

# GULFTON'S MAIN STREET

## A NEW VISION FOR HILLCROFT AVENUE



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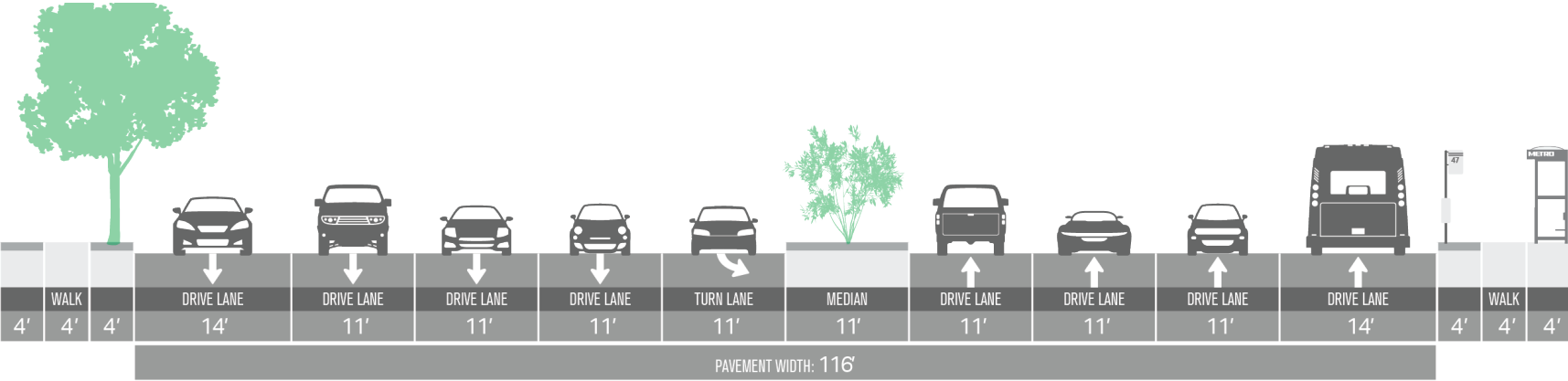
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connect  
community

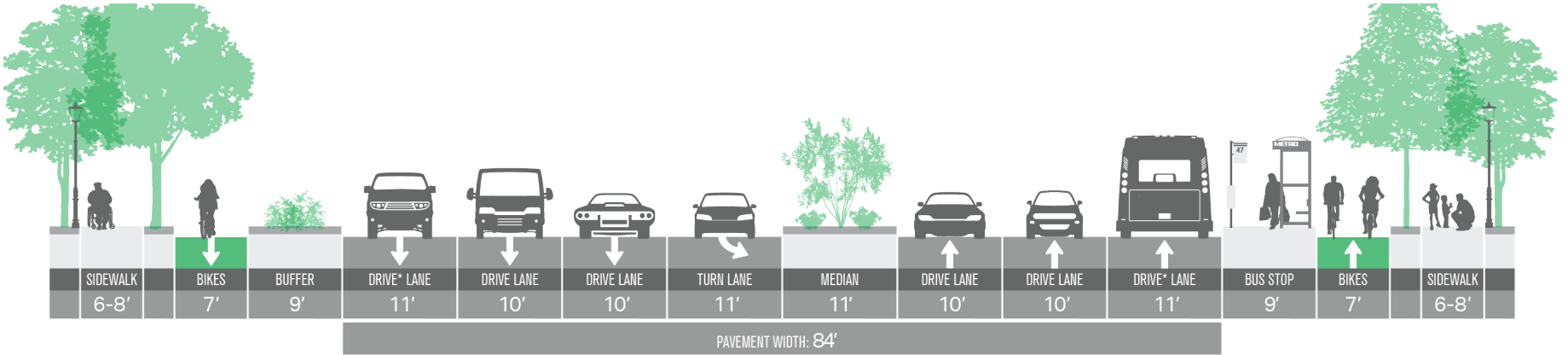
**SEPTEMBER 2019**



**FIGURE 1** HILLCROFT AVENUE LOOKING NORTH AT DASHWOOD DRIVE



**FIGURE 2** EXISTING CROSS SECTION OF HILLCROFT AVENUE AT DASHWOOD DRIVE



**FIGURE 3** A NEW VISION FOR A SAFER, WALKABLE, BIKEABLE HILLCROFT AVENUE



# EXECUTIVE SUMMARY

A New Vision for Hillcroft Avenue is a project prioritized by the Mayor's Safer Streets initiative which was announced in April 2019 in the Gulfton neighborhood, and was moved forward by Connect Community and Together for Safer Roads. This project is focused on improving safety within the Gulfton neighborhood, with a focus on Hillcroft Avenue. The project team worked closely with Houston Public Works to define a new vision for the corridor, as outlined in this report.

This report is the result of a safety assessment focused on finding solutions that will improve safety along Hillcroft Avenue in the Gulfton neighborhood. The project team focused on defining implementable short-term and long-term design improvements to improve safety along Hillcroft Avenue between Bellaire Boulevard and High Star Drive/Westward Street.

This report defines projects developed through a rigorous process of data analysis, public engagement, City input, and weekly involvement with a group of seven local high school students who were part of the Summer Safety Internship. Working with students who live in Gulfton and go to school and work near the study area provided invaluable insight for the project team to help tailor recommendations to what the community really wanted and needed.

The goal of this project was to define a new, bold vision for Hillcroft Avenue. Hillcroft Avenue is the main street of Gulfton, a new vision is needed to support this key community corridor. The safety assessment defined seven key areas of concern and opportunities for improvements along Hillcroft Avenue:

1. There is a high corridor crash rate.
2. Vehicular speeds are high and there is excess vehicular capacity along the corridor.
3. High rates of both transit users and people walking.
4. Hillcroft Avenue lacks safe and visible crossings

5. Multiple challenges for drivers resulting from the wide cross-section including: high vehicular speeds, limited gaps for turning vehicles, and high rates of weaving vehicles.
6. Opportunities for corridor enhancements to improve overall user experience
7. There is strong community support for a safer Hillcroft Avenue.

Based on findings from the safety assessment, three transformative projects were defined. The projects are based on input from two Public Meetings and discussions with Houston Public Works with the goal of implementing all projects within a 1 to 3 year timeline. Cost estimates were developed for each project.

**Project 1: Gulfton's Main Street**, includes the redesign of Hillcroft Avenue as Gulfton's main street by reallocating space to improve safety for all users. The recommended cross section for the corridor is shown in **Figure 3**. Project 1 includes enhancements to the pedestrian realm, bus stop optimization, opportunities for beautification, and a new signal at the intersection of Hillcroft Avenue and Dashwood Drive. The estimated cost of Project 1 is \$2,028,595.

**Project 2: Gateway to Gulfton**, includes both a Gateway to Gulfton along Hillcroft Avenue and the construction of a Community Plaza along High Star Drive. The Gateway to Gulfton is intended to be a physical space that both welcomes those entering the community and is a visual queue to drivers that Hillcroft Avenue is the Main Street for the community, not just a through street to be sped down.

For Project 2, the Gateway to Gulfton design includes plaza space that can house community-focused permanent or temporary art installations. It is proposed for the intersection of Hillcroft Avenue at High Star Drive/Westward Street by reallocating space from the Project 1 redesign into a green plaza space.

The High Star Community Plaza would be along High Star Drive and includes the redesign of High Star Drive into a Community Plaza space to complement the reimaging of Legacy Community Health and Southwest Multi-Service Center Campus. High Star Drive will be

designed to support programming that encourages gathering within the plaza and prioritizes comfort for people walking, bicycling, and using the plaza. The estimated cost of Project 2 is \$1,147,660.

**Project 3: Westward Connection**, includes the construction of a 10' shared-use path along the west side of Westward Street to connect bikeways on Hillcroft Avenue to destinations along Gulfton Street. The estimated cost of Project 3 is \$289,604.

While Hillcroft from High Star to Bellaire was the core focus areas for the project, the team also assessed how the benefits and improved connectivity of these three projects could be extended to neighborhoods and destinations north and south along Hillcroft Avenue.





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# PROJECT OVERVIEW

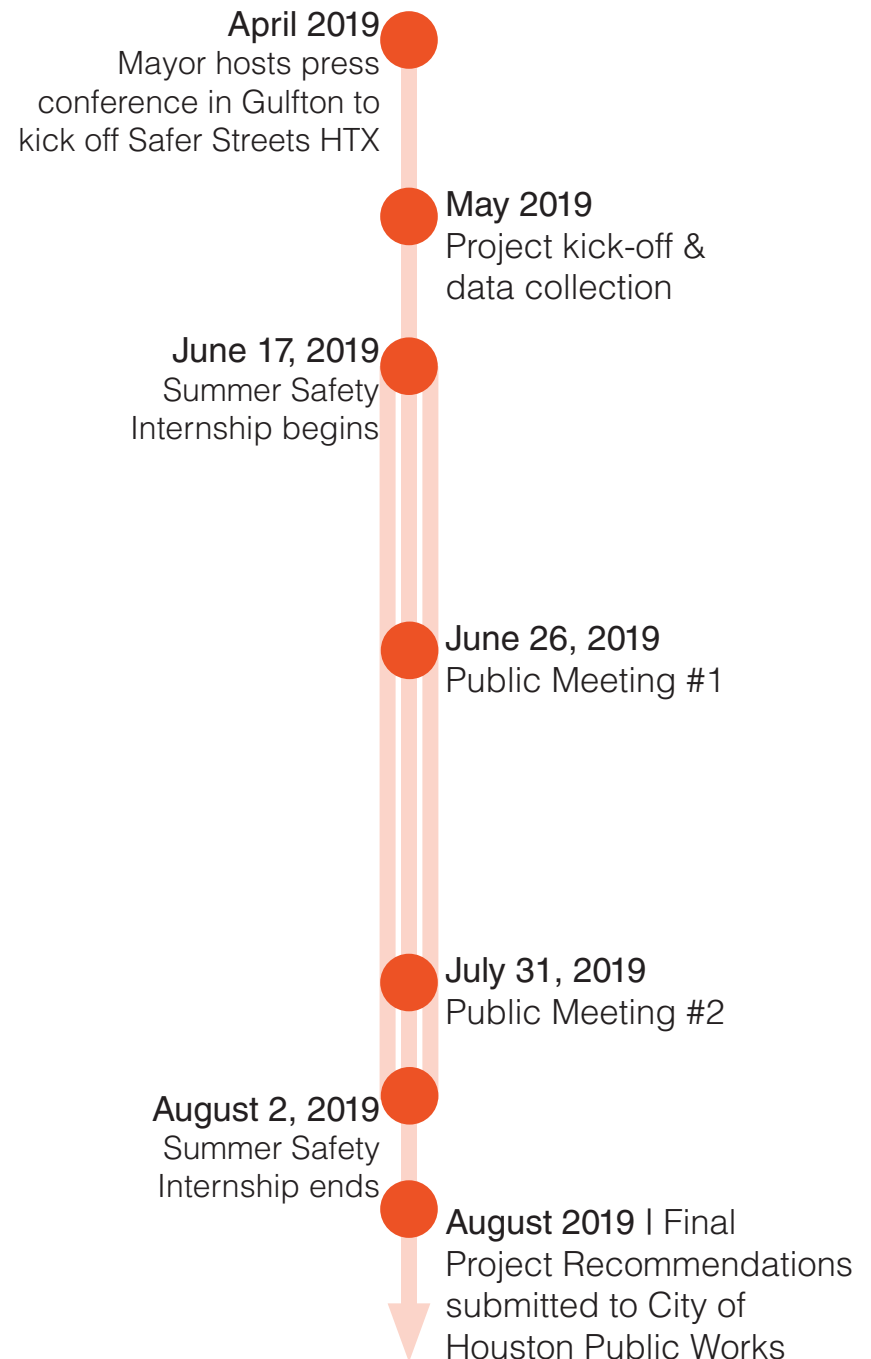
## PROCESS

The Hillcroft Safety Assessment was conducted in collaboration with the City of Houston Public Works, Connect Community, and Together for Safer Roads to find solutions to improve safety along Hillcroft Avenue in the Gulfton neighborhood of Houston, Texas. This project focused on defining implementable short-term and long-term design improvements focused on improving safety for Hillcroft Avenue between Bellaire Boulevard and High Star Drive/Westward Street. This project was prioritized within the Mayor's Safer Streets initiative which he announced in April 2019 in Gulfton.

The project included a safety assessment, the development of recommendations for the corridor, and defining projects for a new, bold vision of Hillcroft Avenue. This work was conducted through a rigorous process of data analysis, public engagement, City input, and weekly involvement with a group of seven local high school students who were part of the Summer Safety Internship. Working with students who live in Gulfton and go to school and work near the study area provided invaluable insight for the project team to help tailor recommendation to what the community really wanted and needed.

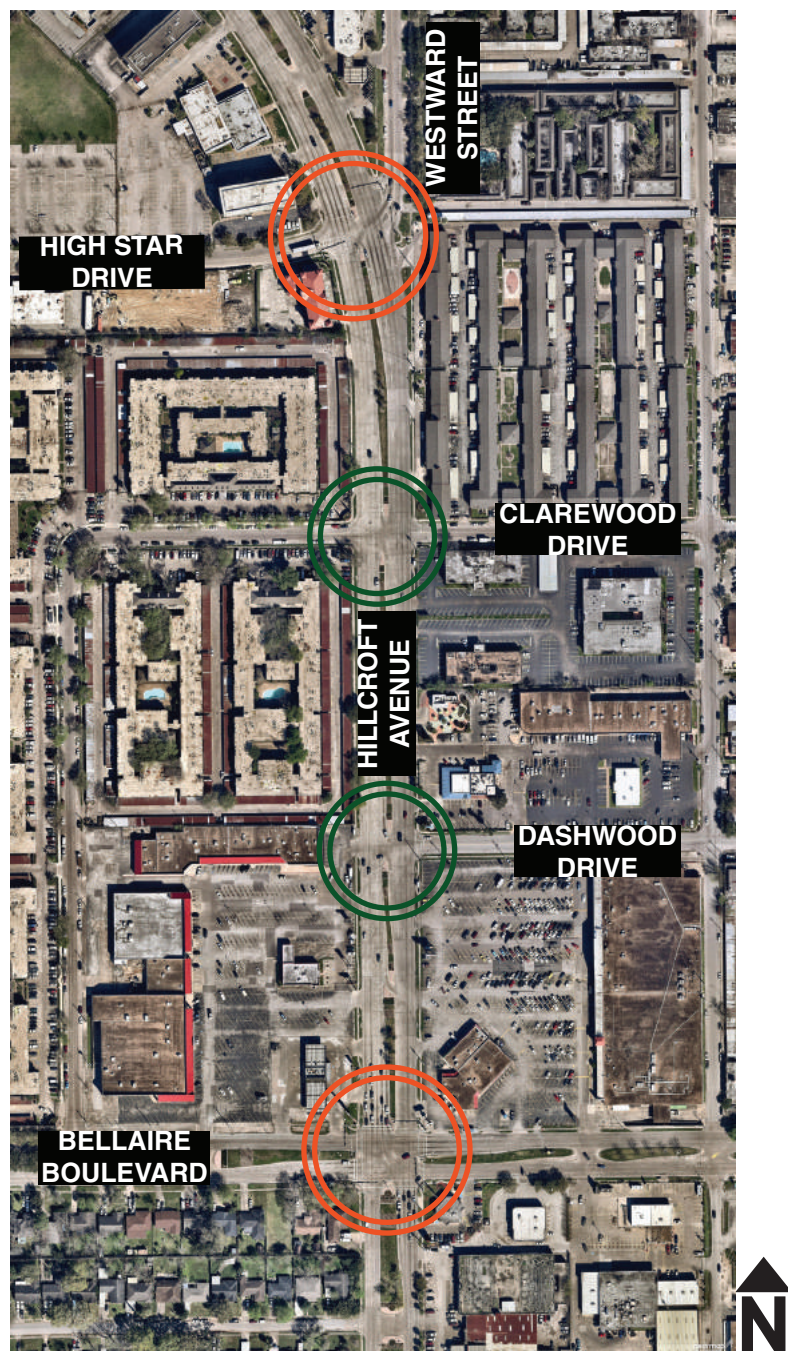
In addition to the community input gained from working closely with the interns, two public meetings were held at the Southwest Multi-Service Center. During the first meeting, input was gathered from the community on how they use the corridor, what improvements they would like to see, and what other important connections this project should look to improve. During the second meeting, the public was asked to prioritize and provide input on the developed recommendations.

This study is not the first mobility-focused study within Gulfton. It builds on previous studies and community engagement efforts conducted by the City of Houston through the Complete Communities initiative, Connect Community, and Kinder Institute for Urban Research at Rice University. There is strong community support for a safer Hillcroft Avenue.



**FIGURE 4** PROJECT TIMELINE





**FIGURE 5** PROJECT STUDY AREA

## STUDY AREA

The primary project study area encompasses 0.4 miles of Hillcroft Avenue between Bellaire Boulevard and High Star Drive/Westward Street as shown in **Figure 5**. The study area included four street intersections, two signalized intersections (orange circles) and two unsignalized intersections (green circles).

Hillcroft Avenue is a north-south connection through Gulfton providing access to Sam Houston Tollway to the south and IH-69, Westpark Tollway, and Westheimer Road to the north. North of Westheimer Road, Hillcroft Avenue turns into South Voss Road and continues north to the Katy Freeway. Within the study area, Hillcroft Avenue is classified as a P-8-140 according to the 2018 Major Thoroughfare and Freeway Plan (MTFP), a Principal Thoroughfare with 140' of right-of-way (ROW) with sufficient width.

Hillcroft Avenue currently has eight travel lanes. The speed limit is 35-mph. Four-foot sidewalks are provided along the entire corridor and curb ramps are present at all intersections. The existing cross section is presented in **Figure 2**.

Gulfton is the densest residential community within the City of Houston. Population density is estimated to be 15,000 persons per square mile, five times the average for the City of Houston. Land uses near the study area consist primarily of large apartment complexes and large strip center retail parcels. Many apartment complexes take up entire city blocks. Hillcroft Avenue is lined by multiple commercial uses in strip center developments. At the northeast corner of the Bellaire Boulevard Intersection is Fiesta Mart, a key grocery store for the community. Along High Star Drive, west of the study area, are multiple civic institutions, providing a variety of services to the Gulfton community including the Southwest Multi-Service Center, The Alliance, a Library branch, Baker-Ripley, and Legacy Community Health.

There are many schools in close proximity to the study area including: Jane Long Academy, Yes Prep Gulfton, Kipp Connect, Etoile Academy, Benavidez Elementary School, and Las Americas Newcomer School.



# COMMUNITY ENGAGEMENT

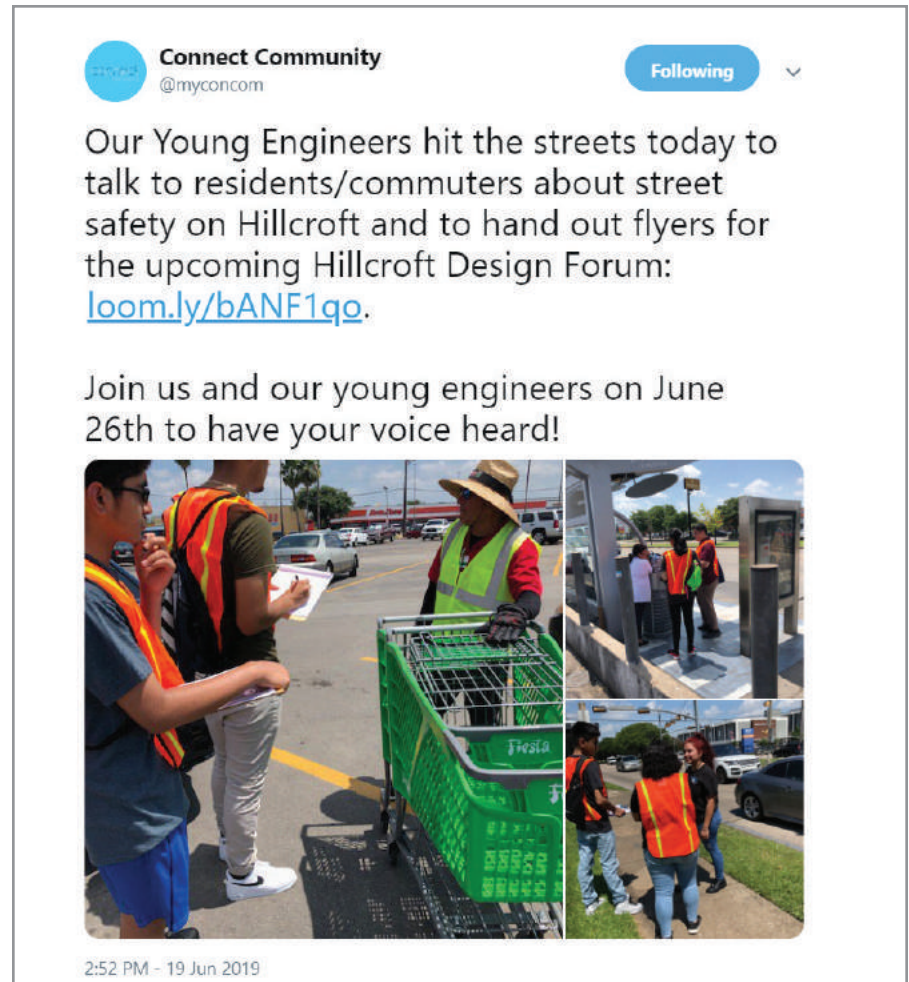
Community engagement was an essential part of defining a new vision for Hillcroft Avenue. The community was engaged through two main avenues. The first was the Summer Safety Internship. The second was through public involvement that occurred primarily with two public meetings hosted by Connect Community.

## SUMMER SAFETY INTERNSHIP

A key component of public outreach for the corridor was the Summer Safety Internship. Seven high school students who live, work, and go to school in the area were hired by Connect Community to provide valuable insight into how residents use Hillcroft Avenue and any safety or other needs they have when interacting with the street. The seven students ranged from rising sophomores to rising seniors. All students attended one of three of the high schools within the area: Jane Long Academy, Kipp Connect, and Yes Prep Gulfton.



PROJECT TEAM AND INTERNS IN THE FIELD



### CONNECT COMMUNITY SOCIAL MEDIA POST

The Summer Safety Internship was a seven week program that aligned with the safety assessment and development of recommendations as shown in **Figure 4**. The detailed schedule of the Summer Safety Internship is included in **Appendix A**. During the interns' first week of the internship, TEI hosted a workshop to provide a crash course in transportation planning and traffic engineering. TEI also presented preliminary findings from the data collection and analysis (**Appendix C**). After the workshop, the interns conducted a field visit with the





PROTOTYPE DEVELOPED BY INTERNS WHILE AT TXRX

project team, including staff from Houston Public Works. The field visit included walking all sidewalks along the entire length of the Hillcroft Avenue study area as well as short detours to areas of interest including High Star Drive. In the field, the project team assessed design and safety concerns while interns shared their insights and experiences as daily users of Hillcroft Avenue.

During the first weeks, the interns were exposed to various traffic engineering analyses and processes including signal timings, pedestrian crossing time calculations, ADA sidewalk and curb ramp standards, City of Houston design standards, the *Texas Manual on Uniform Traffic Control Devices (TMUTCD)*, and signage standards that helped facilitate the prototypes and recommendations they would develop during the internship.

Interns assisted with developing materials for the First Public Meeting. The purpose of the First Public Meeting was to share existing conditions and the results of the interns' in-person surveys conducted along Hillcroft Avenue to better understand the concerns and needs of the public about this corridor before developing recommendations. The

seven interns formed three groups to develop existing conditions and needs assessment boards. The boards developed for the First Public Meeting are included within **Appendix B**.

After the First Public Meeting, the interns used the information from the safety assessment, public input, and design preferences to develop their own safety improvement projects for Hillcroft Avenue and the study area. The students spent three weeks at TXRX, a non-profit makerspace, to build out prototypes that depicted their design recommendations for Hillcroft Avenue.

Each team came to the conclusion that the design of Hillcroft Avenue caters to the vehicle rather than people walking and bicycling. Their prototypes focused on reducing the amount of space allocated to vehicles and increasing the pedestrian and bicycle realms. In addition, each team focused on safety concerns of interest to them.

One team focused on ways to decrease vehicular speeds along the corridor. They recommended more signage, in visible locations, and minimizing unsafe crossing locations for people by using landscaping within the median to make an aesthetically pleasing barrier and direct people to safer crossings such as crosswalks.



INTERNS DURING A TOUR OF HOUSTON TRANSTAR

The second team focused on the cross section of the corridor and proposed a cross section that dedicated more space to people walking and bicycling by installing a bikeway and increasing the pedestrian realm by widening sidewalks and pedestrian refuges within the median. They also focused on lighting and shading along sidewalks and suggested pedestrian-level lighting should alternate with trees to provide lighting and shade at all times of day.

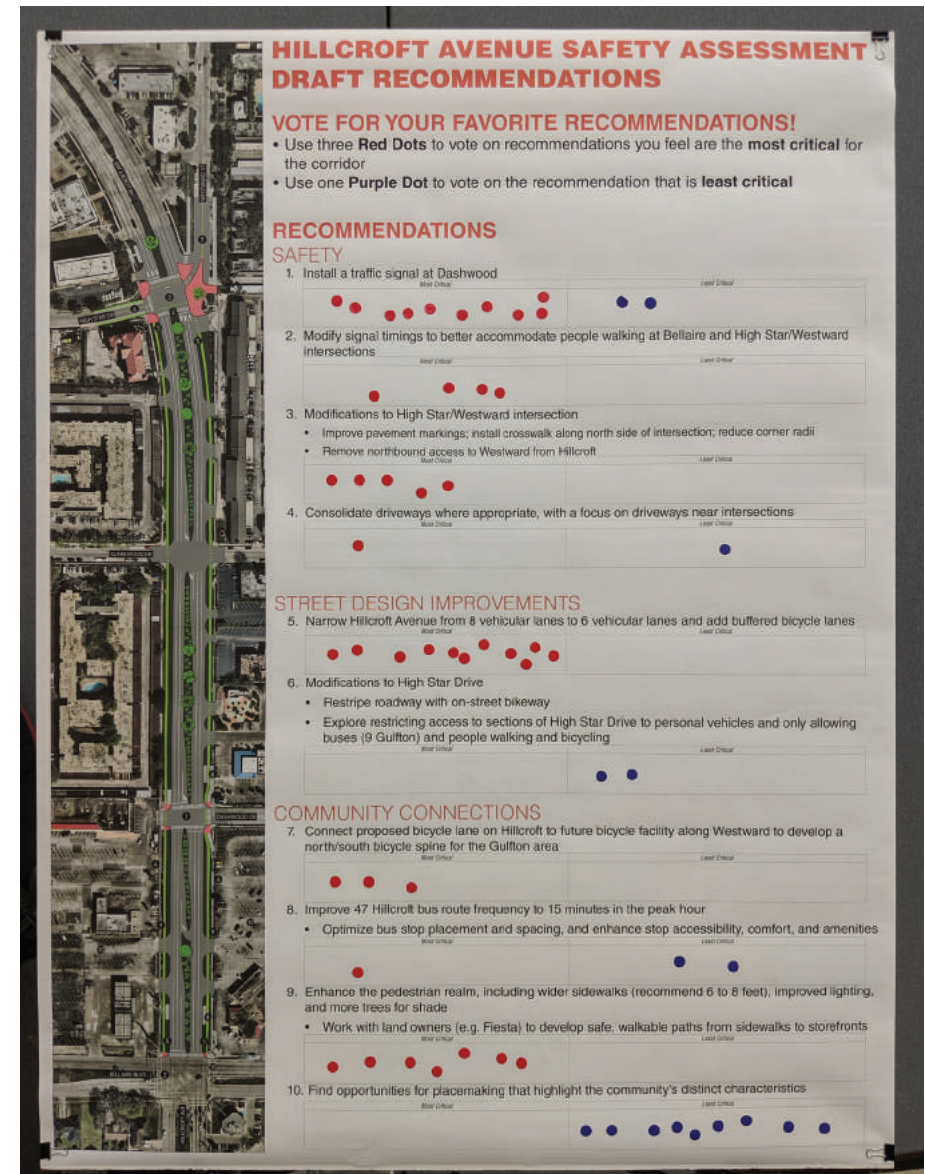
The third team focused on both the lack of crosswalks and the lack of maintenance of existing crosswalks. The team recommended that crosswalks be more engaging and visible to drivers. They also saw an opportunity for developing culturally-influenced designs that would resonate with the diverse Gulfton community.

At the Second Public Meeting, the interns presented their prototypes and boards with conceptual recommendations for public feedback. The interns also presented to the City of Houston Public Works staff during a tour of Transtar, City Council District J Councilman Mike Laster at his office, and to the full City Council.

## PUBLIC INVOLVEMENT

Engaging the community was a central component of this project. Understanding the needs of the community and how they move through Gulfton during a typical day would lead to better recommendations and ensure community buy-in for recommended projects. Operating under the premise that understanding the needs of the community and how they move through Gulfton during a typical day would lead to better recommendations and community buy-in, two public meetings, hosted by Connect Community, were held at the Southwest Multi-Service Center.

The First Public Meeting, held on June 26, 2019, introduced the public to the Hillcroft Safety Assessment project and how all data that had been collected along the corridor will inform the project team recommendations for corridor improvements. The community was engaged through a variety of interactive activities at the meeting. Community members were encouraged to develop their own ideal roadway cross section for Hillcroft Avenue by balancing mobility needs and making tradeoffs for different roadway users. The



COMMUNITY VOTES FOR EACH RECOMMENDATION AT SECOND PUBLIC MEETING

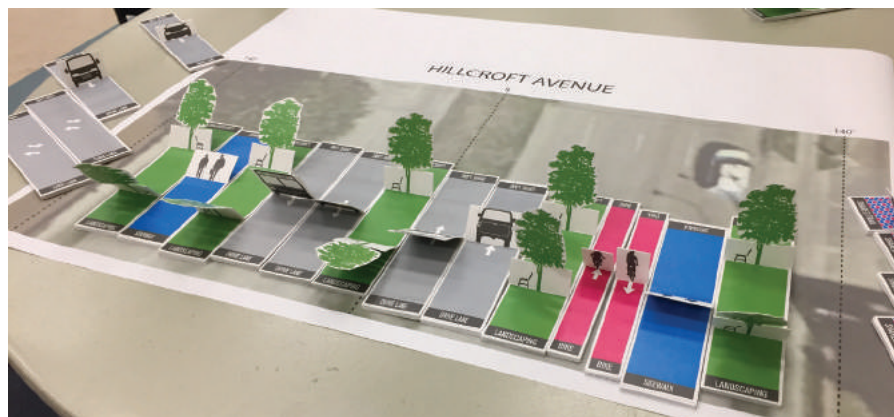


community was asked to show where they lived and worked as well as other key destinations in the area to help focus recommendations. Additionally, there was an opportunity for the community to speak about their experiences along the corridor.

Based on input from the First Public Meeting, ten key recommendations were developed. These recommendations focus on design improvements to support Hillcroft Avenue as the main street of Gulfton. Hillcroft Avenue is the key corridor for residents traveling to and from work, school and shopping and dining. The future design of the corridor should reflect this by focusing on improving mobility for all users along Hillcroft Avenue.

At the Second Public Meeting, held on July 31, 2019, the community was presented with recommendations, reflective of their prior input, for improving Hillcroft Avenue. They prioritized the recommendations and voted for their top priorities. Additionally, the public shared where additional connections, building off the recommendations within the Hillcroft study area, should be made.

Community engagement was a critical element to develop recommendations and define projects for the corridor. Working closely with the Summer Safety Interns provided an additional layer of community support that enhanced this project and the resulting recommendations.



COMMUNITY-DEVELOPED CROSS SECTION AT FIRST PUBLIC MEETING



INTERNS EXPLAINING PROTOTYPES AT SECOND PUBLIC MEETING



INTERNS PRESENTING AT SECOND PUBLIC MEETING

# SAFETY ASSESSMENT

The safety assessment conducted for Hillcroft Avenue between Bellaire Boulevard and High Star Drive is based on data collected along the corridor, in-field experiences, and input from the public about their experiences along the corridor. Data collection was conducted by Houston Public Works. In addition, Brisk Synergies conducted a study on collision near-misses along the corridor and provided outputs of their analysis to the project team.

The safety assessment, conducted with assistance from our high school interns, developed seven key findings for the study area. Additional details, data, and analysis from the safety assessment are included in **Appendix C**.

## HIGH CORRIDOR CRASH RATE

A detailed crash analysis was conducted to identify potential vehicle crash trends and roadway deficiencies within the study area. The study area (0.4 miles of Hillcroft Avenue) had a total of 333 reported crashes between 2014 and 2018. The crash rate for Hillcroft Avenue within the study area is 360 crashes per 100 million vehicle miles traveled, a rate that is two times the state average compared to similar urban roadways. Twelve of those crashes involved a person walking and ten involved a person bicycling. There were two fatalities during the time period, both were people walking.

The greatest concentration of crashes occurred at the Hillcroft Avenue and Bellaire Boulevard intersection, while the greatest concentration of pedestrian and bicycle crashes occurred at both Hillcroft Avenue at Dashwood Drive and Hillcroft Avenue at Bellaire Boulevard intersections, as shown in **Figure 6**. These two hotspots are not surprising considering the high number of people crossing Hillcroft Avenue at Dashwood Drive and at Bellaire Boulevard. Additional crash analyses are included in **Appendix C**.



**FIGURE 6** PEDESTRIAN & BICYCLE INVOLVED CRASH DENSITY

Brisk Synergies conducted a study, in parallel to this study, on collision near-misses along the corridor and provided outputs of their analysis to the project team. Crash data only gives a snapshot of collisions that have occurred. Understanding collision near-misses can provide an additional layer of understanding to a safety assessment. Brisk Synergies provided video of near-miss collisions along the corridor to help visualize safety issues within the study area. They intend to use this data for a before and after analysis of safety improvements along Hillcroft Avenue.



## HIGH VEHICULAR SPEEDS AND EXCESS VEHICULAR CAPACITY

The speed limit along Hillcroft Avenue is 35 miles per hour. Speed data collected in May 2019 indicated that the 85th percentile speed is 41.5 mph and that over seven percent of vehicles (2,275 daily vehicles) were traveling over 45 mph. Field observations were conducted with a speed radar gun that highlighted a number of vehicles traveling at speeds over 50 mph along the corridor.

The wide four-lane roadway (47-feet wide in each direction) encourages drivers to speed due to its design. A roadway redesign that properly allocates space and provides lane capacity more in-line with demand will help reduce speeds by providing more visual queues to drivers to slow down along Hillcroft Avenue.

The data shows that current average daily traffic (ADT) along Hillcroft Avenue is approximately 32,600 vehicles, down 20 percent from 2014 ADT counts when approximately 40,450 cars passed along Hillcroft Avenue. Turning movement counts (TMCs) including vehicles, pedestrians, and bicycles were collected at all intersections. The TMCs were used to assess existing intersection operations. Capacity analyses were conducted at all intersections and field observations verified analyses. Details on the capacity analyses are included within **Appendix C**.

The team analyzed the existing Hillcroft Avenue eight-lane cross section and two future proposed scenarios. The first proposed scenario included a six-lane cross section with no additional signals. The second proposed scenario included a six-lane cross section with a new signal at Dashwood Drive. The analyses, supported by field observations, indicate a reduction of lanes maintain operations at study area intersections. The signal at Dashwood Drive improves operations at this intersection by reducing delay for vehicles on the westbound approach. These results indicate there is excess vehicular capacity along Hillcroft Avenue.

One concern with reducing the capacity of Hillcroft Avenue intersections is the increase in queue length. Through the analysis,

queueing at the signalized intersection was reviewed and while there could be slight increases in queueing, the intersection operating capacity is maintained, indicating that the vehicles queued are able to clear the intersection without additional delays. Therefore, queueing at the intersections does not significantly change with reduced capacity along Hillcroft Avenue.

## HIGH VOLUME OF TRANSIT USE AND PEOPLE WALKING

Approximately 40 percent of all Gulfton residents use walking, biking, or transit as their primary modes of transportation. Field observations and public input highlighted the number of people walking along the corridor to either a destination along Hillcroft Avenue, a destination across Hillcroft Avenue, or to one of the nine bus stops within the study area.

Hillcroft Avenue has strong public transit connections with four bus routes with stops within the study area. METRO Bus Route 47 Hillcroft travels through the study area along Hillcroft Avenue and METRO Bus Route 9 Gulfton travels through the Hillcroft Avenue/High Star Drive/Westward Street intersection along High Star Drive. METRO Bus Routes 2 Bellaire and 402 Bellaire Quickline travel along Bellaire Boulevard passing through the Hillcroft Avenue intersection.

METRO transit data indicates that on an average day approximately 2,370 people board or alight the bus within the study area. Roughly 1,550 boardings and alighting occur at the intersection of Hillcroft Avenue and Bellaire Boulevard. The eastbound and westbound bus stops at the intersection rank within the top 65 for total activity across all METRO transit stops (a total of almost 9,000 stops).

Approximately 530 people board or alight the bus along Hillcroft at Dashwood Drive or Clarewood Drive, unsignalized intersections. Figures included in **Appendix C** depict the proportion of boardings and alighting with respect to locations of available safe crossings across Hillcroft Avenue. The transit data indicates a high percentage of people who take transit are required to cross Hillcroft Avenue on at least one leg of their journey.

Field observations supported the data collected. Many people were witnessed walking along the corridor either to a local business or a bus stop. Bus stops were typically occupied with people waiting for the next bus to approach. At the Dashwood Drive intersection, many people were observed crossing the street while dodging vehicles.

## LACK OF SAFE AND VISIBLE CROSSINGS

There is a lack of safe and visible crossings for people walking or bicycling along or across Hillcroft Avenue. At signalized intersections, the pedestrian signal timings were inadequate for crossing roadways during a single walk phase. Signal timings have been designed for the person walking to wait within the median instead of having the necessary time to cross the entire crosswalk during one walk phase.

At the intersection of Hillcroft Avenue at High Star Drive/Westward Street, the time to cross the intersection from the northwest corner to the northeast corner was upwards of five minutes. Due to these frustrating crossing patterns, many pedestrians were observed running across intersections to cross during one walk phase or crossing where there is no crosswalk.

At both unsignalized intersections, specifically Dashwood Drive, many people still cross the street despite no signalized crossing and were witnessed dodging vehicles. The Dashwood Drive intersection is a popular crossing point due to the Fiesta Mart and the location of the 47 Hillcroft bus stops.

## CHALLENGES FOR DRIVERS

The eight vehicles lanes and high speeds along Hillcroft Avenue also present challenges for drivers. The wide roadway results in a high amount of weaving as drivers navigate to turn left or turn right at an intersection or driveway. High speeds can increase these weaving challenges for drivers.

High speeds also affect the ability for vehicles waiting at driveways and side streets to turn on to Hillcroft Avenue. During the First Public Meeting, residents expressed their safety concern about turning onto Hillcroft Avenue from both Dashwood Drive and Clarewood Drive due to the number of lanes and the high vehicle speeds of on-coming traffic.

The traffic analysis conducted at both unsignalized intersections identified long approach times for the stop controlled approaches. The long approach times are a result of drivers being unable to find gaps in traffic along Hillcroft Avenue to safely turn or travel through the intersection. The analysis indicated that a signal at Dashwood Drive would decrease delays on the Dashwood Drive approach. A signal would provide vehicles with protected turning movements, eliminate conflicts with on-coming vehicles, and allow pedestrians a safe crossing to and from Dashwood Drive and Fiesta Mart.

## OPPORTUNITIES FOR CORRIDOR ENHANCEMENTS

The most frequent comment from both the interns and members of the community was related to the experience of walking along Hillcroft Avenue. There were many observations related to narrow sidewalks and lack of shade along most of the corridor. The block between Dashwood Drive and Clarewood Drive, on the west side, has some excellent trees providing great shade for pedestrians traveling along the corridor. Interns noted they could feel the difference of walking this segment of sidewalk versus a segment with minimal tree coverage.

Lack of lighting was often mentioned by both interns and community members. Adding pedestrian lighting along the sidewalks would improve both the walking experience and safety.

## STRONG COMMUNITY SUPPORT FOR A SAFER HILLCROFT AVENUE

This safety assessment is not the first mobility-focused study in the Gulfton area. It builds on many previous studies conducted by the City of Houston through the Complete Communities initiative, Connect Community, and Kinder Institute for Urban Research at Rice University. All studies have indicated that residents have a strong desire for multimodal connections through Gulfton that are safe and attractive. Hillcroft Avenue has been highlighted due to the high crash rate along the corridor. The community wants the design of Hillcroft Avenue to support the corridor as the main street of Gulfton.





RUSHING TO CROSS THE INTERSECTION



CONFLICT POINTS AT MEDIAN OPENINGS



CROSSINGS AT DASHWOOD INTERSECTION



MIDBLOCK CROSSING



WALKING WITH A DESIRE FOR MORE SHADE



STUDENT BICYCLE AT JANE LONG ACADEMY



HIGH BOARDING ACTIVITY NEAR FIESTA



FADED CROSSWALKS



HIGH VEHICLE SPEEDS



## RECOMMENDATIONS:

### A BOLD VISION FOR HILLCROFT AVENUE, THE MAIN STREET OF GULFTON

Hillcroft Avenue is the main street of Gulfton. It is the key corridor for residents traveling to and from work, grocery shopping, getting their kids to and from school, and enjoying an evening meal at one of the many local restaurants along the corridor.

While Hillcroft Avenue currently operates as the main street of Gulfton, the existing roadway design does not complement how the roadway is used. The roadway is 8-lanes wide, with a wide outside lane, that encourages high-speed vehicular traffic through the corridor. It is recommended that a new, bold vision for Hillcroft Avenue be created that redesigns the corridor to better complement how the community uses the corridor by providing safe spaces for all users. Hillcroft Avenue should support local area businesses by making the corridor a destination, providing safe mobility for residents getting to school or to work, and actually looking and feeling like the main street of the Gulfton area.

Ten recommendations were developed in three categories: safety and near-miss crash prevention, street design improvements, and community connections supporting the bold vision of redesigning Hillcroft Avenue into the main street of Gulfton. The ten recommendations are based on findings from the safety assessment, input and design ideas from the Summer Safety Interns, and other community input collected during the First Public Meeting.

These ten recommendations were presented to the community at the Second Public Meeting. The public expressed strong support for the new, bold vision for Hillcroft Avenue. These recommendations were compiled into three implementation phases discussed in more detail in the next section of the report.

## SAFETY & NEAR-MISS PREVENTION RECOMMENDATIONS

### ONE

#### Install a signalized intersection at Dashwood Drive

The installation of a traffic signal at Dashwood Drive is recommended to support safe crossings and transit access to the two bus stops located at the intersection. The traffic signal will also decrease vehicle conflicts points at this median opening, an oft-expressed concern from residents.



**FIGURE 7** PROPOSED TRAFFIC SIGNAL AT DASHWOOD DRIVE



## TWO

### Re-time signals at both Bellaire Boulevard and High Star Drive/Westward Street

Signal timing modifications are recommended to allow for one-stage pedestrian crossing at key crossings within the study area. At the north- and southbound crosswalks at Bellaire Boulevard and the east and westbound crosswalks at High Star Drive, a pedestrian is unable to completely cross the street in one crossing phase. This results in a pedestrian either waiting for a complete cycle in the median (cycle times are two minutes) or running across the intersection. While in the field, the team rarely saw people waiting within the median. Instead, people typically crossed against the walk phase, ran across the corridor, or just avoided the signal all together.

While in the field, observations of the existing signal timing indicated there may be opportunities to alter signal timings to remove two-stage pedestrian crossings without making significant changes to the overall timing for each of the vehicle approaches. One recommendation for Bellaire Boulevard is to only use concurrent lead or lag (instead of lead/lag) left-turn phasing to increase the time of concurrent through movement which will result in more time for the pedestrian crossing.

In addition, due to the high number of people walking within the study area, it is recommended that the City consider removing push buttons and have pedestrian phases run every cycle.

## THREE

### Modifications to High Star Drive/Westward Street intersection

The skew of the intersection of Hillcroft Avenue at Westward Street/High Star Drive presents challenges for all roadway users. To improve safety, it is recommended that the northbound dedicated right-turn lane be removed. All radii should be reduced, where possible, to reduce vehicular turning speeds.

To improve the crossing experience for people walking, pavement markings need to be replaced. In addition, a crosswalk across the southbound approach should be installed. If a persons wishes to walk

from the northwest corner to the northeast corner, they are required to walk counterclockwise around the intersection, instead of directly across. Due to the existing two-stage pedestrian crossing along the northbound approach, this can take up to 4.5 minutes.



**FIGURE 8** PROPOSED IMPROVEMENTS AT HIGH STAR/WESTWARD

## FOUR

### **Consolidate driveways where appropriate, with a focus on driveways in close proximity to intersections**

Driveways cause conflicts for all roadway users. It is recommended that driveways be consolidated where appropriate and cross access between adjacent properties be encouraged. Driveways near intersections substantially increase conflict points for drivers and should be the focus of consolidation or closure.

## STREET DESIGN IMPROVEMENTS

## FIVE

### **Reallocate space along Hillcroft Avenue to improve safety and experience for all users**

It is recommended that the outside 14' travel lane be converted into a raised island and a protected bicycle lane. This can be done without a full roadway reconstruction by saw-cutting into the existing pavement and installing new curbs. Special attention will need to be paid to the existing drainage inlets along Hillcroft Avenue to ensure no adverse impacts to drainage as a result of the new raised island.

It is also recommended that the two inside vehicular lanes be narrowed from 11' to 10'. The outside lane should remain 11' to accommodate the existing bus routes along Hillcroft Avenue. Narrowing the roadway cross-section and narrowing vehicular travel lanes will help reduce vehicular speeds.

The proposed cross section will decrease the crossing distance for people walking across Hillcroft Avenue. The narrowing of the two inside lanes to 10' will shorten pedestrian crossing distance even more. The raised island will act as protection for cyclists and can be used for floating bus stops to reduce conflict between buses and bicyclists. The islands can create space for plantings and art installations that tie into the community. METRO should be coordinated with on bus stop design as they are currently updating their standards.

## SIX

### **Convert High Star Drive into a Community Plaza**

It is recommended that the City redesign High Star Drive into a Community Plaza that prioritizes space for people walking and bicycling in addition to providing a gathering space that supports the adjacent land uses and public services. The plaza should either restrict access, or fully prevent access, for personal vehicles.

There are a variety of roadway treatments that can be explored to convert the roadway into a plaza space, including a narrower roadway section, a Woonerf (a roadway where space is shared by all users, traffic calming is used, and speeds are low), and bollards to control access during specified times of day.

## RECOMMENDATIONS FOR COMMUNITY CONNECTIONS

Making design improvements to Hillcroft Avenue will provide an opportunity to expand multimodal connections within the community. The following recommendations are focused on ways to improve overall connectivity for all modes as well as aesthetic improvements and placemaking. Design ideas are presented on the following pages.

## SEVEN

### **Connect proposed bicycle lane on Hillcroft Avenue to planned bikeway along Westward Street to develop a north/south bicycle spine**

Westward Street bikeway is currently on the City's CIP list for bicycle projects. The Westward Street bikeway would also provide an opportunity to connect Gulfton across IH-69/US 59 to the Hillcroft Transit Center.



## EIGHT

### **Improve 47 Hillcroft bus route frequency to 15 minutes in the peak hour**

This recommendation is consistent with METRO's Long Range Plan (MetroNext). It is also recommended that bus stop placement be reviewed and consolidation of bus stops be considered. Currently bus stops are approximately every 700 feet within the study area. Quarter-mile spacing is the preferred spacing to balance both access and bus operations. However, existing boardings and surrounding context should be considered prior to any stop consolidation.

## NINE

### **Enhance the pedestrian realm, including wider sidewalks (6 to 8 feet), improved lighting, and more trees for shade**

It is also recommended that the community work with land owners (e.g. Fiesta Mart) to develop safe, walkable paths from sidewalks to store fronts. Currently, people walking are often directed into parking lot aisles to access a store front, instead of being provided a dedicated safe space to walk.

## TEN

### **Find opportunities for placemaking that capitalize on the distinct characteristics of the community**

Opportunities for placemaking include community specific crosswalk designs, art installations within medians, and wayfinding/signage in multiple languages.

## DESIGN IDEAS



CORRIDOR RENDERING OF HILLCROFT AVENUE FROM REVITALIZATION PLAN FOR GULFTON-SHARPSTOWN STUDY



DESIGN IDEAS FOR HIGH STAR COMMUNITY PLAZA: PAINTED PAVEMENT



# DESIGN IDEAS



DESIGN IDEAS FOR HILLCROFT:  
SEPARATED BIKEWAY WITH LANDSCAPING



DESIGN IDEAS FOR HIGH STAR COMMUNITY PLAZA:  
STREET FURNITURE



DESIGN IDEAS FOR HILLCROFT:  
DECORATIVE CROSSWALKS





# DESIGN IDEAS



CORRIDOR RENDERING OF ROOKIN STREET FROM REVITALIZATION PLAN FOR GULFTON-SHARPSTOWN STUDY



DESIGN IDEAS FOR HIGH STAR COMMUNITY PLAZA: SHARED STREETS



DESIGN IDEAS FOR HIGH STAR COMMUNITY PLAZA: PAINTED PAVEMENT



DESIGN IDEAS FOR HIGH STAR COMMUNITY PLAZA: SHARED STREETS



DESIGN IDEAS FOR HILLCROFT: MULTI-LANGUAGE SIGNAGE



# GULFTON'S MAIN STREET

## A NEW VISION FOR HILLCROFT AVENUE

### PROJECT 1

DESIGN HILLCROFT AVENUE AS GULFTON'S  
MAIN STREET

### PROJECT 2

GATEWAY TO GULFTON & HIGH STAR  
COMMUNITY PLAZA

### PROJECT 3

WESTWARD STREET SHARED-USE PATH

### EXTENSION PROJECT 1 (E1)

HILLCROFT AVENUE NORTH

### EXTENSION PROJECT 2 (E2)

HILLCROFT AVENUE SOUTH

# Project Number



**FIGURE 9** CORRIDOR SCHEMATIC, PROPOSED DESIGN





**FIGURE 9** CORRIDOR SCHEMATIC, PROPOSED DESIGN

# PROJECTS

The ten recommendations were synthesized into three projects for the study area. Through public input received at the Second Public Meeting, feasibility discussions with Houston Public Works, and an eye towards implementation within one to three-years, these three projects were identified as priorities and are presented in this section with cost estimates.

At the Second Public Meeting, the community was asked to choose between two implementation timelines for Hillcroft Avenue. The first proposed timeline included the implementation of all Hillcroft Avenue specific recommendations in a single phase that would require more preparation time on the front end for design and fund identification.

The second proposed timeline is to implement in stages, as funding becomes available. The challenge with this timeline is that while some recommendations could be implemented in the near term, the time needed to complete the entire project would take much longer and efficiencies in the construction process would be lost.

The community, along with members of Connect Community and the Summer Safety Interns, expressed preference for the first timeline that would implement improvements along Hillcroft Avenue in one phase. However, they all stressed the desire to find smaller recommendations to be implemented immediately, such as signal timing improvements, new curb ramps, and new paint at intersections and crossings. The community will continue to work with the City to find opportunities for enhancements to be implemented in the very near-term.

In addition, extension projects and future focus areas were developed and presented. An overarching goal of this safety assessment is to not only implement projects within the study area but to build momentum which will lead to more street improvements in Gulfton.

## PROJECT 1

### DESIGN HILLCROFT AVENUE AS GULFTON'S MAIN STREET

Project 1 encompasses all recommended improvements to redesign the Hillcroft Avenue corridor into the main street of Gulfton. Improvements include the reallocation of space on Hillcroft Avenue for the safe movement of all users by converting the outside lanes into landscaped buffers and protected bicycle lanes between Bellaire Boulevard and High Star Drive/Westward Street. (See **Figure 11**)

The newly-designed cross section includes widening sidewalks from 4' to a minimum of 6' and preferably 8'. To improve the walking experience, pedestrian enhancements include improved lighting and more shade trees. An important consideration in the design is that the bikeway be wide enough to accommodate City street sweepers for cleaning purposes.

The project includes the installation of a traffic signal at Dashwood Drive to support safe crossings and transit access to the two bus stops located at the intersection. The traffic signal will also decrease median conflicts points for vehicles at this median opening, a concern of residents who drive along the corridor.

To support multi-modal transit along the corridor, Project 1 includes optimizing bus stop placement and spacing. Bus stop optimization recommendations include:

- Moving the northbound Hillcroft Avenue at Bellaire Boulevard stop to the far side of the intersection
- Moving the eastbound Bellaire Boulevard at Hillcroft Avenue stop to the far side of the intersection
- Moving the westbound Bellaire Boulevard at Hillcroft Avenue stop to the far side of the intersection
- Moving the northbound Hillcroft Avenue at Dashwood Drive stop to the far side of the intersection
- Removing both bus stops at Clarewood Drive



- Moving the northbound Hillcroft Avenue at Westward Street bus stop south to be closer to the far side of the intersection

Project 1 also includes enhancements for stop accessibility, comfort, and new amenities including shelters, trash cans, and lighting. Design improvements should be implemented in coordination with METRO which is currently updating their bus stop standards.

To reduce conflict points, it is recommended that driveways be consolidated where appropriate and cross access between adjacent properties be encouraged.

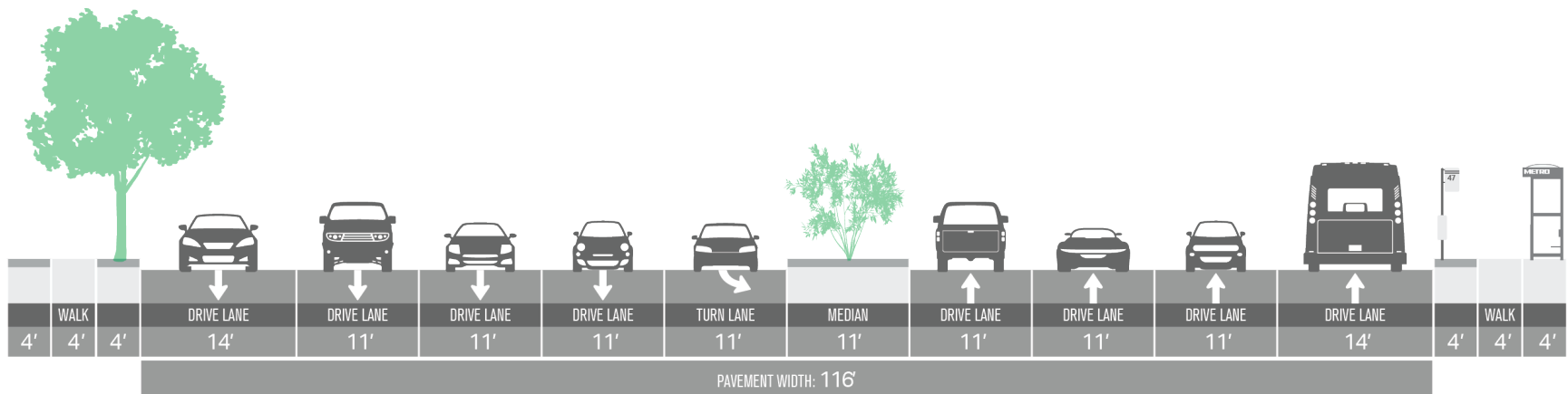
The recommended reallocation of space and redesign of Hillcroft Avenue provides opportunities to incorporate community-inspired art along the newly-landscaped buffers or within the pedestrian realm. Community-specific signage should also be considered. Ideas from interns on community-specific signage include decorative crosswalks and multi-lingual signage to highlight the multiple ethnic communities that call Gulfton home.

The estimated cost for Project 1 is \$2,028,595 with the breakdown is show in **Figure 12**. A schematic rendering of the improvements to Hillcroft Avenue between Bellaire Boulevard and High Star Drive/ Westward Street is shown in **Figure 9**.

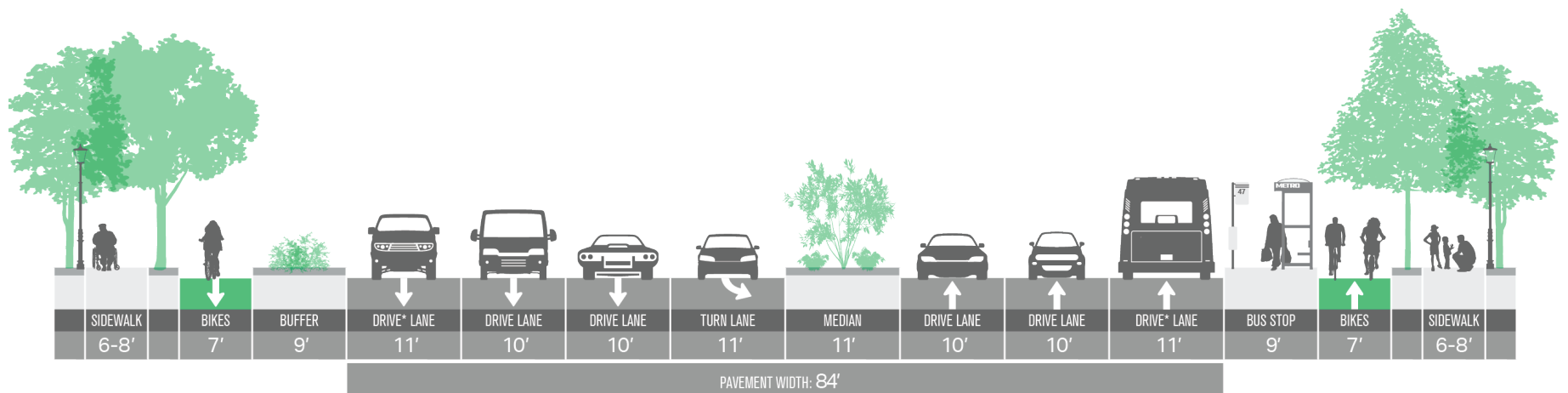
Project 1 can also be expanded on in the future if the 47 Hillcroft bus route increases frequency to 15 minutes or less in the peak hour to include a dedicated bus lane within the outside lane. The existing ADT along Hillcroft Avenue can be accommodated on a four-lane divided roadway, providing an opportunity for installing a dedicated bus lane, if future bus frequency supports it. The existing METRO Long Range Plan (METRONext) includes the recommendation for the 47 Hillcroft to become a frequent route.



DESIGN IDEAS FOR PROPOSED BIKEWAY ALONG HILLCROFT AVENUE



**FIGURE 10** EXISTING CROSS SECTION OF HILLCROFT AVENUE AT DASHWOOD DRIVE



**FIGURE 11** A NEW VISION FOR A SAFER, WALKABLE, BIKEABLE HILLCROFT AVENUE



## PROJECT 2

### GATEWAY TO GULFTON & HIGH STAR COMMUNITY PLAZA

Project 2 focuses on community enhancements within Gulfton to complement the land uses and services that are present along High Star Drive. The Southwest Multi-Service Center, the area's public library branch, Legacy Community Health, The Alliance, Baker-Ripley, and other community focused services are located along High Star Drive west of Hillcroft Avenue.

A Gateway to Gulfton is proposed for the intersection of Hillcroft Avenue at High Star Drive/Westward Street. Project 2 includes improvements to this intersection by removing the dedicated northbound right-turn lane, and the reduction of turning radii for all corners. These improvements expand the space behind the curb that can be converted into plaza spaces with trees, lighting and amenities. The Gateway to Gulfton is intended to be a physical space that both welcomes those entering the community and is a visual queue to drivers that Hillcroft Avenue is the Main Street for the community, not just a through street to be sped down.

Project 2 is primarily focused on the redesign of High Star Drive into a Community Plaza space to connect and complement the reimagining of Legacy Community Health and Southwest Multi-Service Center Campus. The redesign of High Star Drive should be designed to support programming that encourages gathering within the plaza and prioritizes comfort for people walking, bicycling, and using the plaza.

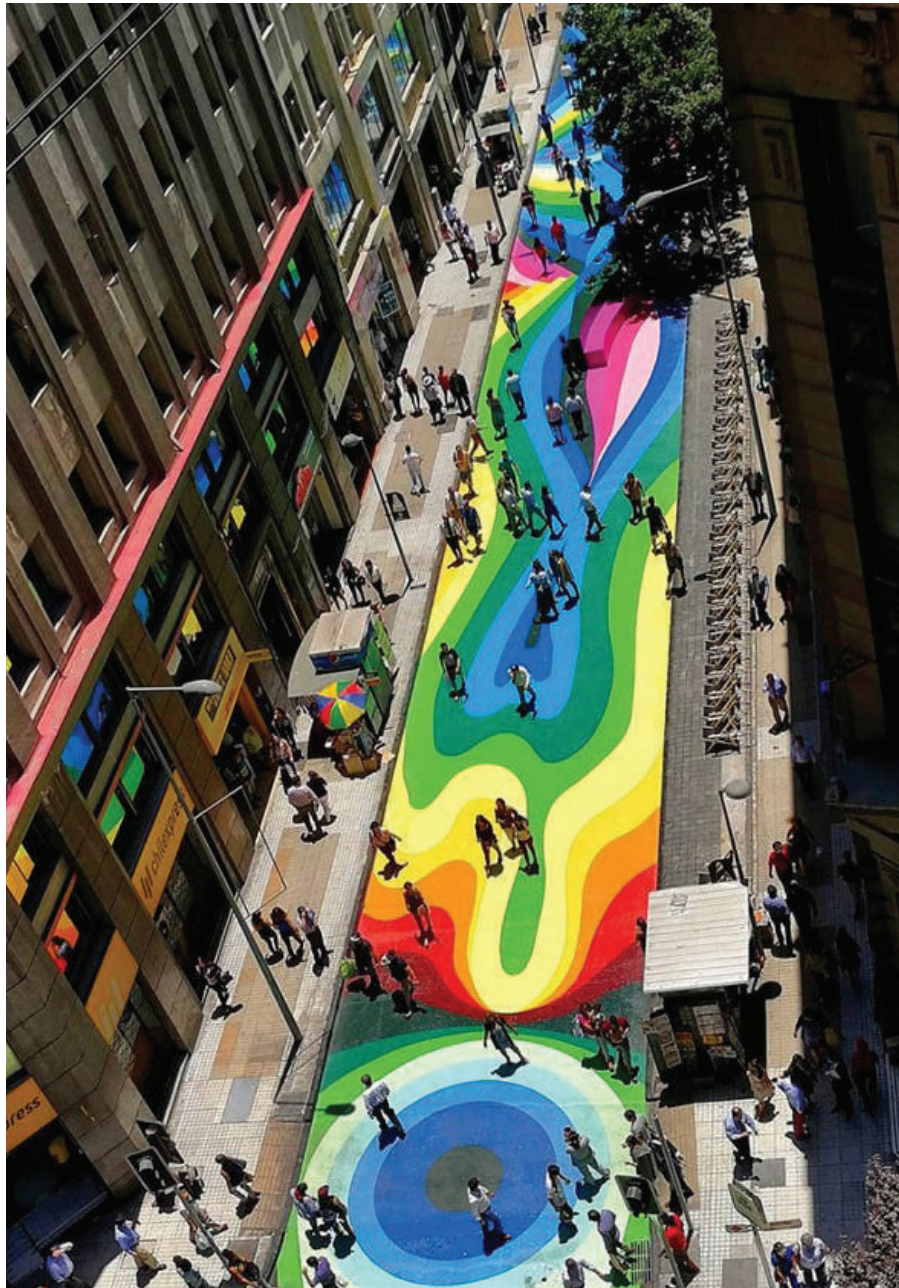
It is recommended that the City implement a design that restricts personal vehicles through High Star Community Plaza. Vehicle restriction could be all day or portions of the day or only for weekends. It is recommended that there be continued collaboration with the community to come to a consensus on how personal vehicles should be restricted through the Community Plaza.

The estimated cost for Project 2 is \$1,147,660. The cost estimate breakdown is shown in **Figure 12**. A schematic rendering of both the Gateway to Gulfton and the Community Plaza are shown in **Figure 9**.



DESIGN IDEAS FOR HIGH STAR COMMUNITY PLAZA





DESIGN IDEAS FOR HIGH STAR COMMUNITY PLAZA

## PROJECT 3 WESTWARD STREET SHARED-USE PATH

Project 3 includes the construction of a 10' shared-use path along the west side of Westward Street to connect bikeways on Hillcroft Avenue to destinations along Gulfton Street. In addition, this bicycle connection enhances bikeway connections within Gulfton included in the Houston Bike Plan (See **Figure 13**). The estimated cost for Project 3 is \$289,604. The cost estimate breakdown is show in **Figure 12**.

Westward Street is included on the Houston Bike Plan as a proposed bikeway within the street ROW. The bikeway will provide connections for many adjacent apartments, area businesses, and Benavidez Elementary School. Westward Street is also the proposed connection from the Gulfton Area south of IH-69/US 59 to the Hillcroft Transit Center which is north of IH-69/US 59. This connection is proposed via a freeway underpass east of the intersection of Westward Street at the Eastbound IH-69/US 59 Frontage Road.



DESIGN IDEAS FOR WESTWARD BIKEWAY

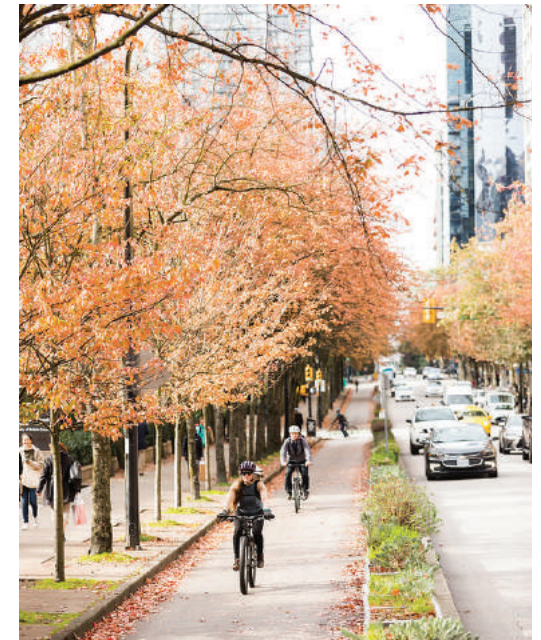
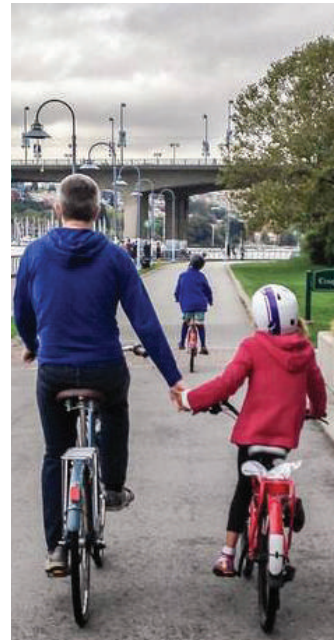




PROJECT 1	Buffered Bike Lane	\$505,000
	Signalized Intersection at Dashwood	\$300,000
	Sidewalks	\$320,000
	Lighting	\$213,300
	Trees	\$60,000
	<b>Construction Subtotal</b>	<b>\$1,398,300</b>
	Contingency (25%)	\$349,575
	Design (15%)	\$209,745
	Mobilization (10%)	\$20,975
	Traffic Control	\$50,000
	<b>Project 1 Total</b>	<b>\$2,028,595</b>
PROJECT 2	Gateway to Gulfton Plaza	\$92,000
	High Star Plaza Construction	\$399,000
	Sidewalks (8')	\$160,000
	Lighting	\$96,000
	Trees & Landscaping	\$57,000
	<b>Construction Subtotal</b>	<b>\$804,000</b>
	Contingency (25%)	\$201,000
	Design (15%)	\$120,600
	Mobilization (10%)	\$12,060
	Traffic Control	\$10,000
	<b>Project 2 Total</b>	<b>\$1,147,660</b>
PROJECT 3	Shared-use Path (west side)	\$197,600
	<b>Construction Subtotal</b>	<b>\$197,600</b>
	Contingency (25%)	\$49,400
	Design (15%)	\$29,640
	Mobilization (10%)	\$2,964
	Traffic Control	\$10,000
	<b>Project 3 Total</b>	<b>\$289,604</b>
PROJECTS 1-3	Projects 1-3 Construction Subtotal	\$2,399,900
	Projects 1-3 Contingency (25%)	\$599,975
	Projects 1-3 Design (15%)	\$359,985
	Projects 1-3 Mobilization (10%)	\$35,999
	Projects 1-3 Traffic Control	\$70,000
	<b>All Project Total</b>	<b>\$3,465,859</b>
	<b>EXTENSION PROJECT 1 (E1)*</b>	<b>\$1,957,000</b>

\*The estimated cost for this extension project is based on the Project 1 cost.

**FIGURE 12** PROJECT COST ESTIMATES



## EXTENSION PROJECTS

Two complementary extension projects to the Hillcroft Avenue redesign were developed. The first one focuses on the expansion of Project 1 to the north and the other extension project focuses on connecting the proposed bikeway along Hillcroft Avenue south.

### EXTENSION PROJECT 1 (E1)

#### HILLCROFT AVENUE NORTH

Extension Project 1 recommends the continuation of the Hillcroft Avenue main street design north from High Star Drive to IH-69/US 59. The estimated cost for this extension project is \$1,957,000. This cost is based on the Project 1 estimated cost.

### EXTENSION PROJECT 2 (E2)

#### HILLCROFT AVENUE SOUTH

Extension Project 2 includes the continuation of the Hillcroft Avenue bicycle facility south, potentially using the existing wide median, to create a strong bicycle connection to local neighborhoods south of Bellaire Boulevard, Bayland Park, and ultimately to Brays Bayou.

## FUTURE COMPLEMENTARY PROJECT IDEAS

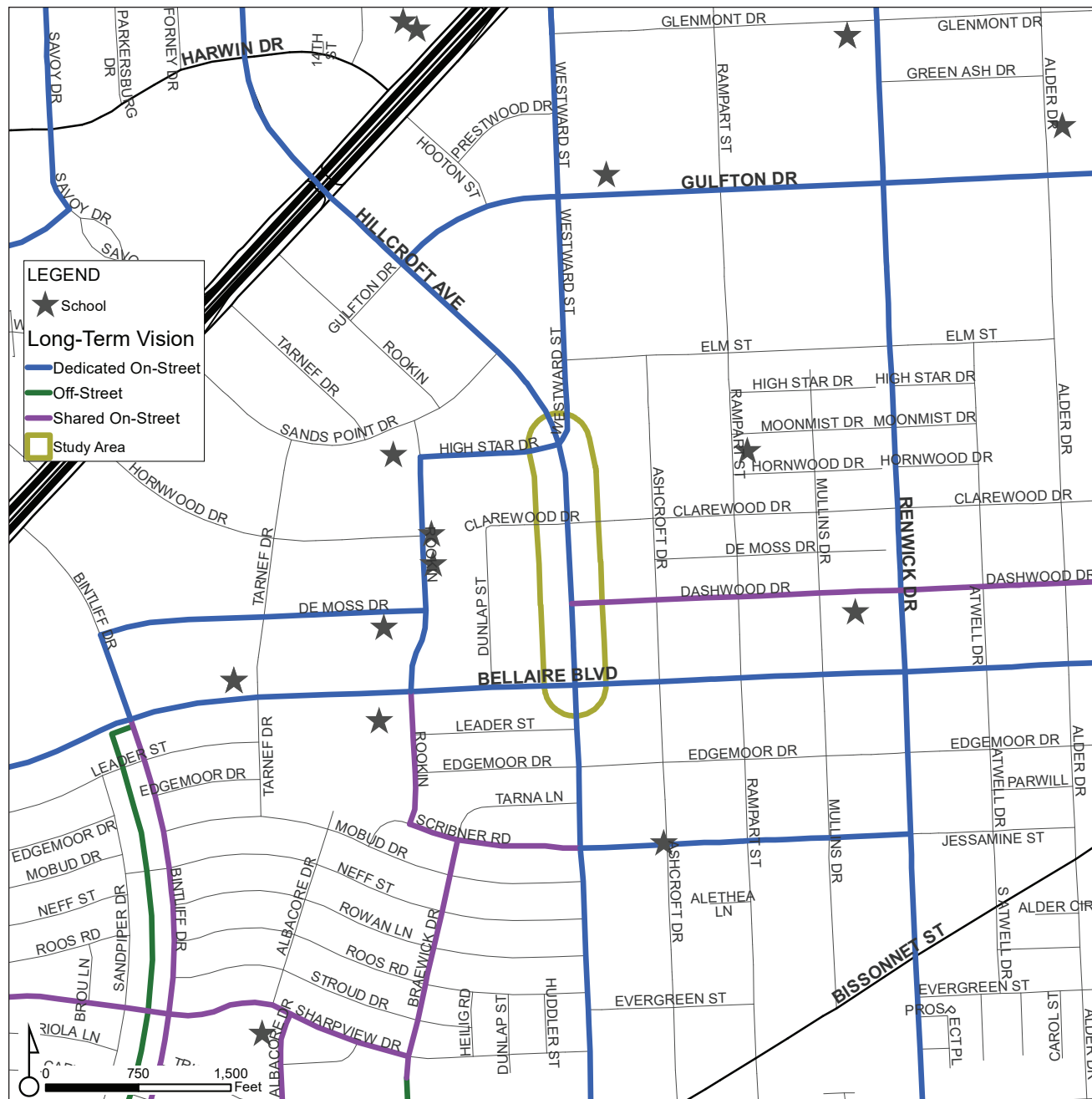
The three recommended projects for the Study Area are intended to be spring boards for future improvements within the Gulfton area to support users of all modes. Below are three future project ideas.

**DASHWOOD DRIVE:** Enhance Dashwood Drive to align with Houston Bike Plan vision for a shared on-street bicycle facility along the corridor and improve sidewalks for people walking.

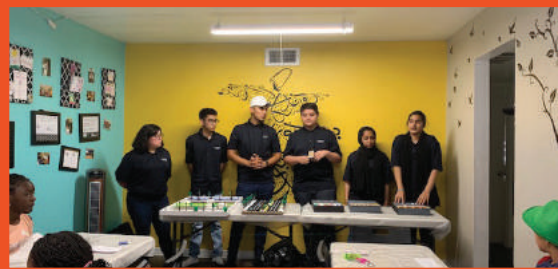
**SIDEWALK AND BIKEWAY CONNECTIONS TO AREA SCHOOLS:** It is recommended that a focus be put on improving both sidewalk connections and bikeway connections through Gulfton, focused primarily on connecting area schools. The proposed bikeways on the Houston Bike Plan Long-Term Vision that extend from High Star Drive to Bintliff Drive along Rookin Street and De Moss Drive would connect six schools, proving a safe connection for students traveling to and from school. (See **Figure 13**)

**CLAREWOOD DRIVE:** Clarewood Drive is a key connection through Gulfton, that provides connections to and from many residences to other important destinations. It is recommended that this corridor be redesigned to better serve area residents through safety improvements such as updated sidewalks, crosswalks, curb ramps, as well as shade/landscaping and improved lighting at night.





**FIGURE 13** HOUSTON BIKE PLAN LONG-TERM VISION FOR GULFTON





# APPENDIX

**APPENDIX A** - SUMMER SAFETY  
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SUMMARY & MATERIALS 41

**APPENDIX C** - DETAILED SAFETY  
ASSESSMENT 59

# APPENDIX A

## SUMMER SAFETY INTERNSHIP OVERVIEW

Seven high school students who live, work, and go to school in the area were hired by Connect Community, with funding from Together for Safer Roads, to provide invaluable insight into how residents of the neighborhood use Hillcroft Avenue and their street safety needs and concerns. The seven students ranged from rising sophomores to rising seniors. All students attended one of three area high schools: Jane Long Academy, Kipp Connect, and Yes Prep Gulfton.

The Summer Safety Internship was a seven week program that aligned with the safety assessment and development of recommendations for this project. During the first week of the internship TEI hosted a workshop with the students to provide a crash course in transportation planning and traffic engineering. TEI presented preliminary findings from the data collection and analysis, and interns conducted a field visit with the project team, including staff from City of Houston Public Works. In the field, the project team assessed design and safety concerns while interns shared their insights and experiences as daily users of Hillcroft Avenue.

During the first weeks, the interns were exposed to various traffic engineering analyses and processes including signal timings, pedestrian crossing time calculations, ADA sidewalk and curb ramp standards, City of Houston design standards, the *Texas Manual on Uniform Traffic Control Devices (TMUTCD)*, and signage standards that helped facilitate the prototypes and recommendations they would develop during the internship.

Based on the safety assessment and input from the interns, materials for the First Public Meeting were developed. The seven interns formed three groups. Each group developed boards that shared existing conditions and needs assessments.

After the First Public Meeting, the interns used the information compiled within the Safety Assessment, public input, and their own findings and design preferences to develop their own safety improvement projects for the Hillcroft corridor and study area. The students spent three weeks at TXRX, a non-profit makerspace in the East End of Houston, to build their prototypes.

Each team came to the conclusion that the design of Hillcroft Avenue caters to the vehicle rather than people walking and bicycling. Their prototypes focused on narrowing the amount of space allocated to vehicles and increased the pedestrian and bicycle realms. In addition, each team focused on a distinct safety concern.

In addition to presenting their prototypes and design recommendations to the public at the Second Public Meeting, the interns presented to City of Houston Public Works Staff during a tour of TranStar. The interns also presented their prototypes at a City of Houston Council Meeting and directly to District J City Council Member Mike Laster.



# INTERNSHIP SCHEDULE

## WEEK 1 | JUNE 17 - JUNE 21

- Project overview and an introduction to transportation planning and traffic engineering
- Team Workshop including guest speakers from METRO and Houston Public Works
- Team Field Visit with Houston Public Works
- Conducted field surveys with people walking along Hillcroft Avenue
- Advertised for the First Public Meeting by passing out fliers within the community

## WEEK 2 | JUNE 24 - JUNE 28

- Preparation for the First Public Meeting by developing boards and presentations
- Presented at the First Public Meeting and engaged with community members
- Field trip to transportation hubs throughout the region

## WEEK 3 | JULY 1 - JULY 3

- Learned skills at TXRX, a non-profit makerspace, including woodworking, laser cutting, 3D printing, jewelry making, and leather works

## WEEK 4 | JULY 8 - JULY 12

- Worked with project team on developing recommendations for Hillcroft Avenue
- Develop prototypes at TXRX to highlight each team's recommended improvements
- Initiated Junior Toastmaster class to hone public speaking skills

## WEEK 5 | JULY 15 - JULY 19

- Finalized recommendations with project team
- Finalized prototypes at TXRX
- Presented to Houston Public Works staff at TranStar

## WEEK 6 | JULY 22 - 26

- Preparation for the Second Public Meeting by creating boards and presentations
- Presented to City of Houston City Council

## WEEK 7 | JULY 29 - AUG 2

- Presented at the Second Public Meeting and engaged with community members
- Visited TEI offices to experience a "Day in the Life of Transportation Engineers"



WORKSHOP



WORKSHOP



AT CITY HALL



FIELD WORK



PRESENTING TO CITY COUNCIL

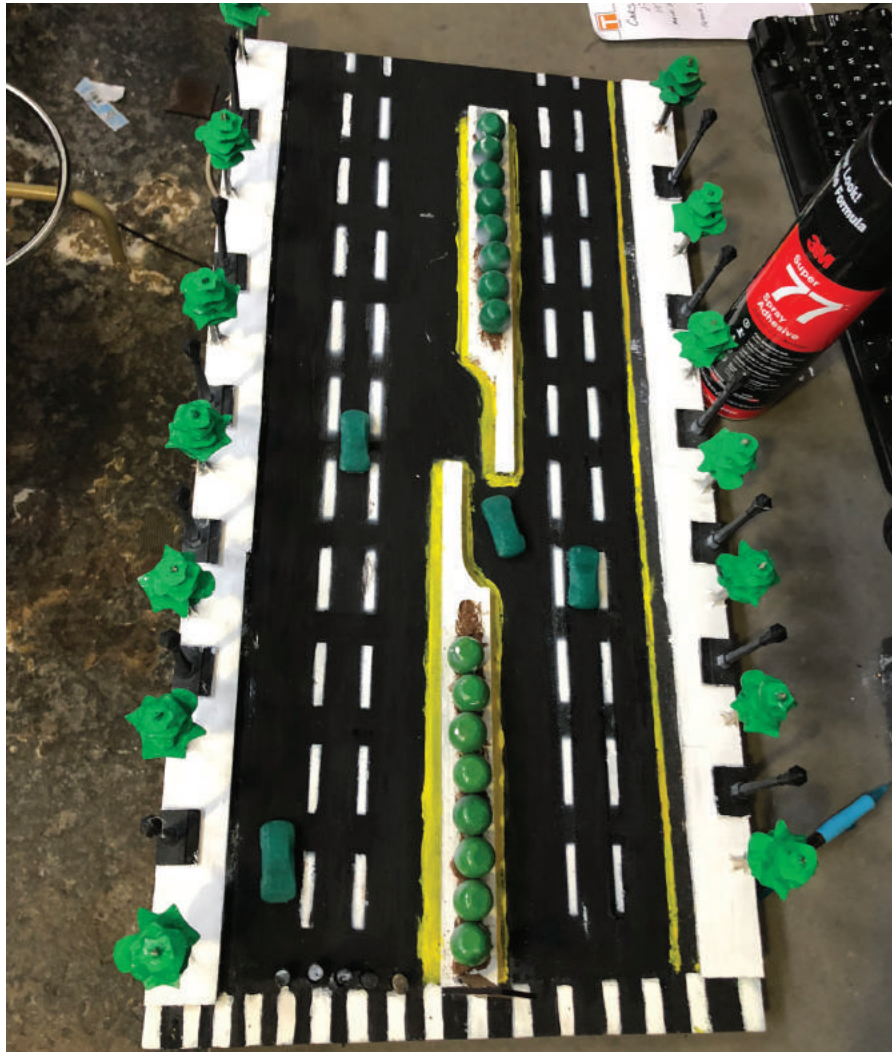


PRESENTING AT TRANSTAR

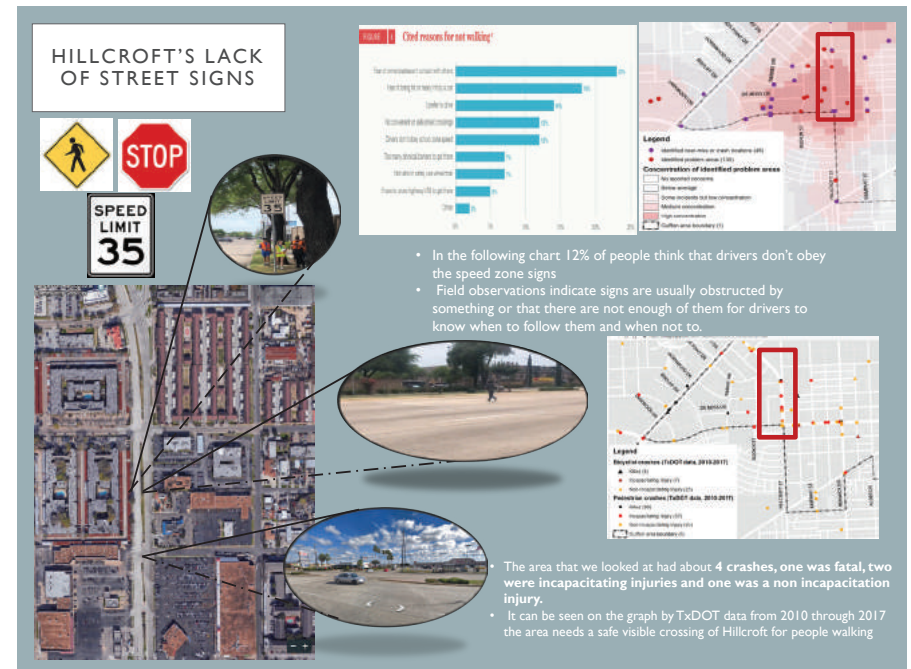


# INTERNSHIP GROUP 1

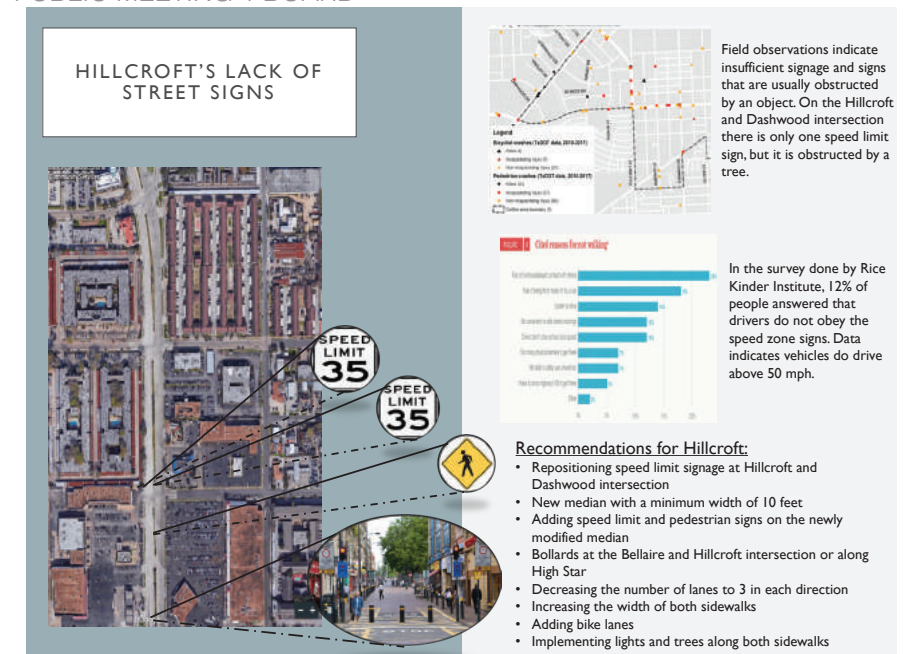
This team focused on ways to decrease vehicular speeds along the corridor. They recommended more visible signage and fewer pedestrian crossing spaces except at designated crosswalks. To minimize illegal crossings, they recommended using natural plantings in the median to act as barriers to crossing.



STREET CROSSING PROTOTYPE



PUBLIC MEETING 1 BOARD



PUBLIC MEETING 2 BOARD



# INTERNSHIP GROUP 2

This team focused on the cross section of the corridor. They proposed a cross section that dedicated more space to people walking and bicycling by installing a bikeway, increasing the pedestrian realm, widening sidewalks, and widening pedestrian refuges within the median. They also focused on lighting and shading along sidewalks and suggested pedestrian level lighting should alternate with trees to provide lighting and shade at all times of day.



PROTOTYPE

### Issues and Safety Concerns With Sidewalks and Ramps

Problem area concentrations, including near-misses and crashes

- Of the 486 street segments within the neighborhood, 36% of the segments do not have sidewalks.
- Ramps on Hillcroft Avenue do not direct pedestrians in a safe manner.
- Some Ramps direct pedestrians into the busy streets, which is a safety concern for those limited mobility and in wheel chairs.
- Some ramps do not have truncated domes that are needed to help people with vision impairment.

## PUBLIC MEETING 1 BOARD

**Currently**  
40% of residents in the Gulfton community do not drive, relying solely on walking and cycling.

Of the 486 street segments within the neighborhood, 36% of the segments do not have sidewalks.

### Improving Pedestrian Safety in Hillcroft

### Recommendations

- Expansion of Sidewalks
- Expand The Median
- Implement Bike Lanes
- Increase Shading And Lighting

## PUBLIC MEETING 2 BOARD



# 

This team focused on the lack of crosswalks and the general poor condition of existing crosswalks. The team recommended that sidewalks should be designed to be engaging and more visible to drivers. They also saw an opportunity for developing culturally-influenced designs. At the second public meeting, this team invited community members to design their own crosswalk.



PROTOTYPE

### Danger of Limited Crosswalks

♦About 40 percent of those who live in Gulfton and adjacent areas did not drive, relying instead on walking, biking, taking the bus or carpooling.

Drivers do high speeding and volume along Hillcroft. The streets have especially long distances between signalized crossings.

- Difficulties crossing wide streets safely.
- Lacking crosswalks
- Problems with poor street lighting.
- Fear of crime contributed to the challenge of walking and biking in the community.

### Cited reasons for not walking\*

Reason	Percentage
Fear of criminal activity or contact with others	40%
Fear of being hit or nearly hit by a car	30%
Lack of time	15%
No convenient or safe street crossings	10%
Others don't always follow crosswalk	5%
Insufficiently lit streets to get there	5%
Not able to safely use vehicle	5%
Other	5%

\*Based on survey data from the Hillcroft area, Hillcroft project team

### High Star

PUBLIC MEETING 1 BOARD

### Issues

- Difficulties crossing wide streets safely
- Faded/missing crosswalks
- Insufficient street lighting
- Fear of crime contributes to the challenge of walking and biking in the community

### EXISTING FADED CROSSWALK

### Possible Solutions

#### REFLECTIVE PAINT

#### SHOW DIVERSITY

#### PICTURES AND WORDS

#### BRIGHT COLORS

### Revolutionizing Crosswalks

♦About 40 percent of those who live in Gulfton and adjacent areas do not drive, relying solely on walking, biking, taking the bus or carpooling.

PUBLIC MEETING 2 BOARD



# INTERNSHIP ADVENTURES



TEAM PHOTO WITH PROTOTYPES



WORKSHOP



COMMUNITY ENGAGEMENT



RECEIVING JUNIOR TOASTMASTERS CERTIFICATES



# INTERNSHIP ADVENTURES



TEAM PHOTO WITH PROTOTYPE



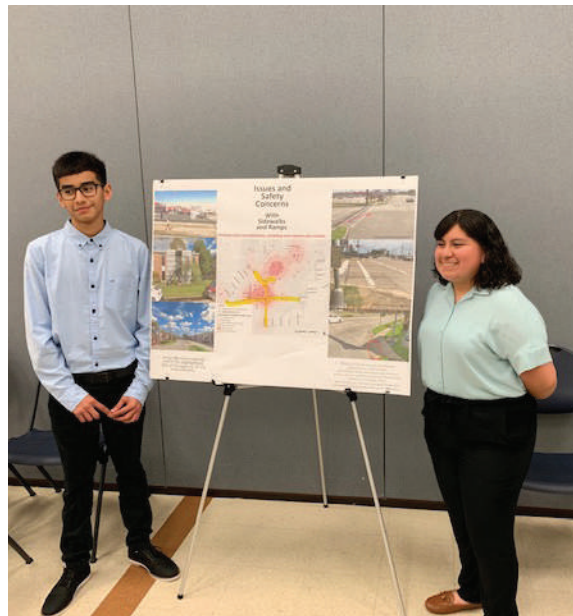
PRESENTING AT TRANSTAR



PRESENTING AT CITY HALL



FIELD VISIT TO POST OAK BOULEVARD



PRESENTING AT PUBLIC MEETING 1



PRESENTING AT TRANSTAR



# APPENDIX B

## **PUBLIC INVOLVEMENT SUMMARY & MATERIALS**

Engaging the community was a central component of this project. Understanding the needs of residents and how they move through Gulfton during a typical day would lead to better recommendations and ensure community buy-in for recommended projects. Two public meetings, hosted by Connect Community, were held at the Southwest Multi-Service Center as part of this project.

The First Public Meeting, occurred on June 26, 2019. The meeting provided an opportunity for the public to learn about the Hillcroft Safety Assessment project and to hear how the road data collected on Hillcroft will inform corridor improvements. The community was engaged through a variety of interactive activities. Community members were encouraged to develop their own ideal roadway cross section for Hillcroft Avenue by balancing mobility needs by balancing tradeoffs between vehicular throughput needs and making space for different roadway users. The community was asked to show where they lived and worked as well as other key destinations in the area to help focus recommendations. Additionally, there was an opportunity for the community to speak about their experiences on the corridor.

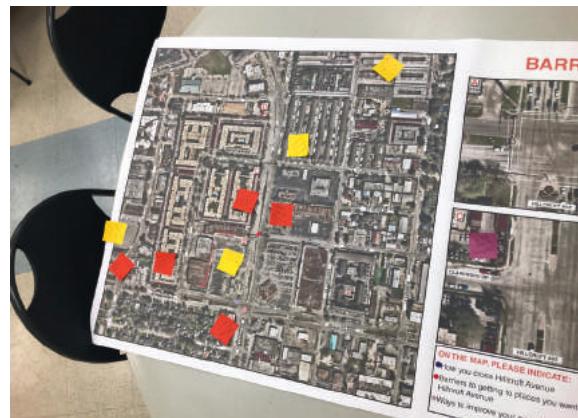
Based on input from the First Public Meeting, ten key recommendations, presented later in this report, were developed. The ten recommendations focus on design improvements to support Hillcroft Avenue as the main street of Gulfton. Hillcroft Avenue is the key corridor for residents traveling to and from work, grocery shopping, getting their kids to and from school, and enjoying an

evening meal at one of the many local restaurants along the corridor. Future roadway design should reflect this by focusing on improving mobility for all along Hillcroft Avenue.

At the Second Public Meeting, held on July 31, 2019, the community saw how their comments and input from the previous meeting had been incorporated into the recommendations proposed for Hillcroft Avenue. They voted on what recommendations were the most important and least important to them. Additionally, the public shared their opinions on where additional connections should be made to build off of the Hillcroft Safety Assessment.



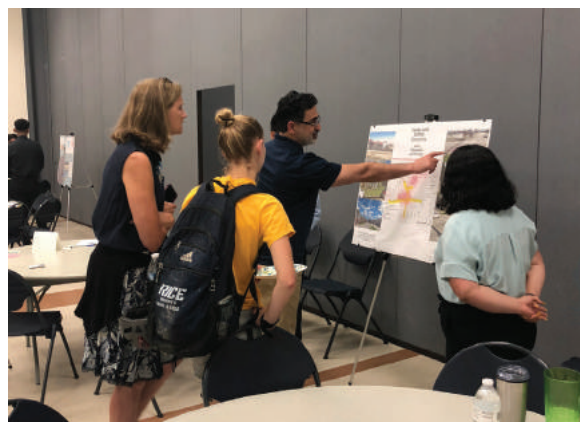
COMMUNITY INPUT FROM MEETING 1



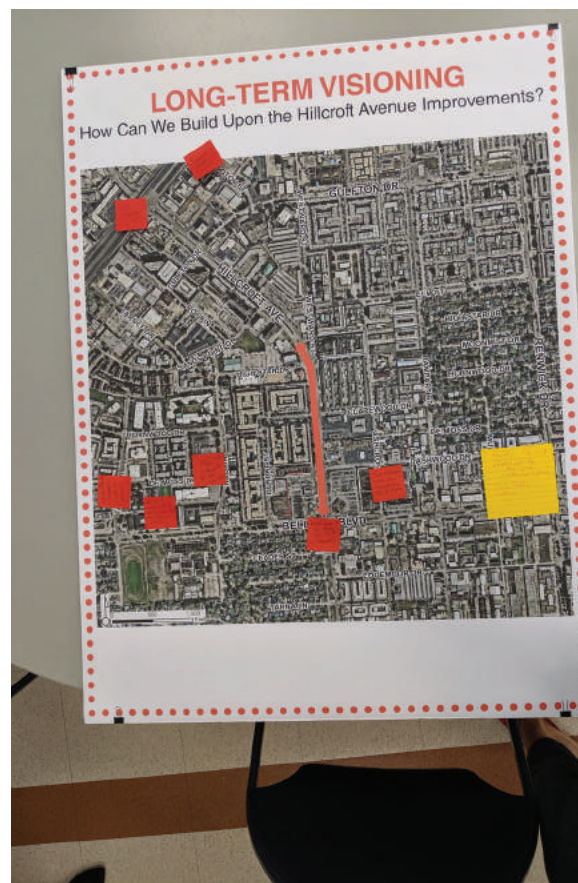
COMMUNITY INPUT FROM MEETING 1



COMMUNITY INPUT FROM MEETING 1



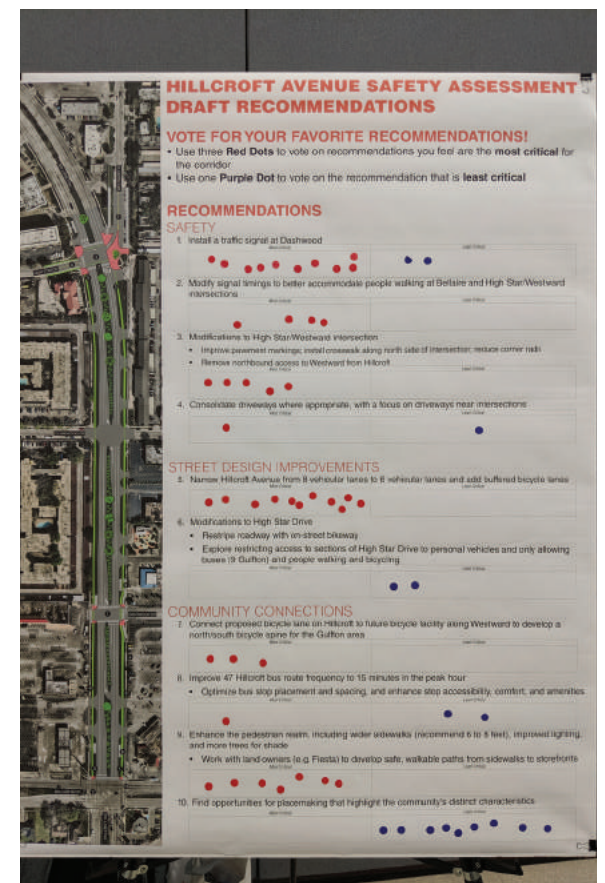
COMMUNITY DISCUSSION AT MEETING 1



COMMUNITY INPUT FROM MEETING 2



COMMUNITY DISCUSSION AT MEETING 2



COMMUNITY INPUT FROM MEETING 2



# APPENDIX B.1

## PUBLIC MEETING 1 PRESENTATION



## MEETING AGENDA

- 6:30 - 6:50 | Table Discussion and Open House
- 6:50 - 7:10 | Presentation
- 7:10 - 7:20 | Q&A
- 7:20 - 8:00 | Table Discussion and Open House
  - Please provide your input in these areas:
    - Table 1: Barriers and opportunities along Hillcroft Avenue
    - Table 2: Hillcroft Avenue street design
    - Table 3: Destinations - Where do you live, work, and go
    - Summer Safety Internship Boards



Hillcroft Design Forum

2

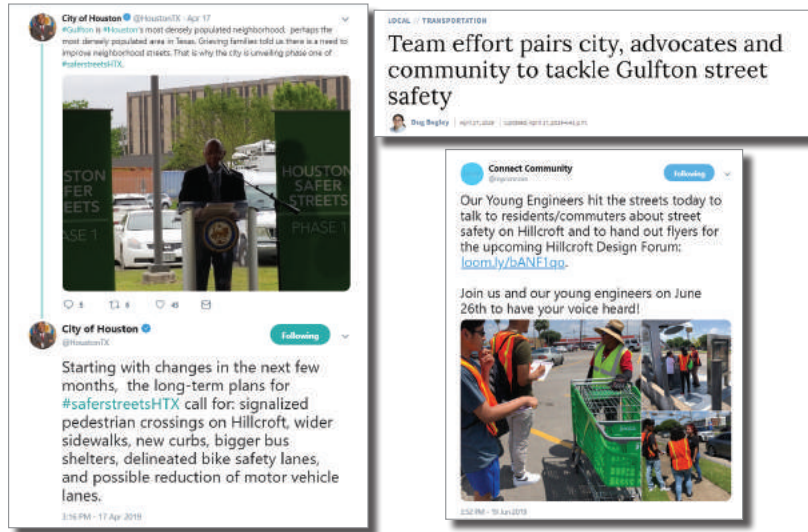
## PROJECT BACKGROUND

- Focused on finding solutions to **improve safety** along Hillcroft Avenue
- In collaboration with: City of Houston Public Works, Connect Community, and Together for Safer Roads
- Exploring **short term** and **long term** improvements
- Today is one of two **Public Meetings**
  - Today, we are gathering input from **YOU** and your **neighbors**
  - At the Second Public Meeting on **July 31, 2019**, we will present draft recommendations based on your input for **YOUR** review

Hillcroft Design Forum

3

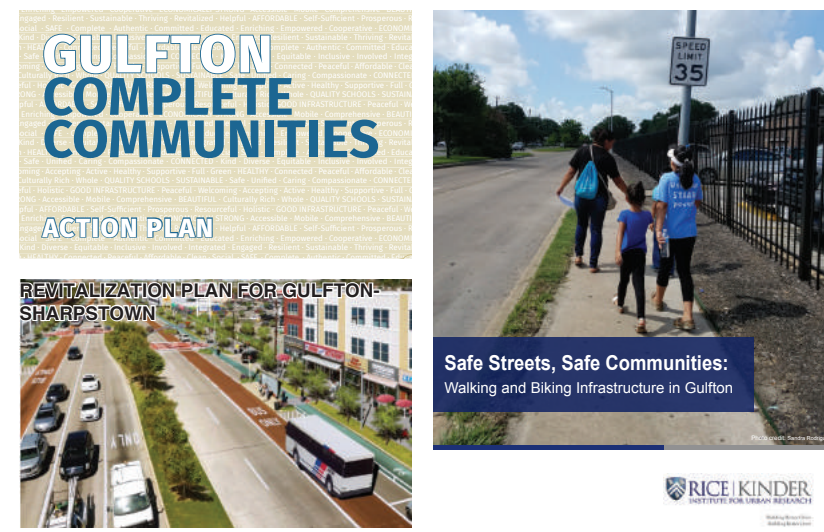
## PROJECT MOMENTUM



Hillcroft Design Forum

4

## RECENT GULFTON STUDIES



Hillcroft Design Forum

5



## THE GULFTON AREA



- Key corridors include:  
Gulfton Dr, Bellaire Blvd, Chimney Rock Rd, Renwick Dr, & Hillcroft Ave
- Home to about 90 apartment complexes with more than 15,000 units developed in the 1960s and 1970s
- Gulfton is the densest residential community within Houston  
Population density is approx. 15,000/ sq mi
- About 40% of residents do not drive
- Area with distinct transportation challenges

Hillcroft Design Forum

6

## HILLCROFT AVENUE STUDY AREA



- Extents:  
Hillcroft Avenue between Bellaire Boulevard and High Star Drive/Westward Street
- Length:  
2,130 feet (0.4 miles)
- Signalized Intersections:
  1. Bellaire Boulevard
  2. High Star Drive/ Westward Street
- Unsignalized Intersections:
  1. Dashwood Drive
  2. Clarewood Drive

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## DESTINATIONS IN GULFTON



- Hillcroft is a key thoroughfare for the area, providing accesses to many destinations
- Study area is comprised primarily of commercial establishments, civic institutions, and apartment complexes
- There are many schools serving many ages near Hillcroft Avenue

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## USERS OF HILLCROFT AVENUE



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## USERS OF HILLCROFT AVENUE



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## USERS OF HILLCROFT AVENUE



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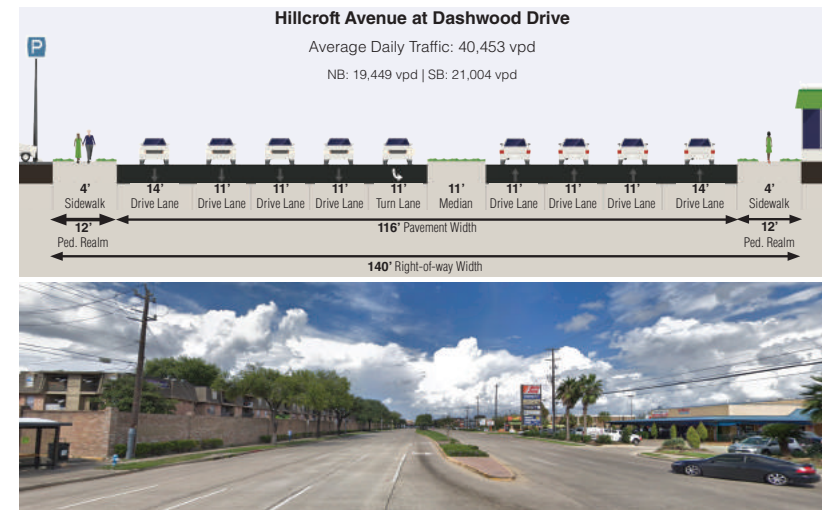
## USERS OF HILLCROFT AVENUE



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## HILLCROFT AVENUE



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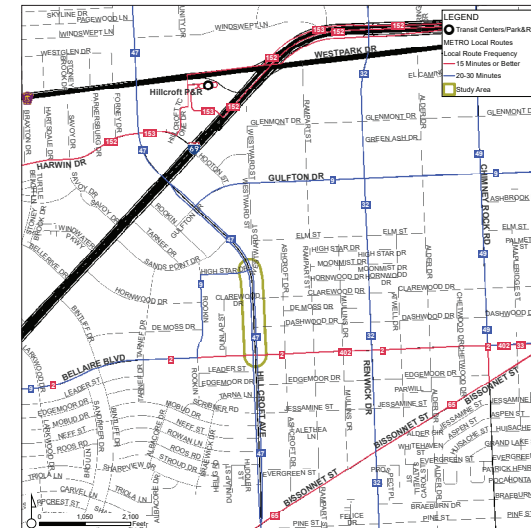




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## TRANSIT | BUS NETWORK

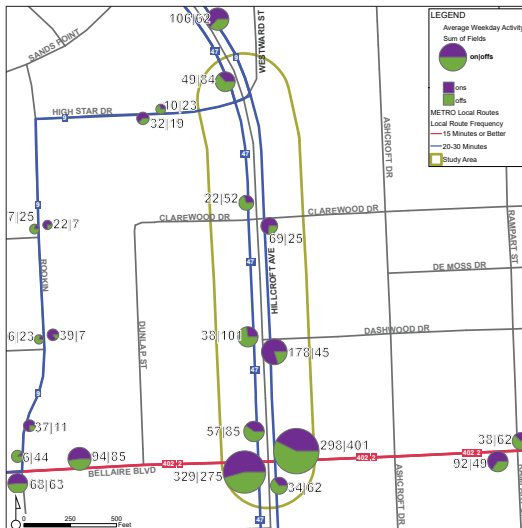


- Four bus routes intersect the Study Area
- 47 Hillcroft
- 9 Gulfton/Holman
- 2 Bellaire
- 402 Bellaire Quickline

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## TRANSIT | BOARDINGS & ALIGHTINGS



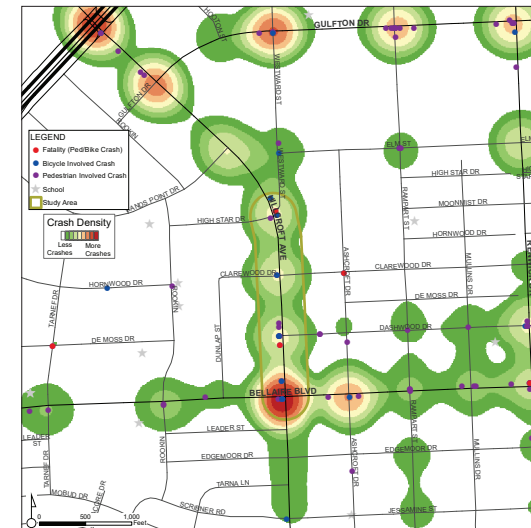
- High number of daily boardings and alightings in the study area
- **1,541** people get on or off the bus each day at the intersection of Bellaire Blvd at Hillcroft Ave
- **530** people get on or off the bus each day along Hillcroft Ave at an unsignalized intersection

Source: METRO, Oct 2018

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## CRASHES | ALL CRASHES



- Within Study Area
- Total crashes: **333**
- Crashes involving a person walking: **12**
- Crashes involving a person bicycling: **10**
- Total fatalities: **2**
- Fatalities involving a person walking: **2**

Source: TxDOT CRIS Database, 2014-2018

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## CRASHES | PEDESTRIAN & BICYCLE



Within Study Area

- Total crashes: 333
- Crashes involving a person walking: 12
- Crashes involving a person bicycling: 10
- Total fatalities: 2
- Fatalities involving a person walking: 2

Source: TxDOT CRIS Database, 2014-2018

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## WE NEED YOUR INPUT!!!



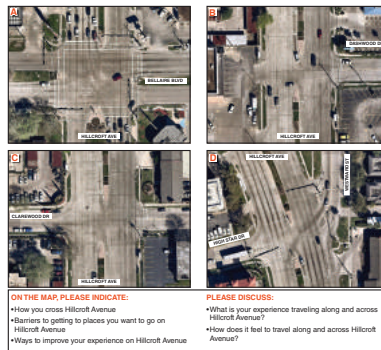
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## BARRIERS AND OPPORTUNITIES



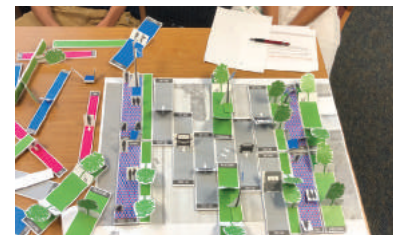
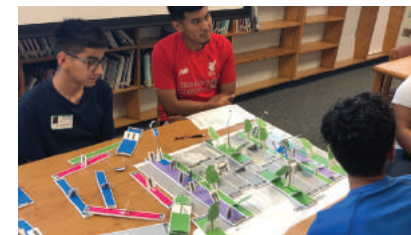
### BARRIERS & OPPORTUNITIES



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## HILLCROFT AVENUE STREET DESIGN



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# DESTINATIONS

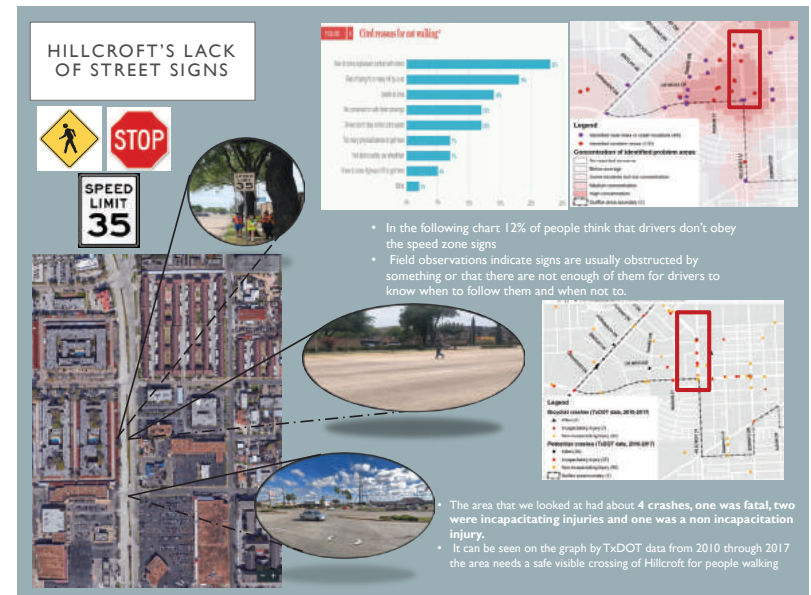
## DESTINATIONS

Where do you LIVE?  
Where do you WORK?  
Where do you GO?



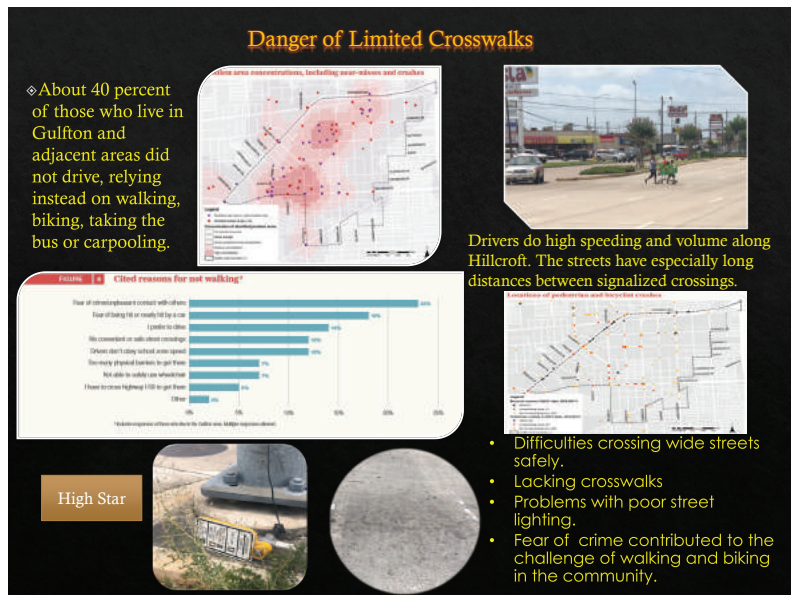
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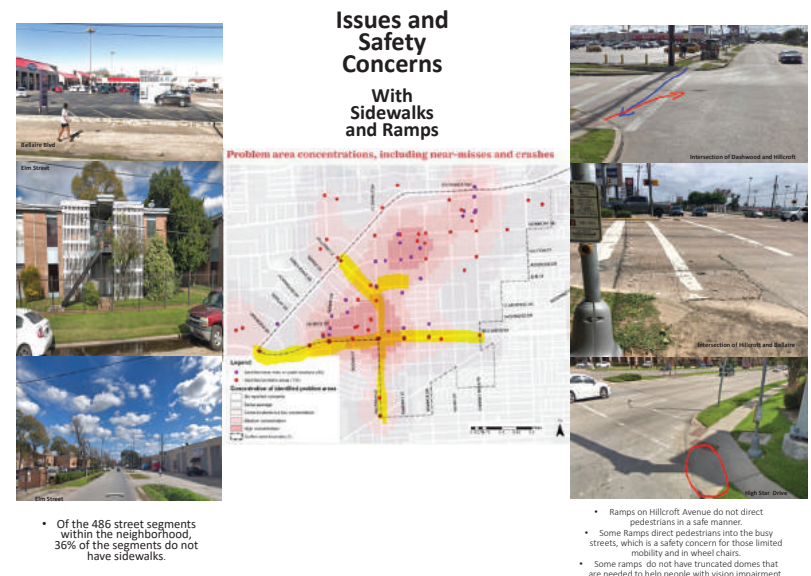
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## WHATS NEXT

- 
- Summarize findings from community input
  - Present data findings and community input to City
  - Work together to develop draft recommendations
  - Present findings and draft recommendations at Second Public Meeting - **July 31, 2019**
  - Refine recommendations
  - Implement short term solutions
  - Develop vision for long term recommendations



# APPENDIX B.2

## PUBLIC MEETING 2 PRESENTATION



## MEETING AGENDA

- 6:30 - 6:45 | Table Discussion and Open House
- 6:45 - 7:10 | Presentation
- 7:10 - 7:20 | Q&A
- 7:20 - 8:00 | Table Discussion and Open House
  - Please provide your input in these areas:
    - **Table 1:** Prioritizing Recommendations
    - **Table 2:** Draft Corridor Schematic
    - **Table 3:** Long-term Visioning: How Can We Build on Hillcroft Improvements?
    - **Tables 4-6:** Summer Safety Internship Prototypes & Boards

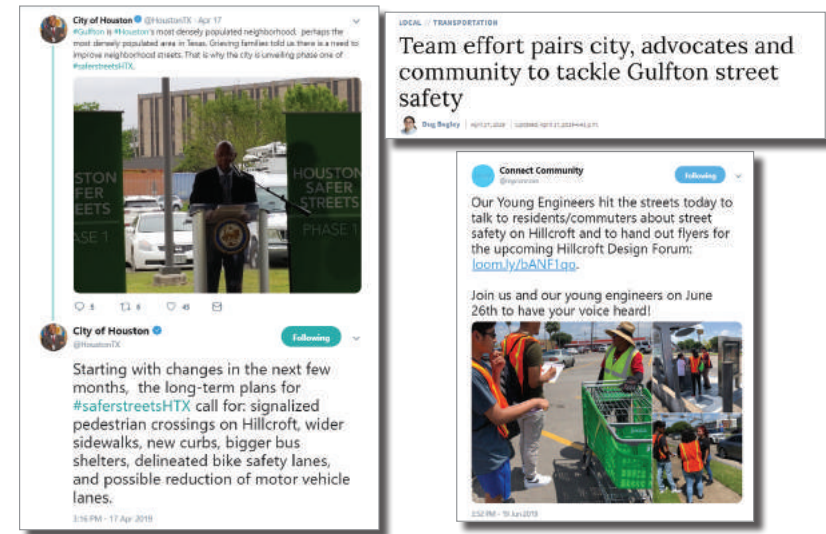
## PROJECT BACKGROUND

- Focused on finding solutions to **improve safety** along Hillcroft Avenue
- In collaboration with: City of Houston Public Works, Connect Community, and Together for Safer Roads
- Building on previous studies conducted within the community
- Exploring **short-term** and **long-term** improvements
- Today is the second of two **Public Meetings**
  - Today, we will present draft recommendations based on your input for **YOUR** review

## PROJECT TIMELINE

- May, 2019 | Project kick-off & data collection
- June 17, 2019 | Summer Safety Internship begins
- June 26, 2019 | Public Meeting #1
- July 16, 2019 | Draft recommendations presented to City of Houston Public Works
- July 31, 2019 | Public Meeting #2
- August 2, 2019 | Summer Safety Internship ends
- Define final recommendations & implementation strategy

## PROJECT MOMENTUM





# HILLCROFT AVENUE STUDY AREA



- **Extents:**  
Hillcroft Avenue between Bellaire Boulevard and High Star Drive/Westward Street
- **Length:**  
2,130 feet (0.4 miles)
- **Signalized Intersections:**
  - Bellaire Boulevard
  - High Star Drive/ Westward Street
- **Unsignalized Intersections:**
  - Dashwood Drive
  - Clarewood Drive

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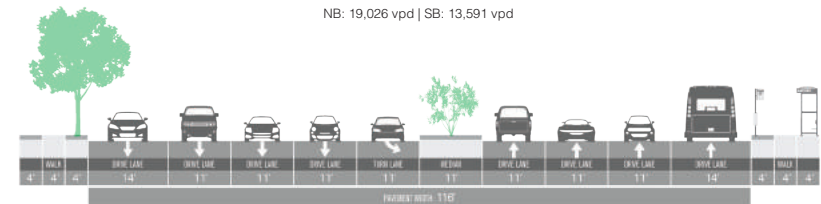
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# HILLCROFT AVENUE existing

## Hillcroft Avenue at Dashwood Drive

Average Daily Traffic, 2019: 32,617vpd

NB: 19,026 vpd | SB: 13,591 vpd



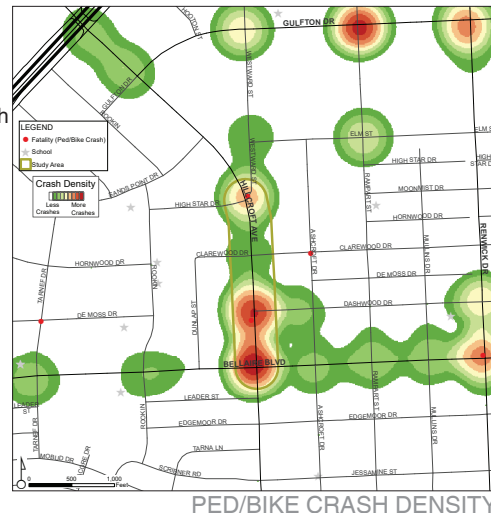
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# SAFETY ASSESSMENT FINDINGS

## High corridor crash rate

- Study Area total crashes: **333**
- Hillcroft Avenue corridor crash rate: **360** crashes per 100m VMT
  - **2x** state average for similar roadways
- Crashes involving a person walking: **12**
- Crashes involving a person bicycling: **10**
- Total fatalities: **2 people walking**



PED/BIKE CRASH DENSITY

Sources: TxDOT CRIS, 2014-2018

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# SAFETY ASSESSMENT FINDINGS continued

## High vehicular speeds & excess vehicular capacity

- 85th Percentile Speed: **41.5** mph
  - 2,275 vehicles per day traveling over 45 mph
- Average Daily Traffic (2019): **32,617** vpd



Sources: COH, 2019

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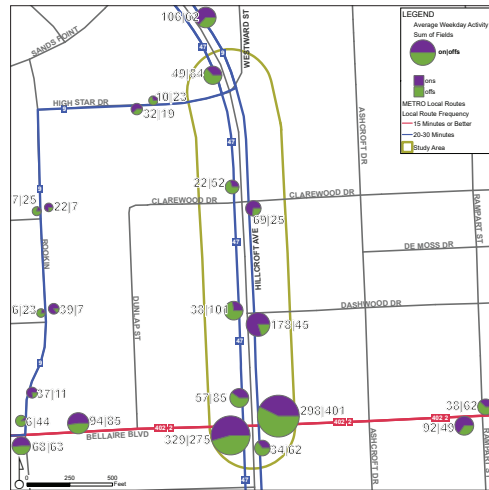
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## SAFETY ASSESSMENT FINDINGS

continued

**High volumes of transit use and people walking**

- 40% of area residents do not drive
- 1,541 people get on or off the bus each day at the intersection of Bellaire Blvd at Hillcroft Ave
- 530 people get on or off the bus each day along Hillcroft Ave at an unsignalized intersection



Sources: METRO, October 2018

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## SAFETY ASSESSMENT FINDINGS

continued

**Lack of safe and visible crossings**

- People cross Hillcroft Avenue at uncontrolled intersections & mid-block
- People cross against pedestrian signal

**Challenges for drivers**

- High speeds and frequent vehicular weaving
- Challenging to turn onto Hillcroft from side streets

**Opportunities for corridor enhancements**

- Increase shade
- Widen sidewalks
- Improve lighting at sidewalks, bus stops, and crossings

**Strong Community support for a safer Hillcroft Avenue**



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## RECOMMENDATIONS

### A BOLD VISION FOR HILLCROFT AVENUE, THE MAIN STREET OF GULFTON

3 CATEGORIES OF RECOMMENDATIONS

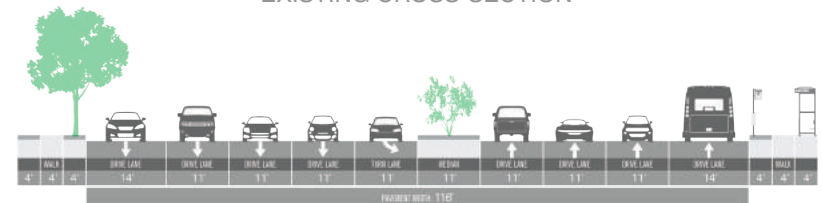
- Safety
- Street Design Improvements
- Community Connections

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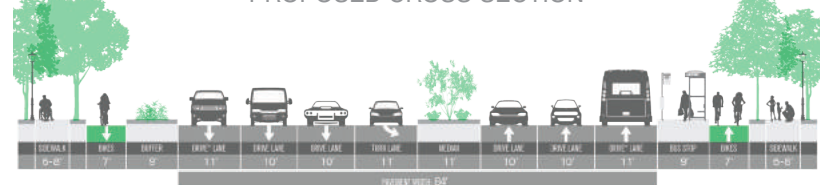
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## HILLCROFT AVENUE

EXISTING CROSS-SECTION



PROPOSED CROSS-SECTION



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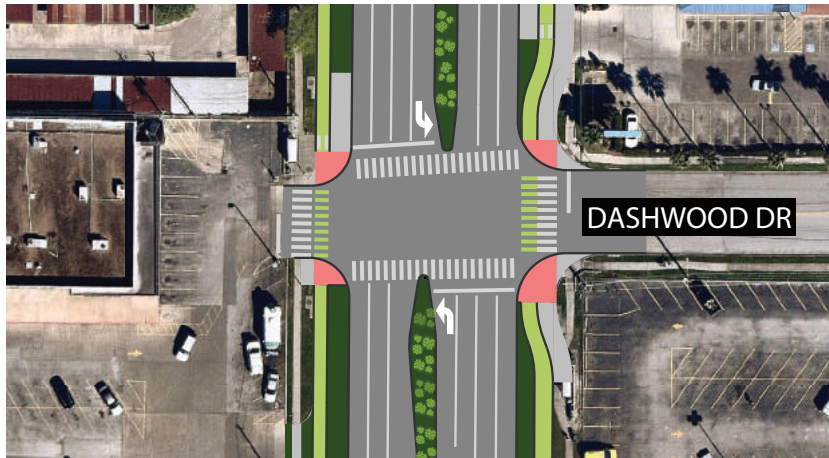
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## RECOMMENDATIONS

### SAFETY

1. Install a traffic signal at Dashwood Drive



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## RECOMMENDATIONS

### SAFETY

2. Modify signal timing to better accommodate people walking at Bellaire and High Star/Westward intersections



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## RECOMMENDATIONS

### SAFETY

3. Modifications to High Star/ Westward intersection
  - Improve pavement markings; install crosswalk along north side of intersection; reduce corner radii
  - Remove northbound access to Westward from Hillcroft



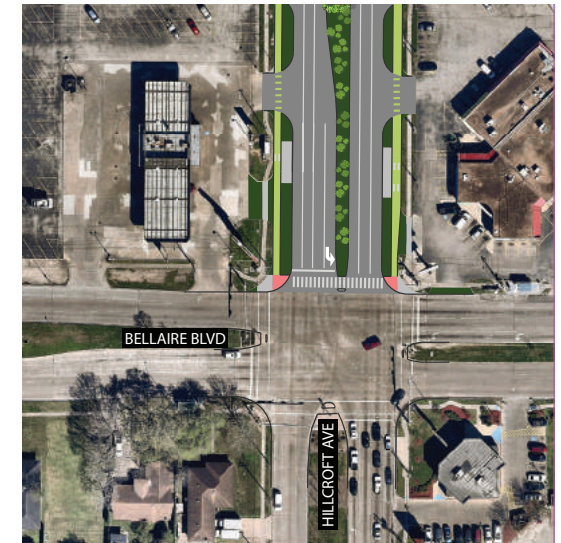
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## RECOMMENDATIONS

### SAFETY

4. Consolidate driveways where appropriate, especially near intersections



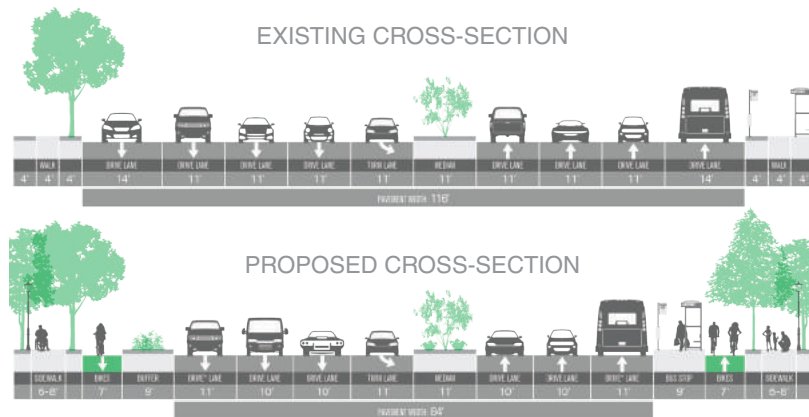
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## RECOMMENDATIONS

### STREET DESIGN IMPROVEMENTS

5. Narrow Hillcroft Avenue from 8 vehicular lanes to 6 vehicular lanes, converting the outside travel lanes to buffered bicycle lanes



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## RECOMMENDATIONS

### COMMUNITY CONNECTIONS

7. Connect proposed bicycle lane to future bicycle facility along Westward Street
8. Improve 47 Hillcroft bus route frequency to 15 minutes in the peak hour
- Optimize bus stop placement and spacing, and enhance stop accessibility, comfort, and amenities
9. Enhance the pedestrian realm, including wider sidewalks, improved lighting, and more trees
- Work with land owners (e.g. Fiesta) to develop safe, walkable paths from sidewalks to storefronts
10. Find opportunities for placemaking that highlight the community's characteristics



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## RECOMMENDATIONS

### STREET DESIGN IMPROVEMENTS

6. Modifications to High Star Drive to support community focus of adjacent land use

Alternatives include:

- Installing a separated bikeway and narrowing travel lanes
- Restricting access to personal vehicles and only allowing buses (9 Gulfon) and people walking and bicycling
- Redesigning as a Woonerf



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## IMPLEMENTATION STRATEGIES

### TIMELINE A

#### Implement All at Once

- All final recommendations implemented in a single phase
- Organized around the redesign of Hillcroft Avenue from an 8-lane corridor to a 6-lane corridor
- Requires additional time to secure funding

### TIMELINE B

#### Phased Implementation

- Recommended improvements implemented in phases
- Funding for first phase is already secured
- Timing of additional phases will be determined by funding availability
- The narrowing of Hillcroft Avenue would be a later phase of implementation

**PUBLIC INPUT AND PRELIMINARY COST ESTIMATES WILL BE FACTORS IN DECIDING IMPLEMENTATION TIMELINE**

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# WE NEED YOUR INPUT!!

- What are the most critical recommendations to implement?
- What is your preferred implementation strategy?
- How can we build on the Hillcroft Avenue improvements?



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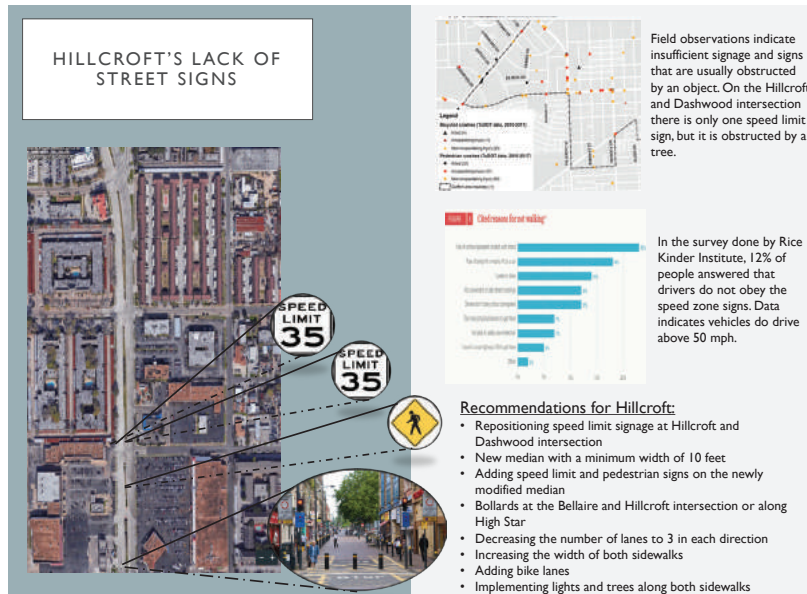
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# SUMMER SAFETY INTERNSHIP



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### Issues

- Difficulties crossing wide streets safely
- Faded/missing crosswalks
- Insufficient street lighting
- Fear of crime contributes to the challenge of walking and biking in the community

High crime concentrations, including near schools and churches

### EXISTING FADED CROSSWALK

### Possible Solutions

#### REFLECTIVE PAINT

#### SHOW DIVERSITY

#### PICTURES AND WORDS

#### BRIGHT COLORS

## Revolutionizing Crosswalks

◆ About 40 percent of those who live in Gulfton and adjacent areas do not drive, relying solely on walking, biking, taking the bus or carpooling.

## WHATS NEXT

- Summarize findings from community input
- Refine recommendations
- Coordinate with City on implementation strategies, timeline, and funding
- Implement solutions
- Look for further enhancements and connections to build on Hillcroft Avenue improvements



# APPENDIX C

## DETAILED SAFETY ASSESSMENT

This appendix includes the Detailed Safety Assessment conducted for A New Vision for Hillcroft Avenue. This assessment includes detailed analysis of data along with a series of maps and figures summarizing findings. Maps and figures were compiled into a factbook and were presented to the interns during the team workshop. The factbook is included within **Appendix C.1** in **Figure C1** through **Figure C14**. All data within this appendix was input into recommendations developed.

### STUDY AREA

Hillcroft Avenue is a north-south connection through Gulfton (**Figure C1**) providing access to Sam Houston Tollway to the south and I-69, Westpark Tollway and Westheimer Road to the north. Past Westheimer Road, Hillcroft Avenue turns into S. Voss Road and continues north to the Katy Tollway. Traffic conditions along the 0.4 mile stretch of Hillcroft Avenue between Bellaire Boulevard and High Star Drive/Westward Street were analyzed. The study area includes four street intersection, two signalized intersections and two unsignalized intersections as shown in **Figure C2**.

Within the study area, Hillcroft Avenue is classified as a P-8-140 on the 2018 Major Thoroughfare Plan (MTFP). A P-8-140 is a Principal Thoroughfare with 8 vehicles within 140 feet of right-of-way (ROW). Hillcroft Avenue is classified as having sufficient ROW width. The speed limit along Hillcroft Avenue is 35-mph speed limit. Four-foot sidewalks are provided along the entire corridor and curb ramps are

present at all intersections. The typical cross-section of the roadway is shown in **Figure C6**. Additional cross section photos are shown in **Figure C7** and **Figure C8**.

Hillcroft Avenue at Bellaire Boulevard is a signalized intersection at the southern end of the study area. The Hillcroft southbound approach provides two left-turn only lanes, two through lanes, and one through/right lane. Northbound provides one left-turn only lane, two through lanes, and one through/right lane. The Bellaire Boulevard eastbound and westbound approaches both provide one left-turn lane, two through lanes and one through/right lane. The intersection runs on a six phase, 120-second cycle providing lead/lag protected left turns at all approaches. Pedestrian signals along with faded crosswalks are provided across all approaches. The pedestrian timings suggest a two-stage crossing for all approaches.

Hillcroft Avenue at Dashwood Drive is an unsignalized intersection approximately 650 feet north of the Bellaire Boulevard intersection. Dashwood Drive is an east-west roadway terminating at Hillcroft Avenue. The westbound approach is stop-controlled and operates as a two-lane approach. Hillcroft Avenue approaches provide one left-turn pocket lane, three through lanes, and one through/right lane. A faded crosswalk is provided across the Dashwood Drive approach, no crosswalks are provided across Hillcroft Avenue.

Hillcroft Avenue at Clarewood Drive is an unsignalized intersection

with Clarewood Drive stop controlled. Clarewood Drive is an east-west roadway connecting to Dunlap Street to the west and Farris Street to the east. The street primarily operates with one general purpose lane at the approaches and provides parking on both sides of the street near the intersection. The Hillcroft Avenue approaches provide one left turn pocket lane, three through lanes, and one through/right lane. No crosswalks are provided across Hillcroft Avenue, while there are crosswalks provided across Clarewood Drive, they are faded and provide little comfort for people trying to cross.

Hillcroft Avenue at High Star Drive/Westward Street is a signalized intersection at the northern end of the study area. High Star Drive is the eastbound approach that provides access to many community services and connects to Rookin Street a block west of the intersection. At the intersection, High Star Drive typically provides one general purpose lane, but offers enough space, if there is no one parked at the intersection, for two lanes. Westward Street is the westbound approach and provides a connection northbound to Gulfton Street and IH-69/US 59. Westward Street offers a single left/through lane and a channelized right-turn lane. Hillcroft Avenue southbound approach provides a left-turn pocket lane, with three through lanes and one through/right turn lane. The Hillcroft Avenue northbound approach provides a single left turn pocket lane, four through lanes, and one right turn only lane. The intersection provides crosswalks along all approaches except the northern Hillcroft Avenue approach. The intersection runs on a five-phase, 120 second cycle providing pedestrian signals for all provided crosswalk crossings. The crossing for Hillcroft Avenue and Westward Street are two stage crossings offering small refuge islands for pedestrians.

**Figures C3 through C5** include maps depicting land uses, population density, and information on the housing stock within Gulfton. Gulfton has a population density five times the average population for the City. The population density is partially driven by the large block apartment complexes within the area. Land uses along the corridor are primarily large strip center retail and large, often full block size, apartment complexes. Most of the housing stock was built in the 1970s when Gulfton was initially developed into the “yuppie” community of Houston.

## TRAFFIC COUNTS

Turning movement counts (TMCs) including vehicles, pedestrians and bicycles were conducted at the Bellaire Boulevard, High Star Drive/Westward Street and Clarewood Drive intersections on May 15, 2019. TMCs for the Dashwood Drive intersection were captured on September 26, 2017. TMCs were conducted during the commuter peak periods and peak hour turning movement counts are shown in **Figure C8** and **Figure C9** for the morning and evening peak hours.

In addition to TMCs, a daily traffic count was conducted between May 14, 2019 and May 16, 2019 between High Star Drive/Westward Street and Clarewood Drive. The data shows that the average daily traffic (ADT) along Hillcroft Avenue is approximately 32,600 vehicles. Comparing this ADT to historical ADT counts, from November 2014, when ADT was approximately 40,450, the daily traffic along Hillcroft has decreased by approximately 20 percent.

Speed data was also collected during the daily traffic counts between May 14, 2019 and May 16, 2019. The average speed within the Hillcroft Avenue segment of High Star Drive/Westward Street and Clarewood Drive is 35 miles per hour (mph), which is the posted speed limit along the corridor. The data shows the 85th percentile speed is 41.5 mph and over seven percent of vehicle were traveling over 45 mph.

## TRANSIT

Approximately 40 percent of all Gulfton residents use walking, biking, or transit as their primary mode of transportation. METRO transit data indicates that on an average day roughly 1,550 people board or alight the bus at the intersection of Hillcroft Avenue and Bellaire Boulevard. Approximately 530 people board or alight the bus along Hillcroft Avenue at Dashwood Drive or Clarewood Drive. Hillcroft Avenue offers great connectivity with four bus routes passing through the study area. **Figure C10** shows the transit routes within the study area and shows connectivity of these routes. **Figure C11** shows the daily boardings and alightings at each transit stop within and around the study area.

METRO Bus Route 47 Hillcroft travels through the study area along



Hillcroft Avenue and METRO Bus Route 9 Gulfton travels through the Hillcroft Avenue/High Star Drive/Westward Street intersection along High Star Drive. METRO Bus Routes 2 Bellaire and 402 Bellaire Quickline travel along Bellaire Boulevard passing through the Hillcroft Avenue study area intersection. The bus routes are described below.

Hillcroft Avenue is served by METRO Bus Route 47 Hillcroft traveling from Northwest Transit Center in the north to Hillcroft Avenue at Greencraig in the south. The majority of the route runs along Hillcroft Avenue connecting to many important destinations like Bayland Park, Riverway Complex, and the Southwest Multi-Service Center. Within the study area the 47 Hillcroft stops at Bellaire Boulevard providing service to Fiesta Mart and a transfer connection to the 2 Bellaire and 402 Bellaire Quickline; Dashwood Drive providing service to many retail shops and residential buildings; Clarewood Drive providing service to more apartment complexes and retail/commercial destinations; and High Star Drive/Westward Street providing service to the Baker-Ripley Center, the Library, and Legacy Community Health Center. The route runs daily approximately every thirty minutes between 5 AM and midnight.

The METRO Bus Route 9 Gulfton/Holman runs through the Hillcroft Avenue at High Star Drive/Westward Street intersection providing access from the Eastwood Transit Center in the east and Bonhomme and Clarewood Drive in the west. The route provides connections to many important destinations including Emancipation Park, HCC, People's Health Center and the Southwest Multi-Service Center as well as connection to many other transit lines including 25 Richmond, 33 Post Oak, 54 Scott, 82 Westheimer, and the METRORail Red and METRORail Purple lines. The bus runs approximately every 30 minutes during peak and off-peak times including Saturday and Sunday from 5 AM to midnight. Within the study area the route stops along High Star Drive adjacent to the Southwest Multi-Service Center, the Library, and Legacy Community Health Center.

Metro Bus Route 2 Bellaire and 402 Bellaire Quickline travel exclusively along Bellaire Boulevard, stopping at Hillcroft Avenue within the study area. Route 2 Bellaire is a local service, providing more frequent stops, traveling from Mission Bend Transit Center

to TMC Transit Center passing through the Bellaire Transit Center. Service is provided every 10 minutes during the peak hours and 15 minutes during off-peak hours between 4 AM and 1:30 AM (the next day). The 402 Bellaire Quickline only stops ten times along the route from Clarewood at Ranchester to the TMC Transit Center and passing through the Bellaire Transit Center. Service is provided between 5:30 AM and 6:45 PM every 15 minutes, daily.

## CRASH DATA

A detailed crash analysis was conducted to identify potential vehicle crash trends and roadway deficiencies in the study area. The approximate location and number of crashes occurring in the study area from 2014 to 2018 is depicted in **Figure C12** and **Figure C13**.

The study area had a total of 333 reported crashes, with a crash rate of 360 crashes per 100 million vehicle miles traveled, two times the state average compared to similar roadways. Twelve of those crashes involved a person walking and ten involved a person bicycling. There have been two fatalities within this time period, both were people walking.

The greatest concentration of crashes occurred at the Hillcroft Avenue and Bellaire Boulevard intersection, while the greatest concentration of pedestrian and bicycle crashes occurred at both Hillcroft Avenue and Dashwood Drive and Hillcroft Avenue and Bellaire Boulevard intersections.

## FIELD OBSERVATIONS

Many field visits were conducted throughout the study including a corridor walk-through with the Summer Safety Interns, individual intersection observations, and vehicle and transit corridor rides. During these site visits, observations were conducted on signal timings, traffic congestions and queuing, sampling of vehicular speeds, behavior of vehicles, pedestrians and bicyclist using the road, condition of the pedestrian realm, and the interaction between all road users.

During the corridor walk-through many important observations were

made by the Summer Safety Interns. The pedestrian signal timings were inadequate for crossing roadways in a single phase, with the Hillcroft crossing from the northwest corner of High Star Drive to the northeast corner of Westward Street taking upwards of five minutes. Because of these frustrating crossing patterns, many pedestrians were observed running across intersections to make it in one phase or crossing where there is no crosswalk.

The interns also observed the inadequate landscaping and lack of trees to provide a shade canopy along the corridor. The Hillcroft Avenue block between Dashwood Drive and Clarewood Drive, on the west side, has some excellent trees providing great shade for pedestrians traveling along the corridor. All other blocks within the study area lack trees and provide no shade for pedestrians.

High speeds were also observed and measured during the field visits. The wide roadway (four-lanes in each direction) gives drivers the perception that driving fast could be safe and when there is little traffic around, many vehicles were observed traveling over 40 mph. A vehicle was even clocked going 53 mph within the segment of Hillcroft Avenue between Clarewood Drive and Dashwood Drive. These high speeds also affected the ability for vehicles waiting at driveways and side streets to turn on to Hillcroft Avenue.

Other traffic observations showed that there was queueing at all intersection approaches, but all queued vehicles were able to clear the intersection within the next cycle.

## STUDY AREA TRAFFIC OPERATIONS

Based on the available data and field observations, an intersection capacity analysis was conducted for the study area intersections. The conditions analyzed included the existing condition with Hillcroft Avenue as an eight-lane cross section, a proposed condition with Hillcroft operating as a six-lane cross section, and the proposed six-lane cross section with the addition of a signal at Dashwood Drive.

Capacity analysis provides information regarding traffic operations at an intersection and is expressed in terms of the level of service (LOS). The LOS indicates the average seconds of delay experienced by a

motorist at a signalized intersection or at the stop-controlled approach of an unsignalized intersection. As a frame of reference, intersection LOS ranges from LOS A to LOS F, with LOS A representing free flow conditions and LOS F representing highly-congested conditions. In general, a signalized intersection or stop-controlled approach at an unsignalized intersection operating at LOS D or better in an urban area is characterized by acceptable delays. LOS methodology is typically based on the *2010 Highway Capacity Manual* (HCM) from the Transportation Research Board. The analysis was conducted in Trafficware Synchro SimTraffic. HCM results were not used due to the limitations of analyzing an unsignalized intersection with a cross section of more than four lanes wide.

**Table C1** and **Table C2** summarize the LOS during the AM and PM peak hours, respectively, for the existing and proposed conditions.

The above analysis and field observations show that the reduction of lanes as well as the addition of a traffic signal at Dashwood maintain or improve operations at study area intersections. One concern with reducing the capacity of Hillcroft intersections is the increase in queue length. Through the above analysis, queueing at the signalized intersection was reviewed and while there could be slight increases in queueing, the LOS is maintained, indicating that the vehicles queued are able to clear the intersection without additional delays. Therefore, queuing at the intersections is not a significant problem with a reduced capacity along Hillcroft Avenue.

The analysis also indicated that a signal at Dashwood Drive would reduce delays on the Dashwood Drive approach. A signal would not only improve vehicular operations at Dashwood Drive, it would also provide many safety benefits for the community. A signal would provide vehicles with protected turning movements, eliminating conflicts with oncoming vehicles. Additionally, pedestrians would have a safe crossing to and from Dashwood Drive and Fiesta Mart.



<b>AM Peak Scenarios</b>	<b>Bellaire Boulevard at Hillcroft Avenue</b>	<b>Dashwood Drive at Hillcroft Avenue</b>	<b>Clarewood Drive at Hillcroft Avenue</b>	<b>High Star Drive/ Westward Street at Hillcroft Drive</b>
Existing 8-lane cross section	LOS C	Westbound Stop- controlled Approach - LOS F	EB - F	LOS C
Proposed 3-lane cross-section	LOS C	Westbound Stop- controlled Approach - LOS F	EB - F	LOS C
Proposed 3-lane cross-section with Dashwood signals	LOS C	LOS C	EB - F	LOS C

**TABLE C1** AM PEAK HOUR CAPACITY ANALYSES SUMMARY TABLE

<b>PM Peak Scenarios</b>	<b>Bellaire Boulevard at Hillcroft Avenue</b>	<b>Dashwood Drive at Hillcroft Avenue</b>	<b>Clarewood Drive at Hillcroft Avenue</b>	<b>High Star Drive/ Westward Street at Hillcroft Drive</b>
Existing 8-lane cross section	LOS D	Eastbound Stop- controlled Approach - LOS F	EB - F	LOS C
Proposed 3-lane cross-section	LOS D	Westbound Stop- controlled Approach - LOS F	EB - F	LOS C
Proposed 3-lane cross-section with Dashwood signals	LOS D	LOS C	EB - F	LOS B

**TABLE C2** PM PEAK HOUR CAPACITY ANALYSES SUMMARY TABLE

# APPENDIX C.1

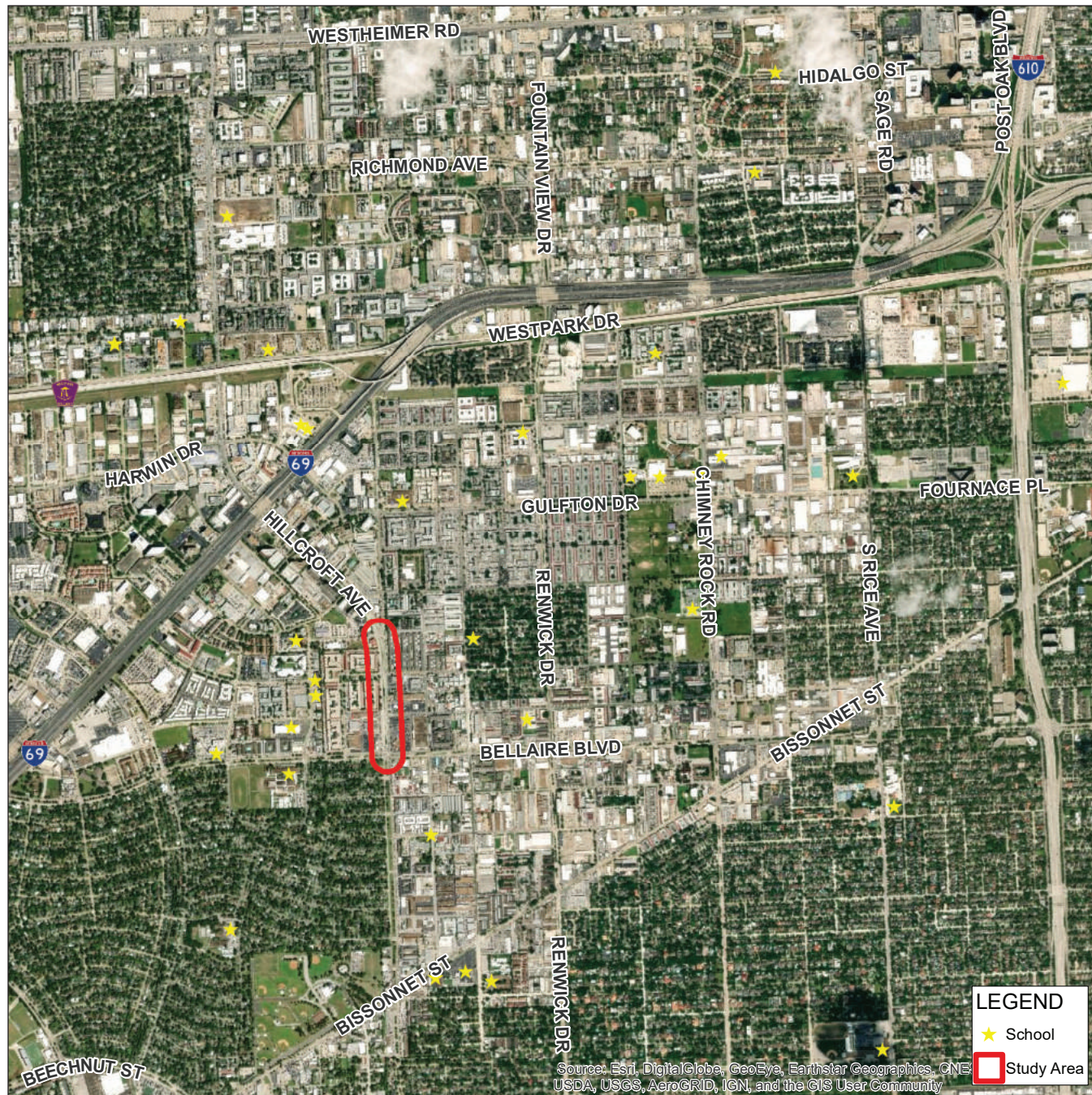
## DETAILED SAFETY ASSESSMENT FACTBOOK

FIGURE C1 THROUGH FIGURE C14





# GULFTON

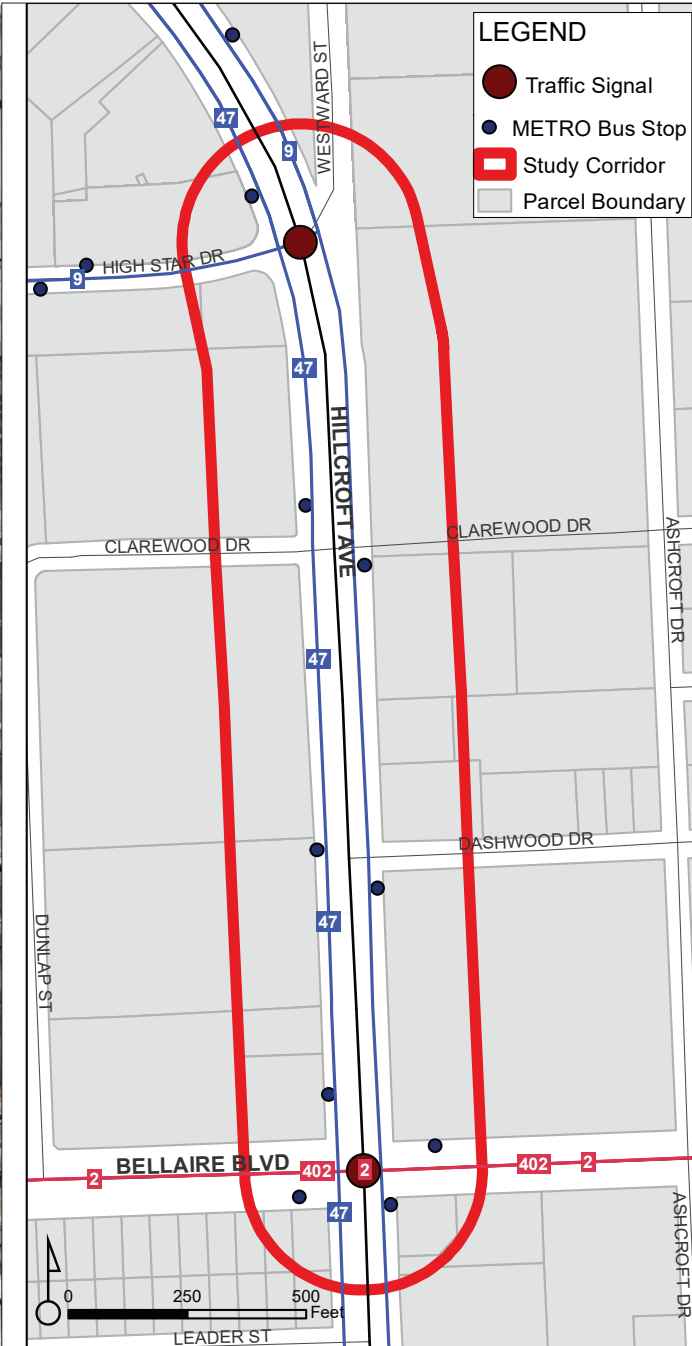


**FIGURE C1** GULFTON & SURROUNDING AREA





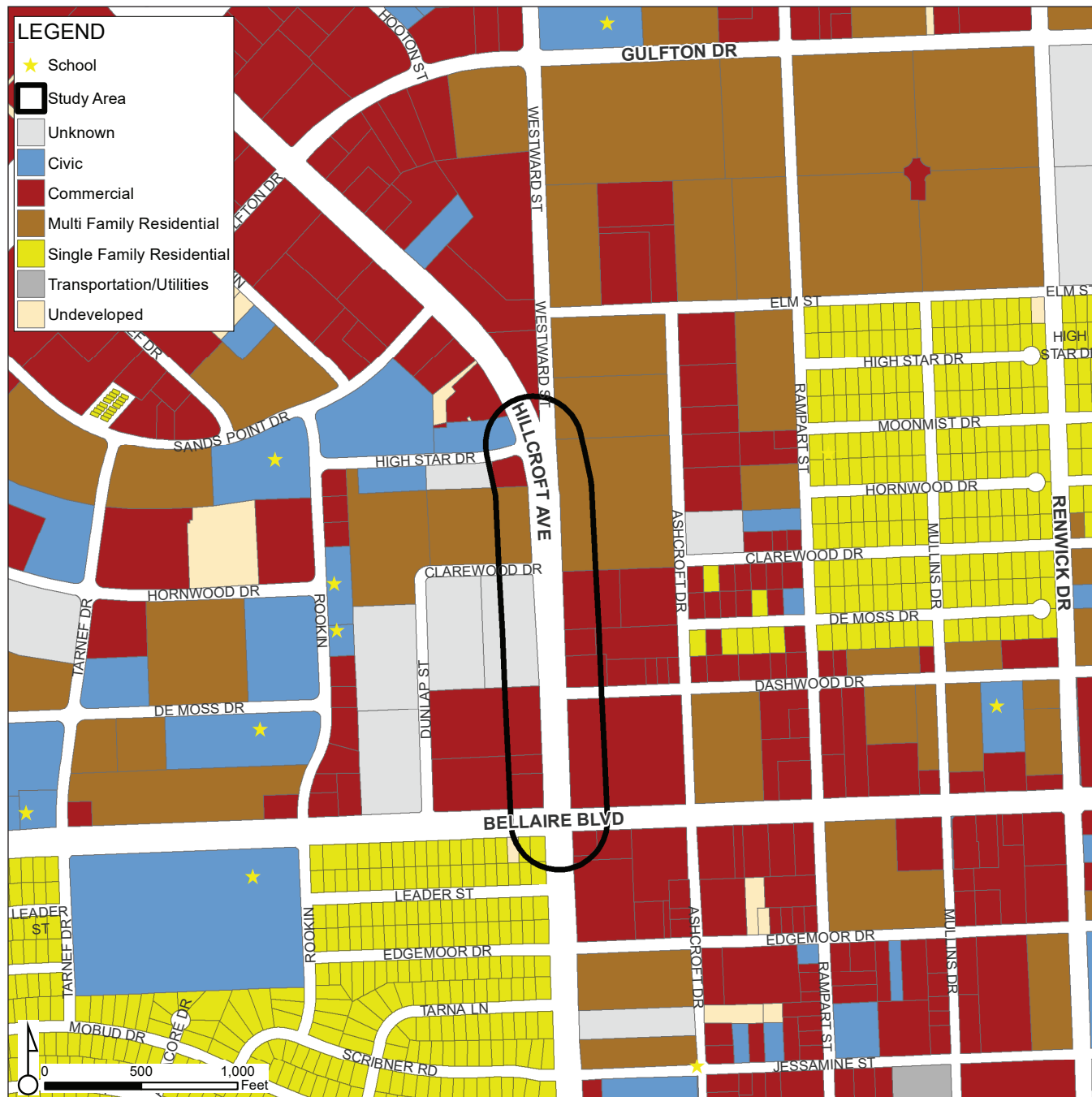
**FIGURE C2** STUDY AREA



## STUDY AREA

- **Extents:**  
Hillcroft Avenue between Bellaire Boulevard and High Star Drive/ Westward Street
- **Length:**  
2,130 feet (0.4 miles)
- **Signalized Intersections:**
  - Bellaire Blvd
  - High Star Dr/ Westward St
- **Unsignalized Intersections:**
  - Dashwood Dr
  - Clarewood Dr

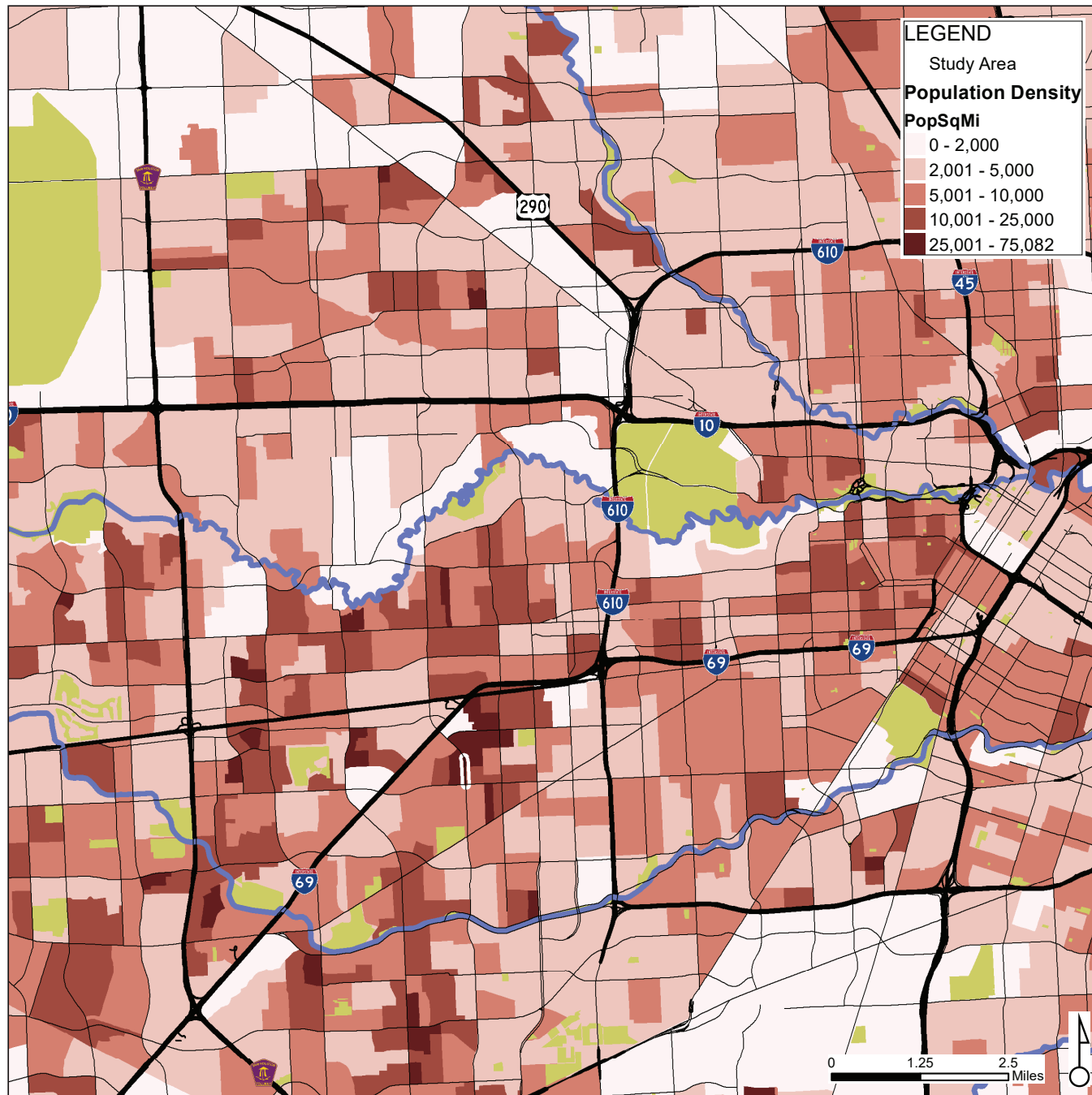




**FIGURE C3** LAND USES NEAR STUDY AREA

## LAND USES & ROADWAY NETWORK

- Study area primarily commercial, civic, and multifamily residential

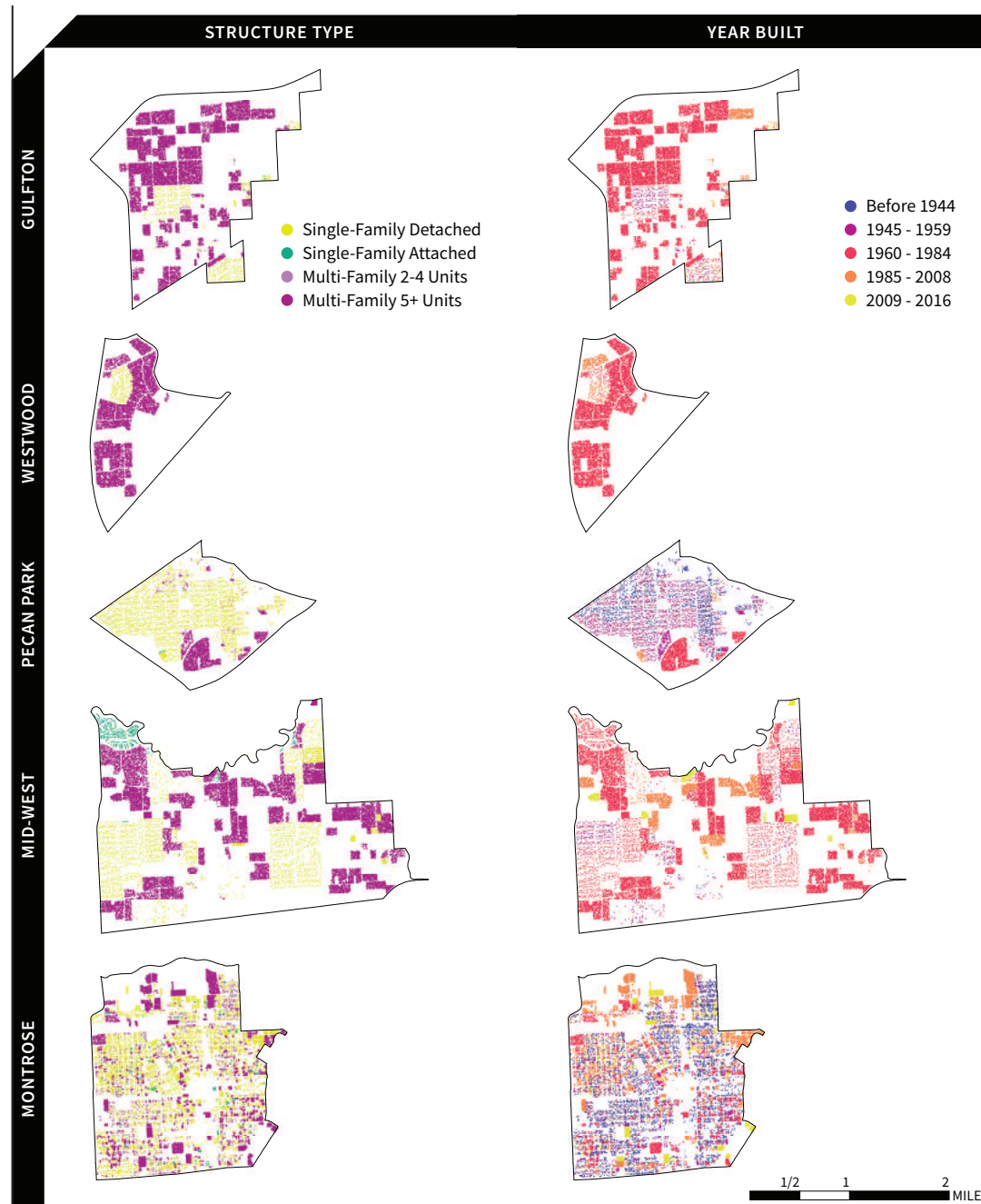


**FIGURE C4** POPULATION DENSITY IN SOUTHEAST HOUSTON

## POPULATION DENSITY

- Gulfton is the densest residential community within Houston

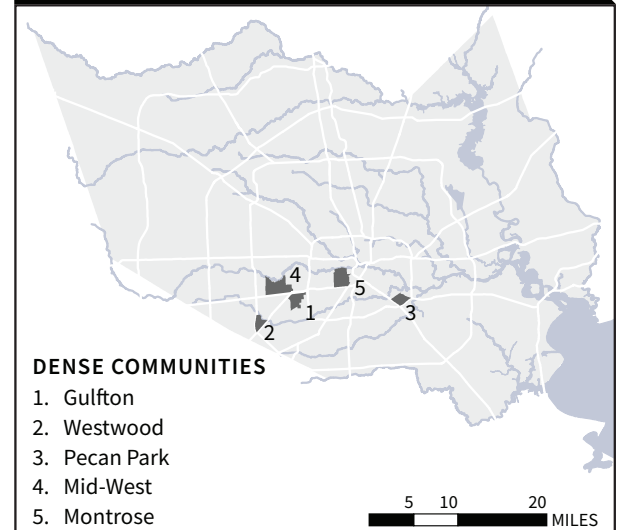




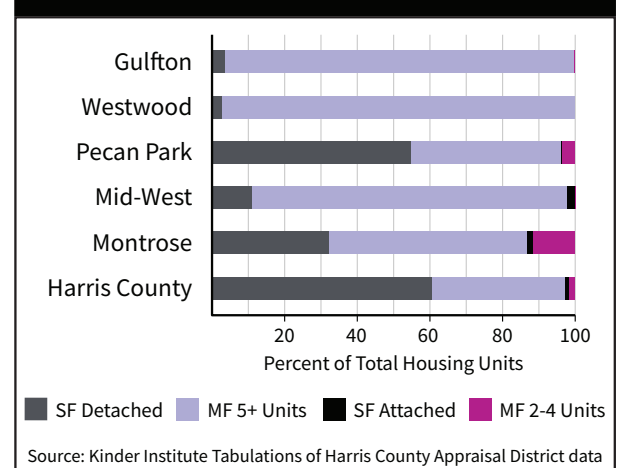
**FIGURE C5** HOUSING TYPE AND AGE WITHIN FIVE DENSEST NEIGHBORHOODS

## DENSITY & HOUSING TYPE

**FIGURE 11.** Densely Populated Communities

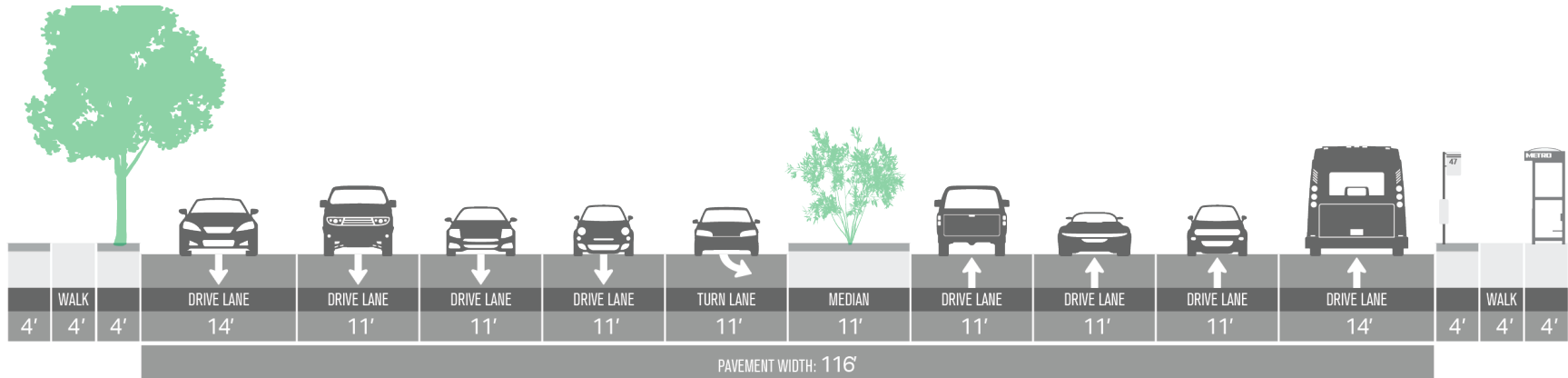


**FIGURE 12.** Breakdown of Housing Units by Type in Dense Communities



Source: Kinder Institute for Urban Research

# HILLCROFT AVENUE CROSS SECTION



**FIGURE C6** HILLCROFT AVENUE CROSS SECTION AT DASHWOOD DRIVE, LOOKING NORTH



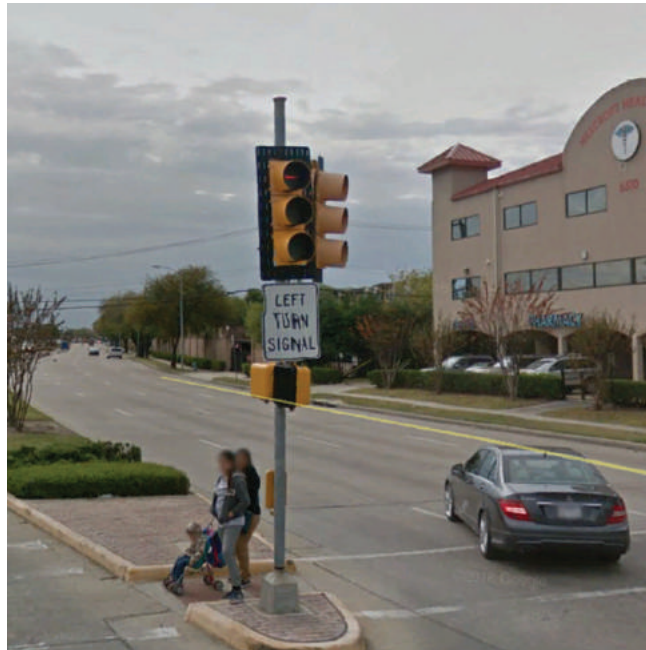
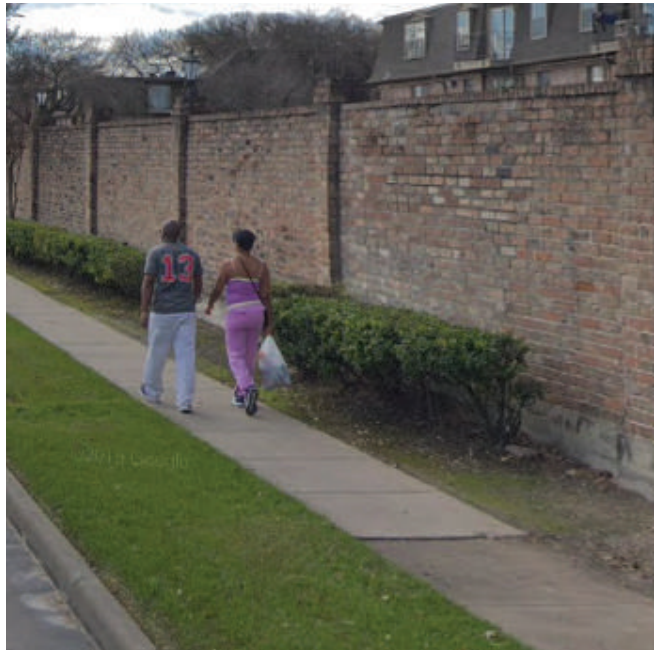


**FIGURE C6** HILLCROFT AVENUE AT HIGH STAR DRIVE/WESTWARD STREET, LOOKING NORTH



**FIGURE C7** HILLCROFT AVENUE AT CLAREWOOD DRIVE, LOOKING NORTH



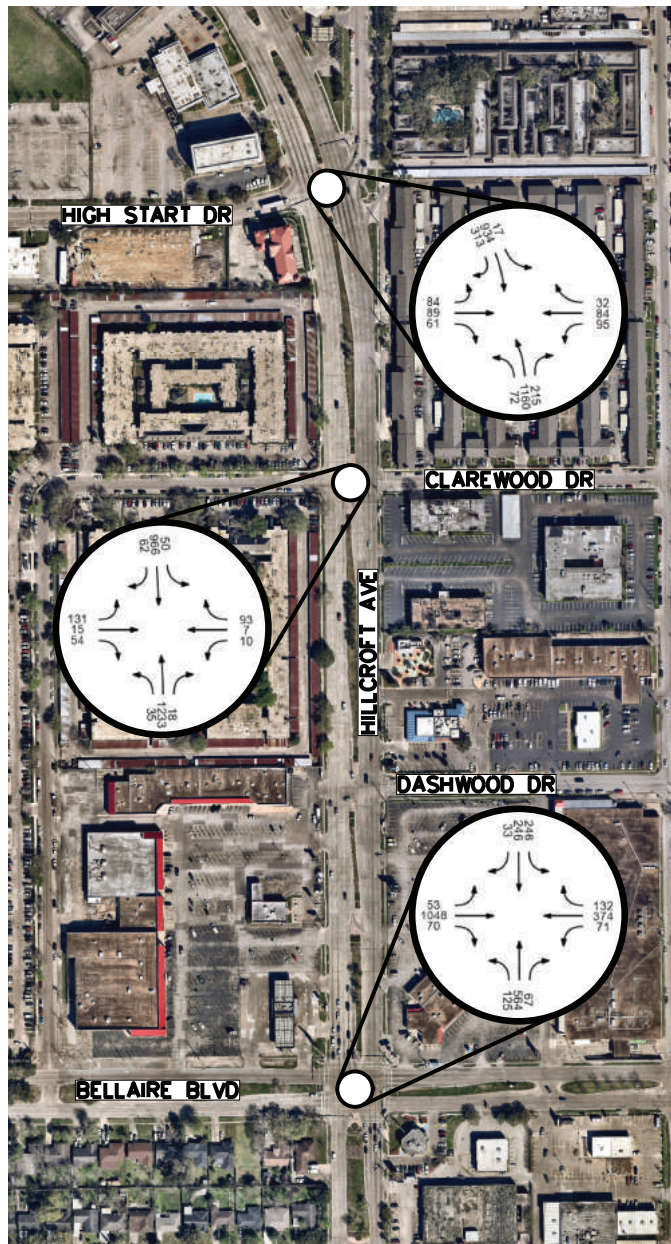


## USERS OF HILLCROFT AVENUE

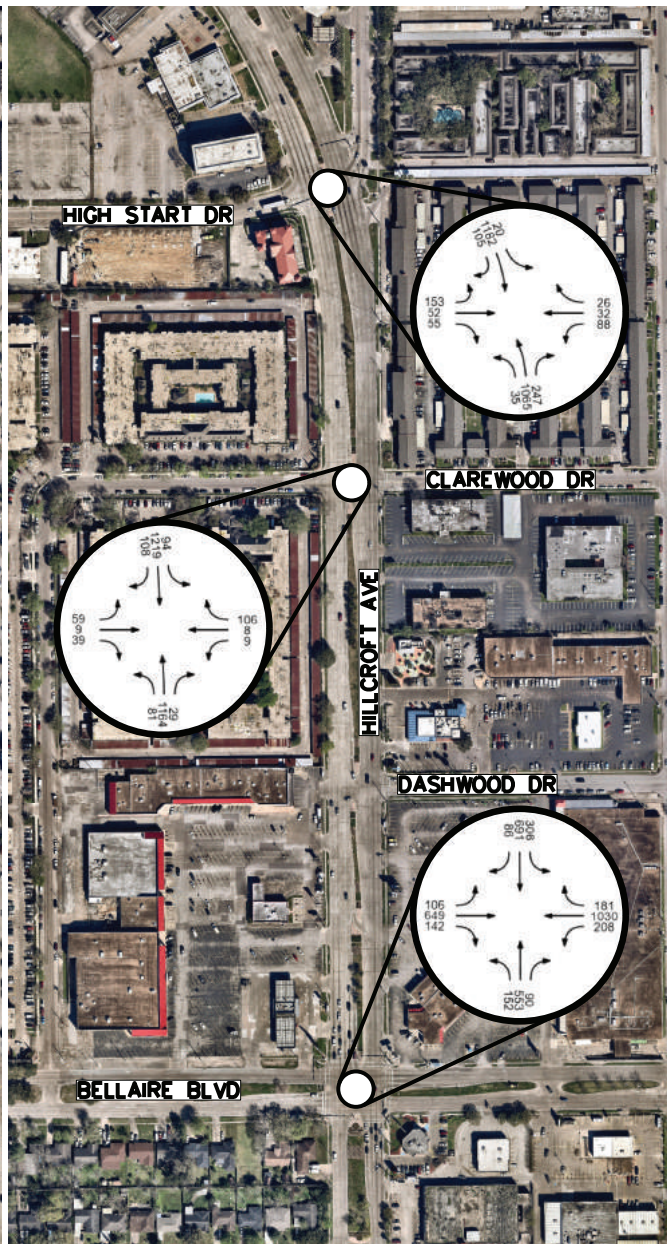
- People walking
- People bicycling
- People driving
- People catching the bus







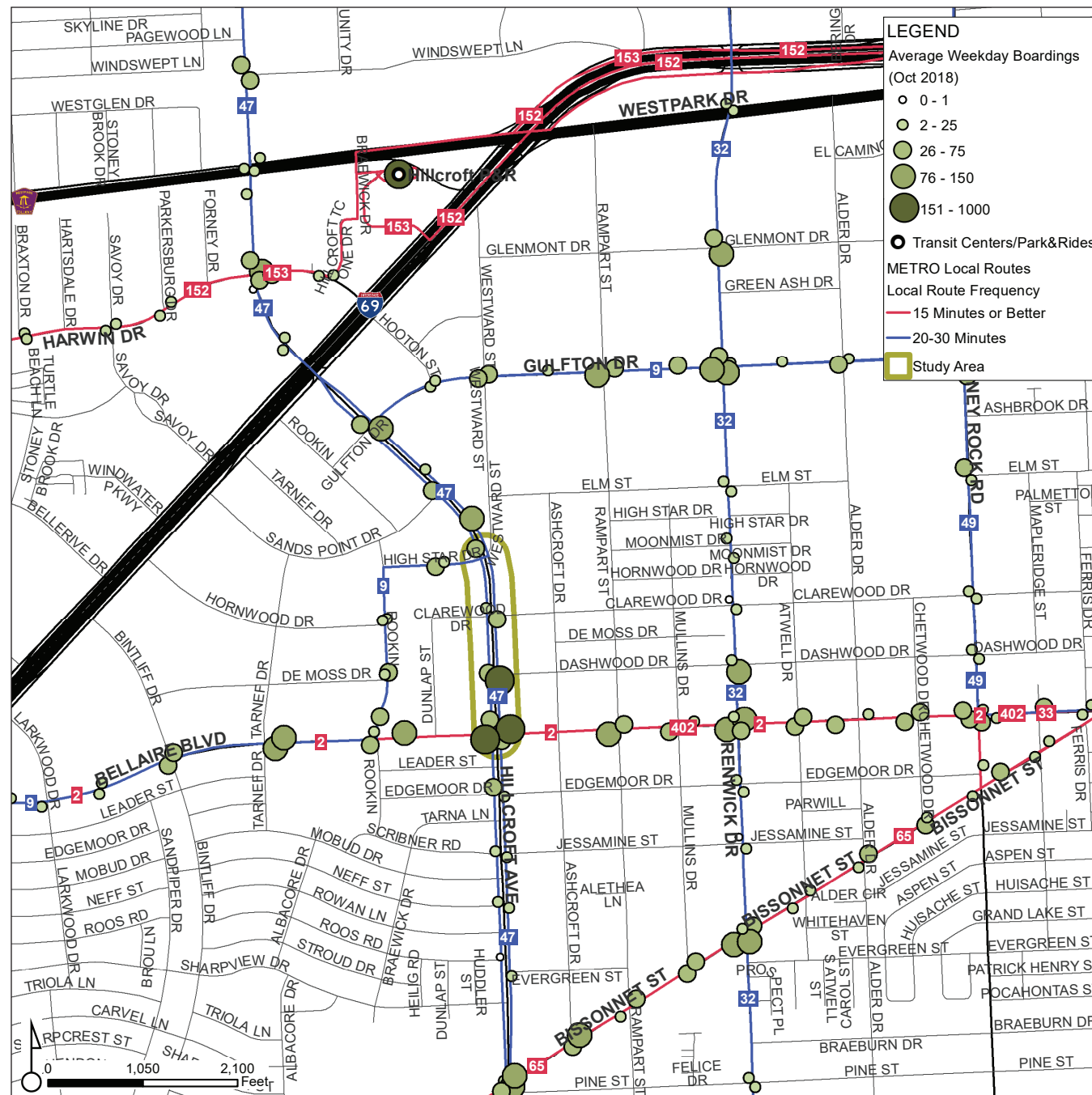
**FIGURE C8** TURNING MOVEMENT COUNTS (AM PEAK HOUR)



**FIGURE C9** TURNING MOVEMENT COUNTS (PM PEAK HOUR)

## INTERSECTION VEHICULAR VOLUME

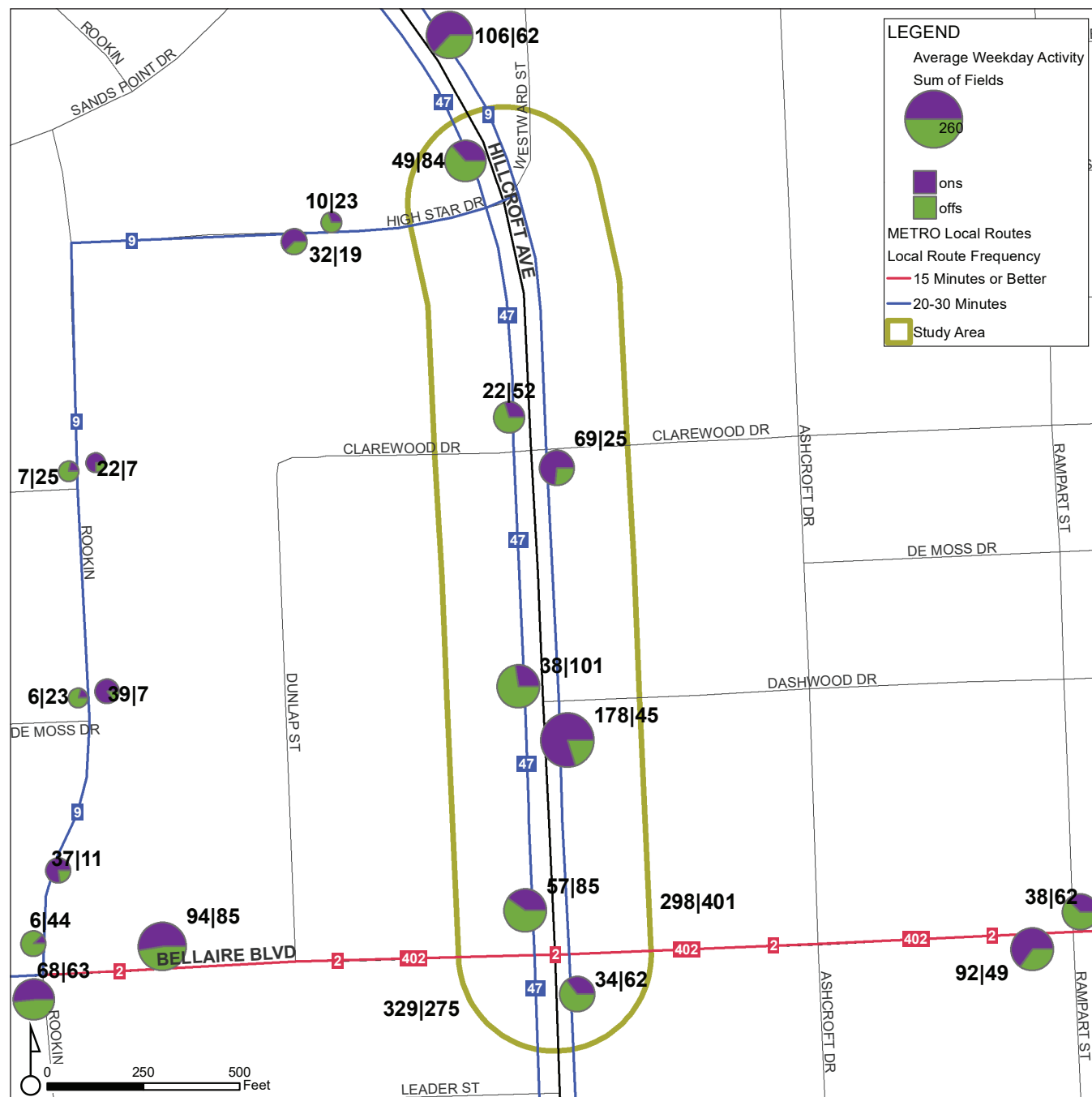
- Hillcroft at Bellaire TMC to be collected



**FIGURE C10** REGIONAL TRANSIT NETWORK & AVERAGE DAILY BOARDING (2018)

## TRANSIT BUS NETWORK & ACTIVITY

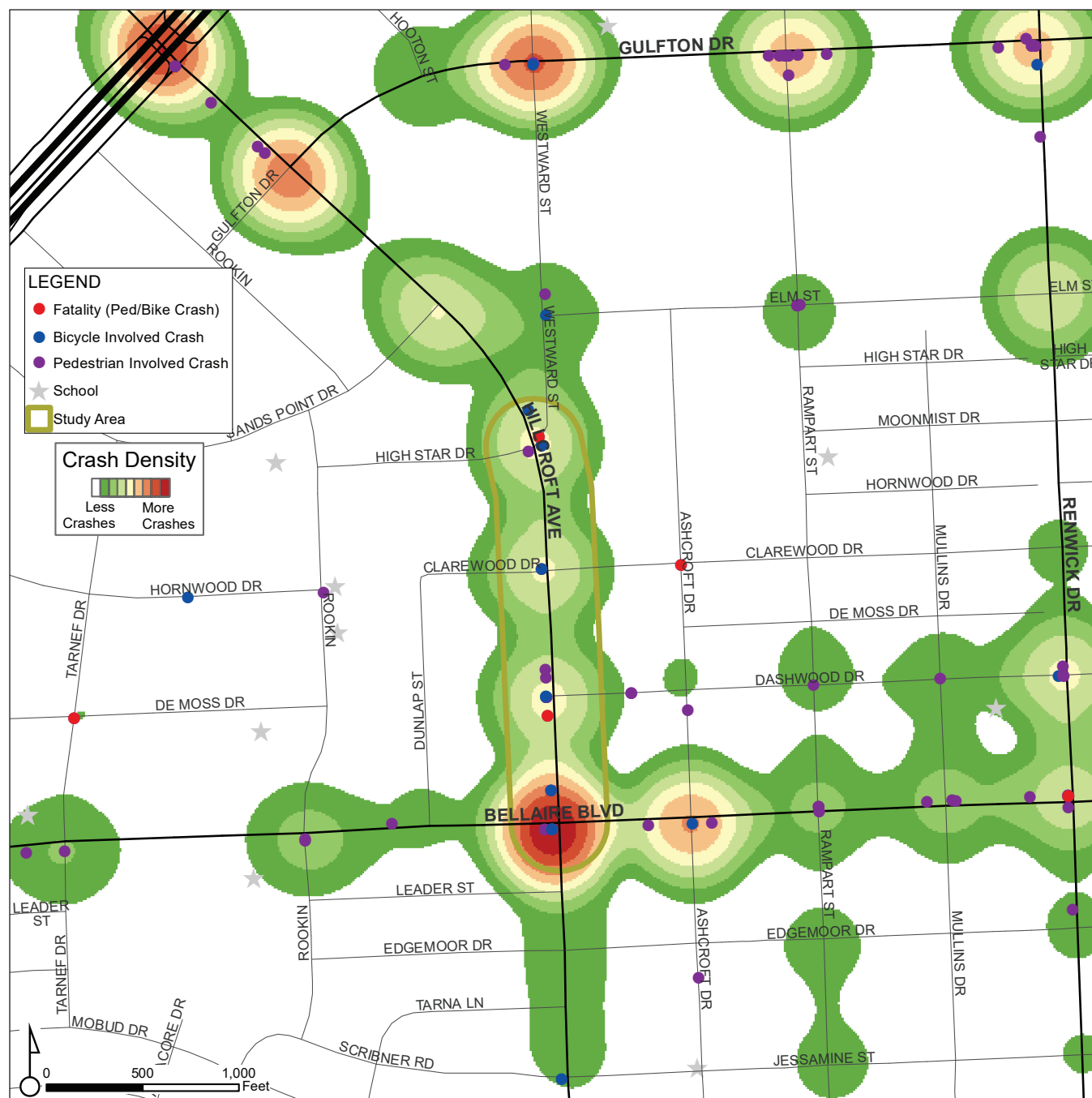




**FIGURE C11** TRANSIT ACTIVITY WITHIN STUDY AREA

## TRANSIT BOARDINGS | ALIGHTINGS

- Four Routes intersect the Study Area
- 47 Hillcroft
- 9 Gulfton
- 2 Bellaire
- 402 Bellaire Quickline



**FIGURE C12** CRASH DENSITY, ALL CRASHES (2014-2018)

## CRASHES

ALL CRASHES (2014-2018)

Within Study Area

- Total crashes: **333**
- Total crashes involving a person walking: **12**
- Total crashes involving a person bicycling: **10**
- Total number of fatalities: **2**
- Fatalities involving a person walking: **2**



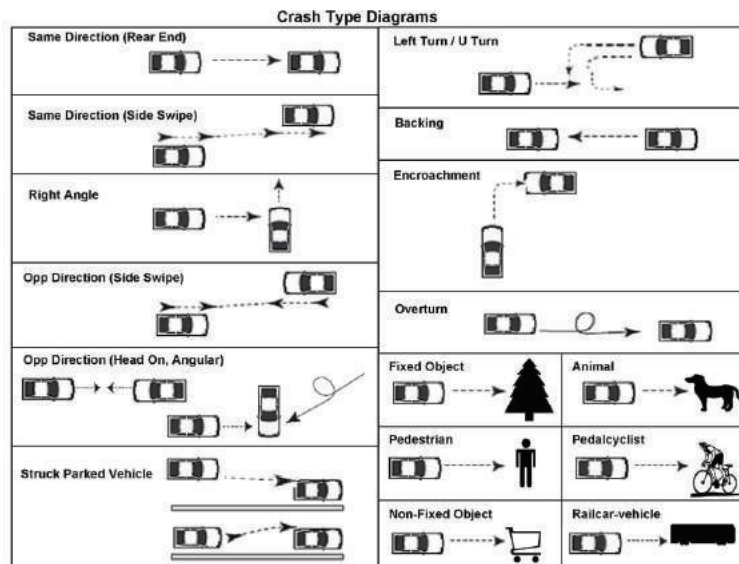
# CRASHES

## ALL CRASHES

### (2014-2018)

Intersection	Total Number of Crashes	Fatalities	Incapacitating Injury	Involving Person Walking	Involving Person Bicycling	Most common manner of collision
Hillcroft Avenue & Bellaire Blvd	73	0	6	1	3	Same Direction (Rear End)
Hillcroft Avenue & Dashwood Drive	45	0	2	1	2	Right Angle
Hillcroft Avenue & Clarewood Drive	47	0	1	1	1	Right Angle
Hillcroft Avenue & Westward St/High Star Drive	31	0	1	1	1	Right Angle
Corridor	Total Number of Crashes	Fatalities	Incapacitating Injury	Involving Person Walking	Involving Person Bicycling	Most common manner of collision
Hillcroft Avenue	84	2 (persons walking)	6	7	3	Same Direction (Sideswipe)

**FIGURE C13** STUDY AREA CRASHES SUMMARY TABLE



- 1. Same Direction (Rear-end)**- Two vehicles moving one behind the other and collide, regardless of what movements either vehicle was in the process of making. This would include a collision in which the leading vehicle spun out and became turned 180 degrees around such that the resulting same direction collision had it strike front end to front end with the following vehicle.
- 2. Same Direction (Sideswipe)**- Two vehicles moving alongside each other and collide, with at least one of the vehicles being struck on the side. This type would include a collision resulting from one of the vehicles making an improper turn such as a left from the right lane or vice-versa or turning right from the appropriate outside lane and striking a vehicle passing on the right shoulder.
- 3. Right Angle**- Two vehicles approaching from non-opposing angular directions collide, typically resulting as one vehicle failed to either stop or yield right of way from a Stop or Yield sign, ran a red light, or was not cleared from the intersection upon the onset of the conflicting movement's green signal.
- 4. Opposite Direction (Head-on/Angular)**- Two vehicles approaching opposite directions and intending to continue in opposite directions collide in a frontal or angular manner as a result of one or both vehicles crossing the painted or unpainted centerline or divided median of the roadway. This includes a collision resulting from one vehicle traveling the wrong way down a divided highway.
- 5. Opposite Direction (Sideswipe)**- Two vehicles approaching opposite directions and intending to continue in opposite directions collide in a sideswiping manner as a result of one or both vehicles crossing the painted or unpainted centerline or divided median of the roadway. This also includes a collision resulting from one vehicle traveling the wrong way down a divided highway.
- 6. Parked Vehicle**- A crash involving a vehicle in transport striking a parked vehicle within the roadway or in a parking lot.
- 7. Left Turn/U Turn**- Two vehicles approaching from opposite directions collide as a result of at least one vehicle attempting to make a left or U turn in front of the opposing vehicle.
- 8. Backing**- This type of crash, previously labeled as "Other" type, is defined as any multi-vehicle collision when at least one vehicle was in the act of backing.
- 9. Encroachment**- Previously labeled as "Other" type crash, but frequently mislabeled as an angle crash due to the approach directions of one of the turning vehicles and a stopped, starting or slowing vehicle on an adjacent approach, this crash defines the collision of two adjacent approach vehicles whose paths are unintended to come in conflict, but collide as a result of one or both vehicles over- or under-turning.
- 10. Overturned**- A crash in which a vehicle overturns on or off the roadway without first having been involved in some other type single or multiple vehicle crash. This includes motorcycle crashes in which the operator loses control of and drops bike, but had not initially struck another motor vehicle, fixed or non-fixed object, animal, pedalcyclist or pedestrian.
- 11. Fixed Object**- A crash in which the primary collision involved a single vehicle and a fixed object.
- 12. Animal**- A crash involving a vehicle striking any animal, including a deer. However, a deer crash could also be so-named for specific identification of this more common type animal crash within the appropriate box on the Police Crash Report form.
- 13. Pedestrian**- A crash involving a vehicle and pedestrian in which the collision between the two is the first event and also took place within the road proper. This type includes a vehicle colliding with someone walking their bicycle in the roadway.
- 14. Pedalcyclist**- A crash involving a vehicle and a bicycle that is in the act of being ridden or stopped in the roadway, but currently mounted by the cyclist.
- 15. Non-fixed object**- Excluding the single motor vehicle type crashes defined in numbers 10-14 above, this type implies any crash initially involving a single vehicle and object not considered a fixed or permanent condition of the highway like ruts, bumps, sink- or potholes or other miscellaneous stationary or airborne road debris such as garbage, tree limbs, fallen-off parts of other vehicles, broken and scattered signs/posts, etc.
- 16. Railcar-vehicle**- Any crash involving a vehicle and a train, trolley, light transit or other type railcar that occurred within a roadway right-of-way or at an at-grade intersection.
- 99. Other**- This category encompasses all other categories of single and multi-vehicle crashes that are not defined above. These include, but are not limited to, all other non-collision events such as immersion, cargo loss, separation of units, fire/explosion, and run-off road incidents (whereby damage is caused to the vehicle, but nothing else was physically struck during or following the act of leaving the highway).
- 00. Unknown**

**FIGURE C14** CRASH TYPES