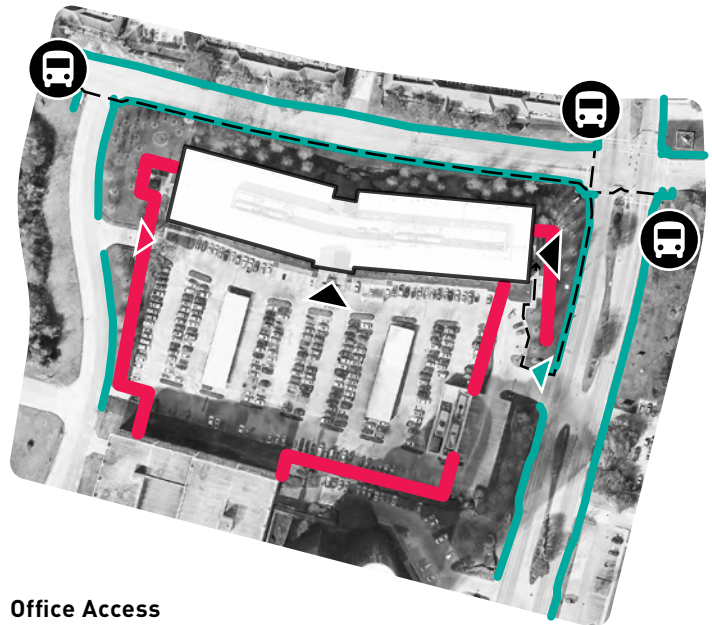


Figure 1.1 Crossing Conditions



Office Access

- ▲ Building Entrance
- ▲ Vehicle Only Entrance
- ▲ Pedestrian Entrance
- Path to Closest Entrance
- █ Fence
- █ Sidewalks

Figure 2.16 Pedestrian Access to Office Entrance

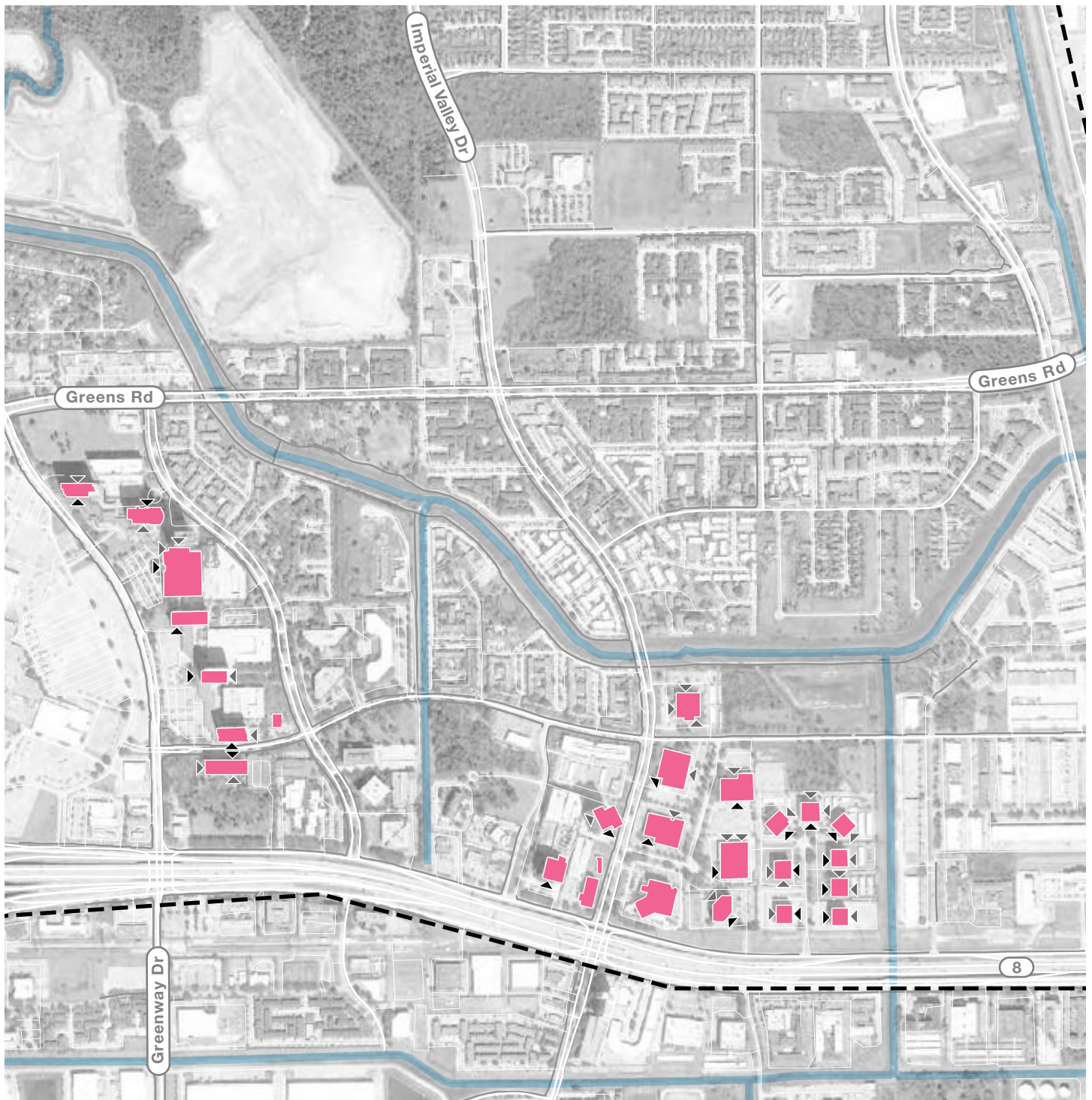


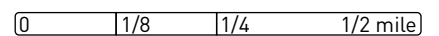
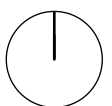
Figure 2.17 Location of Office Entrances

Office entrances in Greenspoint are mostly separated from the street by parking lots, but the offices along Greenspoint Drive are well connected to walking and biking routes.

Office Entrances

- ▲ Main pedestrian entrance
- ▲ Secondary entrance

- Sidewalks
- - - Site
- Streets



Existing Conditions

Apartment Building Entrances

Many of the large apartment complexes in Greenspoint have only a limited number of entries. This can result in roundabout walking paths for the residents.

In some apartment complexes, the units are designed so that the entrances face the street and gates are provided in the fence so that residents can easily enter their unit without having to walk along the driveway or share space with cars within the complex. Many apartments in the area don't cater to pedestrians this well though. Pedestrian entrances are seldom located near the main vehicular entrances, but the entrances to the apartment units are often oriented to the driveway. In these cases, residents have to walk further to find a gate in the fence and then may have to backtrack to the driveway in order to enter their apartment.

Entrances are also often clustered along one street, even if the apartment complex borders other streets or walking trails. The most comfortable walking / biking path in the area is the one along Greens Bayou, which connects several of the parks and open spaces, but notably few apartments have entrances onto that path. In some cases, residents have created improvised entrances off of the bayou path, like the one in Figure 1.2, which really shows how necessary entrances off the bayou really are. It's also important to note that many of the apartment complexes share a border and a fence with each other, without any space between them for a sidewalk or goat path. This means that a resident may have to walk all the way around the block in order to access a park that they can see from their apartment window.

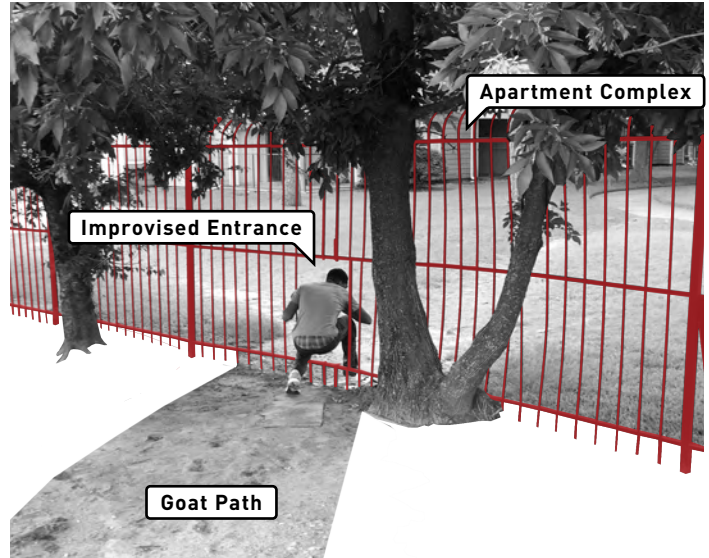


Figure 2.18 Improvised Apartment Entrance along the Bayou

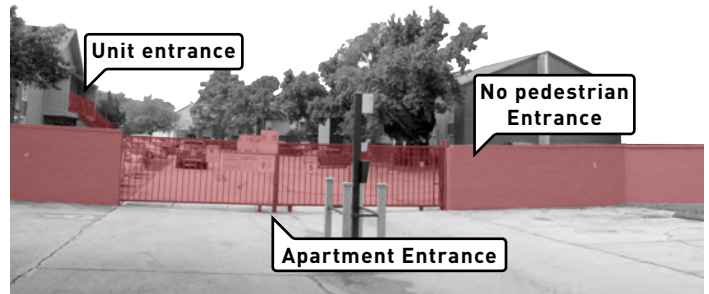


Figure 2.19 Car-Oriented Apartment Entrance

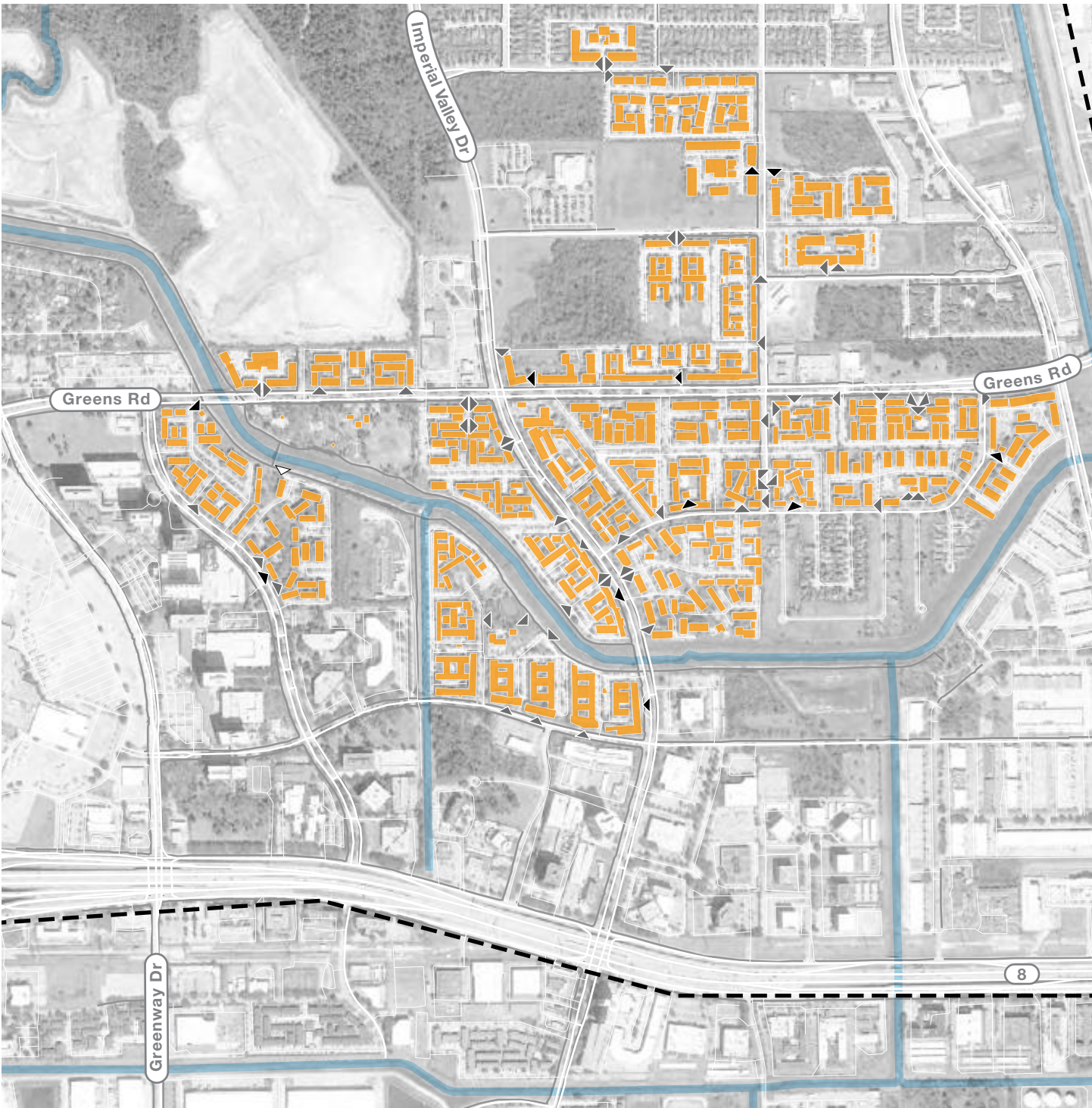
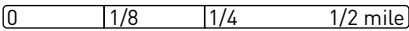


Figure 2.20 Location of Apartment Building Entrances
 Many of the large apartment complexes in Greenspoint have only a limited number of entries, which result in longer and roundabout walking routes for the residents.

Apartment Entrances

- ▲ Leasing office entrance
- ▲ Secondary entrance
- △ Improved entrance
- Sidewalks
- - - Site
- Streets



Existing Conditions

Hotel Building Entrances

The majority of the hotels in Greenspoint are in very car-oriented locations along Beltway 8. A few even have their porte-cochers oriented toward the freeway, and mostly serve airport-goers. They tend to lack connections to the sidewalk network and have limited non-car connectivity to the bayou, parks, offices, retail, or restaurants.

The Hilton and the Marriott have potential for good pedestrian connectivity. The Marriott fronts on Greenspoint Drive, a very comfortable, safe street, and has plenty of access to the surrounding offices and fairly easy access to the Greens Bayou walking and biking trail. The Hilton likewise fronts on a tree-lined, shaded, comfortable street to walk on and has safe crossing points to the office cluster across the street from it to the north. It takes longer to get to the bayou or a park from the Hilton than it does from the Marriott, but the sidewalks and crosswalks to get to the bayou are complete and relatively comfortable.

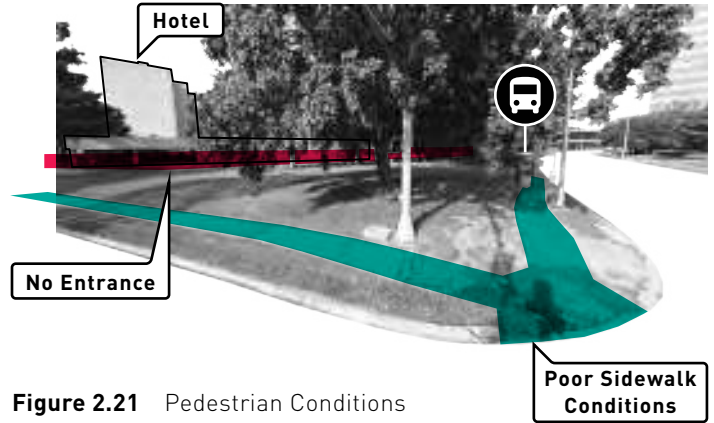
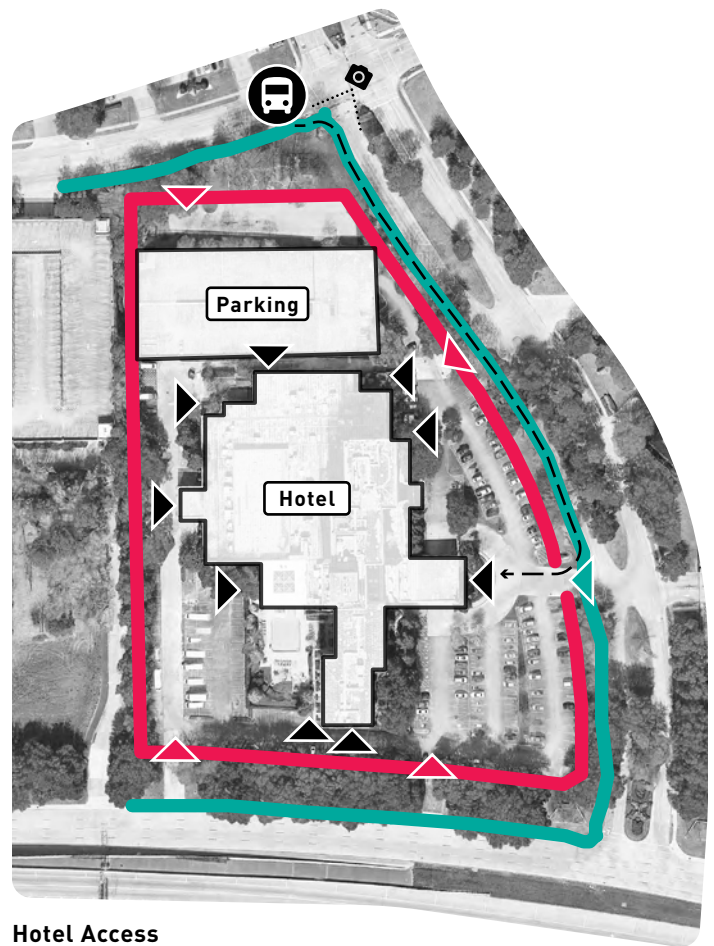


Figure 2.21 Pedestrian Conditions



Hotel Access

- ▲ Building Entrance
- ▲ Vehicle Only Entrance
- ▲ Pedestrian Entrance
- Path to Closest Entrance
- █ Fence
- █ Sidewalks

Figure 2.22 Pedestrian Access to Hotel Entrance

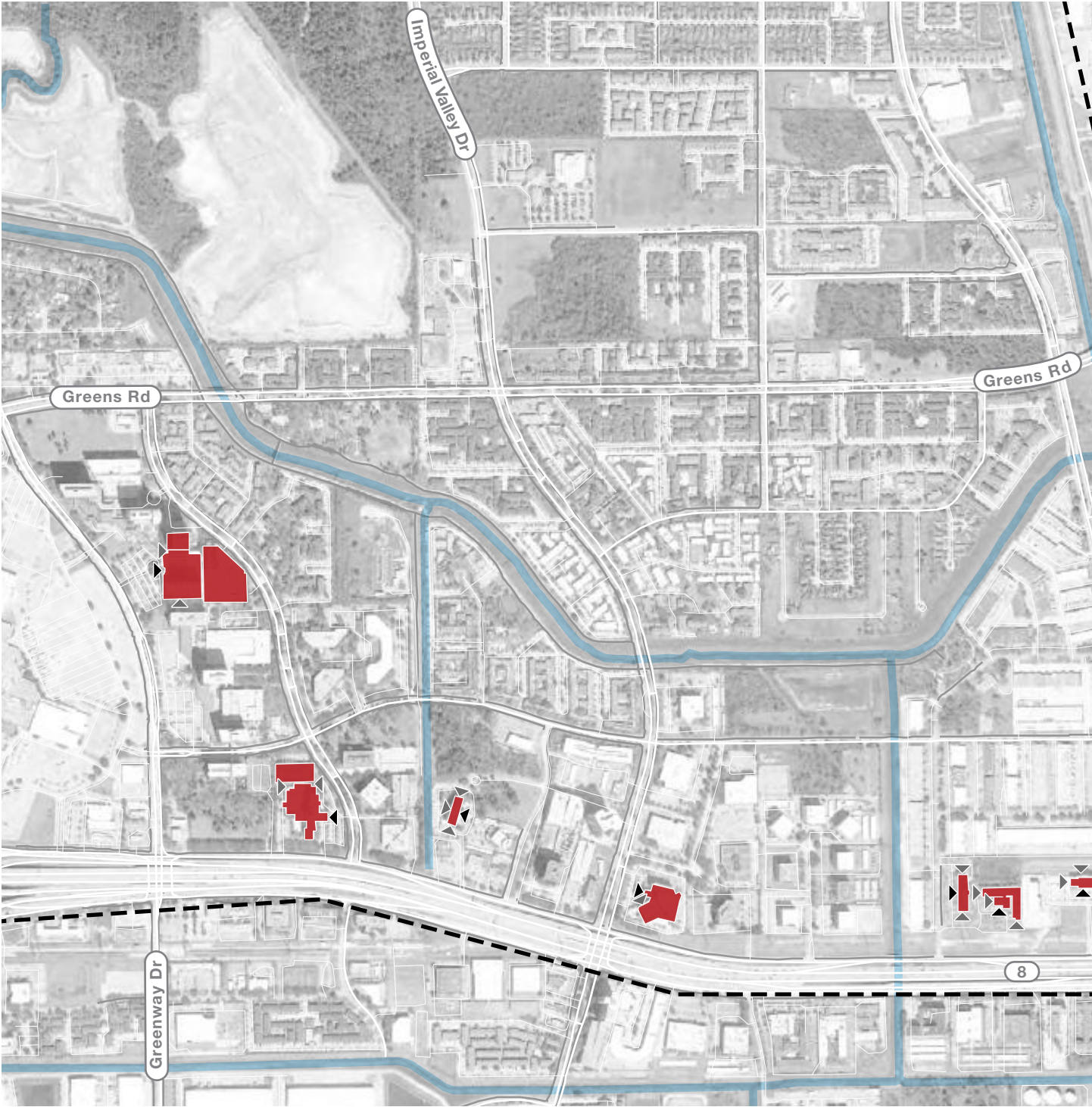


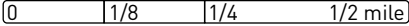
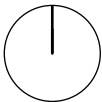
Figure 2.23 Location of Hotel Entrances

Most hotels are located in car-oriented areas, but the Hilton and the Marriott are better connected to amenities and offices.

Hotel Entrances

- ▲ Main entrance
- ▲ Secondary entrance

- Sidewalks
- - - Site
- Streets



Existing Conditions

Sidewalk Conditions

In 2016, the North Houston District commissioned a study of the sidewalks in Greenspoint. The study rated the quality of the sidewalks based on width, smoothness, and obstructions, and also noted where sidewalks were missing. A sidewalk met standards if it was smooth, unobstructed, and at least five-feet wide. A sidewalk was considered below standard if it was under five feet wide, the pavement quality was low, and there were some obstructions, and it was considered needing replacement if the sidewalk presented challenges to the user such as unacceptable pavement conditions and substantial obstructions.

The results of the study showed that the core of Greenspoint has a complete sidewalk network, but that most of the sidewalks don't meet standards, with the exception of Greenspoint Drive and the bayou trail. The outlying areas of Greenspoint, however, are mostly missing sidewalks. Since then, Greenspoint has been working to expand the sidewalk network to the outlying areas and fill in the gaps, and has focused on ensuring that there are safe routes to school. There are still gaps, especially around the edges of the study area, but there are new sidewalks in the northern quadrant of Greenspoint that meet standards.

Most of the sidewalks in the core of Greenspoint haven't been updated since the study, and are still categorized as being below standard, but that is mostly due to their width. Many are narrow, but are actually rather comfortable if other factors are assessed. Most sidewalks have large grassy buffer zones between the sidewalk and the street that make the user feel safe and protected by cars. Bus stops, sign posts, street lights, and utility poles typically don't intrude into the sidewalk, and for the most part, the sidewalks in the core of Greenspoint are smooth and in fair to good condition. The most notable downfall of the sidewalks in Greenspoint is not so much the width as the lack of shade.

North Houston District, "North Houston District Focuses on Safe Sidewalks for Community" Press release, July 05, 2017.

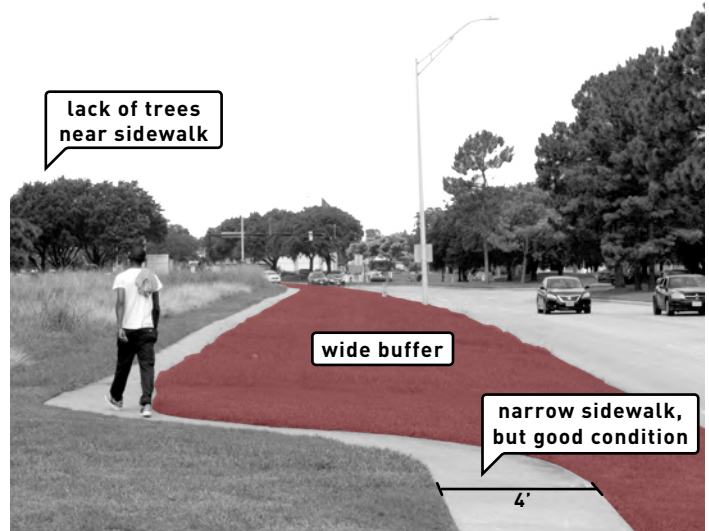


Figure 2.25 Narrow, but comfortable sidewalk along Greens Rd

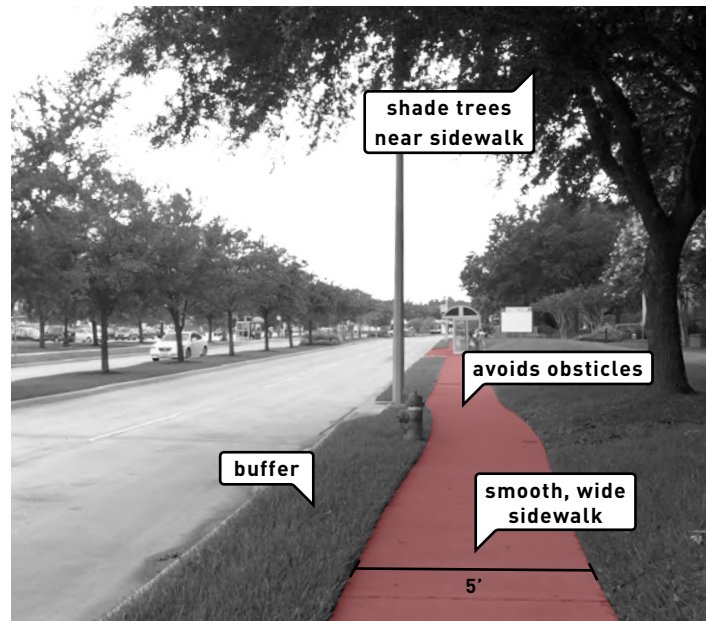


Figure 2.24 Comfortable sidewalk on Greenspoint Drive

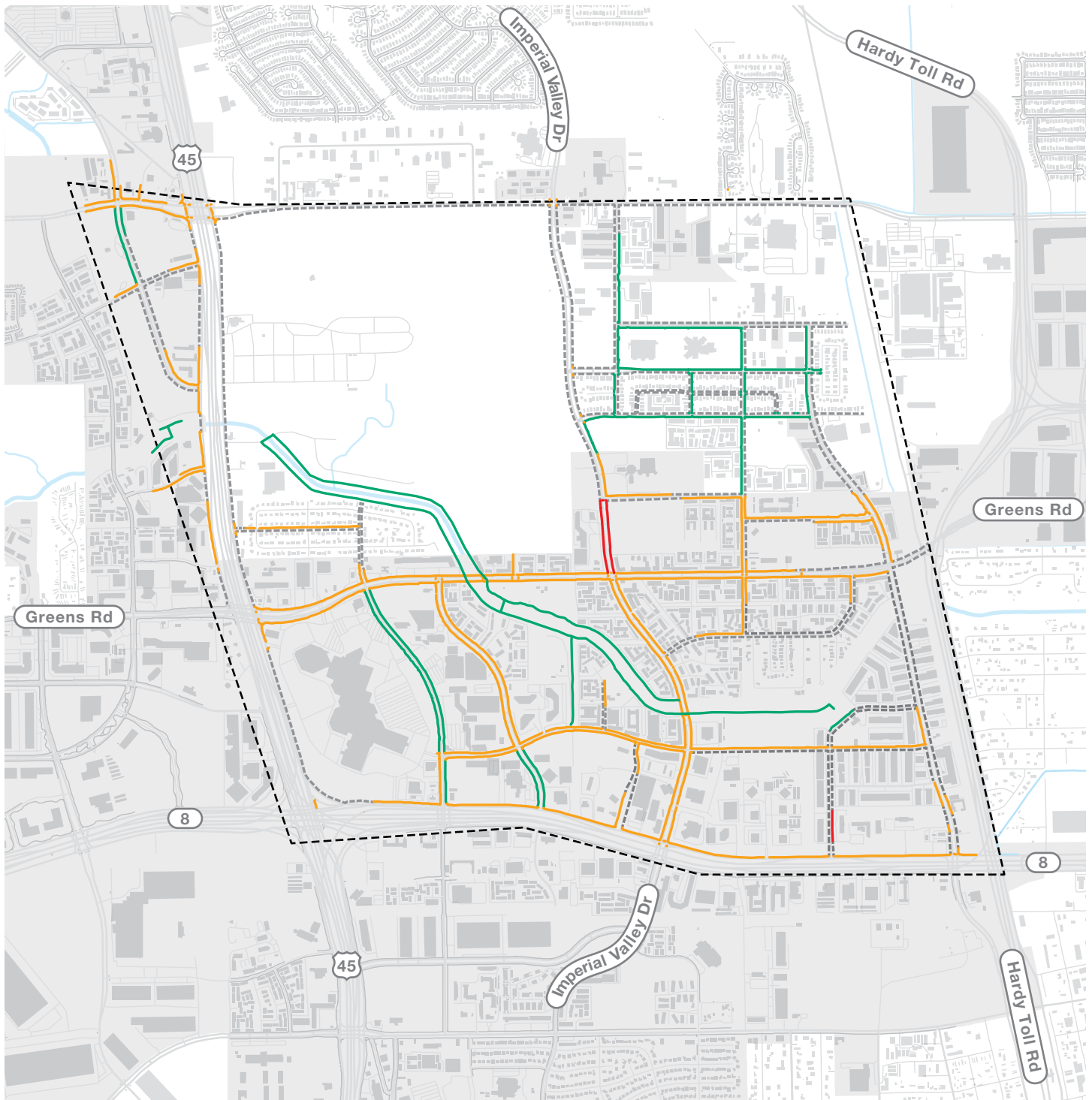


Figure 2.26 Condition of Sidewalks in Greenspoint

Based on sidewalk width and condition, most sidewalks in Greenspoint do not meet standards, but the presence of things like landscape buffers make the sidewalks feel comfortable despite generally being too narrow.

Sidewalk Conditions

- Meets Standards
- Below Standards
- Needs Replacement
- - - Missing
- - - Site
- Streets
- Buildings
- COH City Limits

0 1/4 1/2 1mile

Existing Conditions

Crosswalks

Within the core of Greenspoint, most intersections have crosswalks. Outside of the core, where there are more industrial buildings and single-family homes, most of the intersections do not have marked crosswalks. This is somewhat misleading. Most of the industrial areas-- along the eastern half of the study area --don't have very many intersections. With the exception of the intersections under I-45 and Beltway 8, most of the intersections that don't have crosswalks are in single-family neighborhoods, where cars are driving slower, there are four-way stops, and crossing is generally easier and safer and crosswalks aren't as necessary. There are several crosswalk-less intersections along Rankin Road at the northern edge of the study area. Those intersections could probably use crosswalks, but there are also few destinations and few residences in that area.

Most of the crosswalks in Greenspoint are fairly well designed. The paint on the crosswalks is typically well maintained and legible, curb ramps may or may not be quite aligned with the desired direction of travel, but most intersections do have curb ramps, and many also have pedestrian refuge areas in the medians. The intersections on Greenspoint Drive near the mall are particularly well designed (Figure 1.12), with different pavement patterns for the crosswalks and in the center of the intersection to slow down cars and make them more aware of pedestrians.

There are also some mid-block crosswalks, which are good for pedestrians, but not very common in most places. These mid-block crosswalks give pedestrians a place to cross near bus stops, bridges over the bayou, and near parks. They are also particularly useful in Greenspoint, because the blocks are so large that the distance between intersections is often high and create roundabout routes for pedestrians trying to cross the street. However, most of these mid-block crossings do not have warning signs or signals for cars, and pedestrians still must cross at their own risk.

Even though many of the crosswalks have safety features like the pedestrian refuges and signals, the speeds that cars are traveling and turning at still make it dangerous for pedestrians to cross the street, especially along Greens Road. The crosswalks underneath the freeways are also dangerous. There are several destinations beyond the freeway, but drivers don't typically expect pedestrians at these intersections and the crosswalks there either don't exist or are long, unprotected, and faded, and can be dangerous for pedestrians.



Figure 2.27 Crosswalk Examples

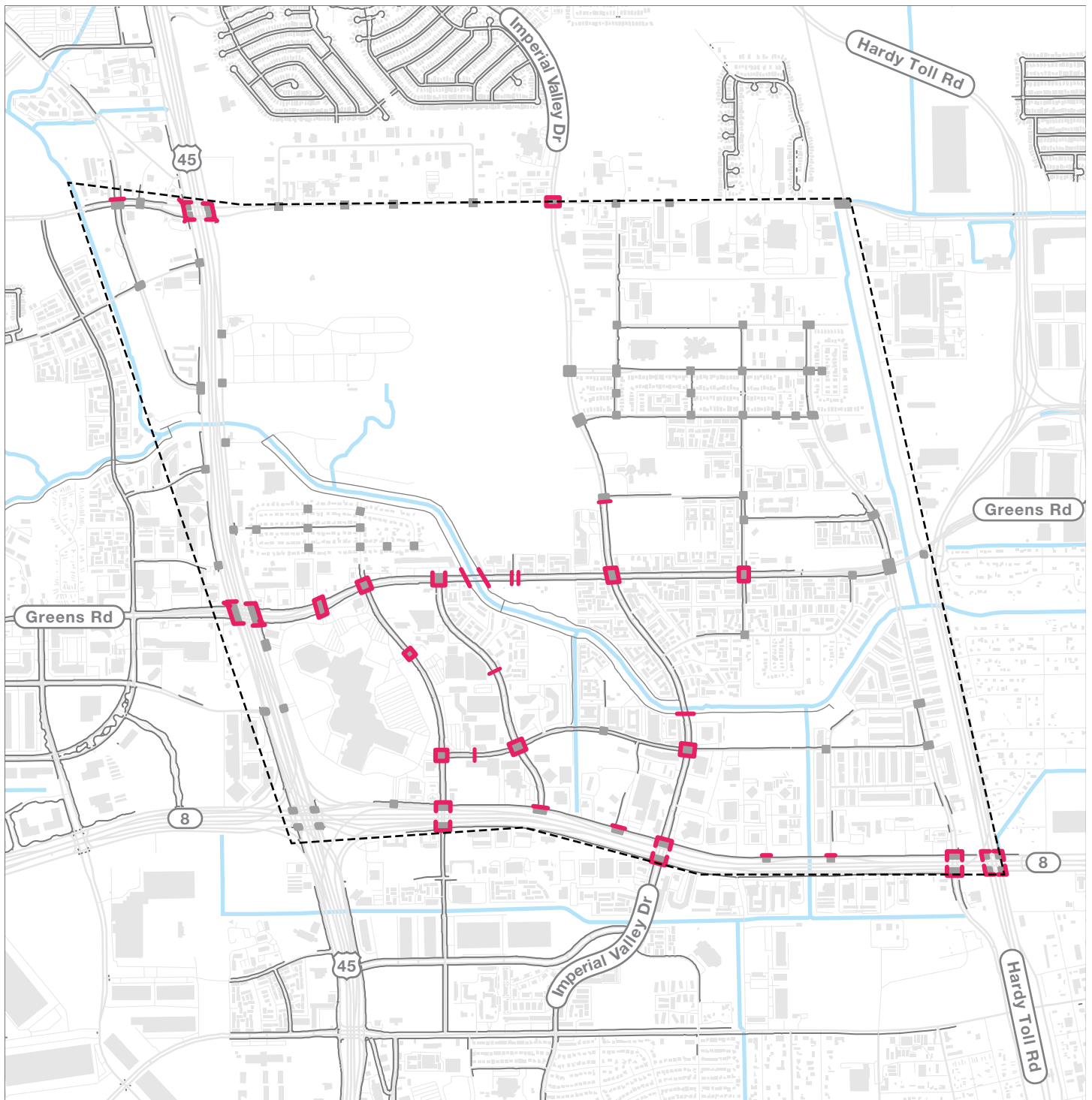
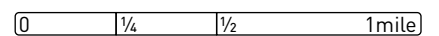
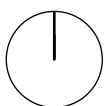


Figure 2.28 Location of Intersections and Crosswalks

Most intersections in Greenspoint have crosswalks and there are some mid-block crosswalks near bus stops, but distances between crosswalks are sometimes high.

Crosswalks

- Intersection
- Marked Crosswalk
- Sidewalks
- Streets



Existing Conditions

CIP 2019-2023

Each year, the City of Houston updates their five-year Capital Improvement Plan (CIP) to budget for and address the City's infrastructure needs. The North Houston District projects within the 2019-2023 CIP are illustrated on the map and include water, wastewater, sidewalk, and inter-agency-related projects. The CIP categories include more than these few listed, but within the current CIP, those are the types of projects planned in this vicinity.

Harris County Flood Control has flood mitigation projects within the Greens Bayou corridor and watershed. The projects will help improve drainage and help prevent future flooding, and will also include new and improved bridges across the bayou.

As CIP projects are planned and implemented, there may be opportunities to leverage resources with other public infrastructure-related improvements. For instance, during this Livable Centers Study, projects and programs will be identified for future implementation. If those projects align within the timing of a CIP project within the same corridor, the projects could be coordinated and leveraged for efficiency.

One of the key opportunities could be along Greens Road considering improvements that could be made within the CIP and with the future BRT within the corridor.

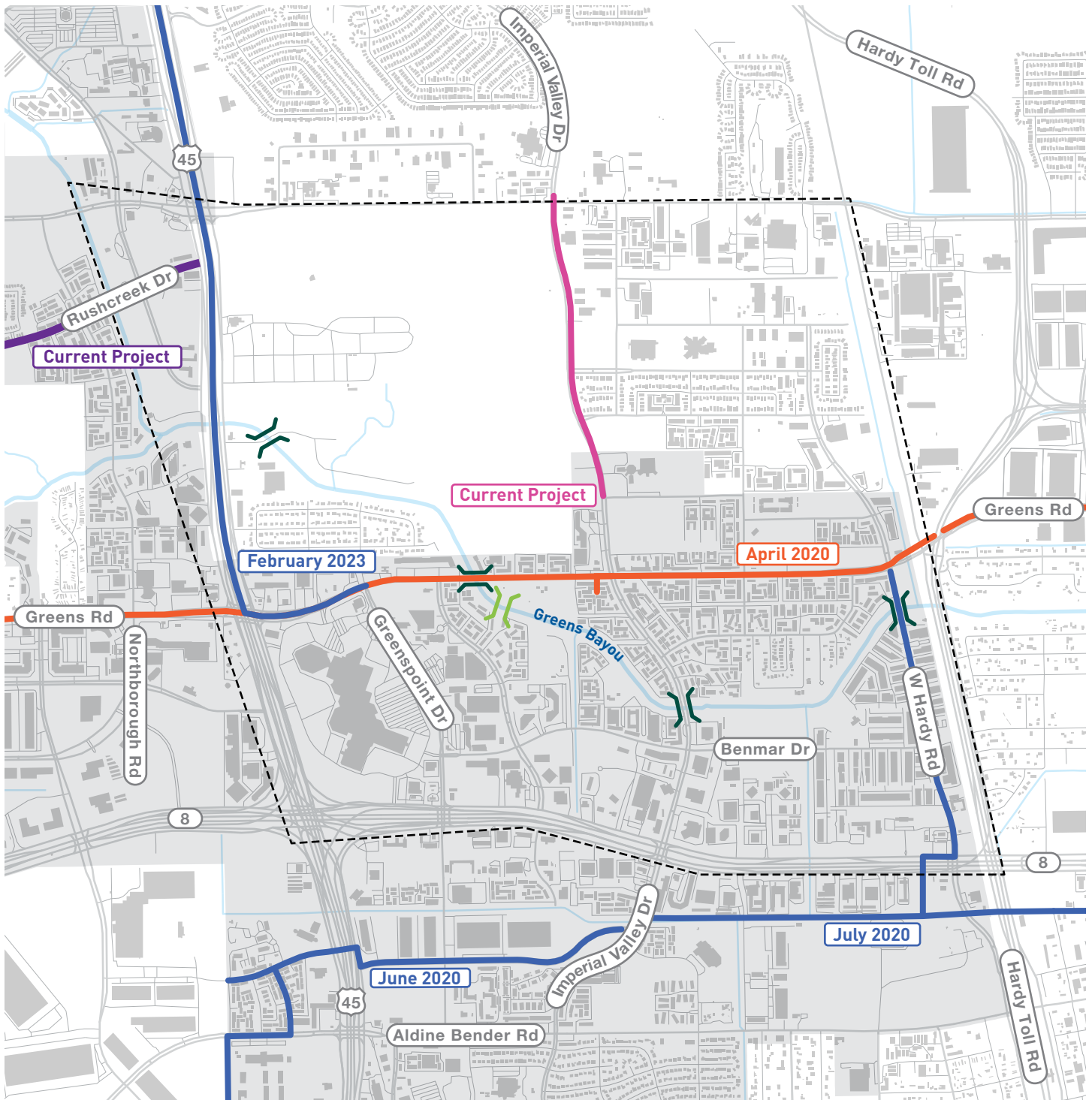
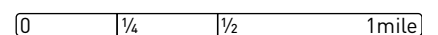


Figure 2.29 City of Houston Capital Improvement Plan

The City of Houston's current Capital Improvement Plan (CIP) shows projects that are budgeted for implementation within the years of 2019-2023. When creating recommendations as a part of this planning study, coordination with planned CIP projects could better leverage public resources.

Capital Improvement Projects - 2019-2023 City of Houston

- Water
- Wastewater
- Interagency Project
- Sidewalk
- Site
- Streets
- City Limit
- ⌋ Bridge (planned reconstruction)
- ⌋ Pedestrian/Bicycle Bridge (planned reconstruction)



Existing Conditions

Air Pollution

Houston's air quality is ranked among the worst in the nation, and is exacerbated by high urban temperatures and lack of trees and vegetation. Figure 1.12, visualizes 500 and 1000-foot buffers around Hardy Toll Road as well as Highways 8 and I-45, which surround Greenspoint on three sides, indicating the potential reach of highway pollution into the study area. People, animals, buildings, and plants that are within 500 and 1000-foot buffers are considered to be in hazard areas. Pedestrians and bicyclists navigating Greenspoint face both particulate air pollution from Highway 8 and 45 and high urban temperatures in the southwest corner of the site, which may exacerbate air pollution. Air pollution can lead to several health conditions, such as asthma. A large portion of the Greenspoint Mall is within the 1000-foot buffer.

In addition to creating a buffer around the major highways, traffic counts were observed across the site using the average daily volume of traffic. The site has a higher traffic count in the northwest corner along Highway I-45 and a smaller count in the southeast corner along Hardy Toll Road as compared to the rest of the site. Traffic counts were also identified in multiple places along Greens Road and Imperial Valley Road. The site also includes several land uses zoned for industry, which might be another point source of pollution in the study area.

Despite the potential for air pollution from traffic and industry, the majority of residential land uses fall outside of the 1000-foot buffer. Residents of Greenspoint are at a reduced risk of constant exposure to air pollutants than those living across Houston.

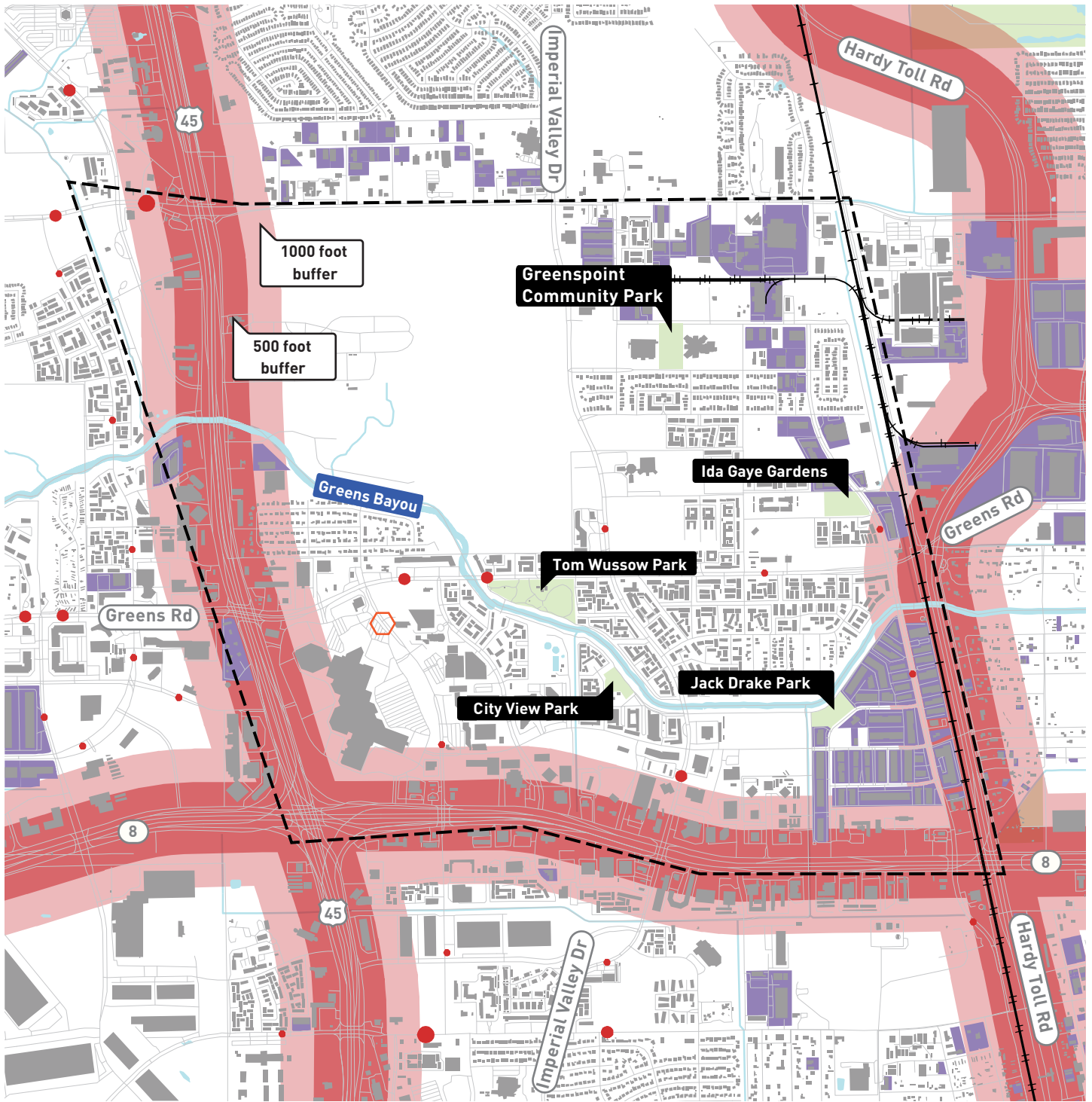
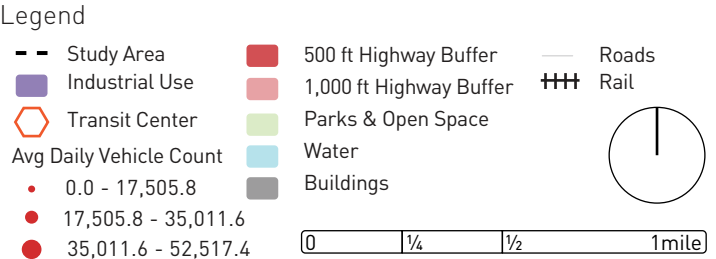


Figure 2.30 Air Pollution
500 and 1000 foot buffers around Highways 45 and 8 as well as Hardy Toll Rd.



Existing Conditions

Urban Heat

Urbanized areas vary in temperature due to differences in land cover type. Places with a high percentage of land covered by pavement and buildings, such as downtown streets and parking lots, are hotter because paved surfaces and buildings absorb and release heat back into the air. Areas with trees and vegetation are cooler, because they provide shade and cooling through evapotranspiration.

The U.S. Geological Survey's LandsAT satellite imagery taken at 4:50 p.m. on September 29th, 2017, was used to assess urban land cover temperatures. LST is defined as the temperature felt when the land surface is touched, and it can be calculated using LandsAT thermal bands 4 (red), 5 (Near Infrared), and 10 (Thermal Infrared 1). The image selected on this date and time was chosen because it did not have any cloud cover in the image, which can alter LST, and was taken during one of the hottest months in Houston. Once LST was determined, Figure 1.11 was created to show temperature differences within the study area in two degree increments.

Within the North Houston Study Area alone, there was a 19-degree difference in land surface temperature, with the lowest temperature at 68 degrees and the highest temperature at 87 degrees. The coolest temperature found in the northeast area of the site, can be explained by the concentration of trees in the area and the adjacency to the vacant, forested area just northeast of the site. The hottest temperature was located in the center of the Greenspoint Mall, a 132-acre site that is completely covered with pavement and buildings. At that same time, most of Downtown Houston, which is even more urbanized, was on average about 2 degrees hotter than North Houston.

Hot streets and sidewalks are more dangerous for people who are low-income, minorities, and/or transit dependent; because it puts them at increased risk for heat stroke and other heat-related illnesses. Heat contributes to a reduction in air quality as it makes air pollution worse. It is critical that a plan for North Houston's future includes abundant street trees and urban vegetation to provide shade and cooling, which will encourage active transportation.



Figure 2.31 Street view of Greens Road facing Greenspoint Mall, one of the hottest roads in North Houston. The lack of trees and heavily paved areas cause this area to become very hot.



Figure 2.32 Street view of Rankin Road in the northeast corner of North Houston. The numerous trees in this area help cool air temperatures.

How Urban Microclimates Work

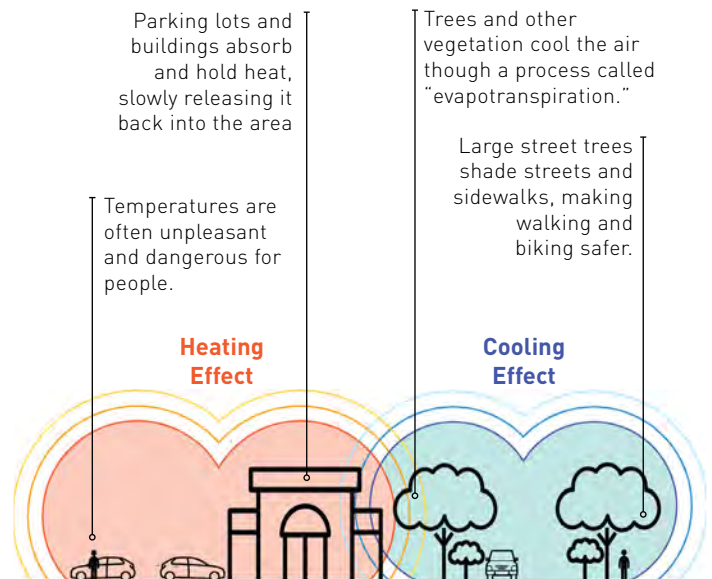


Figure 2.33 Street view of Rankin Road in the northeast corner of North Houston. The numerous trees in this area help cool air temperatures.

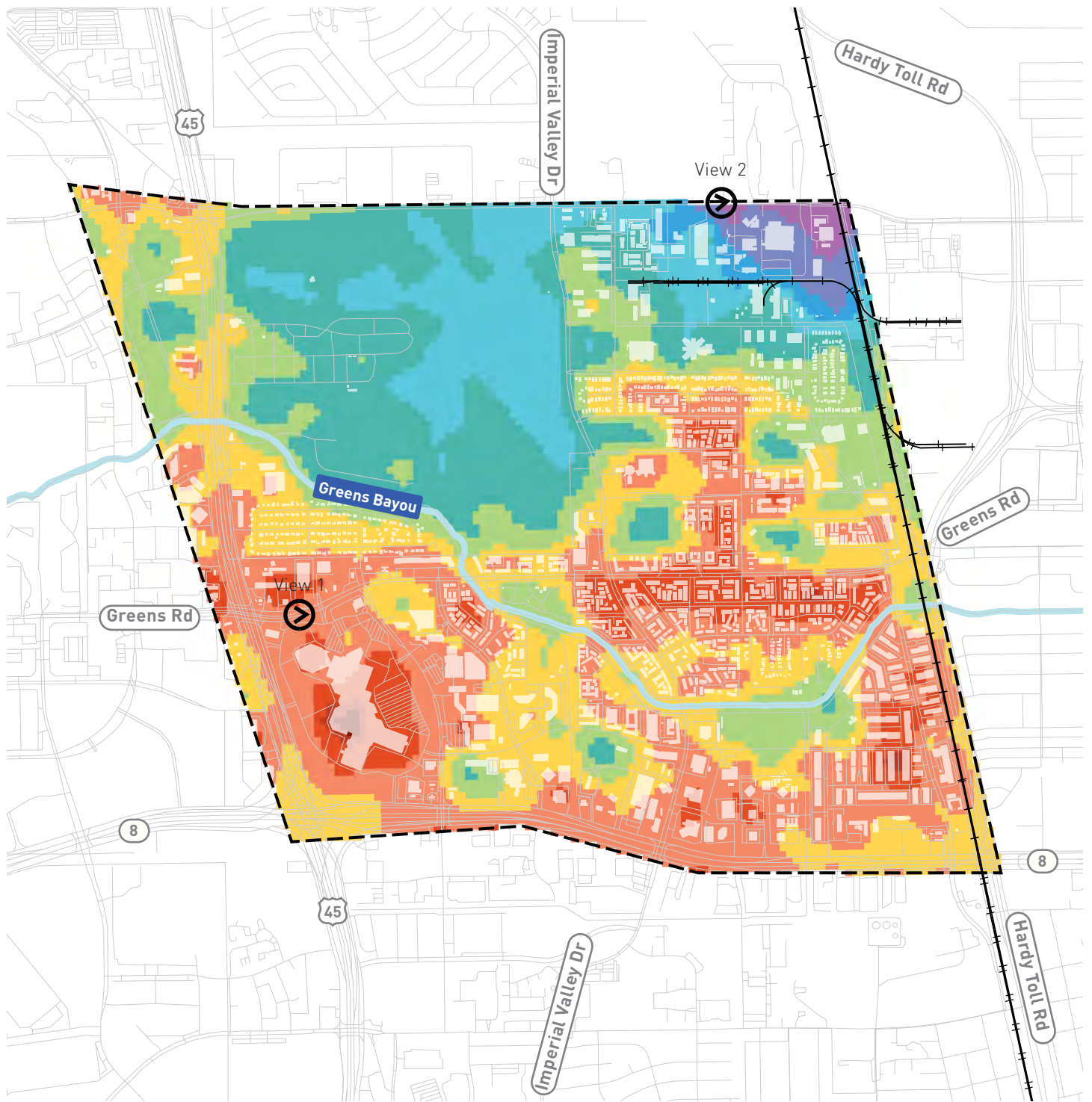
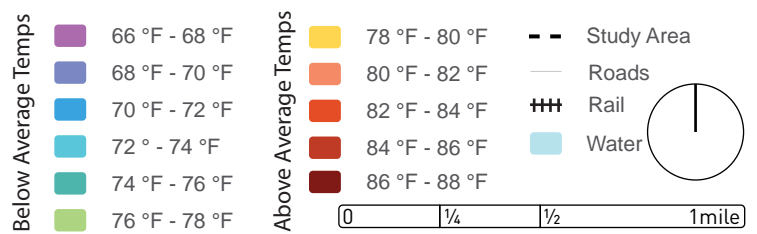


Figure 2.34 Microclimate Map

Urban heat microclimate map based on land surface temperature.



Legend



Recommendations

05 Create a Comprehensive North Houston Bikeways Network

Summary

Create a north-south and east-west network of bikeways that support the Greens Bayou Greenway trails as a spine for multi-modal transportation network that serves the majority of people living and working in the North Houston District. The North Houston District has a much higher percentage of people who walk, bike, and/or take transit than most places in Houston. With approximately six percent of the population biking to work (compared to Houston’s overall average of 0.3%), providing dedicated, safer, all ages and abilities places to bike must be a priority. The district can advocate and participate with the City of Houston to identify and prioritize potential projects and can implement low-cost bikeway projects.

Recommendation Characteristics

Type	Project
Timeline	Medium-term (5-10 years)
District’s Role	Advocate Participate
Lead Agencies	City of Houston Houston Parks Board Harris County North Houston District

Livability Principles Supported

1. Provide More Transportation Choices
3. Enhance Economic Competitiveness
4. Support Existing Communities
6. Value Communities and Neighborhoods

Partners

Approval From

North Houston District, City of Houston, Harris County, Houston Parks Board, and METRO

Capital Funding

City of Houston, Houston Parks Board, North Houston District, TIRZ 11, Harris County Flood Control District, and METRO

Operational Funding

City of Houston and Houston Parks Board

Description

The recommendations map illustrates corridors where an “All Ages and Abilities” bikeway could be implemented, supporting a comprehensive North Houston bikeways network. Most of the corridor aligns with lines in the Houston Bike Plan with a few additional corridors outside the city limits (Harris County corridors). There is also a new desired off-street path connection through the future drainage basins as well as bikeway corridors added near Greenspoint Elementary School on streets where there may be roadway capacity to convert from a four lane to a three lane corridor (or less). This allows space for safer, protected on-street bikeways. The line colors indicate the type of bikeway based on the Houston Bike Plan’s symbology, with green as off-street, blue as dedicated in-street bikeways, and purple as shared on-street bikeways (or neighborhood bikeways). The highlighted dashed lines indicate “priority” projects for near-term implementation. A description of bikeway types is provided in the toolbox on the following pages.

Safety is a priority for any corridor recommendations and must include ways to protect people, especially at intersections where most conflicts occur. The crash data presented on previous pages show the hotspots including severity of vehicular and pedestrian/bicycle crashes. Crashes at frontage road intersections are high as well and are also along Greens Road, specifically at the Imperial Valley Drive and Wayforest Drive intersections. The Walk-Bike Toolbox on the following pages presents types of bikeways to consider along these corridors and at intersections that may assist and/or address safety-related concerns for people walking and/or biking.

Jump Start Action Steps

- Finalize network recommendations, priorities, and cost estimates
- Discuss opportunities with Houston Parks Board to coordinate future grant application/funding as available, especially for off-street trail improvements on easement and drainage corridors. Coordinate with local Greenspoint TIRZ on funding partnerships.
- Coordinate with City of Houston (Planning, Engineering, and Council District), Harris County Pct 1, and METRO on implementation of on-street segments, intersections, and street crossings.
- Build momentum with the business community in the North Houston District to advocate for and leverage additional improvements.

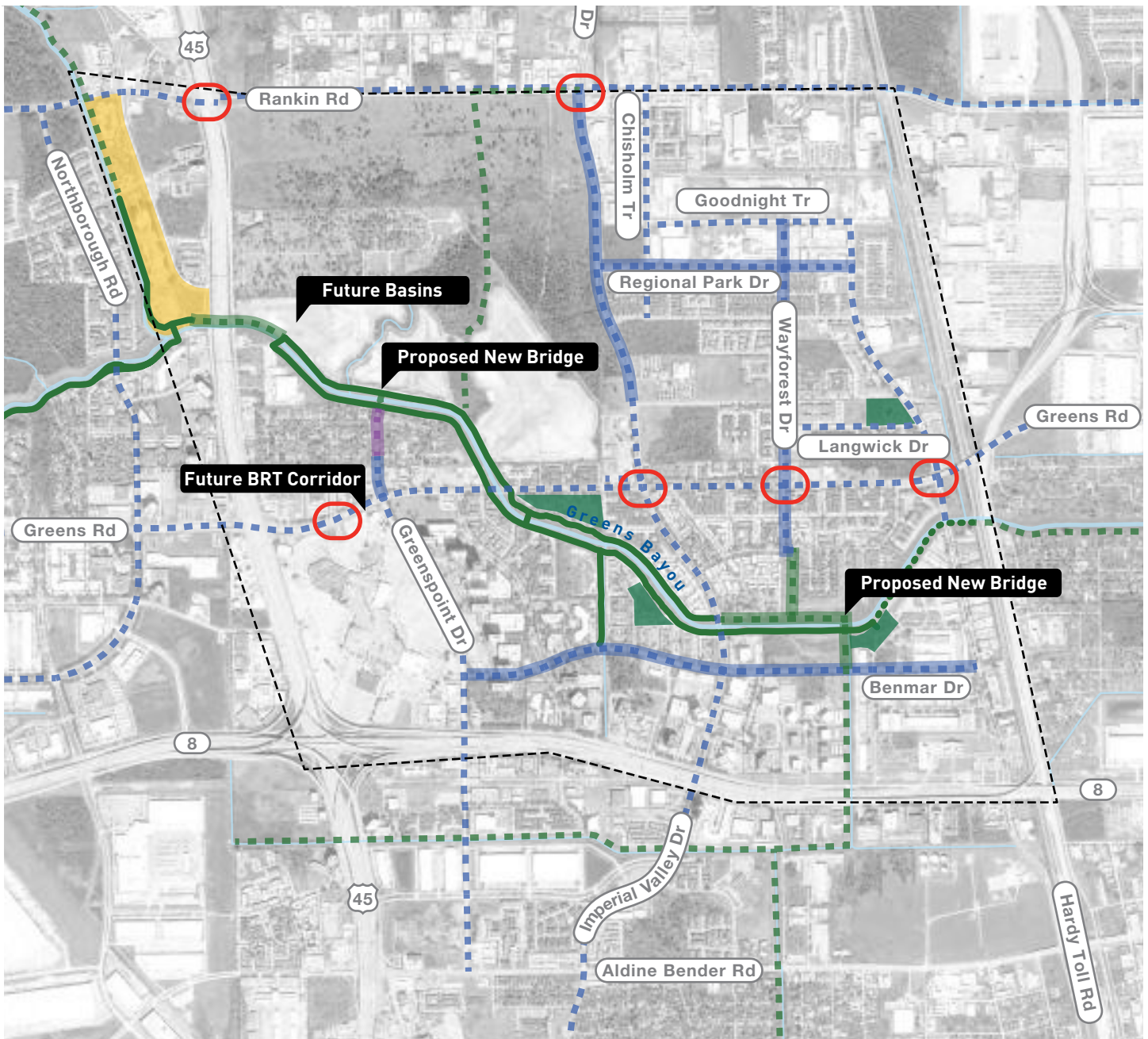


Figure 1.2 North Houston Bikeways Network
 The bikeways network vision for North Houston supporting on-street and off-street bikeways throughout the District.

Legend

Shared On-Street	Existing Bikeway
Dedicated On-Street	Programmed Bikeway
Off-Street	Vision/Long-Term Bikeway
Priority Shared On-Street	Study Area
Priority Dedicated On-Street	Streets
Priority Off-Street	N. Houston Bikepark
Intersection Recommendations	Parks

Recommendations

05

Walk-bike Toolbox

The Walk-Bike Toolbox provides best practice walking and biking design considerations supporting a comprehensive North Houston Bikeways Network as well as supporting safer places to walk and access transit in the North Houston District. The bikeways recommendations support the “All Ages and Abilities” criteria defined below.

All Ages and Abilities Bikeways (AAA)

“All Ages and Abilities” is a criteria set forth by the National Association of City Transportation Officials (NACTO) in their Urban Bikeway Design Guide that encourages bikeway design that is safe for everyone including women, children, seniors, and people with disabilities, including minority and low-income individuals. This national and international best practice guide supports designing bikeways for the more vulnerable or under-represented bicyclists and should be referenced with bikeway design supporting the North Houston Bikeways Network recommendations.

Bikeways

Off-Street Bikeways

The green lines on the Bikeways Network map in Figure 2.36 illustrate the existing and the vision for off-street bikeways. Off-street bikeways are at least 10-foot wide usually concrete or asphalt trails that provide a shared-use place for people walking and biking in locations separated from vehicular traffic. The Greens Bayou Greenway trail provides a spine for off-street walking and biking that should be built upon creating a larger more integrated network.

Dedicated In-Street ROW Bikeways

The blue lines on the Bikeways Network map in Figure 2.36 illustrate the vision for bikeways that could be located within the right-of-ways of the street. A dedicated in-street bikeway could be in the form of a sidepath or a protected bike lane. A sidepath is a back-of-curb design solution that creates a wide path in lieu of a 5’ sidewalk that can be shared with people walking and biking, particularly if a separated on-street bikeway is infeasible. Sidepaths can be one-way or two-way bike facilities with the understanding that people walking can travel in both directions. Along Greens Road, supporting the vision for a coordinated transit, walk, and bike corridor as seen in Figure 1.17, a sidepath could be considered within the existing right-of-way allowing for people to walk and/or bike supporting a multimodal corridor.



Figure 1.3 Off-Street Bikeway (Houston, TX)



Figure 1.4 Dedicated In-Street Bikeway One-Way (San Francisco, CA)



Figure 1.5 Dedicated In-Street Bikeway Two-Way (Houston, TX)



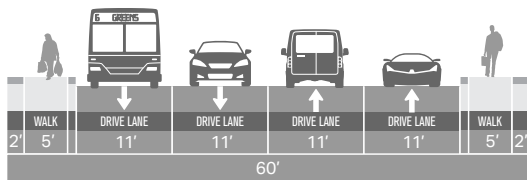
Figure 1.6 Neighborhood Bikeway (Portland, OR)

Another example of a dedicated in-street bikeway is where a buffered or separated bike lane is constructed or retrofitted into the inside of the curb of the corridor. This type of bikeway is sometimes referred to as a “cycle track” and can be designed as a paired one-way facility or as a two-way facility. Along Greens Road, Figure 1.17 also shows a separated bike lane adjacent to the transit corridor and sidewalks in a scenario where right-of-way would be needed to accommodate space for this type of buffered bikeway.

Shared On-Street Bikeways (Neighborhood Bikeways)

The purple lines on the Bikeways Network map in Figure 2.36 illustrate locations where a shared on-street bikeway, or neighborhood bikeway could be implemented. This type of bikeway does not require additional right-of-way or a buffer, but does require designing the street to manage vehicle speeds and volumes in a way that safely supports the presence of bikes. The only purple line on the map is along the northern section of Greenspoint Road in a neighborhood providing a short connection from a dedicated bikeway to an off-street shared use path along Greens Bayou Greenway.

Benmar Drive Existing Four-Lane Corridor



Benmar Drive Proposed Three-Lane Corridor



Figure 1.7 Benmar Existing and Proposed Cross Section Four-lane to Three-Lane Reconfiguration

Four-lane Retrofits

The following corridors in Figure 2.36 including Benmar Drive, Chisholm Trail, Wayforest Drive, Goodnight Trail, Regional Park Drive, and Langwick Drive are identified as “Potential 4-lane Road (potential retrofits)”. These are corridors that could provide connections supporting the bikeways network in the North Houston District by converting the existing travel lanes from four lanes to three, or even two lanes, allowing for more potential space outside the vehicular travel lanes for protected, dedicated bikeways. The current lane widths and general understanding of existing traffic on those corridors would need to be studied in further detail, but through preliminary field analysis, those corridors could accommodate a safe place for bikes within the existing rights-of-way.

Bike Parking and Bike Share

The North Houston District may consider and encourage locations for bike parking at key destinations and businesses that support the bikeway network and current Greens Bayou Greenway trails. Bike share could also be considered at locations where people can make short trip connections between local destinations and transit.



Figure 1.8 Houston B-Cycle Station (Bike Share)

Recommendations

05

Walk-bike Intersection Tools

Based on the existing conditions data presented earlier in the chapter, there are specific intersections with high crash rates including Greens Road and Imperial Valley, Greens and Wayforest Drive, and intersections near frontage roads (among others). The North Houston District could prioritize signalized intersection improvements including safe walk/bike infrastructure improvements at these locations as well as at locations that serve transit. To leverage funds, the North Houston District should work closely with METRO, Harris County, as well as the City of Houston on coordinating any capital-related improvements that may occur in the North Houston District vicinity, supporting safer intersections for people walking, biking, and taking transit.

Intersection improvements to consider could include (but are not limited to):

- **Update and upgrade signals.** If not already available, ensuring ADA compliant pedestrian signals are functioning and that they allow a person walking to cross the street safely during the signal crossing time allotted. If a bikeway is being considered, update the signal to include signalized bike crossing. Both pedestrian and bicycle-specific signals could be prioritized to cycle first before traffic receives a green light, to allow more time for the vulnerable user to get through the intersection.
- **Upgrade crosswalk visibility.** Crosswalks fade quickly and need refreshing. Where possible, new paint and any pavement improvements should be made at intersections to allow for a smooth walk from ramp to ramp across the street without any obstacles. At intersections that may need enhanced pedestrian visibility, a raised crosswalk could be considered to provide a physical and visual cue to drivers that people may be present at the intersection crossings.
- **Provide enhanced median refuge.** Many intersections are long between one side to the other. A median refuge can be created near the middle of the intersection to allow the person walking refuge from the cars between the two-way traffic. The small refuge that is prevalent along Greens Road intersections may not be enough, and improving the protected space with a larger buffer or median would allow the person walking more safety and comfort when crossing the busy corridor.



Figure 1.9 Bicycle Signal with Pedestrian Signal (Houston, TX)



Figure 1.10 Median Refuge and Crosswalk Visibility Example NACTO



Figure 1.11 Median Refuge Example NACTO

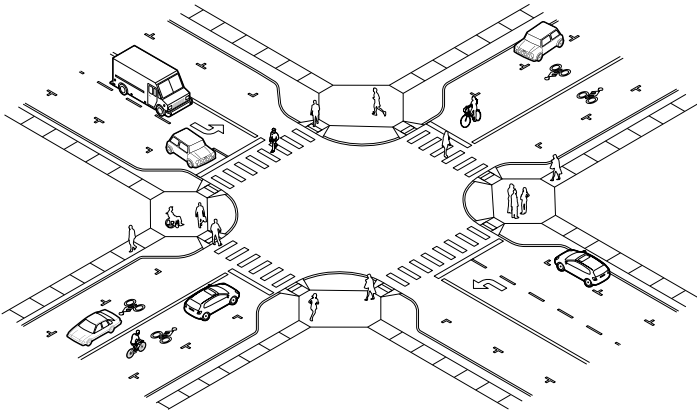


Figure 1.12 Sample Curb Bulb-Outs (Curb Extensions)

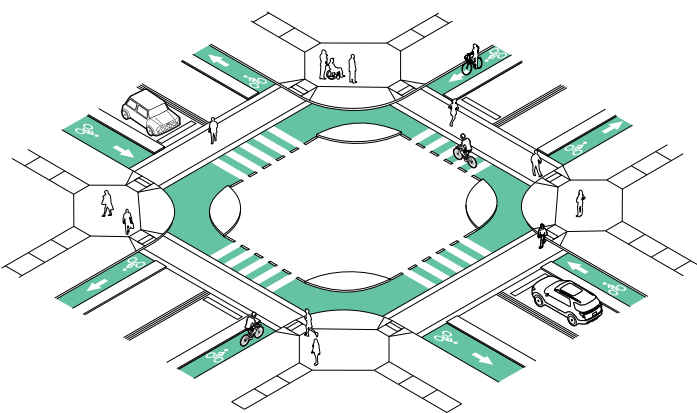


Figure 1.13 Sample Protected Intersection



Figure 1.14 Existing Airport Sign Near Transit in North Houston District

- **Provide curb bulb-outs.** At some intersections, pulling the corner curbs out some to make a larger turning radius for cars turning right will support a slower right-hand turn allowing for more pedestrian visibility. The bulb-out also decreases the length of the crossing distance for a person walking.
- **Curb ramp upgrades.** Many curb ramps in the North Houston District do not provide a clear crossing direction through an intersection. The current curbs allow for the person walking to utilize the same ramp for either crossing location which can be confusing for a motorist understanding the direction the pedestrian may choose. Providing directional ramps provides more visibility of the person crossing the street and more safely provides a direct route across the street.
- **Consider “Protected Intersection” Design.** In locations where bikeways approach a signalized intersection, a protected intersection provides bikeway setbacks and corner islands for people biking to wait in refuge areas, that also improves visibility and lower turning speeds of vehicular traffic.
- **Enhance lighting.** Signalized intersections are usually where people will prefer to cross a major corridor both in the daylight and when it is dark. Ensuring there is good lighting to provide extra awareness of people at the intersection should be considered and enhanced where needed.
- **Update signage.** Many street signs have been upgraded to the North Houston District’s standards, and provide clearer identification for wayfinding. To enhance this further, signage for people walking and biking could be improved to provide better wayfinding to local destinations, transit locations, and bike routes.

05

Walk-bike Mid-Block Crossings

Throughout the North Houston District, there are locations where people walking and biking will cross at a non-designated crossing location or at mid-block instead of at a signalized intersection. To prevent conflicts there are some locations where designating a mid-block crossing may be warranted. If the distance between signalized intersections are farther than a comfortable/quick walk, a person will most likely cross where they need to cross out of convenience, regardless of the safety concerns. There are a few mid-block crossings that could be considered along corridors where a safe mid-block crossing may be needed.

One specific location where a mid-block crossing would provide value, is along Greenspoint Drive from the transit center on the west side across Greenspoint towards the hotels and businesses on the east side of the corridor. The distance from the transit center stop to the nearest signalized intersection at Greens Road is out of the way for anyone needing to walk across Greenspoint to get to the business along the east side of the corridor. There is a median located within the corridor that provides some pedestrian refuge when crossing four lanes of traffic, but there is not a designated location to cross mid-block. Field visits indicate this is a common mid-block crossing location.

Mid-block crossing treatments vary and can range from a painted crosswalk with signage, to a full HAWK signal that provides a red light for vehicular traffic to stop for a person crossing. Mid-block crossing treatments should be considered to enhance the safety of people needing to cross busy, unsafe corridors to reach destinations.

- **Median Refuge Islands** are usually wide raised islands (or medians) with a place for a pedestrian to cut through, allowing refuge from roadway traffic in the middle of a block. There are a few median refuge islands within the District, but many medians could be enhanced to formalize this refuge for pedestrians and support the crossing with a painted crosswalk and signage.
- **Raised Crosswalks** provide enhanced visibility for a person crossing the street through vertical deflection that may slow approaching vehicles while visually reinforcing the crossing for the person walking as the priority.

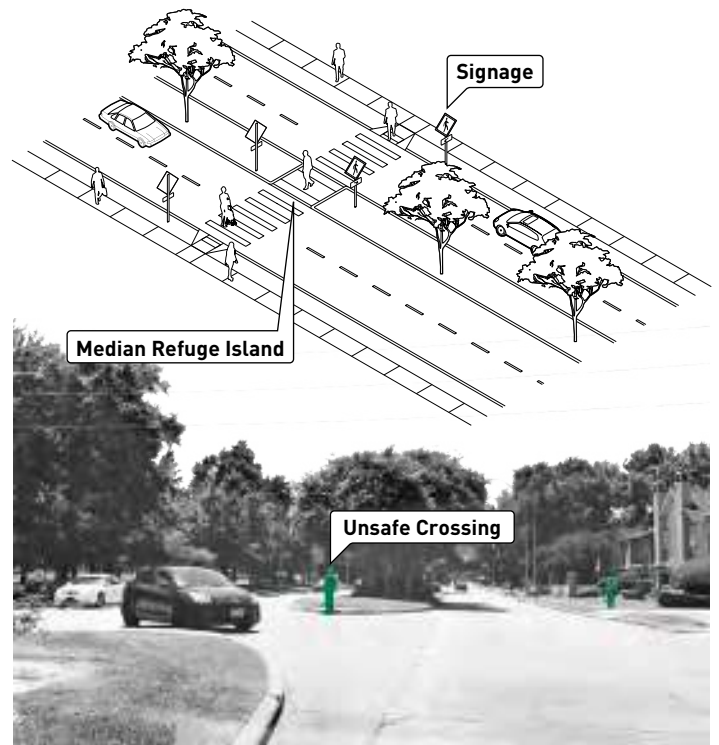


Figure 1.15 Pedestrian Crossing at Unmarked Location North Houston District and Median Refuge Island Example

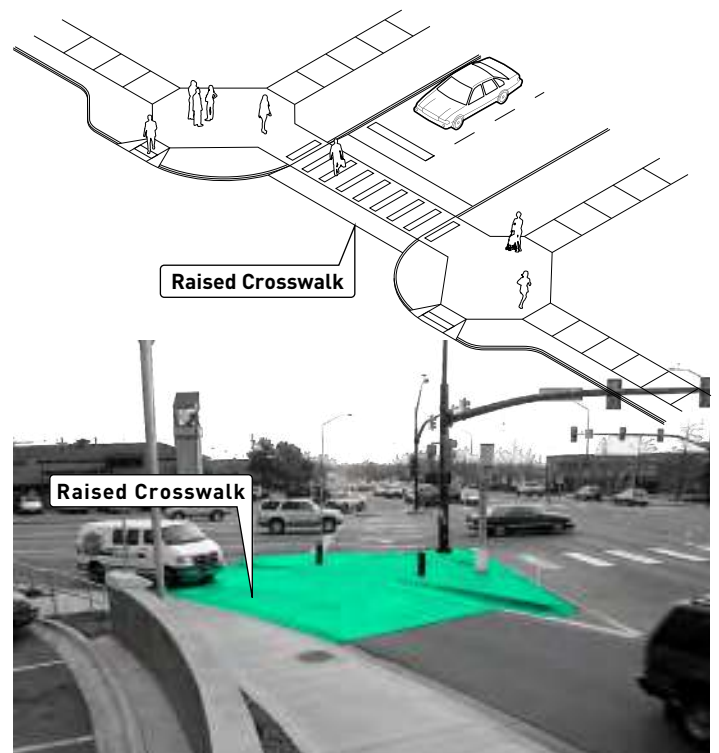


Figure 1.16 Raised Crossing at Channelized Right Turn Lane Boulder, CO, and Typical Example

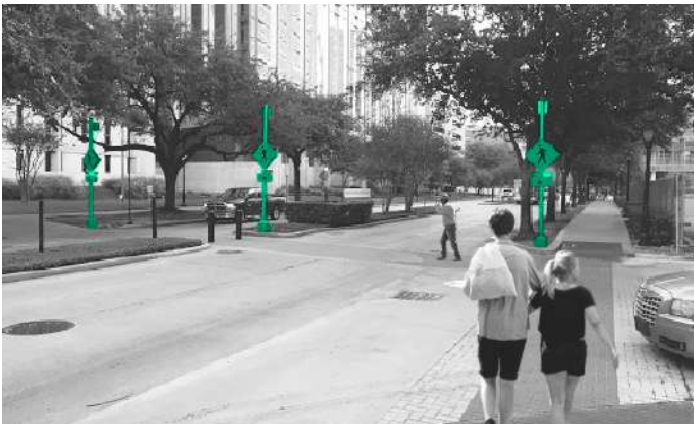


Figure 1.17 RRFP Example



Figure 1.18 HAWK Signal Example

- **RRFB** stands for a “rectangular rapid flashing beacon” and is a type of mid-block crossing treatment that provides flashing lights notifying oncoming drivers of a person crossing the street. The person crossing the street usually must push a button to indicate their intent to cross the street, triggering the sign to begin flashing. Oncoming vehicular traffic must stop to allow the person to safely cross.
- **HAWK** signals or pedestrian hybrid beacons (as they are known as well) provide the most intense form of mid-block crossing that acts as a signalized intersections involving motorists and pedestrians at a crossing location with yellow or red lights indicating presence of someone crossing the street. If a person wants to cross the street, they would push a button to indicate their intentions to cross at the HAWK signal. The signal switches from a flashing yellow light to a red solid light (indicating motorists must stop), to a flashing red indicating that cars must yield to anyone crossing, and then the light will go back to flashing yellow. This is the most expensive form of mid-block crossing.

CIP COORDINATION

Prioritizing walking and biking recommendations will need to be coordinated and/or pursued in partnership with a variety of agencies including the North Houston District, City of Houston, METRO, Harris County Precinct 1, and the Greenspoint TIRZ. Coordinating CIP-related projects such as sidewalks, intersection improvements, and bikeways not only help to leverage resources to pay for projects, but can support a better project that takes into account multimodal and overall safety benefits.

The North Houston District may consider coordinating with the aforementioned entities (and others that may not be listed here). One best practice the North Houston District may implement, is to identify a sidewalk, bikeway, or intersection improvement(s) that can be accomplished within a fiscal year to support progress towards the larger vision and recommendations of this plan. Leveraging the District assessment dollars with grants and partnerships with other entities can support viability of this plan’s implementation.

METRO could be an integral partner on providing safe walking and/or biking access along transit corridors and to transit hubs.

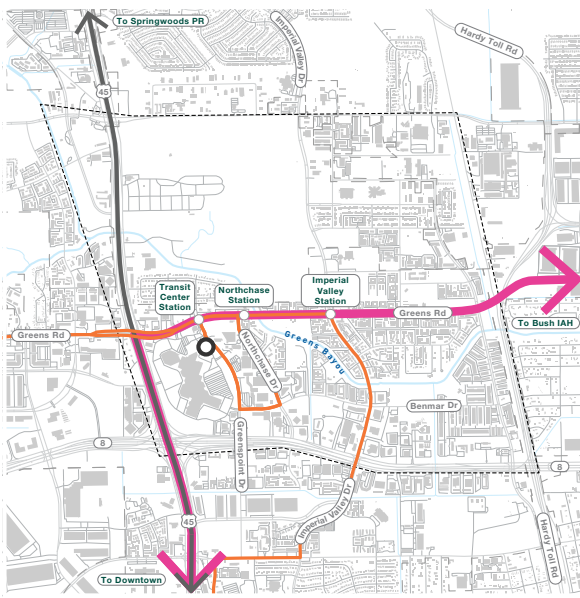


Figure 1.19 METRONext Moving Forward Plan Opportunities to Coordinate

Recommendations

06 Upgrade Priority Sidewalks Including Safe Routes to School

Summary

Improve pedestrian access in North Houston by prioritizing the reconstruction of safer and wider sidewalks and safer intersection treatments on Greens Road and Imperial Valley with an emphasis on safe routes to schools. The district can work with the City of Houston to identify and prioritize sidewalk and intersection improvements and get them included in the City Capital Improvement Projects through the Safe Routes to School Program.

Recommendation Characteristics

Type	Project
Timeline	Short-term (1-5 years)
District's Role	Initiate
Lead Agencies	City of Houston North Houston District

Livability Principles Supported

1. Provide More Transportation Choices
4. Support Existing Communities
5. Coordinate Policies and Leverage Investment
6. Value Communities and Neighborhoods

Partners

Approval From

North Houston District, City of Houston, and Aldine ISD

Capital Funding

North Houston District, City of Houston, TIRZ 11, Coordinate with METRO on Universal Accessibility program along transit corridors. Coordinate with Harris County for school access funding for Greenspoint Elementary

Operational Funding

North Houston District and the City of Houston

Description

The existing conditions show that many of the sidewalks near the two schools in Greenspoint are missing, that the sidewalks along two of the most trafficked streets, Greens Road and Imperial Valley Drive, do not meet standards, and that the majority of the crosswalks in the study area should be improved.

The graphic to the right identifies high and medium priority repairs to sidewalks and crosswalks, with high indicating that the sidewalk or crosswalk is missing or should be redone in areas of high pedestrian traffic, and medium priority indicating that repairs and improvements to important sidewalks would make walking much more comfortable for the majority of people walking, and would improve the pedestrian experience and the overall perception of Greenspoint.

Several routes have also been outlined as potential safe routes to school. These could be designated as safe routes through the Safe Routes to School program, which could help to provide additional funding to improve sidewalks that children would use to walk or bike to school. These routes have been determined by identifying areas where people live and how they would most likely walk to school.

Jump Start Action Steps

- Develop and prioritize list of new sidewalks and intersection improvements and develop cost estimates. Priorities should include: Safe School Access, Transit Access, Greens Bayou Access, and corridors where both bike and sidewalk enhancements are proposed.
- Develop intersection safety toolbox and define some initial pilot locations for improvement including funding
- Coordinate with City of Houston and Harris County Vision Zero initiatives including potentially participating on steering committees as possible.
- Coordinate with TxDOT on improvements to freeway crossings including safe turn radii, improved curb ramps, under freeway lighting and sidewalk reconstruction.

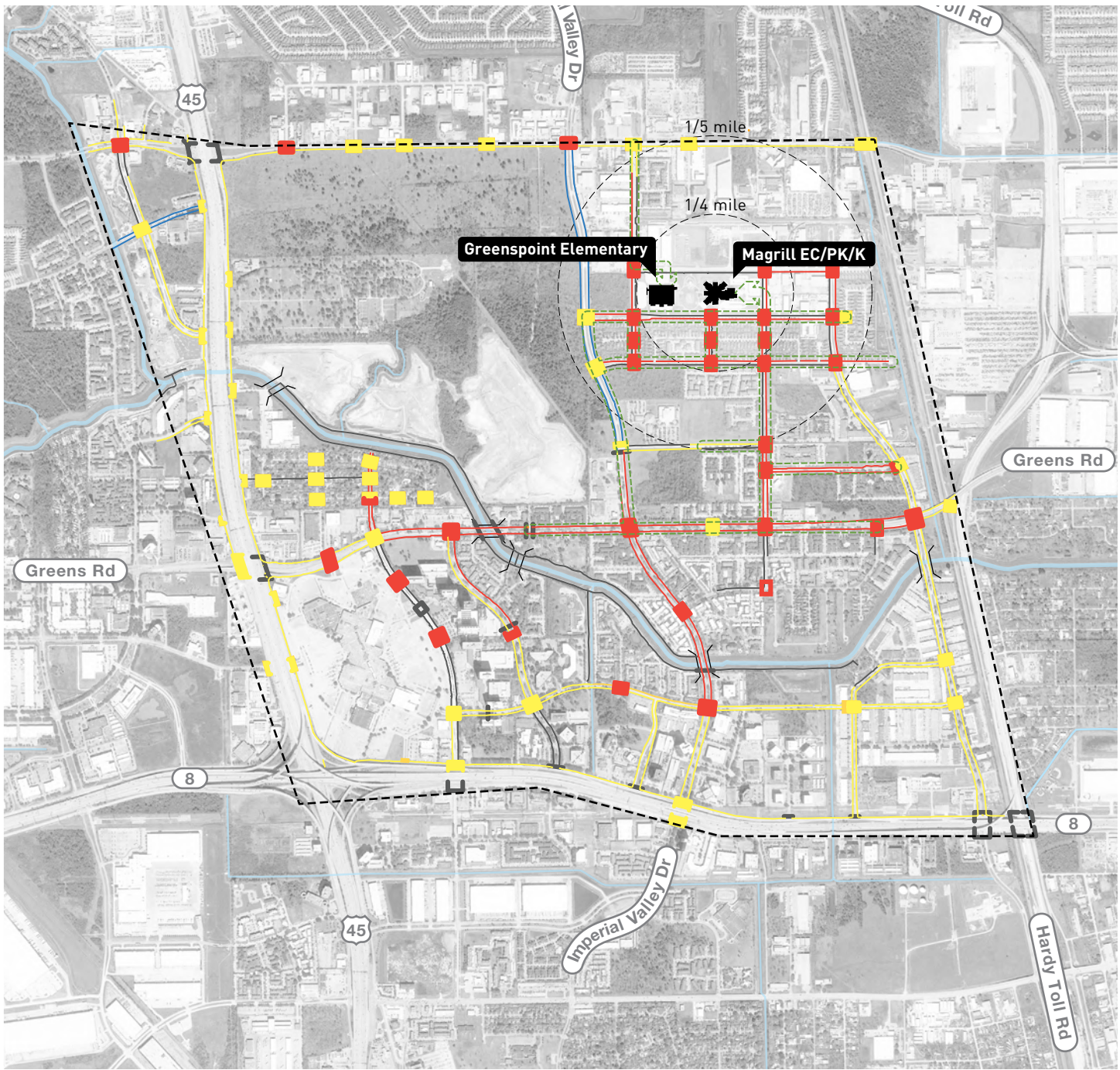


Figure 2.35 Sidewalk Repair Priority Map

Many sidewalks in Greenspoint need to be repaired or rebuilt. Priority should be given to sidewalks along Greens Road and Imperial Drive, and along the safe routes to school.

Sidewalk Priorities

- Site
 - High Priority Repairs
 - Medium Priority Repairs
 - C.I.P. Planned Projects
 - Existing Sidewalk
 - Safe Routes to Schools
 - Bridge
 - (planned reconstruction)
 - High Priority Crosswalk Repairs
 - Medium Priority Crosswalk Repairs
 - Existing Crosswalk
- 0 | 1/4 | 1/2 | 1mile

Recommendations

07 Create Green Streets / Urban Design Standards

Summary

Develop standards for what North Houston’s streets should look and feel like. The design standards can provide requirements and establish minimum standards for designing streets such that streets are built to be safe, comfortable, and are sustainable for everyone. The district can develop green street and urban design guidelines and work with the City of Houston to adopt them for new construction.

Recommendation Characteristics

Type	Project
Timeline	Short-term (1-5 years)
District’s Role	Initiate
Lead Agencies	North Houston District

Livability Principles Supported

1. Provide More Transportation Choices
3. Enhance Economic Competitiveness
4. Support Existing Communities
5. Coordinate Policies and Leverage Investment
6. Value Communities and Neighborhoods

Partners

Approval From

North Houston District and the City of Houston

Capital Funding

North Houston District and the City of Houston

Description

The existing conditions on Greens Road create unsafe scenarios for all forms of active travel. These Design Standards will not only lead to safer car travel speeds, but a more inviting and safe ped/bike realm as well. By encouraging other modes of travel and prioritizing bus access and timeliness, we will facilitate a more lively community and a decrease car dependency in Greenspoint.

In order for on-street changes to have measurable effect, it is imperative that there are no physical obstacles between residential developments and the public realm. This will ensure both visual and physical connectivity.

The design standards are a collection of urban design components, like a toolbox, which can be employed to easily make streetscape design continuous and better. These include guidelines for shade (trees), consistent lighting, where transit and bus stops should be located so that they can be worked around, and a minimum dimension of a shared bike and pedestrian path, with addition options such as separated bike/ped paths for greater comfort and wayfinding.

In addition to creating functionally better streetscapes, these standards could develop a new identity for the area. Wayfinding, light fixtures, crosswalk design, and signature elements can all create a cohesive sense of place and community.

Standards can also include guidelines for connections between the sidewalk and private land uses, such as apartments, hotels and office buildings. And the standards can be applied when new developments are built or when existing developments are redeveloped.

Jump Start Action Steps

- Define Transit Corridor Ordinance Standards along Greens Road for future BRT.
- Develop overall goals with holistic design standard and specific criteria beyond “Green” a. Lighting, b. Trees / Shade, c. Public Art, d. Innovative Materials (permeable, reduce heat island).
- Develop Thoroughfare Plan recommendations (e.g., add minor collectors) to increase connectivity and break down super blocks to more manageable sizes where possible. This may include additional freeway crossing points.

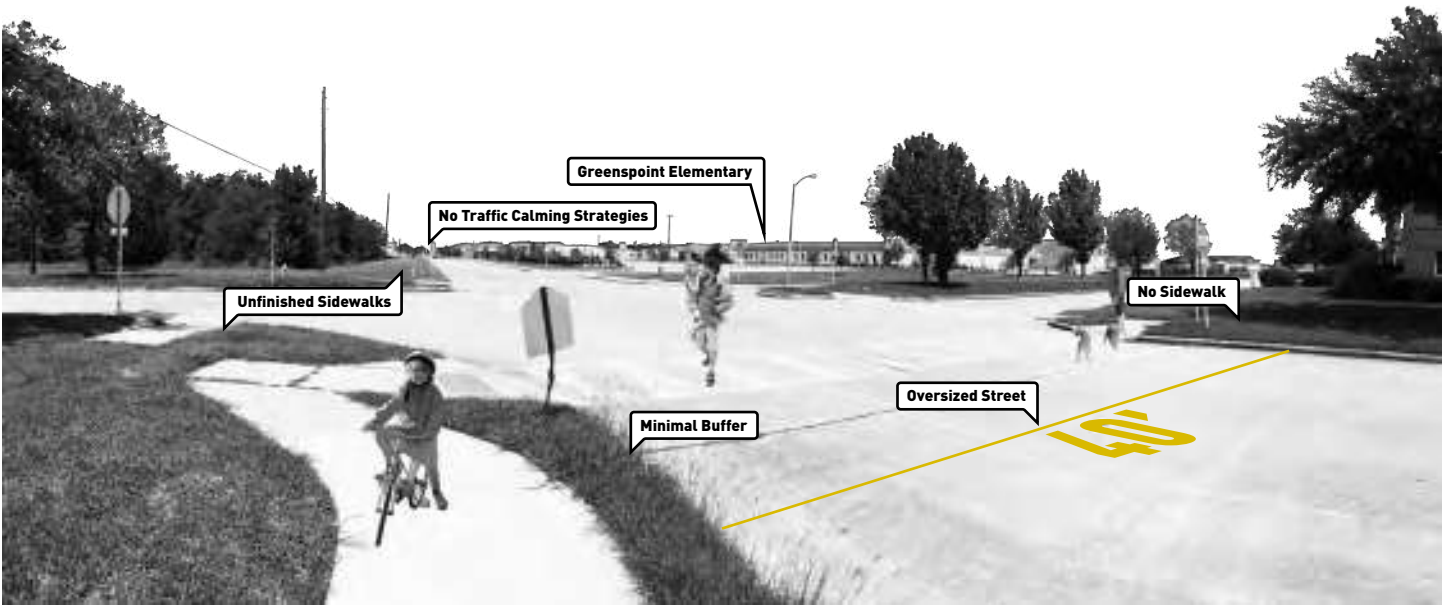
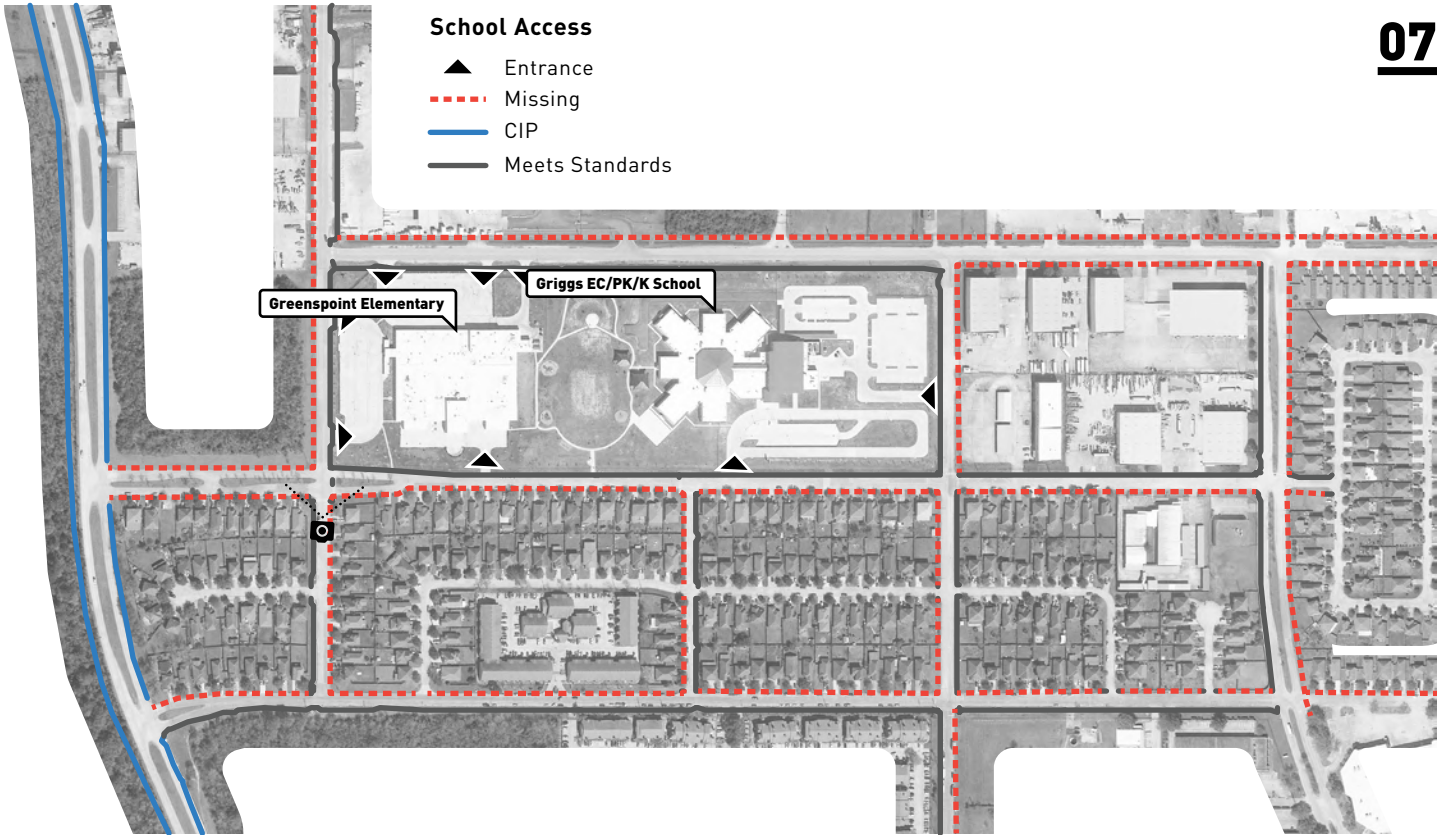


Figure 2.36 Sidewalk Repair Priority Map

07

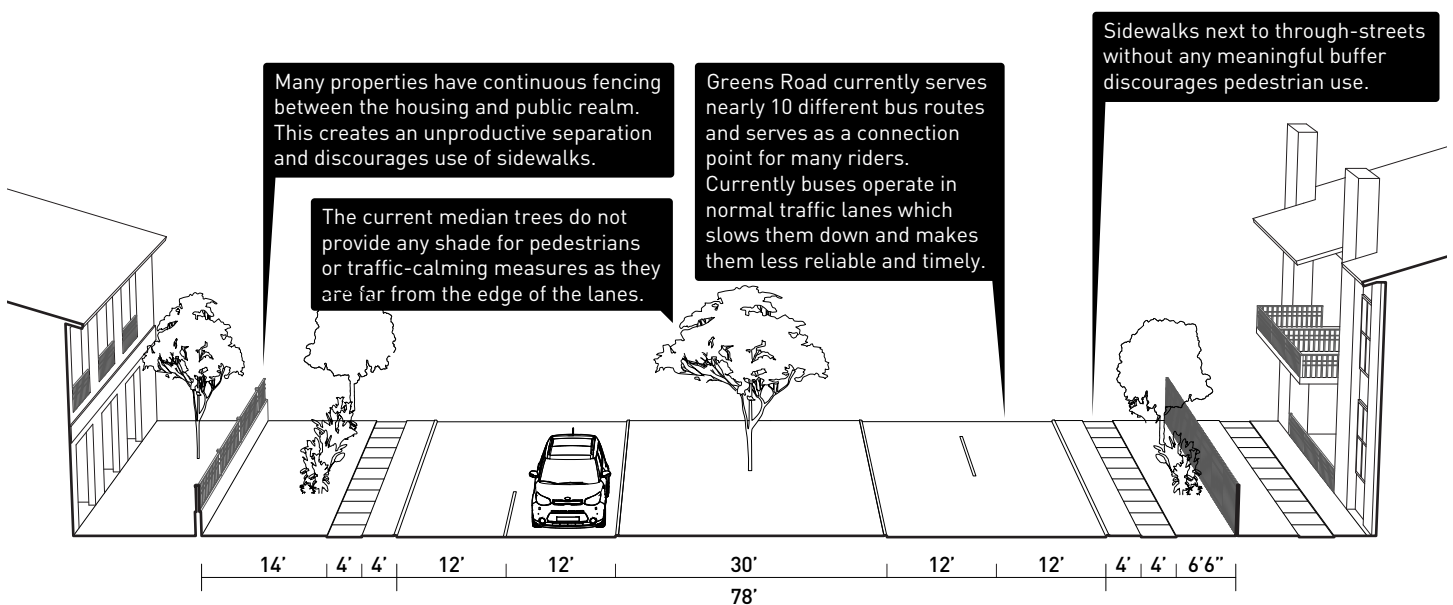


Figure 2.37 Greens Road Existing Typical Cross Section

Greens Road currently serves nearly 10 different bus routes and serves as a connection point for many riders. Currently, buses operate in normal traffic lanes which slows them down and makes them less reliable and timely. Many properties have continuous fencing between the housing and public realm. This creates an unproductive separation and discourages use of sidewalks.

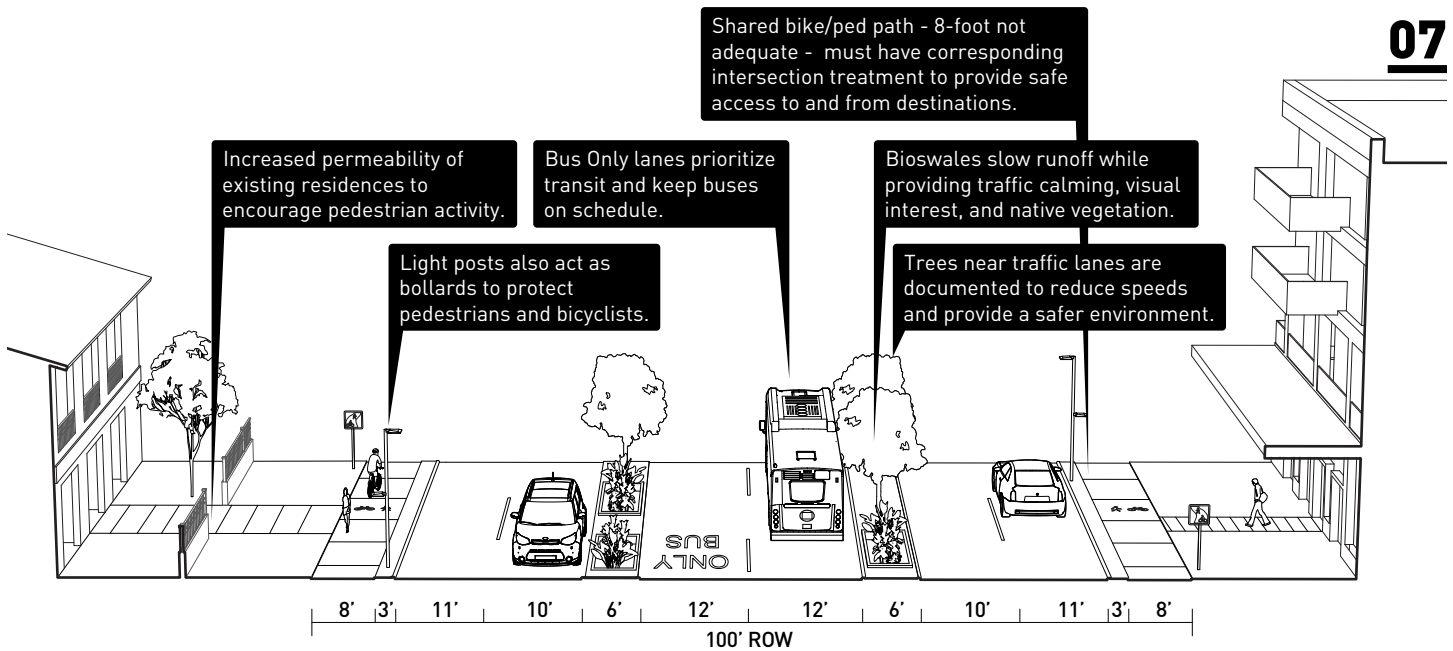


Figure 2.38 Greens Road Potential 100' ROW Cross Section
 Bioswales slow runoff while providing traffic calming, visual interest, and native vegetation. Trees near the open traffic lanes are documented to reduce speeds and provide a safer environment. Bus Only lanes prioritize transit and keep buses on schedule. Shared bike/ped path - 8' minimum - with corresponding intersection treatment to provide safe access to and from destinations.

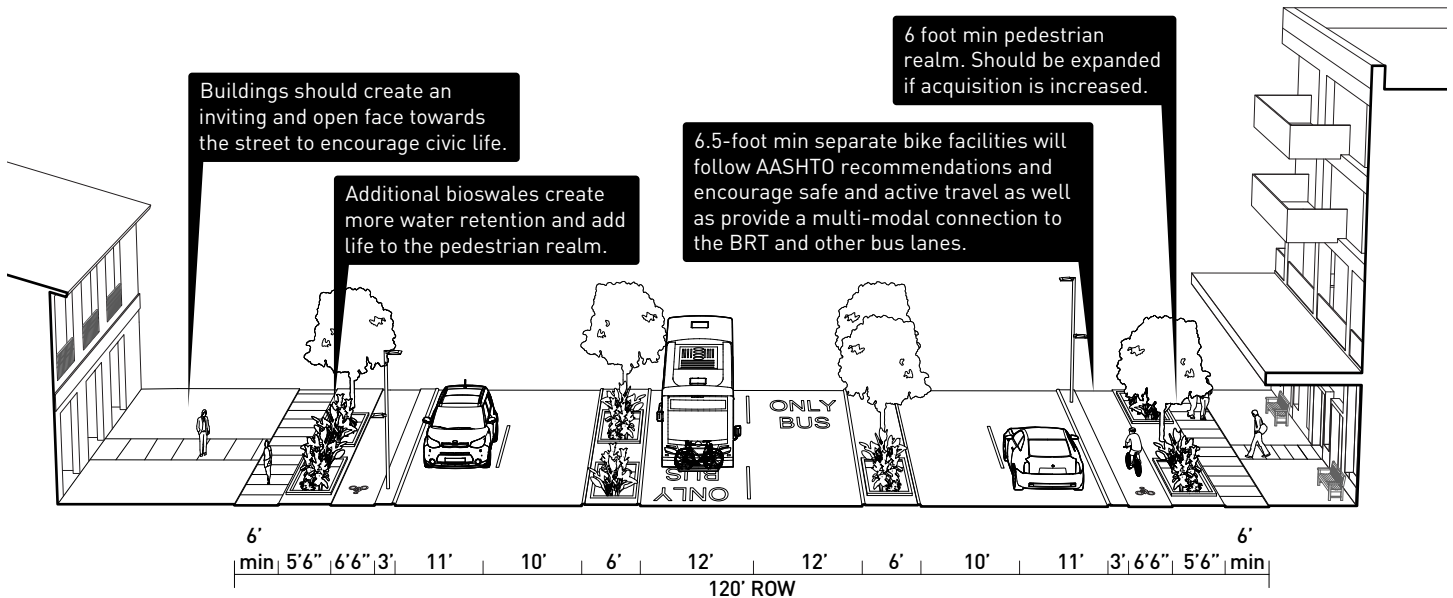


Figure 2.39 Greens Road Potential 120' ROW Cross Section
 Separate bike facilities will encourage safe and active travel as well as provide a multi-modal connection to the BRT and local bus. Additional bioswales create more water retention and add life to the pedestrian realm. Buildings should create an inviting and open face towards the street to encourage civic life.

BE DEFINED BY A CENTRAL PARK THAT HOLDS FLOODWATER

Flooding is a regular occurrence in Greenspoint, which is located in the Greens Bayou Watershed. Over forty-three percent of the site is covered by the floodway or floodplain (existing and future estimated). Twenty-five percent of the site is covered by the 100-year floodplain and twelve percent of the site is covered by the floodway. Four of the five parks on the site are covered by the floodway or floodplain (existing and future estimated). The majority of housing in the study area is located within the current and estimated 100-year floodplain. The “estimated 100-year floodplain,” what is currently the 500-year floodplain, is predicted to become the 100-year floodplain in the future due to increased precipitation resulting from global climate change, according to NOAA Atlas 14.

There are a total of 498 multi-family homes on the site and eighty-five percent of these are in a floodway or floodplain (existing or future estimated). Only forty-three percent of the 230 single-family homes are in the floodway or floodplain (existing or future estimated). Currently there are about 262 acres of land associated with buyouts. Several residential areas within the floodway were offered the option to participate in a buyout program through the Harris County Flood Control District in 2018, following Hurricane Harvey and only a few residences remain in these areas.

While Greenspoint has relatively good physical parks access - a majority of residents are within a 5 or 10 minute walk of a park, the issue Greenspoint must face is whether or not the acreage of parks can support the number of people living there. Greenspoint contains five parks that total approximately 20 acres: Thomas R. Wussow Park, CityView Park, Greenspoint Community Park, Ida Gaye Gardens, and Jack Drake Park. Inside the study area, the majority of residential buildings are within a five- or ten-minute walk of the parks, with the exception of Jack Drake Park.

The National Recreation and Park Association (NRPA) has found that the typical parks and recreation agency has 9.5 acres of park per 1,000 residents and one park for every 2,277 residents. Greenspoint has one park for every 5,003 residents. NRPA also found that for jurisdictions with less than 20,000 residents, there is one park for every 1,335 residents; that number rises to one park for every 2,396 residents for jurisdictions with populations between 50,000 to 99,999. In addition to issues of parks per capita, The parks that do exist in Greenspoint are deficient in amenities including playgrounds, picnic shelters, trails, outdoor basketball courts, tennis courts, dog parks, skate parks, community centers, swimming pools, and softball and soccer fields.



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Existing Conditions

Flooding in Greenspoint

Flooding is a regular occurrence in Greenspoint, which is located in the Greens Bayou Watershed. Greens Bayou bisects the study area and includes wide floodways, particularly on the bayou’s north side, that makes up close to thirteen percent of the study area. Another thirty-one percent of the study area is within the 100-year floodplain (25.0%) and the estimated 100-year floodplain (5.87%). In total, forty-three percent of the study area is either in the floodway, existing 100-year floodplain, or estimated 100-year floodplain. The “estimated 100-year floodplain” is currently the 500-year floodplain. It is predicted to become the 100-year floodplain in the future due to increased precipitation resulting from global climate change, according to Atlas 14, a recent research effort by the National Oceanic and Atmospheric Administration (NOAA) to update precipitation predictions. Scattered wetlands exist throughout the site, with larger wetland patches outside the site to the north and southwest. All four parks in the study area are within the floodway or floodplain (existing and future estimated), with Thomas R. Wussow Park, City View Park, and Jack Drake Park being entirely within the floodway. Ida Gaye Gardens is within the 100-year floodplain.

Project Area

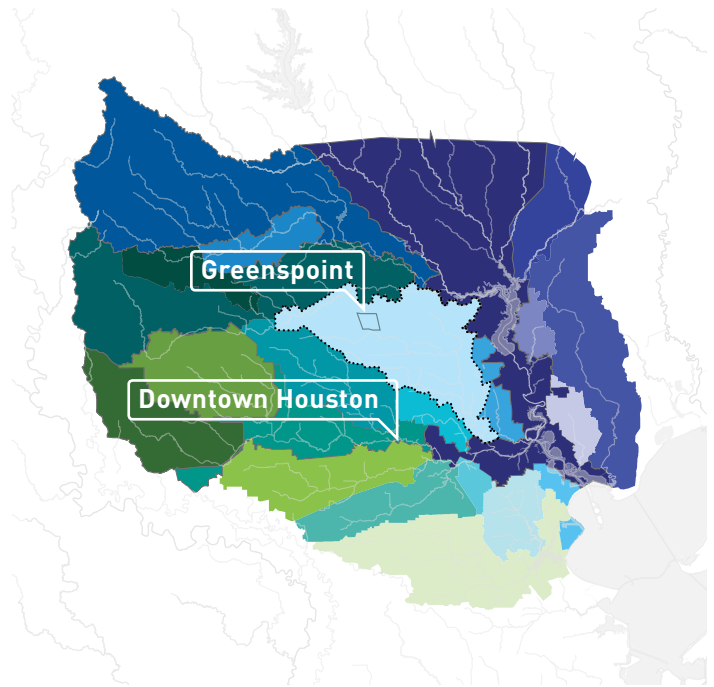


Figure 3.1 The North Houston Study Area is located in the Greens Bayou Watershed.

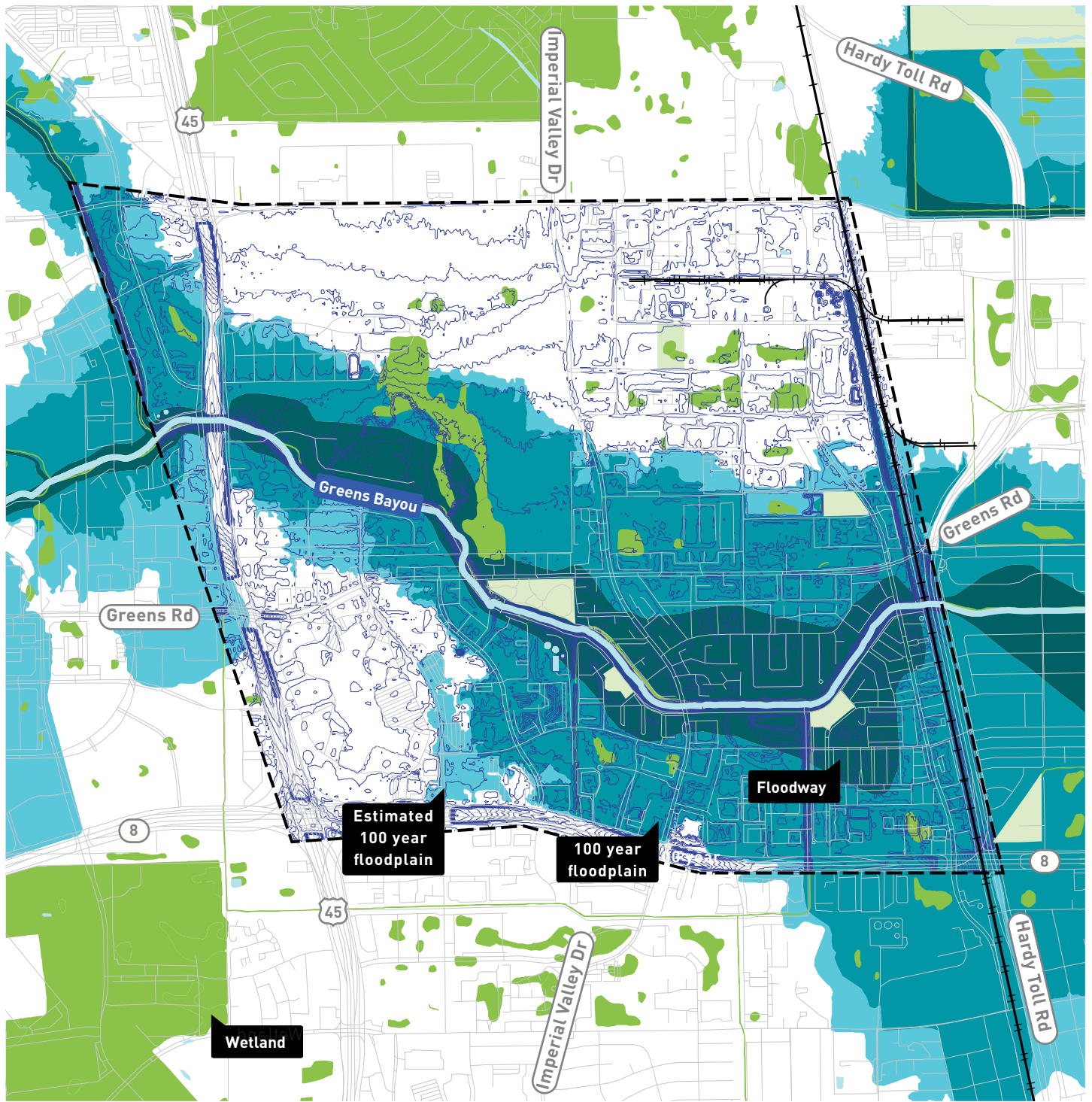
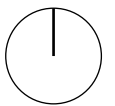
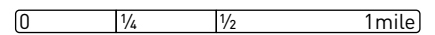


Figure 3.2 Flooding in Greenspoint

Floodway, 100-year floodplain, 500-year floodplain, wetlands, elevation contours.

Legend

- Study Area
- Water
- Floodway
- 100-year Floodplain
- 500-year Floodplain
- Wetlands
- Parks & Open Space
- 2 foot Contours
- Roads



Existing Conditions

Greens Bayou Detention Basins

The Harris County Flood Control District (HCFCD) is in the process of constructing the Glen Forest Stormwater Detention Basin on a 160-acre site near Greenspoint Mall, east of I-45. The project consists of three interconnected detention basin cells designed to hold 293.1 million gallons of water. It will also incorporate 2.5 acres of native plantings, .81 acres of stormwater quality treatment wetlands, and natural channel design features that will enhance environmental and water quality.

The project is named for the Glen Forest Subdivision, which occupied the site until approximately 115 homes in the neighborhood were purchased by the HCFCD Buyout Program in the years between Hurricanes Allison (2001) and Ike (2008). The Glen Forest Stormwater Detention Basin and the Kuykendahl Stormwater Detention Basin to the northwest of the study area near Ella Road were funded by FEMA under the Hurricane Ike Hazard Mitigation Grant Program in 2015, with funds matched by the HCFCD. Together, the two projects will hold approximately 1 billion gallons of water, and are expected to reduce or remove flooding risk from over 1,100 structures along Greens Bayou.



Figure 3.3 The Glen Forest Stormwater Detention Basin site in 2017.

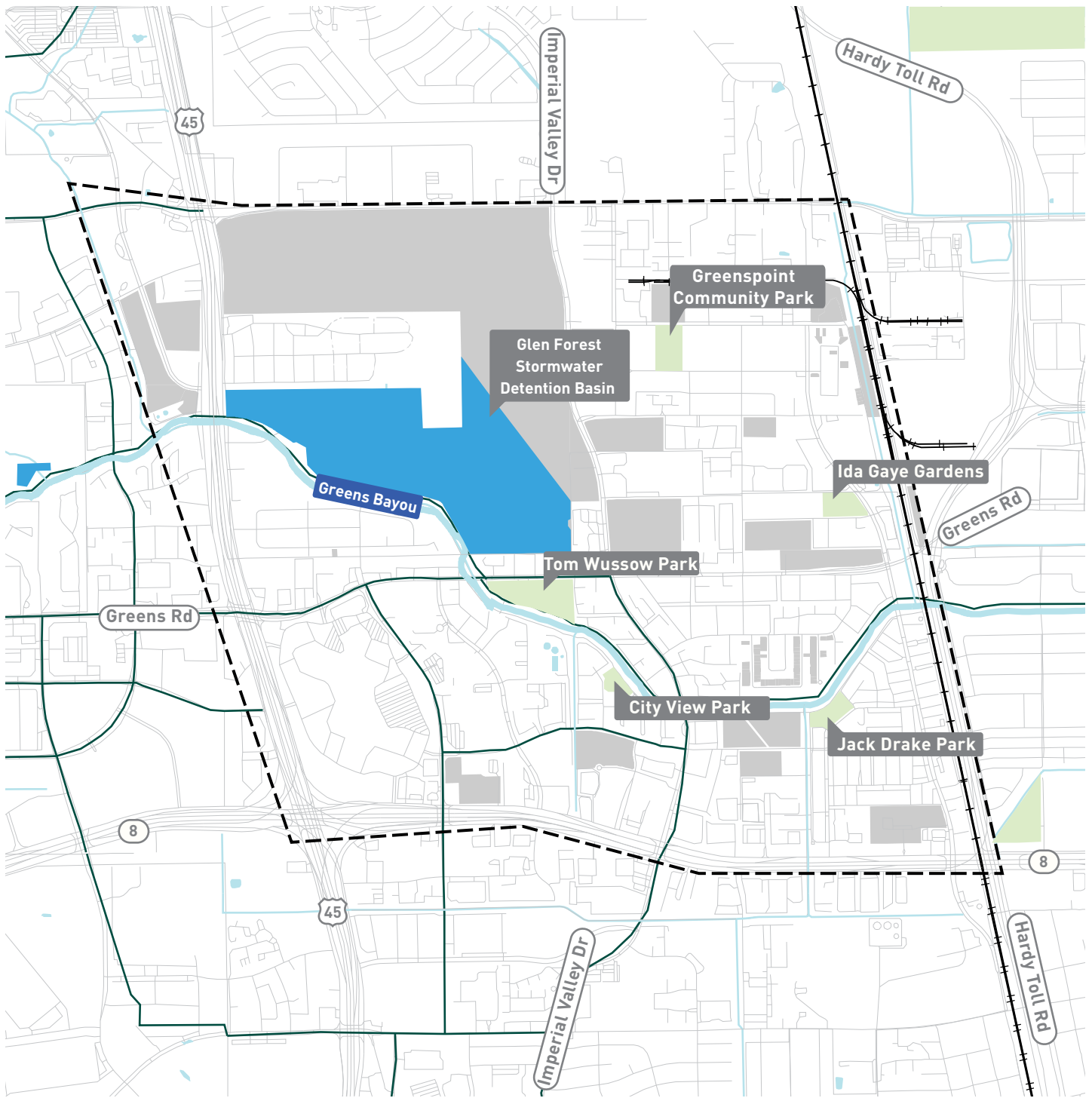
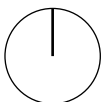


Figure 3.4 Detention Basin
Detention Basin in Greenspoint

Legend

- Vacant Lot
- Park
- Water
- Detention Basin
- Roads
- Bikeways
- Railroad
- Study Area

0 | 1/4 | 1/2 | 1 mile



Existing Conditions

Past, Current, and Future Housing in Danger

The majority of housing in the study area is located within the current and estimated 100-year floodplain. As mentioned previously, the “estimated 100-year floodplain,” what is currently the 500-year floodplain, is predicted to become the 100-year floodplain in the future due to increased precipitation resulting from global climate change, according to NOAA Atlas 14. Multiple developments are located directly in the floodway, placing them in particular danger of regular and repeated flooding. Repeat flooding might make the option of buyouts more relevant for residents finding themselves in the floodway. Currently on the site, there are about 262 acres of land associated with buyouts. Several residential areas within the floodway were offered the option to participate in a buyout program through the Harris County Flood Control District in 2018, following Hurricane Harvey; only a few residences remain in these areas. So far, 146 structures have been bought out. Buyouts provide potential park opportunities.

Housing types are not evenly distributed throughout the site. There are a total of 498 multi-family homes on the site and eighty-five percent of these are in a floodway or floodplain (existing or future estimated). Only forty-three percent of the 230 single-family homes are in the floodway or floodplain (existing or future estimated). The bulk of multi-family homes are in the 100-year floodplain, which is not the case for single-family homes. Despite there being more multi-family homes in a floodway or floodplain, there are almost nine times as many single-family homes in the 100-year estimate.

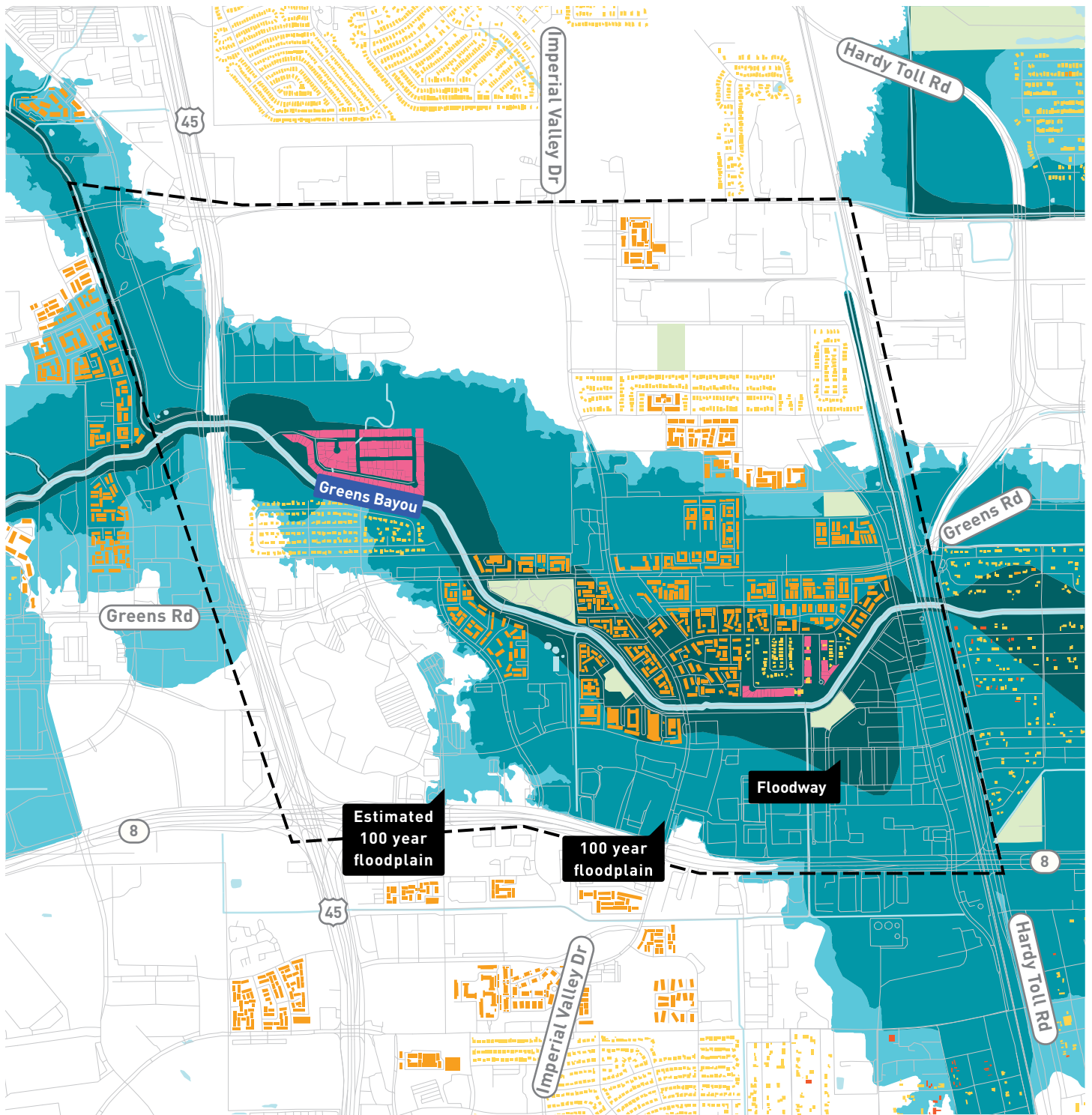
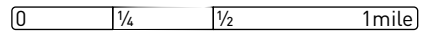


Figure 3.5 Past, Current, and Future Housing in Danger
 Single and multi-family homes that fall within the floodway, 100-year floodplain, and estimated 100-year floodplain.

Legend

- Study Area
- Water
- Floodway
- 100-year Floodplain
- Est. 100-year Floodplain
- Parks & Open Space
- Mobile Homes
- Multi-Family Housing
- Single-Family Housing
- Buyouts
- Roads



Existing Conditions

Park Access

The incorporated areas of Greenspoint are part of Houston Parks Sector 20, which contains only one park operated by the Houston Parks and Recreation Department (HPARD). The study area contains five parks that total approximately 20 acres: Thomas R. Wussow Park, CityView Park, Greenspoint Community Park, Ida Gaye Gardens, and Jack Drake Park. All parks in the study area with the exception of the Greenspoint Community Park are operated by the North Houston District. Greenspoint Community Park is a newly constructed park that sits east of Greenspoint Elementary School, which has been operating for only 3 years. The park is fenced as it serves around 600 elementary school students in addition to community members. Additionally, the North Houston Bike Park, operated by the North Houston District, to the west of the study area, across I-45, opened August 16, 2019. These parks are profiled in greater detail on the next page.

According to the Houston Parks Masterplan (2015), Greenspoint contains areas of “high” and “very high” park needs, determined as areas where residents cannot access a park within half a mile. The degree of need is determined by population density, household income under \$35,000 per year, and the presence of youth ages, 19 and under. After looking at which buildings zoned for residential use are within a five and ten minute walk and parks per capita the need is more of a density issue than an access one. Inside the study area, the majority of residential buildings are within a 5- or 10-minute walk of the parks, with the exception of Jack Drake Park, which is an access issue. Despite having residential land uses to its north, Jack Drake Park has no bridge close enough to allow for a 5- or 10-minute walk to the park. Residents, that would ordinarily be within a 5- to 10-minute walk, have to walk along the Greens Bayou making their commute upwards of 15 minutes. The five minute radius around Jack Drake Park shows the residences that would be within a five minute walking distance if there was a bridge.

Greenspoint has 20,013 residents within the study area with about one park acre per capita. The National Recreation and Park Association has found that the typical Parks and Recreation Agency has 9.5 acres of park per 1,000 residents and one park for every 2,277 residents. Greenspoint has one park for every 5,003 residents. The NRPA also found that for jurisdictions with less than 20,000 residents there is one park for every 1,335 residents; that number rises to one park for every 2,396 residents for jurisdictions with populations between 50,000 to 99,999.

In addition to issues of access and density, Greenspoint residents also lack access to the amenities that parks can provide. The parks that do exist in Sector 20 are deficient in amenities including playgrounds, picnic shelters, trails, outdoor basketball courts, tennis courts, dog parks, skate parks, community centers, swimming pools, and softball and soccer fields. The top three resident-identified priorities for the area are hike, bike, and walk trails; upgraded recreation centers; and playground areas.

- Sector 20 Parks Masterplan Recommendations:
- Acquire new parkland
- Develop new park facilities
- Develop Neighborhood connections to parks and trails
- Preserve environmentally sensitive areas
- Develop partnerships with school systems and other entities
- Revitalize existing parks

The Parks Masterplan found that as of 2015, Sector 20 contained a total of 15 acres of parkland, 36 acres short of the 51 acres needed to serve the projected 2040 population. This figure does not include Ida Gaye Gardens, Jack Drake Park or Greenspoint Community Park, both of which were completed after 2015, or any other parks within Sector 20 that have been developed since the plan’s writing. The plan recommends pursuing Community Development Block Grants and continuing to partner with North Houston District and the Greater Greenspoint Redevelopment Authority (Tax Income Reinvestment Zone 11) to acquire, develop and maintain parks in the area. Additionally, the North Houston District 2030 Plan (2006) lists flooding mitigation projects including park development at flood detention basins on its potential programs and projects.

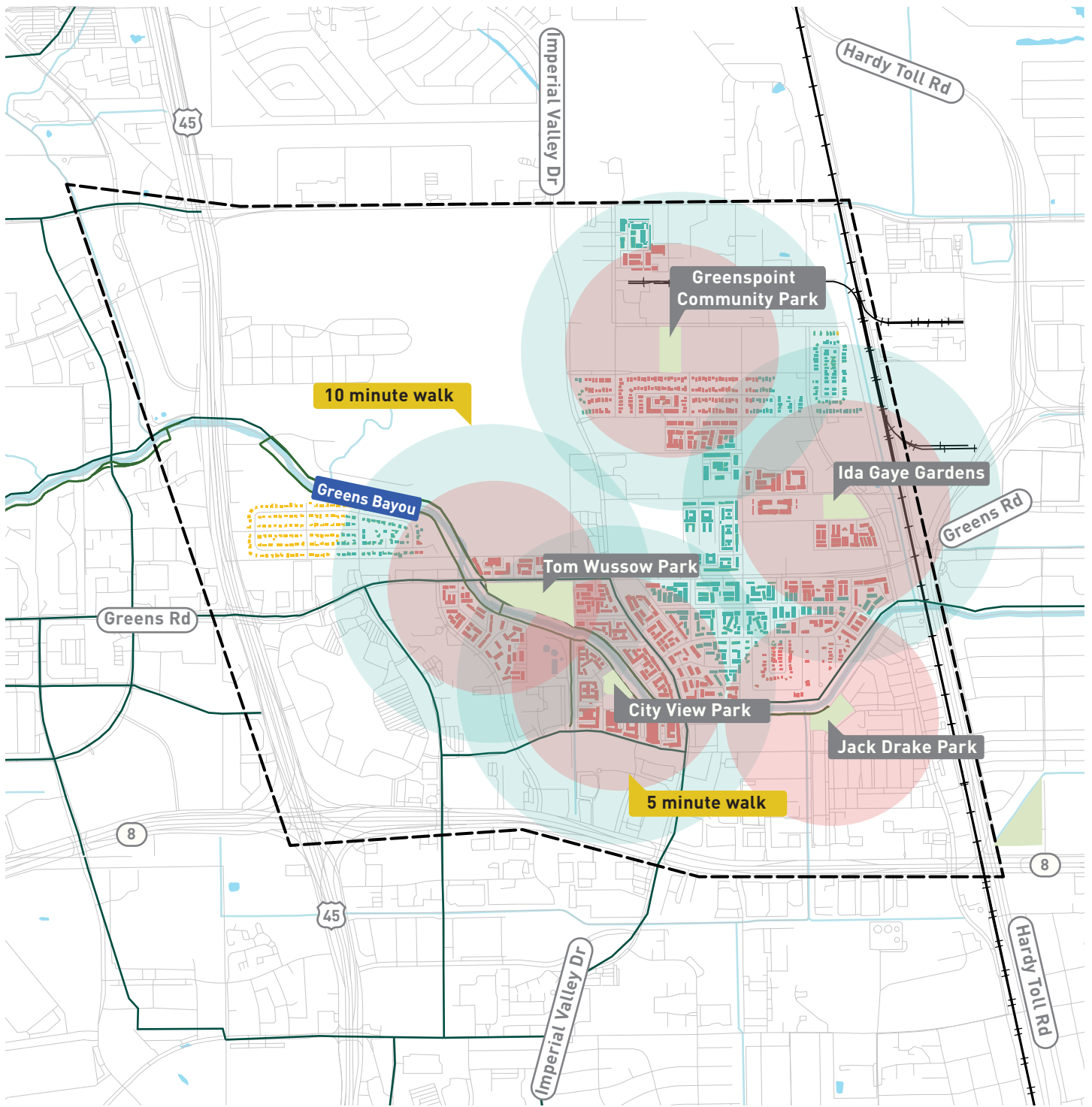
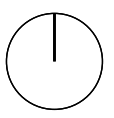
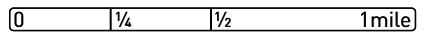


Figure 3.6 Park Access Map

A map of residential buildings that are within a 5 and 10 minute walking distance of parks.

Legend

- Residential Buildings
- Water
- Parks
- Residences within 5 minutes of a park
- Residences within 10 minutes of a park
- Roads
- Bikeways
- Railroad
- Study Area
- Existing Trails



Existing Conditions

Greenspoint Park Profiles

Thomas R. Wussow Park

Thomas R. Wussow Park, an 11-acre park along the north-side of Greens Bayou, was developed in 2003, on the site of a foreclosed apartment building.

Amenities:

- Multiple playgrounds
- Baseball and soccer fields
- Sand volleyball courts
- Tables and benches
- Future canoe launch
- Pedestrian and bicycle trails, including a bridge across the bayou to CityView Park

CityView Park

CityView Park, a 2.5-acre park along the south-side of Greens Bayou, was developed in 2003, alongside Thomas R. Wussow Park, to which it is connected by a pedestrian and bicycle bridge and trail.

Amenities:

- Reservable public pavilion
- Walking trails
- Flower gardens
- Shaded benches

Ida Gaye Gardens

Ida Gaye Gardens, a 3.2-acre park developed in 2011, adjacent to the Langwick Senior Residences, is specifically designed with seniors in mind.

Amenities:

- Specialized exercise equipment for seniors
- Area for structured exercise classes
- Garden with raised beds
- Walking trails
- Pond and bog
- Benches
- Educational signs



Figure 3.7 Thomas R. Wussow



Figure 3.8 CityView Park



Figure 3.9 Ida Gaye Gardens

Jack Drake Park

Jack Drake Park, a 3.5-acre park on the south side of Greens Bayou, was developed in 2018, and is the newest park in the study area. It is the trail head for the newly completed Greens Bayou Trail, which was a project of the Statewide Transportation Enhancement Program (STEP).

Amenities:

- Decomposed granite trail loop
- Benches
- Native plant species and habitat restoration
- Public art
- Future canoe launch

The North Houston Bike Park

The North Houston Bike Park, a 20-acre bike park at the intersection of I-45 and Kuykendahl Road, is being developed in preparation for the 2020 UCI BMX World Championships. The park opened on August 16, 2019.

Amenities include

- BMX supercross track
- Pump and dirt jump tracks
- Street riding plaza
- Bowl grove
- BMX educational garage
- Performance pavilion seating approximately 3,500
- Event lawn
- Detention pond
- Bayou trail connections
- Viewing bridge

Greenspoint Community Park

Greenspoint Community Park is a recently constructed park that sits east of Greenspoint Elementary School, which was established in 2016. This park serves over 600 students as well as community members.

Amenities include

- Playgrounds
- Walking Trail
- Exercise Stations



Figure 3.10 Jack Drake Park



Figure 3.11 The North Houston Bike Park



Figure 3.12 Greenspoint Community Park

Existing Conditions

Urban Wildlife Habitat Connectivity

Urban wildlife habitat in Greenspoint is relatively well connected. Greens Bayou runs through Greenspoint from west to east, serving as an urban wildlife corridor. A greenway that includes a shared bicycle and pedestrian path as well as protected wildlife habitat was developed in 2018, between I-45 and East Hardy Road through the Bayou Greenways 2020 Plan and the State Transportation Enhancement Program. Planned greenway extensions to the east and west will connect greenways across these major roads, linking it to existing greenways and other bayou trails. The Bayou Greenways 2020 initiative plans to develop 150 miles of contiguous trails on 3000 acres of linear parks along Houston's bayous as part of the Gulf-Houston Regional Conservation Plan. In addition to supporting the Bayou Greenways 2020 Plan's overarching goals of bringing recreational opportunities and safe walking and biking routes to underserved communities, enhancing greenways along Houston's bayous will benefit urban wildlife as well. The linear parks along the greenways can serve as habitat corridors, strengthening linkages across barriers such as roads and between disparate habitat patches. Sightings of various wild species have been recorded throughout the study area by users of the iNaturalist app, with a fairly even distribution of sightings in the western half of the study area where there is a large vacant lot as well as the Greenspoint Mall, and fewer recorded sightings in the eastern portion where there are more residential buildings. The majority of the observations were of insects, arachnids, birds, and mammals. Several interesting sightings are profiled below.



Figure 3.13 Hylephila phyleus- Fiery Skipper.

The Fiery Skipper can be found as far north as the Southern United States and as far south as Argentina and Chile. Often they can be spotted in fields, gardens, and lawns as they are attracted to sunny open areas.

Photo: CC_KSchneider



Figure 3.14 Piranga rubra-Summer Tanager.

The Summer Tanager is a small bird between the size of a sparrow and a robin. These birds are found in the Southeast United States higher up in the tree canopy. During the winter these birds migrate as far south as Bolivia and Brazil.

Photo: CC_Matt Elsberry

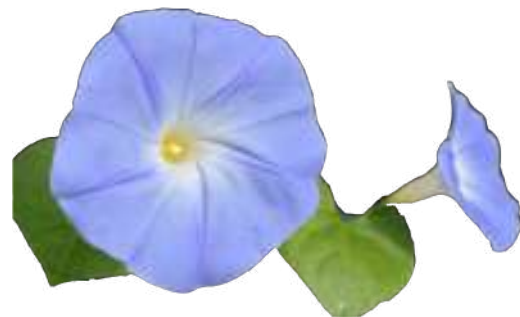


Figure 3.15 Ipomoea indica-Oceanblue Morning Glory

Glory Oceanblue Morning Glory is an annual perennial found in Texas, California, Louisiana, Mississippi, Alabama, Georgia, and Florida. It blooms from late spring to fall and attracts many butterflies and hummingbirds.

Photo: CC_Lorello

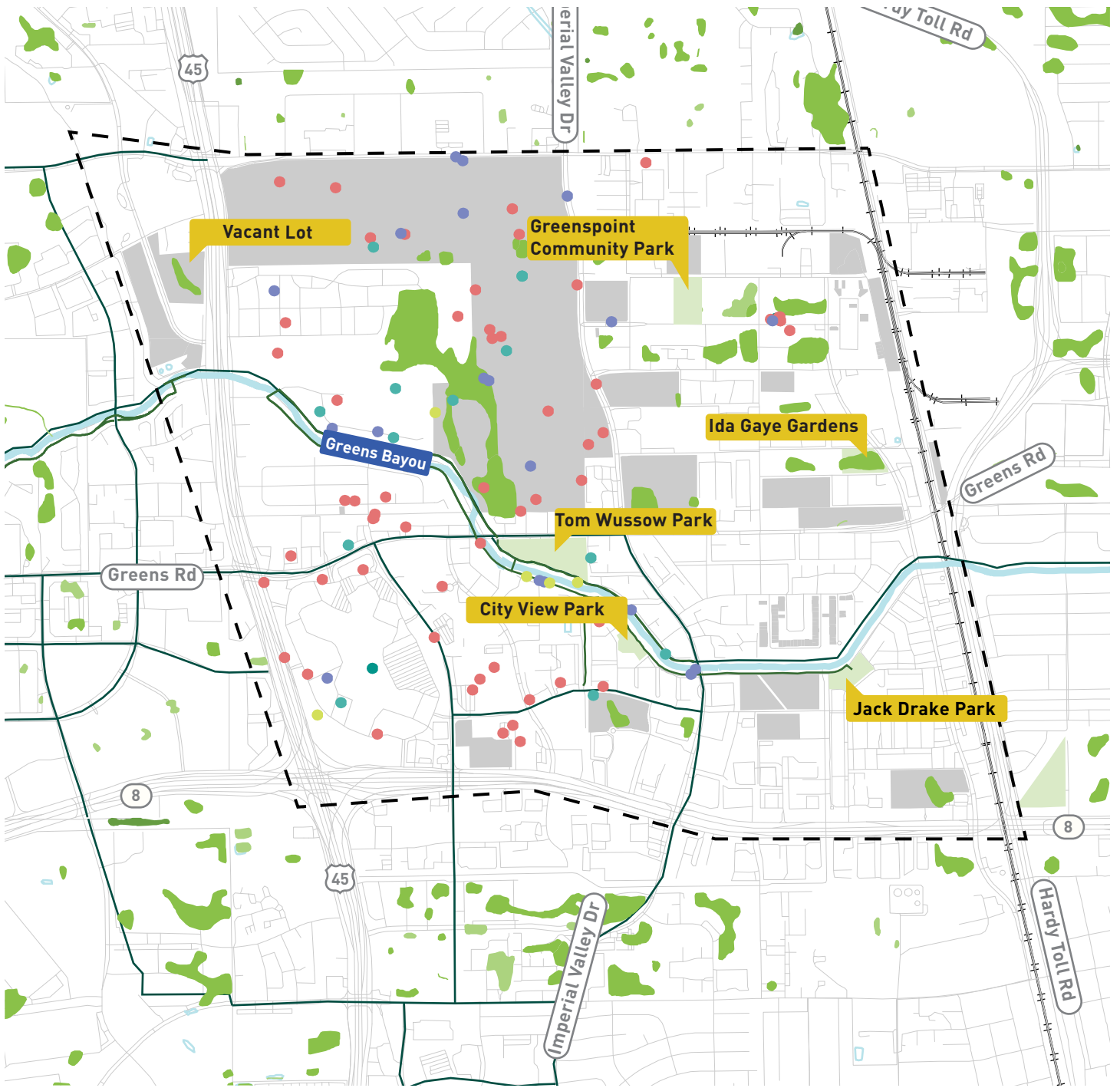


Figure 3.16 Wildlife Connectivity Map
Wildlife sightings, wetlands, parks, and vacant land in Greenspoint.

Legend

Vacant Lot	Insects/Arachnids	Study Area
Park	Birds/Mammals	Bikeways
Water	Amphibians/Molluscs	Trails
Freshwater Pond	Plants/Fungi	Rail
Shrub Wetland	Reptilia	Roads
Freshwater Emergent Wetland		North Arrow

0 | 1/4 | 1/2 | 1 mile

Recommendations

08 Create a Central Park along Greens Bayou

Summary

Build a Central Park along Greens Bayou that would not only serve as a great recreational asset to improve the quality of life for residents, but would mitigate flooding, become the heart of the community, and be a magnet for visitors. The district can encourage continued collaboration between the City of Houston, Harris County Flood Control District, and Houston Parks Board, and can participate in and represent its residents in the planning process.

Recommendation Characteristics

Type	Project
Timeline	Medium-term (5-10 years)
District's Role	Advocate
Lead Agencies	Harris County City of Houston North Houston District Houston Parks Board or a Parks Conservancy

Livability Principles Supported

1. Provide More Transportation Choices
3. Enhance Economic Competitiveness
4. Support Existing Communities
6. Value Communities and Neighborhoods

Partners

Approval From

Houston Parks Board, North Houston District, City of Houston Parks & Recreation Department, City of Houston Public Works, City of Houston Mayor's Office, City of Houston Planning Department, Harris County Flood Control District

Capital Funding

Houston Parks Board, North Houston District, Harris County Flood Control District, City of Houston Parks & Recreation Department, Private Donors, Corporations, Philanthropic Institutions, Local Sports Teams , TIRZ 11

Operational Funding

Houston Parks Board, North Houston District, Harris County Flood Control District, City of Houston Parks & Recreation Department

Description

This park is envisioned as an innovative design and multi-functional space to include flood mitigation and water quality improvement, opportunities to connect with nature and people, and a chance to get outside and be active in a variety of ways. The following pages outline recommendations for key features in Greenspoint's Central Park organized into three categories: 1. Environment and Education; 2. Active Living; and, 3. Community.

It is important to mention that any successful implementation of this recommendation must go hand-in-hand with Recommendation 9. The area proposed for the Central Park includes both existing parkland and areas currently inhabited by residential and commercial uses. Recommendation 9 outlines a buy-in buy-out program that balances removing residents from harm's way within the floodplain with making sure some residents can stay because increased capacity to take on flood waters within the park have removed some properties from the floodplain. Additional engineering will be vital to ensure the footprint of the proposed park and detention areas reduce floodplain boundaries and take on enough volume of water to accomplish this goal.

Jump Start Action Steps

- Fund additional engineering studies to determine the total volume necessary to remove proposed residential areas from the floodplain.
- Create a City-County inter-local agreement on parks that is endowed with resources.
- Consider phasing for the park, since it is a large and complex project. A likely Phase 1 is the HCFCD current buyout area, plus the detention basins and existing parks.



Figure 3.17 Central Park
Buy-in buy-out program in floodplain would provide multi-functional park space including hike / bike trails, multi-purpose fields, playgrounds, and kayaking.

08

Environment and Education

If designed with ecology in mind, the Central Park could provide a variety of opportunities to access and engage with the local ecology, while also providing much needed flood mitigation and watershed-scale water quality improvements. Opportunities include fishing, access to natural trails, green features and detention, and environmental education. In an urban setting, such as Greater Greenspoint, it is important for people of all ages and backgrounds to have access to nature. This park could integrate with and build upon existing ecology in order to leverage its ecosystem services. Key Environmental and Educational functions of the Central Park should include:

- The ability to detain water in major events;
- The ability to filter regular flows of water through the system to improve water quality, improve habitat value, and provide opportunity for recreation;
- The opportunity to prototype green bayou edges, create wider and more historically accurate floodplain including the enhancement of the ecological function of Greens Bayou by adapting hard edges and riparian zones with green/hybrid infrastructure; and,
- The creation of opportunities for environmental education and connection to nature for residents and visitors.

1 Fishing



Fishing is an activity that community members can enjoy for recreation and allows for a more active engagement with the local ecology.

2 Nature Trail



Nature trails are a great opportunity to interact with the local ecology and learn about environmental systems. Opportunities to interact with nature are also shown to reduce anxiety.

3 Green Infrastructure and Detention



Green features can mitigate threats posed by urban environments like flooding and poor water quality. Well-designed detention areas can not only mitigate flooding, but can promote improved water quality and habitat.

4 Environmental Education



Interpretive elements of natural areas provide opportunities to learn about natural sciences up close and personal. These opportunities are even more vital in urban areas.

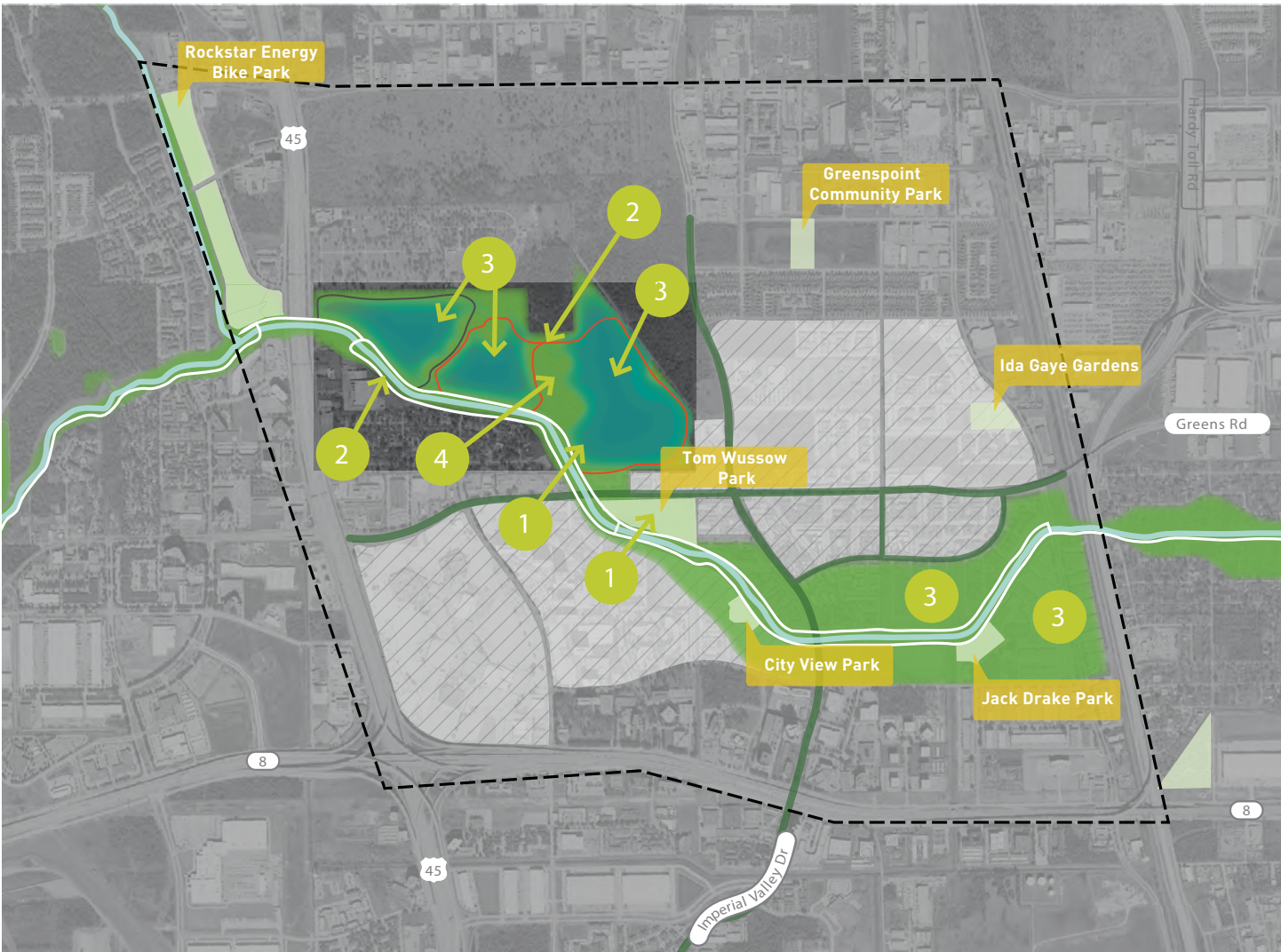


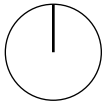
Figure 3.18 Ecology

Ideal locations to observe and interact with the local ecology in Greater Greenspoint.

Legend

- Existing Parks
- Proposed Central Park
- Existing Detention Basin
- Bayou
- Redevelopment/Housing Retrofits
- Proposed Green Streets
- Proposed Nature Trail
- Bayou Greenway (Existing and Future)
- Proposed Bike Loop
- Site

0 1/4 1/2 mile



Recommendations

08

Active Living

The Central Park connects various opportunities to be active in different settings. There are several opportunities for hike and bike trails as well as multi-purpose fields that potentially double as detention. There are spaces along Greens Bayou that can be used as a kayak launch. Only one other kayak launch exists along Greens Bayou and is well downstream at Strickland Park. The Rockstar Energy Bike Park is a new park with regional popularity and is an asset that can be built upon with complementary infrastructure nearby. Key Active Living functions of the Central Park should include:

- The connection of the Central Park along Greens Bayou to the larger pedestrian and bicycle system in Greenspoint with both complete and green streets principles;
- The inclusion of trail connections and grid connectivity for walking and biking to all redeveloped and retrofitted properties nearby;
- The provision of off-bayou trails for hiking and biking including a bicycle-only loop trail in close proximity to the Rockstar Energy Bike Park and a nature trail that provides access to naturally-designed detention features;
- The creation of multi-purpose fields east of Imperial Valley Drive for both active living and flood detention; and,
- The provision of traditional and nature-oriented playscapes for children adjacent to complementary park features for other age groups.

1 Hike and Bike Trail



Trails are a great way to encourage low impact forms of exercise and Greens Bayou provides a scenic backdrop for people to walk, jog, and bike while connecting with nature.

2 Kayak Launch



Thomas R. Wussow Park sits along Greens Bayou, along Greens Rd., and in close proximity to the proposed mall redevelopment which makes it the perfect spot to set up a kayak launch.

3 Multi-Purpose Fields



The Central Park will have fields that will serve as a form of stormwater management as well as a location for a variety of sports and community activities.

4 High Speed Bike Trail



Complementary to the Rockstar Energy Bike Park, this plan proposes the creation of a high speed bike loop along the western detention basin to the east of I-45.

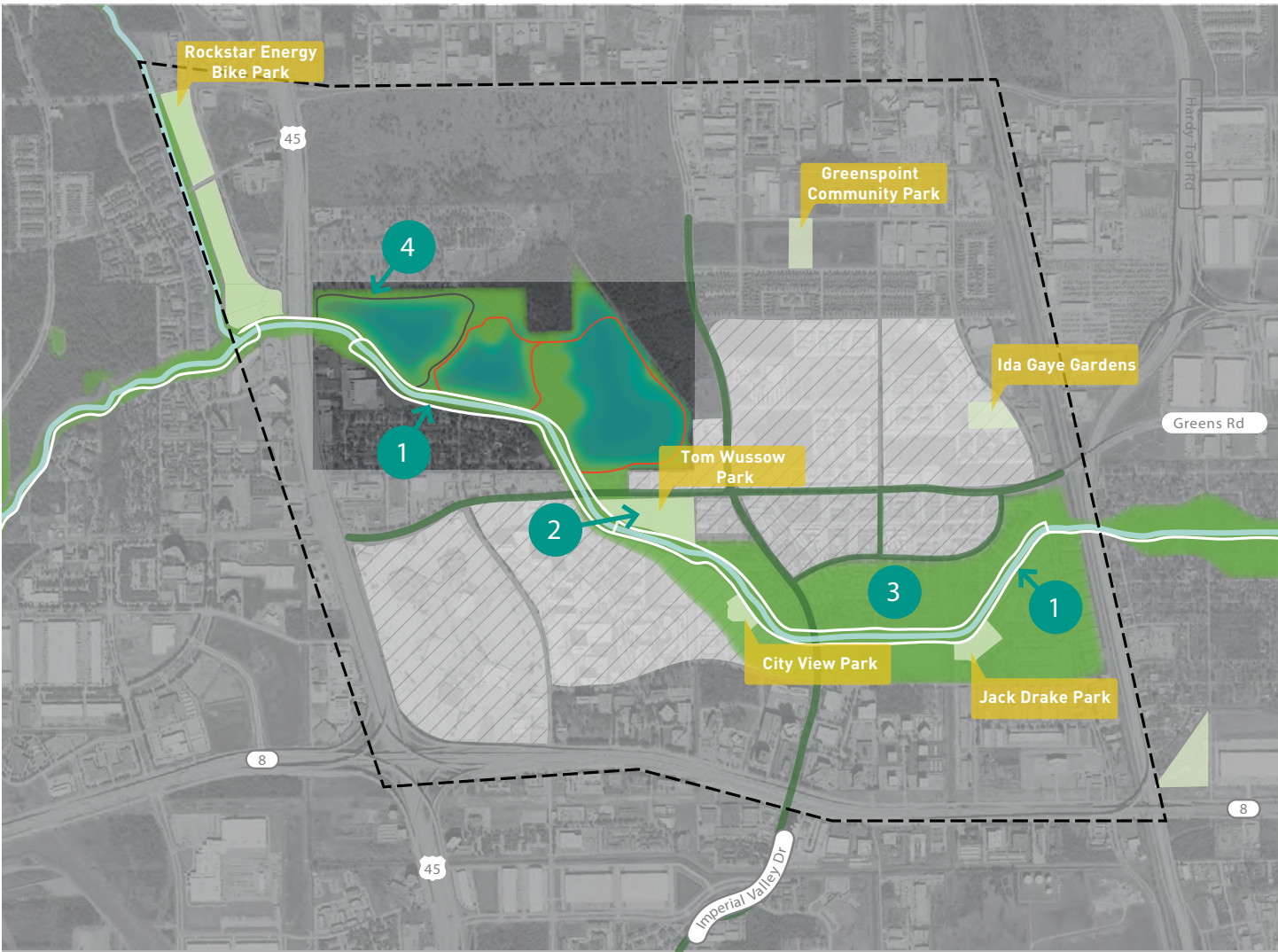
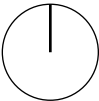


Figure 3.19 Active Living
Ideal locations to support active living in Greater Greenspoint.

Legend

- Existing Parks
- Proposed Central Park
- Existing Detention Basin
- Bayou
- Redevelopment/Housing Retrofits
- Proposed Green Streets
- Proposed Nature Trail
- Bayou Greenway (Existing and Future)
- Proposed Bike Loop
- Site

0 1/4 1/2 mile



08

Community

The Central Park builds community by activating spaces across Greater Greenspoint through community-relevant public art, music venues, and the development of gathering and festival spaces. The provision of physical infrastructure is important to this recommendation but programming to support these ideas is vital to their success. Programming gives community members an opportunity to meet each other, explore parts of Greenspoint they might not otherwise frequent, and create memories. Key Community functions of the Central Park include:

- Ensuring that the arts and culture of Greenspoint are integrated into the design of the Central Park through both temporary and permanent community-driven public art initiatives;
- The provision of small-scale social gathering spaces throughout the Central Park;
- The creation of flex space that may be used for festivals or large events within or in close proximity to the Central Park; and,
- The creation of an amphitheatre appropriate for hosting small- to mid-sized performances including live music and/or community theatre.

1 Public Art



Public art reinforces Greenspoint's identity and can serve as a great wayfinding tool, especially along trails.

2 Festival Space



Festivals can happen in the same locations as multipurpose fields and detention basins in Greenspoint. Festival spaces provide the opportunity to draw out community members and visitors to support local artists.

3 Music Venue



The Central Park south of Greens Rd. could provide an ideal location for music venues and a core community hub.

4 Gathering Spaces



The Central park provides the opportunity to curate spaces for community members to gather. Using site furnishings such as benches, tables, and shade can change the way community members interact with parks.

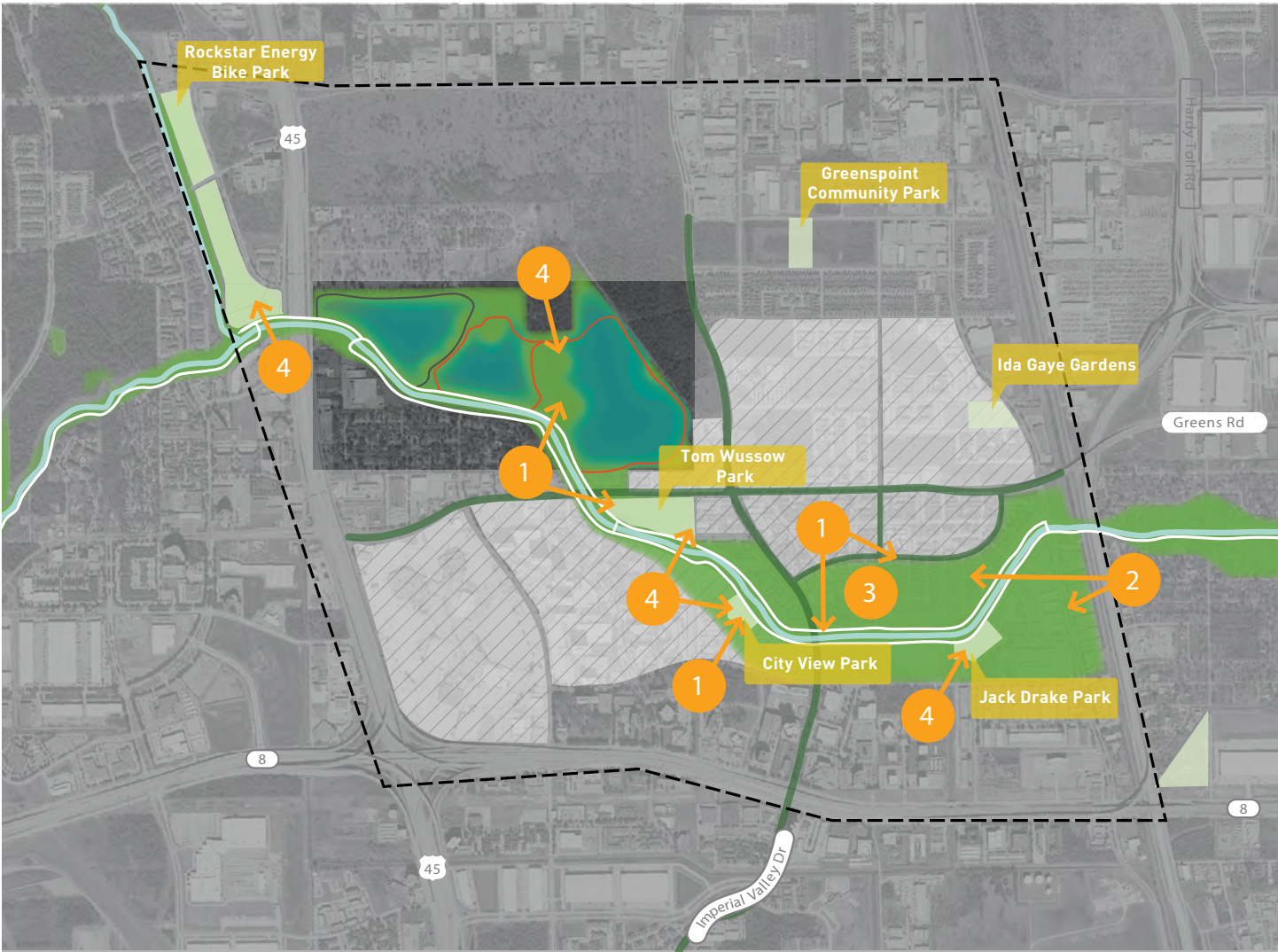
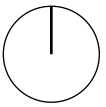


Figure 3.20 Community
Ideal locations for community-building infrastructure and programs in Greater Greenspoint.

Legend

- Existing Parks
- Proposed Central Park
- Existing Detention Basin
- Bayou
- Redevelopment/Housing Retrofits
- Proposed Green Streets
- Proposed Nature Trail
- Bayou Greenway (Existing and Future)
- Proposed Bike Loop
- Site

0 1/4 1/2 mile



BE A PLACE THAT OFFERS ACCESSIBLE, AFFORDABLE HOUSING FOR THE REGION

Greenspoint is a center of housing affordability within the City of Houston, Harris County, and the region. In this area, affordability doesn't necessarily mean that the housing has a government subsidy; some of the housing is subsidized, but some is "market-rate affordable." For market-rate affordable housing stock, there are no restrictions on the prices that property owners can charge; instead, the lower-cost market is driven by location, size of properties, quality and age of properties, and local amenities.

Like many of Houston's Outer Loop neighborhoods, Greenspoint has a large number of garden apartment complexes that were constructed in the late 1960s to early 1980s. The prevalence of garden apartments helps account for the fact that renters are the largest residential population in the study area by far, though renters also live in single-family and smaller multi-family properties in the area. Ninety-three percent of the study area's approximately 7,500 housing units are rentals. Renters generally pay between \$500 and \$1,000 per month, and apartments at the higher-end of that range include two- and three-bedroom apartment options.

The values of owner-occupied housing in the study area are relatively affordable compared to the County average. In the study area, ninety-one percent of homes have estimated values under \$150,000, while just forty-eight percent of homes in Harris County have estimated values at under \$150,000. At a national level, there is an increasing trend for investors to purchase these affordable owner-occupied homes and convert them into rentals. This may decrease the number of owner-occupied homes in the area without intervention.

As the study considers desired housing interventions for Greenspoint, it will be vital to determine a desired mix of housing typologies, and the balance of rentals versus home ownership desired in the future.



EXISTING CONDITIONS

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RECOMMENDATIONS

09 Implement Buyout / Buy-In Program That Helps Residents Who Undergo Buyouts Transition to More Resilient Housing Options	144
10 Implement Programs That Encourage Rehabilitation and New Development of Affordable Units near Transit Corridors and Centers	152



Existing Conditions

Residents' Demographics

People who live in Greenspoint tend to work relatively close to where they live. Thirty-six percent of residents travel less than 10 miles to get to work from Greenspoint, with a large percentage of Greenspoint residents working either in Greenspoint or near Greenspoint at the Aldine Education Center or at IAH. A larger portion of residents, forty-seven percent, travel between 10 and 24 miles to get to work, with the majority of these residents working in Greenway Plaza, Downtown, and the Texas Medical Center.

Greenspoint residents that have jobs are split almost evenly between White and Black or African American, at forty-eight percent and forty-seven percent respectively, and seventy percent of residents are not Hispanic or Latino, meaning that about a third of the employed population is Latino or Hispanic, roughly a third is White (not Latino) and a third is Black or African American (and not Latino).

However, the residents in Greenspoint that are employed still don't make very much money. Forty-seven percent make between \$15,000 and \$50,000 per year and thirty-one percent make less than \$15,000 per year. Most are working in low to medium wage jobs; thirteen percent work in retail, eight percent in Transportation and Warehousing, three percent in Waste Management and Remediation, twelve percent in Health Care and Social Assistance, six-and-a-half percent in Construction, and seven percent in Manufacturing, and only ten percent hold Bachelor's degree or advanced degree.

US Census Bureau, OnTheMap Application, 2015.



Figure 4.1 View of residences near jobs

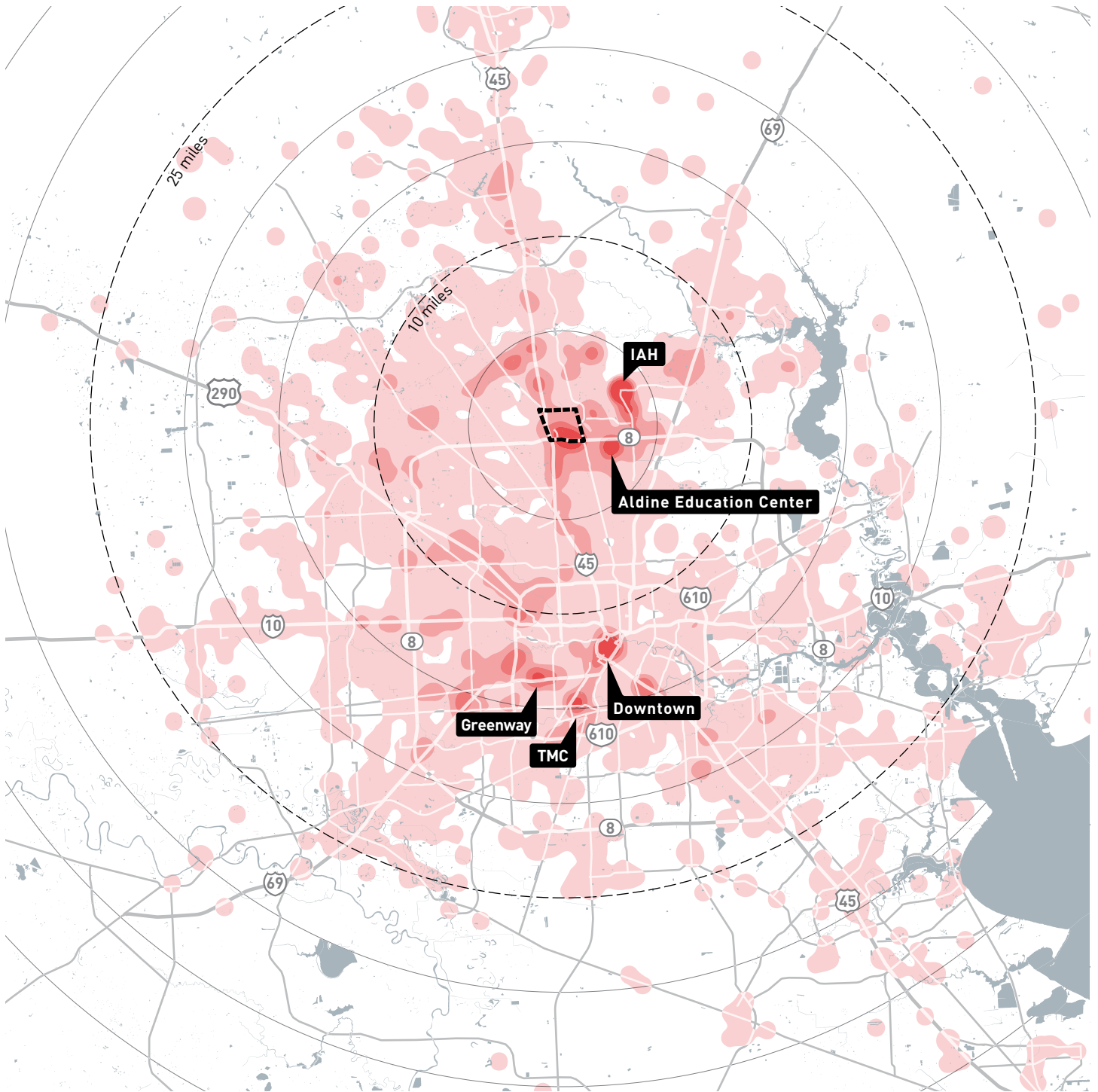
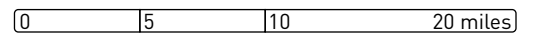
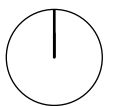


Figure 4.2 Residence of Greenspoint Workers

Heat map of the place of employment by census block for all Greenspoint residents in 2015. The most concentrated areas of employment are in Greenspoint, Aldine Education Center, IAH, and Downtown.

Workplace of Greenspoint Residents

- More Workers
- Less Workers
- Streets
- Water
- Site



Existing Conditions

Housing in Greenspoint

Greenspoint is a center of affordable housing within the City of Houston, Harris County, and the region. While some subsidized housing exists in the area, much of the housing stock here is market-rate affordable housing. For market-rate affordable housing stock, there are no restrictions on the prices that property owners can charge; instead, the lower-cost market is driven by location, size of properties, quality and age of properties, and local amenities.

Affordability is an important asset for many residents of Greenspoint, who tend to have lower incomes.

Rental Housing

The study area has a much higher percentage of rental housing than Harris County as a whole. Ninety-three percent of the study area's occupied housing units are rentals, compared to forty-five percent of housing units in Harris County.

Monthly rents in Greenspoint are low compared to Harris County as a whole. Harris County has seen a spike in units renting for \$1,000 or more per month since 2013. In the 2009-2013 American Community Survey (ACS), thirty-nine percent of units in the county rented for \$1,000 or more; as of the 2013-2017 American Community Survey, nearly half of units (46%) in the county rent for \$1,000 or more per month. Meanwhile, in the same time period, Greenspoint has seen a very small increase in rents above \$1,000 per month, but the vast majority (89%) of units still rented for \$999 or less on a monthly basis according to the 2013-2017 data.

Using 2017 ACS data, the most recent available, likely does not fully account for the effects of Hurricane Harvey on the rental stock in Greenspoint or Harris County as a whole. Rents may have risen in both areas based on decreased availability of rental stock and damage to existing apartments. For example, the Arbor Court Apartments and Biscayne at City View apartments between Greens Bayou and Seminar Drive have been widely highlighted as complexes that experienced significant damage during Harvey. However, a scan of available apartments in the study area at Rent.com, as of July 2019, still shows a significant number of one- and two-bedroom apartments available for \$500-\$1000 per month, and three-bedrooms available at approximately \$1,000 per month or slightly more.

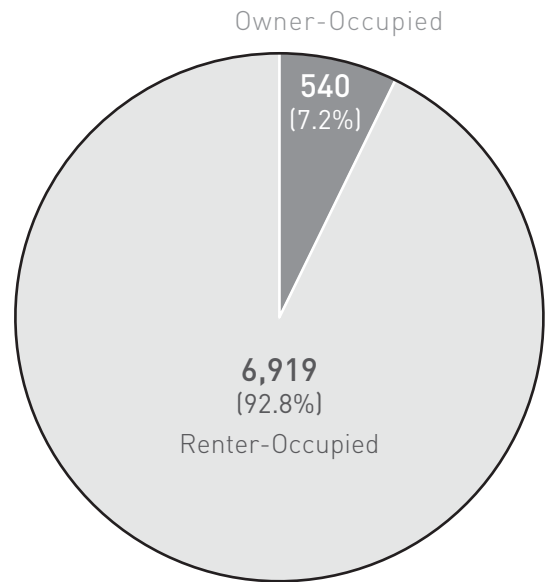


Figure 4.3 2017 Housing Tenure in North Houston Study Area

Source: U.S. Census Bureau, 2013-2017 American Community Survey

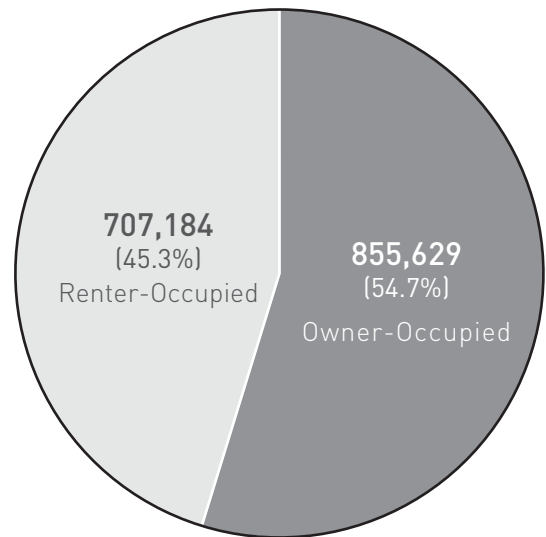


Figure 4.4 2017 Housing Tenure in Harris County, TX

Source: U.S. Census Bureau, 2013-2017 American Community Survey

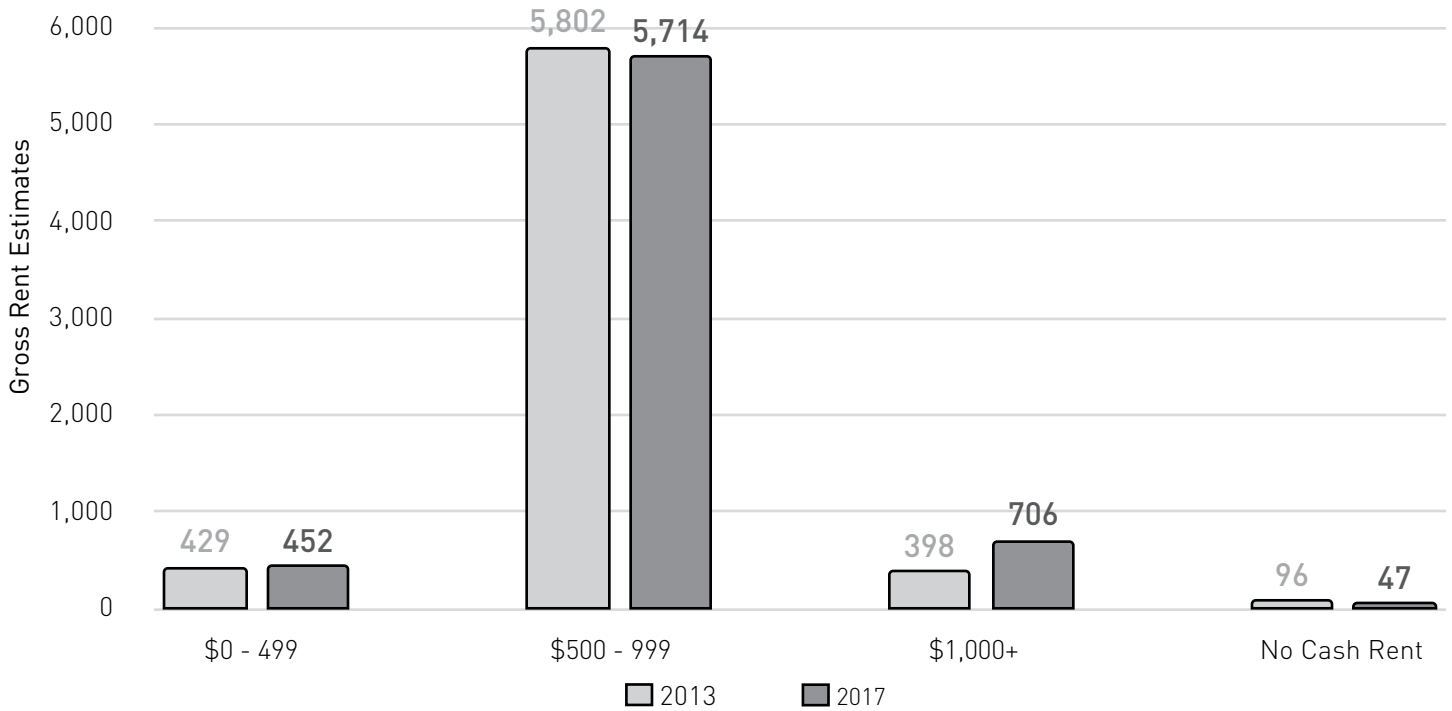


Figure 4.5 Monthly Rent in North Houston Study Area

Source: U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates
 Source: U.S. Census Bureau, 2009-2013 5-Year American Community Survey

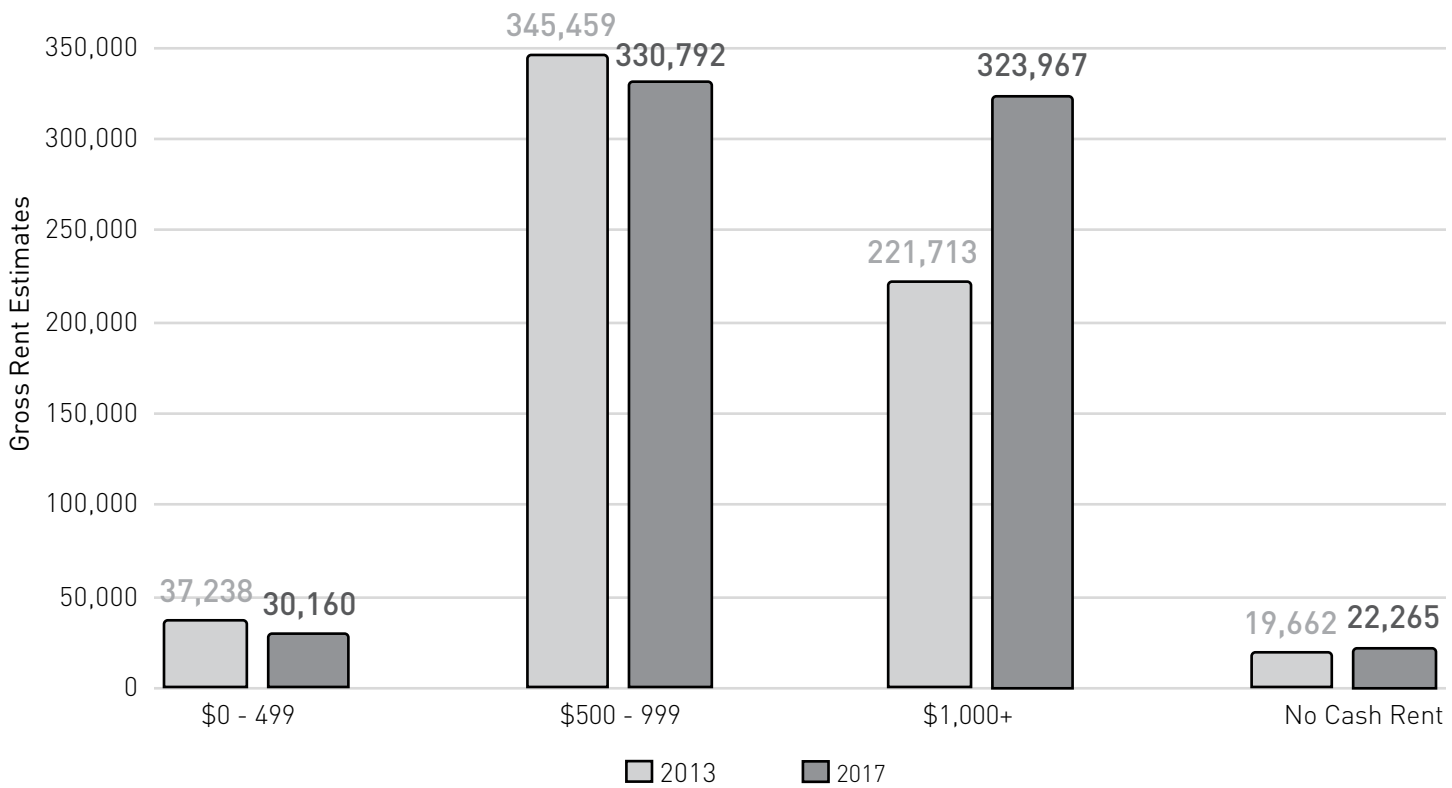


Figure 4.6 Monthly Rent in Harris County, TX

Source: U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates
 Source: U.S. Census Bureau, 2009-2013 5-Year American Community Survey

Existing Conditions

Housing Values

For-Sale Housing

For-sale housing prices in Greenspoint are more affordable, on average, than prices in Harris County as a whole. Approximately forty-eight percent of homes in Harris County are valued at under \$150,000. In Greenspoint, the American Community Survey estimates that ninety-one percent of owner-occupied homes are valued at under \$150,000. A check of Census data against Zillow, an on-line real estate hub, confirms that most houses on the market are selling for less than \$150,000. The July 2019 median sale price for zip code 77060 is \$125,800.

While the American Community Survey counts just 540 owner-occupied residences in the study area, these owner-occupied complexes and neighborhoods are nevertheless an integral part of the study area's landscape. However, this low availability does mean Greenspoint's for-sale stock currently serves far fewer families than the large quantity of affordable rental units.

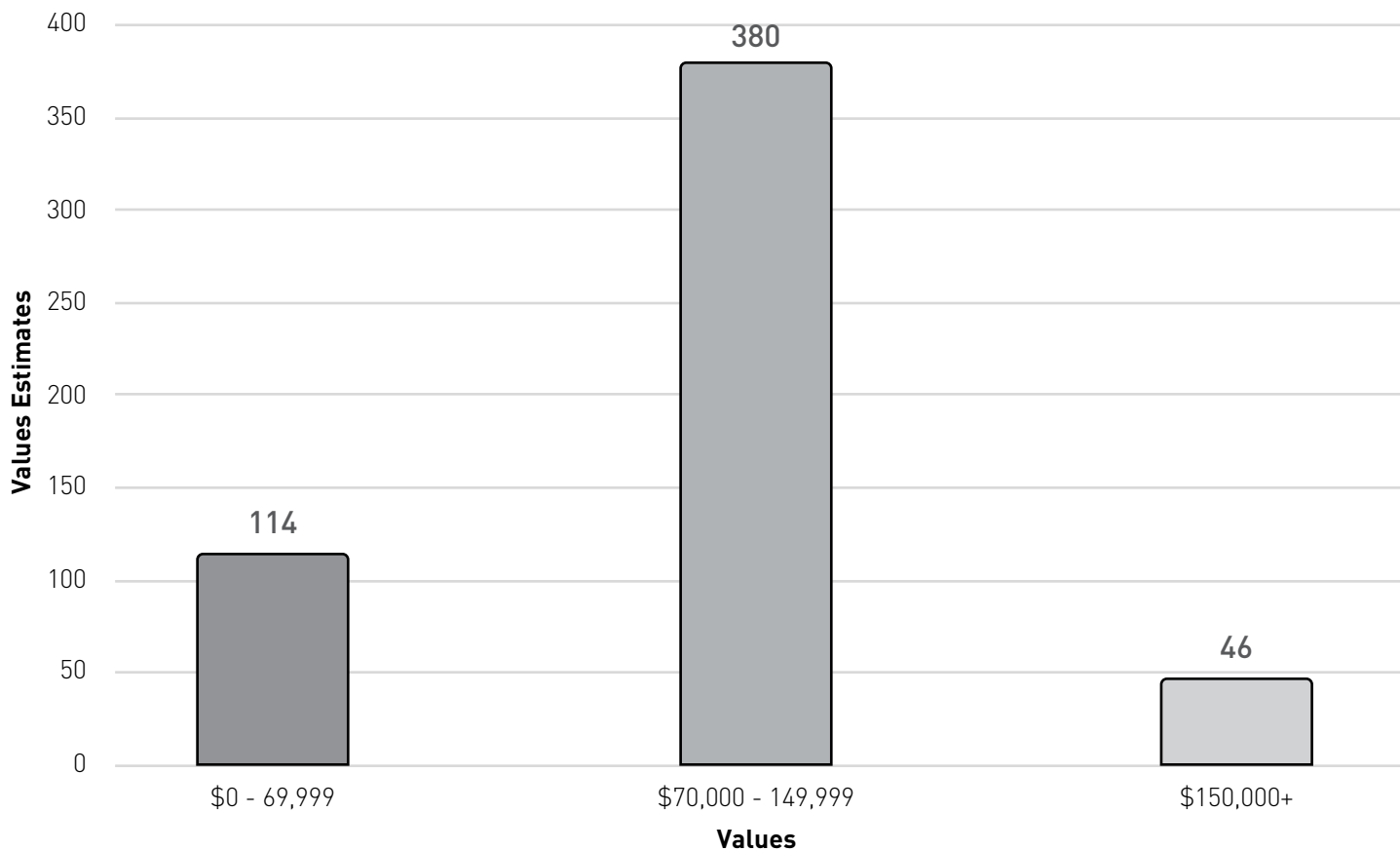


Figure 4.7 2017 Housing Values in North Houston Study Area

Source: U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates

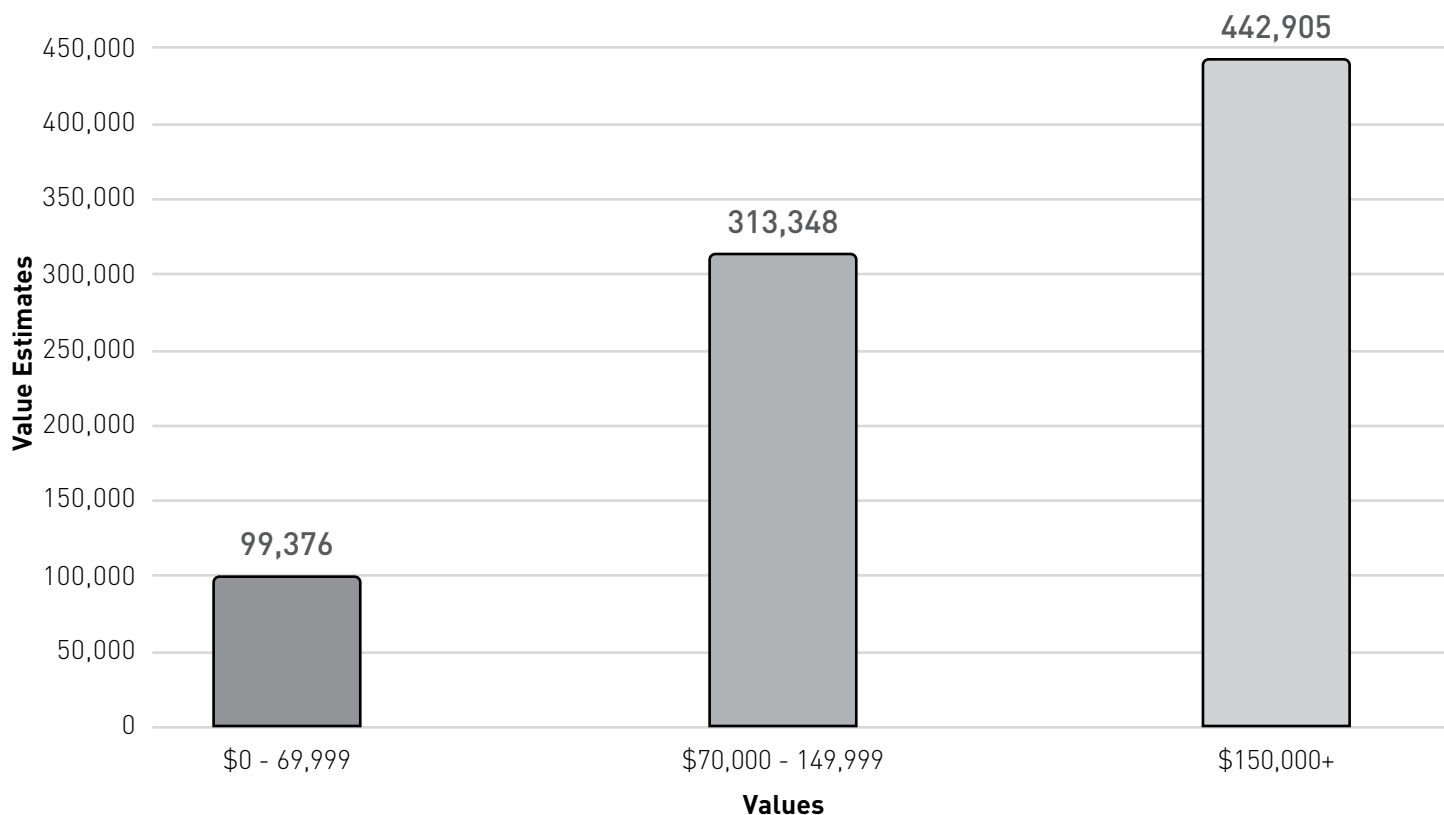


Figure 4.8 2017 Housing Values in Harris County, TX

Source: U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates

Existing Conditions

Housing Typologies

A large majority of Greenspoint’s housing units are located in multi-family developments (8,457, or 85% of all the housing units in the area). This is a far higher percentage of multi-family development than Harris County as a whole. Most of the study area’s multi-family properties are garden apartment complexes, and most were built in the 1970s and 1980s. This garden apartment typology is a familiar one in many Houston neighborhoods outside the I-610 Loop that were developed around the same time.

Anecdotally, we have heard that some of the study area’s apartment complexes have been well-maintained and can command higher rents, while others are suffering from deferred maintenance issues. During the project kickoff meeting, we heard that there has been investor interest in reinvesting in some of the better-maintained properties in the area, while others have not been able to attract the same kind of interest due to high costs of rehabilitation.

Single-family housing represents far fewer total units in the study area, but single-family neighborhoods are still a significant presence and give parts of the study area a unique character. Most of these homes are originally from the 1960s and 1970s, but many have experienced some reinvestment and remodeling that has changed their original forms.



Figure 4.9 A typical single-family home with a two-car garage in North Houston.



Figure 4.10 Multi-family garden apartments are very common in North Houston.



Figure 4.11 A typical garden apartment located in North Houston.

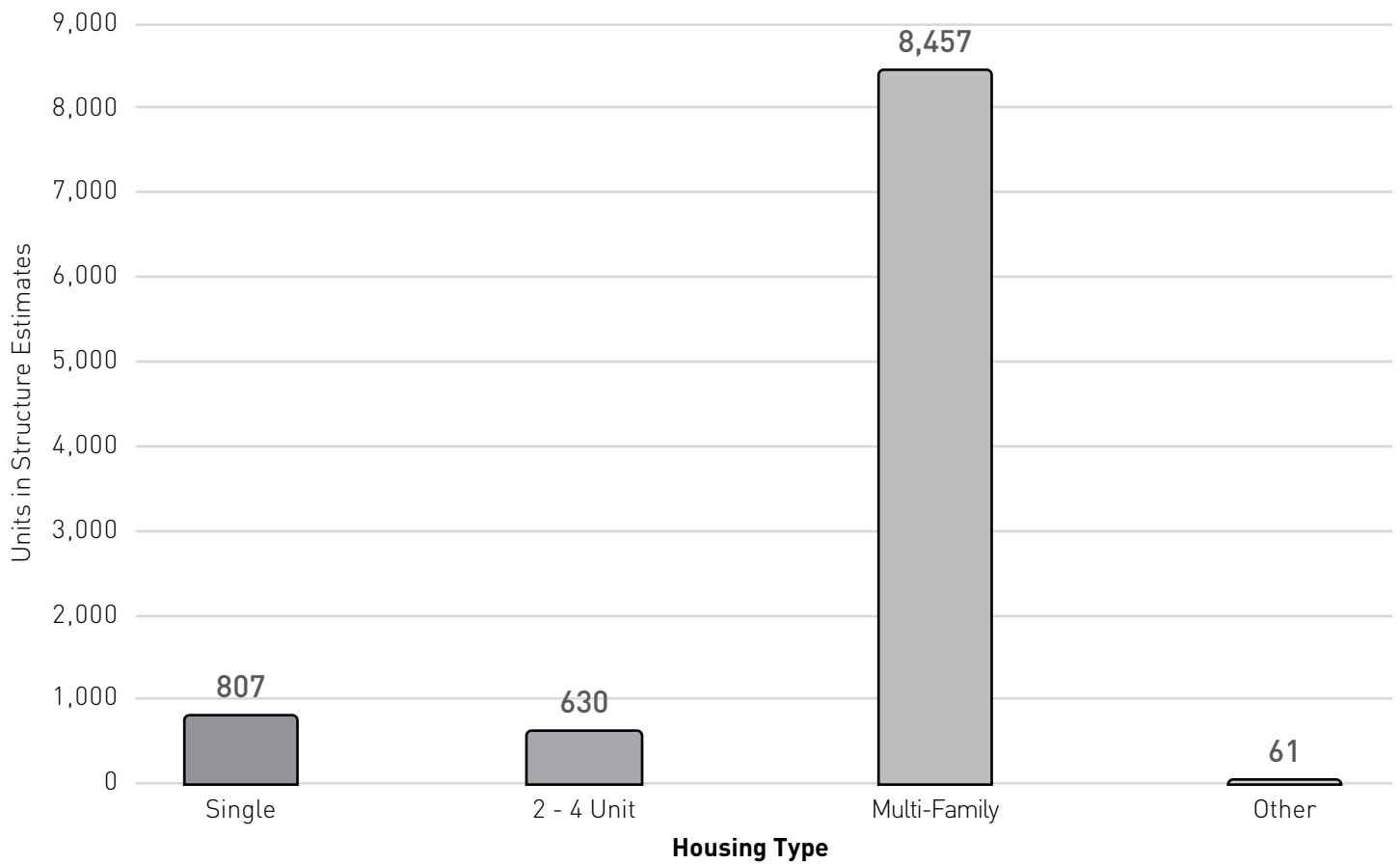


Figure 4.12 2017 Housing by Size/Type: North Houston Study Area

Source: U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates

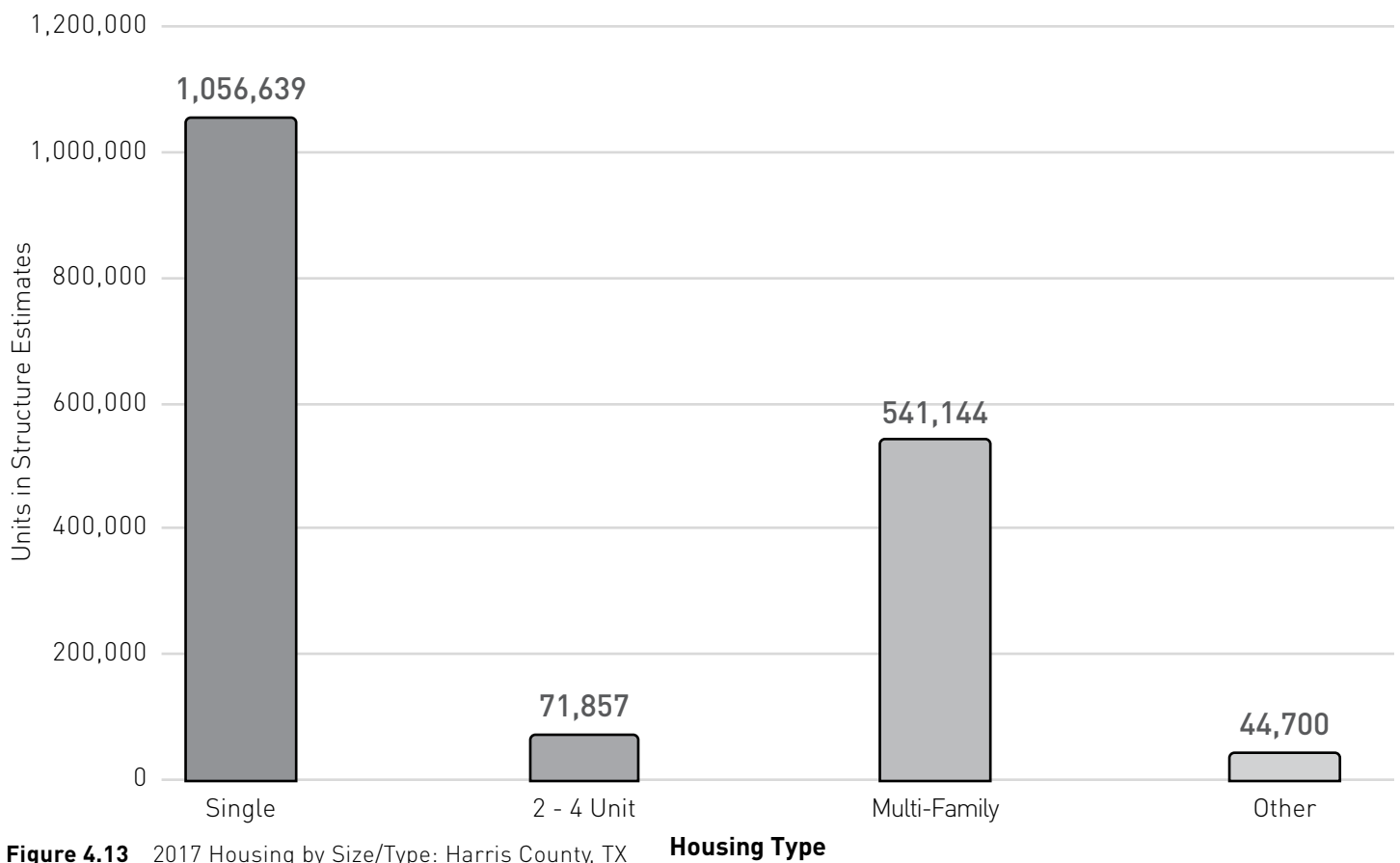


Figure 4.13 2017 Housing by Size/Type: Harris County, TX

Source: U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates

Recommendations

09 Implement Buyout / Buy-In Program That Helps Residents Who Undergo Buyouts Transition to More Resilient Housing Options

Summary

Ensure safety and preserve community by helping residents of the North Houston District move out of flood-prone areas into comparably priced housing options elsewhere in the area. The district can encourage the City of Houston to create a buy-out and buy-in program and provide input on its structure.

Recommendation Characteristics

Type	Program
Timeline	Short Term (1-5 years)
District's Role	Advocate
Lead Agencies	Harris County City of Houston

Livability Principles Supported

- 2. Promote Equitable, Affordable Housing
- 4. Support Existing Communities
- 5. Coordinate Policies and Leverage Investment
- 6. Value Communities and Neighborhoods

Partners

Approval From

Harris County, City of Houston Housing and Community Development Department, City of Houston Planning Department, and City of Houston Mayor's Office

Capital Funding

Harris County Flood Control District, City of Houston Housing and Community Development Department, Opportunity Zones, Houston Parks Board, and Private Developer/Market-Based Strategies

Operational Funding

North Houston District - Wraparound Services (Relocation Counseling, etc) City of Houston

Description

Buyout programs are mechanisms used by local governments to provide options for residents who no longer want to live in high risk flood areas. By law, buyout programs must be voluntary. One challenge of typical buyout programs is that they do not provide clear options for residents to purchase or rent comparable housing in their community directly after a buyout. A buyout program with a "buy-in" component addresses this issue by giving residents the ability to leave housing in flood-prone areas and simultaneously have the opportunity to obtain comparable housing within their community.

Being able to "buy-in" does not necessarily imply ownership of a home, though homeownership counseling for renters and programs for current homeowners can certainly be part of the package. At its core, a "buy-in" option means that both renters and owners who have lived in the neighborhood and "bought in" to the community will have good housing options at similar prices that enable them to stay in the neighborhood if they wish.

As neighborhoods and cities face challenges with keeping people out of flood prone areas while keeping neighborhoods intact and housing affordable, buy-in and buyout program timelines must coordinate so that as residents are bought out they quickly have options to purchase or rent comparably priced, high-quality housing in safe areas of their neighborhood. This issue is particularly relevant in Greenspoint and other neighborhoods of Houston and Harris County that face repetitive flooding challenges.

The City of Houston's strategy, Resilient Houston, strongly supports combining buyout programs with buy-in strategies or "property swaps." The strategy directs the "City and partner agencies [to] develop a comprehensive framework that employs participatory methods for property buyouts and swaps aimed at keeping flood-prone neighborhoods whole while maintaining their cultural identity. Vacant land or buyout sites can provide ideal spaces for detention that remove Houstonians from areas of high flood risk. These lots can slow and store water as well as create ecological benefits if utilized appropriately. As areas with high flood risk are identified and acquired, the community buy-in property swap program will set the roadmap for future property exchange opportunities that maximize social, fiscal, environmental, and flood control benefits, minimize impacts and keep Houstonians in their neighborhoods" (Resilient Houston, Sub-Action 25.2).

Jump Start Action Steps

- Create an acquisition partnership to purchase opportunity sites and enable development of properties where residents can “buy-in” after undergoing a buy-out. City of Houston Housing and Community Development is starting conversations on this issue. Houston Land Bank may also be involved.
- Create a City-County partnership on buyouts in which the County focuses on single-family buyouts and the City focuses on multi-family buyouts. Both will be needed to complete buyouts in this area.

09

Implementing Buyouts in Greenspoint

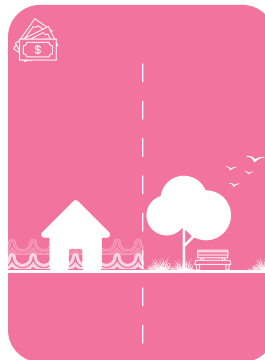
Resilient Houston calls to “remove all habitable structures, and prevent new habitable structures from being built in the floodway.” Our current defined buyout area calls for narrowing the floodway through engineering solutions that reduce the choke points, in order to preserve areas for transit-oriented and park-oriented development on the south side of Greens Road. This results in a total buyout of 2,542 multi-family units and 66 single-family units. This includes 1,666 multi-family units and 66 single-family units on the north side of Greens Bayou (south of Seminar Dr.), and 876 multi-family units south of the bayou (north of Northchase Dr. and Benmar Dr.). The mapped buyout area also calls for a partial buyout of 72 multi-family properties on the south side of the bayou. This area is shown in pink on the map on the following page.

Other studies (Figure 4.16) have called for an even larger buyout area based on the existing floodway and projected future widening of floodplains. Further engineering studies will be needed to define which of these solutions is workable and resilient in the long term.



Keep

If an existing property is not in the current or future floodway then it should be left as it is.



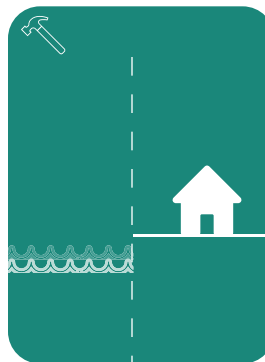
Priority Buyout Area

Homes that are within the floodway can also be purchased instead of going through a retrofit. This enables homeowners to move to another location as well as a repurposing of that for communal space or as part of a larger drainage system.



Retrofit

If a property is in the current 100 year floodplain, but is not expected to become part of the future floodway it can be retrofitted. There are small adjustments that can be made to a home to enable it to be more resilient in the face of flooding.



Redevelop for Resilience

Properties in this area should be redeveloped for greater resilience, including elevation of sites and resilient building strategies, to allow for transit-oriented and park-oriented development near Greens Road that can withstand future flooding threats.

Figure 4.14 Property Interventions

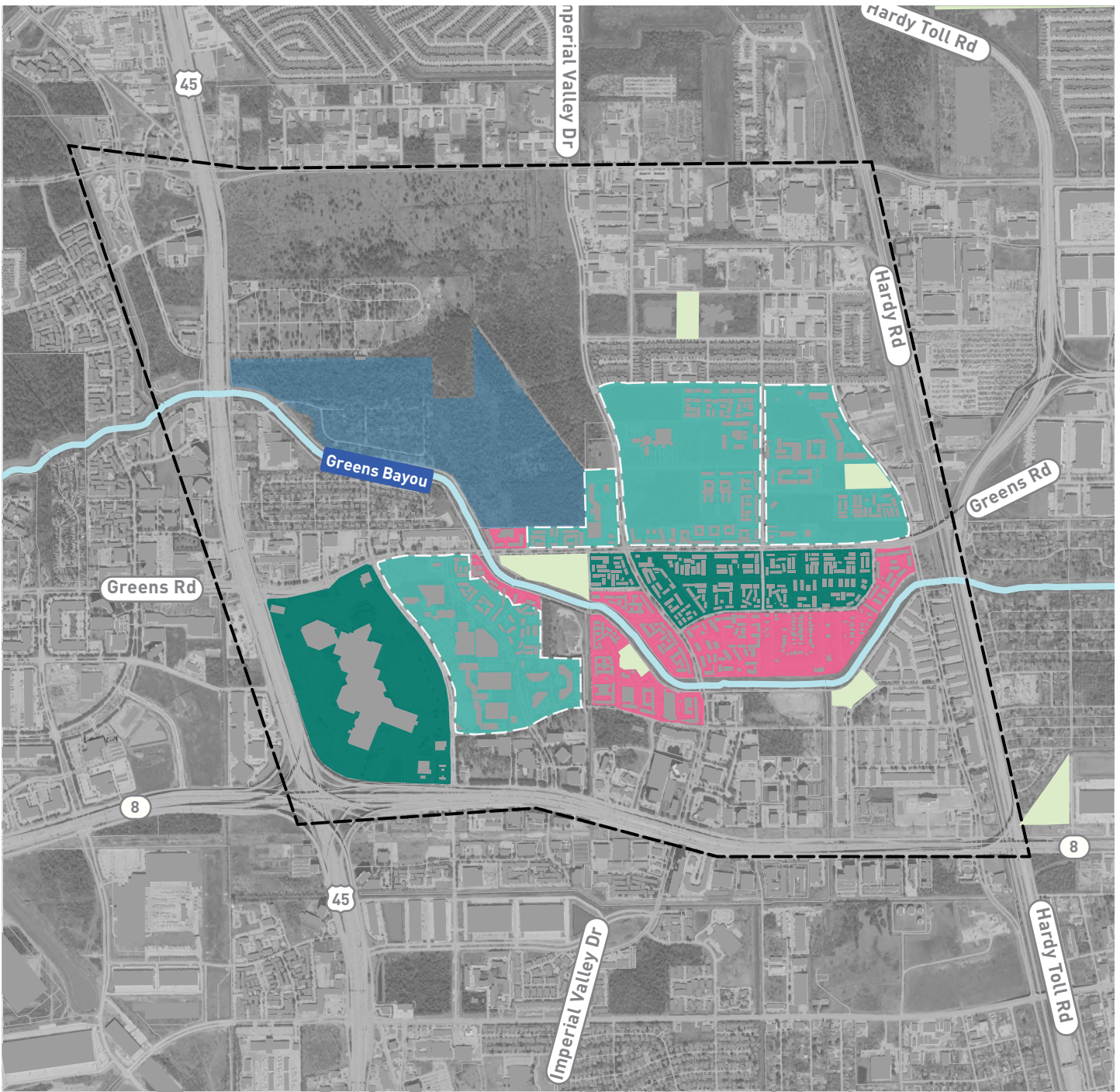
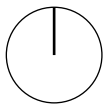


Figure 4.15 Areas for Property Interventions

Legend

- Keep
- Retrofit
- Priority Buyout Area
- Redevelop for Resilience
- Parks & Open Space
- Buildings
- Detention Basin
- Study Area
- Roads

0 1/4 1/2 1mile



09

Reducing Flooding to Create Development Opportunity

Chokepoints are points of natural congestion along a passageway. A chokepoint in the floodway affects the volume of water that can flow into or out of an area. Greenspoint’s flooding is affected by a dual chokepoint underneath Hardy Toll Road and the adjacent railroad line, as shown in the red box on the map below.

Engineering interventions including opening this chokepoint by creating a wider passageway under the railroad and toll road, and digging a deeper, wider channel for the bayou within the proposed buyout area and park space, can help to reduce flooding in surrounding areas during major storm events. This, in turn, can help preserve land between Greens Road and the proposed Greens Bayou park discussed in Recommendation 8, which will allow for increased transit-oriented and park-oriented development.

The priority buyout area, shown in pink, does not fully follow the boundaries of the floodway, shown in teal. In order to make this smaller buyout area practical, the types of engineering interventions described above will need to help elevate these properties out of the floodway.

In areas outside the floodway but within the 100-year floodplain, retrofitting existing properties and building new properties that are more flood-resilient can help to reduce risk to property owners and occupants alike. This includes strategies like elevating the ground floor of buildings, placing parking on the first floor below all occupiable space, elevating all necessary building equipment like air-conditioning and heating systems, and creating green infrastructure and detention within development sites so that runoff does not contribute to more widespread flooding issues. These strategies can be used on properties between the Bayou park and Greens Road, as well as properties to the north and south that still experience occasional flooding challenges.

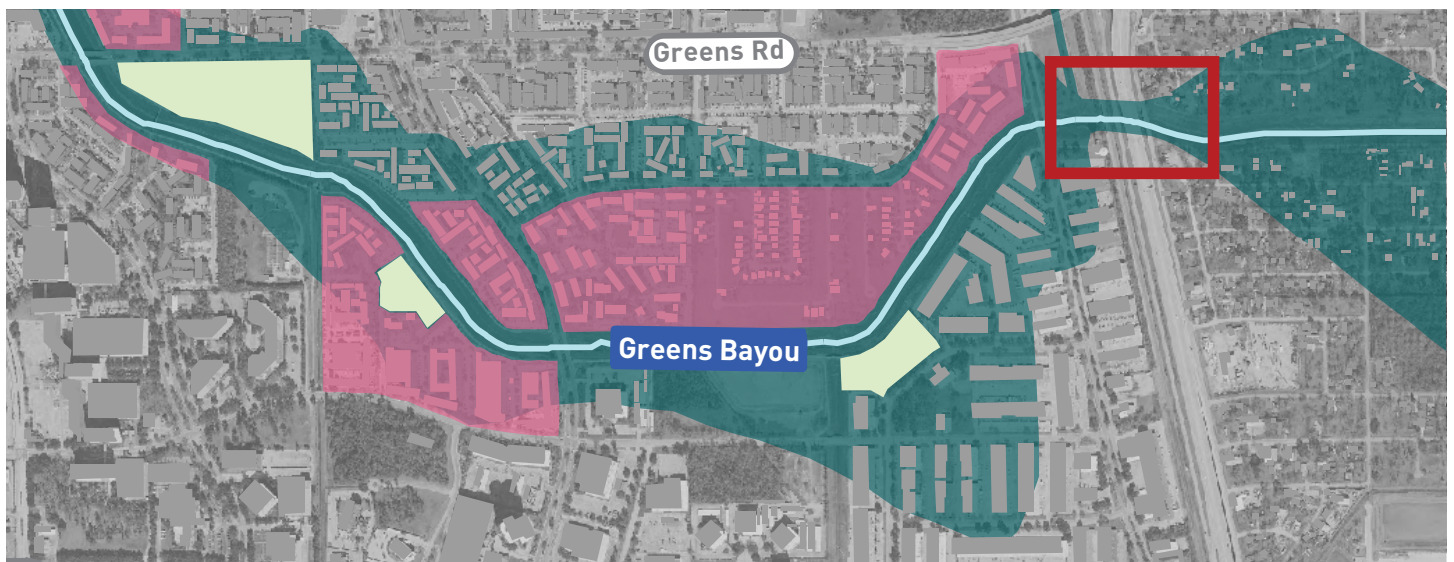
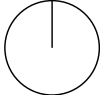
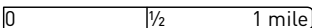


Figure 4.16 Existing Floodway and Chokepoint

Legend

- Floodway
 - Priority Buyout Area
 - Parks & Open Space
 - Buildings
 - Chokepoint
 - Roads
- 




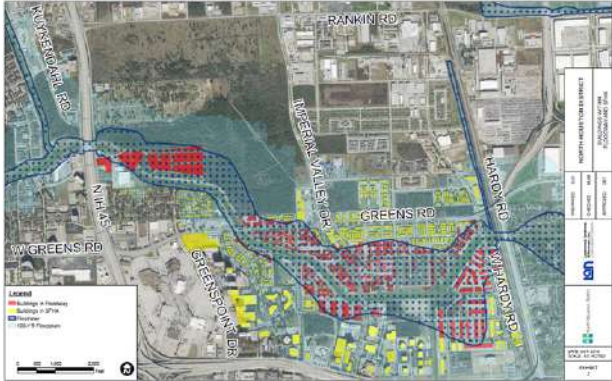


Study	Summary of Buyout Key Points	Plan Image
<p>North Houston Livable Centers Study (2020)</p>	<p>Create buyout / buy-in program to replace buyout units; shrink the required buyout area through engineering interventions to allow for more transit-oriented and park-oriented development along Greens Road. Retrofit other developments where necessary for resilience.</p>	
<p>North Houston District Drainage Evaluation Report (2016)</p>	<p>Strongly recommends buyouts and a localized detention facility with recreational features in a roughly similar footprint to the Livable Centers Study recommendation, though buyouts likely include more of the floodway. Also recommends improving localized conveyance issues on local streets that can address ponding.</p>	
<p>Flood Mitigation Strategies: Brays Vs. Greens Bayou (2019)</p>	<p>Create varying sizes of detention ponds along the Greens Bayou Watershed, including one formed by major buyouts in a similar area to the area proposed in this study; buyout area in this presentation extends north almost to Greens Road in nearly the entire study area, reducing potential for transit-oriented and park-oriented development south of Greens Road.</p>	
<p>Resilient Houston / Living with Water™ Houston (2020)</p>	<p>Create a large bayou park that includes stormwater treatment, water storage, and recreational elements. Improve conveyance by widening the same area underneath railroad and Hardy Toll Road culvert indicated in the Livable Centers study. Park / buyout area extends almost entirely north to Greens Road.</p>	

Figure 4.17 Comparison Chart: Buyout and Flood Mitigation Strategies Proposed in the Study Area

Implementing the Buy-In Component of the Program

At its core, the “buy-in” component of the program involves acquiring strategic vacant sites (or sites ripe for redevelopment) outside of flood zones in the Greenspoint neighborhood, and building new development that is comparably priced to existing units, high-quality, and near assets like transit, jobs, schools, and shopping. In order to maintain continuity of school districts and services for families, buy-in developments must also take the City-County boundary into account.

Greenspoint is a center of affordable housing within the City of Houston, Harris County, and the region. While some subsidized housing exists in the area, much of the housing stock here is market-rate affordable housing, and 93% of housing units in the area are rentals. Rents hover around \$1 per square foot per month, or approximately \$560/month for a 1 bed / 1 bath, 500 square foot unit to \$1,000/month for a 3 bed / 2 bath, 1,050 square foot unit. Single-family homes for sale in the study area tend to sell for less than \$150,000. This implies that in order to be affordable to current residents, newly-built units in “buy-in” properties will need to be subsidized to an extent in order to match the prices of the existing units that the study area’s residents currently rely on.

The vast majority of the 2,680 units located in the priority buyout area are multifamily rental properties, and the buy-in program should therefore reflect the need for over 2,500 cost-appropriate rental units. These can and should be replaced with high-quality development in a number of ways: through the development of high-quality mixed-income rental developments that include enough reasonably priced units for the existing residents to access; through mixed-use development near transit and amenities; and through new homeownership opportunities that offer moderate-income renters a path to ownership.

Because there is so little precedent for a buy-in program associated with a buyout program, it is not clear what percentage of residents will likely elect to join the buy-in program and stay in Greenspoint versus those who will choose to move somewhere else. Generally, uptake of the buy-in option will probably not be 100% among existing residents who are undergoing a buyout. However, residents from other areas of the City and County still experience great demand for quality,

relatively affordable housing, and while buyout residents may be first priority in these new developments, the developers can also accept residents from other parts of Greenspoint or Houston once all of the residents who have undergone a buyout are given priority placing.

The typologies of buy-in development may be somewhat higher-density than the current developments they replace, due to the need to replace a large number of units in a limited number of potential buy-in sites – and particularly a limited number of sites with strong access to the new BRT line on Greens Road and other assets found on Greenspoint’s main streets. New homeownership units may include single-family, townhome, duplex, three-to-four-plex, and larger condominium developments; higher-density ownership developments will help keep costs down and make ownership more attainable to residents.

Acquisition of sites for buy-in development must begin as the buyout component of the program is still being set up. Given the need to acquire, finance, develop, and open nearly 3,000 units, at least 5 years will likely be required to move from the acquisition stage to the completion stage – and more time will be needed if delays in acquisition or financing occur. Buy-in units need to be ready at the same time as buyouts are occurring, or else the program will not have available units to accommodate buyout recipients.

Providing Wraparound Services

Resilience is about more than just flooding. In order to support residents in transitioning from one home to another during a buyout/buy-in program, wraparound services will be needed to help preserve community. This should include housing counselors who can provide clear communication on the buy-in process to residents who are being offered a buyout, including housing costs, locations, types of units, timing for move-in, and income qualifications (if any). Counselors can also provide homeownership and financial literacy counseling to help renters transition to ownership, work with residents to find options near transit or within their school catchment area, and more. These counselors should also conduct follow up with residents post-buy-in for the first 1 - 2 years to track whether they remain in the same units and evaluate the success of the program. The North Houston district may be able to be the conduit for these services in Greenspoint.

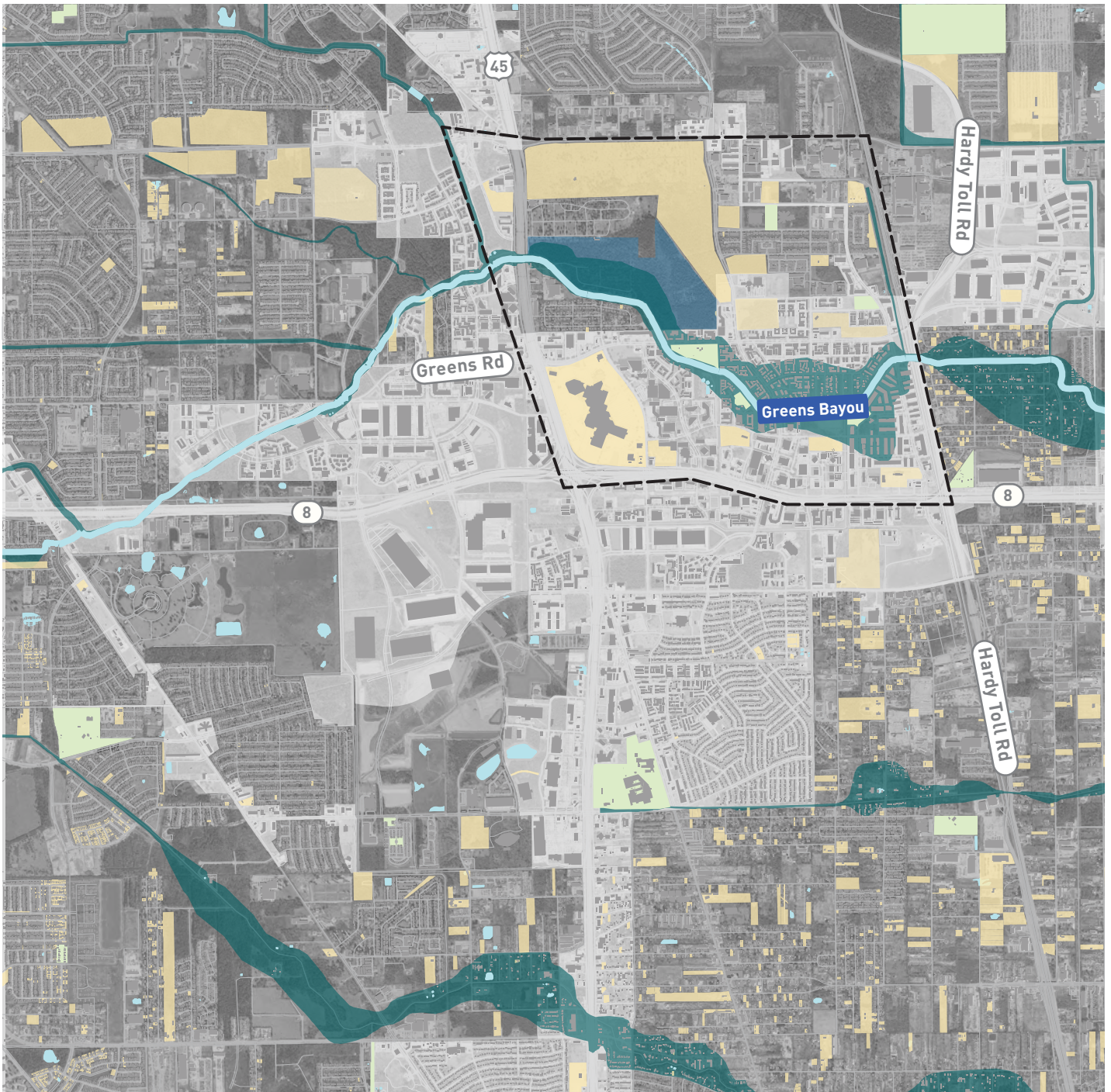


Figure 4.18 Potential Sites for “Buy-in” Opportunities
 Properties in the light gray shaded area are within the city limits. Properties outside of this area are in the Harris County boundary. These properties represent potential development opportunities for a “buy-in” program. Developing these lots on a timeframe complementary to the buyout process, and with similar affordability levels to buyout properties, will meet the goal of creating no net loss of affordable housing.

Legend

Floodway	Detention Basin
Water Feature	Study Area
“Buy-in” Opportunities	Roads
City Limits	
Parks & Open Space	
Buildings	

0 1/4 1/2 1mile

Recommendations

10 Implement Programs That Encourage Rehabilitation and New Development of Affordable Units near Transit Corridors and Centers

Summary

Use federal, state, and local funding sources to provide homes that are affordable to existing and new Greenspoint residents near transit, jobs, and local assets within the study area. Coordinate with buy-in efforts for existing Greenspoint residents as well as city and county-wide work on affordable housing provision. The district can encourage the City of Houston to expand affordable housing programs and identify potential sites for housing.

Recommendation Characteristics

Type	Program
Timeline	Short Term (1-5 years)
District's Role	Advocate
Lead Agencies	City of Houston

Livability Principles Supported

1. Provide More Transportation Choices
2. Promote Equitable, Affordable Housing
3. Enhance Economic Competitiveness
4. Support Existing Communities
5. Coordinate Policies and Leverage Investment
6. Value Communities and Neighborhoods

Partners

Approval From

City of Houston Housing and Community Development Department, City of Houston Mayor's Office, Harris County

Capital Funding

City of Houston Housing and Community Development Department, Harris County Community Services Department, Low-Income Housing Tax Credits, CDBG funds, HOME funds, CDBG-DR funds, Opportunity Zone tax credits

Description

Greenspoint is a center of affordable living options in Houston and Harris County. Currently, its large stock of multifamily housing is largely "naturally affordable," meaning that many residents earning below the region's median income are able to find housing without requiring subsidy. Some subsidized units also exist in the area. However, flooding and aging of existing housing stock threaten this naturally affordable and subsidized housing supply. In order to preserve and enhance the availability of affordable and mixed-income housing options while accomplishing needed buyouts, the City and County will need to work with developers and the North Houston District to leverage a wide array of funding sources that will provide subsidies for new development projects.

Replacement of these approximately 2,680 units that will undergo a buyout with new units that rent or sell at comparable rates will require a significant public-sector investment in addition to private-sector participation. According to available market data, the existing units in the buyout area have approximate average rents of approximately \$615 for a one-bedroom unit, \$800 for a two-bedroom unit, and \$910 for a three-bedroom unit. All of these average rents are affordable to households earning less than 50% of the Area Median Income, as shown on the following page. This means that households who earn less than half of the area's median income can afford to live in many of the area's housing units without any subsidy.

Overall costs of rent are just over \$1 per square foot per month on average. These lower costs are often more possible to achieve when housing stock has aged and been renovated; many of the units in the buyout area have not undergone substantial renovation since the 1970s and 1980s when they were built, while others have been purchased by new owners who have reinvested and renovated them in the more recent past.

Building new housing stock from the ground up has unavoidable hard costs for land, labor, and materials that tend to raise the rents that developers need to charge, if no subsidy is included in the deal. Average subsidy and types of subsidy required from the public sector will vary by project site and typology; based on recent projects funded by the City of Houston, subsidy needs could range from \$51,000 - \$80,000 per unit. This would lead to total expenditures of \$136.5 - \$214.5 million to provide subsidy for affordability. However, Greenspoint is a less expensive market than many other areas of Houston, and innovative strategies around infrastructure provision, acquisition, and other coordinated strategies may help reduce total non-recoverable costs to the public sector.

Jump Start Action Steps

- Create an acquisition partnership to purchase opportunity sites and enable development of properties where residents can “buy in” after undergoing a buyout. The City of Houston Housing and Community Development is starting conversations on this issue. Houston Land Bank may also be involved.

Unit Size	Avg. Market Rent	Household Size Assumption	AMI Affordability Level
1 bedroom	\$615	2-person household	Affordable at 40% AMI
2 bedroom	\$800	3-person household	Affordable at 45% AMI
3 bedroom	\$910	4-person household	Affordable at 45% AMI

Figure 4.19 Current Rental Affordability of Avg Units in Buyout Area

10

Development Opportunities and Partnerships

Potential sites for new, transit-oriented development opportunities in the study area and immediate surrounding area of Greater Greenspoint are shown on the map at right. These sites are all either vacant or significantly underutilized as of early 2020. Overall, the sites shown on the map include approximately 270 acres, or over 11 million square feet, of developable land. This number of acres could easily house the needed 2,680 replacement units from the buyout program; a typical garden apartment complex can provide anywhere from 15 to 25 units per acre, and higher-density multifamily development of three stories or more can produce over 25 units per acre. If all these parcels were completely developed with housing at typical garden apartment densities, they could accommodate at least 4,050 units. With higher-density development, the parcels could accommodate over 8,000 units. Higher-density development would be particularly appropriate for some of the parcels along Greens Road that are near transit, including the Greenspoint Mall site and several others.

Therefore, this strategy does not require that the public sector develop 100% of these identified parcels, which would be difficult. Rather, it requires strategic acquisition, subsidy, or other participation agreements with developers to realize as many affordable and mixed-income units on these properties as possible.

Options for creating public-private partnerships on these properties include:

- Working with the Houston Land Bank to acquire the properties from their current owners and redevelop them as affordable or mixed-income developments through an RFP or other sale or procurement process.
- Providing financial, infrastructural, or other incentives to include affordable units within private owners' redevelopment strategy. This may work especially well for the Greenspoint Mall site and for one site that is owned by a faith-based community. However, this would not address sites that are currently held for a future commercial or other non-residential use.
- Working with existing public-sector owners to determine their future plans for the sites and potentially finding opportunities to swap with other comparable sites that are not as well-situated for transit access, or to work on mixed-use developments that can include residential units while fulfilling the sites' original purpose as well.

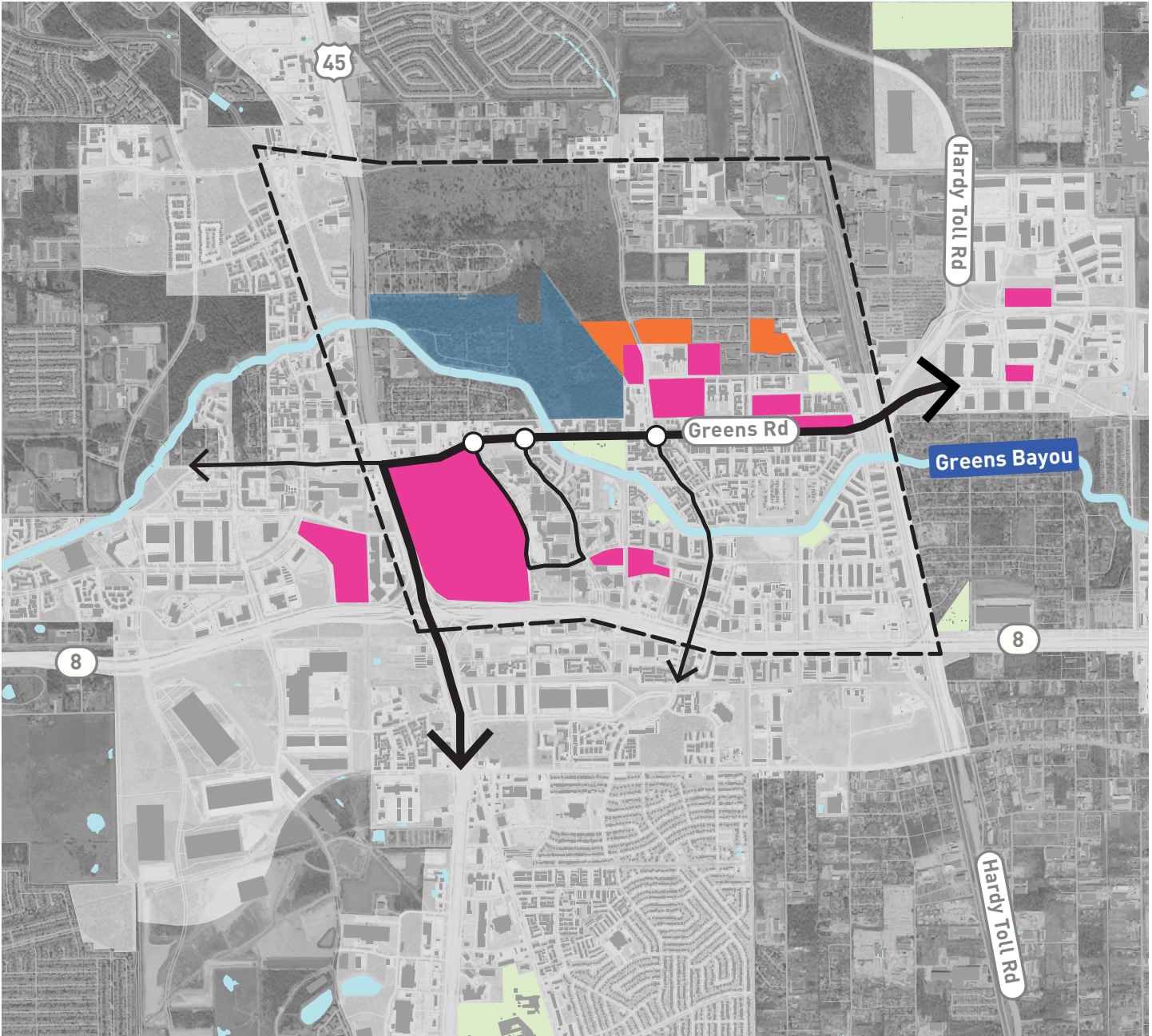
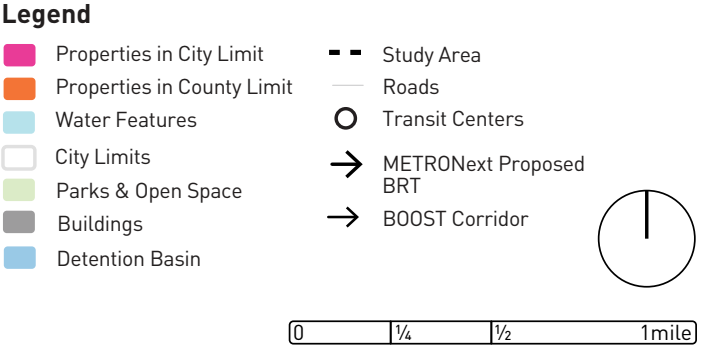
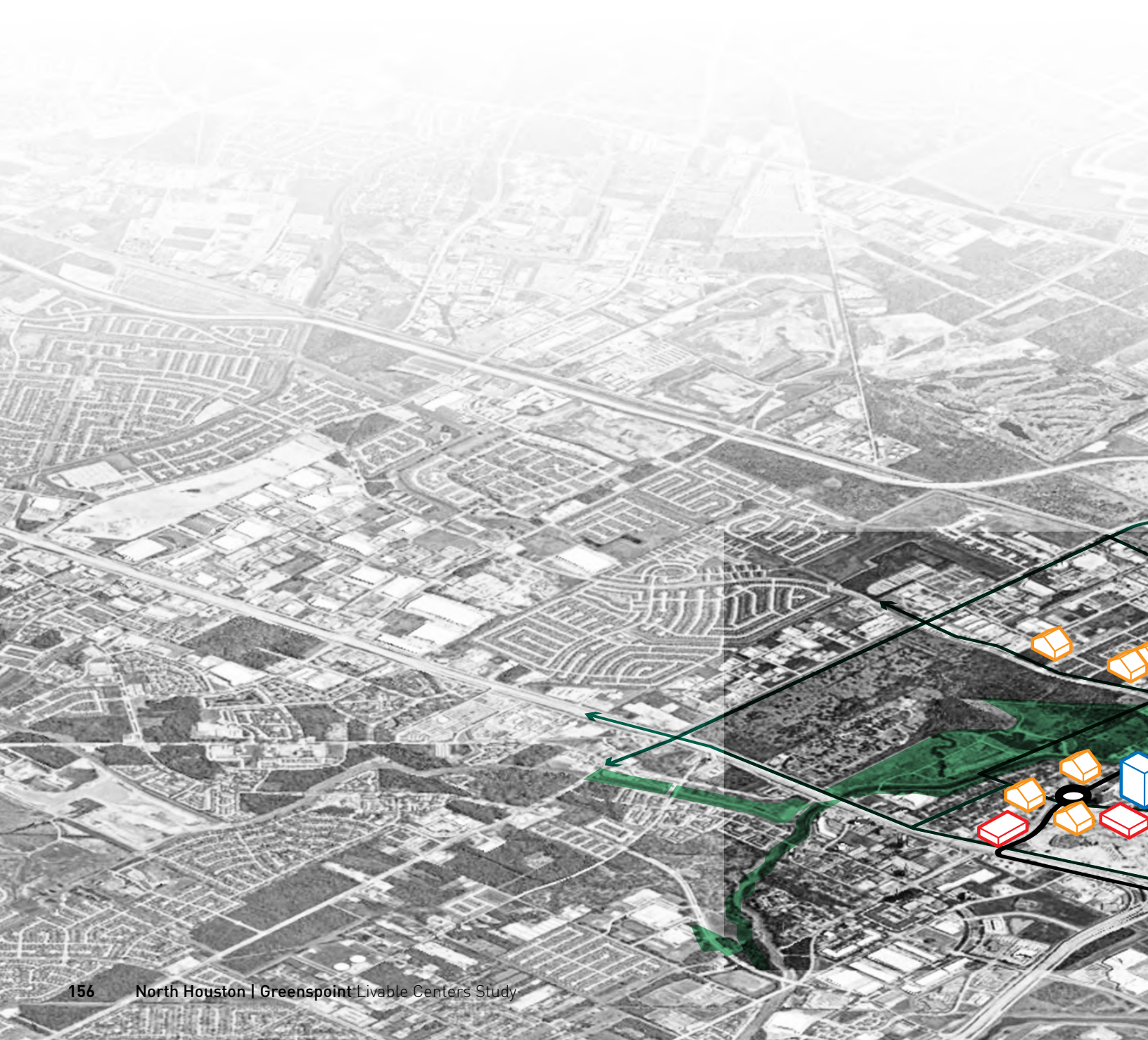


Figure 4.20 Potential “Buy-In” Sites Appropriate for Transit-Oriented Development



IMPLEMENTATION



IMPLEMENTATION

Implementation Matrix	158
Cost Estimates	162



Implementation

		Be the Local Regional International Hub of Houston				Be a Model For Safe Places to Walk & Bike			Be Defined by a Central Park That Holds Floodwater	Be a Place That Offers Accessible, Affordable Housing for the Region	
		01 Build Downtown-Greenspoint-Airport Bus Rapid Transit with New Transit Center and with the Reconstruction of Greens Road	02 Complete the Bayou Greenways	03 Redevelop Greenspoint Mall	04 Create an Airport Based Economic Development Plan	05 Create a Comprehensive North Houston Bikeways Network	06 Upgrade Priority Sidewalks Including Safe Routes to School	07 Create Green Streets / Urban Design Standards	08 Create a Central Park Along Greens Bayou	09 Implement Buy-out / Buy-in Program That Helps Residents Who Undergo Buy-outs Transition to More Resilient Housing Options	10 Implement Programs That Encourage Rehabilitation and New Development of Affordable Units Near Transit Corridors and Centers
Type	Program										
	Project										
Timeline	Short-term (1-5 years)										
	Medium-term (5-10 years)										
	Long-term (10+ years)										
District's Role	Advocate										
	Initiate										
	Participate										
Lead Agency	METRO										
	City of Houston										
	Houston Parks Board										
	Harris County										
	Private Developer										
	Houston Airport System										
	North Houston District										
Livability Principals Supported	1 Provide More Transportation Choices										
	2 Promote Equitable, Affordable Housing										
	3 Enhance Economic Competitiveness										
	4 Support Existing Communities										
	5 Coordinate Policies and Leverage Investment										
	6 Value Communities and Neighborhoods										

		Be the Local Regional International Hub of Houston				Be a Model For Safe Places to Walk & Bike			Be Defined by a Central Park That Holds Floodwater	Be a Place That Offers Accessible, Affordable Housing for the Region	
		01 Build Downtown-Greenspoint-Airport Bus Rapid Transit with New Transit Center and with the Reconstruction of Greens Road	02 Complete the Bayou Greenways	03 Redevelop Greenspoint Mall	04 Create an Airport Based Economic Development Plan	05 Create a Comprehensive North Houston Bikeways Network	06 Upgrade Priority Sidewalks Including Safe Routes to School	07 Create Green Streets / Urban Design Standards	08 Create a Central Park Along Greens Bayou	09 Implement Buy-out / Buy-in Program That Helps Residents Who Undergo Buy-outs Transition to More Resilient Housing Options	10 Implement Programs That Encourage Rehabilitation and New Development of Affordable Units Near Transit Corridors and Centers
Approval From	TxDOT										
	City of Houston										
	Private Developers										
	IAH										
	Houston Parks Board										
	Houston Parks and Recreation Department										
	Harris County Flood Control District										
	North Houston District										
	Union Pacific										
	Private Developer										
	Houston Airport System										
	Houston First										
	IAH										
	Tourism Board										
	METRO										
	Harris County										
	Aldine ISD										
	City of Houston Public Works										
	City of Houston Mayor's Office										
	City of Houston Planning Department										
City of Houston Housing and Community Development Department											

Implementation

		Be the Local Regional International Hub of Houston				Be a Model For Safe Places to Walk & Bike			Be Defined by a Central Park That Holds Floodwater	Be a Place That Offers Accessible, Affordable Housing for the Region	
		01 Build Downtown-Greenspoint-Airport Bus Rapid Transit with New Transit Center and with the Reconstruction of Greens Road	02 Complete the Bayou Greenways	03 Redevelop Greenspoint Mall	04 Create an Airport Based Economic Development Plan	05 Create a Comprehensive North Houston Bikeways Network	06 Upgrade Priority Sidewalks Including Safe Routes to School	07 Create Green Streets / Urban Design Standards	08 Create a Central Park Along Greens Bayou	09 Implement Buy-out / Buy-in Program That Helps Residents Who Undergo Buy-outs Transition to More Resilient Housing Options	10 Implement Programs That Encourage Rehabilitation and New Development of Affordable Units Near Transit Corridors and Centers
Capital Funding	METRO	■				■	■				
	H-GAC call for projects	■									
	City of Houston	■		■	■	■	■				
	TxDOT	■									
	IAH	■									
	Houston Parks Board		■	■		■			■	■	
	Houston Parks & Recreation Department		■						■		
	North Houston District		■		■	■	■	■	■		
	Private Developer			■							
	Houston Airport System				■						
	Harris County	■	■				■				
	Economic Development Administration				■						
	Greater Houston Partnership				■						
	Harris County Flood Control District					■			■	■	
	Private Donors								■		
	Corporations								■		
	Philanthropic Institutions								■		
	Local Sports Teams								■		
	City of Houston Housing and Community Development Department									■	■
	TIRZ 11	■	■	■	■	■	■				
	Opportunity Zones									■	■
	Private Developers / Market-Based Strategies									■	
	Harris County Community Services Department										■
	Low-Income Housing Tax Credits										■
	CDBG funds										■
	HOME funds										■
	CDBG-DR funds										■

		Be the Local Regional International Hub of Houston				Be a Model For Safe Places to Walk & Bike			Be Defined by a Central Park That Holds Floodwater	Be a Place That Offers Accessible, Affordable Housing for the Region	
		01 Build Downtown-Greenspoint-Airport Bus Rapid Transit with New Transit Center and with the Reconstruction of Greens Road	02 Complete the Bayou Greenways	03 Redevelop Greenspoint Mall	04 Create an Airport Based Economic Development Plan	05 Create a Comprehensive North Houston Bikeways Network	06 Upgrade Priority Sidewalks Including Safe Routes to School	07 Create Green Streets / Urban Design Standards	08 Create a Central Park Along Greens Bayou	09 Implement Buy-out / Buy-in Program That Helps Residents Who Undergo Buy-outs Transition to More Resilient Housing Options	10 Implement Programs That Encourage Rehabilitation and New Development of Affordable Units Near Transit Corridors and Centers
Operational Funding	METRO										
	Houston Parks Board										
	Houston Parks & Recreation Department										
	North Houston District										
	Private Developer										
	City of Houston										
	Police Department										
	Harris County Flood Control District										

Cost Estimates

The cost estimates show order of magnitude costs for each project recommended. These costs are reflected in 2020 dollars. These costs may vary depending on the outcome of further engineering and design proposals. Project costs should be used for project planning purposes.

01 Build Downtown-Greenspoint-Airport Bus Rapid Transit with New Transit Center and with the Reconstruction of Greens Road

Support METRO's plans for Bus Rapid Transit (BRT) and expanded regional transit service that can profoundly affect mobility within Greenspoint. Improved transit will provide access to all the opportunities brought from the redevelopment and rejuvenation of the North Houston District area. The district should participate and coordinate with the agency and its partners to ensure that the design of the facilities, including a new transit center and a BRT guideway, support the long-term vision of the study area.

Under the METRONext Moving Forward Plan, the METRORapid project from downtown, through the North Houston District, to IAH Airport is estimated at \$242 million (2017 dollars) for capital/development. While the total distance of the METRORapid line is 11 miles, the costs only reflect capital improvements along Greens Road and the construction of a new Greenspoint Transit Center. The \$242 million excludes the improvements made in downtown (captured in METRONext's budget for Downtown Transit Improvements), the guideway between downtown and Greenspoint (assumed to be included in the North Highway Improvement Project), and the section between the study area and the airport (assumed to use the existing Hardy Toll Road connection to IAH.)

02 Complete the Bayou Greenways

Bridge the gap of Bayou Greenways 2020, by building on work that is already underway and coordinating and working with the different agencies and organizations to provide park space, local connectivity, regional greenways, and flood mitigation to Houstonians. The district can advocate to the City of Houston, Harris County, and Houston Parks Board to complete trails linking North Houston to the rest of the region and can participate in building trail links within the district.

Item	Type	In Site	Qty	Unit	Unit Cost	Total
Skate Park to Knobcrest Dr	Off-street Trail	Yes	0.2707	linear mile	\$1,670,000	\$452,082
Jack Drake Park to Hardy Toll Road	Off-street Trail	Yes	0.4631	linear mile	\$1,670,000	\$773,338
Greens Bayou to Keith-Wiess Park	Dedicated On-street	No	0.7170	linear mile	\$180,000	\$129,057
Greens Bayou to Keith-Wiess Park	Off-street Trail	No	1.1192	linear mile	\$1,670,000	\$1,869,020
Hardy Toll Rd to Houston Ship Channel	Off-street Trail	No	24.7393	linear mile	\$1,670,000	\$41,314,605
Subtotal						\$44,538,102
20% Contingency						\$8,907,620
Total						\$53,445,722

03 Redevelop Greenspoint Mall

Support a well-planned vision for the Greenspoint Mall site, that will transform and focus energy and become a major employment and destination center for North Houston District. The district can continue to participate in the site planning and can help fund and build infrastructure and can operate public spaces that may be created as part of the development.

Transit Center with Structured Parking

The mall redevelopment site is one potential option to facilitate transit-oriented development in coordination with a transit center that is located towards the northeast quadrant of the redevelopment site. While the site is large enough to accommodate a mix of land uses, the transit center would serve as a 'hub' to the redevelopment and would pair best with residential and commercial uses, such as a grocery store. An elevated direct-connector transitway connects a two-way HOV facility in the center of I-45 directly to the transit center without interruption from mixed-traffic or signal delay.

A two-story transit facility would accommodate bays for local service on the first level with bays and station platforms for regional transit and METRORapid on the second story. A transitional ramp down to level one would allow for the transition of Bus Rapid Transit to at-grade, where design treatments such as bus-only lanes and transit signal priority preserves the speed of the METRORapid line. The facility can also include structured parking. We have identified 3.5 acres for the transit center on this site.

Multi-family Development

A potential site for new, transit-oriented development in the study area is the mall site. Higher-density housing development would be particularly appropriate for some of the parcels along Greens Road that are near transit, including the Greenspoint Mall site.

This strategy does not require that the public sector develop 100% of these identified parcels, which would be difficult. Rather, it requires strategic acquisition, subsidy, or other participation agreements with developers to realize as many affordable and mixed-income units as possible. New construction wood-frame multi-family development currently ranges from \$160 to \$180 per square foot. Note, that a significant cost increase is anticipated this year.

Implementation

04 Create an Airport Based Economic Development Plan

Support George Bush Intercontinental Airport as an engine of economic development so that this community emerges as an international metropolitan center of the 21st century. The district can encourage the City of Houston and the Houston Airport System to create a plan and should be a stakeholder in the planning process.

Item	Unit Cost	Unit	Qty	Subtotal
Planning and Design Services	\$135,000	EA	1	\$135,000
20% Contingency				\$27,000
Total				\$162,000

05 Create a Comprehensive North Houston Bikeways Network

Create a north-south and east-west network of bikeways that support the Greens Bayou Greenway trails as a spine for multi-modal transportation network that serves the majority of people living and working in the North Houston District. The North Houston District has a much higher percentage of people who walk, bike, and/or take transit than most places in Houston. With approximately six percent of the population biking to work (compared to Houston's overall average of 0.3%), providing dedicated, safer, all ages and abilities places to bike must be a priority. The district can advocate and participate with the City of Houston to identify and prioritize potential projects and can implement low-cost bikeway projects.

The cost estimates to implement the Comprehensive North Houston Bikeways Network includes priority bikeways and long-term bikeways as seen on the map, to be implemented over time. The cost estimates represent construction only, not including design or contingency, but are meant to assist with planning and budgeting for further design and development. The estimated cost to construct the priority bikeways is around \$2.79 million. The priority projects provide synergy and access to and from the Greens Bayou Greenway trails. The estimated cost for the entire network in addition to the priority bikeways is around \$5 million. There are at least four proposed bridges to cross Greens Bayou or along an easement under I-45 and Beltway 8. The estimated construction cost per bridge is around \$1,500,000. The North Houston District should coordinate closely with the City of Houston, METRO, Harris County Precinct 1, and the Houston Parks Board to leverage costs and provide comprehensive projects that can serve the larger community.

05 Create a Comprehensive North Houston Bikeways Network

Continued

Item	Bikeway Type	From	To	Priority	Unit Cost	Qty	Unit	Subtotal
Greens Bayou near North Houston Bike Park	Off-street (both sides of the bayou)	North Houston Bike Park	Knobcrest Dr	Yes	\$1,670,000	0.49	linear mile	\$818,300
Greenspoint Drive Neighborhood	Shared On-street	Greens Bayou Greenway Tr	South of Abney Dr	Yes	\$60,000	0.16	linear mile	\$9,600
Greenspoint Drive North	Dedicated On-street	S. of Abney Dr	Greens Rd	Yes	\$180,000	0.1	linear mile	\$18,000
Benmar Drive	Dedicated On-street	Greenspoint Rd	W Hardy Rd	Yes	\$180,000	1.4	linear mile	\$252,000
Imperial Valley Drive North	Dedicated On-street	Harvest Time Ln	Rankin Rd	Yes	\$180,000	0.86	linear mile	\$154,800
Regional Park Drive	Dedicated On-street	Imperial Valley Dr	W Hardy Rd	Yes	\$180,000	0.69	linear mile	\$124,200
Wayforest Drive	Dedicated On-street	Goodnight Tr	Seminar Dr	Yes	\$180,000	0.88	linear mile	\$158,400
Wayforest Drive Trail to Greens Bayou	Off-street	Seminar Dr	Greens Bayou	Yes	\$1,670,000	0.18	linear mile	\$300,600
Greens Bayou Extension and Neighborhood Connections	Off-street	Imperial Valley Dr	Benmar Dr	Yes	\$1,670,000	0.49	linear mile	\$818,300
Rankin Road	Dedicated On-street	Northborough Dr	E Hardy Rd	No	n/a	2.29	linear mile	TBD ¹
Northborough Road	Dedicated On-street	Rankin Rd	Gears Rd	No	\$180,000	1.38	linear mile	\$248,400
North Fork Greens Bayou Drainage Ditch	Off-street	Rushcreek Dr	Rankin Rd	No	\$1,670,000	0.25	linear mile	\$417,500
Greens Road	Dedicated On-street	Northborough Rd	West Hardy Rd	No	n/a	2.17	linear mile	TBD ²
Greenspoint Drive	Dedicated On-street	Greens Rd	Aldine Bender Rd	No	\$180,000	1.33	linear mile	\$239,400
Drainage Basin Trail	Off-street	Greens Bayou	Rankin Rd	No	\$1,670,000	0.87	linear mile	\$1,452,900
Imperial Valley Drive South	Dedicated On-street	Harvest Time Ln	Aldine Bender Rd	No	\$180,000	1.71	linear mile	\$307,800
Chisolm Trail	Dedicated On-street	Rankin Rd	Richcrest Dr	No	\$180,000	0.6	linear mile	\$108,000
Goodnight Trail	Dedicated On-street	Chisolm Tr	W Hardy Rd	No	\$180,000	0.55	linear mile	\$99,000
Langwick Drive	Dedicated On-street	Wayforest Dr	W Hardy Rd	No	\$180,000	0.37	linear mile	\$66,600
West Hardy Road	Dedicated On-street	Goodnight Tr	Greens Bayou	No	\$180,000	0.47	linear mile	\$84,600
Drainage Ditch P144-03-00/ P144-02-00	Off-street	Benmar Dr	Aldine Bender Rd	No	\$1,670,000	0.98	linear mils	\$1,636,600
Drainage Ditch P144-00-00	Off-street	Spence Rd	West of I-45	No	\$1,670,000	1.47	linear mile	\$2,454,900
Greenspoint Drive Bridge across Greens Bayou					\$1,500,000			\$1,500,000
Bridge to Jack Drake Park across Greens Bayou					\$1,500,000			\$1,500,000
Bridge Under BW8	Off-street Trail*				\$1,500,000			\$1,500,000
Bridge Under I-45	Off-street Trail*				\$1,500,000			\$1,500,000
Subtotal								\$15,769,900
20% Contingency								\$3,153,980
Total								\$18,923,880

¹ Based on reconstruction of Rankin Rd

² Based on reconstruction of BRT corridor

Implementation

06 Upgrade Priority Sidewalks Including Safe Routes to School

Improve pedestrian access in North Houston by prioritizing the reconstruction of safer and wider sidewalks and safer intersection treatments on Greens Road and Imperial Valley with an emphasis on safe routes to schools. The district can work with the City of Houston to identify and prioritize sidewalk and intersection improvements and get them included in the City Capital Improvement Projects through the Safe Routes to School Program.

Crosswalks

Item	Priority	Current Condition	Median	# of ADA Ramps	Unit	Unit Cost	Subtotal
Abney Dr @ Debbie Dr	Medium	Stop	No	8	EA	\$2,500	\$20,000
Abney Dr @ Greenspoint Dr	High	Stop	No	8	EA	\$2,500	\$20,000
Abney Dr @ Joy Cir	Medium	Stop	No	6	EA	\$2,500	\$15,000
Abney Dr @ Southbrook Cir	Medium	Stop	No	6	EA	\$2,500	\$15,000
Benmar Dr @ City View Pl	High	Stop	No	6	EA	\$2,500	\$15,000
Benmar Dr @ Greenspoint Dr	Medium	Signal	No	16	EA	\$2,500	\$40,000
Benmar Dr @ Hardy St	Medium	Stop	Yes	10	EA	\$2,500	\$25,000
Benmar Dr @ Hedgecroft Dr	Medium	Stop	No	8	EA	\$2,500	\$20,000
Benmar Dr @ Imperial Valley Dr	High	Signal	Yes	10	EA	\$2,500	\$25,000
Benmar Dr @ Northchase Dr	Medium	Signal	Yes	10	EA	\$2,500	\$25,000
Bradfield Rd @ Hardy St	Medium	Stop	Yes	10	EA	\$2,500	\$25,000
Cemetery 1 @ N Fwy Service Rd	Medium	Unsignalized	No	4	EA	\$2,500	\$10,000
Cemetery 2 @ N Fwy Service Rd	Medium	Unsignalized	No	4	EA	\$2,500	\$10,000
City North @ Northchase Dr	High	Unsignalized	Yes	4	EA	\$2,500	\$10,000
City North Entrance @ Greenspoint Dr	High	Unsignalized	No	8	EA	\$2,500	\$20,000
Gears Rd @ N Fwy Service Rd	Medium	Stop	No	2	EA	\$2,500	\$5,000
Glenborough Dr @ N Fwy Service Rd	Medium	Stop	No	2	EA	\$2,500	\$5,000
Goodnight Tr @ Chisholm Tr	High	Stop	No	6	EA	\$2,500	\$15,000
Goodnight Tr @ Hardy St	High	Stop	Yes	8	EA	\$2,500	\$20,000
Goodnight Tr @ Wayforest Dr	High	Stop	No	6	EA	\$2,500	\$15,000
Greens Rd @ Apartment Entrance	Medium	Signal	Yes	8	EA	\$2,500	\$20,000
Greens Rd @ E Hardy Rd	Medium	Signal	No	6	EA	\$2,500	\$15,000
Greens Rd @ Greenspoint Dr	Medium	Signal	Yes	16	EA	\$2,500	\$40,000
Greens Rd @ Hardy St	High	Signal	Yes	12	EA	\$2,500	\$30,000
Greens Rd @ Imperial Valley Dr	High	Signal	Yes	16	EA	\$2,500	\$40,000
Greens Rd @ Mall Entrance	High	Signal	No	16	EA	\$2,500	\$40,000
Greens Rd @ N Fwy Service Rd	Medium	Signal	No	8	EA	\$2,500	\$20,000
Greens Rd @ Northchase Dr	High	Signal	Yes	14	EA	\$2,500	\$35,000
Greens Rd @ Seminar Dr	High	Stop	No	2	EA	\$2,500	\$5,000
Greens Rd @ Wayforest Dr	High	Signal	Yes	12	EA	\$2,500	\$30,000
Gruss Dr @ Debbie Dr	Medium	Stop	No	8	EA	\$2,500	\$20,000
Gruss Dr @ Greenspoint Dr	Medium	Stop	No	6	EA	\$2,500	\$15,000
Gruss Dr @ N Fwy Service Rd	Medium	Stop	No	2	EA	\$2,500	\$5,000
Gruss Dr @ Southbrook Cir	Medium	Stop	No	8	EA	\$2,500	\$20,000
Harvest Time Ln @ Imperial Valley Dr	Medium	Stop	Yes	10	EA	\$2,500	\$25,000
Harvest Time Ln @ Wayforest Dr	High	Stop	No	8	EA	\$2,500	\$20,000
Kuykendahl Rd @ N Fwy Service Rd	Medium	Stop	Yes	4	EA	\$2,500	\$10,000

**06 Upgrade Priority Sidewalks
Including Safe Routes to School**

Continued

Crosswalks

Item	Priority	Current Condition	Median	# of ADA Ramps	Unit	Unit Cost	Subtotal
Langwick Dr @ Hardy St	High	Stop	Yes	12	EA	\$2,500	\$30,000
Langwick Dr @ Wayforest Dr	High	Stop	No	10	EA	\$2,500	\$25,000
Mall Entrance 1 @ N Fwy Service Rd	Medium	Unsignalized	No	4	EA	\$2,500	\$10,000
Mall Entrance 2 @ N Fwy Service Rd	Medium	Stop	No	4	EA	\$2,500	\$10,000
Meadowfern Dr @ N Fwy Service Rd	Medium	Stop	No	2	EA	\$2,500	\$5,000
N Sam Houston PKWY E @ Greenspoint Dr	Medium	Signal	No	10	EA	\$2,500	\$25,000
N Sam Houston PKWY E @ Imperial Valley Dr	Medium	Signal	Yes	10	EA	\$2,500	\$25,000
N Sam Houston PKWY E @ Imperial Valley Dr	Medium	Signal	Yes	10	EA	\$2,500	\$25,000
Rankin Rd @ Ammi Tr	Medium	Stop	No	6	EA	\$2,500	\$15,000
Rankin Rd @ Chisholm Tr	Medium	Stop	No	8	EA	\$2,500	\$20,000
Rankin Rd @ E Hardy Rd	Medium	Signal	No	10	EA	\$2,500	\$25,000
Rankin Rd @ Gillman Park	Medium	Stop	No	6	EA	\$2,500	\$15,000
Rankin Rd @ Imperial Valley Dr	High	Signal	Yes	12	EA	\$2,500	\$30,000
Rankin Rd @ Kuykendahl Rd	High	Signal	Yes	16	EA	\$2,500	\$40,000
Rankin Rd @ Rankin Cir E	Medium	Stop	No	6	EA	\$2,500	\$15,000
Rankin Rd @ Rankin Cir W	High	Stop	No	6	EA	\$2,500	\$15,000
Rankin Rd @ Rankin Park	Medium	Stop	No	6	EA	\$2,500	\$15,000
Regional Park Dr @ Chisholm Tr	High	Stop	Yes	12	EA	\$2,500	\$30,000
Regional Park Dr @ Greenbriar Park	High	Stop	No	6	EA	\$2,500	\$15,000
Regional Park Dr @ Hardy St	High	Stop	Yes	12	EA	\$2,500	\$30,000
Regional Park Dr @ Imperial Valley Dr	Medium	Stop	Yes	12	EA	\$2,500	\$30,000
Regional Park Dr @ Karlow Trail Ln	Medium	Stop	No	6	EA	\$2,500	\$15,000
Regional Park Dr @ Wayforest Dr	High	Stop	No	8	EA	\$2,500	\$20,000
Richcrest Dr @ Chisholm Tr	High	Stop	Yes	6	EA	\$2,500	\$15,000
Richcrest Dr @ Greenbriar Park	High	Stop	No	6	EA	\$2,500	\$15,000
Richcrest Dr @ Hardy St	High	Stop	Yes	12	EA	\$2,500	\$30,000
Richcrest Dr @ Imperial Valley Dr	Medium	Stop	Yes	12	EA	\$2,500	\$30,000
Richcrest Dr @ Wayforest Dr	High	Stop	No	8	EA	\$2,500	\$20,000
Richview Ct @ Chisholm Tr	High	Stop	No	6	EA	\$2,500	\$15,000
Richview Dr @ Greenbriar Park	High	Stop	No	8	EA	\$2,500	\$20,000
Richview Dr @ Wayforest Dr	High	Stop	No	8	EA	\$2,500	\$20,000
Rushcreek Dr @ Kuykendahl Rd	Medium	Stop	Yes	12	EA	\$2,500	\$30,000
Rushcreek Dr @ N Fwy Service Rd	Medium	Stop	No	4	EA	\$2,500	\$10,000
Seminar Dr @ Imperial Valley Dr	High	Stop	Yes	10	EA	\$2,500	\$25,000
Southbrook Cir @ Debbie Dr	Medium	Stop	No	8	EA	\$2,500	\$20,000
Southbrook Cir @ Greenspoint Dr	Medium	Stop	No	8	EA	\$2,500	\$20,000
Transit Center @ Greenspoint Dr	High	Unsignalized	No	TBD			
Subtotal							\$1,500,000
20% Contingency							\$300,000
Crosswalks Total							\$1,800,000

06 Upgrade Priority Sidewalks Including Safe Routes to School

Continued

Sidewalks

Item	Condition	Qty	Unit	Unit Cost	Subtotal
Benmar Dr	Medium	12,456	LF	\$42	\$523,132
Chisholm Tr	High	2,731	LF	\$42	\$114,685
	Medium	827	LF	\$42	\$34,715
Goodnight Tr	High	928	LF	\$42	\$38,976
Greenbriar Park	High	575	LF	\$42	\$24,130
Greenspoint Dr	High	3,752	LF	\$42	\$157,583
	Medium	836	LF	\$42	\$35,116
Gruss Dr	Medium	1,786	LF	\$42	\$75,015
Hardy St	High	3,075	LF	\$42	\$129,164
	Medium	13,823	LF	\$42	\$580,582
Harvest Time Ln	Medium	2,212	LF	\$42	\$92,901
Hedgcroft Dr	Medium	6,034	LF	\$42	\$253,445
Imperial Valley Dr	High	7,828	LF	\$42	\$328,794
	Medium	2,933	LF	\$42	\$123,195
Kuykendahl Rd	Medium	5,262	LF	\$42	\$221,009
Langwick Dr	High	3,774	LF	\$42	\$158,498
Meadowfern Dr	Medium	1,221	LF	\$42	\$51,295
Northchase Dr	High	1,819	LF	\$42	\$76,412
	Medium	3,640	LF	\$42	\$152,859
Regional Park Dr	High	4,107	LF	\$42	\$172,473
Richbourg St	Medium	226	LF	\$42	\$9,485
Richcrest Dr	High	3,882	LF	\$42	\$163,057
Ronan Rd	Medium	2,634	LF	\$42	\$110,644
Wayforest Dr	High	2,811	LF	\$42	\$118,048
BW8 Feeder	HCTRA	8,349	LF		
I45 Feeder	TxDOT	15,214	LF		
Rushcreek Dr	CIP	2,228	LF		
Imperial Valley Dr	CIP	8,179	LF		
Greens Rd	TBD	20,899	LF	Based on reconstruction of Greens Road	
Rankin Rd	TBD	11,948	LF	Based on reconstruction of Rankin Road	
Subtotal					\$3,745,212
20% Contingency					\$749,042
Sidewalks Total					\$4,494,254
Crosswalks & Sidewalks Total					\$6,294,254

Unit Cost is for 6 ft sidewalk with 4" concrete

Unit Cost does not include curb or utility relocation

07 Create Green Streets / Urban Design Standards

Develop standards for what North Houston's streets should look and feel like. The design standards can provide requirements and establish minimum standards for designing streets such that streets are built to be safe, comfortable, and are sustainable for everyone. The district can develop green street and urban design guidelines and work with the City of Houston to adopt them for new construction.

Item	Unit Cost	Unit	Qty	Subtotal
Planning and Design Services	\$60,000	EA	1	\$60,000
20% Contingency				\$12,000
Total				\$72,000

08 Create a Central Park along Greens Bayou

Build a Central Park along Greens Bayou that would not only serve as a great recreational asset to improve the quality of life for residents, but would mitigate flooding, become the heart of the community, and be a magnet for visitors. The district can encourage continued collaboration between the City of Houston, Harris County Flood Control District, and Houston Parks Board, and can participate in and represent its residents in the planning process.

Item	Unit Cost	Unit	Qty	Subtotal
Passive / Recreation Area	\$30,000	acres	172	\$5,160,000
Active / Highly Programmed	\$250,000	acres	19	\$4,750,000
Hike / Bike Trail	\$1,670,000	linear mile	6.2	\$10,354,000
Subtotal				\$20,264,000
20% Contingency				\$4,052,800
Total				\$24,316,800

Cost does not include:

Earthwork, storm & utility, pedestrian & bike bridges

09 Implement Buy-Out / Buy-In Program That Helps Residents Who Undergo Buyouts Transition to More Resilient Housing Options

Ensure safety and preserve community by helping residents of the North Houston District move out of flood-prone areas into comparably priced housing options elsewhere in the area. The district can encourage the City of Houston to create a buy-out and buy-in program and provide input on its structure.

Item	Total Assessed Value	% Buyout	Subtotal
Buyout Costs			
Full Multifamily Buyouts in Priority Area North of Bayou	\$35,910,540	100	\$35,910,540
Full Single Family Buyouts in Priority Area North of Bayou	\$8,224,573	100	\$8,224,573
Full Multifamily Buyouts in Priority Area South of Bayou	\$15,601,345	100	\$15,601,345
Partial Multifamily Buyouts in Priority Area South of Bayou	\$22,619,518	10	\$2,261,952
Subtotal Estimated Buyout Costs			\$61,998,410
20% Contingency			\$12,399,682
Total			\$74,398,092
Cost of demolition of existing multi-family units:			

10 Implement Programs That Encourage Rehabilitation and New Development of Affordable Units near Transit Corridors and Centers

Use federal, state, and local funding sources to provide homes that are affordable to existing and new Greenspoint residents near transit, jobs, and local assets within the study area. Coordinate with buy-in efforts for existing Greenspoint residents as well as city and county-wide work on affordable housing provision. The district can encourage the City of Houston to expand affordable housing programs and identify potential sites for housing.

Item	Subtotal
Buy-in Land Cost (Transit Sites Only)	
Total Land Cost (including estimates based on per-square-foot cost for exempt sites or sites not available in HCAD)	\$21,446,521
Buy-in Cost of Subsidized for Affordability	
Total Units to Replace	2,680
Total Subsidy Per Unit - Low End	\$51,000
Total Subsidy Per Unit - High End	\$80,000
Total Cost of Subsidies for Affordability - Low End	\$136,680,000
Total Cost of Subsidies for Affordability - High End	\$214,400,000
Subtotal Estimated Buy-in Costs	\$372,526,521
20% Contingency	\$74,505,304
Total	\$447,031,825

Recommendation	Total
01 Build Downtown-Greenspoint-Airport Bus Rapid Transit with New Transit Center and with the Reconstruction of Greens Road	N/A
02 Complete the Bayou Greenways	\$53,445,722
03 Redevelop Greenspoint Mall	N/A
04 Create an Airport Based Economic Development Plan	\$162,000
05 Create a Comprehensive North Houston Bikeways Network	\$18,923,880
06 Upgrade Priority Sidewalks Including Safe Routes to School	\$6,294,254
07 Create Green Streets / Urban Design Standards	\$72,000
08 Create a Central Park along Greens Bayou	\$24,316,800
09 Implement Buy-Out / Buy-In Program That Helps Residents Who Undergo Buyouts Transition to More Resilient Housing Options	\$74,398,092
10 Implement Programs That Encourage Rehabilitation and New Development of Affordable Units near Transit Corridors and Centers	\$447,031,825
Est. Total	\$624,644,573

NORTH HOUSTON / GREENSPPOINT

LIVABLE CENTERS STUDY

