## 4west houston <br> MOBILITYPLAN



OCTOBER 2015

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houston

# west 

M O B ILITY PLAN
OCTOBER 2015

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—Stephan Gage


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INTRODUCTION

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## 1.1 <br> PURPOSE AND BACKGROUND

The Houston-Galveston Area Council (H-GAC) is the Metropolitan Planning Organization (MPO) for the Houston-Galveston 8-County Transportation Management Area (TMA), hereafter referred to as the "Region". The Region includes Chambers, Brazoria, Fort Bend, Galveston, Harris, Liberty, Montgomery, and Waller Counties.

Over the past decade, the H-GAC region has grown by 1.2 million residents to equal a population near 6 million. It is anticipated that population growth will continue and an additional three million people will reside in the Region within the next 25 years. This growth has and will impact day-to-day activities including general mobility, access to jobs and homes, availability of amenities, impacts on the environment, and overall quality of life.

To address mobility issues arising from growth within the Region, H-GAC initiated the Subregional Planning Initiative (SPI) in 2008. The goal of the SPI is to facilitate the planning process in sub-regional areas of the TMA in order to create viable projects for the Transportation Improvement Plan (TIP) that reflect the goals of the Regional Transportation Plan (RTP). SPI is the integration of transportation and land use planning in recognition of the need for a more holistic, strategic approach to planning. SPI demonstrates how a balanced approach including added capacity, operations and demand management will be more cost-effective in achieving our goals than the current emphasis on added capacity projects.

The Greater West Houston Subregional Planning Initiative, also known as the West Houston Mobility Plan, is the seventh sub-regional planning initiative commissioned by H-GAC since 2008. The plan is intended to facilitate for the orderly provision of infrastructure to accommodate future population and employment growth in West Houston. The plan will include the conceptualization of optimal land use, identification of needed transportation improvements, and the development of multimodal transportation strategies.


### 1.2 GOALS AND OBJECTIVES

The vision, goals, and objectives of the study reflect the dynamic nature and progressive spirit of West Houston. Big ideas are what will be required to manage the ever increasing population and job growth projected in the Study Area. These goals guide the development of the study recommendations.

## PROJECT GOALS

- Develop growth projections and alternative urban design and development scenarios
- Achieve a consensus on the vision and growth scenario(s) of the Greater West Houston Region
- Improve mobility for all modes of transportation, while balancing the quality of life for existing and future residents within the Study Area
- Recommended best practices for transportation infrastructure and urban design to maximize multimodal access to development DW/IDI
- Protect environmentally sensitive areas and green spaces
- Develop a sustainable transportation plan to help guide transportation investments within this area
- Develop feasible and practical recommendations that can be easily integrated into other local and regional plans


## PROJECT OBJECTIVES

- Define, characterize and quantify the region's existing and projected demographics, development patterns, transportation facilities, services and usage
- Integrate protection of environmentally sensitive areas and green spaces, existing land uses and future development scenarios into the transportation planning process
- Identify and assess by magnitude and mode share, the major travel markets that play a key role in impacting travel patterns
- Evaluate the ability of the existing transportation system to efficiently and effectively serve current and projected travel needs
- Examine the benefits and impacts of the proposed improvements identified by this study in the context of the regional transportation system
- Evaluate, refine and prioritize the proposed transportation improvements and modal alternatives
- Refine and integrate the multimodal street classification as proposed in the City of Houston Mobility Planning initiative for all streets


## DESIRED PROJECT OUTCOMES

- Achieve a consensus on goals and objectives through the stakeholder, Steering Committee and public meetings
- Develop and identify a preferred sub-regional development scenario to guide transportation investment
- Provide transportation and land use scenario visualizations that help stakeholders and the public make informed decisions
- Incorporate best practices to optimize transportation investments
- Identify concepts to help increase transit ridership
- Implement identified strategies
- Create a list of recommendations for integration into local and regional plans
- Provide a prioritized list of short-range, mid-range and long-range improvements with costs
- Establish a plan to promote quality communities to help attract new residents and businesses to the region and promote economic success
- Develop a multimodal street classification methodology and recommended classification report for all streets


## 1.3 <br> VISION

Change is an essential component of strategic planning. Articulating the purpose and value of change is important for garnering support and allaying concerns. Recommendations of this study represent major change in many ways for the residents and businesses of West Houston And so, below is articulated their purpose and value.

The Greater West Houston Sub-regiona Planning Initiative Study will enhance the quality of life in West Houston by advancing recommendations that encourage the development and expansion of a range of viable transportation modes for work and leisure travel, as well as sustainable land development that complements the area's transportation infrastructure.

Correspondingly, the vision statements of the study's Funding Partners echo this sentiment.


THE ENERGY CORRIDOR MANAGEMENT DISTRICT
Our vision is to be internationally recognized as a high-quality place in which to work live and invest. Our mission is to enhance our community's quality of life and sense of place by implementing mobility, public safety, and streetscape and business development initiatives.


MEMORIAL MANAGEMENT DISTRICT
The Memorial Management District and
progressive developers are looking beyond today and have a plan to keep the area thriving for the years ahead


CITY OF HOUSTON
Houston, the 4th largest city in the United States, is a dynamic, growing city, rich in culture and diversity. The Planning and Development Department's mission is to work to ensure that it remains a vibrant and sustainable city by partnering with decision makers and the community to balance a spectrum of needs and interests while addressing the dynamics of growth and change.

## INTRODUCTION


"VISION WITHOUT ACTION IS MERELY A DREAM. ACTION WITHOUT VISION JUST PASSES THE TIME. VISION WITH ACTION CAN CHANGE THE WORLD."

- JOEL A. BARKER



EXISTING CONDITIONS

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## 2.1 <br> STUDY AREA CHARACTER

The boundaries of the West Houston Study Area include portions of unincorporated Harris and Fort Bend counties, the City of Houston and some of the cities within the enclave known as The Villages. The Study Area is traversed by several major creeks and bayous, including Brays and Buffalo bayous, Bear Creek, South Mayde Creek, Mason Creek, and Langham Creek. The Addicks and Barker Reservoirs are prominent physical and environmental features in the Study Area (Figure 2.2).

The Study Area has three distinct sub-areas with different physical characteristics: the undeveloped Addicks and Barker Reservoirs the more developed "inner" sub-area to the east and southeast, and the less developed mostly residential "outer" sub-area to the north and west. The inner and outer regions are roughly separated by SH 6 (Figure 2.1). The reservoirs were constructed in the 1940's to help control flooding in the Houston area. They are traversed by few roads and trails, and have only a few outdoor-oriented land uses such as playing fields, golf courses, dog parks, and shooting ranges. The inner sub-area contains The Energy Corridor District, the Westchase District, Memorial Management District, and the office and light industrial areas close to US 290 and Beltway 8 . It has a mix of single-family residential, multifamily, commercial/retail strips, large shopping
centers, a regional shopping mall, major employment centers that including mid- and high-rise office, and several partly or fully developed trail networks.

The outer sub-area contains mostly singlefamily subdivisions, primary and secondary schools, and some local parks. Commercia development is mostly retail strips with a few larger centers and a regional shopping mall. Its few denser commercial, light industrial, health care and office uses are found along or near SH 6 and IH 10. Much of the outer sub-area is outside Houston's city limits but within its Extra-Territorial Jurisdiction.

The Study Area is one of the most densely populated, economically dynamic, culturally diverse and ecologically sensitive locations in the Houston-Galveston area. Table 2.1 summarizes some of West Houston's major demographic and transportation infrastructure characteristics


With 12 percent of the region's population and 14 percent of its jobs, the Study Area is a major socio-economic engine. The size and population of the Study Area place it on par with other major US cities (Table 2.2). As shown in Figures 2.3 and 2.4, the Study Area's population and job growth rates are comparable to those for the City of Houston and the Region.

| TABLE 2.2 - STUDY AREA IN COMPARISON TO |  |  |  |
| :---: | :---: | :---: | :---: |
| MAJOR U.S. CITIES |  |  |  |
| City/Area | State | Land area (sq mi) | Population (2010) |
| West Houston | Texas | 180.9 | 618,953 |
| Denver | Colorado | 153.0 | 600,158 |
| Las Vegas | Nevada | 135.8 | 583,756 |
| Portland | Oregon | 133.4 | 583,776 |
| Atlanta | Georgia | 133.2 | 420,003 |
| Milwaukee | Wisconsin | 96.1 | 594,833 |
| Seattle | Washington | 83.9 | 608,660 |
| Baltimore | Maryland | 80.8 | 620,961 |



Figure 2.1 Study Sub-areas



## Legend

City of Houston
City of Houston ETJ
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## EXISTING CONDITIONS

Although the Study Area has only six percent of the businesses that collect sales tax in Harris and Fort Bend counties (Figure 2.5), it generated 28 percent of the gross sales in Fort Bend and Harris counties in 2013. Figure 2.6 compares the gross sales of the Study Area with these of the City of Houston, and Harris and Fort Bend counties from 2004 through 2013.

Figure 2.7 illustrates the current right-ofway (R.O.W.) and easements that exist within the Study Area. There are 103,465 acres of R.O.W. parcels and 341 miles of easements in the Study Area. These parcels and easements, as well as and bayous and creeks within the Study Area, represent opportunities to enhance the bicycle and pedestrian infrastructure in West Houston.


Figure 2.3 Population Growth Percentage


Figure 2.4 Job Growth Percentage


Figure 2.5 Sales Tax Generating Businesses


Figure 2.6 Gross Sales Tax Comparison


## EXISTING CONDITIONS

## 2.2 <br> DEMOGRAPHICS

West Houston has grown tremendously over the past 65 years. Table 2.3 compares the population growth of West Houston to that of the City of Houston and Harris County since 1950.

The Study Area population was 683,518 persons (2010), which represent 12 percent of the Region's population. A 35 percent increase in population to 924,101 persons is projected by 2040 (Table 2.4). The projected growth rate is slightly lower than, but still comparable to, the City of Houston's growth rate of 38 percent.

The Study Area population density is equivalent to the City of Houston and approximately five times that of the Region as a whole (Figure 2.10). Area population density is expected to increase by 35 percent by 2040, which is again comparable to the City of Houston's projected 38 percent.

The Study Area's ethnic diversity mirrors that of the Region as a whole with comparable percentages of major ethnic groups (Table 2.5). Likewise, housing occupancy in the Study Area is also comparable to the Region, but with a lower percentage of vacant housing units. This lower vacancy rate is indicative of the high demand for housing in the Study Area due to its strong

| TABLE 2.3 - POPULATION GROWTH RATES |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Year | West Houston | Change (\%) | City of Houston | Change (\%) | Region | Change (\%) |
| 1950 | 4,665 | NA | 596,163 | NA | 1,070,387 | NA |
| 1960 | 22,537 | 383.11\% | 938,219 | 57.38\% | 1,583,097 | 47.90\% |
| 1970 | 79,240 | 251.60\% | 1,233,505 | 31.47\% | 2,183,285 | 37.91\% |
| 1980 | 258,704 | 226.48\% | 1,595,138 | 29.32\% | 3,121,808 | 42.99\% |
| 1990 | 356,200 | 37.69\% | 1,810,532 | 13.50\% | 3,733,121 | 19.58\% |
| 2000 | 485,035 | 36.17\% | 2,076,991 | 14.72\% | 4,671,571 | 25.14\% |
| 2010 | 683,518 | 40.92\% | 2,272,110 | 9.39\% | 5,894,009 | 26.17\% | Source: US Census; H-GAC; Texas Almanac


|  |  |  |  |
| :--- | ---: | ---: | ---: |
| Year | TABLE 2.4 - POPULATION PROJECTIONS |  |  | Source: H-GAC \& US Census


| Population | Wes Houston | Percent | City of Houston | Percent | 8-County Region | Percent |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Total Population | 683,518 |  | 2,057,617 |  | 5,887,189 |  |
| Households | 244,954 |  | 781,407 |  | 3,631,503 |  |
| Average Household Size | 2.7 |  | 2.7 |  | 2.8 |  |
| Ethnicity |  |  |  |  |  |  |
| White Not Hispanic | 230,636 | 37\% | 537,272 | 26\% | 2,318,265 | 39\% |
| Black Not Hispanic | 91,560 | 15\% | 472,653 | 23\% | 993,091 | 17\% |
| Asian Not Hispanic | 66,482 | 11\% | 124,693 | 6\% | 384,324 | 7\% |
| American Indian Not Hispanic | 1,555 | 0.30\% | 4,081 | 0.20\% | 16,601 | 0.30\% |
| Some Other Race Not Hispanic | 1,635 | 0.30\% | 4,064 | 0.20\% | 725,539 | 12\% |
| Two or More Races Not Hispanic | 9,983 | 2\% | 67,088 | 3\% | 178,247 | 3\% |
| Hispanic | 217,102 | 35\% | 892,370 | 43\% | 2,089,095 | 35\% |
| Housing |  |  |  |  |  |  |
| Total Housing Units | 247,773 |  | 874,058 |  | 2,279,035 |  |
| Housing Units Occupied | 225,092 | 91\% | 767,251 | 88\% | 2,050,324 | 90\% |
| Housing Units Vacant | 22,681 | 9\% | 106,807 | 12\% | 228,711 | 10\% |




Figure 2.9 Zero Auto Households


- Region
- West Houston
- City of Houston

Legend
$\square$ Sounties
$\square$ counties

| $0.10 \%$ |
| :--- |
| $\square$ |
|  |

0


Figure 2.11 Employment Density (jobs per square mile)
population growth. The poverty rate for the Study Area is less than the City of Houston Harris County, and the Region (Table 2.6). Figure 2.8 shows that the Study Area contains a fewer areas with high poverty rates than the Region. The Study Area also has fewer households without access to automobiles (Figure 2.9),

| TABLE 2.6-POVERTY RATES |  |  |
| :--- | ---: | ---: |
| Location | Population | Percentage |
| West Houston | 81,516 | $13.40 \%$ |
| City of Houston | 456,791 | $22.20 \%$ |
| Fort Bend County | 48,097 | $8.30 \%$ |
| Harris County | 725,651 | $17.90 \%$ |
| Region | 952,553 | $15.90 \%$ |
| Source: H-GAC \& US Census |  |  |

The Study Area includes three major employment centers: The Energy Corridor, the Westchase District and the Memorial District. There were 387,509 jobs
throughout the Study Area in 2010, which was 14 percent of the Region's employment (See Table 2.7). Employment in the Study Area is projected to grow by 86 percent to 722,073 by 2040. West Houston's projected employment growth is expected to exceed the expected employment growth for both the City of Houston (44\%) and the Region (53\%) for the same period.

| TABLE 2.7 - PROJECTED EMPLOYMENT |  |  |  |
| :---: | :---: | :---: | :---: |
| Year | West Houston | City of Houston | Region |
| 1990 | 186,572 | 1,251,342 | 1,837,310 |
| 2000 | 222,525 | 1,372,573 | 2,178,567 |
| 2010 | 387,509 | 1,673,401 | 2,742,878 |
| 2020 | 527,780 | 1,937,114 | 3,309,842 |
| 2030 | 648,708 | 2,192,043 | 3,750,311 |
| 2040 | 722,073 | 2,403,017 | 4,202,062 |

## EXISTING CONDITIONS


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Figure 2.132010 Population Density


Figure 2.142010 Employment Density
 Legend
 $\square_{>}^{\text {5,0,000 } 15,0000}$ 0

Figure 2.15 Study Area Ethnicity

As shown in Figure 2.11, projected employment density in the Study Area has grown to rival employment density in the City of Houston, and is now over six times the employment density of the Region. This high concentration of jobs is an important consideration for future transportation improvements within the Study Area. West Houston also has a higher concentration of office jobs than the City of Houston and the Region (Table 2.8).

| TABLE 2.8-EMPLOYMENT CATEGORIES |  |
| :--- | ---: | ---: | ---: |

Govermment
Figure 2.12 summarizes the relationship between household densities, job concentration, and current levels of mobility in West Houston. As shown in the figure, households in West Houston are heavily concentrated in the western and northwest portions of the Study Area. Jobs are primarily located in and around the major employment centers. Many of the major roadways leading to employment centers are experiencing severe congestion.

Figures 2.13 and 2.14 show 2010 Population and Employment densities, respectively, for the Houston Area as compared to the Study Area. Likewise, Figure 2.15 compares the ethnic diversity of the Houston Area to the Study Area.

## EXISTING CONDITIONS

## 2.3 <br> LAND USE

The land use maps on the next pages (Figures 2.17 through 2.20) reveal patterns of land use that have developed in the Study Area, despite the absence of zoning regulations. An area locator for the land use maps is shown in the top right corner of each map.
Retail, commercial and office uses are generally concentrated along major highway corridors, especially in the southern portions of the Study Area. Industrial land uses are concentrated in the northeast portion of the Study Area, where large tracts of land and rail facilities are available. The northwest portion of the Study Area, which has seen the most recent residential development, still has abundant undeveloped land and some agricultural uses.

The land use maps also make apparent the barrier that Addicks and Barker reservoirs pose to mobility and connectivity. The reservoirs totaling 26,000 acres comprise more than one quarter ( 26 percent) of the land in the Study Area (and 75 percent of all open space), and are situated at the junction of two of major roadways, I 10 and State Hwy 6. Only State Hwy 6, Eldridge Parkway and Clay Road traverse Addicks Reservoir, and Westheimer Parkway is the only road that crosses Barker Reservoir.

The breakdown of land used by type is shown in Figure 2.16, and listed in Table 2.9. Only 10 percent of the Study Area is undeveloped and just two percent is used for agricultural production. The small percentage of available land suggests that West Houston will develop in a denser pattern in the future. The Study Area is currently subject to rapid redevelopment due to growth and the age of existing properties.

| TABLE 2.9 STUDY AREA LAND USE |  |  |
| :--- | ---: | ---: |
| Land Use Category | Parcels | Acres |
| Agriculture Production | 36 | 2,285 |
| Commercial | 2,564 | 5,371 |
| Industrial | 2,219 | 7,208 |
| Multi-Family Residential | 1,644 | 4,369 |
| Office | 720 | 2,149 |
| Park \& Open Spaces | 3,837 | 34,366 |
| Public \& Institutional | 582 | 4,646 |
| Single-Family Residential | 146,033 | 27,886 |
| Transportation \& Utility | 450 | 1,308 |
| Undeveloped | 7,518 | 10,058 |
| TOTALS | 165,603 | 99,645 |
| Source: HCAD |  |  |



- Public (5
- Utilities ( $1 \%$ )
- Park \& Open Space (34\%)
- Vacant (10\%)
- Agriculture ( $2 \%$ )

Figure 2.16
Study Area Land Use Percentages



## EXISTING CONDITIONS



Figure 2.17
Northwest Quadrant Land Use


Legend
$\square$ Study Area
Land Use

|  | Agriculture Production |
| :--- | :--- |
|  | Commercial |
|  | Industrial |
|  | Multi-Family Residential |
|  | Office |
|  | Park \& Open Spaces |
|  | Public \& Institutional |
|  | Single-Family Residential |
|  | Transportation \& Utility |
|  |  |

## EXISTING CONDITIONS



Figure 2.18


## Legend

Study Area
Counties
Land Use

|  | Agriculture Production |
| :--- | :--- |
|  | Commercial |
|  | Industrial |
|  | Multi-Family Residential |
|  | Office |
|  | Park \& Open Spaces |
|  | Public \& Institutional |
|  | Single-Family Residential |
|  | Transportation \& Utility |
|  | Undeveloped |

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## EXISTING CONDITIONS



Figure 219
Southwest Quadrant Land Use


## Legend

## Study Area $\square$ Counties

## Land Use

Agriculture Production
Commercial
Industrial
Multi-Family Residential
Office
Park \& Open Spaces
Public \& Institutional
Single-Family Residentia Transportation \& Utility

Undeveloped
0

## EXISTING CONDITIONS



Figure 2.20
Southeast Quadrant Land Use


## Legend

Study Area
Land Use

|  | Agriculture Production |
| :--- | :--- |
|  | Commercial |
|  | Industrial |
|  | Multi-Family Residential |
|  | Office |
|  | Park \& Open Spaces |
|  | Public \& Institutional |
|  | Single-Family Residential |
|  | Transportation \& Utility |
|  |  |

## 2.4 <br> SPECIAL DISTRICTS

There are numerous special purpose districts in the West Houston area including six Municipal Management Districts, three Tax Increment Reinvestment Zones (TIRZs), and nine Super Neighborhoods

## MANAGEMENT DISTRICTS

Article III, Section 52, Article XVI, Section 59, and Article III, Section 52-a, of the Texas Constitution authorizes the creation of certain special districts for limited purposes. These districts are areas of the state, county municipality, or other political subdivision that have been divided for judicial, political, electoral, or administrative purposes. These districts may acquire, purchase, sell, or lease real or personal property; litigate legal matters; impose and collect taxes; issue bonds; borrow money; and contract with other entities. Some types of districts are granted the power of eminent domain.

Municipal Management Districts Municipal Management Districts (MMD) are one of several types of special districts authorized by State law. The Texas Local Government Code governs the creation and operation of MMDs. MMDs are empowered o "promote, develop, encourage, and maintain employment, commerce, economic development, and the public welfare in the commercial areas of municipalities and metropolitan areas of this state" (Sec 375.001 (b)). MMDs have the power to finance their operations by issuing bonds or other obligations, payable in whole or in part from ad valorem taxes, assessments impact fees, or other funds of the MMD to provide improvements and services. MMDs may levy a tax only after holding an election within the district. MMDs are intended to supplement, not supplant, existing public services.

Of the six MMD in the study area (Figure 2.21), three are funding partners of this study. They include Westchase Management District, Memoria Management District, and The Energy Corridor Management District.


Westchase Management District The Westchase Management District was formed in 1995. The District comprises 4.2 square miles and has 26,883 residents and 15,621 housing units in 2010. The District's employers however employ approximately 88,317 employees. The District has over 15 million square feet of office space, 2.4 million square feet of retail space, and 1.6 million square feet of service center and warehouse space. There are also 22 hotels and over 50 multi-family communities within the District.


Corporate Campus in the
Werporate Gampus

Memorial Management District The Memorial Management District was created in 1999, and works in conjunction with the Memorial City Redevelopment Authority (TIRZ 17). The District is approximately 850 gross acres of land between Bunker Hill Road and the West Sam Houston Toll Road - north and south of the newly expanded Interstate 10 , the Katy Freeway. The major employers in the District include the Memorial City Mall, the Memorial City Memorial Hermann Medical Center, the Chase Bank Service Center, Air Liquide, CEMEX US Operations, and the Metro National Corporation. There is more than 3.5 million square feet of retail space, almost 3.2 million square feet of office space, several eminent hotels and multifamily housing all located within the District. Businesses within the District employ more than 47,000 people who commute in daily from all over the Houston area.

The Energy Corridor
Management District
The Energy Corridor Management District was created in 2001. Currently, the Energy Corridor is the third largest employment center in the region with more than 91,000 employees. The Energy Corridor currently has over 21 million square feet of office space, with another 12 million proposed or under construction.




## Tax Increment Reinvestment Zones

 Chapter 311 of the Texas Tax Code enables counties and city to create Tax Increment Reinvestment Zones (TIRZs). TIRZs help finance the cost of redevelopment and encourage development within the designated area that would otherwise not attract sufficient market development in a timely manner. Taxes attributable to new improvements (tax increments) are set aside in a fund to finance public improvements within the boundaries of the zone. The two TIRZs in the StudyArea are shown in Figure 2.22.



## EXISTING CONDITIONS

## Super Neighborhoods

The Super Neighborhood Initiative was developed as a means to receive and consolidate input offered by residents and communitybased organizations throughout the City of Houston. The initiative provides a more organized and efficient system of community participation in decisions of local significance made of the City.

The City of Houston launched the Super Neighborhood Initiative in 1999 to encourage residents to work together to identity and prioritize needs and concerns in their communities. In 2003, the City passed an ordinance formalizing the Super Neighborhood Initiative as a program with the Department of Planning \& Development. The boundaries of each super neighborhood are typically designated by major physical features (bayous, freeways, etc.) to group together contiguous communities that share common physical characteristics, identity or infrastructure. Super Neighborhoods in the Study Area are shown in Figure 2.23.

Figures $2.24-2.26$ show the home zip codes of employees that work in the three funding partner management districts. These maps indicated that a significant number of people are commuting from areas along SH 6 north of Interstate 10, as well as Fort Bend County, and inside Loop 610



## EXISTING CONDITIONS

## 2.5 <br> PROPOSED DEVELOPMENT

Figure 2.27 shows the proposed major developments in the Study Area for the next several years, as of January 2015. These developments include 2,024 residential units and 6.7 million square feet of commercial space. Table 2.10 provides a description of each project.

These projects are indicative of the growth in West Houston. The leasing of 6.7 million square feet of additional office space and over 2,000 residential units will undoubtedly increase congestion within the Study Area.



## EXISTING CONDITIONS



## 2.6 <br> ROADWAYS <br> AND ROADWAY SAFETY

The roadways in the West Houston Study Area are some of the most heavily traveled in the Region. The Study Area contains over 50 miles of limited access freeways and toll roads, and nearly 400 miles of major thoroughfares. Figure 2.28 shows the current classifications of major transportation facilities in the Study Area.

The 2014 Average Daily Traffic (ADT) volumes of the Study Area roadways are depicted in Figure 2.30. ADT is the total traffic volume for a given roadway segment during a given time period. ADT is a simply measure of how busy a road is during the year. Note that State Highway 6 and Westheimer Road (FM 1093) both carry Freeway capacity volumes ( $50,000+$ ADT $)$ along nearly their entire length in the Study Area.

Figure 2.32 is the City of Houston 2014 Major Thoroughfare and Freeway Plan (MTFP). The MTFP identifies roadway segments that need to be lengthened or widened based on future growth and development. The plan is updated annually, and serves as notice to the public for developing land adjacent to the identified roads

Figure 2.31 shows the Level of Service (LOS) for roadways in the Study Area. LOS is a volume-to-capacity ( $\mathrm{v} / \mathrm{c}$ ) ratio that measures the quality of service on a given facility. The capacity of a given roadway is constant, and is based on the facility's size and geometry. However, the volume of traffic on that facility varies by time and conditions on a given day.

LOS is a range of $\mathrm{v} / \mathrm{c}$ ratios denoting the level of traffic congestion on a given facility. Typically, a v/c ratio of less than 0.85 indicates good traffic flow. A rate from 0.85 to 1.0 is acceptable. A rate between 1.0 and 1.25 indicates moderate congestion, and a rate above 1.25 is indicative of severe congestion.

Within the West Houston Study Area, many of the major thoroughfares are currently experiencing moderate to severe congestion. State Hwy 6, Eldridge Parkway, Brittmore Drive, the Beltway 8 frontage roads, Clay Road, Briar Forest Drive, Barker Cypress Road and Gessner Road are some of the roadways currently experiencing the most congestion. Few roadways in the Study Area have $\mathrm{v} / \mathrm{c}$ less than 0.85 . This means that most roadways in the Study Area are already near or exceeding their designed capacity TxDOT produces an annual list of the 100 most congested roadways in Texas. Table 2.11 lists the roadways in the Study Area that are on the 2014 Top 100 Congested Roadway in Texas.

west
houston

## EXISTING CONDITIONS

| TABLE 2.11 - MOST CONGESTED ROADS WITHIN STUDY AREA |  |  |  |  |  |  |
| :--- | :--- | :--- | :--- | ---: | ---: | :---: |

Source: TxDOT, 2014 Top 100 Most Congested Roadways in Texas


Vehicular crash information from 2008 to 2012 was obtained from TxDOT and analyzed to determine the severity and nature of vehicle collisions in West Houston. The results of this analysis are presented below.

On average, vehicle crashes in West Houston account for nine percent of all crashes in the Region (Table 2.12) A total of 41,043 crashes occurred in the Study Area from 2008 to 2012. Annual crash totals are shown in Figure 2.29. After peaking at 9,179 crashes in 2010, vehicle crashes declined 27 percent to 6,714 crashes in 2012.


Figure 2.34 shows vehicle crashes from 2008 to 2012 by time of day. Nearly half of all vehicle crashes (46\%) in West Houston occur during peak traffic periods (6AM-9AM [17\%] and 4PM-7PM [29\%]), the 5PM hour having the highest crash rate of the day Weekday analysis shows a rise in crashes as the week progressed, with Friday having the highest crash occurrence of any weekday (Figure 2.35).

In terms of severity, nearly two-thirds of al crashes were non-injury, property damage only crashes, slightly more than one-third were injury crashes, and one percent involved a fatality (Figure 2.36). Over the five year period, there were 232 fatalities and 21,706 injuries reported (Table 2.13).

| TABLE 2.13-CRASH SEVERITY |  |  |  |
| :---: | :---: | :---: | :---: |
| Year | Crashes | Total Injuries | Fatalities |
| 2008 | 8,876 | 4,937 | 48 |
| 2009 | 8,413 | 4,496 | 37 |
| 2010 | 9,179 | 4,604 | 47 |
| 2011 | 7,861 | 3,956 | 44 |
| 2012 | 6,714 | 3,713 | 56 |
| TOTAL | 41,043 | 21,706 | 232 |

According to Figure 2.37, a roughly equal number of crashes occurred at intersection and non-intersection locations. Only 12 percent related to driveway access. Over 70 percent of all crashes occurred on surface streets (city, county, and farm-to-market roads), while only 29 percent took place on highways and toll roads (Figure 2.38).

The types of collision are listed in Table 2.14. Rear-end collision were the most predominate type, accounting for nearly one-fifth of all collisions. Broadside, or "T-bone" collision, collisions with parked cars, single vehicle crashes, and sideswipe collisions rounded out the top five collision types.

| TABLE 2.14-VEHICLE COLLISON DYNAMICS |  |  |
| :--- | :---: | :---: |
| Collision Type |  | Percent |
| Rear End $18.80 \%$ <br> Broadside $16.30 \%$ <br> Rear End-Parked Car $15.80 \%$ <br> One Vehicle Crash $13.20 \%$ <br> Sideswwe-SD $9.70 \%$ <br> Left Turn Broadside-OD $8.80 \%$ <br> Left Turn Broadside $4.30 \%$ <br> Through with Left Turn $2.30 \%$ <br> Through with Right Turn $2.20 \%$ <br> Right Turn Broadside $1.80 \%$ <br> Headon $1.10 \%$ <br> All Others* $5.80 \%$ |  |  |

The spatial distribution of vehicle crashes is illustrated in Figure 2.39. It shows that crashes are heavily concentrated in the Southwest quadrant of the Study Area, and additional clusters along State Hwy 290 and State highway 6 at Farm-to-Market Road 529. These findings correlate exactly with the Level of Services depicted in Figure 2.32 for the same locations in the Study Area.

Figure 2.37 shows the number of intersection related crashes. Table 2.16 compares the Study Area roadway crash rates to State averages for those road types. Table 2.15 shows the 2012 TxDOT crash rates for varied urban and rural road types.

$|$| TABLE 2.15-URBAN TRAFFIC CRASHES PER |  |
| :--- | ---: |
| 100 MILLION VEHICLE MILES |  |
| Highway System | Crash Rate |
| Interstate | 94.14 |
| US Highway | 148.64 |
| State Highway | 198.3 |
| Farm-to-Market | 212.17 |
| Road Type | Crash Rate |
| 2 lane, 2 way | 181.25 |
| 4 or more lanes, divided | 117.37 |
| 4 or more lanes, undivided | 276.34 |

## EXISTING CONDITIONS


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## Legend

- Study Area
$\square$ Counties
Level of Service


# - At or Below Capacity 

## EXISTING CONDITIONS




## EXISTING CONDITIONS




Figure 2.34 Study Area Accident Counts By Hour of Day* *AM Peak 6 AM to 9 AM; PM Peak 4 PM to 7 PM


Figure 2.35 Study Area Accident Counts By Weekday


- Injury ( $34 \%$
- Fatal (1\%)
- Not Injured ( $62 \%$ )
- Unknown (3\%)
- Not Reported (<1\%)


## Figure 2.36

Study Area Accident Severity


- Intersection Related (43\%)
- Driveway Access ( $12 \%$ - Non Intersection (45\%) - Not Reported (<1\%)


## Figure 2.37

Study Area Accident Intersection Relationship


- Highways (27\%)
- Farm To Market $9 \%$ )
- County Road (17\%)
- City Street (45\%)
- Tollways ( $2 \%$ )
- Other Roads (. $.01 \%$ )


## Figure 2.38

Figure 2.38
Study Area Accident Roadway Type

## EXISTING CONDITIONS



## EXISTING CONDITIONS

| TABLE 2.16 - HIGHWAY AND MAJOR ROADWAY CRASH RATES |  |  |  |
| :---: | :---: | :---: | :---: |
| Street Name | Road Type | Rate(Crashes per 100M VMT) | Percent State Average |
| US 290 | US Highway | 175.67 | 18\% |
| Beltway 8 | State Highway | 69.90 | -65\% |
| Grand Parkway | State Highway | 33.35 | -83\% |
| Katy Frwy | Interstate | 61.43 | -35\% |
| W Little York Rd | 4+ Undivided | 703.16 | 154\% |
| Boheme Dr | 4+ Undivided | 330.71 | 20\% |
| Synott Rd | 4+ Undivided | 227.45 | -18\% |
| Hammerly Blvd | 4+ Undivided | 173.72 | -37\% |
| Barker Cypress Rd | 4+ Undivided | 171.66 | -38\% |
| Alief Clodine Rd | 4+ Undivided | 169.60 | -39\% |
| Long Point Rd | 4+ Undivided | 168.21 | -39\% |
| Memorial Dr | 4+ Undivided | 157.29 | -43\% |
| Eldridge Parkway | 4+ Undivided | 138.15 | -50\% |
| Addicks-Fairbanks | 4+ Undivided | 108.70 | -61\% |
| Rogerdale Rd | 4+ Undivided | 103.78 | -62\% |
| Cook Rd | 4+ Undivided | 91.33 | -67\% |
| Britmore | 4+ Undivided | 70.95 | -74\% |
| SH 6 | 4+ Undivided | 38.77 | -86\% |
| Hempstead Hwy | 4+ Undivided | 32.63 | -88\% |
| Old Westheimer Rd | 4+ Undivided | 3.86 | -99\% |
| Cinco Ranch Blvd | 4+ Divided | 781.11 | 566\% |
| Bellaire Blvd | $4+$ Divided | 405.53 | 246\% |
| Harwin Dr | $4+$ Divided | 375.99 | 220\% |
| Fondren Rd | 4+ Divided | 276.83 | 136\% |
| Ranchester Dr | $4+$ Divided | 240.50 | 105\% |
| Richmond Ave | 4+ Divided | 235.64 | 101\% |
| Franz Rd | 4+ Divided | 196.18 | 67\% |
| Gessner Road | 4+ Divided | 190.06 | 62\% |
| Dairy Ashford | $4+$ Divided | 186.26 | 59\% |
| Fry Road | 4+ Divided | 184.16 | 57\% |
| Senate St | 4+ Divided | 175.36 | 49\% |
| Park Ten Blvd | $4+$ Divided | 172.33 | 47\% |
| Westheimer | 4+ Divided | 168.89 | 44\% |
| Mason Road | $4+$ Divided | 166.25 | 42\% |
| Saums Rd | 4+ Divided | 146.29 | 25\% |
| Westriew Dr | $4+$ Divided | 142.48 | 21\% |


| TABLE 2.16 - HIGHWAY AND MAJOR ROADWAY CRASH RATES (CONTINUED) |  |  |  |
| :---: | :---: | :---: | :---: |
| Street Name | Road Type | Crash Rate (per 100M VMT) | Percent State Average |
| Blalock Rd | 4+ Divided | 140.44 | 20\% |
| Clay Road | 4+ Divided | 139.03 | 18\% |
| FM 1464 | 4+ Divided | 137.72 | 17\% |
| Queenston Blvd | 4+ Divided | 124.74 | 6\% |
| Huffmeister Rd | 4+ Divided | 123.26 | 5\% |
| Kingsland Blvd | 4+ Divided | 112.04 | -5\% |
| Wilcrest Dr | 4+ Divided | 110.07 | -6\% |
| Greenhouse Road | 4+ Divided | 89.45 | -24\% |
| Kempwood Dr | 4+ Divided | 84.56 | -28\% |
| Briar Forest Dr | 4+ Divided | 83.15 | -29\% |
| Kirkwood | 4+ Divided | 81.80 | -30\% |
| Highland Knolls Dr | 4+ Divided | 79.10 | -33\% |
| Addicks Clodine Rd | 4+ Divided | 76.03 | -35\% |
| Keith Harrow Blvd | 4+ Divided | 73.32 | -38\% |
| Park Row | 4+ Divided | 69.52 | -41\% |
| Westheimer Pkwy | 4+ Divided | 56.33 | -52\% |
| Groeschke Rd | 4+ Divided | 44.05 | -62\% |
| Peek Rd | 4+ Divided | 33.78 | -71\% |
| Westgreen | 4+ Divided | 28.97 | -75\% |
| Colonial Pkwy | 4+ Divided | 16.48 | -86\% |
| Westpark Tollway | 4+ Divided | 11.83 | -90\% |
| FM 529 | 4+ Divided | 6.87 | -94\% |
| Howell Sugarland Rd | 4+ Divided | 3.10 | -97\% |
| High Star Dr | 2 lane, 2 way | 440.46 | 143\% |
| Bunker Hill Rd | 2 lane, 2 way | 177.90 | -2\% |
| Campbell Rd | 2 lane, 2 way | 136.62 | -25\% |
| Greenbay | 2 lane, 2 way | 127.56 | -30\% |
| Strey Ln | 2 lane, 2 way | 99.98 | -45\% |
| Taylorcrest Rd | 2 lane, 2 way | 88.40 | -51\% |
| Briar Hill Dr | 2 lane, 2 way | 85.22 | -53\% |
| Tanner Rd | 2 lane, 2 way | 74.64 | -59\% |
| Morton Road | 2 lane, 2 way | 72.76 | -60\% |
| Clodine Rd | 2 lane, 2 way | 28.86 | -84\% |
| Patterson Rd | 2 lane, 2 way | 11.39 | -94\% |
| Study Area | All Major Roads | 92.76 | N/A |
| Source: TXDOT/H-GAC |  |  |  |


west
nouston


## 2.7 <br> TRANSIT AND ALTERNATIVE MODES

West Houston is served by public transit and other alternative travel modes. The availability and capacity of these services varies significantly throughout the Study Area. All of these services have the potential for improvement and expansion, as they can play a more vital role in enhancing mobility in West Houston. Indeed, mode choice and integration will be the keys to resolving the transportation challenges facing West Houston residents and commuters in the future.

The Metropolitan Transit Authority of Harris County (METRO) is the primary transit service provider for the study area (Figure 2.40). There were previously 31 routes serving the study area (as shown in Figure 2.41), including 18 local routes, 11 Park and Ride routes, a Signature Bus service, and an employee shuttle. Five of the 18 local routes have the highest average daily ridership in the METRO system in 2013. Moreover, these routes accounted for nearly $25 \%$ of METRO's daily ridership. Ridership information and Productivity/Performance metrics these routes are shown in Table 2.15. Additional information about each route is provided in Appendix C.

ADA/paratransit service is provided by METROLift within Harris County. Park and Ride services are focused on the IH 10 Katy Freeway, Westpark Tollway and US 290 corridors, using the HOV/HOT lanes. Local services were provided on the following corridors:

- North Eldridge Parkway
- Dairy Ashford Road
- Wilcrest Drive
- Gessner Road
- Kempwood Road
- Hammerly Road
- Long Point Drive
- Memorial Drive
- Briar Forest Drive
- Westheimer Road
- Richmond Avenue
- Alief-Clodine Road/Harwin Drive
- Bellaire Boulevard

The seven Park \& Ride facilities in the study area are listed below with their respective parking capacities:

| PARK AND RIDE FACILITIES |  |
| :--- | :--- |
|  | Park \& Ride |

METRO supports vanpool services known as METRO STAR. METRO also supports groups with common destinations by providing matching and administrative services. Currently, there are 127 METRO vanpools serving destinations in West Houston and these vanpools have 9,655 commuters registered to use the service





## EXISTING CONDITIONS



## Legend <br> Study Area <br> P Park \& Rides <br> 圊 Transit Centers <br> New Bus Network Routes <br> Peak Only <br> - 15 <br> 15 Min Headway <br> 30 Min Headway <br> - 60 Min Headway <br> Fort Bend Public Transit <br> A

TABLE 2.17-2013 METRO RIDERSHIP INFORMATION AND PERFORMANCE METRICS (PREVIOUS BUS NETWORK)
Productivity Metrics (Weekday)

| Route | Type | AVG Daily Ridership | Productivity Metrics (Weekday) |  |  | AVG Fare | Operating Ratio | AVG Subsidy per Boarding | Productivity Metrics (Weekend) |  | Performance Metrics |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | AVG Daily Ridership | Boardings per Revenue Mile | Boardings per Revenue Hour |  |  |  | Saturday Boardings per Revenue Hour | Sunday Boardings per Revenue Hour | AVG Speed | On-Time Performance | Notes |
| 303-WEST SHUTTLE | Employee Shuttle | 238 |  |  |  |  |  |  |  |  |  |  | FY 2012 METRO Ridership Report |
| 2-BELLAIRE $\dagger$ | Local | 7,354 | - |  |  |  |  |  |  |  |  |  |  |
| 4-BEECHNUT | Local | 4,469 |  |  | - |  |  |  | - |  |  |  |  |
| 9-GULFTON LIMITED | Local | 1,402 |  |  |  |  |  |  |  |  |  |  |  |
| 19-WILCREST | Local | 1,126 |  |  |  |  |  |  |  |  |  |  |  |
| 20-LONG POINT LIMITED | Local | 2,391 |  |  |  |  |  |  |  |  | - |  |  |
| 25-RICHMOND | Local | 5,360 | - |  |  |  |  |  |  |  |  |  |  |
| 36-KEMPWOOD | Local | 1,563 |  |  |  |  |  |  |  |  |  |  |  |
| 46-GESSNER CROSSTOWN | Local | 4,983 | - | - | - |  | - |  | $\bullet$ | - |  |  |  |
| 53-BRIARFOREST LIMITED | Local | 3,802 |  |  |  |  |  |  |  |  |  |  |  |
| 58-HAMMERLY | Local | 818 |  |  |  | - |  | - |  |  |  |  |  |
| 67-DAIRY ASHFORD CROSSTOWN | Local | 758 |  |  |  |  |  |  |  |  |  |  |  |
| 70-MEMORIAL | Local | 429 |  |  |  |  |  | - |  |  |  |  |  |
| 72-WESTVIEW CIRCULATOR | Local | 806 |  |  |  |  |  |  |  |  |  |  |  |
| 75-ELDRIDGE CROSSTOWN | Local | 381 |  |  |  |  | - | - |  |  |  |  |  |
| 81-WESTHEIMER SHARPSTOWN | Local | 4,946 | $\bullet$ | - |  |  |  |  |  |  |  |  |  |
| 82-WESTHEIMER WEST OAKS | Local | 6,523 | $\bullet$ | - | $\bullet$ |  | $\bullet$ |  | - | - |  |  |  |
| 131-MEMORIAL | Local | 1,694 |  |  |  |  |  |  |  |  | $\bullet$ |  |  |
| 132-HARWIN | Local | 2,251 |  |  |  |  |  |  |  |  | - |  |  |
| 214-NORTHWEST STATION | Park \& Ride | 2,334 |  | $\bullet$ | $\bullet$ | - | $\bullet$ |  |  |  | $\bullet$ |  |  |
| 216-PINEMONT / W LITTLE YORK | Park \& Ride | 687 |  |  |  |  |  |  |  |  |  |  |  |
| 217-CYPRESS | Park \& Ride | 1,502 |  |  |  | $\bullet$ | $\bullet$ |  |  |  | $\bullet$ |  |  |
| 219-PINEMONT W LITTLE YORK NORTHWEST STATION | Park \& Ride | 257 |  |  |  |  |  |  |  |  |  |  |  |
| 221-KINGSLAND | Park \& Ride | 2,307 |  |  |  |  |  |  |  |  |  |  |  |
| 222-GRAND PARKWAY | Park \& Ride | 713 |  |  |  | $\bullet$ | $\bullet$ |  |  |  | $\bullet$ | $\bullet$ |  |
| 228-ADDICKS | Park \& Ride | 1,960 |  |  |  | $\bullet$ |  |  |  |  |  | - |  |
| 229-ADDICKS KINGSLAND MIDDAY | Park \& Ride | 468 |  |  |  |  | $\bullet$ |  |  |  |  |  |  |
| 274-WESTCHASE / GESSNER | Park \& Ride | 431 |  |  |  |  |  |  |  |  |  | - |  |
| 285-KINGSLAND UPTOWN | Park \& Ride | 179 |  |  |  |  |  |  |  |  | $\bullet$ | $\bullet$ |  |
| 298-KINGSLAND / ADDICKS / TMC | Park \& Ride | 1,117 |  |  |  |  |  |  |  |  |  |  |  |
| 402-QUICKLINE BELLAIRE | Signature | 719 |  |  |  |  |  |  |  |  |  |  |  |
| Marker ( $\bullet$ ) indicates that route is in the top 10 among local bus routes or the top 5 among Park \& Ride routes for the indicated productivity or performance metric // $\dagger$ - Highest Average Daily Ridership among local routes in the METRO Service Area |  |  |  |  |  |  |  |  |  |  |  |  |  |

Marker $(\bullet)$ indicates that route is in the top 10 among local bus routes or the top 5 among Park \& Ride routes for the indicated productivity or performance metric // $\dagger$ - Highest Average Daily Ridership among local routes in the METRO Service Area

## EXISTING CONDITIONS



## Legend <br> Study Area <br> P Park \& Rides <br> Transit Centers <br> Parcel <br> - Bus Routes <br> Fort Bend Public Transit <br> Transit Accessibility <br> 0.25 mi <br> 0.5 mi <br> 1

huosston

## EXISTING CONDITIONS



Figure 2.44
New METRO Bus Network Accessibility

## Legend

| $\square$ | Study Area |
| :--- | :--- |
|  | Counties |
| $\mathbf{P}$ | Park \& Rides |
| R | Transit Centers |
|  | Parcels |

## New Bus Network Routes

Peak Only

- $10-15$ mins
- $16-30 \mathrm{mins}$
- $31-60 \mathrm{mins}$

Fort Bend Public Transit

## Transit Accessibility

0.25 mi
0.5 mi
©

On August 16, 2015, METRO launched its new local bus service throughout the region Under METRO's New Bus Network, West Houston is serviced by 24 routes, including 11 High Frequency routes (Headways of 15 minutes or less), 2 Ridership routes ( 30 minute headways), 9 Coverage routes ( 60 minute headways), 2 Peak-Hour Service routes, plus all 11 Park \& Ride routes ${ }^{\dagger}$. Figure 2.42 and Table 2.16 provide information on these local routes. The proposed routes would address some of the suggestions mentioned above.

A portion of the southwest corner of the study area is in Fort Bend County. Roughly half of this area is within METRO's Service Area. However, all of this area has access to transit services offered by Fort Bend County. All the services offered by the Fort Bend County Public Transportation Department, with the exception of demand response, operate outside the study area.

Fort Bend County provides demand response and commuter services through its Public Transportation (hereafter referred to as FBCT) that was formed in 2005. A total of 37 vehicles are used to provide these services Monday through Friday (excluding County Holidays). All services are open to the general public and all vehicles are handicap accessible. Demand Response service is provided within the County, and to medical facilities in Harris County.

The commuter services offer trips in to the Greenway Plaza, Galleria and Texas Medical Center areas of Houston. Figure 2.45 shows the annual Demand Response and Commuter Service Trips since 2005.

The Demand Response service allows riders to schedule service by phone (tollfree) Monday through Friday from 8 AM to 5 PM. Reservations can be made from one to 30 days in advance. Repeat trips may also be scheduled in advance. However, reservations are accepted on a "time and space" available basis. Service is curb-tocurb, although persons with disabilities may request door-to-door service. Passengers 12 years or younger must be accompanied by another person 18 years or older. (Fort Bend County Westpark Corridor Park and Ride Advance Planning Report, IDC, Inc., June 2011)

## TABLE 2.18 - METRO NEW BUS NETWORK

 ROUTES (OCTOBER 2014| Route\# | Route Name | Network |
| :---: | :---: | :---: |
| 2 | Bellaire | Frequent |
| 4 | Beechnut | Frequent |
| 25 | Richmond | Frequent |
| 26 | Long Point Cavalcade | Frequent |
| 46 | Gessner | Frequent |
| 63 | Fondren | Frequent |
| 82 | Westheimer | Frequent |
| 152 | HarwinExpress-Westwood | Frequent |
| 153 | HarwinExpress-Briar Forest | Frequent |
| 160 | Memorial City Express | Frequent |
| 161 | Wilcrest Express | Frequent |
| 23 | Clay W 43rd | Coverage |
| 39 | Katy Freeway | Coverage |
| 58 | Hammerly | Coverage |
| 67 | Dairy Ashord | Coverage |
| 70 | Memorial | Coverage |
| 72 | Westriew | Coverage |
| 75 | Eldridge | Coverage |
| 162 | Memorial Express | Coverage |
| 9 | Gultoon Holman | Ridership |
| 36 | Kempwood W 34th | Ridership |
| 151 | Westpark Express | Peak Only |
| 402 | Bellaire Quickline | Peak Only |


Coverage routes are designed to provide access tit the transits sytem for transit
riders and locations that cannot supoort freuunent senice

Ridership routes have strong ridership potential but without the curenent demand to
 in the off-peak, mimday, evening, ate night, and weekend periods, and som
Peak Period expresss routes operate a portion of the same route as Iocal senice (regularly spaced stopss) and somemtimes a portion of the rout is non-stio on a treeway. Averages speed is, thereforere, higher than other Iocal routes but still ower
than commuter routes. These routes are peak-period, weekday only service. Pead thena commuter routes. These outes aref epak-perinod
periods


Figure 2.45 Fort Bend County Transit Service Trips


Figure 2.46 Annual Memorial City Shuttle Service Ridership


FBCT offers two commuter services known as TREKEXPRESS and FORT BEND EXPRESS. TREKEXPRESS provides direct bus services into the Greenway Plaza and Uptown Galleria area of Houston from two Park \& Ride locations in Sugarland. TREKEXPRESS routes also stop at METRO's West Bellfort Park \& Ride lot to allow passengers to transfer to other METRO routes, if desired. FORT BEND EXPRESS provides commuter service to the Texas Medical Center. The service originated at the Fort Bend County Fairgrounds and stops at both Sugarland Park \& Ride locations before continuing the Texas Medical Center. (Fort Bend County Westpark Corridor Park and Ride Advance Planning Report, IDC, Inc., June 2011)

FBCT is projected to begin construct its first permanent Park \& Ride facility in the Westpark Corridor in 2016. The facility will offer commuter services to locations in Houston, and could become an important transit hub for commuter shuttles and local bus service in the future. Additional information about the new FBCT Park \& Ride is in Section 5.2.

The Energy Corridor partnered with METRO to create the 75 -Eldridge Crosstown. The route operates along Eldridge Parkway, and provides connections with other METRO routes and Park \& Rides. Memorial City has a complimentary shuttle service (Figure 2.45 ) operated by Metro National, Inc, the Memorial Management District's largest property owner.

The shuttle currently operates from 11AM to 2 PM Monday thru Friday, and takes riders from several locations within the Management District to and from the food court at Memorial City Mall. From 2005 to 2014 the average annual ridership has been over 12,000 persons. Figure 2.46 provides annual ridership information on the Memorial City Shuttle.

In addition to public transit, vanpools, and circulator shuttles residents and commuters in West Houston can utilize other means of getting around. There are numerous private and employer-sponsored carpools, as well as ridematching services like NuRide and Carma, taxi services like Yellow Cab and Uber, and vehicle sharing services like Enterprise CarShare

Enterprise CarShare gives commuters access to a shared vehicle throughout the day so they can run personal or work errands. Vehicles can be rented 24 hours a day, seven days a week with fuel, physical damage/liability protection, vehicle maintenance and $24 / 7$ roadside and member assistance for nominal hourly fees. Currently, Enterprise CarShare and the Energy Corridor have partnered to provide this service at two locations within the Study Area.

West Houston employers can also participate in other alternative commuting solutions such as telecommuting, alternate work schedule and parking management to allow their employees greater work flexibility. These solutions are offered by H-GAC's Transportation Department as incentives to help improve air quality in the Region. Bicycle and pedestrian-related commute solutions will be discussed in the next section.

| TABLE 2.19 - TRANSIT ACCESSIBILITY |  |  |  |
| :---: | :---: | :---: | :---: |
|  | METRO |  | FBCT |
| Land Use | Previous Network | New Bus Network | Parcels Serviced |
| Agricultural | 71 | 84 | 3 |
| Commercial | 2,776 | 3,035 | 131 |
| Government/ Institutional | 878 | 955 | 1,339 |
| Industrial | 25 | 36 | 3 |
| Multi-Family | 442 | 478 | 10 |
| Other | 1,254 | 1,401 | 236 |
| Parks \& Open Space | 139 | 147 | 526 |
| Residential | 50,181 | 52,409 | 12,580 |
| Vacant | 1,986 | 2,165 | 198 |
| TOTAL | 57,752 | 60,710 | 15,026 |
| Percentage of Study Area Parcels | 35\% | 37\% | 9\% |

## 2.8 <br> BICYCLE AND <br> PEDESTRIAN SAFETY

As stated in the Energy Corridor District's Bicycle Master Plan, "Bicycling and walking are integral components of an efficient transportation network, along with public transit and the use of private motor vehicles. Therefore it is important that appropriate bicycle and pedestrian accommodations be made available to the public." The existence, condition, and connectivity of bicycle and pedestrian facilities vary considerably throughout the West Houston Study Area Bicycle and pedestrian facilities will be discussed in relation to the Study Area subregions described in Section 2.1

The West Houston Study Area has an extensive collection of bicycle and shared use facilities (See Figure 2.47). The Study Area contains 13 percent of the $1,254.5$ miles of bicycle and shared use facilities in the Region. As shown in Table 2.20, the Study Area has over 160 miles of existing public facilities, with another 113 miles of proposed public facilities planned for construction in the next 10 years. These planned public facilities are in addition to any facilities planned by private interests. All of the bicycle lanes and signed bicycle routes are located in the Inner Study Area within the Houston city limits. The inner

Study Area also contains an extensive network of shared use trails (approximately 10 miles) in Terry Hershey Park along Buffalo Bayou.

Both reservoirs contain shared use trails George Bush Park located in Barker Reservoir has more than 11 miles of trails. The trails in George Bush Park also connect to the trails in Terry Hershey Park to create nearly 22 miles of connected trails. Bear Creek and Cullen Parks are located in Addicks Reservoir and together these parks have 5.5 miles of trails.

The Outer Study Area has numerous shared use trails. However, many of these trails are off-street along waterways and are generally not connected. Exceptions include the 6.8 mile signed bicycle lane along FM 529 from US 290 to Barker Cypress Road, and the extensive network of shared use trails in the Cinco Ranch community.

Though many exceptions exist especially along arterial streets, large portions of the inner Study Area are either connected with sidewalks for pedestrian travel, or composed of very low traffic streets within subdivisions on which walking in the street is sufficiently safe and comfortable. Pedestrians can cross major streets relatively easily at signalized intersections, but large distances between controlled crosswalks locations lead many to cross at mid-block (as Study Area crash data shows) where motorists may not expect them.

Few state-of-the-practice pedestrianactivated enhanced crosswalks are in place. These include active warning devices and Pedestrian Hybrid Beacons, which stop traffic with a solid red indication during the "WALK" phase then permit stop-and-proceed with flashing red while pedestrians finish crossing.

In the outer Study Area, conditions for pedestrians vary widely. Typically the walking environment is pedestrian-friendly within subdivisions (sidewalks, or very-low-traffic internal streets without them) but pedestrian-hostile outside them (no sidewalks along arterials and collectors, and major gaps where sidewalks do exist). Within some subdivisions there are sidewalk gaps across utility corridors such as power line rights of way. Although the trails system is well developed in the area it may be difficult for pedestrians and cyclists to access their final destinations as there are few dedicated on-street or other connecting facilities for the "last mile" of the trip. Many retail strips, commercial centers, and big box and superstore developments throughout the Study Area have no protected walkways between streets and storefronts, and are walled off from adjacent neighborhoods that would otherwise be an easy walk or bike ride away.

| TABLE 2.20 - WEST HOUSTON BICYCLE \& PEDESTRIAN FACILITIES |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Facility Type | Existing |  | Proposed |  | and Totals |  |
|  | Facilities | Length (mi) | Projects | Length (mi) | Faciilities | Length (mi) |
| Bike Lane | 18 | 31 |  |  | 18 | 31 |
| Pedestrian Walkway* | 1 | 0.05 |  |  | 1 | 0.05 |
| Shared Use Path/Trail | 155 | 105.1 | 72 | 113.8 | 227 | 218.9 |
| Signed Shared Roadway | 39 | 28.6 |  |  | 39 | 28.6 |
| Total | 213 | 164.7 | 72 | 113.8 | 285 | 278.5 |

*Length of City of Houston Pedestrian Walkway is approximately 258 feet


Current Bike and Trails Projects in the Energy Corridor

## EXISTING CONDITIONS



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Figure 2.48 Annual Bicycle and Pedestrian Crashes


Figure 2.49 Bicycle and Pedestrian Crash Frequency by Weekday


Figure 2.50 Bicycle and Pedestrian Crash Frequency by Month

The safety experience for bicyclists and pedestrians in West Houston has been mixed. Bicycle and pedestrian crashes respectively averaged eight and nine percent of all crashes in the Region (Tables 2.21 and 2.22 , respectively).

| TABLE 2.21 - ANNUAL BICYCLE CRASHES |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Year | Region | $\begin{gathered} \text { City of } \\ \text { Houston } \end{gathered}$ | $\begin{array}{r} \text { West } \\ \text { Houston } \end{array}$ | $\begin{array}{r} \text { Regional } \\ \text { Pct } \end{array}$ |
| 2008 | 579 | 323 | 55 | 9\% |
| 2009 | 612 | 350 | 50 | 8\% |
| 2010 | 479 | 234 | 47 | 10\% |
| 2011 | 455 | 193 | 37 | 8\% |
| 2012 | 677 | 370 | 39 | 6\% |
| 5 YR AVG | 560.4 | 294 | 45.6 | 8\% |
| TABLE 2.22-ANNUAL PEDESTRIAN CRASHES |  |  |  |  |
| Year | Region | $\begin{gathered} \text { City of } \\ \text { Houston } \end{gathered}$ | West Houston | $\begin{array}{r} \text { Regional } \\ \text { Pct } \end{array}$ |
| 2008 | 1239 | 871 | 100 | 8\% |
| 2009 | 1125 | 824 | 105 | 9\% |
| 2010 | 911 | 528 | 87 | 10\% |
| 2011 | 890 | 498 | 83 | 9\% |
| 2012 | 1269 | 894 | 104 | 8\% |
| 5 YRAVG | 1,086.80 | 723 | 95.8 | 9\% |

From 2008 to 2012, 228 bicyclists and 479 pedestrians were involved in collisions with motor vehicles. Tables 2.23 and 2.24 provide more detail on crashes, injuries, and fatalities for bicyclists and pedestrians in the Study Area. Crash characteristics are shown in Figures 2.48-2.56. Annual crashes (Figure 2.48) have fluctuated over the five year period for both bicyclists and pedestrians. From 2011 to 2012, crashes increased by 25 percent for pedestrians, and 5 percent for bicyclists.

Similarly, crashes vary by weekday for both bicyclist and pedestrians. For pedestrians, Tuesdays and Fridays were days with the highest crashes, while it was Mondays for bicyclists (Figure 2.49). An analysis of crashes by month of the year (Figure 2.50) revealed that March and October were the worst months for pedestrians, while April and October were the worst months for bicyclists. The time of day (Figure 2.51) bicycle and pedestrian crashes occurred was similar to the general crash pattern for the Study Area (See Figure 2.34). For pedestrians, nearly half of all crashes occurred during peak traffic hours (6AM9AM and 4PM-7PM). Likewise, over half (53 percent) of all bicycle crashes in the Study Area occurred during these times. The age of bicyclist and pedestrians involved in crashes (Figure 2.52) was interesting. For pedestrians, the largest age group of crash victims were 25-44 year olds, followed by those 18 years and under. For bicyclists, those 18 years and younger were the largest groups of victims, followed by those 25-44 years old

As mentioned above, varied pedestrian environment in the Study Area may cause pedestrians to cross streets at mid-block creating a safety hazard. Crash data confirms this phenomenon, as 53 percent of pedestrian crashes in the Study Area do not occur at intersections (Figure 2.53).

| TABLE 2.23 - BICYCLE CRASH SEVERITY |  |  |  |
| :---: | :---: | :---: | :---: |
| Year | Crashes | Injuries* | Fatalities |
| 2008 | 55 | 55 | 0 |
| 2009 | 50 | 50 | 0 |
| 2010 | 47 | 42 | 2 |
| 2011 | 37 | 33 | 2 |
| 2012 | 39 | 40 | 0 |
| TOTAL | 228 | 220 | 4 |


| TABLE 2.24 - PEDESTRIAN CRASH SEVERITY |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: |
| Year |  | Crashes | Injuries | Fatalities |
| 2008 |  |  |  |  |
| 200 |  |  |  |  |
| 209 |  |  |  |  |
| 105 |  |  |  |  |
| 2011 |  |  |  |  |

Interestingly, the opposite is true for bicyclists, as 56 percent of bicycle crashes occurred at intersections (Figure 2.54). 90 percent of pedestrian crashes and 95 percent of bicycle crashes resulted in injuries. 9 percent of pedestrian crashes and 2 percent of bicycle crashes were fatal (Figures 2.55 and 2.56).

Spatially, 83 percent of pedestrian crashes and 72 percent of bicycle crashes occurred east of State Highway 6, and 84 of the 228 bicycle crashes occurred with one-quarter mile of an existing bicycle facility, resulting in 81 injuries and 2 deaths (Figures 2.57 and 2.58).



Figure 2.53 Pedestrian Crash Frequency by Roadway Location


Figure 2.55 Pedestrian Crash Severity

Figure 2.54 Bicycle Crash Frequency by Roadway Location



Figure 2.56 Bicycle Crash Severity
$=$ Intersection Related (38\%)

- Driveway (9\%)

Non Intersection (53\%)

- Pedestrian
- Bicycle
- Injured (90\%)
- Fatal (9\%)
- Not Injured (1\%)


## EXISTING CONDITIONS



## EXISTING CONDITIONS



## Legend

1 Study Area

## $\square$ Counties

0

## EXISTING CONDITIONS

## 2.9 <br> RAIL FACILITIES

There is only one active rail facility in the Study Area. Union Pacific Railroad has an active rail line adjacent to Hempstead Road and US 290. As Shown in Figure 2.59, approximately 3.5 miles of this rail line pass through the Study Area. However, there are two abandoned rail line right-of-way corridors in the Study Area. One corridor is adjacent to Interstate 10, and the other runs along the Westpark Tollroad.

The railroad line along Interstate 10 , first built in 1893, was abandoned in 1997 when Union Pacific sold the right-of-way to TxDOT for the expansion of Interstate 10. The line was approximately 23 miles long, and extended from Harris-Fort Bend County line in Katy, TX to the Eureka yard just inside Loop 610. The Westpark rail line, formerly the Bellaire Subdivision, extended for approximately 38 miles from US 59 and Montrose Blvd. to the Fort Bend-Wharton County line. The rail line was abandoned in 1992 when Southern Pacific Railroad sold the 100 feet of right-of-way to METRO. In 1999, METRO sold half of the right-of-way to the Harris County Toll Road Authority to construct the Westpark Tollway. METRO currently has plans to use the remaining portion of right-of-way for construction of a portion of the University Lightrail line.

In 2008, H-GAC commissioned the Regional Commuter Rail Connectivity Study that took an unconstrained long range look at commuter rail options in the Houston area. The study examined the Westpark corridor and four others as potential commuter rail corridors. It concluded that the Westpark Rail Corridor could potential have over 6,800 passengers per week. The study did not consider the Interstate 10 corridor as a commuter rail route because the right-of-way had already been sold to expand the Katy Freeway

Recently, METRO sold additional portions of the Westpark Corridor right-of-way to the Fort Bend County Toll Road Authority for expansion of the Westpark Tollway from the Grand Parkway to Jones Lane in Fulshear, TX.



### 2.10 <br> REGULATIONS, POLICIES AND STRATEGIC PLANS

The land development regulatory framework of political entities in West Houston is diverse. Lack of land use zoning regulations throughout the area presents unique challenges and opportunities for developers However, local governments and special districts have addressed this issue with a wide range of statutes and policies. Peter Coy states that, "Houston is well known as the only major U.S. city with no formal zoning code. Such a seeming lack of order is difficult to grasp by those unfamiliar with the area

The absence of a comprehensive land use code conjures up images of a disjointed landscape where oil derricks sit next to mansions and auto salvage yards abut churches" (2007). But, Teddy M. Kapur says that "...contrary to its free market reputation, the [C]ity of Houston has directed land use

TABLE 2.25-CITY OF HOUSTON DEVELOPMENT ORDINANCES

## Ordinance

Chapter 10 - Buildings and Neighborhood Protection
Chapter 19 - Flood Plain
Chapter 26 - Parking
Chapter 33-Planning and Development
Chapter 38 - Rairroads
Chapter 40 - Streets and Sidewalks
Chapter 42 - Subdivisions, Developments and Platting
Chapter 45 - Traffic
allocations by intervening in private deed restrictions and enacting land management controls such as subdivision regulations, street design standards, tax increment reinvestment zones, and prevailing lot size requirements" (2004)

Indeed the City of Houston has a wide array f ordinances (Table 2.25) and policies that give the City the ability to effectively manag land uses. In addition to enforcing deed restrictions in residential areas, the City has a detailed Infrastructure Design Manual and the following ordinances at its deposal to regulate the built environment.


1. Chapter 10 - Buildings and Neighborhood Protection: establishes regulations to protect neighborhoods against blight and outlines various building standards. Buildings on utility easements, deed restrictions, abatement of unauthorized blight, abatement of junked vehicles, Houston multi-family habitability codes, and hoarding and related behaviors provide a few examples of articles defined under this Chapter
2.Chapter 19-Flood Plain: The purpose of this chapter is to promote the public health safety and general welfare and to minimize public and private losses due to flood conditions in specific areas. This chapter provides a regulatory system to monitor the issuance of plats and permits to reduce the likelihood that development within the City of Houston will increase the dangers of flooding.
3.Chapter 26 - Parking: Establish parking regulations for on and off street facilities within the City of Houston. Parking meters commercial vehicle loading zones, booting/ towing, valet parking services, parking benefit districts and residential parking
permits are outlined in this Chapter
4.Chapter 33 - Planning and Development: establishes regulations associated with planning and development within the City of Houston. This chapter relates to regulations regarding the Planning Commission, tree planting, historic preservation, super neighborhoods, and landscape unit costs among others.
2. Chapter 38 - Railroads: establishes regulations for the City's interactions with rail throughout Houston inclusive of permit to lay tracks, crossings of right-of-way by city water and sewer lines, separation of railroad from street grade, closing of crossing gates and guards, speed limit for trains, blowing whistle, as well as the City authorization to participate in certain costs relating to street and railroad intersections are example articles within this Chapter.
3. Chapter 40 - Streets and Sidewalks: establishes regulations for streets and sidewalks within the City of Houston Articles examples associated with this Chapter include the construction of sidewalks, driveways, curbs and gutters, excavation of the public way, bus shelters, paving assessments, sidewalk sales and

TABLE 226 - SELECT STATE OF TEXAS ECONOMIC DEVELOPMENT PROGRAMS

| \# | Program | Statue | Tax Type |
| :---: | :---: | :---: | :---: |
| 1 | Tax Increment Financing | Chapter 311, Tax Code | Property Tax |
| 2 | Tax Abatement Agreements | Chapter 312, <br> Tax Code | Property Tax |
| 3 | Value Limitation and Tax Credit | Chapter 313, Tax Code | Property Tax |
| 4 | Development Corporation Act of 1979, | $\text { Chapters } 501$ $-505,$ | Local Sales \& Use Tax |
|  | Type A/B Sales Tax for Economic Development | Local <br> Government Code |  |
| 5 | County Assistance Districts | Chapter 387, Local Government Code | Local Sales \& Use Tax |
| 6 | Enterprise Zones | Chapter 2303, <br> Government <br> Code | Sales and Use |
| 7 | Chapter 380/381 Agreements | Chapters 380-381, Local Government Code | Sales and <br> Use, Property <br> Tax, Other |
| 8 | Municipal \& County Hotel Occupancy Tax | Chapters 351 352, Tax Code | Local Hotel Occupancy Tax |
| 9 | Public <br> Improvement Districts (PIDs) | Chapter <br> 372, Local Government Code | Special Assessment |
| 10 | Neighborhood Empowerment Zones | Chapter <br> 378, Local Government Code | Property Tax, Sales Tax and Local Fee Waivers |


performances, alleys, sidewalk and roadway obstructions and impairments.

## 7 Chapter 42 - Subdivisions,

Developments and Platting: establishes regulations for the platting, subdividing and development of land within Houston's Corporate City Limits to ensure that development and redevelopment efforts in Houston occur in a safe and healthy manne Planning standards and development associated with the City's transit corridors are outlined in this Chapter.
8.Chapter 45 - Traffic: establishes regulations associated with traffic inclusive of the vehicle, pedestrian and bicycle. Articles associated with this Chapter include pedestrian, bicycles, etc. upon limited or controlled-access highways, boarding and alighting moving vehicles, application of chapter to persons propelling push carts, riding animals, etc., use of coasters, toy vehicles and similar toy devices on the roadway.

In 2013, the City of Houston amended Chapter 42 and Chapter 10. Chapter 42 was amended to allow increased housing density outside of Loop 610 by eliminating the distinction between "urban" (inside Loop 610) and "suburban" (outside Loop 610). The Chapter 10 amendment provides neighborhoods with greater protection from incompatible land uses and ensures access to single-family residences

The City says the ordinance changes will eliminate confusion and discrepancies contained within the codes, provide additional resources for neighborhoods to manage their future; make the City competitive with suburban development, improve development standards and increase single-family residential construction within the city limits.

In addition to the aforementioned ordinances, the City also has an Infrastructure Design Manual (IDM). The IDM contains detailed standards for project submittals, including plat drawings, streets, utilities, and traffic controls. The IDM also governs street classification, including designation of transit corridors.

All of the Management Districts, TIRZs, and Super Neighborhoods in the Study Area work with the City of Houston to develop capital improvement projects in their areas, and some have their own capital improvement programs that are incorporated into the City's Capital mprovement Program. In addition, some of these groups develop long-range strategic plans that inform and guide development in their areas. These plans outline broad goals and in some cases include conceptual depictions of future infrastructure and building projects.

Harris County annually adopts Appendix A of the City of Houston's Major Thoroughfare Plan (See Section 4.2). Appendix A contains street cross section geometries that Harris County enforces in the unincorporated areas of the county. Harris County does not utilize the City's Complete Streets Program.

Unlike Harris County, Fort Bend County (FBC) does not adopt the City of Houston's MTFP Appendix A. FBC developed its own street cross section geometries and ROW requirements. The County does not endorse the City's Complete Streets program, although its development regulations contain many elements of the program.

FBC adopted a revised MTFP in February 2015. FBC is currently revising its Subdivision regulations. The revisions should be completed by December 2015.

The State of Texas provides a rich array of economic development tools to help local and county governments encourage and maintain the economic vitality of their jurisdictions. Tools applicable to the Study Area are listed in Table 2.26, and described below. Many of these incentives and assessments are currently being utilized in the Study Area. Details regarding each of these development tools can be found in Appendix G


## PUBLIC ENGAGEMENT



## PUBLIC ENGAGEMENT

## PUBLIC ENGAGEMENT

## 3.1 <br> PUBLIC <br> INVOLVEMENT

Stakeholder participation and community involvement were a major area of focus for $\mathrm{H}-\mathrm{GAC}$ and the project team during the development of the West Houston Mobility Plan. No plan of this nature can be complete without the input and review of the public, as such, there has been an important effort on part of the West Houston Mobility Plan to gather and incorporate the public's input and feedback.

Throughout the course of the study, there have been numerous opportunities for the public to give their input and be heard. Outreach was accomplished through a variety of methods including a Steering Committee, public meetings, a project website, crowd sourced mapping application, online survey, and stakeholder meetings. Each of the outreach efforts and data gathered from those efforts is outlined in this chapter.

## FUNDING PARTNERS

The City of Houston, the Energy Corridor District, Memorial Management District and the Westchase Management District all contributed funds for the local match portion of this study. The funding partners also served on the Steering Committee.



## WESTCHASE





## 3.2 <br> STEERING COMMITTEE

Key Study Area stakeholders and groups were identified and recruited for involvemen in the study process. A steering committee was formed from this group to assist in identifying key areas of focus for the study effort, as well as to guide the development of the final report and recommendations. The Steering Committee was made up of representatives from the following organizations.

- Houston-Galveston Area Council

City of Houston
The Energy Corridor
The Westchase Management District
West Houston Association

- Memorial Management District METRO
- Harris County
- Gulf Coast Rail District
- TxDOT

The Steering Committee met six times throughout the course of the project, reviewing work and providing guidance to ensure that the goals and desired outcomes for the study were met. All steering committee meetings were held at H-GAC offices ( 3555 Timmons Lane, Houston, TX 77027) and at Houston TranStar (6922 Old Katy Road, Houston, TX 77024). The dates of the steering committee meetings are
listed below:

Steering Committee Meeting \#1 June 26, 2013
Steering Committee Meeting \#2: October 10, 2013
Steering Committee Meeting \#3: December 11, 2014

- Steering Committee Meeting \#4: April 30, 2014
- Steering Committee Meeting \#5: June 24, 2014
- Steering Committee Meeting \#6: November 5, 2014
- Steering Committee Meeting \#7: April 21, 2015
Steering Committee Meeting \#8: April 29, 2015


### 3.3 PROJECT WEBSITE

A project website (Figure 3.1) was created and launched in August 2013, as a method to gather input from those that could not or chose not to attend the public meetings. The website was named My West Houston (http://mywesthouston.com) and featured information about the study, a Study Area map, meeting materials, a crowd sourced mapping application that allowed users to geographically locate their comments and view project contact information.

The website was maintained by H-GAC. Over the course of the study, the website saw 6,575 visitors who provided 35 comments.

## fwest <br> houston <br> MOB ILITY PLAN



Final Public Meeting on December 18, 2014!
Posted on December 2, 2014

The Houston-Galveston Area Council will hold the fourth and final public meeting for the Greater West Houston Mobility Study will be held on Thursday December 18, 2014 at Maurice Wolfe Elementary School starting at 6:00 PM. During this meeting the proposed study recommendations will be presented for public review and comment Recommendations will cover changes to the City of Houston Major Thoroughfare Plan, addition and/or expansion of transit services and other alternative transportation modes, bicycle and pedestrian improvements, and government policy changes needed to facilitate implementation

WHEN: 6:00-8:00 PM
This is a free event open to the public


Project Website Crowdmap


Figure 3.1 Project Website
twest
nouston



Figure 3.2 Multi-lingual Public Meeting Flyers/Annuncios de Reuniones Publicos

### 3.4 PUBLIC MEETINGS

There were four public meetings held throughout the course of the study. These meetings took place during the evenings at locations across the Study Area to try to provide the opportunity for as many people as possible to participate. Figure 3.3 is a map of the public meeting locations. Over 200 people attended the public meetings

## STAKEHOLDER AND PUBLIC

 MEETING NUMBER 1October 15, 2013
The first stakeholder and public meetings were held at Wolfe Elementary School, located in the Energy Corridor District. The stakeholder meeting was held from 4:30 5:30 PM and the public meeting was held from 6-8 PM. Each meeting followed a similar format where there was a short presentation to introduce the study, followed by an open house where attendees were encouraged to give their input regarding existing problems and conditions in the Study Area and what transportation improvements or services they would like to see in the future. The room was divided into four broad topics of interest:

- Vehicles/Roadways
- Bicycles
- Transit
- General Mobility

Representative for each topic gathered information about that topic on maps located in each area.

## PUBLIC ENGAGEMENT

PUBLIC MEETING NUMBER 2
January 15, 2014
The second public meeting was held at the Tracy Gee Community Center, located in the Westchase District. At this meeting the stakeholders and public were presented with information about the proposed toolbox, intersections to be analyzed, and the expected development scenarios. During the presentation, feedback was encouraged through the use of interactive polling regarding existing travel behaviors and desired mobility options. The questions and a summary of the results are listed in Appendix B.


## PUBLIC MEETING NUMBER 3



Figure 3.3
Public Meeting Map

July 22, 2014
A third public meeting was held at the Houston Community College - Spring Branch Campus, in the Memorial
Management District. Attendees viewed a presentation that recapped the results of the study, including traffic projections, example projects, and traffic analysis


## Legend

Study


HAC

## PUBLIC ENGAGEMENT

PUBLIC MEETING NUMBER 4 December 18, 2014
A fourth public meeting was held once more at Wolfe Elementary School. Attendees were presented with all the study's major findings and recommendations

unest
nouston

PUBLIC ENGAGEMENT


Hact

hwest

## ASSESSMENT

## ASSESSMENT

## 4.1 <br> GROWTH <br> SCENARIOS

In order to better understand future conditions and needs in the Study Area, four demographic and land development scenarios were developed for comparison. These scenarios used different parameters and methods to project population and employment growth, as well as land development trends through the year 2040 Each of the scenarios is briefly described below, and depicted in Figures 4.1-4.16.

## SCENARIO 1-BASE SCENARIO

 The Scenario 1 forecast is H-GAC's most recent projections (2014, 3rd quarter) by Travel Analysis Zone (TAZ) $\dagger$, from 2010 through 2040. H-GAC's parcellevel forecasting model generates these projections, which H-GAC aggregates into TAZ geographies. This model tends to produce results that indicate considerable regional centralization of growth, especially for employment. In the West Houston Study Area, this means that locations along the Sam Houston Tollway / Beltway 8 redevelop into much denser employment centers over time, likely via new office development. This forecast is based on the transportation projects in the 2035 Regional Transportation Plan (RTP).

Figure 4.1 Scenario 1 Job Growth


Figure 4.3 Scenario 1 Job Growth


Figure 4.2 Scenario 1 Population Growth


Figure 4.4 Scenario 1 Population Growth


Figure 4.5 Scenario 2 Job Growth


Figure 4.7 Scenario 2 Job Growth


Figure 4.6 Scenario 2 Population Growth


Figure 4.8 Scenario 2 Population Growth

## SCENARIO 2 - DISTRIBUTED

 JOB GROWTHScenario 2 is the first forecast to employ the shift-share methodology ${ }_{+1}$. As with Scenario 1, Scenario 2 uses H-GAC figures as the baseline for its projections. The region and county-level control totals for 2040 are calculated by applying the growth rates from CDS' 2012 regional forecast to the 2010 baseline totals given by H-GAC. From these new control totals, the shift-share method calculates the forecast to the TAZ level using growth shares established in the most recent toll road forecast issued by CDS.
These growth shares are based on CDS' assessment of current development patterns for housing and commercial uses, take into account both planned and underway development projects, and consider the market forces which are likely to generate new development or redevelopment in the future. Employmen category shares are also adjusted and AZ level employment category figures are calculated by applying each category's share to the total employment figure in each TAZ. The results of the Scenario 2 model generally produce more decentralization, particularly of employment, than the Scenario 1 model, meaning less intense commercial redevelopment along the Sam Houston Tollway / Beltway 8 corridor. More future growth is also distributed to outlying locations outside of the Study Area compared to the growth in Scenario 1. This forecast is also based on projects which are in the current RTP. A comparison between the Scenario 1 and 2 forecasts can be seen on these pages.

## SCENARIO 3 - URBAN <br> FRAMEWORK

Scenario 3 considers the land use impacts of potential local government policies and investments, demonstrating the sensitivity of the transportation system to a specific growth pattern. The development policies are assumed to reflect the recommendations of the Urban Houston Framework Case Study, an effort by H-GAC included in the process of creating the agency's Our Great Region 2040 Plan. These recommendations are included as an Appendix to this report. In CDS' forecast modeling, the effects of these policies and investments include the following:

Make localized density of multiple land uses more economically and practically attractive in selected locations.

Enable a more walkable neighborhood environment through changes to street design and operation, investments in pedestrian and bicycle infrastructure, and differently provided and managed parking supply
Provide enhance transportation facilities tailored to serving densely developed areas, most notably public transit.
Potential changes to land use (and population / employment) growth patterns from these measures could include:

- Redistribution of land use growth within a small area to cluster more densely within the area governed by the Urban Framework policies, with less development outside the Urban Framework area. This would
be associated with changes in use; e.g., single family and/or one-story retail less likely and multi-story office and multifamily more likely within an Urban Framework area. The reverse would be true in locations outside of Urban Framework application. These changes may not necessarily entail changes in growth between one TAZ and another, but might occur primarily within single TAZs, depending on where TAZ boundaries fall.

Redistribution of land use (and population and employment) growth patterns from one regional location o another because of:

- Improved regional-level transportation infrastructure (most likely commuter transit) that results in significant differences in travel time or other relevant metrics related to travel convenience and cost and/or
- A significant difference in regional market appeal due to development of a notable "urban center" that, by virtue of its "quality of place" and image, attracts an above-average level of denser development from around the region.
- These changes would likely result in an alteration of projected growth allocation from one TAZ to another. This scenario will demonstrate the sensitivity of the transportation system to a specific growth pattern. The team recognizes that the actual growth patterns that take place by 2040 will likely be a hybrid of several of the patterns considered in this study.

URBAN HOUSTON FRAMEWORK
Houston, Texas
A CASE STUDY FOR THE H-GAC REGIONAL PLAN FOR SUSTAINABLE DEVELOPMENT


City of Houston’s Urban Houston Framework



Figure 4.11 Scenario 3 Job Growth

While still employing a version of the
shift-share methodology, Scenario 3's 2040 forecast is built upon the numbers in Scenario 1 and is quite similar to Scenario 1 in most TAZs. The regional and countylevel forecast numbers for Scenario 3 are identical to those in Scenario 1, and used as control totals for the shift-share method. Shift-share is employed in this scenario only to make adjustments in the TAZs that would be effected by specific transportation mprovements. The employment category forecast was also adjusted for Scenario 3 and the TAZ level numbers calculated using the same method used in Scenario 2.

## ASSESSMENT

## SCENARIO 4 - SLOWER GROWTH

Scenario 4 is intended to provide an alternative look at Houston's growth potential. It is possible that due to fluctuations in the national or international economy, or a downturn or slowing of the oi and gas industry locally, the Houston region could experience slower growth than H-GAC and CDS have forecast.

In method, Scenario 4 is quite similar to Scenario 2. Using the 2010 base numbers from H-GAC, new region and county control totals are calculated, applying slower growth rates from a Scenario 4 - specific adjusted version of CDS' 2012 regional and county forecast. The shift-share method is again employed to calculate the forecast at the TAZ level and uses the same TAZ growth shares used in Scenario 2. Employment category calculations use the same shares as well.

This scenario considers what the land use impacts of slower growth may be and how that would translate to a different population and employment forecast:

- Given the existing program of transportation improvements planned in West Houston, would slower growth of traffic congestion lead to less pressure either to develop denser housing closer to employment centers, or to distribute employment further to the west to be closer to employee residences?

A more generally moderate economy could lower pressures to create more


Figure 4.13 Scenario 4 Job Growth


Figure 4.15 Scenario 4 Job Growth


Figure 4.14 Scenario 4 Population Growth

Figure 4.16 Scenario 4 Population Growth
vertical, denser projects because land values will not rise as rapidly. Furthermore a slower economy would give developers and financial partners less confidence to undertake costly and risky projects. However, existing centers of population and employment might continue to fill in and thus become denser overall, just perhaps not with rising intensity at the individual project level.

Scenario 4 explores the possibility that slower economic growth may mean (1) less development overall, either for infill redevelopment or for outward greenfield growth; (2) less tendency to develop in higher value, higher density "urban centers"; and (3) a resulting pattern of lower density, non-centralized growth, albeit of a total volume less than the other three scenarios.
$\dagger$ Traffic analysis zones (TAZs) are the basic traftic analysis zones (TAZs) are the basic
geographic units (areas) used for inventorying geographic units areas) used for inventorying
demographic data and land use in transportation planning models (Federal Highway Works Administration (FHWA))
tt Shift-share analysis is a method of decomposing regional income or employment growth patterns into expected (share) and differential (shift) components (A.C. Selting and $S$. Loveridge, 1992)

## SELECTED SCENARIO - URBAN

 HOUSTON FRAMEWORKThe scope of this study requires that a single scenario from the four alternatives be selected for all subsequent modeling and forecasting of traffic volumes, traffic operating conditions and recommendations for improvement projects. The Urban Houston Framework scenario was selected as the preferred scenario by the steering committee.

The demographics of the Urban Houston Framework Scenario are the same as those used by H-GAC for all other forecasting and modeling purposes. This consistency of demographics is important to avoid disputes regarding the fundamentals of the forecast. The Urban Framework has been adopted by he City of Houston and is more likely to be implemented than the development patterns that have prevailed over the past several decades.

The Urban Framework is more conducive to transportation solutions, particularly transit that may be the most practical manner to provide a mobility system that can effectively address forecast travel demand. Land development recommendations in the Urban Houston Framework, by nature, will generate shorter trips and a higher proportion of trips by alternative modes, resulting in lower demand on the roadway network than current and historic development patterns.

Tables 4.1 and 4.2 summarize some of the tenets of the Urban Houston Framework. All three Funding Partner Management Districts are included in that study. Additional information about the Urban Houston Framework is available online at http:// www.houstontx.gov/planning/DevelopRegs urbanhoustonframework/PDFs/FullReport_ UrbanHoustonFramework.pdf

The model forecasts for the Urban Houston Framework Scenario are also shown in the following figures. Figure 4.17 shows the level of service ${ }_{\text {It }}$ (LOS) for select intersections in the Study Area in 2040. An unacceptable amount of delay is projected for all intersections. Table 4.3 provides details of individual intersection LOS. Figures 4.18 and 4.19 show the level of mobility (LOM) for the roadways in the Study Area in 2025 and 2040, respectively. As shown in each figure, the LOM on freeways, tollways, and major arterials will deteriorate substantially between 2025 and 2040 especially east of State Highway 6.
${ }_{t+1}$ Level of Service is the quantitative range of a service. Quality of service describes how well a transportation facility or service operates from the traveler's perspective (Highway Capacity Manual,


| TABLE 4.1 - URBAN CENTER CRITERIA |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| PREREQUISITE |  |  |  |  | OPTIONAL CRITERIA |  |  |  |  |  |  |  |  |  |
| Urban Center Size + Criteria Threshold | Name | Boundary Used | Average Population + Job Density | Funding Mechanism | Infill Redevelopment Potential (Residential) | Infill Redevelopment Potential (Com., Office, Ind.) | Major <br> Thoroughfare (w/in $1 / 2$ mile) | Major Thoroughfare (w/in $1 / 4$ mile) | Amenities | Food Amenities | Amenity Density | Intersection Density | Bikeways | METRO Transit Stops |
| LARGE CENTER THRESHOLD <br> Population <br> + Job Density <br> $>25$ | Central Business District | Management District |  | Yes |  |  | Yes | Yes | Yes | Yes | - | Yes | Yes | Yes |
|  |  |  | 139.34 | - | 0.32 | 4.42 |  |  | 359 | 7 | 0.32 | 0.81 |  |  |
|  | Texas Medical Center | Super Neighborhood | - | Yes | - |  | Yes | Yes | Yes | No | - | Yes | Yes | Yes |
|  |  |  | 68.19 | - | 2.38 | 1.63 |  |  | 64 | 1 | 0.05 | 0.26 |  |  |
|  | Greater Uptown | Management District | - | Yes | - | - | Yes | Yes | Yes | No | - | Yes | Yes | Yes |
|  |  |  | 62.37 | - | 2.91 | 1.57 |  |  | 154 | 3 | 0.19 | 0.27 |  |  |
|  | Midtown | Management District | - | Yes | - |  | Yes | Yes | Yes | Yes | - | Yes | Yes | Yes |
|  |  |  | 37.36 | - | 2.05 | 0.36 |  |  | 122 | 6 | 0.17 | 1.02 |  |  |
|  | Westchase | Management District | - | Yes | - | - | Yes | Yes | Yes | Yes | - | Yes | Yes | Yes |
|  |  |  | 29.24 | - | 1.43 | 1.69 |  |  | 138 | 7 | 0.05 | 0.1 |  |  |
|  | Fourth Ward | TIRZ | - | Yes | - |  | Yes | Yes | Yes | Yes | - | Yes | Yes | Yes |
| MEDIUM CENTER <br> THRESHOLD <br> Population <br> + Job Density <br> $>12<25$ |  |  | 20.57 | - | 1.7 | 1.02 |  |  | 23 | 0 | 0.16 | 1.12 |  |  |
|  | Energy Corridor | Management District | - | Yes |  |  | Yes | Yes | Yes | No | - | Yes | Yes | Yes |
|  |  |  | 18.73 | - | 2.77 | 3.5 |  |  | 63 | 0 | 0.03 | 0.29 |  |  |
|  | Third Ward | Super Neighborhood | - | Yes | - |  | Yes | Yes | Yes | Yes | - | Yes | Yes | Yes |
|  |  |  | 17.30 | - | 0.64 | 0.78 |  |  | 59 | 14 | 0.04 | 0.63 |  |  |
|  | Rice Village | Super Neighborhood | - | No | - | - | Yes | Yes | Yes | No | - | Yes | Yes | Yes |
|  |  |  | 16.77 | - | 0.49 | 0.67 |  |  | 116 | 4 | 0.07 | 0.4 |  |  |
|  | City Centre/ Memorial City | Proposed <br> Management <br> District | - | Yes | - |  | Yes | No | Yes | No | - | Yes | Yes | Yes |
|  |  |  | 12.51 | - | 2.71 | 0.48 |  |  | 32 | 2 | 0.05 | 0.32 |  |  |
|  | Greater East End | Management District | - | Yes | - |  | Yes | Yes | Yes | Yes | - | Yes | Yes | Yes |
|  |  |  | 10.44 | - | 1.54 | 1.37 |  |  | 224 | 34 | 0.02 | 0.47 |  |  |
| SMALL CENTER THRESHOLD | Greater Greenspoint | Management District |  | Yes | - |  | Yes | Yes | Yes | Yes | - | Yes | Yes | Yes |
|  |  |  | 5.33 | - | 2.54 | 2.73 |  |  | 127 | 12 | 0.02 | 0.16 |  |  |
|  | Palm Center | Super Neighborhood |  | Yes |  |  | Yes | Yes | Yes | Yes | - | Yes | Yes | Yes |
| Population <br> + Job Density <br> < 12 |  |  | 8.85 | - | 1.98 | 1.21 |  |  | 67 | 13 | 0.03 | 0.4 |  |  |
|  | Greater Greenspoint | Management District |  | Yes |  |  | Yes | Yes | Yes | Yes | - | Yes | Yes | Yes |
|  |  |  | 5.33 |  | 2.54 | 2.73 |  |  | 127 | 12 | 0.02 | 0.16 |  |  |

TABLE 4.2-URBAN CENTER CHARACTERISTICS

1. Reduced Setbacks
2. Connectivity
3. Short Block Lengths
4. Increased Building Height
5. Greater Number of Businesses
6. Civic Amenities
7. Population Density
8. Diversity of Housing
9. Diversity of Housing

| 9. Higher Floor to Area Ratio |
| :--- |
| 10. Historic Structures/Landmarks |
| 11. |

11. Increased Number of Jobs
12. Management Entity
13. Access from Major Roads
14. Access from Minor Roads
15. Park Once, But Do Many Things
16. Parks and Open Space
17. Higher Density of Students
18. Street Intersection Density
19. Reduced Street Width
20. Air Transportation
21. Automobile Transportatio
22. Bicycle Transportatio
23. Bus Transportation
24. Rail Transportation
25. Pedestrian Options
26. Reduced Vacancy Rates
27. Quality Education
28. Security
29. Residential Amenitie

## ASSESSMENT



Figure 4.17 Intersection Level of Service

Legend
Study Area Counties

## Level of Service

- D
- E - $F$

| TABLE 4.3 - INTERSECTION LEVEL OF SERVICE |  |  |  |  |
| :--- | ---: | ---: | ---: | :---: |

0



## LAND USE

With limited undeveloped land available in most of the Study Area, redevelopment is the likely course for construction of new commercial buildings and housing of all types. Moreover, various factors are prompting developers to consider higher density and mixed-use development for new projects. Two of these factors include recent changes to the City of Houston Development Ordinances and changing opinions towards urban living and commuting.

In 2013, the City of Houston amended Chapter 42 of its code of ordinances to allow greater housing density outside of Loop 610 Under the old provisions of the ordinance, the "urban" area inside Loop 610 allowed 27 units per acre, while the "suburban" area outside of Loop 610 was limited to 16 units per acre. The revision is intended to extend the residential density of the Inner Loop throughout the city while providing protections for neighborhoods concerned about incompatible development (Houston Chronicle, 2013).

More interestingly, Houston area residents opinions towards urban lifestyles are beginning to change. Rice University's Houston Area Survey states:
"The Houston region ... is one of the most sprawling, least dense, most automobiledependent metropolitan areas in the county. It is particularly interesting therefore to find in these surveys continued evidence across a variety of questions that area residents now are evenly divided in their support for
improved transit or expanded highways and for living in single-family residential areas or in more urbanized neighborhoods with a mix of developments." (2014)

In the 2014 survey, 51 percent of respondents said they preferred a singlefamily home with a big yard, while 47 percent would like a smaller home in a more urbanized area, within walking distance of shops and workplaces (Houston Area Survey, 2014). Ryan Holeywell notes, "The [survey] results, which are also reflected in recent development patterns, have city leaders, developers and advocates for density buzzing" (Governing, October 2013). Figure 4.20 illustrates the contrasting trends in housing preferences. Prominent examples of mixed-use developments in the Houston area include Hanover Rice Village, West Ave, at Kirby and Westheimer, Pearland Town Center, and City Centre in the Memorial Management District (Houston Chronicle, David Kaplan, 2014).

The Market and Development Density Index developed for METRO as part of their System Reimagining process visually and quantitatively illustrates the locations with he greatest potential for higher density development, especially if served by high quality transit options.

The Index is the weighted average of five demographic and market factors that influence transit-oriented development. These factors include population density, change in population density, transitsupportive employment density, change in
employment density, and assessed property value density. A full description of Index methodology is provided in Appendix E . The Index shows that neighborhoods in and around Houston's major employment centers had relatively high index scores That is true of all the major employment centers (i.e.-Management Districts) in the Study Area, particularly Westchase and Memorial Management Districts

The Index also illustrates in a general way those areas within West Houston that are good candidates for further densification and/or redevelopment. The planned developments listed in Section 2.5 validate this proposition.



Figure 4.20 Houston Residential Preferences (Source: Rice University)


Mixed Use Center Examples - Hannover Center and Renderings of West Ave and City Centre

4.2

## PLANNED

 IMPROVEMENTSThere are many transportation-related capital improvement projects that are planned for the West Houston area. Figures on the following pages show both short-term and long-term Study Area transportation projects currently slated for implementation. These projects include automotive, bicycle and pedestrian improvements. The projects are included on one or more of the transportation plans described below.

H-GAC Transportation Improvement Program (TIP)
The TIP is a short-range transportation plan developed and maintained by H-GAC. The planning horizon of the current TIP is 20152018. The TIP is a fiscally constrained plan that has a 4 year time frame. It is updated frequently to capture new transportation projects that are being implemented by local jurisdictions within the H-GAC region. The TIP shows a combination of federally funded and locally funded projects. H-GAC has a call-for-projects every two to three years to program projects for inclusion in the TIP

## H-GAC Regional Transportation Plan (RTP) <br> The RTP is a long-range (2040)

 transportation plan developed and maintained by H-GAC. The RTP typically has a 20-25 year horizon for all large-scale transportation projects in the H-GAC region. The RTP is not fiscally constrained, meaning that not all projects included in the RTP have designated funding for implementation The RTP is typically updated every five years. Current TIP and RTP Projects are shown in Figure 4.21 and listed in Tables 4.4 and 4.5.
## City of Houston Capital Improvement

 Program (CIP)The CIP is a short-range transportation plan of projects slated for construction within the City of Houston. The City's CIP is updated annually and approved by the City Council. The projects in the CIP are not limited to transportation projects, and also include buildings, water and sewer infrastructure and similar capital projects

## Fort Bend County Mobility Bond

 Projects (FBCMB)FBCMB is a list of transportation projects in Fort Bend County designated for near-term implementation. The bond program was passed in 2013 by Fort Bend County voters to provide funding for significant roadway projects across the Fort Bend County area City of Houston CIP and Fort Bend County Mobility Bond Projects are shown in Figure 4.22 and listed in Table 4.6

It should be noted that the TIRZs and Management Districts in the Study Area develop CIPs in conjunction with the City of Houston. The projects developed by these entities are included in the City's CIP plan. The projects presented on the following pages are not intended to represent a complete list of projects that will occur in the Study Area. All of these projects may not be built in the short term, but are likely to move forward at some point. There will likely be other projects added to this list as growth and redevelopment continue in the Study Area.

## PREVIOUS

## RECOMMENDATIONS

More than a dozen transportation studies (Table 4.7) have been conducted in the Study Area over the last 13 years by various entities. The scopes of these studies varied from specific corridor segments to 1,000 square mile regions. All the studies put forth transportation and policy recommendations for improving mobility in Study Area. As part of this study, these previous studies were reviewed to determine the status and validity of their recommendations Where appropriate, previous study recommendations are reiterated in this study to indicate their continued importance. Table .8 summarizes the recommendations of these previous studies.
TABLE 4.4-CURRENT RTP PROJECTS

| Project\# | MPOID | $\begin{gathered} \text { CSJ } \\ \text { Number } \end{gathered}$ | Street | From Limit | To Limit | Project Descripion | Length (mi) | Existing Lanes | Proposed Lanes |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | 6 |  | BELLAIRE BLVD | FM 1464 | SAN PABLO DR | CONSTRUCT NEW 4-LANE ROAD | 0.75 | 0 | 4 |
| 2 | 77 |  | GESSNER DR S | N OF BRIAR FOREST | RICHMOND AVE | WIDEN TO 6-LANES | 1.67 | 4 | 6 |
| 3 | 111 |  | LITTLE YORK RD W | US 290 | houston city LIMITS | WIDEN TO 6-LANE DIVIDED | 2.99 | 4 | 6 |
| 4 | 2977 |  | BELLAIRE BLVD | BW 8 | FONDRENRD | WIDEN TO 8-LANES | 2.10 | 6 | 8 |
| 5 | 134 |  | RICHMOND AVE | W OF ROGERDALE | WILCREST | WIDEN TO 6-LANES | 0.70 | 4 | 6 |
| 6 | 2978 |  | DAIRY ASHFORD RD | MEMORIAL DR | BRIAR FOREST | WIDEN TO 6-LANES | 1.00 | 4 | 6 |
| 7 | 6016 |  | GREENHOUSE RD | HANSTON CT | GREENWIND CHASE DR | CONSTRUCT 4-LANE <br> CONCRETE W/ STORM SEWERS | 0.50 | 0 | 4 |
| 8 | 7 |  | BELLAIRE BLVD | SH 99 | FM 1464 | CONSTRUCT 4-LANE BLVD (IN SECTIONS) | 4.69 | 0 | 4 |
| 9 | 162 |  | BOONE RD | ALIEF CLODINE | WESTPARK | CONSTRUCT 4-LANE ROAD | 0.40 | 0 | 4 |
| 10 | 165 |  | WILCREST DR | MEMORIAL DR | BELLAIRE BLVD | WIDEN TO 6-LANES | 4.74 | 4 | 6 |
| 11 | 11547 | $\begin{array}{r} 0912-72- \\ 924 \end{array}$ | HEMPSTEAD RD | JONES RD | GESSNER | CONSTRUCT 4 MANAGED LANES WITH TWO 2-LANE FRONTAGE ROADS \& DC to BW 8 (TOLL) | 1.01 | 4 | 4 |
| 12 | 11372 | $\begin{gathered} 0912-72- \\ 923 \end{gathered}$ | HEMPSTEAD RD | GESSNER DR | 43RD ST/CLAY RD | CONSTRUCT 4 MANAGED LANES WITH TWO 2-LANE FRONTAGE ROADS (TOLL) | 3.84 | 4 | 4 |
| 13 | 7762 |  | PARK ROW BLVD | SUMMITRY CIRCLE | WESTGREEN BLVD | WIDEN TO 4-LANE UNDIVIDED ASPHALT | 0.75 | 2 | 4 |
| 14 | 7898 |  | FAIRBANKS-N HOUSTON ST | BW 8 | US 290 | WIDEN 4-LANE TO 6 LANE CONCRETE BLVD | 5.78 | 4 | 6 |
| 15 | 7792 |  | LITTLE YORK RD W | ELDRIDGE PKWY N | BRITTMORE RD | WIDEN FROM 2 TO 3-LANES IN EACH DIRECTION | 2.50 | 4 | 6 |
| 16 | 16019 | 0050-09- | US 290 | E OF LITTLE YORK RD W | W OF PINEMONT DR | RESTRIPE TO 10 MAIN LANES WITH AUXILIARY LANES | 4.00 | 11 | 10 |
| 17 | 16020 | 0050-09903 | US 290 | W OF FM 529 | W OF LITTLE YORK RD W | RESTRIPE TO 10 MAIN LANES WITH AUXILIARY LANES | 1.75 | 11 | 10 |


| TABLE 4.5 - CURRENT TIP PROJECTS |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Project\# | MPOID | CSJ Number | Street | From Limit | To Limit | Project Description | Length (mi) | Existing Lanes | Proposed Lanes |
| 1 | 7649 |  | SAUMS <br> RD | W OF HCFD UNIT U101-02-00 (W OF GREENHOUSE) | HOUSTON CITY LIMITS | WIDEN TO 5-LANE ASPHALT PAVEMENT SECTION W/ STORM SEWER | 0.45 | 2 | 5 |
| 2 | 5007 | $\begin{array}{r} 0912- \\ 71-695 \end{array}$ | TANNER RD | TRIWAY LN | HEMPSTEAD | WIDEN TO 4-LANE DIVIDED | 1.25 | 2 | 4 |
| 3 | 15571 | $\begin{gathered} 0271- \\ 07-305 \end{gathered}$ | IH 10 W | W OF SH 6 | BW 8 | RESTRIPE IN SECTIONS TO ADD LANES TO PROVIDE 10 MAIN LANES THROUGHOUT THE PROJECT | 4.66 | 8 | 10 |
| 4 | 487 | $\begin{gathered} 1258- \\ 03-043 \end{gathered}$ | FM 1093 | FM 1463/FM $359$ | W OF KATY GASTON RD | CONSTRUCT TWO 2-LN FRONTAGE RDS WITH PARTIAL 4 TOLL LANES FROM W OF SPRING GREEN TO W OF KATYGASTON | 2.75 | 2 | 4 |
| 5 | 11864 |  | TANNER RD | CAMPBELL RD | TRIWAY LN | WIDEN TO <br> 4-LANE DIVIDED <br> ROAD WITH <br> CURBS AND <br> SIDEWALKS AND <br> NECESSARY <br> UNDERGROUND <br> UTILITIES | 1.00 | 2 | 4 |
| 6 | 14739 | $\begin{gathered} 1258- \\ 03-042 \end{gathered}$ | FM 1093 | W. OF KATY GASTON RD | SH 99 | CONSTRUCT <br> 4 TOLL LANES <br> WITH TWO <br> 2-LANE <br> FRONTAGE <br> ROADS | 1.38 | 2 | 4 |


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## ASSESSMENT



| TABLE 4.6 COH CIP PROJECTS |  |  |
| :---: | :---: | :---: |
| Map Ref\# | CIP_NO | Project Description |
| 1 | N-001037-0053 | Patterson: Sh 6 To N Eldridge Pkwy |
| 2 | N-321037-0069 | Saums Rd: Barker Cypress To Greenhouse |
| Roadway Reconstruction Projects |  |  |
| Map Ref\# | CIP Number | Project Description |
| 77 | N-000809-0001 | Gessner: Neuens To Long Point |
| 20 | M-410005-0001 | Pomeran: Westray To ND/E \& S D/E |
| 20 | M-410005-0001 | Moss Hill: Westray To N D/E \& S D/E |
| 81 | N-000815-0001 | Westpark: Dairy Ashford To Wilcrest |
| 34 | N-000388-0001 | Britway: Shadow Wood to Shadow Wood / Nsr 456 |
| 34 | N-000388-0001 | Mayfield: Buescher To Wyclife Dr / Nsr 456 |
| 129 | N-310650-0083 | Dairy Ashord @ Richmond: Trafic Signal Rebuild |
| 108 | N-100026-0001 | Wilcrest: Il 10 To Buffalo Bayou |
| 20 | M-410005-0001 | Bandelier: Westray To N D/E \& S D/E |
| 34 | N-000388-0001 | Wyclife Dr: 228' North Of Day Rd To North D/E/ Nsr 456 |
| 20 | M-410005-0001 | Palo Pinto: Westray To N D/E \& S D/E |
| 128 | N-310650-0079 | Fire Station \#83 @ 3350 Breezewood: Traffic Signal Construction |
| 131 | N-310662-0047 | Dairy Ashford North Of Memorial / Roadway Modification |
| 126 | N-000650-0071 | Gessner @ Richmond: Trafic Signal Management Program |
| 111 | N-100029-0002 | Kirkwood Paving and Drainage: Buffilo Bayou to Briar Forest |
| 115 | N-100033-0001 | Walnut Bend: Westheimer to Westpark |
| 94 | N-100017-0001 | Gessner Paving and Drainage: Westheimer To Richmond-Sub Project 2 |
| 20 | M-410005-0001 | Rosefield: Westray To Kempwood \& S D/E |
| 131 | N-310662-0047 | Kirkwood @ Meadow Glenn / Left Turn Lane - North |
| 107 | N-100023-0001 | Dairy Ashford: IH10 To Buffalo Bayou |
| 73 | N-000798-0001 | Memorial: Eldridge To Kirkwood |
| 94 | N-100017-0001 | Gessner Paving and Drainage: Buffalo Bayou towards Westheimer-Sub Project 1 |
| 20 | M-410005-0001 | Anniston: Westray To N D/E \& S D/E |
| 34 | N-000388-0001 | Metronome: Shadow Wood To D/E / Nsr 456 |
| 34 | N-000388-0001 | Wycifife Dr: 228' South Of Day Rd To South D/E / Nsr 456 |
| 20 | M-410005-0001 | Parana: Westray To N D/E \& S D/E |
| 132 | N-000650-0067 | Fondren @ Clarewood: Traffic Signal Rebuild |
| 128 | N-310650-0079 | High Star @ Wilcrest: Traffic Signal Construction |
| 34 | N-000388-0001 | Mayfield: Buescher To Britmoore / Nsr 456 |
| 20 | M-410005-0001 | Southwick: Westray To N D/E \& S D/E |
| 131 | N-310662-0047 | Richmond (BW8 To Briarpark) / Roadway Modification By Arkk |
| 129 | N-310650-0083 | Synott @ Richmond: Traffic Signal Rebuild |
| 34 | N-000388-0001 | Hazelhurst: Buescher To Britmoore / Nsr 456 |
| 132 | N-000650-0067 | Bellaire @ Boone: Traffic Signal Rebuild |
| 20 | M-410005-0001 | Talina: Westray To ND/E \& S D/E |
| 20 | M-410005-0001 | Teague: Westray To Kempwood \& S D/E |
| 20 | M-410005-0001 | Pine Village: Westray To N D/E \& S D/E |
| 99 | N-100029-0001 | Kirkwood Paving and Drainage: Briar Forest to Westheimer |


| TABLE 4.6 COH CIP PROJECTS (CONTINUED) |  |  |
| :---: | :---: | :---: |
| 61 | N-000589-0001 | Tanner Road: Hempstead To Bw8 |
| 127 | N-310650-0078 | Fire Station \#57 @ 13602 Memorial: Trafic Signal Construction |
| 34 | N-000388-0001 | Buescher: Hazelhurst To 126' South Of Mayfield To S/De / Nsr 456 |
| 132 | N-000650-0067 | Bellaire @ Cook: Traffic Signal Rebuild |
| 94 | N-100017-0001 | Gessner Paving and Drainage: Sub Project 3 |
| 125 | N-000650-0070 | Barry Knoll @ Bunkerhill: Trafic Signal Management Program |
| 20 | M-410005-0001 | Westray: Gessner To Palo Pinto |
| 127 | N-310650-0078 | Britmore @ Westview: Trafic Signal Construction |
| 34 | N-000388-0001 | Ivyridge: Buescher To Britmoore / Nsr 456 |
| 20 | M-410005-0001 | Hollow Hook: Westray To N D/E \& S D/E |
| 34 | N-000388-0001 | Shadow Wood: Britmoore To Wyclife / Nsr 456 |
| Sidewalk Projects |  |  |
| Map Ref\# | CIP Number | Project Description |
| 119 | N-00610A-0113 | Lakeside Place: 11306 Lakeside Place To Hayes |
| 120 | N-00610A-0125 | Knoboak: Stebbins to Shadowdale |
|  | N-00610A-0125 | Stebbins: Knoboak to Shadow Wood |
|  | N-00610A-0125 | Del Monte: Blue Willow to W Sam Houston Pkwy |
|  | N-00610A-0125 | Fondren: S Piney Point To 8800 Woodway |
|  | N-00610A-0125 | Richmond: Kirkwood to 11910 Richmond |
|  | N-00610A-0125 | Kimberley: Kirkwood to Carlingford |
|  | N-00610A-0125 | Westpark: Eldridge Pkwy to Synott |
| 122 | N-320610-0002 | Clay Rd: 10777 To 11197 |
| Traffic Signal Projects |  |  |
| Map Ref\# | CIP Number | Location |
| 125 | N-000650-0070 | Barry Knoll @ Bunkerrill |
| 126 | N-000650-0071 | Gessner @ Richmond |
| 127 | N-310650-0078 | Fire Station \#57 @ 13602 Memorial |
|  | N-310650-0078 | Britmore @ Westview |
| 128 | N-310650-0079 | Fire Station \#83 @ 3350 Breezewood |
|  | N-310650-0079 | High Star @ Wilcrest |
| 129 | N-310650-0083 | Dairy Ashford @ Richmond |
|  | N-310650-0083 | Synott @ Richmond |
| 131 | N-310662-0047 | Dairy Ashford North Of Memorial |
|  | N-310662-0047 | Kirkwood @ Meadow Glenn |
|  | N-310662-0047 | Richmond: From BW8 To Briarpark |
| 132 | N-000650-0067 | Fondren @ Clarewood |
|  | N-000650-0067 | Bellaire @ Boone |
|  | N-000650-0067 | Bellaire @ Cook |
| 133 | 13302 | Bellaire Blvd. Drainage ditch (Sierra Bend) to Parkway Lakes Ln |
| 134 | 13303 | Bellaire Blvd. Lakemont Bend Ln to Sierra Bend Dr |
| 135 | 13304 | Bellaire Blvd. Lake Head Ln to S. Mason Rd |
| 136 | 13202 | Bellaire Blvd. |



| TABLE 4.7 - PRIOR TRANSPORTATION STUDIES |  |  |
| :---: | :---: | :---: |
| Study Name | Abbreviaion | Publication Date |
| Westchase District Mobility Plan | WDMP | 2001 |
| H-GAC FM 1093 Access Study | 1093AM | 2002 |
| Westchase District Long Range Plan | WOLRP | 2006 |
| West Houston <br> Association West <br> Houston 2050 Plan | WH2050 | 2007 2010 |
| H-GAC Regional Commuter Rail Connectivity Study | RCRC | 2008 |
| H-GAC SH Management Study | SH6AM | 2008 |
| Energy Corridor Plan | ECLCP | 2010 |
| Energy Corridor District Bicycle Master Plan | ECBMP | 2010 |
| H-GAC Fort Bend Subregional Plan | FBSRP | 2011 |
| H-GAC SH 6 North Access Study | SH6NAM | 2011 |
| Westchase District Pedestrian/Transit Access Master Plan | WDPTM | 2011 |
| H-GAC 2040 Regional Bicycle Plan | 2040RPB | 2012 |
| City of Houston Urban Houston Framework | COHUHF | 2013 |
| METRO Bike \& | MBR | 2014 |


| TABLE 4.8 - PRIOR TRANSPORTATION STUDY RECOMMENDATIONS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Study Abbreviation | WDMP | 1093AM | WDLRP | WH2050 | RCRC | SH6AM | ECLCP | ECBMP | FBSRP | SH6NAM | WDPTM | 2040RPB | COHUHF | MBR |
| Category/Recommendation |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Roadways |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Extend/Widen Roadway(s) | - | - | - | - |  |  |  |  | - |  |  |  |  |  |
| Grade Separation(s) | - |  |  | - |  |  |  |  | - |  |  |  |  |  |
| Right-of-Way Acquisition/Preservation |  |  |  | - |  |  |  |  |  |  |  |  |  |  |
| Signal Synchronization | - |  |  | - |  |  |  |  |  |  |  |  |  |  |
| Intersection Improvements | - | - |  |  |  | $\bullet$ |  |  | - | - | - |  |  |  |
| Express/Super Street |  |  |  | - |  |  |  |  |  |  |  |  |  |  |
| Transit |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Circulator Services | $\bullet$ |  | $\bullet$ |  |  |  | - |  |  |  |  |  |  |  |
| Local Fixed Route Service | - |  |  | - |  |  |  |  |  | - |  |  |  |  |
| High Frequency |  |  |  | - |  | $\bullet$ |  |  | - |  |  |  | $\bullet$ |  |
| LRT/BRT |  | - | - |  |  | - |  |  |  |  |  |  |  |  |
| Commuter Rail |  |  | $\bullet$ |  | - |  |  |  | $\bullet$ | $\bullet$ |  |  |  |  |
| Park \& Ride (Add/Expand//mprove) |  |  |  |  |  |  | $\bullet$ |  | $\bullet$ |  |  |  |  |  |
| Transit Center/Hub |  | $\bullet$ | $\bullet$ |  | $\bullet$ |  | $\bullet$ |  | $\bullet$ |  | - |  |  |  |
| Bicycle/Pedestrian |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Add/Extend Bicycle-Hike Trail/Lane | - |  | - |  |  | - | - | - | - | - | - | - |  | - |
| Add/Extend Sidewalks |  | - | - |  |  | - | - | - |  | - | - | - |  | - |
| Add/Expand Bicycle Facilities/Accommodations |  | $\bullet$ |  |  |  |  |  |  |  |  | $\bullet$ | - |  | $\bullet$ |
| Land Development |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Mixed-Use Development |  | $\bullet$ | - |  |  | $\bullet$ | - |  | - | $\bullet$ | - |  |  |  |
| Green Space Conservation |  |  | - | - |  |  |  |  | - |  |  |  |  |  |
| Urban Street Grid |  | $\bullet$ | - |  |  |  |  |  |  |  |  |  | $\bullet$ |  |
| Parking |  | $\bullet$ | $\bullet$ |  |  |  | $\bullet$ |  | - |  |  |  | $\bullet$ | $\bullet$ |
| Policy |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Access Management |  | - |  |  |  |  |  |  |  | - |  |  |  |  |
| Trafic Impact Analysis |  |  |  |  |  |  |  |  |  |  |  |  | $\bullet$ |  |
| Residential Development Standards |  |  |  | - |  |  |  |  |  |  |  |  |  |  |
| Commercial Development Standards |  |  |  | - |  |  |  |  |  |  |  |  |  |  |
| Land Density Development Standards |  | $\bullet$ |  |  |  |  |  |  | $\bullet$ |  |  |  | $\bullet$ |  |
| Creat/Amend Ordinance/Regulation/Law |  |  |  |  |  |  |  |  |  |  |  | - | $\bullet$ | $\bullet$ |
| Public-Private Coordination/Partnerships |  | - |  |  |  |  |  |  | - | $\bullet$ |  |  | - | - |
| Incentives |  | $\bullet$ |  |  |  |  |  |  |  |  |  | - | - | - |

twest
houston


Figure 4.23 2014 Select Zone Analysis

## Legend

Study Area Vehicles Per Day
$\longrightarrow$ > 65,000
——20,001-65,000

- 5,001-20,000

0-5,000
$\qquad$ $\square$ Counties
Management Districts

## 4.3 NATURE OF FUTURE GROWTH

Select zone and trip attraction analyses were performed as part of the examination of the current transportation system in the Study Area. These analyses revealed the extent to which West Houston has become a destination for work and non-work related trips, as shown in Figures 4.23-4.26.

Select zone analysis is a transportation modeling technique that estimates the amount of traffic coming to and from a particular area or place. The goal of trip attraction analysis is to predict the number of trips attracted to an area or to a particular land use. Both techniques were employed on each Funding Partner Management District separately and as a whole to determine individual and combined effects on traffic flow in the Study Area. The combined traffic flows are illustrated in the figures on this page and the following pages.

Figure 4.23 shows the combined select zone analysis for the three management districts. The results indicated heavy traffic flows coming from Fort Bend County, the US 290 corridor, inside Loop 610, and the Spring area. These traffic flows correspond almost identically with the Employee Home Zip Code Maps in Section 2.4.

## ASSESSMENT

Figure 4.24 and 4.25 illustrate the trip attraction analysis for all three management districts. There is significant attraction from Fort Bend County, the Cypress area along US 290, and areas West of State Hwy 6. The attractions hold true for non-work as well as work related trips. These analyses, and their information previously presented in this study, indicate that West Houston is a destination in its own right, and not a residential suburb of the City of Houston. West Houston a city within a city, and from a traffic perspective it functions as such.

## Takeaways from the forecasting and

 analysis process include the realization and acceptance that there are very significant mobility challenges that cannot be overcome by continuation of past practices. Even small amounts of growth in the Study Area result in significant increases in delay to vehicle traffic. Participants in the public outreach process seem to be open to solutions other than traditional addition of capacity, including walking, cycling, ride sharing, and increased transit use. The most significant source of improvement in the person-carrying capacity of the street network would be increased vehicle occupancy. While this will require behaviora changes, the capital and operating costs of higher occupancy trips are insignificant compared to any other alternatives for all but the shortest trips.

Figure 4.24 Work Trip Attractions

## Legend

Study Area
$\square$ Counties
$\square$ Management Districts

## Work TipAAtractions

$<100$ Trips $24 \%$
100-250 Trips 23\%
| 251 - 500 Trips $21 \%$
> 500 Trips $57 \%$

## ASSESSMENT



## ASSESSMENT

## 4.4 <br> CONTEXT SENSITIVE DESIGN

Recently, the City of Houston and TxDOT have acknowledged the need for a multimodal approach to transportation planning, and both have adopted policies to achieve this objective. On November 1 2013, Houston Mayor Annise Parker issued an executive order establishing the Houston Complete Streets and Transportation Plan. The plan calls for the City to take a more comprehensive view of planning, designing, constructing and reconstructing all transportation improvements. The plan states that "[p] ublic roadways take into account all users including people who are driving or riding in cars, using mass transit, using wheelchairs, driving or riding in trucks, driving or being transported by emergency vehicles, and being served at their residence or property by other users..." (COH Executive Order 1-15).


Shared Use Path in the Westchase District


MIxed Use Streetscape


Human Scale Planning


Similarly, TxDOT has adopted guidelines emphasizing bicycle and pedestrian accommodations in the construction and reconstruction of State roadway facilities. In a memorandum dated March 23, 2011 TxDOT Deputy Executive Director John Barton, P.E., stated "[w]ith this stronger emphasis for multimodal transportation acilities, TxDOT is committed to proactively plan, design, and construc facilities to safely accommodate bicyclists and pedestrians". (Memo, J. Barton, 3-23 2011).

The policies adopted by the City of Houston and TxDOT are examples of context sensitive design (CSD). CSD is a holistic approach to transportation facility design and construction. CSD is responsive to the environment in which the facility is built, as well as the characteristics of the current and future users of the facility. In contrast to long-standing practices in transportation design that place primary importance on moving traffic, CSD emphasizes that transportation facilities should fit their physical settings and preserve scenic, aesthetic, historic and environmental resources, while maintaining safety and mobility.

The range of recommendations offered in this study should be designed and constructed using CSD principles, which include:

- Significant involvement of the public and continuous solicitation of input;

Cooperation of highway agencies with a variety of resources and other public agencies throughout the development of the project;

- Willingness of the designers to accept and try alternative solutions as well as to deviate from standard designs,
Inclusion of specialists other than highway designers in the design teams to provide different viewpoints; and
- Use of a variety of tools for communicating project alternatives and designs.
(CSD, Transportation Research Board Circular, 2004)



# IMPROVEMENT OPPORTUNITIES 

## IMPROVEMENT OPPORTUNTITES

### 5.1 BUILT ENVIRONMENT

In addition to the current projects identified in the H-GAC RTP and TIP, as well as these Fort Bend County Bond projects within the Study Area (See Section 4.2), the following infrastructure projects should be considered to help further alleviate congestion and provide improved transportation choices in West Houston.

Recommendations presented in this study are intended to represent a vision of what the Study Area transportation system could look like. Recommendations are not representative of what can be built today. Furthermore, study recommendations do not obligate any public and/or private entity within the Study Area to construct said infrastructure, provide said services, or adopt or modify their current policies.

The following restrictions apply to infrastructure in unincorporated Harris County:

Sidewalks are not encouraged along Major Thoroughfares, but are considered a priority within residential subdivisions and around schools
Shared-use paths (as defined in the 2012 AASHTO Guide for the Development of Bicycle Facilities, the 2011 Texas Manual on Uniform Traffic

Control Device, and/or any local municipality ordinance or executive order) are constructed by the County. Where appropriate the County encourages partnership with other entities to build such facilities adjacent to the road right-of-way

Bike lanes, or variants thereof, are not constructed along roadways

## MTFP TABLE ADDITIONS

The roadway segments listed in Table 5.1 (and shown in Figure 5.1) are displayed on the City of Houston's MTFP map, but are not currently listed on the MTFP and Transit Corridor Street Hierarchy Classification Table (Table 5.2). Traditionally, roadway segments in the City of Houston's ETJ are not listed in the MTFP table because the City's street classifications cannot be enforced outside of its city limits. While the MTFP map provides the limits and corridor designation type (i.e. thoroughfare, collector etc.), it does not provide the same level of detail as corridors listed on the MTFP table including number of lanes and existing/ future right-of-way width. These roadway segments should be placed on the MTFP table to provide land developers and others with the same level of information on these corridors when making decisions regarding land use projects



## IMPROVEMENT OPPORTUNITIES

## COLLECTOR STREET NOMINATIONS

The roadway segments listed in Table 5.2, and shown in Figure 5.2 are currently classified as local streets. The traffic flow patterns and volumes on these streets suggest that their classification should be upgraded. These roadways were selected after careful analysis because they (1) connect major thoroughfares already on the MTFP; (2) connect freeway frontage roads to major thoroughfares already on the MTFP; (3) are corridors that relieve traffic stress from existing major thoroughfares; and (4) typically avoid neighborhood streets as much as possible.

The City of Houston should consider adding these roadway segments to the MTFP map and MTFP table. Adding these roadway segments to the MTFP will help preserve the existing connectivity of the roadway network and aide in servicing future traffic demand in the West Houston. Below are a set of criteria that were utilized in developing these recommendations.



Figure 5.2 Collector Streets

| TABLE 5.2 - COLLECTOR STREET NOMINATIONS |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Map Ref. \# | Roadway | Segment | Location | Recommended <br> MTFP <br> Classification |
| 1 | Greenwind Chase | Barker Cypress to Fry Road | City | Minor Collector |
| 2 | Barker Road | I 10 to Greenwind Chase | City | Minor Collector |
| 3 | Winkelman Road | Bellaire to Alief Clodine | ETJ | Minor Collector |
| 4 | Chisel Point Dr. | Katy Freeway to Kingsland | City | Minor Collector |
| 5 | Mechants Way | Grand Circle Blvd to Katy Freeway | ETJ | Minor Collector |
| 6\&7 | Elrod | Franz to Clay | ETJ | Minor Collector |
| 8 | Raintree Village Dr. | Franz to Clay | ETJ | Minor Collector |
| 9 | Westfield Village | Clay to Kieth Harrow | ETJ | Minor Collector |
| 10 | Windsong Trail | Clay to Kieth Harrow | ETJ | Minor Collector |
| 11 | Park Ten | Katy Freeway to Park Row | City | Major Collector |
| 12 | Addicks- <br> Sastuma/Timber <br> Creek | FM 529 to SH 6 | ETJ | Major Collector |
| 13+14 | Windern | US 290 to Clay | City | Minor Collector |
| 15 | Wingfoot | Blalock to Windfern | City | Minor Collector |
| 16 | Neuens | Blalock to Gessner | City | Minor Collector |
| 17 | Witte | Katy Freeway to Neuens | City | Minor Collector |
| 18 | Sugarland Howell | Bellaire to Alief Clodine | ETJ | Major Collector |
| 19 | Hayes Road | Richmond to Wilcrest | City | Major Collector |
| 20 | West Houston Center Blvd | Westheimer to Westpark Tollway | City | Major Collector |
| 21 | Rogerdale | Harwin to Bellaire | City | Major Collector |
| 22 | Jeanetta | Westheimer to Westpark Dr | City | Minor Collector |
| 23 | Pagewood/ Windswept | Fondren to Tanglewilde | City | Minor Collector |
| 24 | Tanglewilde | Pagewood to Westpark | City | Minor Collector |
| 25 | Town Park Dr. | Gessner to Bugle | City | Minor Collector |
| 26 | Seagler/ Westcenter | Westheimer to Westpark Dr | City | Minor Collector |
| 27 | Whittington | Dairy Ashford to Eldridge | City | Minor Collector |
| 28 | Tully | Katy Freeway to Memorial | City | Minor Collector |
| 29 | Westlake Park Blvd. | Katy Freeway to Memorial | City | Minor Collector |
| 30 | Addicks-Howell | SH 6 to Katy Freeway | City | Minor Collector |

## ROADWAY PROJECTS

Table 5.3 lists roadway project recommendations (Shown in Figure 5.3) for the West Houston Study Area in addition to those currently listed in H-GAC's RTP and TIP, or the City of Houston's CIP or Rebuild Houston Program (See Section 4.2). The proposed projects are only conceptual and each will require independent stakeholder collaboration, advanced planning, preliminary engineering, and final design. The purpose of these projects is to reduce traffic stress on corridors in West Houston that are already (or will soon be) congested by providing alternate connections within the Study Area. It is anticipated that all these projects will be completed in 5 to 15 year time frame.

Figure 5.4 is a map of the top 13 intersections in the Study Area that will experience the most traffic delay in the future due to excessive traffic demand. Candidate intersections were selected based on unmet demand in 2040 for each street of each intersection. Where unmet demand was a range of volumes, the midpoint (average) of the range was used. The sum of the unmet demand for the cross streets was used to select intersections with the most unmet demand. The list is based on demand only, not the availability of ROW or engineering considerations that would have to be resolved to advance a project. Improvements at these intersections could range from addition of dedicated turn lanes to grade separation of travel lanes

Subsequent research on the selection of improvements for these intersections should include the following considerations:

- Development that would be affected on each approach
- Driveways to be closed
- Alternative access provided
- Damages
- Total takings
- Drainage considerations
- Underground utilities to be relocated
- Grade Separation decisions
- Adjacent intersections and operating conditions
- Nature of the streets

Well-planned sidewalks, multi-use paths and trail networks can complement existing mobility infrastructure and provide much needed multimodal travel opportunities. The thoughtful placement of pedestrian- and bicycle-friendly connections can improve access to parks and open space, promote walking and biking to neighborhood civic or retail destinations and garner a heightened sense of community. West Houston has an extensive network of sidewalks, multi-use trials, and on-street bicycle facilities (See Section 2.8). However, this network can be improved by building proposed facilities, connecting existing facilities, and linking facilities to other modes of travel.

The installation of sidewalks or multi-use trails along under utilized utility corridors and drainage channels is encouraged. Pedestrian bridges can improve connectivity across physical barriers such as drainage corridors. Communities should also partner with bayou greenway organizations to retrofit inactive spaces to accommodate more pedestrian connectivity.

Opportunities for intra-neighborhood, interneighborhood, and sub-regional trails often exist along edges and boundaries between adjacent subdivisions, between phases of a given subdivision, and between residential lots and utility areas and corridors (detention ponds, drainage channels, petrochemical pipeline easements, and electric power line easements). These opportunities should be identified corroboratively with developers early in subdivision plan development phase. Trail alignments, access easements, and future trail/street crossing locations should be designed into subdivision plans.

Previous studies have made numerous bicycle and pedestrian related recommendations. These recommendations should be implemented, where still applicable. The following statements in many ways summarize and echo the recommendations in these previous studies

- Connect activity centers

Connect facilities to transit and park and rides
Cross barriers-creeks, drainage channels, reservoirs and highways Utilize utility corridors to enhance offstreet connections

Continue to build-out the off-street trail network

Complete system gaps

- Provide multimodal accommodations, where appropriate, as streets are constructed or rebuilt

To maximize safety, all network facilities should be implemented in conformance with crime prevention though environmental design principles and the American with Disabilities Act (ADA) Standards for Accessible Design. These standards help to ensure these facilities are safe and accessible for all users.

Figures 5.5-5.13 on the following pages are conceptual maps of potential bikeway and trail network segments and crossings in the Study Area. The locations of key civic and commercial amenities such as schools, churches, hospitals and major retail centers are identified to show the potential benefits of network segments. A map locator grid is on each map


## IMPROVEMENT OPPORTUNITIES



## IMPROVEMENT OPPORTUNITIES



| TABLE 5.3 ROADWAY PROJECT RECOMMENDATIONS |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Map Ref. \# | Roadway | Segment | Recommendation | On <br> MTFP <br> Map | On MTFP Table | Location | Comments |
| 1 | Addicks- <br> Satsuma/Timber <br> Creek | FM 529 to SH 6 | Widen |  |  | ETJ | This corridor lies in the northern portion of the study area, between SH 6 and N Eldridge Parkway, both of which already have high traffic volumes and are projected to have significantly higher traffic volumes in the future. Addicks-Satsuma serves as a north/south connection between FM 529 and West Little York. South of West Little York, Addicks-Satsuma turns west and meets SH 6 at the northern edge of Addicks Reservoir. The current roadway configuration of Addicks-Satsuma is one traffic lane in each direction, with open ditches on either side. The proposed project would replace the open ditches with culverts and widen the roadway to two traffic lanes in each direction to help relieve traffic on the major thoroughfares in the immediate area. |
| 2 | Jack Rabbit Road | FM 529 to Little York | Extend |  |  | ETJ | Jackrabbit Road currently exists from FM 1960 (near US 290) FM 529. The proposed project would extend Jackrabbit Road from FM 529 southward to West Little York and help to relieve SH 6 and N Eldridge Parkway from current and future traffic congestion. If extended, the corridor would effectively serve as a direct route from West Little York to US 290. |
| 3 | Jones Road | FM 529 (Spencer Road) to Little York | Realign | $\bullet$ |  | ETJ | Jones Road was extended to FM 529 (Spencer Road) in 2011. The current MTFP should be amended to remove the Melendy/Cunningham alignment and extend and widen Northwinds Dr to Cunningham Road. This realignment would provide north-south connectivity from Tanner Road to SH 249. |
| 4 | Windfern-US 290 | US 290 | Connect |  |  | City | brook Dr. on the northern end, near Betlway 8. However, |
| 5 | WindfernHempstead | Hempstead Rd. | Connect |  |  | City | assist in relieving trafic congestion along Gessner Dr. |
| 6A | Mason Road | Clay Rd. to Stockdick School Rd. | Realign | $\bullet$ |  | ETJ | Ma |
| 6B | Mason Road | Morton Rd. to l-10 | Widen | $\bullet$ |  | ETJ | major intersections due to the alignment of the Grand Parkway. The currently alignment of Mason Road at Stockdick School Road would place the intersection within 700 feet of the intersection at Stockdick School Road and the Grand Parkway. Traffic Engineering standards state that major intersections should be at least one-quarter mile ( 1,320 feet) apart for good traffic progression. The proposed realignment would move the Mason Road-Stockdick |
| 6 C | Mason Road | Rocky Canyon to FM 1093 (Westheimer Rd.) | Widen | $\bullet$ |  | ETJ | volumes. Likewise, (6C) Mason Road between Rock Canyon Drive and the Westpark Tollway should be widened to 6 lanes to meet trafic demands. |
| 7 | Baker-Cypress Road | $\underset{1-10}{\text { Little York Rd. to }}$ | Widen | $\bullet$ |  | ETJ | Baker-Cypress is the first major north-south through route west of SH 6. The segment between I-10 and Little York Rd. currently carry from 25,000 to 30,000 vehicles per day. By 2040, traffic volume on this segement of BarkerCypress is projected to increase $20 \%$. Widening the roadway to 6 lanes will relieve congestion by adding the capacity needed for the projected traffic volumes. |
| 8 | Patterson | Elderidge Pkwy <br> to Hammerly (@ <br> Brittmoore) | Extend |  |  | City | Patterson Road currently connects SH 6 to Elderidge Parkway through the Addicks Reservoir. Patterson is currently listed on the MTFP as a thoroughfare to be widened in the future. The extension of Patterson to Hannerly Blvd would provide additional east-west connectivity to meet project travel demands in 2040 . When Patterson is aligned with Groeschke Road (See Number X), the combined corridors will provide east-west connectivity from US 290 to the Grand Parkway, and serve as a effective alternative route to the Katy Freeway. |
| 9 | Wycliffe/Upland Drive | Hammerly to Katy Freeway | Connect |  |  | City | The northwest quadrant of the intersection of Bettway 8 and the Katy Freeway is currently underdeveloped and according to the growth projection models utilized in this study, will likely develop into higher density land uses in the future. The lack of connectivity in this particular area is likely to be a challenge as the redevelopment occurs. Currently, Brittmoore is the only corridor between Beltway 8 and Addicks Reservoir that extends from the Katy Freeway to US 290. As the density of land uses increases along this portion of the Beltway 8, Britmoore is likely to exceed its traffic capacity according to the travel demand model. An additional connection that would relieve some traffic pressure from the southern end of Brittmoore could be Timberline Road. A connection could be made from Wycliffe Drive and aligned with Church Lane at Brittmoore. Church Lane could then be extended to Clarborough Place to provide connectivity to the Beltway 8 frontage road and Westview Drive. |
| 10 | Grisby | SH 6 to Westlake Park Blvd. | Extend |  |  | City | Grisby Rd. is currently on the MTFP from its connection to the Katy Freeway frontage road (between Barker Cypress and SH 6) to SH 6. The recommendation of this study is to consider extending Grisby westward along its current alignment to Barker Cypress. If constructed, it would serve in a similar capacity to Park Row on the north side of the Katy Freeway. The proposed alignment is very close to the Barker Reservoir, so special attention would need to be given to avoiding conflicts with the protected reservoir. |
| 11 | Addicks-Howell | SH 6 to Katy Freeway | Widen |  |  | City | Along SH 6, just south of Memorial Dr., Addicks-Howell Rd. diverges from the SH 6 alignment and continues to the Katy Freeway frontage road. The alignment is currently one traffic lane in each direction, with open ditches on both sides of the roadway. The recommendation is to consider widening the roadway to accommodate two traffic lanes in each direction from SH 6 to the Katy Freeway frontage road. It is possible that the overhead utilities would have to be moved as well. The benefit of this project is to relieve congestion along SH 6, particularly at the intersections of Memorial Dr. and the Katy Freeway frontage road. |
| 12 | Baker Road | Barker Road to Highland Knolls | Abandon | $\bullet$ | $\bullet$ | City | Currently, the MTFP map recommends acquiring right-of-way through the Barker Reservoir for future connection between Baker and Highland Knolls, just south of IH 10.This alignment should be abandoned and realigned due to the recommended extension of Briar Forest to Highland Knolls (See Number X). However, to accommodate north-south traffic demand Greenhouse Road should be extended to Barker Rd and then down to the proposed extension of Briar Forest. |

## IMPROVEMENT OPPORTUNITIES

## TABLE 5.3 ROADWAY PROJECT RECOMMENDATIONS

| Map Ref. \# | Roadway | Segment | Recommendation | On <br> MTFP <br> Map | On MTFP <br> Table | Location | Comments |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 13 | Briar Forest | SH 6 to Highland Knolls | Extend |  |  | City | The MTFP currently shows Memorial Drive extending across the Barker Reservoir to Kingsland Drive. Projected traffic volumes necessitate adding an additional east-west corridor across Barker Reservoir to balance traffic demand and preserve the capacity of other roadways like Memorial Drive, FM 1093 (Westheimer Rd.), Richmond Ave, and Westpark Drive. It is therefore recommended that Briar Forest be extended across Barker Reservoir to Highland Knolls. Although the acquisition of right-of-way will require extensive local, state, and federal review, the traffic benefits derived from this corridor by 2040 will ultimately offset the prolong planning process and higher construction costs. |
| 14 | Grand Mission | Westpark Tollway <br> to Westheimer <br> Parkway | Abandon | $\bullet$ | $\bullet$ | ETJ | The MTFP map currently shows a planned roadway segment along the Grand Mission alignment between Westpark Tollway and Westheimer Parkway. The proposed alignment lies within the Barker Reservoir and requires a crossing of Buffalo Bayou. Since the proposed alignment lies within the Barker Reservoir, the proposed project must go through extensive evaluation and review by local, state and federal agencies before the project can move forward, causing the financial cost to be escalated. Since there is no development in the Barker Reservoir, there seems little gained from making the proposed connection along the Grand Mission alignment. The same connection can be made via Westheimer Rd. or Mason Rd. without having to acquire land and construct a roadway along the Grand Mission alignment. |
| 15 | FM 1093 (Westheimer Rd.) | SH 6 to Westpark Tollway | Widen | $\bullet$ | $\bullet$ | City | Westheimer Road between SH 6 and the Westpark Tollway is already one of the busiest arterial roadway segments in the Houston area. Currently traffic volumes on this segment of Westheimer are over 60,000 vehicles per day, which is the same capacity as a limited access freeway. Traffic volumes are projected to increase by $25 \%$ by 2040 . Widening this segment of Westheimer Rd. to 8 lanes will provide the capacity needed for the additional traffic volumes. |
| 16 | Richmond Avenue | Wilcrest Dr. to FM 1093 (Westheimer Rd.) | Widen | $\bullet$ | $\bullet$ | City | Richmond Avenue is one of two major arterial roads between Westheimer and the Westpark Tollway. Widening Richmond will provide additional roadway capacity to handle the project trafic volumes by 2040. |
| 17 | Meadowglen | Cross BW 8 | Connect |  |  | City | The Meadowglen Dr. corridor is an east/west alignment that lies between Richmond and Westheimer in the Westchase District area. The corridor extends from Kirkwood on the western end to Gessner on the eastern end, however it does not cross Bettway. 8 . The recommendation is to consider a grade separated connection spanning the Bettway 8 right-of-way to Rogerdale on the western side. This proposed connection of Meadowglen would alleviate some of the current and future traffic demand on Richmond and Westheimer. |
| 18 | Westpark Drive | $\begin{array}{\|l} \text { Gessner Rd. to } \\ \text { SH } 6 \end{array}$ | Widen | $\bullet$ | $\bullet$ | City | Westpark Drive is the other major east-west arterial roadway between Westheimer and the Westpark Tollway. Varies segments of Westpark has been fully or partial completed. It is recommended that Westpark be fully built out and widened to 6 lanes to accommodate projected traffic volumes and service to relieve traffic demand on Westheimer Rd., Richmond Ave, and the Westpark Tollway. |
| 19 | Town Park Drive | Cross BW 8 and utility ROW | Connect |  |  | City | The Town Park Dr. corridor is an east/west alignment that lies between Harwin and Bellaire, just south of the intersection of the Westpark Tollway and Beltway 8. Currently, the Town Park Dr. corridor extends from Gessner to Synott, changing names to High Star Dr. near Wilcrest. However the corridor does not currently extend across Beltway 8 or a drainage way between Rogerdale and Wilcrest. The recommendation of this study is to consider a grade separation along the Town Park Dr. alignment at Beltway 8 and a bridge over the drainage way between Rogerdale and Wilcrest. |
| 20 | $\begin{aligned} & \text { Dairy Ashford } \\ & \text { Drive } \end{aligned}$ | Westpark Tollway to Bellaire Blvd. | Widen | $\bullet$ | $\bullet$ | City | It is recommended that Dairy Ashford be widened to 6 lanes with a shared use path between Westpark Tollway and Bellaire to accommodate projected traffic volumes and to service the pedestrian traffic around the public schools and other facilities along this segment of the roadway. |
| 21 | Sugarland Howell | Alief Clodine to Richmond | Connect |  |  | ETJ | Sugarland-Howell Rd. is a north/south corridor in the southern portion of the study area that lies between Eldridge Pkwy. and SH 6. Sugarland-Howell Rd. currently terminates on the southern end at Old Richmond Rd. (south of Bissonnet St.) and terminates on the northern end at Alief Clodine, near the Westpark Tollway. The proposed project would require an elevated roadway to be constructed across Westpark Tollway and an existing pond before coming down to grade near Westpark Dr. From that point, a connection could be made to the existing Westhollow Dr. which continues all the way to Westheimer. The proposed project would relieve congestion from both Eldridge Pkwy. and SH 6 , while providing connectivity to Westpark Dr., Richmond Ave. and Westheimer. |
| 22 | Groeschke | Barker-Cypress Rd to SH 6 | Realign | $\bullet$ | $\bullet$ | City | Preliminary design concepts have been developed for the West Houston Airport to extend the main runway from 3,953 feet to 5,000 feet. The proposed extension would necessitate the realignment of Groeschke Road. Final alignment would depend upon the airport receiving approval for the runway extension. The realignment of Groeschke Road should be coordinated with the extension of Patterson Road to ensure that the two roads align. |



Figure 5.4
Intersection Improvements

| INTERSECTION | IMPROVEMENTS |
| :--- | :--- |
| Map Ref\# | Location |
| 1 | Clay @ Britmoore |
| 2 | Memorial @ Elderidge |
| 3 | Briar Forest @ Dairy Ashford |
| 4 | Briar Forest @ Kirkwood |
| 5 | Briar Forest @ Wilcrest |
| 6 | Westheimer @ SH 6 |
| 7 | Westheimer @ Elderidge |
| 8 | Westheimer @ Wilcrest |
| 9 | Westheimer @ Beltway 8 |
| 10 | Alief Clodine @ Diary Ashford |
| 11 | Harwin @ Wilcrest |
| 12 | Westpark @ Briarpark |
| 13 | Harwin @ Ranchester |

## Legend

$\square$ Study Area
Improvement Intersections



P Park \& Rides

* Bike Path Street

Crossing
""n"un"un"w Gap or Potential Link

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Figure 5.6


## Legend

$\square$ Study
P Park \& Rides

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Figure 5.7

## Legend

$\square$ Study
$\square$ Counties
P Park \& Rides

* Bike Path Street Crossing
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P Park \& Rides

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Figure 5.10
Bicycle and Pedestrian Facility Feasibility Section B3


Legend
ITudy
$\square$ Counties
P Park \& Rides

* Bike Path Street

Crossing
""w"un"w"u" Gap or Potential Link

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Legend
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Street Low-Med Volume


## IMPROVEMENT OPPORTUNITIES



### 5.2 SERVICE OPPORTUNITIES

In order to preserve adequate mobility in the Study Area, transit and alternative mode services will play an increasing vital role. As previously mentioned, nearly 25 percent of METRO's 2013 average daily ridership is on local routes that operate in the Study Area. With the launch of METRO's new local bus network (METRO NBN) that percentage should increase substantially. The recommendations below include enhancements to METRO NBN, as well as recommendations to expand alternative modes that complement transit or serve as additional travel modes. Table 5.4 lists the transit enhancements that will help maintain and/or boost ridership under METRO NBN. Recommendations include capital projects to enhance operations, policy changes to test and meet untapped demand, and concepts for future high capacity service.

Service and facility recommendations are shown together in Figure 5.17. Individual routes are shown in greater detail in Figures 5.18 and 5.19

Fort Bend County Transit (FBCT) is in the preliminary stages of constructing a Park \& Ride facility along the Westpark Tollway The facility is located in 19800 block of FM 1093 near Mason Road. The facility will initially provide 262 parking spaces (Figure 5.20 ), and is will offer direct service to Greenway Plaza and Uptown/Galleria. The facility is expected to begin operating in 2016.

FBCT should explore formal Interlocal agreements or partnerships with METRO to provide express bus service in METRO's Service Area. This includes current routes outside the Study Area. FBCT routes currently stop at METRO Park \& Rides to afford passengers the opportunity to transfer to and from METRO routes. Formal Interlocal Agreements would help synchronize services to reduce transfer wait times as well as pave the way for a common fare box system

To complement METRO NBN in the Study Area, Enhanced Transit Transfer Areas (ETTAs) are proposed primarily at locations were two high frequency routes intersect (Figure 5.19). These ETTAs would provide ease of transfer from one route to another with pedestrian intersection improvements upgraded bus shelters, lighting, security, and dynamic information systems (Figures 5.15 and 5.16).

Each Funding Partner Management District should develop or refine one or more circula shuttle services within their districts. These circulars provide vital "last mile" service to and from existing or future transit facilities. Circulars should be coordinated with other services at these facilities to minimize wait times and allow seamless transfer from one mode to another. The circulars would provide a level of convenience needed to encourage daily commuters to use transit Circulator services could be created through partnerships with METRO similar to the 75 Elderidge Crosstown route between METRO and the Energy Corridor. Such partnerships
would be beneficial to both METRO and Management Districts by lowering METRO's operating costs and allowing to management districts to avoid huge capital outlays for vehicles and drivers

Metro National is considering expanding the operating hours of Memorial City shuttle (See Figure 2.46) as demand warrants This service should be coordinated with METRO routes and facilities in the Memoria Mall area to provide enhance services and boost ridership on both services. Likewise, the Energy Corridor District has proposed additional circulator service to enhance utilization of the Addicks Park \& Ride/ Transit Center (Figure 5.20). Westchase Management District's Long Range Strategic Plan calls for the development of a district circulator service (See Figure 5.14) to complement both current and future transit services in the area.

Rideshare, carpool and vanpool service utilization will have to be expanded substantially to meet the unmet demand in West Houston. These services should be coupled with car sharing services, guaranteed ride home, flexible work schedules, and tele-working to give employees true options when and if they choose to commute. These services will equire the participation of virtually all employers in the Study Area to truly be successful. Therefore, local jurisdictions, management districts, and other area partners will have to develop ways to incentive participation in these programs








Figure 5.16
Figure 5.16
Gessner and Westheimer Proposed Improvements

| TABLE 5.4-TRANSIT ENHANCEMENTS |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Timeframe | Category | Type | Descripition | Comments |
| Short | Service | Circulator Bus | Energy Corridor Circulator | Facilitates short trips within Energy Corridor. Could be its own route or more frequent turnback service of Routes 67/75/162; to be designed funded by Management District. |
| Short | Service | Circulator Bus | Westchase Circulator | Faciiltaes short trips within Westchase. To be designed and funded by Management District. |
| Short | Service | Express Bus | Nonstop service from Memorial City to Addicks P\&R using Katy Freeway | Provides high-speed connection between Energy Corridor and Memorial City. Could be extension of Route 160. |
| Short | Service | Local Bus | Park Row: Addicks P\&R to Fry Road | Serves apartments, offices, hospitals and HCC campus along Park Row. 60 min base headway; Could be new route or extension of Route 32 or 33 |
| Short | Service | Local Bus | FM 1960/SH 6: Willowbrook Mall to Addicks P\&R | Connects Energy Corridor to development along FM 1960/SH 6 corridor and Willowbrook Mall. 30 min base headway. |
| Short | Service | Signature Bus | Extension of Route 402 (Bellaire Quickline) to Mission Bend P\&R | Limited stops and frequent headways; operates during weekdays only. |
| Short | Service | Signature Bus | Westheimer Quickline: Downtown to West Oaks Mall | Limited stops and frequent headways; operates during weekdays only. |
| Short | Service | Signature Bus | Gessner Quickline: West Airport to West Little York P\&R | Limited stops and frequent headways; operates during weekdays only. |
| Short | Capital | Enhanced Transfer Point | Bellaire at Gessner | Provided at areas of frequent transfer activity; increases rider safety and comfort by providing shelters, lighting, ramps, special crosswalk treatment, landscaping, etc. |
| Short | Capital | Enhanced Transfer Point | Bellaire at Fondren | Provided at areas of frequent transfer activity, increases rider safety and comfort by providing shelters, lighting, ramps, special crosswalk treatment, landscaping, etc. |
| Short | Capital | Enhanced Transfer Point | Beechnut at Wilcrest | Provided at areas of frequent transfer activity; increases rider safety and comfort by providing shelters, lighting, ramps, special crosswalk treatment, landscaping, etc. |
| Short | Capital | Enhanced Transfer Point | Westheimer at Gessner | Provided at areas of frequent transfer activity; increases rider safety and comfort by providing shelters, lighting, ramps, special crosswalk treatment, landscaping, etc. |
| Short | Capital | Enhanced Transfer Point | Westhemier at Wilcrest | Provided at areas of frequent transfer activity; increases rider safety and comfort by providing shelters, lighting, ramps, special crosswalk treatment, landscaping, etc. |
| Short | Capital | Enhanced Transfer Point | Westheimer at Eldridge | Provided at areas of frequent transfer activity; increases rider safety and comfort by providing shelters, lighting, ramps, special crosswalk treatment, landscaping, etc. |
| Short | Capital | Park and Ride | West Bellfort P\&R Expansion | Current facility is at parking capacity. |
| Medium | Service | Circulator Bus | Memorial City - Citycentre Circulator | Facilitates short trips within Memorial City. Operational once transit center is constructed; to be designed and funded by Management District. |
| Medium | Service | Express Bus | SH 6: Addicks P\&R to Sugar Land Town Center | Facilitates "suburb to suburb" commute. Limited stops (West Oaks Mall, Shell Tech Ctr, Mission Bend P\&R, Bissonnet, etc.); requires signal synchronization, access management enhancements, and other improvements prior to implementation; would require TxDOT and Fort Bend County participation. |
| Medium | Service | Express Bus | West Sam Houston Tollway Express: West Bellort P\&R to West Little York P\&R | Facilitates "suburb to suburb" commute. Intermediate stops at Westtchase P\&R, Memorial City Transit Center, and Clay Road Transit Center. |
| Medium | Service | Local Bus | Extension of Route 65 (Bissonnet) from Synott to SH 6 | Frequent route; coordinate with Fort Bend County (although intersection of SH 6 \& Bissonnet is within COH limited purpose annexation area and therefore may be within METRO Service Area). |
| Medium | Service | Local Bus | Extension of Route 79 (West Little York) from Fairbanks - N Houston to SH 6 | Provides local route coverage within study area. 60 min base headway; Serves West Little York P\&R; Routes 45 (Tidwell West) and 46 (Gessner) would be adjusted to serve West Little York Park and Ride as well. |
| Medium | Service | Local Bus | North Eldridge/Tanner/Brittmore: Northwest Station P\&R to Clay Road Transit Center | Provides local route coverage within study area. 60 min base headway. |
| Medium | Service | Local Bus | West Road: Northwest Station P\&R to Barker - Cypress | Provides local route coverage to area just north of study area. 60 min base headway. |
| Medium | Capital | Park and Ride | Possible TOD redevelopment of Addicks P\&R | Pending METRO/H-GAC Station Area Planning Study. |
| Medium | Capital | Park and Ride | Possible TOD redevelopment of Westchase P\&R | Pending METRO/H-GAC Station Area Planning Study. |
| Medium | Capital | Park and Ride | Possible TOD redevelopment of Kingsland P\&R | Pending METRO/H-GAC Station Area Planning Study. |
| Medium | Capital | Transit Center | Memorial City Transit Center | Serves riders traveling to and from Memorial City; transer point between Routes $26,46,70,160,161,162$ and proposed Memorial City - Citycentre Circulator. |
| Medium | Capital | Transit Center | Clay/Sam Houston Tollway Transit Center | Transfer point between Route 23,36,58 and proposed North Eldridge/Tanner/Britmore route. |
| Long | Service | Local Bus | FM 529: Grand Parkway to West Little York P\&R | Serves FM 529 corridor on northern edge of study area. 30 min base headway. |
| Long | Service | Express Bus | Nonstop service from Addicks P\&R to Grand Parkway P\&R using Katy Freeway | Provides high speed service between Grand Parkway and Energy corridor. Could be extension of Route 160. |
| Long | Service | Local Bus | Barker - Cypress: Cypress P\&R to Kingsland P\&R | Provides north-south connection through rapidly-developing portion of study area. 60 min base headway. |
| Long | Service | Local Bus | Extension of Route 79 (West Little York) from SH 6 to Fry Road | Coverage route. 60 min base headway. |
| Long | Service | Local Bus | Extension of Park Row route from Fry Road to Katy Mills Mall | Coverage route. 60 min base headway. |
| Long | Service | Local Bus | Fry Road - W Little York to Kingsland | Coverage route. 60 min base headway. |
| Long | Service | Local Bus | South Mason: Park Row to Westpark Park and Ride | Provides north-south connection through rapidly-developing portion of study area. 60 min base headway; Requires Fort Bend County participation. |

## IMPROVEMENT OPPORTUNITIES

| TABLE 5.4-TRANSIT ENHANCEMENTS (CONTINUED) |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Timeframe | Category | Type | Description | Comments |
| Long | Service | Local Bus | Memorial/Kingsland: SH 6 to Katy Mills Mall | Provides east-west connection through rapidly-developing portion of study area. 60 min base headway; Serves Kingsland P\&R; requires extension of Memorial Drive through Barker Reservoir. |
| Long | Service | Local Bus | Clay Road - SH 6 to Grand Parkway | Coverage route. 60 min base headway. |
| Long | Capital | Direct Connector | T-Ramp from Katy Managed Lanes to Memorial City TC | Allows direct access from Katy Freeway managed lanes to Memorial City Transit Center. Requires TxDOT participation. |
| Long | Guideway | High Capacity | Westpark Corridor: Grand Parkway to Bellaire/Uptown TC | Could interline with University Line between Hillcroft TC and Bellaire Uptown TC depending on chosen technology; requires Fort Bend County and/or GCRD participation. |
| Long | Guideway | High Capacity | US 290/Hempstead Corridor: Downtown Hempstead to Northwest Transit Center | Could extend into downtown; requires TxDOT and/or GCRD participation. |
| Very Long | Guideway | High Capacity | Katy Corridor: Grand Parkway P\&R to Northwest Transit Center | Would replace existing managed lanes; requires TxDOT and possibly GCRD participation. |
| Very Long | Guideway | High Capacity | Gessner Corridor: West Little York P\&R to West Bellfort P\&R | Provides high-capacity north-south connection on eastern edge of study area. |

Projects assumed to be implemented by METRO unless otherwise noted
Last updated 11/10/2014

twest
houston

## IMPROVEMENT OPPORTUNITIES



Figure 5.17 Proposed Local Bus Service

## Legend

Study Area
$\square$ Counties
Management Districts
圈 Transit Centers
[ Park \& Rides
—— Routes

## Proposed Facilities

(P) Park and Ride Expansion

P New Park and Ride
Proposed Services Local
= = = - Local, Extension

- Local, New


## Major Destinations

- Commercial
- Educational
- Industrial
- Medical
- Retail



## IMPROVEMENT OPPORTUNITIES



Figure 5.19 Proposed Facilities

## Legend

## Study Area <br> Counties <br> Management Districts <br> 圊 Transit Centers <br> [ Park \& Rides <br> (1. METRO Operations Facilities

## Proposed Facilities

E) Enhanced Transfer Point
[P Park and Ride Expansion
D New Park and Ride
Proposed Transit Centers
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Figure 5.21
Proposed Energy Corridor Circular Service

IMPROVEMENT OPPORTUNITIES


### 5.3 POLICIES

The policy recommendations below are intend to guide future development for transportation infrastructure and services in the West Houston Study Area. These policy recommendations are intended to remove procedural barriers to transportation and land development options that currently hinder the types of improvements and development needed to ensure mobility and preserve the quality of life that residents and commuters in West Houston expect and deserve.

Some recommendations are summaries of statements in previous sections, while others provide general guidance for future development in the Study Area and the Region. All recommendations are grouped by government entity or subject matter.

## City of Houston

Major Thoroughfare and Freeway Plan

Add all roadways shown in the MTFP Map to the MTFP Hierarchy Table (Section 5.1)

- Add the list of nominated collector streets to the MTFP (Section 5.1)
- Add needed roadway connections across Addicks and Barker Reservoirs (Section 5.1)

Require a minimum of 120 ' right-of-way for 6-lane roadway configurations

Infrastructure Design Manual
City of Houston should amend Chapter 42 of the Charter of Ordinances to allow for corridors that have high-frequency transit service (as described in METRO Reimagining) to be classified as Transit Corridor Streets; currently corridors must have fixed guideway transit to be classified as Transit Corridor Streets

- Continue emphasis on Context Sensitive Design (Section 4.4) on all current and future roadway projects

Inclusion of safe and equitable pedestrian facilities on all roadway projects within the City of Houston where appropriate and feasible

## County Governments

- Consider inclusion of Bicycle and/ or Pedestrian facilities along streets with transit service, were appropriate (Section 5.1)
Ensure build out of the MTFP grid in unincorporated areas


## Special Districts

- Continue/improve partnerships between City, County, management districts and developers on large-scale projects with significant impact on the Study Area
- Develop or refine circulator shuttle services within the management districts (Section 5.2), including partnering with METRO and/or Fort Bend County Transit to provide services

Provide incentives to employers to provide transit and/or alternative mode
benefits for their employees, including partnerships for use of park-and-ride facilities and expanding the use of vanpools, ridesharing, car sharing guaranteed ride programs, flexible work schedules, and tele-working opportunities throughout the Study Area

## Transit Providers

- METRO should consider adding fixed route or flex zone service in the West Houston Study Area within Harris County between SH 6 and SH 99
- METRO should consider amending the guideline in Reimagining that stipulates that flex zones will not be considered in areas that previously did not have fixed route transit services

Increase coordination between METRO and Fort Bend County transit programs to serve local and commuter transit demand in the West Houston Study Area
METRO should assist management districts in planning for future transit connections between the Major Activity Centers within the Study Area

METRO should build the transit centers and park-and-ride facilities identified in his study

METRO should partner with the Energy Corridor Management District and private developer(s) to construct a structured parking facility at the Addicks Park and Ride lot that can accommodate future TOD

METRO should partner with area management districts and employers
to offer last mile service that enhances reverse-commute options

- METRO should indentify a location for a future bus barn in the Study Area to reduce "deadhead" travel times for routes in the Study Area
- Fort Bend County Transit should study current and future commuter service demand to the major activity centers in the Study Area


## General Polices

Adopt concepts detailed in the Urban Houston Framework Study

- Implement recommendations from previous studies, where they are still applicable
- Adopt recommendations in the 2040 Regional Bikeway Plan, where applicable and appropriate
- Apply Access Management principles on all new and reconstruction projects where appropriate
Develop utility and drainage corridors for pedestrian and bicycle facilities when feasible
- Implement a regional incident management program
- Increase maintenance resources, especially safety-related maintenance
- Consider mid-mile grade separations across freeways (no connection to freeway/frontage roads)
- Stagger construction along corridors to ease traffic congestion due to construction
- Expand intelligent transportation
systems (ITS) including improved accuracy and timeliness of traveler information; add or expand ITS on high-volume arterials and toll facilities, upgrade dynamic message signs to be able to provide wider array of messages and graphics

Synchronize and optimize signal timing where necessary, especially on corridors where traffic signals are maintained by multiple jurisdictions
Develop improvement projects at thoroughfare intersections forecast to have the highest congestion, up to and including grade separations

- Provide separate bus lanes on those thoroughfares when and where ridership would justify Express/BRT Services


## Regional Policy

Build out all projects currently listed in the City of Houston's MTFP and the HGAC RTP (Section 4.2)

- Implement proposed changes from METRO Reimagining program
- Provide permanent funding for a regional incident management program
- Use best practices for bicycle and pedestrian facility connectivity and safety
- Provide permanent funding for commuter rail


## Regional Procedures

Review and revise incident management procedures for lane closures

- When analyzing mobility effectiveness utilize person and freight throughput rather than vehicles throughput


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## IMPLEMENTATION TOOLBOX

### 6.1 FUNDING

As outlined in Section 2.10, there are many development tools and strategies available to local jurisdictions and special districts in West Houston to implement recommendations in this study. These items will be discussed with an emphasis on encouraging greater coordination of effort among local jurisdictions, private land developers, and other area stakeholders. In addition to the federal and state funding available through the H-GAC RTP/TIP process, local jurisdictions and stakeholders can utilize existing funding mechanisms or collaborate to create new ones were appropriate. Existing funding mechanisms include Energy Corridor Management District and Westchase Management District 380 agreements, the Memorial City Redevelopment Authority (TIRZ 17), the City of Houston's Rebuild Houston Program, funds from the collection of tolls by the Harris County and Fort Bend County Toll Road Authorities, and various TxDOT discretionary funds. In addition, PublicPrivate Partnerships can be created around the right opportunities to funding facilities and/or services.

Currently, two of the three Funding Partner Management Districts have 380 agreements. These agreements provide additional funding for capital improvements with the designated funding area. Both are examples of creative, collaborative funding arrangements being utilized to implement improvements in West Houston. The Energy Corridor Management District initiated a 380 agreement with the City of Houston in December 2012 to fund the construction of $\$ 20$ million in capital improvements along Park Row. These improvements include extending Park Row from the Addicks Park and Ride to its existing terminus west of Eldridge Parkway. The project includes the installation of water and sewer infrastructure as well as street lights and all applicable traffic controls. In October 2013, the Westchase Management District entered into a 380 agreement with the City of Houston to funding approximately \$573.5 Million in mobility, drainage and community improvements over 30 years The improvements include civic buildings, parking structures, a transit center, new street construction, street modification, parks, and trails.



Expected population growth in West Houston will place increasing demands upon the area's transportation infrastructure and services. In order to meet this demand both public and private entities in the area will need to develop and significantly expand alternative modes of travel and work to increase housing density and choices within the Study Area. Improving east-west connectivity will be critical.

However, the reservoirs pose a challenge to this objective. The impediment caused by the reservoirs makes the expansion of alternative modes of travel, particularly highcapacity transit even more important. If highcapacity transportation is properly expanded and utilized it could negate the need to build additional roadways through the reservoirs.


## APPENDIX A PUBLIC COMMENTS

Comments received from the public are listed below. The comments are grouped by method of receipt.

## DIRECT EMAILS

Received February 10, 2015
I appreciate your taking the time to review this portion of the mobility plan. My 1st goal is for the Greater West Houston Mobility Plan to 2040 to substantially incorporate segregated or physically separated pedestrain and cycle lanes. I am starting with advocating for the 2 roads that we discussed: Addicks Satsuma and West Little York. These roads intersect at an combined elementary and middle school complex. Currently, I see two major issues that will need to be considered when updating Addicks Satsuma: 1) there is a narrow bridge that spans the bayou that is only wide enough for 2 vechicles and it sits right after a major curve in the road. This is dangerous for both automobile drivers, pedestrians, and cyclists. 2) Along major portions of Addicks Satusuma, specifically north of the bridge that spans the bayou and all the way to FM 529, there are very large ditches that are located on both sides of the road.

Thank you again for your help!! Oh, I am also curious if Harris county has received any federal funding from the Safe Routes to School (SRTS) federal program? Would you know if this funding has been incorporated into the mobility plan or any other associated projects?

Received February 5, 2015
I was very alarmed to receive word of the proposed Highland Knolls extension. I am very concerned that efforts were not made to make sure the public, who use this well loved area and appreciate it, knew of this proposal and that efforts were not made to see that they were. Concerning that it seems those seeking for this extension were discreet about it so as not to be opposed when so many others, who knew nothing of this proposal, will be affected by it. It sees that every person in the community affected by this roadway should be informed about such a proposed plan and have rights to express their concerns and reasons for not putting it in. It is unfair to bring something like this to the public discreetly and that, during the holidays when so many other things are going on to keep a very interested and perhaps negatively impacted public and community out of the picture. I hope all involved will do things more positively and upfront for the community involved in the future! I would like to share a few things that have come to mind with this proposal.

First, I live near this area and it seems unnecessary and a waste of public money to put the proposed extension in. This area is currently well developed and traffic is not terrible. I don't believe it would help the current traffic situation on $\mathrm{I}-10$ or Westheimer Parkway. All other routes this road leads to are already congested. It would really benefit no one in the end and negatively impact the communities/ neighborhoods from George Bush Park to the Grand Parkway. Would it not be better to have a nature reprieve for the public's use instead reserved and left alone? As the city grows and expands, I believe all such areas are needed, necessary and beneficial for the well being of it's people. Can we not utilize funds better, improving those highways that are already in place? Is the stream of traffic on Westheimer Parkway so bad that we need to construct another main highway just a few minutes north of Westheimer? Do we want to put more traffic through already developed quiet neighborhoods (especially the Highland Knolls road between Mason and Westgreen)? This area has been developed. I don't believe adding another road is necessary to help traffic through the area.

Second, would it not be better for traffic to instead encourage and better develop routes for other commuting options such as biking? We live in a climate that can be biked nearly all year. Except when the park is flooded from rainfall, it's a great and safer way for commute. Third, I believe it would negatively impact all in the community on the west side of the park in many ways. Businesses and those living on the west side of the park do not need the Highland Knolls extension. I fear it would allow for increased crime in an area that has a natural city barrier. The trail through George Bush Park is a step away from the city into a natural reprieve. A very nice bit of nature right in the surrounding neighborhood's and community's back yard. A road through this park would destroy much of what makes this trail so special. Thank you for taking time to address my concerns. Please put a stop to the proposed Highland Knolls extension!

First, let me say that I hope you are not serious about "stealing" a bike path from underneath the feet of the Houston-Katy cycling community (per attached). That would be a major step backwards for a city that promotes active lifestyles and is a major source of fund raising for the MS 150 ride. Are there no other options? I have one, how about encouraging drivers to venture out from behind the wheel of their vehicle and commute to work on a bike? I realize very few would even consider that as an option; the point is that the interests of those cyclists that use that trail for commuting to work or for exercise in general need to be given strong consideration before converting the trail into one for motorized vehicles. I can assure you that there is strong local cycling community that will insist its voice be heard those eager to "convert paradise to a parking lot" get started.

I recently have learned about the proposed roads through George Bush Park. https://mywesthouston.files.wordpress.com/2014/12/wh-public-meeting-4-presentation1.pdf. I do not like any of it. George Bush Park is a real gem for the Houston/Katy area. It's why we bought our current house. My family walks, rides bikes, or runs in the park every day. So many of my friends and neighbors also regularly use the path. The trees, wildlife, and serenity of the park make it my favorite place in Houston/Katy. Our house is a block away from the path. We enjoy seeing the birds in our yard that come from the park. If roads were built through George Bush Park everyone would lose all of this. Also, the construction would be incredibly noisy and the increased traffic would be a nuisance. It would make living where we are undesirable.

First, I hope all of you have been enjoying good rides lately. I still can't say I miss the cold north one little bit and I love having the option of riding almost every day. HOWEVER: It looks like our commute route and weekend getaway area may be at risk. Attached is a flier that was put up in Bush Park with information that the West Houston Mobility Plan would wipe out the Bush Park bike paths to build more roads (so people can find new places to sit in their cars waiting to get past Hwy 6). There are so many things wrong-headed with this idea that it is hard to know where to start, but since there have been meetings and the plan seems real, I would propose that we learn who else may be organized to oppose the plan and support them. Let me know if you are interested in somehow helping to oppose the plan and we'll figure out next steps.

For more information about the plan, the link is http://mywesthouston. com/meeting-materials/ and the email address for the guy that put up the signs: David_lippeH@hotmail.com.

I live in Katy and frequently (two to three times a week) use the bike paths that start at Highland Knolls and run through George Bush Park eventually surfacing at I-10 near the Constables Station. The attached file contains a picture of a sign that has been posted along the trails. While I agree that West Houston needs more east-west routes to relieve congestion, how will the extension of Highland Knolls to connect with Briar Forest impact the bike trails? The email distribution list you see below is a group of cyclists and friends all of whom also use the trails including some who commute by bike to their jobs in the energy corridor.
..I know traffic is a big problem in Katy and I understand the need for progress related to Highland Knolls expansion. I am hoping that the walking/bike path will be rerouted/replaced in conjunction with the Highland Knolls expansion. The trails through George Bush park are one of the big attractions to people living in Katy. It helps keep home values up and attract new residents as older ones downsize. I bike 16.5 miles each way to work 2-3 times a week using these trails to go from Peek and Fry to Eldridge Parkway. I'm healthier and happier for it. And there is one less car on the roads when l'm on my bike!!

Please rebuild the main walking/biking treks through George Bush park. Please!

Received February 4, 2015
I agree with John Ciccarelli's comments. As a folding bike owner, I know we have not tried this sub-mode much at all in Houston, but it is extremely useful for use with transit, and it makes the demand on the transit vehicle much less.

The only thing I have to add is... I know where to get a property for the Copperfield Park and Ride. It is the abandoned HEB property at the SE corner of Barker-Cypress and FM529. It has been vacant for years. It has a large parking lot. It must be going for a song by now. No one wants it. Buses could originate there, and travel down FM529 to Highway 6, or they could make a run up-and-down Barker-Cypress and E-W on Park Row to the Addicks Transit Center.

Received January 29, 2015
Here's another public comment that I agree totally. http://www. littergetters.com/mobilityplan.htm. George Bush trail is the best 12 miles out of my 17 miles regular bike commute route. Westheimer Parkway can shorten my commute to 10 miles, but the traffic there moves at freeway speed.

## PUBLIC COMMENTS INBOX EMAILS

Received January 17, 2015
I am a resident of Parklake Village. We purchased our home in 200 under the premise that the George Bush park would remain as a sanctuary. I strongly oppose the construction of the continuation of Highland Knolls to Highway 6. Please let me know if there will be a hearing or meeting regarding this issue.

Received January 16, 2015
I have been working in energy corridor since 3 years now commuting from Sugar Land every day. And over 3 years, the traffic has gone from good to worse now. I see that there are some programs started by energy corridor to mitigate and reduce traffic congestions. But I see none of them helping in any way, and its making traffic every day worse. I currently have a van pool with metro, and we are finding difficulty maintaining the number of riders in the van. All because of fixed times associated with commuting with van pool. Energy corridor is like another downtown, and metro has bus services from all over the Houston to downtown. However, there is not a single express bus from anywhere in the city to energy corridor. I don't know why this option has not been thought of. I would like to know if this option was considered and if yes, why is it not implemented. I think this would greatly reduce the traffic even if there is a bus every 30 minutes or hour to begin with from various parts of the town. I reviewed the last meeting materials. And see that there is no mention or plan to provide Metro Bus services to energy corridor which is another Houston Downtown now, with many oil companies in the area. Why can't there be bus services from various park and rides to energy corridor?

Received December 22, 2014
Please incorporate Peter Wang's comments (below) regarding the West Houston Mobility Study. What happened to the bicycle study? Peter has more knowledge of the potential for alternative modes possible in this study area than any of the consultants. Please respect his comments.

1. Show express bus service on SH 6 north of IH 10 to the Addicks
P\&R in dedicated lane or queue jumpers art intersections (not local bus service)
2. Refer to high speed rail on the Hempstead railroad alignment
3. Rather than roads why not consider elevated electric powered high capacity transit in the reservoirs
4. Show ped/bike sidewalks and pathways connecting to transit
5. Show the level of stress diagrams referring to bicycling on existing streets
6. Show cycle tracks on Barker Cypress and on SH 6
7. Refer to H-GAC (Alliance) SH 6 Access Management study for per bike along SH 6 .

Transit - It was great to finally see a transit poster, but I noticed that the service on Highway 6 north of I-10 was tagged as "local service" not "express service". I beg to differ; I think we need express service as badly as they do south of I-10. The big problem for transit on Highway 6 is that you really need it to be in a dedicated, segregated guideway You want the BRT or train to blow by motionless grid-locked cars at 40-50 MPH. Sheer envy and covetousness will get people out of their cars. If the BRT is suffering with the rest of the vehicles on grid-locked Highway 6, and going ever slower because it is big, slow, and making frequent stops, then it becomes the Transportation of Last Resort for the Poor, which is what METRO local bus service is already. Suburban neighborhoods will reject that, too. In the final report, please discuss, in general terms, the possible impacts of Houston Dallas HSR along 290. You have to realize, having an HSR station on 290 would be orders of magnitude more impactful than having a simple METRO bus stop. It would be like having an airport along 290. It would be a major socio-economic engine, a total game-changer for at least half of the sub-region. You have to make an effort to address is as best you can, even if only by borrowing materials from the Texas Central website Streets across the Army Corp reservoir? We know the damage that runoff pollution, trash, and internal combustion fumes would cause to the natural environment? If you want traffic to go over the Reservoir, why not use electrified transit vehicles on an elevated, dedicated guideway across reservoirs to have a non polluting solution? Run the vehicles across the Reservoir to the Addicks Transit Center, for example.

Bike/Ped - There was no bike-ped map or any kind of display. This was disappointing. What happened to John Ciccarelli, Bicycle Solutions? The "Thoroughfare Changes" poster didn't show hardly any roads recommended for a shared-use path. That's inconsistent with the transit poster, because every street with transit needs to have a sidewalk, right? People walk or bike to transit, no one drives $1 / 4$ mile or $1 / 2$ mile, parks, and then takes transit. Why would you stop your car journey at that point? If you don't have sidewalks and paths you will have trouble initiating transit, because people will be unable or reluctant to get to it. A bike transportation plan cannot be afraid of bikes in or near the street and road. Yes, I agree, separation by more than a mere paint stripe is good. But consigning most of the effort in bike routes to bayous, gas pipeline, and electric ROWs is consigning them to being far less relevant as transportation. There are no originations, and no true destinations for bike journeys on bayous, electric, or gas pipeline ROWs. They all have to start and end with some kind of a journey on a street, even if they use the non-street as part of the journey. So please don't avoid bikes-onstreets. Those type of facilities have to be built. This is a transportation plan, not a parks and recreation plan. We have to get out of the Harris County mindset (this was actually told me by a Harris County official) that "roads are for cars, and bikes should stay off the roads." No! That's such an outdated, "last millennium" sentiment! Barker Cypress road has so many apartments and businesses on it now, it desperately needs a shared use path, and Highway 6 too, just like the Highway 6 North Access Management Study recommended. Speaking of which, I didn't see evidence in the meeting that you merged in the Highway 6 North Access Management Study recommendations for bike/ped, because there was no bike/ped display. Please address this deficiency.

Received January 12, 2015
I submitted the below comment at www.mywesthouston.com on 01/02/2015 and have not received any kind of response: Regarding the transit recommendations map on page 29 of the Dec. 18, 2014 presentation, is there a map legend to help me better understand the transit recommendations?

Received January 9, 2015
I have been riding bicycles in the George Bush/Eldridge Park for almost as long as it's been open. Every other weekend I ride about an hour primarily to maintain health but also to enjoy to enjoy nature. One of the best features of this park is that there are still trails which are remote enough that there are no man made sounds, no diesel trucks, no cars honking, no sound of cars going down the road, no ambulances or police, only the quiet sound of nature and wildlife. I have heard that there are plans being considered to extend Briar Forest through the middle of the park. I strongly object to this proposal. Doing this will destroy the quiet solitude that exists there now. There are essentially NO places in Houston like the Bush/Eldridge Park. That is why there are so many people going there, they go to get away from the city, get away from the noise of the city and chill out. PLEASE do not put a road through here.

Absolutely no more construction should occur in Barker Reservoir. It is built for detention and not roadways. The region you propose to build roadway is a swamp, and floods extensively after relatively small rains. Before any serious consideration of construction, the land should be surveyed by an engineer. This study clearly had no professional engineer survey the lands. A professional engineer would realize the dangers with constructing a roadway here and not see it as a site to build any. This road not only would interfere with pedestrians on bikes and running, but also kill the large amount of wildlife inside the reservoir. There are many pigs, deer, and alligators in the reservoir and if this road was built it would be a VERY short time before someone ran into them and got injured. There are also many snakes, frogs, lizards, bunnies and other wildlife that would get run over by cars frequently. Overall any roads built inside Barker Reservoir is a terrible idea.

Received January 8, 2015
I speak for a large group of cyclists when I say that we do not want to have a road cut through the middle of George Bush Park. My apologies for the questions, I have not been aware of previous meetings. When will this go to a vote? What is the status?

Received January 5, 2015
When I read your about your "mobility plan" yesterday it started 2015 on a bad note. It was hard to pick my jaw up from the disbelief at how stupid some of your recommendations are. There is plenty wrong with this plan but I am going to focus my comments on the worst part of it allthe proposals you have for land within Barker and Addicks Reservoirs. Did anyone who designed this "mobility plan" even go out and explore the areas within Barker and Addicks Reservoirs that you plan on destroying? It appears to me from reading this plan that you never physically entered the area and just looked at satellite photos and drew a line wherever you felt like a road or trail should be. If this is the case your entire study is the equivalent of a child drawing on a napkin with a crayon and whoever put this together should be fired and ashamed to even be alive. I spend the majority of my free time within Barker Reservoir and will focus my comments on that section of your plan but everything I have to say applies to what you are proposing within Addicks Reservoir as well. I will begin by addressing the roads first and the "shared use path/trails" afterwards

Road impact on wildlife - My primary problems with your "plan" are the proposed street extensions of Patterson, Baker, and Highland Knolls/ Briar Forest roads through Barker and Addicks Reservoirs. Barker and Addicks Reservoirs are the ONLY areas in West Houston/Katy that have been left in a somewhat undeveloped state (excluding the shooting ranges, golf course, baseball fields, etc) and they absolutely should remain undeveloped. As West Houston and Katy have grown into ridiculous sprawl these two reservoirs are the only refuge for wildlife that have been forced out of their homes for an endless procession of retail centers, subdivisions, and apartment complexes. When you look at a satellite photo of West Houston these reservoirs are the first thing you notice due to the development in every direction around them. The area of Buffalo Bayou North of Westheimer Parkway heading towards Mason Creek is perfectly described by Louis Aulbach as "the wildest, most remote and inaccessible sections of its course. Protected from development and allowed to remain in a mostly natural state, the land in the interior of Barker Reservoir is a wild an untamed place within a stone's throw of urban civilization. $1^{\prime \prime}$

Both Mason Creek and Buffalo Bayou are tree lined and beautiful throughout this area other than the litter that flows in constantly from residents of the very developments you are trying to appease by building these roads. Neither channel looks anything like the portions outside of the reservoir where Cinco Ranch and other developments have widened them to ridiculous proportions and removed all foliage along the banks. And you want to build a road directly through this area to destroy it! The wildlife diversity in this area of Barker Reservoir is incredible and I have spent hundreds of hours there exploring and photographing wildlife. There are already numerous species of animal that have been extirpated from the West Houston/Katy area and this loss of species will increase if you are allowed to build roads to bisect these reservoirs. For instance the archaeological study by Joe Ben Wheat which started in 1947 within Addicks Reservoir found bone evidence from bison, badgers, and antelope. When is the last time you saw any of those in West Houston2?

These sections of Buffalo Bayou and Mason Creek overflow their banks anytime it rains more than an inch or two and the surrounding woods in any direction are left multiple feet under water for weeks at a time. Consequently the amount of reptiles and amphibians here is greater than areas outside of the reservoir. Satellite photos reveal a couple oxbow lakes and ponds but in actuality the entire area is primarily wetland. From a human standpoint these street extensions are a horrible idea as well. For cyclists, joggers, walkers, etc the trails within Barker and Addicks Reservoir are the ONLY places in West Houston/ Katy where someone can go multiple miles without having to worry about automobiles running them over or choking them with exhaus fumes. The trail that begins at the Highland Knolls and Fry Road intersection into Barker Reservoir is a haven for cyclists and you are proposing building a road there to ruin it. Whether the road is separate from the trail or you plan to build a "shared use" road the end result is the same-it will destroy this area for cyclists. Why don't you put out a map of your proposed roadway near the benches where cyclists gather near Highland Knolls and Fry Road and ask their opinion of your plans? Are you scared of the backlash? From an archaeological perspective these roads are also a horrible idea. Previous archaeological studies within Addicks and Barker Reservoir such as those by Blaine Ensor, Prewitt \& Associates, or Joe Ben Wheat all found numerous historic sites.

You are proposing building roads in areas that could contain undiscovered historic sites. Once you cover the ground with concrete for a road there is no turning back-those sites will be lost forever. The former LH7 Ranch has already been destroyed for an apartment complex adjoining Barker Reservoir and we do not need more of our past lost. How do you plan to mitigate for wildlife in this area when you build a road that bisects their home? How do you plan on keeping alligators, snakes, frogs, skinks, deer, feral hogs, and other animals from getting ran over constantly? What do you plan on doing when the first human is killed that runs into a feral hog on these roads with their vehicle? Nowhere in the Houston area have roads been built with any wildlife considerations like wildlife overpasses, underpasses, culverts, or elevated roadways and I suspect you have no intentions of doing so either. How do you plan on keeping debris, chemicals, and other pollutants from the roadway from contaminating these areas? If these horrible roads are allowed to be built I sincerely hope that whoever designs them has read the book Road Ecology by Forman et al and that wildlife mitigation is a primary concern. Putting a road through these areas will also open up access to humans who otherwise would not visit them and further stress wildlife that currently lives in relative peace with infrequent human visitation. Regardless of how you build the road there will always be a place where someone can pull over and park their car to get out and explore. People on dirtbikes and four wheelers will find a way into these areas from your new roads and be off-roading where they do not belong in no time at all. What is your plan to mitigate the flooding impact of your proposed roads in these reservoirs? You are proposing building roads through spots that are constantly flooding and concrete will only add to the problem. During the last large rainfall events in May 2014 and September 2014 are you aware that Buffalo Bayou overflowed its banks less than $3 / 4$ mile from the Cinco Ranch Saddlebrook Crossing neighborhood and your road could be the cause of a future flooding disaster.

The proposed shared use path/trails - The Army Corp of Engineers manages these reservoirs for flood control along with "recreation and nature observation opportunities..the visitor is welcome to come and walk through the fields or along the streams and enjoy the many opportunities that mother nature has to offer.(3)" There is simply no reason to build a path or trail on every single piece of land around-it is just as bad as building a roadway. Organizations such as your own are obsessed with building hike and bike trails and so called greenways along every single bayou in existence. These areas are already open to the explorative public at all hours.

I am going to focus on the proposed trails along Buffalo Bayou and Mason Creek within Barker Reservoir but my comments apply to all the other areas within the reservoirs you want to build a trail on. You want to build a trail along Buffalo Bayou connecting the Barker Clodine trail and the Texas Western Railway trail for what reason? The primary allure of this section of Buffalo Bayou is the lack of visitors. For those such as myself that spend time there it gives a chance to explore nature for hours and escape the surrounding city. On the paved trails within the reservoirs it is rare to go even 30 seconds most days without seeing another person. You are basically wanting to build a shortcut to connect two existing recreation trails and promoting laziness by offering people an easy way out. If people want to explore this area of Buffalo Bayou there is already a game trail parallel to the water on both sides that is easily followed. If people cannot follow an obvious trail through the woods they should not be there because they are likely unaware of their surroundings and could be injured, yet these are the people you are wanting to create access for. Your proposed trail would take away both the seclusion and chances for exploration in this area.

Wildlife will be negatively affected by these trails both by loss of habitat and by being killed by pedestrians using the trails. These areas are heavily populated with snakes which inevitably are killed by many morons whenever they are encountered. Are you aware of how many ponds, creeks, and other wetlands exist in this area that branch off of Buffalo Bayou or Mason Creek? Do you intend to build bridges over all of these spots (every 100 or so feet) to keep people high and dry who use this trail?

Again this goes back to my initial question of whether you even visited these areas since these wetlands are not visible on satellite photos. If you just sat in an office and never went out there you need to get off your rear end and go for a hike to see for yourself how stupid your plans are. Are you aware that along Buffalo Bayou there are wooden nesting boxes every couple hundred feet throughout this area along the game trail? Do you know that multiple nesting boxes have become full of active bee hives that many people will not like to pass by. These trails would do nothing to increase mobility or allow more than a fraction of a percent of people to commute to work by bicycle. They are unnecessary and should not be made.

In conclusion - Have you even contacted the U.S. Army Corp of Engineers to inquire about whether it is possible to build roads and trails on their land? How exactly do you intend to seize federal land to build a road when you have no authority to do so? The overall problem spurring your study is the sprawl that is continuing unrelentingly within the West Houston and Katy area. These "master planned" communities are built with seemingly no consideration for mobility or pedestrian use. I could type a few thousand words on it but instead would just suggest you read the book Suburban Nation by Andres Duany, Elizabeth Plater-Zyberk, and Jeff Speck. Your "mobility plan" is only doing exactly what developers want by building more roads to allow them to build more useless sprawl. Transit options make sense constructing more roads does not. Unsurprisingly there is no stakeholder group listed on your website that has any concerns about wildlife. Nothing was considered for your plan except human interests and how to attract more development and growth, which will require yet more roads in a never ending cycle. The stakeholders listed such as The Energy Corridor were created to represent some of the most environmentally appalling companies on the planet that have offices in West Houston. From looking at the plans it appears that you put absolutely no thought into anything other than trying to worsen the sprawl situation. Everyone in the Houston area will be worse off if your horrible recommendations within Barker and Addicks Reservoir are turned into reality. We are all blessed to have 2 reservoirs that contain around 26,000 acres of somewhat natural areas in the West Houston area and they should remain undeveloped perpetually-no trails, no roads, no retail centers, donut shops, or whatever you come up with next to screw them up.

Just because a piece of land is undeveloped does not mean that it is useless. If you are allowed to build a road in either reservoir there is no question you will want to keep building more things alongside it and you need to be stopped before ever starting. I have also put my comment online illustrated with photographs backing up many points at www. littergetters.com/mobilityplan.htm

Received January 5, 2015
I strongly oppose the proposals to build new roads through George Bush Park. In my view the best way to address Houston's traffic issues is through public transport, not by building more roads and especially not through existing parks. I view this proposed intrusion into a great public space to be a significant backwards step for the quality of life for the residents of Houston

I commute to work nearly daily, year-round, from Katy through Barker Reservoir to the Energy Corridor on Eldridge. The primary reason I choose to live where I do is to have cycling access to work where I don't have to worry about getting hit by cars while riding. Further, I love to take advantage of the fantastic green space offered by the Barker Reservoir with my family. Barker Reservoir in its current state is an amazing asset to have in West Houston. It certainly has a "Central Park" feel as Houston has exploded around it. I see countless people running, walking, fishing, cycling and more at all times of the year in Barker Reservoir - it is an oasis in the chaos of streets, traffic and urban sprawl I recognize that the study being performed is trying to balance various modes of commuting but in respect for all the people who currently use the trail system in the park as well as the generations yet to come, I feel obligated to voice a preference to NOT construct additional roads through George Bush Park / Barker Reservoir as tempting as it may be from a traffic perspective. The park is a unique and wonderful resource and offers to be that way for decades to come. Traffic patterns and centers of industry are fickle and change frequently, often radically. Once roads, traffic lights, etc. are put into the park, they will stay there forever, regardless of how the city expands or where job centers move. Further, there is a sustained upkeep cost forever imposed on taxpayers to maintain these additional roads. I humbly plea that if any changes are made to the park / reservoir, that they instead be additional access points for cyclists, runners, etc.

Promote a healthier Houston by way of commuting via bike, rather than compound the problem by just encouraging more driving. Large employers like Conoco Phillips, BP and more reward employees by finding alternative modes of commuting - but people won't cycle to work if the roads are as hazardous as they are now in Houston. A trick to reducing car traffic is to provide alternative options and other cities around the world have already taken this on in spades.

Received January 1, 2015
I am a resident in Spring Branch, Council Member Pennington's area, and have added my voice along with my neighbors about our concern that TIRZ 17 will disregard our desire NOT to widen Gessner or Memorial.

Received May 26, 2014
I was wondering what the status of the study is. According to the presentation on the website there should have been a public meeting in March 2014 for Proposed improvements to key corridors.

## Received January 1, 2014

Working at BP at the Westlake Campus I just don't understand every time I drive down Memorial or more commonly known as the Moonscape Drive I am amazed that this street has not been rebuilt. Providing a nonpotholed and even street surface will surly improve the flow efficiency along that corridor. I'm not sure how this observation will get included for consideration but Memorial truly does need to be rebuilt between Dairy Ashford and Hwy 6.

Received November 27, 2013
What it shows is that even our here in the suburbs we're really in the "hot" zone for proximity to jobs; of course, we who've lived here for twenty years and have worked in the Energy Corridor and Westchase have always know that, which is why we came... but it also shows that a minimum-investment (Bus Rapid Transit) system going north from I-10 up State Highway 6 could be very useful in connecting Greater West Houston to the employment centers, and it would greatly debottleneck State Highway 6 and I-10 and other roads. Bus Rapid Transit would be a faster service more like Park \& Ride buses than like slow local services.

Received October, 7, 2013
In my immediate area on the West side, the section of Kirkwood that lies between Westheimer and Briar Forest is in absolutely deplorable condition, and getting worse as each month goes by. Please give this your attention when deciding to allocate funds for street repairs.

## Received October 4, 2013

It is definitely challenging for the school buses that serve Nottingham Elementary in SBISD to pick up and drop off students on a daily basis. The street and the driveway are too narrow and is a hassle for parents who pick up their kids in a car also. The whole school should be reconstructed like Wolfe Elementary in my opinion.

I would like to request more biking trails that don't cross major streets. It would be nice to have a safe trail down Westview also. It is safer to cross and can vent some bikes down it and off big roads. I would like to see the Addicks Reservoir developed with some trails inside of it if possible too. With heavy tax rate and nickel and dime of the residents along Woodway, Sage, and other nearby streets. I am told the street funding and mobility funding is directed more towards the lower tax rate areas and lower income areas since they are supposedly more exposed to the failing infrastructures.........also, The residents in and around Tanglewood can afford to repair their cars, also the residents of this area don't need sidewalks - we have new expensive cars to drive instead, also we don't need any flood mitigation near this area - since we can afford the flood insurance ( much higher rates after IKE ), and the out of pocket repairs associated with water damage. ON and on and on. I think --- it would be prudent to at LEAST ... replace and install where projects were never completed - new sidewalks that are wide enough to be a two /away... along the west side of Sage Road all the way from Buffalo Bayou to San Filipe. This area has fairly heavy foot traffic -but we have to mostly walk or bike in the roadway. Then again--- the roadway is in such disrepair ---- the traffic cannot speed along at an alarming rate. I hope anyone reads this --- but I don't really expect to fall on any attentive ears.

## Received October 3, 2013

All bus stops should have a covered seating area...benches are nice, but not important. I understand you don't want homeless turning into a shelter, but riders should be protected from the sun. All bus stops should have a paved walkway up to the corner. Take a ride over to Kirkwood and Richmond, south east corner. People in pain come from the hospital across the street, have to walk thru grass to stand in the sun until a bus comes. That is not only cruel, it's stupid. More biking lanes so we don't all get obese! Thanks!

## COMMENT CARDS RECEIVED AT WOLFE ELEMENTARY SCHOOL PUBLIC MEETING DEC. 18, 2014

If SH 6 will not be limited access, then a "supper street" should be pursued with fewer stoplights and frontage type roads for local access Bus service is greatly needed along SH 6 and FM 529. Stoplight timing for better traffic flow needs to be implemented on all major collectors with adjustments for traffic flow based on time of day. A complete bicycle network that forms grids without gaps is needed--nobody rides a winding trail along a bayou to get to work. Roads connecting through the reservoirs is a good idea, as long as they are above the flood elevation for 50 -year storms. SH 6 needs direct connectors to/from IH 10, and the I-lane northbound SH 6 ramp over the levee needs to be widened.

Can I get a copy of the A\&G booklets? A digital copy is fine. Can rail be run on the IH 10 right of way? That was discussed before the last widening of IH 10 .

Study was very generic, not helpful at all; not sure how you would get funding. Need high-speed /light rail over next 25 years
(1) Need Hwy 6 limited access multi-lane; run it down levee or inside Barker Reservoir. This will relieve congestion at Eldridge/Kirkwood/Dairy Ashford.
(2) Need non-stop flow lanes down Westheimer; run 2 lanes east and 2 lanes west; elevated with up/down ramps per mile; provides east/wes flow plus better north/south cross flow; addresses Westheimer/Gessner; Westheimer/Wilcrest
(3) How would rail work in IH 10 corridor? Would this relieve reverse single-occupant lanes?

Re: the project detailing that Barker-Cypress Road will be widened to Glover. It would be good to have a shoulder, a bike lane, or a sidewalk included so pedestrians/cyclists have adequate space to travel along it. Currently, they have to ride/walk in the ditch.

I'm concerned that some planned road upgrades might include removing esplanades, making it more difficult for people to turn in and out of their neighborhood and also significantly degrading the aesthetics of a neighborhood. I'm particularly concerned about Wilcrest Dr, but I believe this is probably an issue for other roads. This falls under the study goal of "preserve neighborhoods."

## COMMENT CARDS RECEIVED AT HCC NORTHWEST PUBLIC MEETING - JULY 22, 2014

Please help reduce traffic. Please think outside of the box, perhaps 2 levels of roads, rail system/remove HOV lanes. Perhaps this system could travel on IH 10 to Sealy or beyond. I was here since 1981 and saw rail lines over IH 10 and Westpark. Dallas has built out rail lines more than Houston has.

When IH 10 was enlarged, we were told it was designed so a train/rai could be built down the center. Now is the time to do that! You can do away with the tollway and build rail.

Sidewalks are in very bad condition. If you are disabled, you cannot use them. If you are mobile, it still presents big problems. People won't walk f we don't fix this issue.

## MYWESTHOUSTON.COM WEBSITE

Received February 6, 2015
Can someone ever give me an answer as to why no express metro bus services from various parts of the town going to energy corridor ike downtown? Energy corridor has almost same number of people working as in downtown, yet no public transportation thought of. I am just frustrated with the energy corridor management for blocking it or not planning on it.

Received February 3, 2015
Building a road through this area is a waste of money. It will not solve anything. Be more creative.

Received February 2, 2015
I am against

## Received January 21, 2015

live near Highland Knolls and I am concerned regarding the proposed extension of the road through George Bush Park. Any extension would damage the value of all the part space currently at the intersection of Highland Knolls and Fry Roads. The resulting major thoroughfare would cause great harm to the community, in my opinion. In addition, Highland Knolls west of Westgreen is a residential street. Currently, street parking is allowed for these residents. This is already a major issue for traffic going west. It effectively reduces the road to one lane both ways between Westgreen and Mason. The associated traffic increase that would come from an extension would surely make this an even greater issue for residents and drivers

Received January 17, 2015
Amazing that one of the Project Goals is to "Protect environmentally sensitive areas \& green spaces" and the plan is to build roads through exactly those areas and spaces. There is nowhere for the vast wildlife that exists within the park/reservoir to go once it starts getting developed. Building more roads to feed bigger, already jammed roads is not sustainable at all. Alternative transport methods need to be incorporated They are planning to remove the only safe cycling routes from Katy into the Energy Corridor - totally against what their own stated aims are. This whole plan has been somewhat under-the-radar - nobody holds a public meeting the week before Christmas if they genuinely want to engage the public.

Received January 9, 2015
As a regular user of this trail system, I oppose the road expansion for vehicle traffic. However, I favor the widening and maintenance of a trail system that is heavily used by us the tax payers of this state. Texas is not a bicycle friendly state and it is both the motorist's and bicyclist's fault because we don't share the road properly. This area needs to be protected, not developed for our enjoyment and generations to come.

## Received January 6, 2015

I couldn't even figure out what that Kingsland to Memorial road illustrated on the map was supposed to be. They colored it black instead of blue (proposed new road) making it look like whoever drew the map thinks the road already exists. Same thing with Barker Clodine through the reservoir which has been closed to automobile traffic for as long as I can remember it is black on the map as if currently in use. Couldn't agree more though the reservoirs should be off limits to any development. Steve Radack and Harris County have already tried turning them into neighborhood parks and taking away from the original purposes of holding water. Further confusion has been caused by calling huge sections of the reservoirs things like George Bush PARK or Bear Creek PARK when they were not created to be parks.

We all live, work and commute throughout West Houston and I know that I speak for the vast majority when I say that a cutting a road through the park will be a tragic move. It will remove the tranquility and appeal of the area for runners, walkers and cyclists. At a time when most metropolitan areas are providing "greener" options it is outrageous that there is even a proposal to add concrete and motorized traffic through the middle of this area.

Received January 5, 2015
We just moved to the area $11 / 2$ years and bought our house strictly for the location so my husband could commute to work on his bike. Our whole family uses this trail virtually every day summer and winter. I have seen no notices of this plan posted anywhere (other than one a concerned citizen posted just recently). Had we known, we would have attended meetings. It's disappointing at best that 1) this plan to destroy such a widely used recreational trail has even been proposed and 2) that it was done without notice and input of those who currently benefit from this area. In such a huge city which very little "nature" particularly in Katy, one would think that this little piece could remain to serve the wellbeing of this community.

Received January 4, 2015
Please do not build road where existing path enters George bush park. This is utilized by so many runners and bikers. That would be a major blow to those of us trying to stay fit!

Received January 2, 2015
I urge the public who enjoys using Addicks or Barker Reservoir for recreation to read these plans especially concerning the proposed road construction in both reservoirs. I've put my comment online that was submitted 1/2/15 for anyone to see at http://www.littergetters.com/ mobilityplan.htm.

Received December 29, 2015
Please understand that none of these plans can succeed in an area that floods after every heavy rain. First you must 1) Abolish the grandfathering clause that allows developers to channel their floodwaters into surrounding neighborhoods (ie., CityCentre, Memorial City, Town \& Country). 2) Reserve the Barker/Addicks dams for DETENTION. Do not extend roads through the dam for the convenience of residents who live west. Do not continue the practice of building community centers, sports facilities, zoos and pioneer villages inside the dam walls. Having leased the dam floor for his recreational facilities, now CC \#3 Radack does not want his facilities messed up by flood waters. 3 ) Build detention for the Long Point Slough and the Clodine Ditch. 5) Build detention at the headwaters of White Oak bayou. 6) Have TX Dot come back to 110 and Beltway 8 and build detention that was on their original plans and omitted in the construction phase. 7) Buffalo Bayou in its natural riparian state is one of the most appealing attractions of this city and it must be cherished and preserved. I totally agree with Engineer Richard L. Long when he came to the West Houston SN meeting and proposed detention at the headwaters of White Oak bayou. Detaining the storm water before it can enter the bayou and cause flooding makes a lot more sense than cutting all the trees and channelizing the bayou with concrete after it floods. Fix the flooding please, first. then people will come to live and work in West Houston. Finally, you need an architectural committee. That 6 story apartment building and parking garage at the corner of Dairy Ashford and Memorial Drive is hideous. It is totally repulsive. It is going to sell a lot of houses, but not in Memorial. It's going to sell houses in Katy and the Woodlands.

Received December 14, 2014
We need a rapid train. One can keep building roads and get clogged roads. From Katy to downtown, From Katy to energy corridor, Katy to the Galleria from Katy to Memorial City. They should have park and ride lots for the trains as one needs a car to get to the starting point. A train from downtown to serve the Allen Parkway offices and the greenway plaza offices would help further.

## Received December 12, 2014

I am objecting to extending Memorial through Barker dam to Kingsland No further development can be tolerated within the walls of Barker/ Addicks. The primary purpose of the dams is for DETENTION. Harris County has erected permanent structures with the dams: a zoo and pioneer village, community center, shooting range, sports fields, etc. CC Steve Radack does not want his recreational facilities messed up with muddy flood waters. The dams can only hold 2-3 feet of water before the gates are open. The permanent facilities are nice for the people who live upstream of the dams, but devastating for the people who live downstream. Our yards and common areas are serving as detention. I have been to many of the meetings lately and listened to lots of jokes but nothing of substance. The best the bureaucrats can offer is to buy flood insurance. Developers envision the dams as raw land waiting to be developed. They are now drawing maps with road crisscrossing the dams with a vision of future gas stations, chain stores and strip centers Please restore the dams to their original purpose: detention.

# COMMENTS FROM CROWDMAP: HTTPS:// WESTHOUSTON.CROWDMAP.COM 

## Feb. 3, 2014

Issue: Clay Road to north end of Wycliffe Dr Shared Use Path
Mode: Bicycle, Pedestrian, ADA
Location: Clay Road and Addicks Dam
Adding a concrete shared use path would improve the north south hike and bike access to and from the Energy Corridor.

Issue: Piping Rock \& Barker Oaks Stop Signs
Mode: Automobile, Bicycle, Pedestrian, ADA
Location: Piping Rock Lane \& Barker Oaks Drive
Place four way stop signs at this intersection to allow bike/ped traffic to safely cross Barker Oaks when travelling between Terry Hershey and Bishop Fiorenza/Eldridge Detention Basin and other points of interest.

Issue: Pedestrian signals at Westheimer \& Briargreen
Mode: Bicycle, Pedestrian
Location: Westheimer \& Briargreen
This will be a key crossing of Westheimer for pedestrians and cyclists moving between Terry Hershey to the north and Bishop Fiorenza/ Eldridge Detention Basin to the south. No pedestrian signals currently exist, but installing them should be a priority.

Jan. 31, 2014
Issue: Pedestrian Signal at Westheimer \& Briargreen
Mode: Bicycle, Pedestrian
Location: Westheimer \& Briargreen
Adding this pedestrian signal would make for safe passage of pedestrian and cyclists between Terry Hershey trail and Archbishop Fiorenza Park, Mission Bend Greenbelt and other points south and north.

Issue: Grand Parkway Park \& Ride facility needed
Mode: Transit
Location: SH 99 and I-10
Please consider acceleration of the permanent park and ride facility at 99 and $\mathrm{I}-10$. The existing parking is not even large enough to fill the buses that serve this park and ride.

Jan. 27, 2014
Issue: Southeast access point to George Bush park [ Edit ]

## Mode: Bicycle

Location: 2270 Barker Oaks Drive, Houston, TX 77077, USA
There are multiple convenient access points to George Bush park almost everywhere around it, except for the very long southeastern stretch of its border. Hikers and bikers from Westheimer@SH-6 area have to drive north or west to gain access to this wonderful park and its trails. It would extremely convenient to have another access to the park (well, at least to the trail on the dam and the one along the ditch) around where West Oaks Village shopping center is. City of Houston already appears to have some property in that area on 2270 Barker Oaks Dr. There used to be some water facility, but now that property is empty (although, it is still fenced). It would be great to have a trail next to it for hikers and bikers to get to the dam and the trail next to the ditch. That trail is the only major south-north off-the-road thoroughfare in the area. It grants safe access to miles of trails and other amenities in the study area. Such an access point also would make commute in north-south direction by bike a lot safer and more desirable (SH-6 is just too dangerous for that at the moment).

Jan. 23, 2014
Issue: Terry Hershey East/Memorial Corridor Shared Use Path Mode: Bicycle, Pedestrian
Location: Memorial Drive, BW 8 to Blalock
This project should be included in the plan as it would build a key portion of trail connection from the east end of Terry Hershey park to downtown Houston. It would be a series of 8-10' wide sidewalks along Memorial Drive.

Issue: Cinco Buffalo Bayou Trail

## Mode: Bicycle

Location: Buffalo Bayou from 99 to Fry Road
The plan should include a shared use path along Buffalo Bayou in the high density residential area of Cinco Ranch. An adequate pathway with major road underpasses would be heavily used for commuting and recreation.
ssue: Briar Forest to West Oaks Mall Shared Use Path
Mode: Bicycle, Pedestrian
Location: Briar Forest to West Oaks Mall (Westheimer \& Westheimer Pkwy)

This pathway should be included in the plan as it is a key link between Terry Hershey and the Brays Bayou park \& trail complex around Bishop Fiorenza and McClendon Parks.

Issue: Buffalo Bayou West Shared Use Path
Mode: Bicycle Location: Cinco George Bush Park South
Extending the trail along Buffalo Bayou from east of Fry Road, easterly across Long Point Slough, past the cricket field in George Bush Park to Westheimer Parkway \& South Barker Cypress should be included in the plan. Please email me for details on the alignment.

## Jan. 21, 2014

Issue: Sidewalk on Piping Rock Ln, between SH 6 and Briarview Dr Mode: Pedestrian
Location: Piping Rock Ln, from SH 6 to Briarview Dr
A pedestrian crossing was added to the intersection of SH6 and Piping Rock Ln not so long ago. This a fantastic feature which allows residents who live east of SH6, to walk over to the shopping plaza on the west side. However, there is no sidewalk between SH6 and Briarview Dr along Piping Rock Ln. So, the residents are forced to walk on the road A sidewalk along that stretch of Piping Rock Ln would be great for pedestrian safety and convenience.

Jan. 6, 2014
Issue: Grand Parkway Park \& Ride facility needed
Mode: Transit
Location: SH 99 and I-10
Please consider acceleration of the permanent park and ride facility at 99 and I-10. The existing parking is not even large enough to fill the buses that serve this park and ride

Issue: Continuous Frontage Roads for Westpark Tollway
Mode: Automobile, Bicycle, Pedestrian
Location: Westpark Tollway east of Hwy 6
Develop continuous frontage roads for both directions on Westpark Tollway to provide free capacity

Dec. 7, 2013
Issue: Traffic Light at Highland Knolls \& Fry
Mode: Automobile, Bicycle
Location: Highland Knolls at Fry, Katy, TX 77450
Eastbound traffic on Highland Knolls seem to assume they have protected left turn to Fry Northbound. The lights actually turn green for both Eastbound and Westbound traffic from the bike trail, implying the left turn traffic to yield to thru traffic. Safety issue occurs since the leftturning traffic do not see the need to yield. Please either put the sign "Left Turn Yield" or add protected left turn green light

Nov. 17, 2013
Issue: Addicks-Tanner Connection Trail
Mode: Bicycle, Pedestrian
Location: Tanner Road at North Addicks Dam
represent a group promoting a 1000 ft bike/hike trail connection from the north end of Addicks Dam to Tanner Road. We have consulted 3 area HOAs, 4 area MUD, Harris County Precinct 4, Corps of Engineers and CFISD; all are supportive. This could be built by Harris County. I wish to put this project on the map (along with 2 related sidewalk trails; separately) so that planners are aware of the activity.

Issue: Tanner Road Sidewalk Trai
Mode: Bicycle, Pedestrian
Location: Tanner Road from Eldridge to Addicks Dam
I represent a group promoting better bicycle and pedestrian access along Tanner Road from North Eldridge Parkway to a proposed connection to North Addicks Dam and Cullen Park. We have consulted 3 area HOAs, 4 area MUD, Harris County Precinct 4, Corps of Engineers and CFISD; all are supportive. I wish to put this project on the map (along with the related Addicks-Tanner Connection Trail and the Eldridge Sidewalk Trails) so that planners are aware of the activity. We are currently researching funding sources for this project.

Issue: North Eldridge Sidewalk Trai
Mode: Bicycle, Pedestrian
Location: North Eldridge Parkway at Tanner Road
I represent a group promoting better bicycle and pedestrian access along North Eldridge Parkway south and north from the Tanner Road intersection, along with improvements along Tanner. We have consulted 3 area HOAs, 4 area MUD, Harris County Precinct 4, Corps of Engineers and CFISD; all are supportive. I wish to put this project on the map (along with the related Addicks-Tanner Connection Trail and the Tanner Sidewalk Trails) so that planners are aware of the activity. We are currently researching funding sources for this project.

## Oct. 24, 2013

Issue: Overlay Quality of Briar Forest

## Mode: Automobile, Bicycle

ocation: Briar Forest
Briar Forest asphalt overlay quality is horrible (between Dairy Ashford \& Beltway 8). A lot of uneven surface, cracks, low spots where water stands, and overlay not covering the entire lane (uneven bike lanes).

## Issue: SH6 Pedestrian Signal Reques

Mode: Pedestrian
Location: SH6 between Richmond \& Briar Forest
SH6 needs pedestrian signals at the following intersections

1. Briar Forest (Barker Dam trail entrance)
2. Parkhollow Dr. (West Oaks Mall entrance)
3. Richmond Ave

Follow-on Comment
Gregg Nady (Jan 23, 2014)
A pedestrian signal at Westheimer \& Briargreen would help the connection between Terry Hershey and Brays Bayou

Oct. 23, 2013
ssue: Westheimer intersections with Dairy Ashford and SH 6
Mode: Automobile
Westheimer at SH 6, and Westheimer at Dairy Ashford
The afternoon rush hour commute along Westheimer at the intersections of both Dairy Ashford and State Highway 6 includes lengthy waits attempting to get through the intersections. Can the traffic signal timing be improved, and is an overpass planned for the SH 6 intersection?

## APPENDIXA

## Oct. 22, 2013

Issue: Richmond Avenue

## Mode: Automobile

Location: Richmond Avenue
The condition of Richmond Ave from Hwy 6 to the 610 Loop (and probably beyond) is horrible. The roadway is very uneven and, in some places, dangerous. There are a few spots of congestion, but it isn't really too bad in the morning. However, at Eldridge, there seems to be much more traffic on Richmond than Eldridge, yet the traffic on Eldridge has a much longer green light to the point that there is no traffic going through the intersection. In the morning rush, it would probably be beneficial to have a longer light for eastbound Richmond traffic and a shorter one for Eldridge traffic.

Issue: Driving through George Bush Park
Mode: Automobile
Location: Barker Cypress \& FM 1093
Heading south on Barker Cypress (at FM 1093) and heading east on Westheimer Parkway (at FM 1093) it takes a long time to get out of the park during rush hour in the morning. On Barker Cypress, it often backs up more than half way to Westheimer Parkway through the park before 7:00 am. If there was more than one lane heading out of the park, then I think traffic times will be greatly reduced.

Oct. 06, 2013
ssue: Katy Freeway - Kirkwood/Wilcrest

## Mode: Automobile

Location: 11400 Block of Katy Freeway - between Wilcrest and Kirkwood Southside of Freeway

Each morning, I attempt to go from neighborhood on the north side of Katy Freeway to Loop 610 and I-10. This requires that I use Kirkwood intersection to go east of Katy Freeway. Because of the dual right turn lanes on the south side of Katy freeway, the u-turn is extremely congested and very dangerous to use. There is literally no break in the traffic and many of the cars in the u-turn actually want to cross 3 lanes of traffic into the parking lot. I use the lights to make the u-turn. Once l'm east bound on the access road, it's backed up with the traffic exiting Katy freeway and the heavy back up at the Wilcrest light on the south side of the freeway. This will be made worse with the additional apartment housing soon to be available on the south side of Katy Freeway at Wilcrest and the upcoming townhomes on Brittmore. What can be done to ease the traffic flow?


## APPENDIX B SURVEY RESULTS

## SURVEY RESULTS

A survey was conducted at the second public meeting. Participants were asked the following questions regarding mobility opportunities and challenges in the Study Area.

PUBLIC MEETING SURVEY QUESTIONS

| 1. DO YOU LIVE AND/OR WORK IN THE STUDY AREA? (MULTIPLE CHOICE) |  |
| :---: | :---: |
| Response | Percent |
| 1 live in the study area | 22.22\% |
| I work in the study area | 29.63\% |
| I live and work in the study area | 25.93\% |
| I don't live or work in the study area, but I am interested in what is happening here | 22.22\% |
| 2. WHAT IS THE BIGGEST MOBILITY CHALLENGE IN THE STUDY AREA? (MULTIPLE CHOICE) |  |
| Response Percent |  |
| Trafic congestion | 59.26\% |
| Safety | 3.7\% |
| Lack of alternatives to automobile | 37.04\% |
| Other | 0\% |
| Totals 100\% |  |
| 3. PLEASE SELECT THE MOST IMPORTANT OPTION FOR THE STUDY AREA: (MULTIPLE CHOICE) |  |
| Response Percent |  |
| Added capacity | 17.86\% |
| Efficiency/safety enhancements | 21.43\% |
| Demand management | 32.14\% |
| All are equally important | 28.57\% |
| Other | 0\% |
| No changes needed | 0\% |
| Totals 100\% |  |
| 4. HOW OFTEN DO YOU USE TRANSIT? (MULTIPLE CHOICE) |  |
| Responses Percent |  |
| Every day | 7.14\% |
| Once a week | 7.14\% |
| Once a month | 10.71\% |
| Once a year | 32.14\% |
| Never | 42.86\% |
| Totals 100\% |  |
| 5. WHAT KEEPS YOU FROM USING TRANSIT MORE FREQUENTLY? (MULTIPLE CHOICE - MULTIPLE RESPONSE) |  |
| Responses Percent |  |
| My destination(s) are inaccessible by transit | 28.26\% |
| Takes too long | 32.61\% |
| No transit options near my home | 23.91\% |
| Lack of safety on transit | 2.17\% |
| Other | 10.87\% |
| Nothing, I use transit frequently | 2.17\% |
| Totals 100\% |  |




| 6. PREFERRED TRANSIT SERVICE (MULTIPLE CHOICE - MULTIPLE RESPONSE) |
| :--- |
| Responses  <br> Long-haul, park and ride service Percent <br> Local service that's accessible by walking $27.45 \%$ <br> Express bus $29.41 \%$ <br>  Demand-responselparatransit$\quad 29.41 \%$ |
| I don't prefer transit |

7. HOW OFTEN DO YOU RIDE YOUR BIKE? (MULTIPLE CHOICE)

| Responses |  |
| ---: | ---: |
| Daily | Percent |
| Once a week | $14.81 \%$ |
| Once a month | $14.81 \%$ |
| Once a year | $11.11 \%$ |
| $11.11 \%$ |  |
| Never, I don't ride a bike | Totals |

9. WHY DONT YOU RIDE YOUR BIKE MORE OFTEN? (MULTIPLE CHOICE - MULTIPLE RESPONSE) Pesponses Percent

|  | Responses | Percent |
| ---: | ---: | ---: |
| Weather - it's too hot, cold, rainy, etc. | $19.15 \%$ |  |
| Lack of bike paths where I want to go | $19.15 \%$ |  |
| Destination(s) are too far away | $19.15 \%$ |  |
| I don't feel comfortable eriding on the street with traffic | Other | $19.15 \%$ |
| None, I feel comfortable riding my bike | $4.26 \%$ |  |
| Totals | $19.15 \%$ |  |
|  | $100 \%$ |  |

10. WHAT ARE YOUR PREFERRED BICYCLE FACILITIES? (MULTIPLE CHOICE) - 100\%

| Responses | Percent |  |
| ---: | ---: | ---: |
|  | On-street bicycle facilities | $3.85 \%$ |
|  | Off-street bicycle facilities | $19.23 \%$ |
| I prefer a mix of both | $46.15 \%$ |  |
|  | None of the above, I don't ride a bicycle | Totals |

## APPENDIXB



| 12. WHY DO YOU WALK TO DESTINATIONS? (MULTIPLE CHOICE - MULTIPLE RESPONSE) |  |
| :---: | :---: |
| Responses | Percent |
| Recreation | 28.57\% |
| Exercise | 32.65\% |
| Commute to work | 6.12\% |
| Errands - shopping, dining, etc. | 26.53\% |
| Other | 2.04\% |
| None, I don't walk to destinations | 4.08\% |
| Totals | 100\% |
| 13. WHY DONT YOU WALK TO A DESTINATION? (MULTIPLE CHOICE - MULTIPLE RESPONSE) |  |
| Responses Percent |  |
| Weather - it's too hot, cold, rainy, etc. | 18\% |
| Lack of sidewalks where I want to go | 16\% |
| Destination(s) are too far away | 32\% |
| Lack of comfort walking on the street next to traffic | 22\% |
| Other | 6\% |
| None, I feel comfortable walking | 6\% |
| Totals 100\% |  |
| 14. WHAT IS THE MOST IMPORTANT TRANSPORTATION MODE IN THE STUDY AREA? (MULTIPLE CHOICE) |  |
| Responses Percent |  |
| Vehicles | 30.77\% |
| Transit | 11.54\% |
| Bicycling | 0\% |
| Walking | 0\% |
| There should be a good mix/variety | 57.69\% |
| Other | 0\% |
| Totals | 100\% |

hiouston

$\overline{H A C}$


## APPENDIX C METRO PREVIOUS IOCAI SERVICE

ROUTES IN SERVICE UNTLL AUGUST 16TH, 2015

## 2 Bellaire

| Service Metrics | Typical Headway (Minutes) | Span |
| :--- | :---: | :---: |
| Midday | 15 |  |
| AM Peak | 6 |  |
| PM Peak | 8 |  |
| Evening | 30 | $4: 44 \mathrm{am}-1: 43 \mathrm{am}$ |
| Saturday | 15 | $4: 14 \mathrm{am}-1: 45 \mathrm{am}$ |
| Sunday | 22 |  |

- Headways in the non-peak direction are 15 minutes
- Westchase and Mission Bend branches split frequency evenly except during weekday peak periods when Westchase has half hourly service and all other trips go to Mission Bend.

| Productivity Metrics (Weekday) | Value |
| :--- | :---: |
| Average Daily Ridership | 7,354 |
| Boardings per Revenue Mile | 2.9 |
| Boardings per Revenue Hour | 32.4 |
| Average Fare | $\$ 0.66$ |
| Operating Ratio (Fare Revenue/Operating Cost) | $18.8 \%$ |
| Average Subsidy per Boarding | $\$ 3.75$ |
| Productivity Metrics (Weekend) | Value |
| Saturday Boardings per Revenue Hour | 27.8 |
| Sunday Boardings per Revenue Hour | 30.5 |
| Performance Metrics | Value |
| Average Speed (Weekday) | 11.1 mph |
| On - Time Performance | $79 \%$ |

On-

## Route Strengths:

- Connects to the Texas Medical Center and Red Line at TMC TC.
- Opaigntorward route along namesake street.

Operates in a straight line through diverse areas of high density and activity.

## Route Challenges

- Service pattern on Mission Bend branch can be confusing
- Headways on Mission Bend branch are irregular in the peak direction due to uneven split with Westchase branch
- Crosses one railroad crossing with two tracks at grade.

Sources: Sum of Schedules and published bes shedves; 2012 Rowe Ranking Modal; 2013 Ridatect
Sources: Summary of Schedules and published bus schedules; 2012 Route Ranking Model; 2013 Ridecheck Data; 2010 Census; Team Analysis

Transit System Reimagining Going Places


## 4 Beechnut

| Service Metrics | Typical Headway (Minutes) | Span |
| :--- | :---: | :---: |
| Midday | 20 |  |
| AM Peak | 10 |  |
| PM Peak | 10 |  |
| Evening | 30 | $5: 03 \mathrm{am}-1: 43 \mathrm{am}$ |
| Saturday | 25 | $5: 03 \mathrm{am}-2: 09 \mathrm{am}$ |
| Sunday | 30 |  |

- Outbound morning headway is 15 minutes
- Inbound afternoon headway is 20 minutes.
- Inbound headways are inconsistent throughout the day.

| Productivity Metrics (Weekday) | Value |
| :--- | :---: |
| Average Daily Ridership | 4,469 |
| Boardings per Revenue Mile | 2.1 |
| Boardings per Revenue Hour | 29.1 |
| Average Fare | $\$ 0.61$ |
| Operating Ratio (Fare Revenue/Operating Cost) | $15.2 \%$ |
| Average Subsidy per Boarding | $\$ 4.34$ |
| Productivity Metrics (Weekend) Value <br> Saturday Boardings per Revenue Hour 29.8 <br> Sunday Boardings per Revenue Hour 24.0 <br> Performance Metrics Value <br> Average Speed (Weekday) 13.7 mph <br> On - Time Performance $75 \%$ |  |$\ggg$

## Route Strengths:

- Connects to the Texas Medical Center and Red Line at TMC TC
- Straightforward route on namesake street.
- Operates in a straight line through diverse areas of high density and activity.


## Route Challenges:

- Crosses two railroad tracks at one grade crossing

Transit System Reimagining Going Places


## 9 Gulfton Limited

| Service Metrics | Typical Headway (Minutes) | Span |
| :--- | :---: | :---: |
| Midday | 40 |  |
| AM Peak | 25 |  |
| PM Peak | 25 |  |
| Evening | 35 | $5: 39 \mathrm{am}-7: 21 \mathrm{pm}$ |
| Saturday | 30 | - |
| Sunday | - |  |

- Hooked to 9 North Main
- Shorter span and days of service than 9 North Main (no Sunday service).

| Productivity Metrics (Weekday) |
| :--- |
| Average Daily Ridership |
| Boardings per Revenue Mile |
| Boardings per Revenue Hour |
| Average Fare |
| Operating Ratio (Fare Revenue/Operating Cost) |
| Average Subsidy per Boarding |
| Productivity Metrics (Weekend) 1.6 <br> Saturday Boardings per Revenue Hour $11.9 \%$ <br> Sunday Boardings per Revenue Hour $\$ 6.65$ <br> Performance Metrics Value <br> Average Speed (Weekday) 7.8 <br> On - Time Performance - Value |

## Route Strengths:

- Serves Downtown
- Nonstop segment along Southwest Freeway.


## Route Challenges

Name describes neighborhood served; operation along Gulffon Street is primarily one-way

- Large one-way loop in Gulfton neighborhood; duplicates other routes
- Numerous turns at west end


Sources: Summary of Schedules and published bus schedules; 2012 Route Ranking Model; 2013 Ridecheck Data; 2010 Census; Team Analysis

Transit System Reimagining Going Places

## 19 Wilcrest Crosstown

| Service Metrics | Typical Headway (Minutes) | Span |
| :--- | :---: | :---: |
| Midday | 45 |  |
| AM Peak | 20 |  |
| PM Peak | 20 |  |
| Evening | - | $5: 44 \mathrm{am}-8: 38 \mathrm{pm}$ |
| Saturday | 45 | - |
| Sunday | - |  |


| Productivity Metrics (Weekday) | Value |
| :--- | :---: |
| Average Daily Ridership | 1,126 |
| Boardings per Revenue Mile | 1.6 |
| Boardings per Revenue Hour | 21.4 |
| Average Fare | $\$ 0.62$ |
| Operating Ratio (Fare Revenue/Operating Cost) | $10.8 \%$ |
| Average Subsidy per Boarding | $\$ 6.65$ |
| Productivity Metrics (Weekend) Value <br> Saturday Boardings per Revenue Hour 18.0 <br> Sunday Boardings per Revenue Hour - <br> Performance Metrics Value <br> Average Speed (Weekday) 13.4 mph <br> On - Time Performance $66 \%$ |  |$>.$|  |
| :--- |

Route Strengths:

- Straightforward route primarily on namesake street.


## Route Challenges

- One-way figure eight at north end of route. ${ }^{8}$



## 20 Long Point Limited

| Productivity Metrics (Weekday) | Value |
| :--- | :---: |
| Average Daily Ridership | 2,391 |
| Boardings per Revenue Mile | 1.6 |
| Boardings per Revenue Hour | 25.6 |
| Average Fare | $\$ 0.65$ |
| Operating Ratio (Fare Revenue/Operating Cost) | $13.1 \%$ |
| Average Subsidy per Boarding | $\$ 5.65$ |
| Productivity Metrics (Weekend) Value <br> Saturday Boardings per Revenue Hour 23.3 <br> Sunday Boardings per Revenue Hour 22.5 <br> Performance Metrics Value <br> Average Speed (Weekday) 16.3 mph <br> On - Time Performance $69 \%$ |  |$\ggg$

## Route Strengths:

- Nonstop segment along Katy Freeway.
- Serves entire length of namesake street.


## Route Challenges:

- Crosses two railroad crossings at grade; crossings on Canal end impact reliability as well.
- Redundant local service between NWTC and Downtown: 36, 85, 131
- Could provide frequent service between Northwest Mall and Downtown in conjunction with the 85 Antoine but schedules are not synchronized.

Sources: Summary of Schedules and published bus schedules; 2012 Route Ranking Model; 2013 Ridecheck Data; 2010 Census; Team Analysis

Transit System Reimagining Going Places



## 36 Kempwood

| Service Metrics | Typical Headway (Minutes) | Span |
| :--- | :---: | :---: |
| Midday | 60 |  |
| AM Peak | 15 |  |
| PM Peak | 15 |  |
| Evening | 60 | $6: 46 \mathrm{am}-10: 47 \mathrm{pm}$ |
| Saturday | 60 | - |
| Sunday | - |  |

- Shorter weekday span and frequency and different days of service than 36 Lawndale (no Sunday service).

| $\mid$ Productivity Metrics (Weekday) |
| :--- |
| Average Daily Ridership |
| Boardings per Revenue Mile |
| Boardings per Revenue Hour |
| Average Fare |
| Operating Ratio (Fare Revenue/Operating Cost) |
| Average Subsidy per Boarding |
| Productivity Metrics (Weekend) 1.63 <br> Saturday Boardings per Revenue Hour $11.9 \%$ <br> Sunday Boardings per Revenue Hour $\$ 6.70$ <br> Performance Metrics Value <br> Average Speed (Weekday) 17.9 <br> On - Time Performance 14.8 |

## Route Strengths:

- Serves Downtown
- Serves length of namesake street.


## Route Challenges

naton Avenue is not reflected in name

- Crosses two railroad crossings at grade.
- Confusing service pattern Washington Avenue 85 Antoine takes over evening and late nights but schedules are not coordinated during overlap time.
- Redundant service between NWTC and Downtown: 20, 85, 131.

Transit System Reimagining Going Places


Sources: Summary of Schedules and published bus schedules; 2012 Route Ranking Model; 2013 Ridecheck Data; 2010 Census; Team Analysis

Transit System Reimagining Going Places
46 Gessner Crosstown

| Service Metrics | Typical Headway (Minutes) | Span |
| :--- | :---: | :---: |
| Midday | 30 |  |
| AM Peak | 12 |  |
| PM Peak | 12 |  |
| Evening | 30 | $5: 10 \mathrm{am}-10: 30 \mathrm{pm}$ |
| Saturday | 30 | $5: 45 \mathrm{am}-8: 04 \mathrm{pm}$ |
| Sunday | 45 |  |

- Slightly lower frequency southbound in the morning and northbound in the
afternoon.
- Deviates to serve Gessner P\&R during peak hours.

| Productivity Metrics (Weekday) | Value |
| :--- | :---: |
| Average Daily Ridership | 4,983 |
| Boardings per Revenue Mile | 3.2 |
| Boardings per Revenue Hour | 39.2 |
| Average Fare | $\$ 0.67$ |
| Operating Ratio (Fare Revenue/Operating Cost) | $21.3 \%$ |
| Average Subsidy per Boarding | $\$ 3.30$ |
| Productivity Metrics (Weekend) Value <br> Saturday Boardings per Revenue Hour 42.8 <br> Sunday Boardings per Revenue Hour 45.5 <br> Performance Metrics Value <br> Average Speed (Weekday) 12.1 mph <br> On - Time Performance $69 \%$ |  |

Route Strengths:

- Serves Memorial City.
- Straightforward route along namesake street.
- Operates in a straight line through diverse areas of high density and activity.


## Route Challenges:

- Traffic congestion in vicinity of Katy Freeway heavily affects on-time performance.
- Span provided may not be adequate: high ridership on first and final trips most days.


Sources: Summary of Schedules and published bus schedules; 2012 Route Ranking Model; 2013 Ridecheck Data; 2010 Census; Team Analysis

## 53 Briar Forest Limited

| Service Metrics | Typical Headway (Minutes) | Span |
| :--- | :---: | :---: |
| Midday | 24 |  |
| AM Peak | 12 |  |
| PM Peak | 12 |  |
| Evening | 60 | $5: 19 \mathrm{am}-9: 49 \mathrm{pm}$ |
| Saturday | 40 | $5: 12 \mathrm{am}-8: 50 \mathrm{pm}$ |
| Sunday | 40 |  |

- Headway in nonpeak direction is 24 minutes.

| $\mid$ Productivity Metrics (Weekday) |
| :--- |
| Average Daily Ridership |
| Boardings per Revenue Mile |
| Boardings per Revenue Hour |
| Average Fare |
| Operating Ratio (Fare Revenue/Operating Cost) |
| Average Subsidy per Boarding |
| Productivity Metrics (Weekend) 1.7 <br> Saturday Boardings per Revenue Hour $11.8 \%$ <br> Sunday Boardings per Revenue Hour $\$ 6.87$ <br> Performance Metrics Value <br> Average Speed (Weekday) 20.8 <br> On - Time Performance 16.0 Value |

## Route Strengths

- Serves Downtown, Uptown, and Greenway Plaza.
- Nonstop segment along Southwest freeway.


## Route Challenges

- Duplicates other routes for majority of route.
- One-way segments.
- Crosses two railroad tracks at one grade crossing

Sources: Summary of Schedules and published bus schedules; 2012 Route Ranking Model; 2013 Ridecheck Data; 2010 Census; Tean Analysis

Transit System Reimagining Going Places




## Transit System Reimagining Going Places

## 70 Memorial

| Service Metrics | Typical Headway (Minutes) | Span |
| :--- | :---: | :---: |
| Midday | 35 |  |
| AM Peak | 25 | $50 \mathrm{am}-7: 28 \mathrm{pm}$ |
| PM Peak | 35 |  |
| Evening | - |  |
| Saturday | - | - |
| Sunday | - | - |


$\left\lvert\,$| Productivity Metrics (Weekday) | Value |
| :--- | :---: |
| Average Daily Ridership | 429 |
| Boardings per Revenue Mile | 0.6 |
| Boardings per Revenue Hour | 10.9 |
| Average Fare | $\$ 0.63$ |
| Operating Ratio (Fare Revenue/Operating Cost) | $6.1 \%$ |
| Average Subsidy per Boarding | $\$ 11.84$ |
| Productivity Metrics (Weekend) Value <br> Saturday Boardings per Revenue Hour - <br> Sunday Boardings per Revenue Hour - <br> Performance Metrics Value <br> Average Speed (Weekday) 17.7 <br> On - Time Performance $67 \%$ |  |$\ggg\right.$

Route Strengths:

- Serves Memorial City.


## Route Challenges

- Crosses numerous railroad tracks at grade (route to be realigned in June, 2013).
- Operates through areas of relatively low density.

Sources: Summary of Schedules and published bus schedules; 2012 Route Ranking Model; 2013 Ridecheck Data; 2010 Census; Team Analysis


72 Westview Circulator

| Service Metrics | Typical Headway (Minutes) | Span |
| :--- | :---: | :---: |
| Midday | 25 |  |
| AM Peak | 25 |  |
| PM Peak | 25 |  |
| Evening | - | $5: 16 \mathrm{am}-10: 02 \mathrm{pm}$ |
| Sałurday | 40 | $5: 16 \mathrm{am}-7: 53 \mathrm{pm}$ |
| Sunday | 40 |  |


| Productivity Metrics (Weekday) | Value |
| :--- | :---: |
| Average Daily Ridership | 806 |
| Boardings per Revenue Mile | 1.3 |
| Boardings per Revenue Hour | 18.8 |
| Average Fare | $\$ 0.70$ |
| Operating Ratio (Fare Revenue/Operating Cost) | $12.9 \%$ |
| Average Subsidy per Boarding | $\$ 5.90$ |
| Productivity Metrics (Weekend) Value <br> Saturday Boardings per Revenue Hour 15.0 <br> Sunday Boardings per Revenue Hour 14.0 <br> Performance Metrics Value <br> Average Speed (Weekday) 14.3 mph <br> On - Time Performance $81 \%$ |  |

Route Strengths:

- Serves Memorial City.


## Route Challenges

- Large one-way figure eight on the west end

Unfaithful to namesake street 28

Transit System Reimagining
METRD

Sources: Summary of Schedules and published bus schedules; 2012 Route Ranking Model; 2013 Ridecheck Data; 2010 Census; Team Analysis
72 WESTVIEW CIRCULATOR
Weekdays
$\qquad$
$\frac{1}{1} \frac{1}{1} \frac{1}{1}$
101-1700 - Railroads

- METRO Serice Area - Parks


## 75 Eldridge Crosstown

| Service Metrics | Typical Headway (Minutes) | Span |
| :--- | :---: | :---: |
| Midday | 30 |  |
| AM Peak | 20 |  |
| PM Peak | 20 |  |
| Evening | - | - |
| Sałurday | - | - |
| Sunday | - |  |


$\left\lvert\,$| Productivity Metrics (Weekday) | Value |
| :--- | :---: |
| Average Daily Ridership | 381 |
| Boardings per Revenue Mile | 0.7 |
| Boardings per Revenue Hour | 9.5 |
| Average Fare | $\$ 0.73$ |
| Operating Ratio (Fare Revenue/Operating Cost) | $5.0 \%$ |
| Average Subsidy per Boarding | $\$ 18.35$ |
| Productivity Metrics (Weekend) Value <br> Saturday Boardings per Revenue Hour - <br> Sunday Boardings per Revenue Hour - <br> Performance Metrics Value <br> Average Speed (Weekday) 13.3 mph <br> On - Time Performance $81 \%$ |  | |  |
| :--- |\right.

Route Strengths:

- Serves the Energy Corridor.
- Straightforward route on namesake street.


## Route Challenges

- Passes through areas of low density and activity. ${ }^{29}$

Transit System Reimagining
METPD


Sources: Summary of Schedules and published bus schedules; 2012 Route Ranking Model; 2013 Ridecheck Data; 2010 Census; Team Analysis

## Transit System Reimagining Going places

## 81 Westheimer-Sharpstown

| Service Metrics | Typical Headway (Minutes) | Span |
| :--- | :---: | :---: |
| Midday | 20 |  |
| AM Peak | 12 |  |
| PM Peak | 14 |  |
| Evening | 30 | $3: 49 \mathrm{am}-1: 11 \mathrm{am}$ |
| Saturday | 24 | $4: 18 \mathrm{am}-1: 33 \mathrm{am}$ |
| Sunday | 24 |  |

- Headways in nonpeak direction are 20-24 minutes
- Synchronized with 82 Westheimer - West Oaks to provide twice the frequency between Hillcroft and Downtown.

| Productivity Metrics (Weekday) | Value |
| :--- | :---: |
| Average Daily Ridership | 4,946 |
| Boardings per Revenue Mile | 2.9 |
| Boardings per Revenue Hour | 28.3 |
| Average Fare | $\$ 0.62$ |
| Operating Ratio (Fare Revenue/Operating Cost) | $12.7 \%$ |
| Average Subsidy per Boarding | $\$ 5.86$ |
| Productivity Metrics (Weekend) Value <br> Saturday Boardings per Revenue Hour 26.9 <br> Sunday Boardings per Revenue Hour 25.0 <br> Performance Metrics Value <br> Average Speed (Weekday) 9.9 mph <br> On - Time Performance $69 \%$ |  |$\ggg$

## Route Strengths:

- Serves Downtown and Uptown.
- Schedule synchronized with 82 Westheimer-West Oaks to provide high frequency on common segment.


## Route Challenges:

- Common schedule for Westheimer services is not available
- Partially duplicates 53 Briar Forest without schedule synchronization.
- Crosses two railroad tracks at grade
- Connecting to METRORail requires riding all the way into Downtown
- Redundant service in Sharpstown area.

Sources: Summar of Scele Created by: Traffic Engineess


Transit System Reimagining Going Places


Route Strengths:

- Serves Downtown and Uptown.
- Straightforward route on namesake street.
- Schedule synchronized with 82 Westheimer-West Oaks to provide high frequency on
common segment.
- Operates in a straight line through diverse areas of high density and activity

Route Challenges:

- Common schedule for Westheimer services is not available.
- Partially duplicates 53 Briar Forest without schedule synchronization.
- Crosses two railroad tracks at grade.
- Connecting to METRORail requires riding all the way into Downtown.
- Reliability impacted by Galleria-area traffic.

Sources: Summary of Schedules and published bus schedules; 2012 Route Ranking Model; 2013 Ridecheck Data; 2010 Census; Team Analysis

## 131 Memorial Limited

| Service Metrics | Typical Headway (Minutes) | Span |
| :--- | :---: | :---: |
| Midday | 45 |  |
| AM Peak | 15 |  |
| PM Peak | 15 |  |
| Evening | 55 |  |
| Saturday | 42 | $6: 02 \mathrm{am}-9: 25 \mathrm{pm}$ |
| Sunday | - | - |

- Frequency is lower in nonpeak direction West Belt.

| Productivity Metrics (Weekday) | Value |
| :--- | :---: |
| Average Daily Ridership | 1,694 |
| Boardings per Revenue Mile | 1.0 |
| Boardings per Revenue Hour | 18.4 |
| Average Fare | $\$ 0.65$ |
| Operating Ratio (Fare Revenue/Operating Cost) | $8.6 \%$ |
| Average Subsidy per Boarding | $\$ 8.89$ |
| Productivity Metrics (Weekend) | Value |
| Saturday Boardings per Revenue Hour | 15.3 |
| Sunday Boardings per Revenue Hour | - |
| Performance Metrics | Value |
| Average Speed (Weekday) | 18.9 mph |
| On - Time Performance | $71 \%$ |

## Route Strengths:

- Nonstop segment along Katy Freeway managed lanes and I-10 west HOV.


## Route Challenges:

Passes through areas of relatively low density and activity

- Redundant service between NWTC and Downtown: 20, 36, 85.

Transit System Reimagining Going Places


## Transit System Reimagining Going Places

## 132 Harwin Limited

| Service Metrics | Typical Headway (Minutes) | Span |
| :--- | :---: | :---: |
| Midday | 45 |  |
| AM Peak | 8 |  |
| PM Peak | 8 |  |
| Evening | 25 | $5: 40 \mathrm{am}-7: 10 \mathrm{pm}$ |
| Saturday | 40 | - |
| Sunday | - |  |

- Handful of weekday trips and no weekend trips serve Cook Road branch
and Westpark deviation.
- Some peak direction trips operate between Wheeler Station and

Downtown. ${ }^{38}$

| Productivity Metrics (Weekday) | Value |
| :--- | :---: |
| Average Daily Ridership | 2,251 |
| Boardings per Revenue Mile | 1.3 |
| Boardings per Revenue Hour | 21.4 |
| Average Fare | $\$ 0.62$ |
| Operating Ratio (Fare Revenue/Operating Cost) | $9.4 \%$ |
| Average Subsidy per Boarding | $\$ 7.93$ |
| Productivity Metrics (Weekend) Value <br> Saturday Boardings per Revenue Hour 15.8 <br> Sunday Boardings per Revenue Hour - <br> Performance Metrics Value <br> Average Speed (Weekday) 16.6 mph <br> On - Time Performance $74 \%$ |  |

## Route Strengths:

- Nonstop segment on Southwest Freeway; uses HOV lane in peak direction.


## Route Challenges



Sources: Summary of Schedules and published bus schedules; 2012 Route Ranking Model; 2013 Ridecheck Dała; 2010 Census; Team Analysis

## 214 Northwest Station

| Service Metrics | Typical Headway (Minutes) | Span |
| :--- | :---: | :---: |
| Midday | - |  |
| AM Peak | 5 |  |
| PM Peak | 5 | $2: 55 \mathrm{pm}-7: 29 \mathrm{pm}$ |
| Evening | - |  |
| Saturday | - | - |
| Sunday | - | - |

- Does not serve Northwest TC in nonpeak direction
- Midday and evening service provided by 219 Northwest Station/West Little York-Pinemont.

$\left\lvert\,$| Productivity Metrics (Weekday) | Value |
| :--- | :---: |
| Average Daily Ridership | 2,334 |
| Boardings per Revenue Mile | 1.1 |
| Boardings per Revenue Hour | 32.3 |
| Average Fare | $\$ 3.25$ |
| Operating Ratio (Fare Revenue/Operating Cost) | $53.1 \%$ |
| Average Subsidy per Boarding | $\$ 6.80$ |
| Productivity Metrics (Weekend) Value <br> Saturday Boardings per Revenue Hour - <br> Sunday Boardings per Revenue Hour - <br> Performance Metrics Value <br> Average Speed (Weekday) 30.0 mph <br> On - Time Performance $84 \%$ |  |$>=$|  |
| :--- |\right.

## Route Strengths:

- Serves Downtown
- Uses Northwest Freeway HOT lane in peak direction.


## Route Challenges

- Route name is confusing. Northwest Station/Northwest TC
- No local bus connections at Park \& Ride 40

Transit System Reimagining Going Places


Sources: Summary of Schedules and published bus schedules; 2012 Route Ranking Model; 2013 Ridecheck Data; 2010 Census; Team Analysis

Transit System Reimagining Going Places
216 West Little York-Pinemont

| Service Metrics | Typical Headway (Minutes) | Span |
| :---: | :---: | :---: |
| Midday | - | $\begin{aligned} & \text { 5:20am - 9:24am } \\ & \text { 3:10pm -7:15pm } \end{aligned}$ |
| AM Peak | 15 |  |
| PM Peak | 15 |  |
| Evening | - |  |
| Saturday | - | - |
| Sunday | - | - |

- Does not serve Northwest TC in nonpeak direction
- Midday and evening service provided by 219 Northwest Station/West Little York-Pinemont.
- Some PM peak trips also serve Northwest Station P\&R.

| Productivity Metrics (Weekday) | Value |
| :--- | :---: |
| Average Daily Ridership | 687 |
| Boardings per Revenue Mile | 0.9 |
| Boardings per Revenue Hour | 21.7 |
| Average Fare | $\$ 2.59$ |
| Operating Ratio (Fare Revenue/Operating Cost) | $30.7 \%$ |
| Average Subsidy per Boarding | $\$ 11.31$ |
| Productivity Metrics (Weekend) Value <br> Saturday Boardings per Revenue Hour - <br> Sunday Boardings per Revenue Hour - <br> Performance Metrics Value <br> Average Speed (Weekday) 25.5 mph <br> On - Time Performance $84 \%$ |  |

Route Strengths:

- Serves Downtown
- Uses Northwest Freeway HOT lane in peak direction.


## Route Challenges:

OT eliminating direct connector between Pinemont Park \& Ride and HOT lane in January, 2014.


Sources: Summary of Schedules and published bus schedules; 2012 Route Ranking Model; 2013 Ridecheck Data; 2010 Census; Team Analysis

## 217 Cypress

| Service Metrics | Typical Headway (Minutes) | Span |
| :--- | :---: | :---: |
| Midday | - |  |
| AM Peak | 6 | $3: 05 \mathrm{pm}-7: 55 \mathrm{pm}$ |
| PM Peak | 5 |  |
| Evening | - | - |
| Saturday | - | - |
| Sunday | - |  |

- Does not serve Northwest TC in nonpeak direction.

| Productivity Metrics (Weekday) | Value |
| :--- | :---: |
| Average Daily Ridership | 1,502 |
| Boardings per Revenue Mile | 0.9 |
| Boardings per Revenue Hour | 29.9 |
| Average Fare | $\$ 3.88$ |
| Operating Ratio (Fare Revenue/Operating Cost) | $49.1 \%$ |
| Average Subsidy per Boarding | $\$ 9.07$ |
| Productivity Metrics (Weekend) Value <br> Saturday Boardings per Revenue Hour - <br> Sunday Boardings per Revenue Hour - <br> Performance Metrics Value <br> Average Speed (Weekday) 32.9 mph <br> On - Time Performance $83 \%$ |  |

## Route Strengths:

- Serves Downtown
- Uses Northwest Freeway HOT lane in peak direction


## Route Challenges <br> - No midday or evening service

- No local bus connections at Park \& Ride
- Distance from Downtown restricts number of recycled buses/return trips.

Transit System Reimagining Going Places


Sources: Summary of Schedules and published bus schedules; 2012 Route Ranking Model; 2013 Ridecheck Data; 2010 Census; Team Analysis

Transit System Reimagining Going Places
219 NW Station/WLY/Pinemont

| Service Metrics | Typical Headway (Minutes) | Span |
| :--- | :---: | :---: |
| Midday | 60 | 8:00am $-3: 47 \mathrm{pm}$ <br>  <br> AM Peak$: 05 \mathrm{pm}-10: 32 \mathrm{pm}$ |
| PM Peak | - |  |
| Evening | 60 | - |
| Saturday | - | - |
| Sunday | - |  |

- Peak service provided by 214 Northwest Station and 216 West Little York-

Pinemont.

| Productivity Metrics (Weekday) | Value |
| :---: | :---: |
| Average Daily Ridership | 257 |
| Boardings per Revenue Mile | 0.5 |
| Boardings per Revenue Hour | 29.9 |
| Average Fare | \$2.35 |
| Operating Ratio (Fare Revenue/Operating Cost) | 31.4\% |
| Average Subsidy per Boarding | \$5.43 |
| Productivity Metrics (Weekend) | Value |
| Saturday Boardings per Revenue Hour | - |
| Sunday Boardings per Revenue Hour | - |
| Performance Metrics | Value |
| Average Speed (Weekday) | 23.4 mph |
| On - Time Performance | not available |

## Route Strengths:

- Serves Downtown
- Some trips use Northwest Freeway HOT lane.


Sources: Summary of Schedules and published bus schedules; 2012 Route Ranking Model; 2013 Ridecheck Data; 2010 Census; Team Analysis

## 221 Kingsland

| Service Metrics | Typical Headway (Minutes) | Span |
| :--- | :---: | :---: |
| Midday | - | $4: 30 \mathrm{am}-9: 25 \mathrm{am}$ <br> AM Peak$\quad 4$ |
| $3: 04 \mathrm{pm}-7: 22 \mathrm{pm}$ |  |  |
| PM Peak | 5 |  |
| Evening | - | - |
| Saturday | - | - |
| Sunday | - |  |

- Some early morning trips also serve Addicks P\&R
- Midday and evening service provided by 229 Kingsland/Addicks.

| Productivity Metrics (Weekday) | Value |
| :--- | :---: |
| Average Daily Ridership | 2,307 |
| Boardings per Revenue Mile | 0.9 |
| Boardings per Revenue Hour | 30.4 |
| Average Fare | $\$ 4.44$ |
| Operating Ratio (Fare Revenue/Operating Cost) | $54.8 \%$ |
| Average Subsidy per Boarding | $\$ 9.69$ |
| Productivity Metrics (Weekend) Value <br> Saturday Boardings per Revenue Hour - <br> Sunday Boardings per Revenue Hour - <br> Performance Metrics Value <br> Average Speed (Weekday) 31.2 mph <br> On - Time Performance $80 \%$ |  |$>⿱$|  |
| :--- |

## Route Strengths:

- Utilizes Katy Freeway managed lanes.


## Route Challenges

- No local bus connection at Park \& Ride
- Parking lot is capacity constrained

Transit System Reimagining Going Places


Weekdays

- No local bus connections at Park \& Ride.
- Leased spaces in parking lot; cpacity constrained.


Sources: Summary of Schedules and published bus schedules; 2012 Route Ranking Model; 2013 Ridecheck Data; 2010 Census; Team Analysis

Route Challenges:

| Productivity Metrics (Weekday) | Value |
| :--- | :---: |
| Average Daily Ridership | 713 |
| Boardings per Revenue Mile | 0.8 |
| Boardings per Revenue Hour | 23.3 |
| Average Fare | $\$ 4.15$ |
| Operating Ratio (Fare Revenue/Operating Cost) | $45.0 \%$ |
| Average Subsidy per Boarding | $\$ 11.13$ |
| Productivity Metrics (Weekend) Value <br> Saturday Boardings per Revenue Hour - <br> Sunday Boardings per Revenue Hour - <br> Performance Metrics Value <br> Average Speed (Weekday) 31.4 mph <br> On - Time Performance $88 \%$ |  |$\ggg$

Route Strengths:

- Serves Downtown
- Utilizes Katy Freeway managed lanes


## Route Challenges

## Transit System Reimagining Going Places <br> ling places



## 228 Addicks

| Service Metrics | Typical Headway (Minutes) | Span |
| :---: | :---: | :---: |
| Midday | - | $\begin{aligned} & \text { 4:30am - 9:21am } \\ & \text { 3:05pm - } 7: 07 \mathrm{pm} \end{aligned}$ |
| AM Peak | 6 |  |
| PM Peak | 4 |  |
| Evening | - |  |
| Saturday | - | - |
| Sunday | - | - |

- A handful of trips serve Northwest TC and Houston Center
- Midday and evening service provided by 229 Kingsland/Addicks.

| $\mid$ Productivity Metrics (Weekday) |
| :--- |
| Average Daily Ridership |
| Boardings per Revenue Mile |
| Boardings per Revenue Hour |
| Average Fare |
| Operating Ratio (Fare Revenue/Operating Cost) |
| Average Subsidy per Boarding |
| Productivity Metrics (Weekend) 30.1 <br> Saturday Boardings per Revenue Hour 44.26 <br> Sunday Boardings per Revenue Hour $\$ 9.71$ <br> Performance Metrics Value <br> Average Speed (Weekday) - <br> On - Time Performance - |

## Route Strengths:

- Utilizes Katy Freeway managed lanes.
- Local bus connection at Park \& Ride.


## Route Challenges

- Limited access to lot via Park Row.

Transit System Reimagining Going Places
228 ADDICKS


$\quad$| $2-10$ |
| :--- |
| - |
| $-11-30$ | $101-170$



Sources: Summary of Schedules and published bus schedules; 2012 Route Ranking Model; 2013 Ridecheck Data; 2010 Census; Team Analysis

Transit System Reimagining Going Places

Sources: Summary of Schedules and published bus schedules; 2012 Route Ranking Model; 2013 Ridecheck Data; 2010 Census; Team Analysis

| Productivity Metrics (Weekday) | Value |
| :--- | :---: |
| Average Daily Ridership | 468 |
| Boardings per Revenue Mile | 0.7 |
| Boardings per Revenue Hour | 17.7 |
| Average Fare | $\$ 2.87$ |
| Operating Ratio (Fare Revenue/Operating Cost) | $47.7 \%$ |
| Average Subsidy per Boarding | $\$ 3.40$ |
| Productivity Metrics (Weekend) Value <br> Saturday Boardings per Revenue Hour - <br> Sunday Boardings per Revenue Hour - <br> Performance Metrics Value <br> Average Speed (Weekday) 24.3 mph <br> On - Time Performance not available |  |$\ggg$

Route Strengths:

- Serves Downtown
- Utilizes Katy Freeway managed lanes
- Local bus connection at Addicks.


## Route Challenges:

- Significant seating capacity available on most trips.

Weekdays

$$
\begin{aligned}
& \text { - Main Street Line - Rairoads } \\
& \text { - East End Line 口METRO Service Area }
\end{aligned}
$$

$\begin{array}{ll}\text { - North Line } & \text { Parks } \\ \text { - Sotheost Line } \\ \text { - Roil Stops } & \text { Bodies of Woter } \\ \end{array}$


274 Westchase/Gessner

| Service Metrics | Typical Headway (Minutes) | Span |
| :--- | :---: | :---: |
| Midday | - |  |
| AM Peak | 15 | $30 \mathrm{pm}-7: 52 \mathrm{pm}$ |
| PM Peak | 15 |  |
| Evening | - | - |
| Saturday | - | - |
| Sunday | - |  |

- Trips in the nonpeak direction do not serve Gessner P\&R.
- Westchase $P \& R$ served in the midday and evening by local routes.

| Productivity Metrics (Weekday) | Value |
| :--- | :---: |
| Average Daily Ridership | 431 |
| Boardings per Revenue Mile | 0.9 |
| Boardings per Revenue Hour | 16.9 |
| Average Fare | $\$ 2.74$ |
| Operating Ratio (Fare Revenue/Operating Cost) | $29.9 \%$ |
| Average Subsidy per Boarding | $\$ 13.77$ |
| Productivity Metrics (Weekend) Value <br> Saturday Boardings per Revenue Hour - <br> Sunday Boardings per Revenue Hour - <br> Performance Metrics Value <br> Average Speed (Weekday) 18.4 mph <br> On - Time Performance $86 \%$ |  | 

## Route Strengths:

- Serves Downtown
- Utilizes Southwest Freeway HOV lane in the peak direction.
- Local bus connections at Park \& Rides


## Route Challenges

or evening service, though the Westchase lot is served by the 132 Harwin Limited.

Transit System Reimagining Going places


Transit System Reimagining Going Places

## 285 Kingsland/Uptown

| Service Metrics | Typical Headway (Minutes) | Span |
| :--- | :---: | :---: |
| Midday | - | $5: 45 \mathrm{am}-9: 08 \mathrm{am}$ |
| AM Peak | 20 |  |
| PM Peak | 20 |  |
| Evening | - | - |
| Saturday | - | - |
| Sunday | - |  |

- New route in 2012

| $\mid$ Productivity Metrics (Weekday) |
| :--- |
| Average Daily Ridership |
| Boardings per Revenue Mile |
| Boardings per Revenue Hour |
| Average Fare |
| Operailable |
| Average Subailable (Fare Revenue/Operating Cost) |
| Productivity Metrics (Weekend) not available <br> Saturday Boardings per Revenue Hour not available <br> Sunday Boardings per Revenue Hour not available <br> Performance Metrics Value <br> Average Speed (Weekday) - <br> On - Time Performance - $>.$Value |

## Route Strengths

- Serves Uptown.
- Provides connection to other Katy and Northwest corridor services at NWTC.


## Route Challenges

- No midday or evening service.
- No midday or evening service.


Sources: Summary of Schedules and published bus schedules; 2012 Route Ranking Model; 2013 Ridecheck Data; 2010 Census; Team Analysis

## 298 Kingsland/Addicks/TMC

| Service Metrics | Typical Headway (Minutes) | Span |
| :--- | :---: | :---: |
| Midday | - | $5: 06 \mathrm{am}-9: 05 \mathrm{am}$ |
| AM Peak | 8 |  |
| PM Peak | 8 |  |
| Evening | - | - |
| Saturday | - | - |
| Sunday | - |  |

- Does not serve Northwest TC in the nonpeak direction

| Productivity Metrics (Weekday) | Value |
| :--- | :---: |
| Average Daily Ridership | 1,117 |
| Boardings per Revenue Mile | 0.9 |
| Boardings per Revenue Hour | 21.5 |
| Average Fare | $\$ 3.60$ |
| Operating Ratio (Fare Revenue/Operating Cost) | $36.0 \%$ |
| Average Subsidy per Boarding | $\$ 13.12$ |
| Productivity Metrics (Weekend) Value <br> Saturday Boardings per Revenue Hour - <br> Sunday Boardings per Revenue Hour - <br> Performance Metrics Value <br> Average Speed (Weekday) 24.0 <br> On - Time Performance not available |  | 

## Route Strengths

- Utilizis the Texas Medical Center
- Provides connection to other Katy and Northwest corridor services at NWTC


## Route Challenges <br> No midday or evening service.

Transit System Reimagining Going places


Sources: Summary of Schedules and published bus schedules; 2012 Route Ranking Model; 2013 Ridecheck Data; 2010 Census; Team Analysis



## APPENDIX D <br> METRO NEW BUS <br> NETWORK ROUTES

PROPOSED ROUTES AS OF OCTOBER 2014
ROUTES AND ROUTE NUMBERS CURRENTLY IN USE MAY DIFFER

## 2 Bellaire

Frequent Network
Mission Bend P\&R to TMC TC:

| Peak Headway | Base Headway | Span |
| :---: | :---: | :---: |
| 10 | 15 | 20 |
| Minutes | Minutes | Hours (approx.) |

## Activity Centers:

- TMC

Rail Line Connections:
Frequent Network Connections

- 4 Beechnut, 27 Shepherd, 33 Post Oak, 46 Gessner, 56 Airline/Montrose, 63

Transit Center and Park \& Ride Connections:

- Mission Bend P\&R, Bellaire TC, TMC TC
astbound Route: R Metro, L Bellaire, Bellaire TC, S Holcombe, R Fannin, R TMC TC Westbound Route:
TMC TC, R Pressler, L Holcombe, S Bellaire, Bellaire TC, R Metro, L Mission Bend P\&R Proposed Equipment:
$60^{\prime}$ transit bus as fleet allows or $40^{\prime}$ transit bus

Transit System Reimagining Going places


2 Bellaire


## 4 Beechnut

Frequent Network
Mission Bend P\&R to Eastwood TC

| Peak Headway | Base Headway | Span |
| :---: | :---: | :---: |
| 40 | 5 | 20 |
| Minutes | Minutes | Hours (approx.) |

## Activity Centers:

- TMC

Rail Line Connections:
TMC Transit Center Station (Red)
Frequent Network Connections:

- 2 Bellaire, 25 Richmond, 27 Shepherd, 40 Heights/Telephone/41 Kirby Polk, 46 Gessner, 50 Broadway, 54 Scott, 56 Airline/Montrose, 63 Fondren, 65 Bissonnet, 80 MLK/Lockwood
Transit Center and Park \& Ride Connections:
- Mission Bend P\&R, TMC TC

Eastbound Route:
Mission Bend P\&R, L Metro, L Alief Clodine, L Sugarland Howell, R Bellaire, L Pavilion, L Pavilion Point, R Sugarland Howell, L Beechnut, S N Braeswood, LS Main, R Pressler, L TMC TC, L Pressler, L Bertner, R Moursund, L S MacGregor, L Ardmore, L N Macgregor, R Ennis, R Cleburne, L Scott, R Holman, L Cullen, R Elgin, R Eastwood

## Westbound Route:

- Eastwood TC, L Elgin, L Cullen, R Holman, L Scott, R Cleburne, L Ennis, R N MacGregor, R Moursund, L Bertner, R Pressler, R TMC TC, R Pressler, L S Main, R N Braeswood, S Beechnut, R Sugarland Howell, L Pavilion Point, R Pavilion, R Bellaire, L sugarland Howell, R Alief Clodine, R Mission Bend P\&R
Sosed Equipment:
- 60 ' transit bus as fleet allows or $40^{\prime}$ transit bus

Base headway includes weekday middays and weekends. Evening headway is 30 minutes. Span is consistent seven days a week.

Transit System Reimagining Going Places


## REVISED - Elgin Deviation

## 9 Gulfton/Holman

Sharpstown to Eastwood TC:

| Peak Headway | Base Headway | Span |
| :---: | :---: | :---: |
| 5 | 30 | 8 |
| Minutes | Minutes | Hours (approx.) |

Activity Centers:

- Greenway Plaza, UH

Rail Line Connections:

- Ensemble/HCC Station (Red), Robertson Stadium/UH/TSU Station (Purple)

Frequent Network Connections:
2 Bellaire, 4 Beechnut, 25 Richmond, 27 Shepherd, 33 Post Oak, 50 Broadway, 54 Scott, 63 Fondren, 82 Westheimer, 80 MLK/Lockwood, 152/153 Harwin Flyer Transit Center and Park \& Ride Connections:

- Eastwood TC

Eastbound Route:

- Bonhomme \& Clarewood, R Clarewood, L Fondren, L Bellaire, L Rookin, R High Star, L Hillcroft, R Gulfton, L West Loop frontage, R Westpark, L Kirby, R Southwest Freeway frontage, enter ramp after Shepherd, Exit Spur 527, Exit Lovisiana, R Elgin, R Milam, L Holman, L Crawford, R Elgin, R Dowling, L Holman, L Cullen, R Elgin, S Lockwood, R Eastwood TC
Westbound Route:
- Eastwood TC, LMunger, LMaplewood, S Elgin, L Cullen, R Holman, R Dowling, L Elgin, L LaBranch, R Holman, R Travis, L Elgin, L Smith, S Spur 527, S Southwest Freeway, Exit Shepherd, S Southwest Freeway frontage, L Kirby, R Westpark, L West Loop frontage, R Gulfton, L Hillcroff, R High Star, L Rookin, R Bellaire, R Fondren, R Bellerive, L Reims, R Harwin, R Bonhomme, Bonhomme \& Clarewood
Proposed Equipment:
- $40^{\prime}$ transit bus

Base headway includes weekday middays, weekends, and evenings. Span is consistent seven days a week.

Transit System Reimagining Going Places


## 9 Gulfton/Holman

Half Mile Access



## 23 Clay - West 43rd

West Belt to Northline TC:

| Peak Headway | Base Headway | Span |
| :---: | :---: | :---: |
| $\mathbf{3 0}$ |  | 4 |
| Minutes | Minutes | Hours (approx.) |

Rail Line Connections:

- Northline Transit Center/HCC Station (Red)

Frequent Network Connections:
45 Tidwell West, 27 Shepherd, 46 Gessner, 56 Airline/Montrose, 85 Antoine/ Washington
Transit Center and Park \& Ride Connections:

- Northline TC/HCC

Eastbound Route:

- Westway Park \& Clay, L Clay, S 43rd, S Crosstimbers, L Fulton, L Northline TC

Westbound Route:
Northline TC, R Fulton, R Crosstimbers, S 43rd, S Clay, R West Belt frontage, R
Capital Park, R Westway Park, Westway Park \& Clay
Proposed Equipment:

- $40^{\prime}$ transit bus

Base headway includes weekday middays, weekends, and evenings. Span is consistent seven days a week.

Transit System Reimagining Going Places


23 Clay - West 43rd


$$
\begin{aligned}
& \text { Base Headway } \\
& 10,12 \text {, or } 15 \text { minutes } \\
& =30 \text { minutes } \\
& 60 \text { minutes } \\
& \text { an eak Only }
\end{aligned}
$$

$=$ Red Line $=$ Green Line

- Purple Line
© Transit Center
© Park \& Ride
- Quickline Sto - Quickline Sto

REVISED - Wheeler Station to Blodgett Routing
25 Richmond
Frequent Network
Eastwood TC Westchase:

| Peak Headway | Base Headway | Span |
| :---: | :---: | :---: |
| 40 | - | 2 |
| Minutes | Minutes | Hours (approx.) |

Westchase to Mission Bend P\&R:

| Peak Headway | Base Headway | Span |
| :---: | :---: | :---: |
| 20 | $\mathbf{3 0}$ | $\mathbf{1 8}$ |
| Minutes | Minutes | Hours (approx.) |

## Activity Centers:

Activity Centers: $\quad$ Westchase, Uptown/Galleria, Greenway Plaza, UH, TSU
Rail Line Connections:

- Wheeler Station (Red), UH South/University Oaks Station (Purple)

Frequent Network Connections:
Frequent Network Connections: 2 Bellaire, 4 Beechnut, 27 Shepherd, 33 Post Oak, 40 Heights/Telephone/41 Kirby Polk, 46 Gessner, 50 Broadway, 54 Scott, 56 Airline/Montrose, 63 Fondren, 65 Polk, 46 Gessner, 50 Broadway, 54 Scott, 56 Ai
Bissonnet, 80 MLK/Lockwood, 82 Westheimer
Transit Center and Park \& Ride Connections:

- Mission Bend P\&R, Wheeler TC, Eastwood TC

Westbound Route:

- Eastwood TC, L Lockwood, L Spur 5, R University, L Calhoun, R Wheeler, L Scott, R Blodgett, R Live Oak, L Wheeler, L Wheeler TC, R Fannin, R Blodgett, R Main, L Richmond, (short line: $R$ Walnut Bend, L Meadowglen, Meadowglen \& Wicrest), $L$ Eastbound Route:
- Mission Bend P\&R, R Alief Clodine, L Synott, R Ashford Point, L Dairy Ashford, R Richmond (short line: Meadowglen \& Wilcrest, R Wilcrest, R Westheimer, R Walnut Bend, L Richmond), S Wheeler, R Live Oak, L Blodgett, LScott, R Wheeler, L Calhoun, R University, L Spur 5, R Lockwood, R Eastwood TC
Proposed Equipment:
- $60^{\prime}$ transit bus as fleet allows or $40^{\prime}$ transit bus

Base headway includes weekday middays and weekends. Evening headway is 30 minutes. Span is consistent seven days a week.

Transit System Reimagining Going Places


## 25 Richmond

$\qquad$

Base Headway


4west
houston

## 26 Long Point/Cavalcade

 Frequent NetworkMemorial City to Kashmere TC:

| Peak Headway | Base Headway | Span |
| :---: | :---: | :---: |
| $\square$ | 5 | 8 |
| Minutes | Minutes | Hours (approx.) |

## Activity Centers

- Memorial City

Rail Line Connections:
Frequent Network Connections:
33 Post Oak, 27 Shepherd, 46 Gessner, 51/52 Hardy, 56 Airline/Montrose, 80 MLK Lockwood, 85 Antoine/Washington, 160s Memorial City Flyer
Transit Center and Park \& Ride Connections

- Hempstead Mini Terminal, Kashmere TC

Eastbound Route
Memorial \& Gaylord, R Barryknoll, R Gessner, R Long Point, R Hempstead,
8th S 20th, S Cavalade L Hirsch R Kashmere TC
Westbound Route:
Kashmere TC, L Hirsch, R Cavalcade, S 20th, S 18th, R Hempstead, L Long Point, L Gessner, L Katy Freeway frontage, R Memorial City, Memorial City \& Gaylord
Proposed Equipment:

- $40^{\prime}$ transit bus

Base headway includes weekday middays and weekends. Evening headway is 30 minutes. Span is consistent seven days a week.

## 36 Kempwood

West Belt to Northline TC:

| Peak Headway | Base Headway | Span |
| :---: | :---: | :---: |
| 5 | 30 | 8 |
| Minutes | Minutes | Hours (approx.) |

## Rail Line Connections:

- Northline Transit Center/HCC Station (Red)

Frequent Network Connections:
27 Shepherd, 45 Tidwell West, 46 Gessner, 56 Airline/Montrose, 85 Antoine Washington
Transit Center and Park \& Ride Connections:

- Northline TC

Eastbound Route:
Westway Park \& Clay, R Clay, L West Belt frontage, L Kempwood, S 34th, L Shepherd, R Crosstimbers, LIH 45 Frontage, R Lyerly, Lyerly \& Fulton
Westbound Route:
Lyerly \& Fulton, R Fulton, R Crosstimbers, L Shepherd, R 34th, S Kempwood, R Wes Belt frontage, R Capital Park, R Westway Park, Westway Park \& Clay
Proposed Equipment:

- $40^{\prime}$ transit bus

Transit System Reimagining
MERRI


36 Kempwood
$\qquad$

| Base Headway |  |
| :--- | :--- |
| $=10,12$ or 15 minutes | Red Line |
| $=30$ minutes | Green Line |
| $=60$ minutes | Purple Line |
|  | - Rail Station |

© Transit Center
Park \& Ride Quickline Sto - Railroads

## 39 Katy Freeway

Sherwood Forest to Northwest TC:

| Peak Headway | Base Headway | Span |
| :---: | :---: | :---: |
| 30 |  | 4 |
| Minutes | Minutes | Hours (approx.) |

## Activity Centers:

- Memorial City

Frequent Network Connections:

- 26 Long Point/Cavalcade, 33 Post Oak, 46 Gessner, 85 Antoine/Washington, 160s Memorial

Transit Center and Park \& Ride Connections:

- Northwest TC
- Sherwood Forest \& Chatterton, R Katy Fwy frontage, U turn Kirkwood, L N Post Oak, R Old Katy, R Nowthwest TC
Westbound Route:
- Northwest TC, L Old Katy, S Katy Fwy frontage, R Upland, L Chatterton, L Sherwood Forest, Sherwood Forest \& Chatterton
Proposed Equipment:
- $40^{\prime}$ transit bus or $25^{\prime}$ ARBOC bus

Base headway includes weekday middays, weekends, and evenings. Span is consistent seven days a week.

Transit System Reimagining Going Places


## 39 Katy Freeway



Base Headway

- 10,12 , or 15 minutes
$=30$ minutes

60 minutes
= Red Line
= Green Line

- Gurpen Line Line
- Purple Line
- Rail Station
(3) Transit Center
© Park \& Ride
- Park \& Ride Quickline Sto
Railroads


## 43 Kirkwood

## West Bellfort P\&R to Briar Forest:

| Peak Headway | Base Headway | Span |
| :---: | :---: | :---: |
| $\mathbf{3} 0$ |  | 4 |
| Minutes | Minutes | Hours (approx.) |

Frequent Network Connections:

- 2 Bellaire, 4 Beechnut, 65 Bissonnet, 82 Westheimer

Transit Center and Park \& Ride Connections

- W Bellfort P\&R

Northbound Route:
W Bellfort P\&R, L Roark, R Bellfort, R Kirkwood, L Harwin, R W Houston Center, R Richmond, L Kirkwood, R Briar Forest, R Wilcrest, R Westheimer, R Hayes, Hayes \& Westheimer
Southbound Route:
Hayes \& Westheimer, L Briar Forest, L Kirkwood, R Richmond, L W Houston Center, L Harwin, R Kirkwood, L Bellfort, L Roark, R W Bellfort P\&R
Proposed Equipment:
25' Arboc bus

Base headway includes weekday middays, weekends, and evenings. Span is consistent seven days a week.

Transit System Reimagining Going Places


43 Kirkwood
$\qquad$

## Base Headway

$$
\begin{array}{ll}
\text { 10, 12, or } 15 \text { minutes } & \text { Red Line } \\
=30 \text { minutes } & \text { Green Line } \\
=60 \text { minutes } & \text { Purple Line } \\
\text { " } 1 / \text { Peak Only } & \text { - Rail Station }
\end{array}
$$

(3) Transit Center
© Park \& Ride

- Quickline Sto - Quickline Sto

Transit System Reimagining Going Places

## 46 Gessner

Frequent Network
West Airport to Tidwell:

| Peak Headway | Base Headway | Span |
| :---: | :---: | :---: |
|  | - | 8 |
| Minutes | Minutes | Hours (approx.) |

## Activity Centers

, Mal City
Frequent Network Connections:
2 Bellaire, 4 Beechnut, 25 Richmond, 26 Long Point/Cavalcade, 45 Tidwell West, 65 Bissonnet, 82 Westheimer, 152/153 Harwin Flyer, 160s Memorial City Flyer
Transit Center and Park \& Ride Connections:
Northbound Route:
Fondren Meadow \& Gessner, R Airport, R Gessner, R Hempstead, L Tidwell, R Fairbanks $N$ Houston, Fairbanks $N$ Houston \& Tidwell
Southbound Route:
Fairbanks N Houston \& Tidwell, R Hempstead, L Gessner, L Fondren Meadow Fondren Meadow \& Gessner
Proposed Equipment:

- 60' transit bus as fleet allows or $40^{\prime}$ transit bus


## 58 Hammerly

West Belt to Northwest TC:

| Peak Headway | Base Headway | Span |
| :---: | :---: | :---: |
| $\mathbf{3} 0$ |  | 4 |
| Minutes | Minutes | Hours (approx.) |

Frequent Network Connections:
26 Long Point/Cavalcade, 33 Post Oak, 46 Gessner, 85 Antoine/Washington, 160s Memorial City Flye
Transit Center and Park \& Ride Connections

- Hempstead Mini Terminal, Northwest TC

Eastbound Route:
Westway Park \& Clay, R Clay, L Brittmore, L Hammerly, R Hempstead, R N Post Oak, L Old Katy, R Northwest TC
Westbound Route:
Northwest TC, L Old Katy, R N Post Oak, L Hempstead, L Hammerly, R Brittmore, R Clay, L West Belt frontage, R Capital Park, R Westway Park, Westway Park \& Clay Proposed Equipment:

- $40^{\prime}$ transit bus

Base headway includes weekday middays, weekends, and evenings. Span is consistent seven days a week.

Transit System Reimagining Going Places


58 Hammerly


Base Headway
$=10,12$, or 15 minutes
$=30$ minutes

- 60 minutes

60 minutes

- Red Line
= Green Line - Gurple Line - Purple Line
- Rail Station
(3) Transit Center
© Park \& Ride
- Quickline Stop - Railroads


## 63 Fondren

Frequent Network
Missouri City P\&R to Westheimer:

| Peak Headway | Base Headway | Span |
| :---: | :---: | :---: |
| 5 | -5 | 20 |
| Minutes | Minutes | Hours (approx.) |

Frequent Network Connections:
2 Bellaire, 4 Beechnut, 25 Richmond, 65 Bissonnet, 82 Westheimer, 152/153 Harwin Flyer
Transit Center and Park \& Ride Connections:

- Missouri City P\&R

Northbound Route:

- Missouri City P\&R, R Fondren, R Woodway, Woodway \& Westheimer

Southbound Route:

- Woodway \& Westheimer, R Westheimer, L Fondren, L Missouri City P\&R

Proposed Equipment:
60' transit bus as fleet allows or $40^{\prime}$ transit bus

Base headway includes weekday middays and weekends. Evening headway is 30 minutes. Span is consistent seven days a week.

## Transit System Reimagining Going places



63 Fondren
$\qquad$

© Transit Center
© Transit Cente

- Park \& Ride Quickline Sto


## 67 Dairy Ashford

Addicks P\&R to Bissonnet:

| Peak Headway | Base Headway | Span |
| :---: | :---: | :---: |
| 30 |  | 4 |
| Minutes | Minutes | Hours (approx.) |

Extension to Addicks P\&R pending completion of Park Row

## Activity Centers:

- Energy Corridor

Frequent Network Connections:

- 2 Bellaire, 4 Beechnut, 65 Bissonnet, 82 Westheimer

Transit Center and Park \& Ride Connections

## - Addicks P\&R

North Route:

- Dairy View \& Bissonnet, R Bissonnet, R Dairy Ashford, S Park Row, L Addicks P\&R
- Interim layover at Barryknoll \& Dairy Ashford pending completion of Park Row.

Southbound Route:
Addicks P\&R, R Park Row, S Dairy Ashford, L Brookglade, R Dairy View, Dairy View \& Bisson
Proposed Equipment:

- $40^{\prime}$ transit bus

Transit System Reimagining Going Placen


## 67 Dairy Ashford

Half Mile Access
(1) 0
0.75
1.5
(ㅇ) Transit Center
© Park \& Ride

- Quickline Stop
- Quickline Sto - Railroads


## 70 Memorial

Brittmoore to Northwest TC:

| Peak Headway | Base Headway | Span |
| :---: | :---: | :---: |
| $\mathbf{3} 0$ |  | 4 |
| Minutes | Minutes | Hours (approx.) |

Continues to/from 72 Westview.
Coordinated with 72 Westview to provide higher frequency between Brittmoore and Gessner

## Activity Centers:

- Uptown, Memorial City

Frequent Network Connections:
26 Long Point/Cavalcade, 33 Post Oak, 46 Gessner, 85 Antoine/Washington, 160s Memorial City Flye
Transit Center and Park \& Ride Connections

- Northwest TC

Eastbound Route:
Business Center \& Westview Circle, R Westview Circle, R Brittmoore, R Westview, R Gessner, L Memorial, L N Post Oak, R Old Katy, R Northwest TC
Westbound Route:
Northwest TC, L Old Katy, L N Post Oak, R Memorial, R Gessner, L Westview, L
Business Center, Business Center \& Westview
Proposed Equipment:

- 40 transit bus

Transit System Reimagining Going Places


70 Memorial


Base Headway
$=10,12$, or 15 minutes
$=30$ minutes
$=30$ minutes
-60 minutes
60 minutes
$=$ Red Line
$=$ Green Line

- Purple Line
(3) Transit Center
© Park \& Ride
- Quickline Stop - Railroads

Base headway includes weekday middays, weekends, and evenings. Span is consistent seven days a week.

## REVISED - Span

## 72 Westview

## Memorial City to Northwest TC:

| Peak Headway | Base Headway | Span |
| :---: | :---: | :---: |
| 30 |  | 5 |
| Minutes | Minutes | Hours (approx.) |

Continues to/from 70 Memorial.
Coordinated with 70 Memorial to provide higher frequency between Brittmoore and Gessner.

## Activity Centers

- Memorial City

Frequent Network Connections:
26 Long Point/Cavalcade, 33 Post Oak, 46 Gessner, 85 Antoine/Washington, 160s Memorial City Flyer
Transit Center and Park \& Ride Connections

- Northwest TC

Eastbound Route:
Business Center \& Westview Circle, R Westview Circle, R Brittmoore, R Westview, R Gessner, L Katy Fwy Frontage, U turn Campbell, R Blalock, R Westview, R Silber, L Katy Fwy frontage, L N Post Oak, R Old Katy, R Northwest TC
Westbound Route:

- Northwest TC, L Old Katy, S Katy Fwy frontage, R Silber, L Westview, L Blalock, R Katy Fwy frontage, R Gessner, L Westview, L Business Center, Business Center \& Westview Circle
Proposed Equipment:
- $40^{\prime}$ transit bus

Base headway includes weekday middays, weekends, and evenings. Span is consistent seven days a week.

Transit System Reimagining Going places


72 Westview


$$
\begin{array}{ll}
\text { Base Headway } \\
=10,12 \text {, or } 15 \text { minutes } & =\text { Red Line } \\
=30 \text { minutes } & =\text { Green Line } \\
=60 \text { minutes } & =\text { Purple Line } \\
& \text { - Rail Station }
\end{array}
$$


houston

## 75 Eldridge

Addicks P\&R to West Oaks Mall:

| Peak Headway | Base Headway | Span |
| :---: | :---: | :---: |
| 30 |  | 4 |
| Minutes | Minutes | Hours (approx.) |

## Activity Centers:

- Energy Corridor

Frequent Network Connections:

- 2 Bellaire, 4 Beechnut, 82 Westheimer

Transit Center and Park \& Ride Connections

- Mission Bend P\&R, Addicks P\&R

Northbound Route:
Richmond \& S Richmond, L Green Crest, R Westpark, L Addicks Clodine, L Bellaire, L Tres Lagunas, L Sierra Blanca, R Alief Clodine, R Mission Bend P\&R, L Metro, R Alief Clodine, L Eldridge, L Memorial, R Hwy 6, R Park Row, R Addicks P\&R
Southbound Route:
Addicks P\&R, L Park Row, L Hwy 6, L Memorial, R Eldridge, R Alief Clodine, L Metro, R Mission Bend P\&R, L Metro, L Alief Clodine, L Sierra Blanca, R Tres Lagunas, R Bellaire, R Addicks Clodine, R Westpark, L Green Crest, R S Richmond, L Richmond Richmond \& S Richmond
Proposed Equipment:
-40' transit bus or 25' Arboc bus

Base headway includes weekday middays, weekends, and evenings. Span is consistent seven days a week.

Transit System Reimagining Going Places


## 75 Eldridge



## Base Headway

$=10,12$, or 15 minutes
$=30$ minutes

- 30 minutes

60 minutes
$=$ Red Line = Green Line - Purple Line
(3) Transit Center
© Park \& Ride - Quickline Stop Quickline

Transit System Reimagining Going Places

## 82 Westheimer

Frequent Network

## West Oaks Mall to Downtown:

| Peak Headway | Base Headway | Span |
| :---: | :---: | :---: |
| 8 |  | 0 |
| Minutes | Minutes | Hours (approx.) |

## Activity Centers:

- Westchase, Uptown/Galleria, Midtown, Downtown

Rail Line Connections:

- Downtown (Red, Green, and Purple)

Frequent Network Connections:
27 Shepherd, 33 Post Oak, 40 Heights/Telephone/41 Kirby Polk, 46 Gessner, 51/52 Hardy, 54 Scott, 56 Airline/Montrose, 63 Fondren, 85 Antoine/Washington, 137 Northshore Flyer, 160s Memorial City Flyer
Transit Center and Park \& Ride Connections

- Downtown TC

Eastbound Route:
Richmond \& S Richmond, R Westheimer, S Elgin, LTravis, L Congress, Congress \& Smith
Westbound Route:
Congress \& Smith, R Franklin, R Milam, R Elgin, S Westheimer, L Addicks-Howell, R Richmond, Richmond \& S Richmond
Proposed Equipment:

- $60^{\prime}$ transit bus as fleet and street configuration allow or $40^{\prime}$ transit bus

Base headway includes weekday middays and weekends. Evening headway is 20 minutes. Span is consistent seven days a week.

## 82 Westheimer

Half Mile Access

| Base Headway |  |
| :--- | :--- |
| $=10,12$, or 15 minutes | Red Line |
| $=30$ minutes | Green Line |
| $=60$ minutes | Purple Line |
| $1+1$ Peak Only | - Rail Station |

(6) Transit Center
© Park \& Ride

- Quickline Stop


## 151 Westpark Express

Weekday Peak Only

## Mission Bend P\&R to Downtown:

| Peak Headway | Base Headway | Span |
| :---: | :---: | :---: |
| 5 |  | $\mathbf{2 . 5} \mathbf{A M}$ <br> $\mathbf{3 ~ P M}$ |
| Minutes | Minutes | Hours (approx.) |

Local stops, Mission Bend P\&R to Westchase P\&R.
Limited stops, Westchase P\&R to Hillcroff P\&R.
Express to Midtown and Downtown.
Additional peak frequency between Hillcroft P\&R and Downtown

## Activity Centers:

- Westchase, Uptown/Galleria, Greenway Plaza, Midtown, Downtown Rail Line Connections:
- Downtown (Red, Green and Purple)

Frequent Network Connections:

- 2 Bellaire, 4 Beechnut, 40 Heights/Telephone/41 Kirby Polk, 46 Gessner, 51/52 Hardy, 54 Scott, 63 Fondren, 82 Westheimer, 152/153 Harwin Flyer, 137 Northshore Flyer, 160 s Memorial City Flyer
Transit Center and Park \& Ride Connections:
- Mission Bend P\&R, Westchase P\&R, Gessner P\&R, Hillcroff P\&R

Eastbound Route:
Eastbound Route
Gesser P\&R R W, LMetro, R Alief Clodine, S Harwin, Westchase TC, L Gessner, Ges7. Exit Westbound Route:

- Congress \& La Branch, L Smith, S Spur 527, S Southwest Fwy HOT or main lanes, Exit Hillcroft P\&R, L Westpark, Gessner P\&R, L Gessner, R Harwin, Westchase P\&R, S Alief Clodine, L Metro, R Mission Bend P\&R
Proposed Equipment:
- $45^{\prime}$ motorcoach or $40^{\prime}$ transit bus or $60^{\prime}$ articulated bus as fleet allows

Transit System Reimagining Going Places


151 Westpark Express
Half Mile Access

## Base Headway



## 152 Harwin Flyer

Frequent Network
Westwood P\&R to Wheeler TC:

| Peak Headway | Base Headway | Span |
| :---: | :---: | :---: |
| 5 | 30 | 4 |
| Minutes | Minutes | Hours (approx.) |

Schedule coordinated with 153 Harwin Flyer to provide frequent service between Harwin \& Ranchester and Wheeler TC

## Activity Centers:

- Westchase

Rail Line Connections:

- Wheeler Station (Red)

Frequent Network Connections:
2 Bellaire, 4 Beechnut, 25 Richmond, 46 Gessner, 63 Fondren, 65 Bissonnet, 82 Westheimer
Transit Center and Park \& Ride Connections

- Westchase P\&R, Hillcroff TC, Wheeler TC
astbound Route:
- Westwood P\&R, R Centre, L Bissonnet, R Woodfair, L Club Creek, R Beechnut, L

Corporate, R Bellaire, L Ranchester, R Harwin, Hillcroff P\&R, Southwest Fwy HOT or main lanes, Exit Richmond, Wheeler TC
Westbound Route

- Wheeler TC, L Richmond, L Spur 527, Southwest Fwy HOT or main lanes, Exit Hillcroft TC, R Harwin, L Ranchester, R Bellaire, L Corporate, R Beechnut, L Club Creek, R Woodfair, L Bissonnet, R Centre, L Westwood P\&R
Proposed Equipment:
- $40^{\prime}$ transit bus

Base headway includes weekday middays, weekends, and evenings. Span is consistent seven days a week.

Transit System Reimagining Going Places


152 Harwin Flyer



## 153 Harwin Flyer

Frequent Network
Briar Forest to Wheeler TC:

| Peak Headway | Base Headway | Span |
| :---: | :---: | :---: |
| 4 | 3 |  |
| Minutes | Minutes | Hours (approx.) |

Schedule coordinated with 152 Harwin Flyer to provide frequent service between Harwin \& Ranchester and Wheeler TC

## Rail Line Connections:

- Wheeler Station (Red)

Frequent Network Connections:

- 25 Richmond, 46 Gessner, 63 Fondren, 65 Bissonnet, 82 Westheimer

Transit Center and Park \& Ride Connections:

- Westwood P\&R, Hillcroff TC, Wheeler TC

Eastbound Route:
Scholarship \& Valedictorian, R Valedictorian, R Briar Forest, L Eldridge, R Parkway Plaza, R Enclave, R Westella, L Whittington, L Dairy Ashford, R Briar Forest, R City West, L Cityplace, R Rogerdale, L Westheimer, R Briarpark, S Ranchester, L Harwin, Hillcroft P\&R, Southwest Fwy HOT or main lanes, Exit Richmond, Wheeler TC Westbound Route:

- Wheeler TC, L Richmond, L Spur 527, Southwest Fwy HOT or main lanes, Exit

Hillcroft TC, R Harwin, R Ranchester, S Briarpark, L Westheimer, R Rogerdale, Cityplace, R City West, L Briar Forest, L Dairy Ashford, R Whittington, R Westella, L Enclave, L Parkway Plaza, L Eldridge, R Briar Forest, L Briar Home, R Scholarship, Scholarship \& Valedictorian

## Proposed Equipment:

- $40^{\prime}$ transit bus

Transit System Reimagining Going Places

153 Harwin Flyer


© Transit Center
© Park \& Ride - Quickline Stop


Base headway includes weekday middays, weekends, and evenings. Span is consistent seven
days a week.

## 160 Memorial City Flyer

Frequent Network

## Memorial City to Downtown:

| Peak Headway | Base Headway | Span |
| :---: | :---: | :---: |
| 40 | 5 | 8 |
| Minutes | Minutes | Hours (approx.) |

Frequent service between Memorial City and Downtown composed of 160, 161, and 162 .

## Activity Centers:

- Memorial City, Uptown, Downtown

Rail Line Connections:

- Downtown (Red, Green and Purple)

Frequent Network Connections:
26 Long Point/Cavalcade, 33 Post Oak, 40 Heights/Telephone/41 Kirby Polk, 46 Gessner, 51/52 Hardy, 54 Scott, 82 Westheimer, 85 Antoine/Washington, 137 Northshore Flye
Transit Center and Park \& Ride Connections:

- Northwest TC, Downtown TC

Eastbound Route:
Memorial City \& Barryknoll, R Barryknoll, R Gessner, R Katy Freeway, enter managed lanes, exit Northwest TC, ramps to Katy Freeway, enter Katy Freeway HOV, L Franklin R Smith, L Pierce, L Downtown TC
Westbound Route:
Downtown TC, L St. Joseph, R Lovisiana, L Congress, L Franklin, R Katy Freeway HOV, S Katy Freeway, exit Northwest TC, L Old Katy, S Katy Freeway managed lanes, exit Gessner, L Gessner, R Kingsride, R Frostwood, R Katy Freeway frontage, R Memorial City, Memorial City \& Barrykno
Proposed Equipment:
60' transit bus as fleet allows or $40^{\prime}$ transit bus

Base headway includes weekday middays and weekends. Evening headway is 30 minutes. Span is consistent seven days a week.

Transit System Reimagining Going Places


160 Memorial City Flyer
Half Mile Access


## 161 Wilcrest Flyer

West Bellfort P\&R to Downtown:

| Peak Headway | Base Headway | Span |
| :---: | :---: | :---: |
| 20 | 30 | -8 |
| Minutes | Minutes | Hours (approx.) |

Frequent service between Memorial City and Downtown composed of 160, 161, and 162 .

## Activity Centers:

Me Cily Downtow
Frequent Network Connections:
2 Bellaire, 4 Beechnut, 25 Richmond, 26 Long Point/Cavalcade, 33 Post Oak, 40 Heights/Telephone/41 Kirby Polk, 46 Gessner, 51/52 Hardy, 54 Scott, 65 Bissonnet, 82 Westheimer, 85 Antoine/Washington, 137 Northshore Flyer
Transit Center and Park \& Ride Connections
-
Inbound Route:
W Bellfort P\&R, L Roark, R Bellfort, R Wilcrest, R Westpark, L Walnut Bend, L Westheimer, R Wilcrest, R Memorial, L Gessner, R Katy Freeway, enter managed lanes, exit Northwest TC, ramps to Kary Freeway, enter Katy Freeway HOV, L Franklin, R Smith, L Pierce, L Downtown TC
Outbound Route:
Downtown TC, L St. Joseph, R Lovisiana, L Congress, L Franklin, R Katy Freeway HOV, S Katy Freeway, Exit Northwest TC, L Old Katy, S Katy Freeway Managed Lanes, exit Gessner, L Gessner, R Memorial, LWilcrest, L Westheimer, R Walnut Bend, R Westpark, L Wilcrest, L Bellfort, L Roark, R W Bellfort P\&R
Proposed Equipment:

- $40^{\prime}$ transit bus

Base headway includes weekday middays, weekends, and evenings. Span is consistent seven days a week.

Transit System Reimagining Going Places


161 Wilcrest Flyer



## 162 Memorial Flyer

## Addicks P\&R to Downtown:

| Peak Headway | Base Headway | Span |
| :---: | :---: | :---: |
| 20 |  | 6 |
| Minutes | Minutes | Hours (approx.) |

Potential for additional "West Belt" route if peak overloads occur.
Additional frequency between Wilcrest and Northwest TC provided by 161 Wilcrest Flyer Frequent service between Memorial City and Downtown composed of 160, 161, and 162.

## Activity Centers:

- Energy Corridor, Memorial City, Downtown

Rail Line Connections:
Frequent Nown (Red, Green and Purple)
Frequent Network Connections:
26 Long Point/Cavalcade, 33 Post Oak, 46 Gessner, 51/52 Hardy, 54 Scott, 82 Westheimer, 85 Antoine/Washington, 137 Northshore Flyer
Transit Center and Park \& Ride Connections

- Addicks P\&R, Northwest TC, Downtown TC

Eastbound Route:
Addicks P\&R, LPark Row, L Hwy 6, L Katy Fwy frontage, R Addicks Howell, L Grisby, R Westlake Park, L Memorial, L Gessner, R Katy Fwy frontage, enter main lanes, enter Managed Lanes, Exit Northwest TC, ramps to Katy Fwy, enter Katy Fwy HOV lane, L Frankin, R Congress, R Smith, L Pierce, L Downtown TC

## Westbound Route

Downtown TC, L St. Joseph, R Lovisiana, LCongress, L Franklin, R Katy Fwy HOV lane, S Katy Freeway, Exit Northwest TC, ramps to Katy Fwy Managed Lanes, exit Gessner, L Gessner, R Memorial, R Westlake Park, L Grisby, R Hwy 6, R Park Row, R
Addicks P\&R Addicks P\&R
Proposed Equipment:

- 40' transit bus or $45^{\prime}$ motorcoach

Base headway includes weekday middays, weekends, and evenings. Span is consistent seven days a week.


162 Memorial Flyer



Transit System Reimagining Going Places
402 Bellaire Quickline
Weekday Only
Ranchester to TMC TC:

| Peak Headway | Base Headway | Span |
| :---: | :---: | :---: |
| 40 | 5 | 3 |
| Minutes | Minutes | Hours (approx.) |

Route operates weekdays only. laire TC, Stella Link, Kirby, Greenbriar, TMC TC

## Activity Centers:

- TMC

Rail Line Connections:

- TMC Transit Center Station (Red)

Frequent Network Connections:
4 Beechnut, 27 Shepherd, 33 Post Oak, 46 Gessner, 56 Airline/Montrose, 63 Fondren, 65 Bissonnet
Transit Center and Park \& Ride Connections

- Bellaire TC, TMC TC

Eastbound Route:
Clarewood \& Ranchester, R Ranchester, L Bellaire, Bellaire TC, S Holcombe, R Fannin, R TMC TC
Westbound Route
TMC TC, R Pressler, L Holcombe, S Bellaire, Bellaire TC, S Bellaire, R Corporate, R
Clarewood, Clarewood \& Ranchester

## Proposed Equipment

- 40 ' transit bus



## APPENDIX E METRO MARKET AND DEVELOPMENT DENSITY INDEX METHODOLOGY

The following is a detailed description of the Market and Development Density Index Methodology. The index was created for the Metropolitan Transit Authority of Harris County (METRO) as part of the System Reimagining Initiative. The index is part of the METRO Transit System Existing Conditions Report completed in 2013 (Available at URL)

Some content has been abridged for relevance. Table, figure, and footnote numbers have been changed for consistency with this report.

## INDEX METHODOLOGY

The Market and Development Density Index is based on the insight that higher density development can occur as the market responds to firm and household desires to locate in areas with good transit mobility. The goal of the index is to help METRO identify areas of high development potential where bus service can add to the value of the location and potentially stimulate new development.

The index identifies areas of potential demand for both commercial and residential development in the near-to-mid term ( 0 to five years). Longer term potential for TOD will depend more heavily on public policy decisions and the level of investment in specific areas. The index is comprised of five components representing demographic and market factors that influence TOD potential. These indicators are defined briefly below, and described in more detail in the next section of this chapter.

- Population Density is measured as the number of people per square mile in a given block group.
- Change in Population Density measures the difference in block group population density between 2000 and 2010.
- Transit-Supportive Employment Density is measured as the number of transit-supportive jobs per square mile. The definition of transit-supportive employment is based on prior research conducted by the Center for Transit-Oriented Development and includes the knowledge-based, education, health care, entertainment and government sectors. To account for the effect of proximity to employment in adjacent neighborhoods, block-level employment is generalized to include a portion of surrounding employment within a mile.
- Change in Employment Density measures the difference in employment density between 2002 and 2010.
- Assessed Property Value Density is calculated by adding the land and structure values for all residential and commercial properties in a given block group, and then dividing the total value by the block group area.

Each indicator is assigned a weight reflecting its relative impact on the total index score. The five indicators, associated weights and data sources are summarized in Table E-1. The specific steps involved in constructing the Market and Development Density Index were as follows:

1. Population, employment and property value data was compiled at the census block group level.
2. To address wide variations in data values, each data set was processed to create a more evenly distributed, compressed set of values. ${ }^{1}$
3. Each data set was scaled so that all values fall between 0 and 1 , with the lowest data point set to 0 and the highest data point set to 1 .
4. Each data set was multiplied by the indicator weight.
5. The index score for each block group was calculated by summing the scaled, weighted indicators

The index is intended to evaluate relative market strength at the regional level and does not include the full range of factors that impact TOD potential, particularly factors that influence the walkability and bikeability of the neighborhood, access to retail or services, and other important components of a successful transit-oriented development. A future revision of the index may include an indicator of the built environment, such as intersection density. Input from local developers will also enable the index to be interpreted and applied in a way that acknowledges more nuanced, qualitative factors.

- In all of the raw data sets, the standard deviation was equal or greater than the mean, indicating askewed istribution. Hi oher worrs, a feew block groups have much higher orlower values hian he majorty of block



## INDEX COMPONENTS

The following section describes each of the indicators in greater depth, including the rationale for incorporating each component into the overall index, and the main findings for each indicator.
TABLEE E-1:SUMMARY OF MARKET AND DEVELOPMENT
DENSITY INDEX COMPONENTS

## POPULATION DENSITY

High population density suggests current and historic market strength for compact and multifamily housing. Higher density places may also be more willing to accept additional density in comparison with lowerdensity, single family neighborhoods.

## POPULATION DENSITY CHANGE

In order to understand where recent population growth has taken place, the change in population density between 2000 and 2010 was calculated.

## TRANSIT-SUPPORTIVE EMPLOYMENT DENSITY

Proximity to employment centers is one of the most important factors influencing development around transit. ${ }^{2}$ Households consider access to jobs when making residential location decisions, while businesses consider the commute trips of their workforce, and are attracted to existing employment clusters for the benefits that come from clustering. Due to the importance of employment centers and the agglomeration effect, employment-related factors are given the greatest combined weight out of all the index components

Given the importance of employment centers as destinations for transit trips, major employment centers were identified in the Service Area1. These employment centers are listed in Table E-2.

More so than population density, employment is clustered in the CBD and to the west of the CBD. Almost all regional employment centers are located in this portion of the Service Area


## CHANGE IN EMPLOYMENT DENSITY GROWTH

In order to understand where recent employment growth has taken place, the change in employment density between 2002 and 2010 was calculated

| TABLE E-2 SUMMARY OF METRO SERVICE AREA EMPLOYMENT |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Employment Center | $\begin{aligned} & \text { Total } \\ & \text { Jobs } \end{aligned}$ | TOD Supportive Jobs | TOD Job Density <br> (Jobs per SqMi) | Percent TOD Supportive Jobs |
| Downtown | 151,500 | 95,000 | 53,700 | 63\% |
| Texas Medical Center/ Rice University | 80,600 | 78,600 | 36,800 | 98\% |
| Greenway | 79,000 | 64,800 | 59,100 | 82\% |
| Westchase | 51,500 | 31,800 | 6,800 | 62\% |
| Uptown/Galleria | 53,700 | 31,200 | 30,600 | 58\% |
| NASA/Clear Lake | 29,200 | 23,800 | 3,300 | 82\% |
| Energy Corridor | 30,800 | 19,900 | 5,400 | 65\% |
| Memorial City/ Town \& Country | 21,300 | 17,700 | 10,900 | 83\% |
| University of Houston/Texas Southern University | 15,700 | 15,600 | 17,800 | 99\% |
| Sharpstown | 16,300 | 12,000 | 8,800 | 74\% |
| Midtown | 19,400 | 11,900 | 12,800 | 61\% |
| Augusta/Fountain View | 15,800 | 10,800 | 10,200 | 68\% |
| Greenspoint | 21,900 | 10,300 | 7,500 | 47\% |
| Post Oak - East of 610 | 15,000 | 10,200 | 18,500 | 68\% |

## ASSESSED PROPERTY VALUE DENSITY

Assessed property values reflect the value of land, residentia development and commercial development throughout the Service Area Areas with strong real estate markets are likely to have higher land and building values, as well as higher density development, all of which will contribute to higher property values within a given area. Thus, this indicator reflects existing and historic market strength in a given location.


# APPENDIX F EXISTING AND FUTURE TRAFFIC VOLUMES 

\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline \multicolumn{2}{|r|}{ROADWAY} \& \multicolumn{6}{|c|}{ExIsting} \& \multicolumn{11}{|c|}{FUTURE} \\
\hline Street \& Segment \& Classification \& Lanes \& Wath \& at range \& ADt (High) \& Lane Demand \& Estimated 2040 ADT
Range \& \[
\begin{gathered}
\text { Estimated } 2040 \text { ADT } \\
\text { (High) }
\end{gathered}
\] \& \[
\begin{aligned}
\& \text { Future Lane } \\
\& \text { Demand }
\end{aligned}
\] \& Lane Availability Based
on ROW \& \[
\begin{aligned}
\& \text { Lane Demand Not } \\
\& \text { Met }
\end{aligned}
\] \& Venicie Demand Not Met \& Daily Vehicle \& Daily Vehicle Passengers \& \[
\begin{aligned}
\& \text { Lane Demand Not } \\
\& \text { Met }
\end{aligned}
\] \& Vehicle Demand not
Met \& Daily Vehicle
Passengers not Met \\
\hline \multirow{4}{*}{Alietcodidine} \& Beleakto kitwood \& T \& 4 \& 80 \& 30,500 \& 30,500 \& 4.1 \& 37,000 \& 37,000 \& 4.9 \& 4 \& 0.9 \& 6,750 \& 46,250 \& 8,438 \& 0.9 \& 6,750 \& 8.438 \\
\hline \&  \& T \& 4 \& 80 \& 20,000-39,000 \& 39,000 \& 5.2 \& 30,50.50,000 \& 50,000 \& 6.7 \& 4 \& 2.7 \& 20,50 \& 62,500 \& 25,313 \& 2.7 \& 20,50 \& 25,313 \\
\hline \& Daivastior it smot \& T \& 4 \& 80 \& 24,000-25000 \& 25,000 \& 3.3 \& 34,000-34,500 \& 34,500 \& 4.6 \& 4 \& 0.6 \& 4,500 \& 43,125 \& 5.625 \& 0.6 \& 4.500 \& 5,625 \\
\hline \& symatiow. Ciy Limt \& T \& 4 \& 80 \& 11,000-27,000 \& 27,000 \& 3.6 \& 23,000-36,000 \& 36,000 \& 4.8 \& 4 \& 0.8 \& 6,000 \& 45,00 \& 7,500 \& 0.8 \& 6,000 \& 7,500 \\
\hline \multirow[t]{2}{*}{Bare-colotine} \& N. Cyylum towestemer Pky. \& T \& 4 \& 100 \& \& \& \& \& \& \& 4 \& \& \& \& \& \& \& \\
\hline \& Sthemer Pew. tow westemer \& T \& 4 \& 100 \& \& \& \& \& \& \& 4 \& \& \& \& \& \& \& \\
\hline \multirow{3}{*}{Barce-c.pypess} \& Kay fw. © Parar Row \& T \& 6 \& 100 \& 22,000 \& 22,000 \& 2.9 \& 26,500 \& 26,500 \& 3.5 \& 6 \& -2.5 \& -18,750 \& 33,125 \& -23,438 \& -2.5 \& -18,750 \& -23,438 \\
\hline \& Pak Row losams \& T \& 4 \& 100 \& 28,000 \& 28,000 \& 3.7 \& 33,500 \& 33,500 \& 4.5 \& 6 \& -1.5 \& -11,250 \& 41.875 \& -14,063 \& 0.5 \& 3,750 \& 4,688 \\
\hline \& Saums on Covivimit \& T \& 4 \& 100 \& 29,500 \& 29,500 \& 3.9 \& 35,500 \& 35.500 \& 4.7 \& 6 \& -1.3 \& -9,750 \& 44,375 \& -12,188 \& 0.7 \& 5,250 \& 6,563 \\
\hline \multirow[t]{2}{*}{Bankuoll} \& Cessmer to sumer Hill \& m \& 4 \& 60 \& \& \& \& \& \& \& 4 \& \& \& \& \& \& \& \\
\hline \& Fonden los. Cosesmer \& P \& 8 \& 135 \& 57,00-58,000 \& 58,000 \& 7.7 \& 90,50.98,000 \& 98,000 \& 13.1 \& 8 \& 5.1 \& 38,250 \& 122,500 \& 47,813 \& 5.1 \& 38,250 \& 47,813 \\
\hline \multirow{8}{*}{Bellife} \& S. Cessserat Peancosester \& P \& 8 \& 150 \& 51,000 \& 51,000 \& 6.8 \& 90,000 \& 90,000 \& 12.0 \& 8 \& 4 \& 30,000 \& 112,500 \& 37,500 \& 4.0 \& 30,000 \& 37,500 \\
\hline \& Rancheseser to West Bat \& P \& 8 \& 130 \& 50,000 \& 50,000 \& 6.7 \& 98,000 \& 98,000 \& 13.1 \& 8 \& 5.1 \& 38,250 \& 122,500 \& 47,813 \& 5.1 \& 38,250 \& 47,813 \\
\hline \& West eitlo Wiresest \& P \& 6 \& \({ }_{120}^{120}\) \& 41,000.54,000 \& 54,000 \& 7.2 \& \({ }^{61,000-79,000}\) \& 79,000
56500 \& \begin{tabular}{l}
10.5 \\
7 \\
\hline
\end{tabular} \& 8 \& 2.5 \& 18,750 \& 98,50 \& 23,438 \& 4.5 \& 33,50
11250 \& \({ }^{42,188}\) \\
\hline \& Wicest okitwood \& P \& 6 \& 120 \& 34,000-43,000 \& 43,000 \& 5.7 \& 50,00-56,500 \& 56,500 \& 7.5 \& 8 \& -0.5 \& -3,750 \& 70,625 \& -4,688 \& 1.5 \& 11,250 \& 14,063 \\
\hline \& Kitsood lo Cook \& P \& 6 \& 120 \& 35,500 \& 35,500 \& 4.7 \& 47,500 \& 47,500 \& \({ }_{6} .3\) \& 8 \& -1.7 \& -12,750 \& 59,375 \& -15,938 \& 0.3 \& 2,250 \& 2,813 \\
\hline \& Cook O DiandAstiocd \& P \& 6 \& 120 \& 30,500 \& 30,500 \& 4.1 \& 40,500 \& 40,500 \& 5.4 \& 8 \& -2.6 \& -19,500 \& 50,625 \& -24,375 \& -0.6 \& -4,500 \& -5,625 \\
\hline \& Dairs-Astrocr i s symot \& P \& 6 \& 120 \& 34,000-39,500 \& 39,500 \& 5.3 \& 49,50-53,500 \& 53,500 \& 7.1 \& 8 \& -0.9 \& -6,750 \& \({ }^{66,875}\) \& -8,438 \& 1.1 \& 8,250 \& 10,313 \\
\hline \& spmot ow. Cily Limit \& P \& 6 \& 120 \& 33,500 \& 33.500 \& 4.5 \& 45,500 \& 45,500 \& 6.1 \& 8 \& -1.9 \& -14,250 \& 56.875 \& -17,813 \& 0.1 \& 750 \& 937 \\
\hline \multirow{5}{*}{Blook} \& Kay Fw. toweswew \& T \& 4 \& 100 \& 26,000 \& 26,000 \& 3.5 \& 31,500 \& 31,500 \& 4.2 \& 6 \& -1.8 \& -13,500 \& 39,375 \& -16,875 \& 0.2 \& 1,500 \& 1.875 \\
\hline \& Wessuev ot olon Pont \& T \& 4 \& 100 \& 22,500 \& 22,500 \& 3.0 \& 26,000 \& 26,000 \& 3.5 \& 6 \& -2.5 \& -18,750 \& 32,500 \& -23,438 \& -0.5 \& -3,750 \& -4,688 \\
\hline \& \& T \& 4 \& 100 \& 21.5002.2500 \& \(\begin{array}{r}22,500 \\ 1.500 \\ \hline\end{array}\) \& 3.0 \& 250,00288000 \& \({ }^{28,000}\) \& \({ }^{37}\) \& \({ }_{6}\) \& \({ }^{23}\) \& -17250 \& 35000

25000 \& -21,563 \& ${ }^{-0.3}$ \& $\begin{array}{r}\text {-2,30 } \\ -250 \\ \hline 0\end{array}$ \& ${ }_{2}^{2813}$ <br>
\hline \& Hammerly to Kempwood \& T \& 4 \& 100 \& 18.5500 \& 16.500 \& 2.2 \& 20.000 \& 20.00 \& 2.7 \& 6 \& ${ }^{3.3}$ \& 24,50 \& 25.00 \& ${ }^{-3,9988}$ \& ${ }^{1.3}$ \& -9,750 \& - $\begin{array}{r}\text {-12,188 } \\ -10313 \\ \hline\end{array}$ <br>
\hline \& Kemmeothaly Pa \& T \& 4 \& 100 \&  \& 17,500
19.500 \& 2.3
26 \&  \& 21,500
24.500 \& 29
3 \& 6 \& 3.1
.27 \& 22350
.20250 \& 26.875
30.625 \& ${ }_{\text {-20033 }}$ \& $\stackrel{-1.1}{-.7}$ \&  \& ${ }_{-0}^{-10.538}$ <br>
\hline \multirow[t]{3}{*}{} \& Ealiere svo of tawn \& m \& 4 \& 80 \& \& \& \& \& \& \& 4 \& \& \& \& \& \& \& <br>
\hline \& Hewe towestemer \& m \& 4 \& 80 \& 23,5002.8,500 \& 28.500 \& ${ }^{3} 8$ \& 4,5,50,54,000 \& 54,00 \& 7.2 \& 4 \& 3.2 \& 24,000 \& 67,500 \& 30.00 \& 3.2 \& 24,000 \& 30,00 <br>
\hline \& Nenorial cosesser \& T \& 4 \& 100 \& 34,00040,000 \& 40,00 \& ${ }_{5} 5$ \& 499000.53,500 \& ${ }^{53,500}$ \& 7.1 \& 6 \& 1.1 \& 8.250 \& 6.8875 \& 10,313 \& 3.1 \& 23,35 \& ${ }^{29,063}$ <br>
\hline \multirow{7}{*}{Briar Foest} \& Cosseret Wesestert \& T \& 4 \& 100 \& 33,5003.35.500 \& 35.50 \& 4.7 \& 4 4,00044,500 \& 44.500 \& 5.9 \& 6 \& 0.1 \& -750 \& ${ }_{56,265}$ \& -937 \& 1.9 \& 14.250 \& 17,813 <br>
\hline \& Westelt wicest \& T \& 4 \& 100 \& 33,0003,9000 \& 39,00 \& 52 \& 4,400047,000 \& 47,000 \& ${ }_{6} 3$ \& 6 \& 0.3 \& 2250 \& 58,70 \& 2.813 \& 23 \& 17,50 \& 2,563 <br>
\hline \& Weastokitwood \& T \& 4 \& 100 \& 3,450-37,500 \& 37,500 \& 5.0 \& 44,00046,000 \& 46,000 \& ${ }_{6} 6$ \& 6 \& 0.1 \& ${ }^{750}$ \& 57,500 \& ${ }^{937}$ \& 2.1 \& 15,550 \& 19.688 <br>
\hline \& Kimeoot odivinatiod \& T \& 4 \& 100 \& 29,0003,1.500 \& 31,500 \& 42 \& 37,0004,4,000 \& 44.000 \& 5.9 \& 6 \& 0.1 \& -750 \& 55,00 \& -937 \& 1.9 \& 14,250 \& 17,813 <br>
\hline \& DaimAstioctiodedides \& T \& 4 \& 100 \& 22,5002-29500 \& 29.500 \& 3.9 \& 37,50040,500 \& 40,500 \& 54 \& 6 \& -0.6 \& 4.500 \& ${ }_{50,225}$ \& -5.625 \& 1.4 \& 10.500 \& ${ }^{13,125}$ <br>
\hline \& Eatidge of Patwey Plara \& T \& 4 \& 100 \& 33,00 \& 33,00 \& 4.4 \& 44,000 \& 44.00 \& 5.9 \& 6 \& 0.1 \& -750 \& 55.00 \& . 937 \& 1.9 \& 14.50 \& 17,813 <br>

\hline \& Patay Plaza iost \& T \& 4 \& ${ }_{80}^{100}$ \& 20.000 \& | 20.000 |
| :--- |
| 2450 | \& ${ }^{27}$ \& ${ }^{31,000}$ \& 31.00 \& ${ }_{1}^{4.1}$ \& 4 \& $\stackrel{-1.9}{85}$ \& -14,250 \&  \& -17,813 \& 0.1

85 \& ${ }_{\substack{750 \\ 6350}}$ \& ${ }_{\text {c }} 937$ <br>
\hline \multirow{4}{*}{Bitimoore} \& Key Fw, bwesver \& T \& 4 \& ${ }_{80}^{80}$ \& ${ }_{2}^{24,500}$ \& ${ }^{24,000}$ \& $\begin{array}{r}27 \\ 2.7 \\ \hline\end{array}$ \& ${ }^{93,500}$ \& ${ }^{93,500}$ \& 12.8
6.8 \& 4 \& ${ }_{2} 8$ \& 21,000 \& ${ }^{16,3750}$ \& 20.250 \& ${ }_{28} 8$ \& 2,000 \& 79.688
26,50 <br>
\hline \& Henmely b Kenpuod \& T \& 4 \& ${ }^{80}$ \& 16,000 \& 16,000 \& 2.1 \& 37,500 \& 37,500 \& 5.0 \& 4 \& 1 \& 7.500 \& 46.875 \& ${ }^{\text {9,375 }}$ \& 1.0 \& 7.500 \& ${ }^{\text {9,725 }}$ <br>
\hline \& \& T \& 4 \& 80 \& 20,00 \& 20.00 \& 2.7 \& 47,500 \& 47,500 \& ${ }_{6} .3$ \& 4 \& ${ }^{2} 3$ \& 17.250 \& 59.375 \& 2.5153 \& 23 \& 17.250 \& 21.563 <br>
\hline \& Ciay fi. on. Civimimit \& T \& 4 \& 80 \& 27,500 \& 27,500 \& 3.7 \& 39.500 \& 39,500 \& ${ }_{5} 5$ \& 4 \& 1.3 \& 9,750 \& 49,375 \& 12,188 \& 1.3 \& 9,550 \& 12,188 <br>
\hline \multirow[b]{3}{*}{simeer till} \& NLTue Yokt temensear \& T \& 4 \& 80 \& 31,5003.35,00 \& 35000 \& 4.7 \& 47,50048,500 \& 48.500 \& ${ }_{6} .5$ \& 4 \& 2.5 \& 18,50 \& 60,625 \& 23.488 \& 2.5 \& 18,50 \& 23.388 <br>
\hline \& Kay wew blowesuav \& m \& 4 \& 70 \& 17,500 \& 17.550 \& ${ }^{2} 3$ \& 21.500 \& 21.500 \& 2.9 \& 4 \& ${ }^{1.1}$ \& -8,50 \& 28.875 \& -10,313 \& ${ }^{-1.1}$ \& -8,20 \& -10,313 <br>

\hline \& Wessievololop Poin \& mu \& 4 \& ${ }_{70} 70$ \& | 19,500 |
| :--- |
| $\begin{array}{l}2,500\end{array}$ |
| 1 | \& | 19,500 |
| :--- |
| $\begin{array}{l}1,500\end{array}$ |
| 1 | \& 26

29 \& \begin{tabular}{l}
26,500 <br>
24500 <br>
\hline

 \& 

26,500 <br>
24500 <br>
\hline

 \& 

3.5 <br>
3 <br>
\hline
\end{tabular} \& 4 \& 0.5

-07 \& | 3.750 |
| :--- |
| .5520 | \& 33,25

3.205

3 \& -4.688 \& -0.5 \& | 3,750 |
| :--- |
| .5520 | \& -4.688 <br>

\hline \multirow{5}{*}{Campeal} \& Baloxt ohammely \& m \& 4 \& ${ }_{70}$ \& ${ }^{2,1,500}$ \& ${ }_{\text {2, }}^{1,5000}$ \& ${ }_{2}^{29}$ \& ${ }_{4}^{24,2000}$ \& ${ }_{42,500}^{24500}$ \& | 3.3 |
| :--- |
| 5.6 | \& 4 \& | 0.0 |
| :--- |
| 1.6 | \& | 5.250 |
| :--- |
| 12.200 |
| 1 | \& ${ }_{\substack{30,25 \\ 52500}}$ \&  \& 0.7

1.6 \& \begin{tabular}{l}
-5,200 <br>
12000 <br>
\hline

 \& 

-.6.53) <br>
15000 <br>
\hline
\end{tabular} <br>

\hline \& mameituemor \& m \& 4 \& 70 \& 14,000 \& 14.000 \& 1.9 \& 20,00 \& 20.000 \& ${ }^{2} 7$ \& 4 \& ${ }^{-1.3}$ \& -9,50 \& 25.000 \& -12,188 \& ${ }^{-1.3}$ \& -9,750 \& -12,188 <br>
\hline \& Empar ionempood \& m \& 4 \& 70 \& 12,000 \& 12.000 \& 1.6 \& 18.000 \& 18,000 \& 24 \& 4 \& 1.6 \& 12,00 \& 22.500 \& -15,000 \& 1.6 \& 12,00 \& -15,00 <br>
\hline \& Kenmod local Red \& ms \& 4 \& 70 \& 16,000 \& 16,00 \& ${ }^{2} 1$ \& 19,000 \& 19,000 \& 25 \& 4 \& 1.5 \& -11,250 \& 23,50 \& -14,03 \& 1.5 \& -11,250 \& -14,03 <br>
\hline \& Clav Rad. Tamer \& ms \& 4 \& 70 \& 13,000-4,4,00 \& 14,000 \& 1.9 \& 17,000-18,000 \& 18.00 \& 24 \& 4 \& ${ }^{1.6}$ \& -12,00 \& 22.500 \& -15,00 \& ${ }^{1.6}$ \& -12,00 \& -15,00 <br>
\hline \multirow[b]{4}{*}{cay} \& tennstaxas locanvelal \& P \& 6 \& 100 \& 27,5003,5,500 \& 35.500 \& 4.7 \& 38,00044,500 \& 46.500 \& 6.2 \& - \& 0.2 \& 1.500 \& 58.125 \& 1.875 \& 0.2 \& 1.500 \& 1.875 <br>
\hline \& Campelth Cesserse Rd. \& p \& 6 \& 100 \& 32,00038,000 \& 38,00 \& 5.1 \& 42000:50,500 \& 50,500 \& 6.7 \& 6 \& 0.7 \& 5.250 \& ${ }^{63,125}$ \& 6.563 \& 0.7 \& 5.250 \& 6.563 <br>
\hline \&  \& P \& 6 \& 100 \& 30,000.34,000 \& 34.000
35000 \& 4.5 \& 38,500.50,000 \& 50.000 \& ${ }^{6.7}$ \& 6 \& 0.7 \& 5.250 \& ${ }^{62500}$ \& 6,563 \& 0.7 \& 5.250 \& 6.563 <br>
\hline \&  \& P \& ${ }_{6}^{6}$ \& 100
100 \& ${ }_{\text {2850003 }}{ }^{351000}$ \& 35000
31000 \& ${ }_{4.7}^{4.7}$ \& ${ }_{\text {chen }}^{\text {4,0000 }}$ \& 44.000
44000 \& 59

59 \& ${ }_{6}^{6}$ \& | -0.1 |
| :--- |
| 0.1 | \& - 7.750 \& 55.000

55000 \& $\stackrel{.937}{.937}$ \& | -0.1 |
| :--- |
| 0.1 | \& $\begin{array}{r}\text { - } 750 \\ .750 \\ \hline\end{array}$ \& $\stackrel{.937}{\text {-.937 }}$ <br>

\hline \multirow{3}{*}{Cook} \& Pher Foestlo Ouvensison \& - \& 6 \& 100 \& 24.500 \& 24.500 \& ${ }^{3} 3$ \& ${ }_{33,500}$ \& ${ }_{33,500}$ \& ${ }_{4.5}$ \& 6 \& ${ }^{-1.5}$ \& ${ }^{11,250}$ \& 41.875 \& 140,03 \& ${ }^{-1.5}$ \& ${ }^{11,250}$ \& 14,003 <br>
\hline \&  \& ms \& 4 \& 100 \& 22.00 \& 22.00 \& 29 \& 29.500 \& 2.550 \& 3.9 \& 6 \& 2.1 \& -15,750 \& 38.875 \& -19,688 \& 0.1 \& -750 \& .938 <br>
\hline \& Elicicato keyFw \& T \& 4 \& 100 \& \& \& \& \& \& \& 6 \& \& \& \& \& \& \& <br>
\hline \multirow{6}{*}{Daiva Afitod} \& Kave ww bowenoial \& T \& 6 \& 100 \& 39,50.54,000 \& 54.00 \& 7.2 \& 59,000778,000 \& 78.00 \& 10.4 \& 6 \& 4.4 \& 33.00 \& 97.500 \& 41.250 \& 4.4 \& 33.00 \& 41.250 <br>
\hline \& Nemorial b biarafoest \& T \& 6 \& 100 \& 42,00.5.2.000 \& 52000 \& 6.9 \& 67,00085,000 \& 85.00 \& 11.3 \& 6 \& ${ }_{5} 5$ \& 39,50 \& 106,250 \& 49.988 \& 5.3 \& 39,50 \& 49.888 <br>
\hline \& Biar Foestiowewtemer \& T \& 6 \& 100 \& 33,000-3,9000 \& 39,000 \& 5.2 \& 43,50046,500 \& 46.500 \& ${ }^{6} 2$ \& 6 \& 0.2 \& 1.500 \& 58.125 \& 1.875 \& 0.2 \& 1.500 \& ${ }_{1}^{1.875}$ <br>
\hline \&  \& T \& ${ }^{6}$ \& 100
100 \& 29,000
40,000 \& 20,000
40,000 \& 3.9
5.3 \& 37,500
47,000 \& 37,500
47,000 \& 5.0
6.3 \& ${ }_{6}$ \& ${ }_{0}^{-1}$ \& -7,500
2.250 \& ${ }_{\substack{46,75 \\ 58,50}}$ \& -9,35
2,813 \& -1.0
0.3 \& -7,500 \& ${ }_{\text {- }}^{\text {- } 2,735}$ <br>
\hline \& Westakk 0 Alicticadine \& T \& 6 \& 100 \& 34,0003,3,000 \& 33,00 \& 4.4 \& 42,50043,000 \& 43,000 \& ${ }_{5} .7$ \& 6 \& ${ }^{0.3}$ \& -2,250 \& ${ }_{53,50}$ \& -2813 \& ${ }^{0.3}$ \& 2.250 \& -2813 <br>
\hline \& Nifetcodeneo osalife \& T \& 4 \& 100 \& 250002.25,500 \& 25.500 \& 3.4 \& 3,5,003,5,500 \& 37,500 \& 5.0 \& 6 \& -1 \& -7.500 \& 4.8 .75 \& -9,375 \& 1.0 \& 7,500 \& 9,375 <br>
\hline
\end{tabular}

hwouston

| ROADWAY |  | OPPortunities |  |  |  | Percent Personsin Other Modes*** | Percent Persons <br> in Other Modes | CONCLUSION | COMMENTS |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Stret | Segm | Bike | Ped | Transit | Increase Number of Lanes |  |  |  |  |
| Alisiclodine | Beleakik okitimood |  |  |  |  | 18\% | 18\% | Area of Concem | Accuire ROW? |
|  |  |  |  |  |  | 41\% | 41\% |  |  |
|  | Daindistioct osmot |  |  |  |  | 13\% | 13\% |  |  |
|  | smatit w. Civ Limit |  |  |  |  | 17\% | 17\% |  |  |
| Barecratome | Westremer Pewy iowestemer |  |  |  |  | . | . |  |  |
|  |  |  |  |  |  |  |  |  |  |
| Baracecopreses | Katy Fwy. to Park Row Park Row to Saums | ? | ? | ? | $\times$ | -71\% | -71\% | Widen | Widen for cas, tansitor bikeleded? |
|  | Sams on coy | ? | ? | $?$ | ${ }^{x}$ | -27\% | 15\% |  |  |
| Bandmoll | Cassere 0 bincer Hill | ? | ? |  |  |  |  |  |  |
| Bellite | Fonden 0 S Cossmer |  | $\times$ | DL? |  | 39\% | 39\% | Area of Concem |  |
|  | S. Cassere to Renctiester |  | x | ${ }^{\text {DL? }}$ |  | 33\% | 33\% |  | Nor rom tow widen |
|  | Ranchesest owest Eetit |  | $\times$ | DL? |  | 39\% | 39\% |  | High hic even if widened |
|  | West Betlo Wicest |  | x | $\mathrm{DL}^{\text {2 }}$ | $x$ | 24\% | 43\% | Widen |  |
|  |  |  | $\times$ | DL? | $\times$ | .7\% | 20\% |  |  |
|  | Kithood tocosk |  | $\times$ | DL? | $\times$ | .27\% | 5\% |  | Add dedicieded tansit lane? |
|  | Cookt Daindestiod |  | $\times$ | DL? | $\times$ | -48\% | -11\% |  |  |
|  | Dind.Astord tosmot |  | $\times$ | DL? | $\times$ | -13\% | 15\% |  |  |
|  | smotit w. Civy Limit |  | $\times$ | DL? | $\times$ | -31\% | 2\% |  |  |
| Baloxk | Kay Fw. Loweswew | $?$ | ? |  | x | -43\% | 5\% | Possible Opoorunity for Pedibicycte | Widen for bikeped |
|  | Nestrew $0^{\text {cong Poin }}$ | ? | ? |  | $\times$ | -72\% | -14\% |  |  |
|  | Lompent thanneit | ? | ? |  | $\times$ | - $6.62 \%$ | - 8 \% |  |  |
|  |  | ? | ? |  | $\times$ | -108\% | .38\% |  |  |
|  | Cay Reltotensead | ? | ? |  | $\times$ | ${ }^{83 \%}$ | .21\% |  |  |
| Sters | Belimematatamin | ? | ? |  |  | . |  |  | High vc: no RoW avalable |
|  |  |  |  |  |  | 44\%\% | 44\%\% | Area i Concem |  |
|  | Memorial to Gessner |  |  |  | $\stackrel{\times}{\times}$ | 15\% | ${ }_{\text {32\% }}^{43 \%}$ |  |  |
|  | Weat Bat oweer |  |  |  | ${ }^{\times}$ | 5\% | $37 \%$ |  | High hc even if widened |
|  | Weseat K itamad |  |  |  | $\times$ | 2\% | 34\% |  |  |
| Brar Foest |  |  |  |  | $\times$ | 2\% | 32\% |  |  |
|  | Dairy-Ashford to Eldridge |  |  |  | $\times$ | -11\% | 20\% |  |  |
|  |  |  |  |  | - | 46\% | ${ }^{32 \%}$ |  |  |
|  | keyprow oweswen |  |  |  |  | 68\% | 68\% |  |  |
|  | Weswevo bemmely |  |  |  |  | 41\% | 41\% |  | High Vc; no ROW |
| 8itimowe | Hammerly to Kempwood |  |  |  |  | 20\%\% | 20\% |  |  |
|  | Cape on ay mit |  |  |  |  | 25\% | 25\% |  |  |
|  | Vime vorus tensplead |  |  |  |  | ${ }_{39 \%}$ | ${ }^{39 \%}$ |  |  |
| smmer Hill | Kay Fw. Loweswem |  |  |  |  | .38\% | .38\% | Leave As is |  |
|  | Westevoloco peort |  |  |  |  | - $214 \%$ | ${ }^{-14 \%}$ |  |  |
| Canpoeal |  | mode? | mode? | model | moder | 29\% | 29\% |  |  |
|  | Hameedy 0 Emod |  |  |  |  | $49 \%$ | 49\% |  |  |
|  | Empor bempued |  |  |  |  | 67\%\% | . $67 \%$ |  |  |
|  | Kempwood to Clay Rd Clay Rd. to Tanner |  |  |  |  |  | . 5 . $67 \%$ |  |  |
| Cay |  |  |  |  |  | 3\% | 3\% | Area of Concem |  |
|  | Candeall 0 cassara fad |  |  |  |  | 10\% | 10\% |  |  |
|  | Gessner Rd. to Brittmoore |  |  |  |  | - $11 \%$ | - $11 \%$ |  | High Vc; no ROW |
|  |  |  |  |  |  | 2\% | -2\% |  |  |
|  | Pen foesto Omenston |  |  |  |  | .34\% | . $34 \%$ |  |  |
| ${ }^{\text {cook }}$ |  | $?$ | $?$ |  | $\times$ | 53\% | .3\% | Widen | Possible bikepeded |
|  | Eldridge to Katy Fwy. |  |  | 2 |  | $4{ }^{2} 26$ | $42{ }^{2}$ | Area of Coneem |  |
|  | Nemomiosiaraees |  |  | $?$ |  | $47 \%$ | 47\% |  |  |
|  | Biaf Foasto westemer |  |  | $?$ |  | 3\% | 3\% |  | Replace evicicle lane w/ transi? |
| Dana Astiod | Westremento Bicimond |  |  | $?$ |  | 20\% | 20\% |  |  |
|  | Richmond to Westpark Nestpark to Alief-Clodine |  |  | ? |  | 5\% | 5\% |  |  |
|  | Anticamem obate |  | $\times$ | ? |  | -20\% | 20\% | Widen |  |

Lane Demand based on 7,50 verlinanelday
For Rows s greater than 100 , assumed maximum number of lanes as 10

 Average evidide ocuranary assumed to be 1.25 personsseneicide
"Assumes al unmet pesson demand is in other modes

|  | Roadway | ExIsting |  |  |  |  |  | FUTURE |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street | Segmat | Classifiction | Lanes | Widh | adt range | ADt (High) | Lane Demand | Estimated 2040 ADT Range Range | $\begin{gathered} \text { Estimated } 2040 \text { ADT } \\ \text { (High) } \end{gathered}$ | $\begin{aligned} & \text { Future Lane } \\ & \text { Demand } \end{aligned}$ | Lane Availability Based on ROW | $\begin{aligned} & \text { Lane Demand Not } \\ & \text { Met } \end{aligned}$ | Venicie Demand Not Met | Daily Vehicle | Daily Vehicle Passengers Not Met | Lane Demand Not Met | $\begin{aligned} & \text { Vehicle Demand not } \\ & \text { Met } \end{aligned}$ | $\begin{gathered} \text { Daily Vehicle } \\ \text { Passengers not Met } \end{gathered}$ |
| Elaridge | N. Ciylmimioay Pd | P | 6 | 100 | 23,50036,000 | 36,00 | 48 | 29,50042,200 | 42000 | 5.6 | 6 | ${ }^{0.4}$ | 3.000 | 52500 | -3,50 | 0.4 | 3.000 | -3,50 |
|  | Caypd. okay fw. | P | 6 | 200 | 34,00:36,000 | 36,00 | 4.8 | 4,0.00043,000 | 43.000 | 5.7 | 10 | 4.3 | 32250 | 53,750 | 40.313 | ${ }^{0.3}$ | 2230 | -2813 |
|  | Kay Fw. - wemenoil | P | 6 | 100 | 55.00 | 55,00 | 7.3 | ${ }^{68,500}$ | ${ }^{68,500}$ | 9.1 | 6 | 3.1 | 23,50 | ${ }^{85,525}$ | 20.03 | 3.1 | 23.50 | 20.03 |
|  |  | P | 6 | 110 | 39,500 | 39,500 | $5_{5}$ | 49.00 | 49.00 | 6.5 | 6 | 0.5 | 3,750 | 61.20 | 4,688 | 0.5 | 3,750 | 4,688 |
|  | Surab Bay bu bia foest | P | 6 | 100 | 31,504, 1,50 | 41.500 | 5.5 | 4.3.000.50,50 | 50,50 | 6.7 | 6 | 0.7 | 5.250 | 63.125 | 6.563 | 0.7 | 5.250 | 6.563 |
|  | Biaia foest Westhemer | P | 6 | 100 | 34,500 | 34.500 | 4.6 | 43.500 | 43.550 | 58 | 6 | -0.2 | -1.500 | 54,375 | -1.875 | 0.2 | -1,500 | -1,875 |
|  | civ Limito Aliticadide | P | 6 | 120 | 29,0003,1,500 | 31,500 | 4.2 | 4.550443,000 | 43.00 | 5.7 | 8 | 2.3 | -17,50 | 53,70 | -21,56 | 0.3 | 2.250 | -2.813 |
| Endave | Eatiose e biat Foust | m | 4 | 90 |  |  |  |  |  |  | 4 |  |  |  |  |  |  |  |
| Fonden | Henssead oww Fiw. | T | 4 | 100 | 17,502:7,500 | 27,500 | ${ }^{3} 7$ | 19,000323200 | 32000 | 4.3 | 6 | ${ }^{1.7}$ | 12,750 | 40.00 | -15,938 | 0.3 | 2.250 | 2.813 |
|  | Pney Pont owesthener | T | 4 | 100 | 22000 | 22000 | 2.9 | 27,50 | 27,500 | 3.7 | 6 | 23 | -17,20 | 34.375 | ${ }^{21,563}$ | ${ }^{0.3}$ | -2.250 | -2813 |
|  | Westremert orcimond | T | 6 | 100 | 45,00045,500 | 45.500 | ${ }_{6}^{6.1}$ | ${ }^{64,0006565500}$ | ${ }^{655500}$ | ${ }^{8.7}$ | 6 | 27 | ${ }^{20,250}$ | ${ }^{81,875}$ | ${ }^{25,313}$ | ${ }^{27}$ | 20,550 | 25,913 |
|  | Richmond to Westpark | T | 6 | 100 | 4,500.5.0.000 3900.5600 | 50,000 56000 | 6.7 <br> 75 | 68,50078.500 58,50-77000 | 78.500 77000 | ${ }_{10.5}^{103}$ | 6 | ${ }_{4}^{4.5}$ | 33750 32250 | 98,25 | 421,188 40313 | ${ }_{4}^{4.5}$ | 33,50 32250 | 42,188 40.313 |
| arimel | shoow ay imi | m | ${ }^{6}$ | ${ }_{60} 100$ | 39,00056,000 | 56,00 | 7.5 | 58,50-7,7,00 | 77,000 | 10.3 | 6 | 4.3 | 32.50 | 96,250 | 40,313 | 4.3 | 32250 | 40,313 |
| Hammait | Batecompest ost6 | T | 4 | 100 | 10,000-1,000 | 16,000 | ${ }^{2} 1$ | 13,000-19,000 | 19,000 | 25 | 6 | ${ }^{3} .5$ | 22,250 | ${ }^{23,50}$ | 328813 | 1.5 | -11,250 | -140,03 |
|  | Balokx tocanpel | T | 4 | 80 | 13,500 | 13.500 | 1.8 | 25,00 | 25,00 | ${ }^{3.3}$ | 4 | -0.7 | -5.30 | ${ }^{31,250}$ | ${ }^{-6.563}$ | 0.7 | -5.250 | ${ }^{-6.563}$ |
|  | Canpeall 6 Gessser | T | 4 | 80 | 22,00-2.8000 | 20,00 | ${ }^{3} .5$ | 37,00041,000 | 41.000 | 5.5 | 4 | 1.5 | 11.250 | 51.250 | 14,063 | 1.5 | 11.250 | 14,063 |
|  | Casseret Wesil beit | T | 4 | 80 | 30,0003,1,00 | 31,00 | 4.1 | 43,00047,000 | 47,00 | ${ }_{6} .3$ | 4 | 23 | 17,20 | 58,50 | 21,563 | ${ }^{23}$ | 17,20 | 2,563 |
|  | Westeat enitimome | T | 4 | 80 | 4,500 | 4,500 | 0.6 | 28,00 | 28.00 | 3.7 | 4 | ${ }^{0.3}$ | -2,250 | 35.00 | -2.813 | ${ }^{0.3}$ | 2250 | 2.813 |
| Hewin | Fonden locasmer | T | 4 | 70 | 27,00030,500 | 30,50 | 4.1 | 40,0004,4,000 | 41,00 | 5.5 | 4 | 1.5 | 11.250 | 51.20 | 14,063 | 1.5 | 11.250 | 14,063 |
|  | Cassmerit Reanclesester | T | 4 | 80 | 24,500 | 24,500 | ${ }_{3} 3$ | 41,00 | 41,00 | 5.5 | 4 | 1.5 | 11.250 | 51.250 | 14,083 | 1.5 | 11.250 | 14,063 |
|  | Rancosesere westeet | T | 4 | 70 | 30,00 | 30,00 | 4.0 | 52.500 | 52.500 | 7.0 | 4 | 3 | 22,500 | 65.25 | 28,125 | 3.0 | 22.500 | ${ }^{28,125}$ |
|  | Westestlowneest | T | 4 | 80 | 30,0004,1,00 | 41,000 | 5.5 | 4,5,50:57,000 | 57,00 | 7.6 | 4 | 3.6 | 27,00 | 71.250 | 33,50 | 3.6 | 27,00 | 33,50 |
|  | Wecesto bilenak | T | 4 | 80 | 26,00 | 26,00 | 3.5 | 35.50 | 35.50 | 4.7 | 4 | 0.7 | 5.250 | 44,375 | 6.563 | 0.7 | 5.250 | 6.563 |
|  | Pranorticambel | p | 6 | 120 | 17.50020 .500 | 20.500 | 2.7 | 23,00033,500 | 33.500 | 4.5 | 8 | ${ }^{3.5}$ | 228,50 | 41.875 | ${ }^{328813}$ | ${ }^{1.5}$ | -11,50 | -14063 |
|  | Camperlo cosesser | P | 6 | 120 | 26,00030,000 | 30,00 | 4.0 | 30,00033,500 | 36,500 | 4.9 | 8 | ${ }^{3} 1$ | 23,250 | 45.625 | 29,03 | 1.1 | 8,250 | -10,313 |
|  |  | P | 6 | 120 | 29,000 | 20.000 | 3.9 | ${ }_{35,500}$ | 35.500 | 4.7 | 8 | .3.3 | -24,500 | 44.375 | ${ }^{30,938}$ | ${ }^{1.3}$ | -9,750 | ${ }^{121,188}$ |
|  | Luterevo Bitimowe | P | 6 | 120 | 18,00028,500 | 28.500 | ${ }^{3.8}$ | 19,00025.5000 | 25,000 | ${ }^{3.3}$ | 8 | 4.7 | 33,250 | ${ }^{31,250}$ | 4.1003 | ${ }^{2.7}$ | -20,30 | ${ }^{225,313}$ |
| Kenpuosd | Biackro Canmoal | T | 4 | 100 | $\stackrel{22500}{225029500}$ | 22.500 20500 | 3.0 | 37,000 | 37000 | 4.9 | 6 | ${ }^{1.1}$ | 8.250 <br> -250 | 46,50 58350 | - 10.313 | 0.9 | 6,750 <br> 12750 <br> 10 | 8,438 <br> 15938 <br> 1 |
|  | Compel | T | 4 | 100 | 23,502-2,500 22,502, | ${ }^{29,500}$ | 3.9 3.8 | $38,50043,000$ 3 3,0038,500 | 43,000 <br> 38,500 | ${ }_{5}^{5.1}$ | 6 | -0.9 | -6,750 | 35,720 48.25 | -8,488 | 1.1 | ${ }^{12,250}$ | ${ }^{15.938}$ |
|  | West entlo Bithoore | T | 4 | 100 | 13,500 | 13.500 | 1.8 | 34,00 | 34,00 | 4.5 | 6 | ${ }^{-1.5}$ | -11,250 | 42.500 | -14,03 | 0.5 | 3.750 | 4.688 |
| Knossiand | W. Civy Limitosh 6 | T | 4 | 100 |  |  |  |  |  |  | 6 |  |  |  |  |  |  |  |
|  | Keve Fw blowenoill | T | 4 | 100 | 32,50040,500 | 40.50 | 54 | 47,000.56,500 | 56.500 | 7.5 | 6 | 1.5 | 11.250 | 70,625 | 14,063 | 3.5 | 26.50 | ${ }^{32813}$ |
| Kireoos | Wenoil loufino Byal | T |  | 100 | 42,00045,00 | 45.00 | 6.0 | 51,500.54,000 | 54,00 | 7.2 | 6 | 1.2 | 9.000 | 67,500 | 11.250 | 3.2 | 24,00 | 30,00 |
|  | Bumbe Byour biat Focest | T | 4 | 100 | 39.00 | 39,00 | 5.2 | 47,500 | 47,500 | ${ }_{6} 6$ | 6 | 0.3 | 2.250 | 59.375 | 2.813 | 23 | 17.50 | 21.563 |
|  | Bira Foestowesthener | T | 4 | 100 | 39,00045,500 | 45.500 | 6.1 | 4.5.500.54,500 | 54.500 | ${ }^{7}$ | 6 | 1.3 | 9,750 | 68.125 | 12,188 | ${ }^{3.3}$ | 24.50 | 30,938 |
|  | Westreimero Reimmond | T | 4 | 100 | 30,500 | 30,500 | 4.1 | 43.00 | 43.00 | 5.7 | 6 | 0.3 | -2,250 | ${ }^{57,50}$ | 2.813 | 1.7 | 12,750 | 15.938 |
|  |  | $T$ | 4 | 100 | 29.500 <br> 27500 <br> 2.500 | 29,500 27500 | 3.9 37 | 42500 34000 | 42,500 <br> 34000 | 5.7 45 | 6 | .0 .3 .15 | $\begin{array}{r}2.250 \\ -11250 \\ \hline\end{array}$ | 53,125 42500 | $\begin{array}{r}\text { 2.813 } \\ .14083 \\ \hline 1\end{array}$ | 1.7 <br> 0.5 | 12,50 $\left.\begin{array}{l}\text { 3,750 } \\ \hline\end{array}\right)$ | 15.938 <br> 4.688 |
|  | Westpark to Alief-Clodine Alief-Clodine to Bellaire | $\begin{aligned} & T \\ & T \end{aligned}$ | 4 | 100 100 | 27,5003,5000 | 27,500 3,500 | 3.7 4.5 | ${ }_{\text {36,5047,500 }}^{34,00}$ | 34,000 47,500 | ${ }_{6.5}^{4.5}$ | ${ }_{6}^{6}$ | ${ }_{0.3}^{-1.5}$ | ${ }_{\text {-12,250 }}$ | ${ }_{\text {22,500 }}^{4.35}$ | ${ }_{2813}$ | 0.5 23 | 3,750 17,250 | ${ }_{\text {4, }}^{4,5688}$ |
| ${ }_{\text {Lite Yook }}^{\text {Long Point }}$ | Westest totenspead | P | 6 | 100 | 31,5003,7,00 | 37,00 | 4.9 | 3,50044,500 | 45.500 | 6.1 | 6 | 0.1 | 750 | 5.8875 | 937 | 0.1 | 750 | ${ }_{937}$ |
|  | Black osinger till | T | 4 | 70 | 26.500 | 22.500 | ${ }^{3} 5$ | 40,500 | 40,500 | 54 | 4 | 1.4 | 10.500 | 50.25 | ${ }^{13,125}$ | 1.4 | 10.500 | ${ }^{13,125}$ |
|  | Bunter thl bocesser | T | 4 | 70 | 25.500 | 25.500 | 3.4 | 39.000 | 30,000 59500 | 52 | 4 | 1.2 | 9.000 | 487,50 | ${ }^{11,250}$ | ${ }^{1.2}$ | ${ }^{9,000}$ | 11,50 <br> 1.505 |
| Masen | N. City Limit to S. City Limit | ${ }_{\text {T }}{ }^{\text {T }}$ | 4 | ${ }_{60}^{120}$ | 20,000:5,500 | 50,50 | 6.7 | 22.000.58,500 | 58,500 | 7.8 | ${ }_{4}^{4}$ | 0.2 | -1.500 | ${ }^{73,125}$ | -1.875 | 3.8 | 28.50 | 35.25 |
|  | Rosatal os crumoor | m | ${ }_{2}^{2}$ | 60 |  |  |  |  |  |  | 4 |  |  |  |  |  |  |  |
| Menorial | Bmice thay ly limit westert | T | 4 | 100 | 9,0002,5,000 | 25.00 | ${ }_{3} 3$ | 10,000:37,000 | 37,00 | 4.9 | 6 | ${ }^{1.1}$ | 8,250 | 46.250 | -10,313 | 0.9 | 6,750 | 8.438 |
|  | Westeltlo wicest | T | 4 | 100 | 34,003:3,00 | 35,00 | 4.7 | 45,00447,00 | 47,00 | 6.3 | 6 | 0.3 | 2.250 | 58,50 | 2.813 | ${ }^{2} 3$ | 17.25 | 21.563 |
|  | Wicestorikuocd | T | 4 | 100 | 30,00032000 | 32,00 | 4.3 | 41,00043,000 | 43.000 | 5.7 | 6 | ${ }^{0.3}$ | -2,250 | 53,50 | -2.813 | 1.7 | 12,750 | 15.938 |
|  | Kituocol Doininaitiod | T | 4 | 100 | 22,0027,000 | 27,00 | 3.6 | 38,500-1,500 | 41.500 | 5.5 | 6 | -0.5 | 3,550 | 51.875 | 4.688 | 1.5 | 11.250 | 14,063 |
|  |  | T | 4 | 100 | 18,503232500 | 32.500 | 4.3 | 31,500.51,000 | 51.000 | 6.8 | 6 | 0.8 | 6.000 | ${ }^{63,750}$ | 7.500 | 28 | 21.000 | 228,50 |
|  |  | T |  | 80 | 22,0002.4500 | 24.500 | ${ }^{3.3}$ | 24,50040,500 | 40,500 | 54 | 4 | 1.4 | 10,500 | ${ }_{50,225}$ | 13,125 <br> .25313 | 1.4 | 10.500 <br> .550 | -13,125 |
| Pakkow | Wcivilimito aiaterapyess | T | 4 | 100 | 13,000 25000 | 13,00 25000 | 1.7 <br> 3 | 24,500 4.000 | 24.500 4.000 | $\begin{array}{r}3.3 \\ 5 \\ \hline\end{array}$ | ${ }_{8}^{6}$ | $\begin{array}{r}2.25 \\ -25 \\ \hline\end{array}$ | -20230 -1850 | 30,25 <br> 51250 | $\begin{array}{r}\text { 225.33 } \\ .23438 \\ \hline 2 .\end{array}$ | 0.7 <br> 15 | -5,50 <br> 11250 <br> 1220 | -6.563 <br> 14038 <br> 1085 |
|  | Hosen Cioncie 0 B Barafica | T | 4 | ${ }_{70}$ | ${ }^{20.500}$ | ${ }^{20,500}$ | 3.0 | ${ }^{42,500}$ | ${ }^{\text {32,500 }}$ | ${ }_{4}{ }^{5}$ | 4 | ${ }_{0}{ }^{2 .} 5$ | 2,250 | 40.225 | ${ }_{2}^{2,883}$ | ${ }_{0} 0.3$ | ${ }^{2} 2.250$ | ${ }^{14.813}$ |
|  | Bioafied besth | T | 4 | 110 | 12,00:3,0,500 | 30,500 | 4.1 | 24,00040,000 | 40,00 | ${ }_{5} 3$ | 6 | -0.7 | -5,20 | 50,00 | ${ }^{-6,563}$ | 1.3 | 9,750 | 12,188 |
|  | SH6 to Elitige Pexy. | T | 4 | 100 |  |  |  |  |  |  | 6 |  |  |  |  |  |  |  |
| Patason | Sth io midide Pevy | T | 4 | 100 | 11.000 | 11.000 | 1.5 | 18.00 | 18.000 | 24 | 6 | ${ }^{3.6}$ | 27,00 | 22.500 | 33,750 | 1.6 | -12,00 | -15,000 |
| Cuesason | Ciay Cocasthe | ${ }^{\top}$ | 4 | 100 | $28.00 \cdot 34$ |  |  |  |  |  | 6 |  |  |  |  |  |  |  |
|  | Belliele ohamin |  |  |  | 28,003 3, 5,00 |  |  |  |  |  |  |  |  |  |  |  |  |  |

hwouston


Lane Demand based on 7,500 vellaneneday
For RoWs s geeaee than 160; assumed maximum number of fanes as 10


Average velicio oculuancy assume to be 1.25 personssenicide
Assumes all unnet persono demandid is in other modes

## APPENDIX F

| ROADWAY |  | Existing |  |  |  |  |  | future |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| streat | Segment | Classfifation | Lanes | With | ADT Range | ADt (High) | Lane Demand | Estimated 2040 ADT Range | Estimated 2040 ADT <br> (High) | $\begin{aligned} & \text { Future Lane } \\ & \text { Demand } \end{aligned}$ | Lane Availability Based on ROW | $\begin{aligned} & \text { Lane Demand Not } \\ & \text { Met } \end{aligned}$ | Venicice demand NotMe | Daily Vehicle | Daily Vehicle Passengers Not Met | $\begin{aligned} & \text { Lane Demand Not } \\ & \text { Met } \end{aligned}$ | Vehicle Demand not Met | $\begin{gathered} \text { Daily Vehicle } \\ \text { Passengers not Met } \end{gathered}$ |
| Rectmond | Fonten 0 Casaler | T | 6 | 120 | 45,00048,000 | 48.000 | ${ }_{6} 6$ | 64,500.68,000 | 68.000 | 9.1 | 8 | 1.1 | 8.250 | 85.00 | 10.313 | 3.1 | 23.250 | 29.063 |
|  | Cesserer to Biepak | T | 6 | 100 | 27,500 | 27,500 | ${ }^{3.7}$ | 48.000 | 48.00 | ${ }^{6} 4$ | 6 | 0.4 | 3.000 | 60,00 | 3,750 | 0.4 | 3.000 | 3,750 |
|  | giapaktowest bet | T | 6 | 100 | 30,00 | 30,00 | 4.0 | 42.500 | 42.500 | 5.7 | 6 | ${ }^{0.3}$ | -2,50 | 53.125 | -2813 | ${ }^{0.3}$ | -2.30 | 2.813 |
|  | Westerlt wicest | T | 6 | 100 | 33,50, 3, 5,50 | 38,500 | 5.1 | 60,000.61,000 | 61.00 | 8.1 | 6 | 2. | 15,50 | 76.250 | 19.688 | 2.1 | 15,50 | 19.688 |
|  | Wesest wocotari Pak | T | 4 | 100 | 30,500 | ${ }^{30,500}$ | 4.1 | 41.500 | 41.500 | ${ }_{5}^{5.5}$ | 6 | ${ }^{0.5}$ | 3,750 | ${ }_{5}^{51,875}$ | 4.4888 | 1.5 | ${ }_{1}^{11250}$ | ${ }^{14,063}$ |
|  | Wooden Pakt o oindentod | T | 4 | 100 | 27,5003,5,500 | 36.500 | 4.9 | 35.00046,500 | 46.500 | 6.2 | 6 | 0.2 | 1.500 | 58.125 | 1.875 | 22 | 16.550 | 20.25 |
|  | Daiketsioct ocivimit | T | 4 | 100 | 19,00:3,0,000 | 30,00 | 4.0 | 3,500,3,000 | 39,00 | 52 | 6 | ${ }^{-0.8}$ | -6,00 | 48,50 | -7,500 | 1.2 | 9.000 | 11.250 |
|  | aiv Limit west thlow | T | 4 | 100 | 12.500 | 12.500 | 1.7 | 28.00 | 28.00 | ${ }^{3} 7$ | 6 | ${ }^{2} 2$ | -17,20 | 35.000 | ${ }^{21,563}$ | ${ }^{0.3}$ | -2,250 | ${ }^{2} 8813$ |
|  | Westhlolow ost6 | T | 4 | 100 | 12,500 | 12.500 | 1.7 | 28.00 | 28,00 | ${ }^{3} 7$ | 6 | 23 | -17,50 | 35.00 | ${ }^{21,563}$ | ${ }^{0.3}$ | -2,250 | -2813 |
|  |  | $\uparrow$ | 4 | 100 |  |  |  |  |  |  | 6 |  |  |  |  |  |  |  |
| Rogagale | Hamnowestark | m | 4 | ${ }^{80}$ | 24,000.3.6.500 | 36.500 | 4.9 | 33,0005.5000 | 50.00 | ${ }_{6} 7$ | 4 | 2.7 | 20.50 | ${ }^{62500}$ | 2.2313 | ${ }^{27}$ | 20.50 | 2.25313 |
|  | Westarato Remmond | m | 4 | 70 | 30,00 | 30.00 | 4.0 | 45.000 | 45.000 | ${ }^{6} 0$ | 4 | 2 | 15.000 | 56,50 | 18,50 | 20 | 15.000 | 18,50 |
|  | Rectront wewestimer | m | 4 | 70 | 26,500 | 26,500 | 3.5 <br> 19 | 42000 <br> 2000 | 42000 2000 | ${ }_{5}^{56}$ | 4 | ${ }^{1.6}$ | 12000 <br> 18000 <br> 1800 | $\begin{array}{r}52500 \\ \hline 3750 \\ \hline\end{array}$ | 15000 <br> .2500 | 1.6 | 12000 <br> $\mathbf{1 2 0 0}$ | 15.000 <br> H.350 |
| SH6 | Batec Copeses of erentose | T | 4 | 100 | 14,00 | 14,000 | 1.9 | 27,00 | 27,000 | ${ }^{36}$ |  | ${ }^{24}$ | 18.8000 | ${ }^{33,750}$ | ${ }^{225500}$ | ${ }^{0.4}$ | -3,000 | -3,750 |
|  | S. Civ Limito westhemer | P | 6 | 180 | 57,500.63,000 | ${ }^{63,000}$ | ${ }^{8.4}$ | 73,000991,000 | 91.000 | 12.1 | 10 | 2.1 | ${ }^{15,750}$ | ${ }^{113,750}$ | ${ }^{19,688}$ | ${ }^{6.1}$ | 45,750 | 57,188 |
|  | Westrimer re Bial frest | P | 8 | 180 | 76,00.93,300 8.200 .1500 | 93,000 | ${ }^{122}$ | 99,0000.12000 | ${ }^{112000}$ | 14.9 | 8 | ${ }_{6}^{69}$ | 517750 5 5 |  | ${ }_{6}^{64,6888}$ | ${ }_{6}^{69}$ | 51,750 5 51750 | ${ }_{6}^{646888}$ |
|  | Bria foest Wenoral | P | 8 | 180 | 82,000.91,500 | 91.500 | 122 | 100,500-111.500 | ${ }^{111,500}$ | 149 | 8 | ${ }_{6}^{69}$ | 51,750 | ${ }^{139,375}$ | ${ }_{64,488}^{688}$ | ${ }^{69}$ | 51,750 | ${ }_{64,688}^{688}$ |
|  | Menoral okevew: | p | 8 | 180 | 90,500-10,4,50 | 104500 | 13.9 | 113,500-135,000 | 135,000 | 18.0 | 8 | 10 | 75,00 | 188,750 | 93,50 | 10.0 | 75,00 | 93,50 |
|  | Kay Fw bondidid dam | P | 6 | ${ }_{120}^{120}$ | ${ }^{90,500}$ | 30,500 | ${ }^{12.1}$ | -10,000 | 101,000 | ${ }^{13.5}$ | 8 | ${ }_{5} 5$ | ${ }_{4}^{41,50}$ | 122,250 112500 | 51,563 <br> 3,500 | 7.5 | ${ }_{5}^{56,50}$ | 70.313 58.250 |
|  | Adides Damit Peatesenn | p | 6 | 120 | 79.50 | 79.500 | 10.6 | 90.00 | 90.00 | 120 | 8 | 4 | 30,00 | 112.500 | 37,500 | 6.0 | 45.00 | 56,250 <br> 40888 <br> 18 |
|  |  | ${ }^{\text {P }}$ | ${ }_{4}^{6}$ | 120 <br> 80 | 7,000 1.500 | 71,000 1.500 | 9.5 | 85000 <br> 12500 | 855000 <br> 12.500 | 11.3 1.7 | ${ }_{4}^{8}$ | 3.3 <br> .23 | 24.50 <br> 17250 |  | 30.938 <br> .21583 | $\begin{array}{r}53 \\ -23 \\ \hline\end{array}$ | 39,50 <br> -17250 | 49.988 <br> .21583 <br> 2.63 |
| smott | Remend owestar | m | 4 | 80 | 16,500 | 16.500 | 22 | 21,500 | ${ }_{21,500}$ | 2.9 | 4 | ${ }_{1}^{1.1}$ | ${ }_{8} 8250$ | 28.875 | -10,313 | ${ }_{1} 1.1$ | 8,250 | ${ }^{-1.10,313}$ |
|  | Westaratomelicaine | m | 4 | 80 | 15,000-1,000 | 16,000 | 2.1 | 23,502-23,500 | 23.500 | 3.1 | 4 | 0.9 | 6.7.50 | 20,375 | 8,438 | -0.9 | 6.750 | 8,438 |
|  | Alvichidine obelite | m | 4 | 70 | 13,000-15,000 | 15.500 | 2.0 | 18,0002.2,500 | 20,500 | 2.7 | 4 | ${ }^{1.3}$ | -9,50 | 2.5625 | 12,188 | $-1.3$ | -9,750 | 12,188 |
| Taner | Campent cosesser | T | 4 | 100 | 17,000-19,500 | 19.500 | 2.6 | 4,5,5004,4,000 | 44,00 | 59 | 6 | 0.1 | -750 | 55.00 | -937 | 1.9 | 14.250 | ${ }^{17,813}$ |
|  | Casserat Westilet | T | 4 | 100 | 15,000.7.,500 | 17,500 | ${ }^{2} 3$ | 24,50042,500 | 42.500 | 5.7 | 6 | ${ }^{0.3}$ | -2250 | 53,125 | -2813 | 1.7 | 12,50 | 15.938 |
| Towel | Campbell to Hempstead | T | 4 | 100 | ${ }^{19,500}$ | 19,500 | ${ }^{26}$ | 46,00 | 46.00 | ${ }^{6} .1$ | 6 | 0.1 | ${ }^{750}$ | 57,500 | ${ }^{937}$ | 2.1 | 15,750 | ${ }^{19,988}$ |
|  | West entio cassier | ${ }_{\text {¢ }}{ }^{\top}$ | 4 | 100 70 | 2,000 | 21,00 | 28 | 35,00 | 35.00 | 4.7 | ${ }_{4}^{6}$ | ${ }^{1.3}$ | 9.,50 | 43,750 | -12,188 | 0.7 | 5.250 | 6,563 |
|  | Westrener to westarar onive | m | 2 | 60 |  |  |  |  |  |  | 4 |  |  |  |  |  |  |  |
|  | Fonden to Casserer | p | 8 | 120 | 94,009.97,00 | 97,00 | 12.9 | 127,500-13,000 | 133.000 | 17.7 | 8 | ${ }^{9.7}$ | 72,750 | 166,250 | 90.388 | ${ }^{9.7}$ | 72,750 | 90.388 |
| Westsimer | Cesserst Westert | p | - | 150 | 83,00085,500 | 85.50 | 11.4 | 17,000-12,200 | 122.000 | 18.3 | 8 | 8.3 | 62.50 | 152.50 | 77,813 | 8.3 | 62.50 | 7,8,813 |
|  | West bello wicest | P | 8 | 120 | 84,000.95,000 | 95.000 | 12.7 | 105.500-141,500 | ${ }^{141,500}$ | 18.9 | 8 | 10.9 | ${ }^{81,50}$ | 178.875 | 102,188 | 10.9 | ${ }^{81,50}$ | 102,188 |
|  | Weest | P | 8 | 120 | 71,00:8,1,500 | 81.500 | 10.9 | 100,000-118,500 | 118,500 | 15.8 | 8 | 7.8 | 58,500 | 148,225 | ${ }^{73,125}$ | 7.8 | 58,500 | ${ }^{73,125}$ |
|  |  | P | 8 | 120 | 81,500.89,000 | 89,00 | 11.9 | 105,500-12,000 | 1220,00 | 16.0 | 8 | 8 | 60,00 | 150,000 | 75,00 | 8.0 | 60,00 | 75.000 |
|  |  | P | 8 | ${ }^{120}$ | 71,00084,500 | ${ }^{8,5000}$ | ${ }^{11.3}$ | 101,000-112,500 | 112.500 | 15.0 | 8 | 7 | ${ }^{52,500}$ | ${ }^{140,625}$ | ${ }_{65,525}$ | 7.0 | ${ }^{52,500}$ | ${ }_{65,525}$ |
|  | Eldicieab bes6 | p | 8 | 120 | 64,00078,000 | 78,00 | 10.4 | 92,000-121,000 | ${ }^{121,000}$ | 16.1 | 8 | 8.1 | 60,50 | 151,250 | ${ }_{75,938}$ | 8.1 | 60,75 | 75.938 |
|  | SH 6 b Batereclodine | p | 6 | 120 | 36,500.64,000 | 64,000 | ${ }^{8.5}$ | 48,00880,000 | 88000 | 10.7 | 8 | 2.7 | 20.250 | 100,000 | ${ }^{25,313}$ | ${ }^{4.7}$ | ${ }_{35,250}$ | 44,063 |
|  |  | T | 6 | $\begin{array}{r}120 \\ 100 \\ \hline 1\end{array}$ | ${ }^{20.5002 .4 .500}$ | ${ }_{2}^{24,500}$ | ${ }_{3}^{3.3}$ | ${ }^{29.000032 .5500}$ | 32,500 32500 | ${ }_{4.3}^{4.3}$ | ${ }_{6}^{8}$ | ${ }_{-}^{.3 .7}$ | ${ }_{\text {- }}^{\text {27,750 }}$ | ${ }_{40,025}^{40,25}$ | 344,688 <br> 15988 | -1.7 0.3 | ${ }_{\text {-12,750 }}^{-120}$ | ${ }_{\text {-15,938 }}^{\text {2, }}$ |
| Westrimere Pexy. |  | T | 4 | 100 | 11.500 | 11.500 | 1.5 |  |  |  | 6 |  |  |  |  |  |  |  |
| Wespark | Fonten lo cesserer | T | 6 | 110 | 33,000.38,500 | 38,50 | 5.1 | 50,0005,7,000 | 57,00 | 7.6 | 6 | 1.6 | 12,00 | 71.250 | 15.00 | 1.6 | 12.000 | 15.000 |
|  |  | T | 4 | 100 | 39,00042,500 | 42.500 | 5.7 | 63,000.55,000 | 65,00 | ${ }^{8.7}$ | 6 | 27 | 20.50 | ${ }^{81,50}$ | 2.25313 | 4.7 | 35.20 | 44.083 |
|  | West selt wicest | T | 4 | 100 | 31,0003,5,50 | 36.500 | 4.9 | 41,000.54,500 | 54,500 | 7.3 | 6 | 1.3 | 9,750 | 68,125 | 12,188 | ${ }^{3} 3$ | 24,50 | 30,38 |
|  | Werestoriteod | T |  | 100 | 28.000 | 26,00 | 3.5 | 38,004040,000 | 40.00 | ${ }_{5} 3$ | 6 | 0.7 | -5.30 | 50,00 | -6.563 | 1.3 | 9,750 | 12,188 |
|  | kituost Doandestrod | T | 4 | 100 | 28,0003,5,500 | 33,500 | 4.5 | 37,500499000 | 49000 | 6.5 | 6 | 0.5 | 3,750 | ${ }_{61,250}$ | 4.888 | 2.5 | 18,50 | 23,388 |
|  |  | T | 4 | 100 | 18,002, 2,500 | 21.500 | 2.9 | 3,5,003.36,000 | 36,00 | 4.8 | 6 | ${ }^{-12}$ | -9,000 | 45.000 | -11,50 | 0.8 | 6.000 | 7.500 |
| Westiew | Edidisel oste | T |  |  | 20,000 |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Blalock to Gessner Gessner to West Belt | T | 2 | 70 100 | $16,50023,300$ 18,0033500 | cen $\begin{aligned} & 23,000 \\ & 33,500\end{aligned}$ | 3.1 4.5 | 22,5003.3000 $30,0055,500$ | 30.000 55,500 | 4.0 7 | ${ }_{6}^{4}$ | ${ }_{1.4}$ | ${ }_{10.500}^{0}$ | $\underset{\substack{37,500 \\ 69,375}}{ }$ | ${ }_{13,125}^{0}$ | 20 3 3 | 15000 25.500 | 18,50 31,85 |
|  | West eit onilimoor | T | 4 | 100 | 16.500 | 16.500 | 22 | 33,000 | 39,00 | 52 | 6 | ${ }^{-0.8}$ | -6,000 | 48,750 | -7,500 | 1.2 | 9.000 | 11.250 |
| whesest |  | T | 6 | 90 | 37,0043,500 | 43,500 | ${ }_{5} 8$ | 57,000.58,000 | 58,00 | 7.7 | 4 | 3.7 | 27,50 | ${ }^{2} 2.500$ | 34.688 | 1.7 | 12,75 | 15.938 |
|  |  | T | 6 | 90 | 37,5046,000 | 46,00 | 6.1 | 67,000-7,500 | 7,5,50 | 10.3 | 4 | ${ }_{6} .3$ | 47.250 | 98.875 | 59.03 | 43 | 32250 | 40.313 |
|  | Biar foest Westhemer | T | 6 | 90 | 41,00 | 41000 | 5.5 | 68,0007, 1,000 | 71.000 | 9.5 | 4 | ${ }_{5}^{5.5}$ | 41.250 | 88,750 | ${ }_{51,563}$ | ${ }^{3.5}$ | 26,50 |  |
|  | Westheimer to Richmond Richmond to Westpark | T | ${ }_{6}^{6}$ | 100 90 | 29.500 30,500 | 20,500 | 3.9 4.1 |  |  | ${ }_{8}^{8.7}$ | ${ }_{4}^{6}$ | ${ }_{4}^{2.1}$ | 20,50 30,50 3 | ${ }_{\substack{8,1875 \\ 7.5,25}}$ | ${ }_{\substack{25,313 \\ 38,38}}^{\text {che }}$ | ${ }_{2}^{27}$ | 20,50 15,50 | ${ }_{\substack{25,313 \\ 19.988}}^{\text {c, }}$ |
|  | Westat besemite | T | - 6 | 90 | 29,50040,500 | 40.500 | 54 | 52,50069,500 | 69.900 | ${ }_{9} 9$ | 4 | ${ }_{5.3}$ | 39,750 | ${ }_{88,775}$ | 49.688 | ${ }_{3} 3$ | 24.50 | 30,988 |

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- Lane Demand based on 7,500 vellanenelay
- For Rows s greater than 160, assumed maximum number of fanes as 10

 -Average venicle occupancy assumed to be 1.25 personssivenicle
... Assumes al un unet person demand is in onter modes

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## APPENDIX G IMPLEMENTATION TOOIS

1. Tax Increment Financing (Tax Code, Chapter 311) is a tool that local governments can use to publicly finance needed structural improvements and enhanced infrastructure within a reinvestment zone. These improvements are usually undertaken to promote existing businesses and/or to attract new business to the area.
2. Tax Abatement (Tax Code, Chapter 312) is an agreement between a taxing unit and a property owner that exempts all or part of an increase in the value of real property and/or tangible personal property from taxation for a period not to exceed 10 years. Counties, cities, and special districts may enter into tax abatement agreements; school districts may not. Taxing units must adopt guidelines and criteria that govern abatements, prior to offering tax abatement agreements. These guidelines and criteria are effective for 2 years; after which they must be reviewed, revised and re-adopted by the governing body of the taxing unit.
3. An appraised value limitation (Tax Code, Chapter 313) is an agreement in which a taxpayer agrees to build or install property and create jobs in exchange for an eight-year limitation on the taxable property value for school district maintenance and operations tax (M\&O) purposes and a tax credit. The minimum limitation varies by school district. The application for a limitation on the appraised value for M\&O purposes is submitted directly to the school district and requires an application fee, which is established by each school district.
4. The Development Corporation Act of 1979 (Local Government Code, Chapters 501-505) authorizes cities to adopt a sales and use tax and establish a Type A or a Type B economic development corporation, or both to administer the tax funds, provided that city voters approve this special, dedicated tax at an election held for that purpose. All cities located in a county with a population of less than 500,000 may impose the Type A sales tax if the new combined local sales tax rate would not exceed 2 percent. Some cities located in counties with a population of 500,000 or more (Bexar, Dallas, El Paso, Harris, Hidalgo, Tarrant and Travis) also may adopt Type A sales tax for economic development efforts but a city's eligibility varies from county to county.

Type A sales tax can fund manufacturing and industrial facilities; research and development facilities; recycling facilities; distribution centers; small warehouse facilities and distribution centers; military facilities; primary job training facilities; corporate headquarter facilities; job training classes; career centers; telephone call centers; business infrastructure; airport facilities; and operation of commuter rail, light rail or commuter buses.

All cities are eligible to adopt the Type $B$ sales tax if the combined local sales tax rate would not exceed 2 percent. Type B sales tax funds may be used for the same purposes as listed for Type A. In addition, Type B sales tax can also fund retail business incentives (if city population is less than 20,000); sports and athletic facilities; entertainment, tourist and convention facilities; public parks and related open space improvements; affordable housing; and water supply and conservation programs (with special voter approval).
5. Local Government Code Chapter 387 allows counties to create County Assistance Districts that are funded by a portion of sales taxes. Any county may adopt this sales tax, in all or part of the county, if the new combined local sales tax rate would not exceed 2 percent at any location within the district. A county may create up to four county assistance districts, but not more than one district may be created in a commissioner's precinct. The commissioners' court may serve as the governing body of the district; or alternatively, the commissioners' court, by order, may appoint a board of directors to administer the district. A county assistance district may fund construction, maintenance or improvement of roads or highways; provision of law enforcement and detention services; maintenance or improvement of libraries, museums, parks or other recreational facilities; promotion of economic development and tourism; firefighting and fire prevention services and provision of services that benefit the public welfare.
6. The Texas Enterprise Zone Program (Government Code, Chapter 2303) is an economic development tool that allows local communities to partner with the State of Texas to promote job creation and capital investment in economically distressed areas of the state. Local communities may provide incentives such as tax abatements, fee waivers and reduced regulations to businesses within an enterprise zone. They also may nominate businesses as enterprise projects. Enterprise projects are selected by the state and may be eligible for sales tax refunds and other benefits.
7. Chapters 380 (cities) and 381 (counties) of the Local Government Code grant cities and counties broad discretion to make loans and grants of public funds or the provision of public services, at little or no cost, to promote all types of business development including industrial, commercial and retail projects. Each agreement can be uniquely tailored to address the specific needs of both the local government entity and the business prospect.
8. Home rule cities, general law cities and 62 counties are authorized to impose a local hotel occupancy tax within their jurisdictions. For most cities the tax rate may not exceed 7percent of the price paid for the use of a hotel room. The tax rate for eligible counties varies. Cities with populations under 35,000 also may impose the hotel occupancy tax in the city's extraterritorial jurisdiction (ETJ). If a city adopts the hotel occupancy tax within its ETJ, the combined rate of state, county, and municipal hotel occupancy taxes may not exceed 15 percent. Expenditures of hotel occupancy tax funds must comply with a "twopart test." First, each expense must promote the hotel and convention industry (i.e. "put heads in hotel beds"). Second, each disbursement also must conform to at least one of seven statutorily-designated categories. The categories are: convention and visitor centers; convention registration; advertising the city; promotion of the arts; historic restoration and preservation; sporting events, if the city is located in a county with a population of 1,000,000 or less; and tourist transportation systems.
9. Public Improvement Districts (PID) (Local Government Code, Chapter 372) offer cities and counties a means for improving their infrastructure to promote economic growth in an area. The Public Improvement District Assessment Act allows cities and counties to levy and collect special assessments on properties that are within the city or its extraterritorial jurisdiction. Additional financing options are available to certain large counties.

PIDs may be formed to create water, wastewater, health and sanitation, or drainage improvements; street and sidewalk improvements; mass transit improvements; parking improvements; library improvements; park, recreation and cultural improvements; landscaping and other aesthetic improvements; art installation; creation of pedestrian malls or similar improvements; supplemental safety services for the improvement of the district, including public safety and security services; or supplemental business-related services for the improvement of the district, including advertising and business recruitment and development.
10. A Neighborhood Empowerment Zone (Local Government Code, Chapter 378) is a designated area within a municipality that is created to promote one or more of the following:

- Affordable housing
- An increase in economic development;
- An increase in the quality of social services, education or public safety; or,
- The rehabilitation of affordable housing in the zone.


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