Pre-Engineering Report

Street and Traffic (Thoroughfares) Improvements

Waugh Drive/Heights Boulevard/ Yale Street (N-2016T-0003)

IH-10 to Nevada Street/Bomar Street

City of Houston Public Works and Engineering

Pre-Engineering WBS No. N-320100-00016-3

Prepared by

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with

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TABLE OF CONTENTS

EXECUTIVE SUMMARY

SUMMARY OF CANDIDATE PROJECT

PLANNING 3 - CANDIDATE PROJECT DEVELOPMENT

- 1.1 Need Area
- 1.2 Problem Definition
- 1.3 Recommended Candidate Project
  - 1.3.1 Candidate Project Development
  - 1.3.2 Candidate Project Cost
  - 1.3.3 Candidate Project Scoring Summary
- 1.4 Public Involvement

PLANNING 3 (P4) APPENDICES

- P3 APPENDIX 1 - Candidate Project Forms
  - City of Houston Form Y
  - Candidate Project Score Sheet
  - Candidate Cost Summary
  - City of Houston Bid Form 410
- P3 APPENDIX 2 - Location Map
- P3 APPENDIX 3 - Land Acquisition Map
- P3 APPENDIX 4 - Candidate Project Schematic & Utility Layout
- P3 APPENDIX 5 - City of Houston Water Line and Wastewater Recommendations

ATTACHMENTS

- Planning 1 Report - Problem Definition
- Planning 2 Report - Alternatives

EXECUTIVE SUMMARY

The City of Houston Pre-engineering for Street and Traffic Improvements is a multi-step process to develop a set of recommendations and define a candidate project to improve a corridor within the city. The process defines appropriate recommendations focused on street improvements (pavement quality, traffic, multi-modal mobility, and safety), drainage needs, wastewater needs, and water line utility improvements.

Need Area N-2016T-0003 includes Yale Street from IH-10 to Waugh Drive, Waugh Drive from Washington Avenue to Nevada Street/Bomar Street, Heights Boulevards from IH-10 to Waugh Drive, Waughford Street from Washington Avenue to Waugh Drive, and Commonwealth Street from Waugh Drive to Nevada Street. All elements of the need area are classified as the Waugh Corridor in this report. The need area includes 2.7 centerline miles of roadway in the inner West Loop area and spans both the Washington Ave Coalition/Memorial Park and Neartown-Montrose super neighborhoods. (Key Map 492H, 492M, 492R, 493E, 493J, 493N ; Council Districts C and H).

The Waugh Drive corridor is a key north-south corridor within the inner West Loop area. The corridor connects the Heights neighborhood north of IH-10 to Montrose, providing a key connection between two of the most dense active urban centers of Houston. Waugh Drive is one of only three thoroughfares that crosses Buffalo Bayou within the inner West Loop (a five mile stretch), along with Montrose Boulevard and Shepherd Drive. The corridor connects to and travels through Buffalo Bayou Park and Spotts Park. These roadways provide key connections for all travel modes within one of the densest parts of Houston. There are over 86,000 residents and 147,000 jobs within the inner West Loop and many of these residents and employees rely on the Waugh Drive corridor. This project provides a opportunity to transform the corridor into a multimodal corridor that supports adjacent development.

The defining element of the corridor is the Waugh Drive at Memorial Drive clover leaf interchange. The interchange was constructed in 1955 and is a remnant of the historical Houston Freeway Plan that included Memorial Drive as a controlled access freeway. Clover leaf interchanges are efficient intersections for connecting two high volume roadways, but they require a substantial amount of land and are not supportive of an urban development context. Standards have also evolved significantly since 1955. The footprint of the Waugh Drive at Memorial Drive interchange is over 22 acres. Traversing the Waugh Drive cloverleaf as a person walking or bicycling is challenging. The existing sidewalks are sub-standard, especially on the bridge where they are four feet wide next to high speed traffic. Crossing the merge points on either a bicycle or foot can be challenging.

Existing traffic volumes along the corridor vary from over 40,000 vehicle per day at the Buffalo Bayou Bridge to 10,000 along Yale Street near Koehler Street on the north end of the study area. While the existing vehicular capacity is meeting demand, as the area around the corridor continues to transform and increase in density, corridor operations are projected to operate poorly and exacerbate challenged for multimodal users along the corridor. Existing corridor LOS is D but is projected to drop to E for some segments by 2040; many intersections are projected to operated at LOS F by 2040. Currently, substandard bicycle lanes are only located on two discontinuous segments of the corridor with a gap in the middle adjacent to Buffalo Bayou Park and Spotts Park. While sidewalks are present for the majority of the corridor, they are often narrow, in poor condition, and not ADA compliant.

Despite the low comfort level bicycle facilities and missing segments, people are biking along the corridor. People walk along the corridor throughout the day to either reach adjacent land uses or to connect to Buffalo Bayou Park. There is a demand for the corridor to be transformed into an urban corridor that provides safer access and improved mobility for all modes. Providing high quality facilities for people walking, bicycling, and taking transit while maintaining vehicular capacity and expanding accessible park space will transform the Waugh Drive corridor into a true urban street that matches the existing and future context of the inner West Loop area while also complementing Buffalo Bayou Park.

CANDIDATE PROJECT

The candidate project recommends the redesign and reconstruction of significant segments of the corridor, while rehabilitating smaller segments that are in better condition or have less flexible design potential. The project included realigning Waugh Drive between Feagan Street and Allen Parkway. The new realigned corridor will intersect Memorial Drive at a Single Point Urban Interchange (SPUI). The corridor realignment and the more compact SPUI interchange will allow for reallocating 16 acres of right-of-way into urban park space. The proposed realignment also supports improvements to all bridges along the corridor.

North of the proposed SPUI, the candidate project recommends roadway reconstruction that includes street modifications such as the closing of Feagan Street between Waugh Drive and Heights Boulevard and realigning the intersection of Waugh Drive at Heights Boulevard so that Waugh Drive intersects Heights Boulevard at a right-angle. These intersections would be signalized to support safe connections for all travel modes. The project also recommends converting Waugh Drive between Washington Avenue and Heights Boulevard from a one-way street into a two-way street that will connect to two-way Yale Street north of Washington Avenue. Signalized intersections are proposed for the intersections of Waugh Drive at Feagan Street, Heights Boulevard at Willia Street, and Waugh Drive at Heights Boulevard.

Waugh Drive north of Feagan Street to Washington Avenue is recommended as a four-lane, two-way corridor with an improved pedestrian realm. The four-lanes provide an opportunity for on-street parking if that is desired. North of Washington Avenue, Waugh Drive turns into Yale Street. Roadway recommendations for Yale Street include the reconstruction of the roadway from Center Street to Washington Avenue, including the reconstruction of both signals, an overlay of the four-lane segment north of Center Street, and improvements to the sidewalks between Washington Avenue and Kohler Street.

The candidate project also includes the closure of Waughford Street at Washington Avenue. The exiting Waughford Street at Waugh Drive intersection will be reconstructed to as orthogonal which will reduce excess pavement, clarify travel paths, and improve the pedestrian realm. Waughford Street can then be restriped to provide additional public parking.

Heights Boulevard between Willia Street and Washington Avenue is proposed as a five to six-lane divided roadway with shared-use paths. The project includes the reconstruction of the Washington Avenue intersection. North of Washington Avenue, Heights Boulevard is proposed as a four-lane divided roadway with buffered bicycle lanes, improved sidewalks and enhanced transit stops. The project recommends realigning the southbound Heights Boulevard lanes to shift east and intersect Center Street so that the Heights Boulevard at Center Street intersection is a single-point orthogonal intersection. The shift of the southbound lanes frees ups space west of the corridor within the existing ROW that provides an opportunity to develop a public plaza adjacent to the commercial properties.

South of the Waugh Drive at Memorial Drive interchange the candidate project recommends the reconstruction of Waugh Drive between Allen Parkway and West Gray Street as a four to six-lane divided corridor with improved bicycle facilities (including both bikeways and shared-use paths), sidewalks, and transit stops to match the urban context and strengthen connections for people bicycling and

walking along the corridor.

To improve drainage along the corridor, existing storm sewers will be improved and inline detention culverts will be installed to address storm events. Detention pond(s) are also recommended for the segment of the corridor near the recommended interchange which would increase available detention in the project area. The candidate project meets both 2-year and 100-year drainage design criteria. The City of Houston has also defined water and wastewater improvements for the corridor to be incorporated into the reconstruction of the overall corridor in a coordinated fashion.

The Candidate Project Priority Score (CPPS) for this project is 32.99 with a total cost of $87,225,775.96. The necessary City of Houston ReBuild Houston Funds is $84,301,267.12. The candidate project was divided into three subprojects.

The high cost and corresponding low score of the entire corridor project for Waugh Drive could limit the competitiveness of the project. However, the large scale and transformation nature of this project provides an opportunity to explore other funding sources, such as grants. Additional funding sources should be explored as this project moves forward.

SUMMARY OF CANDIDATE PROJECT

Name of Project:	Waugh Drive/Heights Boulevard/Yale Street (N-2016T-003)
Project Scope and Description:	Redesign and reconstruct signification segments of Waugh Drive, Heights Boulevard, and Yale Street, while rehabilitating smaller segments that are in better condition. Improve storm sewer systems by providing detention to meet 2-year and 100-year events. Improve segments of wastewater and water utilities in need. Proposed design to match the urban context of the corridor with providing improved safety and access for all modes. Design elements include enhanced improved intersections, expanded park space, bicycle facilities, pedestrian realms, and transit stops. Proposed design includes the realignment of the corridor between Feagan Street and Allen Parkway and reconstruction of the existing cloverleaf interchange at Memorial Drive as a Single Point Urban Interchange to reallocated 16 acres of right-of-way into urban park space.
Project Limits:	IH-10 to Nevada Street/Bomar Street
Type:	Major Thoroughfare and Major Collector
Council Districts:	City of Houston Council Districts D and H
Key Map Nos:	492 H, 492M, 492R, 493E, 493J, 493N
Super Neighborhoods:	Washington Avenue Coalition/Memorial Park and Neartown-Montrose
Project Cost:	$87,225,775.96

Number of Sub Projects:	**3**
Subproject 1 - Interchange Waugh Drive from Heights Boulevard to Allen Parkway Heights Boulevard from Washington Avenue to Waugh Drive	$65,242,999.12
Subproject 2 - South of the Interchange Waugh Drive from Allen Parkway to Nevada Street/Bomar Street Commonwealth Street from Waugh Drive to Nevada Street	$13,067,340.75
Subproject 3 - North of the Interchange Heights Boulevard from IH-10 to Washington Avenue Waugh Drive Washington Avenue to Feagan Street Yale Street from IH-10 to Washington Avenue Waughford Street from Washington Avenue to Waugh Drive	$8,915,436.10

Pre-Engineering Report

Street and Traffic
(Thoroughfares) Improvements

Waugh Drive/Heights Boulevard/ Yale Street (N-2016T-0003)

IH-10 to Nevada Street/Bomar Street

Planning 3
(Candidate Project Development)

City of Houston Public Works and Engineering

Pre-Engineering WBS No. N-320100-00016-3

STATE OF TEXAS
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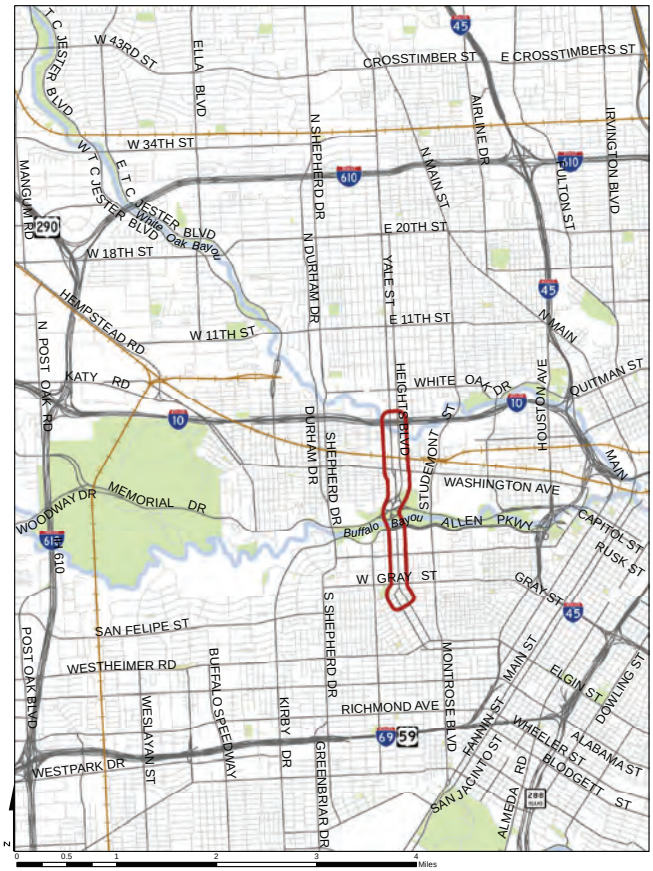
1.0 CANDIDATE PROJECT DEVELOPMENT

The following outlines the Pre-Engineering of Streets and Traffic (Thoroughfares) Improvements process conducted for a segment of Waugh Drive/Heights Boulevard/Yale Street corridors between the IH-10 Eastbound Frontage Road to Nevada Street/Bomar Street. The study area, referred to as the Waugh Drive study corridor within this report, was prioritized by the City of Houston for the pre-engineering process. Corridor information and a project location map is included in **Figure 1**. This work is being completed under Project No. WBS No. N-320100-0016-3 for Need Area N-2016T-0003.

The Planning 3 phase develops a candidate project for the need area based upon the findings from **Planning 1 Problem Definition** and **Planning 2 Alternatives Development**. The candidate project improvements are focused on street improvements (paving, traffic, mulitmodal mobility, and safety), drainage concepts, and water line and wastewater utility improvements.

1.1 NEEDS AREA

The Waugh Drive/Heights Boulevard/Yale Street study area comprises a key north-south corridor within the inner West Loop area. The corridor connects the Heights neighborhood north of IH-10 to Montrose, providing a key connection between two of the most dense active urban centers of Houston. The corridor also intersects both Memorial Drive and Allen Parkway, two key east-west connections between Downtown Houston and Uptown. Memorial Drive and Allen Parkway are both grade separated at Waugh Drive. Waugh Drive at Memorial Drive is a clover leaf interchange and Waugh Drive at Allen Parkway is a diamond interchange.



Corridor Information

- **Project Limits:** IH-10 Eastbound Frontage Road to Nevada/Bomar Street (south of W. Gray Street)
- **Total Project Length:** 2.7 centerline miles
- **Signalized Intersections:** 15
- **Council Districts:** C and H
- **Key Map:** 492H, 492M, 492R, 493E, 493J, 493N
- **Super Neighborhoods:** Washington Ave Coalition/Memorial Park and Neartown-Montrose

Study Area

FIGURE 1 - Study Area

Waugh Drive is one of only three thoroughfares that crosses Buffalo Bayou within the inner West Loop. The corridor connects to and travels through Buffalo Bayou Park and Spotts Park. These roadways provide key connections for all travel modes within the inner West Loop area, which is one of the densest parts of Houston. There are over 86,000 residents and 147,00 jobs within the inner West Loop and many of these residents and employees rely on the Waugh Drive corridor.

For the **Planning 1** phase of this study, the corridor was divided into four segments for analysis, as depicted in **Figure 2**. Segments were defined by the existing and future context of the corridor along with geometrical constraints. **Table 1** summarizes key characteristic of each segment. An in-depth analysis of existing conditions is included with the **Planning 1** report.

1.2 PROBLEM DEFINITION

Needs identification for the corridor are evaluated in several major categories. Street and traffic needs address the roadway condition, capacity, and safety. Drainage needs evaluates the existing storm sewer drainage system. Utility needs summarize the existing water and sanitary sewer lines within the project area, as well as any private utilities or pipelines that have been identified. An in depth analysis of the existing conditions and needs assessment for the corridor is included in **Planning 1** and further refined in **Planning 2**. **Table 2** includes a summary of the corridors needs assessment.

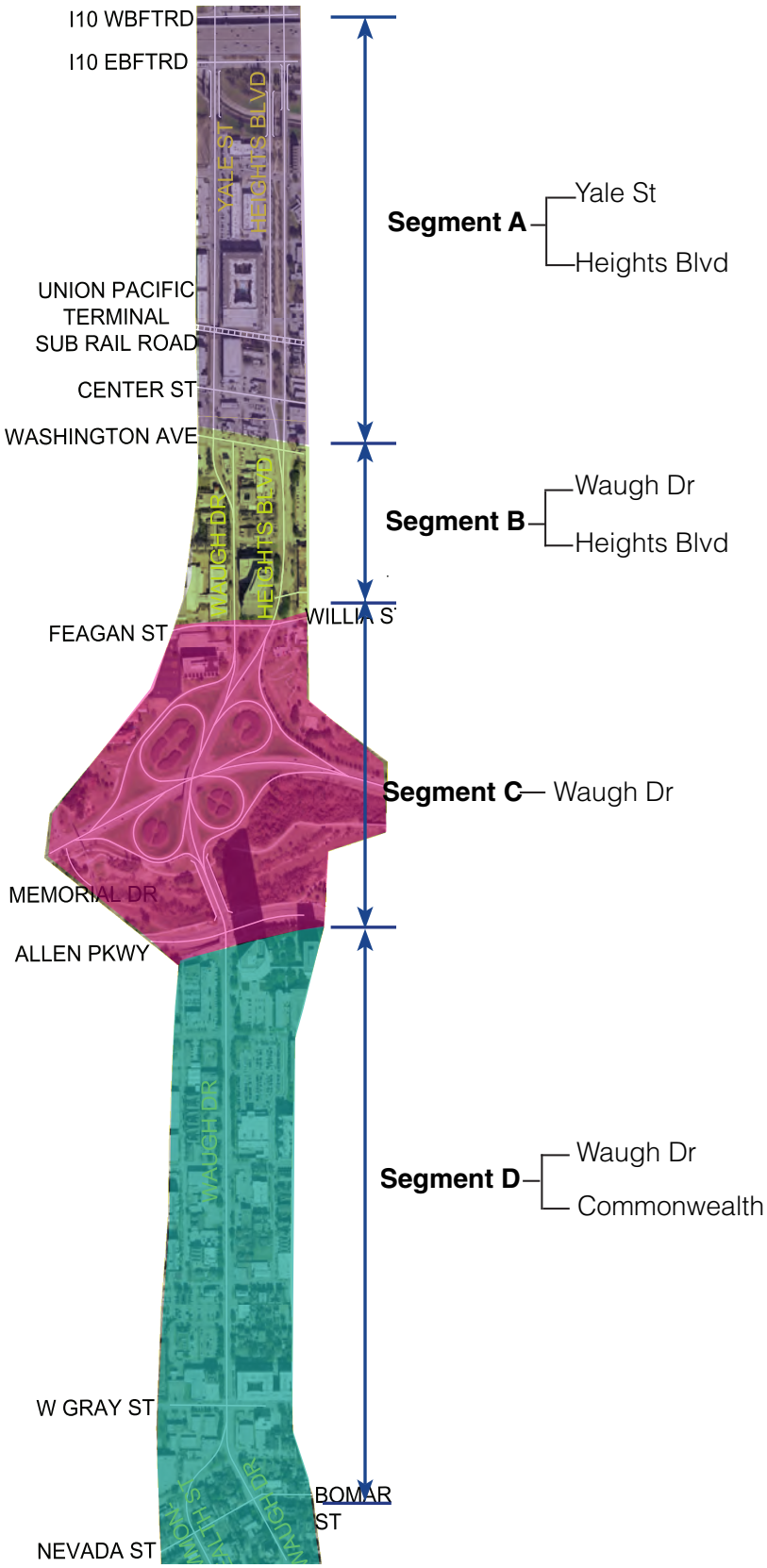


FIGURE 2 - Corridor Segments

TABLE 1 - Existing Corridor Segments

Segment	Extents	Street	MTFP	Corridor Summary
A	IH-10 to North of Washington Avenue	Yale Street	T-4-70	Yale Street is a four-lane roadway (with a two-way, left-turn lane for part of the segment) lined primarily by big box and strip center retail. Yale Street is grade separated (under-pass) at the Union Pacific Railroad Terminal Sub (UPRR).
		Heights Boulevard	T-4-150	Heights Boulevard is a four-lane divided roadway with a wide landscaped median. Heights Boulevard has an existing stripped bicycle lane and is served by Metro Route 40.
B	North of Washington Avenue to North of Feagan/Willia Street	Waugh Drive	T-4-60	Waugh Drive a four-lane, one-way roadway. Parking is allowed with some time restrictions on the outside lanes of Waugh Drive.
		Heights Boulevard	T-4-140	Heights Boulevard is a six-lane divided roadway lined by multi-family residential and mid-rise office.
C	North of Feagan/ Willia Street to South of Allen Parkway	Waugh Drive	T-5-100	The footprint of the Waugh Drive at Memorial Drive interchange is over 22 acres. Traversing the Waugh Drive cloverleaf as a person walking or bicycling is incredibly challenging. The interchange does not fit the urban context of the corridor. There are three bridges along this segment. The Memorial Drive Bridge is listed as a Historically Significant Postwar Bridge by TxDOT, the Texas Historical Commission, and the Historical Bridge Foundation. The Buffalo Bayou Bridge is home to a urban bat colony. The clearance under the Allen Parkway bridge is no longer to standard; therefore any improvements to the bridge could require reconstruction along Allen Parkway. The challenges associated with all three bridges encourage exploring a possible realignment of Waugh Drive between Allen Parkway and Feagan Street/Willia Street.
D	South of Allen Parkway to West Gray Street	Waugh Drive	T-5-100	Waugh Drive is a six-lane roadway though one of the most dense activity areas of west Houston. Southbound Waugh Drive at the West Gray Street intersection has a right-turn only lane that operates as an entrapment lane. Due to the current alignment of the intersection and poor signage and visibility, many drivers continue south from the right-turn only lane, contributing to crashes and observed driver confusion at the intersection.
	West Gray Street to Nevada/Bomar Street	Waugh Drive	MJ-2-50	South of West Gray Street Waugh Drive splits into a one-way pair. Southbound traffic continues south on Commonwealth Street and Waugh Drive carries northbound vehicles. The reverse curve on Commonwealth Street just south of the West Gray Street intersection has tight radii and vehicles often encroach into adjacent lanes, including the bicycle lane.
		Commonwealth Street	MJ-2-80	

TABLE 2 - Corridor Needs Assessment Summary

Street & Traffic Needs Assessment	
Pavement Quality	Pavement quality along the Waugh corridor varies but is generally in decent to good condition. The compound PCI for the entire study corridor is 75.58. Cracking is present along most of the corridor and there are multiple asphalt patches indicating fixes to potholes. For concrete segments, there are multiple panels with joint failure. The segment in the poorest conditions is Waugh Drive between Washington Avenue and Heights Boulevard (Segment B) where there is abundant cracking. The compounded PCI score is 45 for this segment, which is supported by field inspections. The composite PCI score for each segment are listed below: **A** Yale Street 72 Heights Boulevard 83 **B** Heights Boulevard 71 Waugh Drive 45 **C** Waugh Drive 79 **D** Waugh Drive 89 Waugh Drive (one-way) 87 Commonwealth 80
Corridor Capacity	Performance of the Waugh Drive corridor was determined by evaluating the corridor performance of each segment and by analyzing the operations at each signalized intersection. Corridor performance is based on the corridor level-of-service (LOS) based on Exhibit 16-14 from the 2010 *Highway Capacity Manual* (HCM). Today, segments of the Waugh Drive corridor are operating at LOS D or better. Future operations for 2040 were evaluated based on both the Houston-Galveston Area Council (H-GAC) Travel Demand Model (TDM) estimates and a 1% compounded yearly growth scenario. In both future scenarios, segments of the corridor will drop to LOS E due to the high projected traffic volumes. These volumes reinforce the importance of the corridor in providing connections over Buffalo Bayou.
Intersection Capacity	Intersection operations are the key element that effects how a corridor operates. Intersection analysis were conducted for 15 signalized intersections within the study area. In general, a signalized intersection operating at LOS D or better in an urban area is characterized by acceptable delays. Three study area intersections operate at LOS E: Yale Street at both IH-10 Frontage Roads and Yale Street/Waugh Drive at Washington Avenue. With the exception of Yale Street at the IH-10 Westbound Frontage Road, all intersections operate with V/C ratios less than 0.7 indicating there is excess capacity.
Pedestrian Infrastructure	Walking along the Waugh Drive, Heights Boulevard, and Yale Street within the study area is a variable experiencing. Some segments have wide and shaded sidewalks while other segments have narrow sidewalks in poor condition. There is even a short segment near the Memorial Drive interchange with no sidewalk. Often there are obstructions within sidewalks, even recently reconstruction sidewalks. Even in areas with sidewalks are in poor condition, people are walking. There is a demand for a strong and safe pedestrian realm along the Waugh Drive study corridor. Waugh Drive is a major access point to Buffalo Bayou Park, which attracts many runners and walkers. A reconstructed Waugh Drive corridor needs to support safe access to the park while also encouraging a walkable urban environment along the corridor.

TABLE 2 Continued - Corridor Needs Assessment Summary

Street & Traffic Needs Assessment Continued	
Bicycle Infrastructure	Currently there are two disconnected low-comfort bicycle facilities that are poorly maintained along the Waugh Drive study corridor. North of Washington Avenue, there is a low-comfort bicycle lane along Heights Boulevard. South of West Grey Street there is a low-comfort bicycle facility along both Waugh Drive and Commonwealth Street that continues south to Yoakum Boulevard. The Houston Bike Plan proposes a high comfort on-street facility along Heights Boulevard from north of IH-10 to Waugh Drive and along Waugh Drive from Heights Boulevard to south of Nevada Street/Bomar Street. An improved bicycle facility along the Waugh Drive study corridor is critical to developing a strong bicycle network in west Houston. The proposed facility will not only connect to Buffalo Bayou Park but also provide connections between the Heights and Montrose and to key east-west facilities such as Washington Avenue and West Dallas Street.
Transit	There are three METRO routes that operate within the study area: 40 Telephone/Heights, 66 Quitman, 71 Cottage Grove. The 40 Telephone/Heights operates along Heights Boulevard and Waugh Drive from north of the study area to West Dallas Street where it turns to travel north into Downtown. The 40 Telephone/Heights is a semi-frequent route with 30 minute headways and an average daily ridership of 4620. Both the 66 Quitman and 71 Cottage Grove operate at 60 minute base frequency. The low base frequency of these routes do not support high daily ridership.
Drainage Needs Assessment	
Drainage	The Planning 1 evaluation showed that the storm sewer systems in the need area had few flooding complaints according to the COH CDP and many of the systems were listed as having adequate capacity in the CDP. Two systems shown in the COH CDP as inadequate have potential to significantly impact the storm sewer systems in the Waugh Drive Corridor. These systems are W0451 (System C) and W0454 (System G). The existing floodplain storage volume located in the green space areas in the Waugh Drive/ Memorial Drive interchange will need to be preserved in future conditions in accordance with local and FEMA floodplain criteria. The possibility of revising the interchange provides an opportunity to enhance the floodplain storage volume and provide additional flood protection to the surrounding area.
Utility Needs Assessment	
Water	Corridor water lines were constructed between 1938 and 2011. WIRP ratings range from 172 to 284. COH identified improvements.
Wastewater	The sanitary sewers along the corridor were constructed between 1946 and 2012. COH identified improvements.

1.3 RECOMMENDED CANDIDATE PROJECT

1.3.1 CANDIDATE PROJECT DEVELOPMENT

Waugh Drive is a critical corridor within the inner west loop area and has the potential to become a transformative project that will improve multimodal mobility, drainage, park access, and park space. While the existing vehicular capacity is meeting demand, as the area around the corridor continues to transform and increase in density, corridor operations will begin to fail. Existing corridor LOS is D but is projected to drop to LOS E for some segments in 2040; many intersections are projected to operated at LOS F by 2040. Pavement quality varies along the corridor from poor to adequate. But, areas where pavement quality is within an adequate range there is evidences of constant patching. The corridor is in need of a resign and reconstruction.

Currently, substandard bicycle lanes are only located on two discontinuous segments of the corridors. While sidewalks are present for the majority of the corridor, they are often narrow and in poor condition. Despite the low comfort level bicycle facilities and missing segments, people are biking along the corridor. People walk along the corridor throughout the day to either reach adjacent land uses or to connect to Buffalo Bayou Park. There is a demand for the corridor to be transformed into provide access for all modes. Providing high quality facilities for people walking, bicycling, and taking transit while maintaining vehicular capacity will transform the Waugh Drive corridor into a true urban street that matches the existing and future context of the inner West Loop area.

The largest obstacle to Waugh Drive being transformed into a true urban corridor is the existing clover leaf interchange the intersection of Waugh Drive at Memorial Drive. The cloverleaf interchange was constructed in 1955 and is a remnant of the historical Houston Freeway Plan that included Memorial Drive as a controlled access freeway. Clover leaf interchanges are efficient intersections for connecting two high volume roadways, but they require a substantial amount of land. The footprint of the Waugh Drive at Memorial Drive interchange is over 22 acres. Traversing the Waugh Drive cloverleaf as a person walking or bicycling is challenging.

The Planning 2 process presented two alternatives for the reconstruction of the intersection of Waugh Drive at Memorial Drive: a Single Point Urban Interchange and a Diverging Diamond Interchange (DDI). Both proposed alternatives would free up substantial space to be converted to park space and both designed provided shared-use paths to improve access for pedestrians and bicyclists. The preferred alternative that was developed into the center point of the candidate project was the SPUI design that would provide appropriately 16 acres of additional park space. The candidate project recommends the design and construction of an urban concrete curb and gutter corridor that provides access for all modes as it radiates north and south of the proposed SPUI interchange at Memorial Drive.

The candidate project recommends the redesign and realignment of Waugh Drive between Feagan Street and Allen Parkway. Realigning the corridor provides a variety of benefits. The proposed realignment supports improvements to all bridges along the corridor. Both the Memorial Drive bridge (a historical bridge) and the Buffalo Bayou bridge (home to a large urban bat colony) would be difficult to modify, widen, or rehab to align with mobility goals of the corridor or as they reach end of useful life. Due to restrictions and challenges provided by the three bridges, reconstructing the corridor on a straighted alignment provides greater flexibility for traffic control during corridor construction.

North of the proposed SPUI, the candidate project recommends roadway reconstruction that includes street modifications such as the closing of Feagan Street between Waugh Drive and Heights Boulevard and realigning the intersection of Waugh Drive at Heights Boulevard so that Waugh Drive intersects Heights Boulevard at a right-angle. These intersections would be signalized to support safe connections for all travel modes. The project also recommends converting Waugh Drive between Washington Avenue and Heights Boulevard from a one-way street into a two-way street that will connect to two-way Yale Street north of Washington Avenue. Signalized intersections are proposed for the intersections of Waugh Drive at Feagan Street, Heights Boulevard at Willia Street, and Waugh Drive at Heights Boulevard.

Closing Feagan Street improves traffic operations between the three closely spaced intersections while maintaining access to adjacent properties. The street closure also provides an opportunity for enhanced trail connectivity between the on-street bicycle and pedestrian facilities and the proposed park trails. A connection between Waugh Drive and Jackson Hill Street is also proposed to provide additional park access, improve circulation, and potential additional parking for Buffalo Bayou Park.

Waugh Drive north of Feagan Street to Washington Avenue is recommended as a four-lane, two-way corridor with an improved pedestrian realm. The four-lanes provide an opportunity for on-street parking if that is desired. North of Washington Avenue, Waugh Drive turns into Yale Street. Roadway recommendations for Yale Street include the reconstruction of the roadway from Center Street to Washington Avenue, including the reconstruction of both signals, an overlay of the four-lane segment north of Center Street, and improvements to the sidewalks between Washington Avenue and Kohler Street.

The candidate project also includes the closure of Waughford Street at Washington Avenue. The exiting Waughford Street at Waugh Drive intersection will be reconstructed to as orthogonal which will reduce excess pavement, clarify travel paths, and improve the pedestrian realm. Waughford Street can then be restriped to provide additional public parking.

Heights Boulevard between Willia Street and Washington Avenue is proposed as a five to six-lane divided roadway with shared-use paths. The project includes the reconstruction of the Washington Avenue intersection. North of Washington Avenue, Heights Boulevard is proposed as a four-lane divided roadway with buffered bicycle lanes, improved sidewalks and enhanced transit stops. The project recommends realigning the southbound Heights Boulevard lanes to shift east and intersect Center Street so that the Heights Boulevard at Center Street intersection is a single-point orthogonal intersection. The shift of the southbound lanes frees ups space west of the corridor within the existing

ROW that provides an opportunity to develop a public plaza adjacent to the commercial properties. South of the interchange the candidate project recommends the reconstruction of Waugh Drive between Allen Parkway and West Gray Street as a 4- to 6-lane divided corridor with improved bicycle facilities (including both bikeways and shared-use paths), sidewalks, and transit stops to match the urban context and strengthen connections for people bicycling and walking along the corridor.

South of the Waugh Drive at Memorial Drive interchange the candidate project recommends the reconstruction of Waugh Drive between Allen Parkway and West Gray Street as a four to six-lane divided corridor with improved bicycle facilities (including both bikeways and shared-use paths), sidewalks, and transit stops to match the urban context and strengthen connections for people bicycling and walking along the corridor.

To improve drainage along the corridor, existing storm sewers will be improved and inline detention culverts will be installed to address storm events. Detention pond(s) are also recommended for the segment of the corridor near the recommended interchange which would increase available detention in the project area. The candidate project meets both 2-year and 100-year drainage design criteria. The Utility Layouts included within **P3 Appendix 5** depicts the proposed storm sewer and inline detention sizes and location and **Planning 2 Appendix 5** includes a Storm Water Drainage Analysis. The storm sewer system was deigned in accordance with City of Houston criteria.

The City of Houston has also defined water and wastewater improvements for the corridor to be incorporated into the reconstruction of the overall corridor in a coordinated fashion. Water line and wastewater recommendation are included in **P3 Appendix 5**.

The only wastewater recommendations are for Subproject 3 north of the interchange along Heights Boulevard. The recommendation include the installation of an 8” pipe from White Oak Bayou to 2nd Street and a 15” pipe from 2nd Street to Center Street along Heights Boulevard.

The water line recommendations are listed below by subproject number.

- Subproject 1 - Upsize existing 2” waterline on Heights Boulevard south of Washington Avenue to an 8” waterline and extend the proposed 8” water line to connect to the existing 8” waterline on Willia Street.
- Subproject 2 - Upsize existing 12” water lie on Waugh Drive between Allen Parkway and Bomar Street to a 16” water line.
- Subproject 3 - Upsize existing 8” waterlines on Heights Boulevard to 12” while abandoning existing 2” and transfer connection to parallel 8”/12” waterline.

1.3.2 SUBPROJECTS

The candidate project was divided into three subprojects defined by similar characteristics and divided at major intersections. The three subprojects are based on the projects developed in Planning 2, as shown in **Table 3**. Subproject 1 is defined by the reconstruction of the interchange segment of the study corridor. The extents are Waugh Drive from Heights Boulevard to Allen Parkway and Heights Boulevard from Washington Avenue to Waugh Drive, and are shown in blue in **Figure 1**. It has the highest cost of the three defined subproject, but also has the opportunity to transform the entire corridor. Subproject 1 has the same extents as Planning 2 Project 2 and includes all of Planning 1 Segment C and part of Planning 1 Segment B.

Subproject 2, shown in red in **Figure 1**, includes all recommended improvements and roadway reconstruction south of the interchange subproject. The extents of Subproject 2 match the extents of Planning 2 Project 3 and Planning 1 Segment D. Subproject 3, shown in green in **Figure 1**, includes all recommended improvements and roadway reconstruction north of the interchange subproject. The extents of Subproject 3 include the extents of Planning 2 Project 1 and Project 1A and the extents of Planning 1 Segment A and part of Segment B.

TABLE 3 - Subproject Definitions and Divisions

PLANNING 3 SUBPROJECT	PLANNING 2 PROJECT	PLANNING 1 SEGMENT
Subproject 1 - Interchange • Waugh Drive from Heights Boulevard to Allen Parkway • Heights Boulevard from Washington Avenue to Waugh Drive	2	B and C
Subproject 2 - South of the interchange • Waugh Drive from Allen Parkway to Nevada Street/Bomar Street • Commonwealth Street from Waugh Drive to Nevada Street	3	D
Subproject 3 - North of the interchange • Heights Boulevard from IH-10 to Washington Avenue • Waugh Drive Washington Avenue to Feagan Street • Yale Street from IH-10 to Washington Avenue • Waughford Street from Washington Avenue to Waugh Drive	1 and 1A	A and B

Figure 1 - Subproject Extents

1.3.2 CANDIDATE PROJECT COST

The candidate project is estimated to have a total cost of $87,225,775.96. Detailed cost estimates were developed for the candidate project and are summarized in **Table 4**. **Table 5** shows a breakdown of costs for the candidate project that would utilize City of Houston Rebuild Funds. The itemized detailed cost breakdown for both the candidate project and all three subproject are included in the planning level 410 forms included in **Appendix 1**.

TABLE 4 - Total Project Cost Breakdown

COST ITEM	PREFERRED ALTERNATIVE COST
Paving Items	$44,936,619.42
Drainage Items	$2,299,525.30
Wastewater Items	$450,153.00
Water Line Items	$1,221,950.40
Total Construction Cost	**$48,908,248.12**
Contingencies (30% of Construction Cost)	$14,672,474.44
Construction Management (15% of Construction Cost)	$7,336,237.22
Engineering Fee (20% of Construction Cost + Contingencies)	$12,716,144.51
Design Management (15% of Engineering Fee Cost)	$1,907,421.68
Land Acquisition	$1,685,250.00
Total Project Cost	**$87,225,775.96**

TABLE 5 - City of Houston ReBuild Funds

COST ITEM	REBUILD HOUSTON COST
Paving Items	$44,936,619.42
Drainage Items	$2,299,525.30
Total Construction Cost	**$47,236,144.72**
Contingencies (30% of Construction Cost)	$14,170,843.42
Construction Management (15% of Construction Cost)	$7,085,421.71
Engineering Fee (20% of Construction Cost + Contingencies)	$12,281,397.63
Design Management (15% of Engineering Fee Cost)	$1,842,209.64
Land Acquisition	$1,685,250.00
Rebuild Houston Funds	**$84,301,267.12**

1.3.3 CANDIDATE SCORING SUMMARY

Using the City of Houston methodology for determining the Candidate Project Priority Score (CPPS) for a Major Thoroughfare that does not change in classification (Table 3.3), the candidate project score is 32.99. The values used to determine the project score are summarized in **Table 6**. The Form Y completed for this candidate project (and the three subprojects) is included in **Appendix 1**.

The high cost and corresponding low score of the entire corridor project for Waugh Drive could limit the feasibility of the project. But as discussed in this report, this project would be a transformative project for the City of Houston. The large scale of this project provides an opportunity to explore other funding sources, such as grants. **Table 7** includes a breakdown of how the project score can change with 25% and 50% of the project cost coming from grants (or other funding sources). If 50% of the project's funding can be acquired from other sources, the project score will increase to a 65.98.

An alternative score for the candidate project was calculated based on a benefited population calculation based on the highest traffic volumes instead of a weighted average of traffic volumes (**Table 6**). The interchange section of the candidate project will have the highest cost, but also has the highest benefited population due to the high traffic volumes along the Memorial Drive and Buffalo Bayou Bridge (**Figure 5** in *Planning 1*). Using the traffic volumes at the Memorial bridge as the benefited population analysis would be inclusive of the entirety of people benefited on the corridor.

The interchange benefited population is 52,242 while the weighted average benefited population for the entire corridor is 28,773. When calculated the score based on the interchanges calculated benefited population the project score becomes 59.90, as shown in **Figure 8**.

TABLE 6 - Candidate Project Priority Scoring Summary

(Based on COH Table 3.3 Major Thoroughfare and Collectors (No Change in Classification) Candidate Project Priority Score Determination)

CATEGORY	WEIGHT	CRITERIA	BENEFIT	CANDIDATE PROJECT
Streets	75%	Pavement conditions (0-60)	Improved Pavement Condition (driving surface)	14.7
		Traffic Level of Service (0-15)	Reduced wait time at intersections	0
Drainage Systems	15%	Extreme Event LOS (0-5)	Drainage System conveys within public right-of-way	5
		Design Event LOS (0-10)	Drainage System conveys Design Event	10
Water	5%	WIRP Rank (0-5)	Reduction in occurrence of breaks, color, odor, low pressure, etc.	4.1
Wastewater	5%	Sanitary Sewer Overflows or Agreed Order (0-2)	Reduction in stoppages and overflows	1
		Maintenance History (5-Years) (0-2)	Reduction in breaks, stoppages and overflows	0
		Age of Pipe (0-1)	Reduction in collapses/failures due to older pipe	1
Service Area Benefit Factor	Sum of Above			35.8
Benefited Population	35% of Current Average Daily Traffic + 65% of Future Average Daily Traffic + Current Metro Ridership numbers			28,773
City ReBuild Houston Funds	Total Candidate Project Costs including Land Acquisition, Design and Construction that are funded by: Ad valorem, drainage charge, 3rd Party (Metro) or Impact Fee contributions			$84,301 K
Corridor Centerline Miles	As Measured			2.7
Candidate Project Priority Score	$\frac{\text{Service Area Benefit Factor X Benefited Population X Center Line Miles}}{\text{City ReBuild Houston Funds}}$			**32.99**

[1] Composite PCI value for corridor is 75.58. Candidate Project Points computed by using the formula: (0.6 X (100-PCI))
[2] Current average daily traffic (based on weighted average of entire corridor) is 20,547
[3] Projected future average daily traffic (based on weighted average of entire corridor) is 26,094
[4] The value for current metro ridership is calculated by summing the total ridership for all routes along the corridor - total ridership is 4,620.

TABLE 7 - Summary of Project Score Changes as a result of Grand Funding

	ESTIMATED COST (REBUILD HOUSTON)	ESTIMATED SCORE
Score with 0% Grand Funding	$84,301,000	**32.99**
Score with 25% Grant Funding ($21.2 Million)	$63,226,000	**43.99**
Score with 50% Grant Funding ($42.3 Million)	$42,150,000	**65.98**

TABLE 8 - Candidate Project Priority Scoring Summary based on Inclusive Benefited Population Value

(Based on COH Table 3.3 Major Thoroughfare and Collectors (No Change in Classification) Candidate Project Priority Score Determination)

CATEGORY	WEIGHT	CRITERIA	BENEFIT	CANDIDATE PROJECT
Streets	75%	Pavement conditions (0-60)	Improved Pavement Condition (driving surface)	14.7
		Traffic Level of Service (0-15)	Reduced wait time at intersections	0
Drainage Systems	15%	Extreme Event LOS (0-5)	Drainage System conveys within public right-of-way	5
		Design Event LOS (0-10)	Drainage System conveys Design Event	10
Water	5%	WIRP Rank (0-5)	Reduction in occurrence of breaks, color, odor, low pressure, etc.	4.1
Wastewater	5%	Sanitary Sewer Overflows or Agreed Order (0-2)	Reduction in stoppages and overflows	1
		Maintenance History (5-Years) (0-2)	Reduction in breaks, stoppages and overflows	0
		Age of Pipe (0-1)	Reduction in collapses/failures due to older pipe	1
Service Area Benefit Factor	Sum of Above			35.8
Benefited Population	35% of Current Average Daily Traffic + 65% of Future Average Daily Traffic + Current Metro Ridership numbers			52,242
City ReBuild Houston Funds	Total Candidate Project Costs including Land Acquisition, Design and Construction that are funded by: Ad valorem, drainage charge, 3rd Party (Metro) or Impact Fee contributions			$84,301 K
Corridor Centerline Miles	As Measured			2.7
Candidate Project Priority Score	$\frac{\text{Service Area Benefit Factor X Benefited Population X Center Line Miles}}{\text{City ReBuild Houston Funds}}$			**59.90**

[1] Composite PCI value for corridor is 75.58. Candidate Project Points computed by using the formula: (0.6 X (100-PCI))
[2] Current average daily traffic (based on weighted average of entire corridor) is 40,512
[3] Projected future average daily traffic (based on weighted average of entire corridor) is 51,450
[4] The value for current metro ridership is calculated by summing the total ridership for all routes along the corridor - total ridership is 4,620.

TABLE 9 - Summary of Project Score (Based on Inclusive Benefited Population) Changes as a result of Grand Funding

	ESTIMATED COST (REBUILD HOUSTON)	ESTIMATED SCORE
Score with 0% Grand Funding	$84,301,000	**59.90**
Score with 25% Grant Funding ($21.2 Million)	$63,226,000	**79.87**
Score with 50% Grant Funding ($42.3 Million)	$42,150,000	**119.80**

Planning 3 - Appendix 1
Candidate Project Forms

Need Area: N-2016T-0006
Candidate Project

Pre-Engineering Services Contracts

Project Cost Estimate Breakdown (FY17 Dollars)

1	**Base Unit Price (410) Summary**		**$48,908,248.12**
	1.1	Total Unit Price, Paving Items	$44,936,619.42
	1.2	Total Unit Price, Storm Sewer Items	$2,299,525.30
	1.3	Total Unit Price, Wastewater Items	$450,153.00
	1.4	Total Unit Price, Water Items	$1,221,950.40
2	**Contingency (30% of 410 Total)**		**$ 14,672,474.44**
3	**Construction Management (15% of 410 Total)**		**$ 7,336,237.22**
4	**Engineering Fee Estimate (20% of 410 Total and Contingen**		**$ 12,716,144.51**
5	**Design Management (15% of Engineering Fee Estimate)**		**$ 1,907,421.68**
6	**Land Acquisition**		**$1,685,250.00**
	6.1	Additional Street ROW	$1,107,750.00
	6.2	Detention Pond (Vacant Land)	$577,500.00
	6.3	Parcels (Land and Improvements)	$0.00
Total Project Cost			**$87,225,775.96**

City of Houston, Rebuild Houston Fund

1	**410 (Summarized based on List of Unit Prices)**		**$47,236,144.72**
	1.1	Total Unit Price, Paving Items	$44,936,619.42
	1.2	Total Unit Price, Storm Sewer Items	$2,299,525.30
2	**Contingency (30% of 410 Total)**		**$ 14,170,843.42**
3	**Construction Management (15% of 410 Total)**		**$ 7,085,421.71**
4	**Engineering Fee Estimate (20% of 410 Total and Contingen**		**$ 12,281,397.63**
5	**Design Management (15% of Engineering Fee Estimate)**		**$ 1,842,209.64**
6	**Land Acquisition (Engineer's Best Estimate)**		**$ 1,685,250.00**
Total Project Cost			**$ 84,301,267.12**

Need Area: N-2016T-0003
Subproject 1 - Interchange

Heights Boulevard between Washington Avenue and Waugh Drive
Waugh Drive between Feagan Street and Allen Parkway

Pre-Engineering Services Contracts

Project Cost Estimate Breakdown (FY17 Dollars)

1	**Base Unit Price (410) Summary**		**$36,972,841.12**
	1.1	Total Unit Price, Paving Items	$35,971,184.92
	1.2	Total Unit Price, Storm Sewer Items	$787,763.40
	1.3	Total Unit Price, Wastewater Items	$0.00
	1.4	Total Unit Price, Water Items	$213,892.80
2	**Contingency (30% of 410 Total)**		**$ 11,091,852.34**
3	**Construction Management (15% of 410 Total)**		**$ 5,545,926.17**
4	**Engineering Fee Estimate (20% of 410 Total and Contingen**		**$ 9,612,938.69**
5	**Design Management (15% of Engineering Fee Estimate)**		**$ 1,441,940.80**
6	**Land Acquisition**		**$577,500.00**
	6.1	Additional Street ROW	$0.00
	6.2	Detention Pond (Vacant Land)	$577,500.00
	6.3	Parcels (Land and Improvements)	$0.00
Total Project Cost			**$65,242,999.12**

City of Houston, Rebuild Houston Fund

1	**410 (Summarized based on List of Unit Prices)**		**$36,758,948.32**
	1.1	Total Unit Price, Paving Items	$35,971,184.92
	1.2	Total Unit Price, Storm Sewer Items	$787,763.40
2	**Contingency (30% of 410 Total)**		**$ 11,027,684.50**
3	**Construction Management (15% of 410 Total)**		**$ 5,513,842.25**
4	**Engineering Fee Estimate (20% of 410 Total and Contingen**		**$ 9,557,326.56**
5	**Design Management (15% of Engineering Fee Estimate)**		**$ 1,433,598.98**
6	**Land Acquisition (Engineer's Best Estimate)**		**$ 577,500.00**
Total Project Cost			**$ 64,868,900.61**

Need Area: N-2016T-0003
Subproject 2 - South of Interchange

Waugh Drive between Allen Parkway and Bomar Street
Commonwealth Street between Waugh Drive and Nevada Street

Pre-Engineering Services Contracts

Project Cost Estimate Breakdown (FY17 Dollars)

1	**Base Unit Price (410) Summary**		**$6,837,959.26**
	1.1	Total Unit Price, Paving Items	$5,433,149.26
	1.2	Total Unit Price, Storm Sewer Items	$539,998.80
	1.3	Total Unit Price, Wastewater Items	$0.00
	1.4	Total Unit Price, Water Items	$864,811.20
2	**Contingency (30% of 410 Total)**		**$ 2,051,387.78**
3	**Construction Management (15% of 410 Total)**		**$ 1,025,693.89**
4	**Engineering Fee Estimate (20% of 410 Total and Contingen**		**$ 1,777,869.41**
5	**Design Management (15% of Engineering Fee Estimate)**		**$ 266,680.41**
6	**Land Acquisition**		**$1,107,750.00**
	6.1	Additional Street ROW	$1,107,750.00
	6.2	Detention Pond (Vacant Land)	$0.00
	6.3	Parcels (Land and Improvements)	$0.00
Total Project Cost			**$13,067,340.75**

City of Houston, Rebuild Houston Fund

1	**410 (Summarized based on List of Unit Prices)**		**$5,973,148.06**
	1.1	Total Unit Price, Paving Items	$5,433,149.26
	1.2	Total Unit Price, Storm Sewer Items	$539,998.80
2	**Contingency (30% of 410 Total)**		**$ 1,791,944.42**
3	**Construction Management (15% of 410 Total)**		**$ 895,972.21**
4	**Engineering Fee Estimate (20% of 410 Total and Contingen**		**$ 1,553,018.50**
5	**Design Management (15% of Engineering Fee Estimate)**		**$ 232,952.77**
6	**Land Acquisition (Engineer's Best Estimate)**		**$ 1,107,750.00**
Total Project Cost			**$ 11,554,785.96**

Need Area: N-2016T-0003
Subproject 3 - North of Interchange

Heights Boulevard between IH-10 and Washington Avenue
Yale Street between IH-10 and Waugh Drive
Waugh Drive between Washington Avenue and Feagan Street
Waughford Street between Washington Avenue and Waugh Drive

Pre-Engineering Services Contracts

Project Cost Estimate Breakdown (FY17 Dollars)

1	**Base Unit Price (410) Summary**		**$5,097,447.74**
	1.1	Total Unit Price, Paving Items	$3,532,285.24
	1.2	Total Unit Price, Storm Sewer Items	$971,763.10
	1.3	Total Unit Price, Wastewater Items	$450,153.00
	1.4	Total Unit Price, Water Items	$143,246.40
2	**Contingency (30% of 410 Total)**		**$ 1,529,234.32**
3	**Construction Management (15% of 410 Total)**		**$ 764,617.16**
4	**Engineering Fee Estimate (20% of 410 Total and Contingen**		**$ 1,325,336.41**
5	**Design Management (15% of Engineering Fee Estimate)**		**$ 198,800.46**
6	**Land Acquisition**		**$0.00**
	6.1	Additional Street ROW	$0.00
	6.2	Detention Pond (Vacant Land)	$0.00
	6.3	Parcels (Land and Improvements)	$0.00
Total Project Cost			**$8,915,436.10**

City of Houston, Rebuild Houston Fund

1	**410 (Summarized based on List of Unit Prices)**		**$4,504,048.34**
	1.1	Total Unit Price, Paving Items	$3,532,285.24
	1.2	Total Unit Price, Storm Sewer Items	$971,763.10
2	**Contingency (30% of 410 Total)**		**$ 1,351,214.50**
3	**Construction Management (15% of 410 Total)**		**$ 675,607.25**
4	**Engineering Fee Estimate (20% of 410 Total and Contingen**		**$ 1,171,052.57**
5	**Design Management (15% of Engineering Fee Estimate)**		**$ 175,657.89**
6	**Land Acquisition (Engineer's Best Estimate)**		**$ -**
Total Project Cost			**$ 7,877,580.55**

Candidate Project Priority Score Sheet

(Based on COH Table 3.3 Major Thoroughfare and Collectors (No Change in Classification) Candidate Project Priority Score Determination)

CATEGORY	WEIGHT	CRITERIA	BENEFIT	CANDIDATE PROJECT
Streets	75%	Pavement conditions (0-60)	Improved Pavement Condition (driving surface)	14.7
		Traffic Level of Service (0-15)	Reduced wait time at intersections	0
Drainage Systems	15%	Extreme Event LOS (0-5)	Drainage System conveys within public right-of-way	5.0
		Design Event LOS (0-10)	Drainage System conveys Design Event	10
Water	5%	WIRP Rank (0-5)	Reduction in occurrence of breaks, color, odor, low pressure, etc.	4.1
Wastewater	5%	Sanitary Sewer Overflows or Agreed Order (0-2)	Reduction in stoppages and overflows	1
		Maintenance History (5-Years) (0-2)	Reduction in breaks, stoppages and overflows	0
		Age of Pipe (0-1)	Reduction in collapses/failures due to older pipe	1
Service Area Benefit Factor	Sum of Above			35.8
Benefited Population	35% of Current Average Daily Traffic + 65% of Future Average Daily Traffic + Current Metro Ridership numbers			28,773
City ReBuild Houston Funds	Total Candidate Project Costs including Land Acquisition, Design and Construction that are funded by: Ad valorem, drainage charge, 3rd Party (Metro) or Impact Fee contributions			$84,301 K
Corridor Centerline Miles	As Measured			2.7
Candidate Project Priority Score	$\frac{\text{Service Area Benefit Factor X Benefited Population X Center Line Miles}}{\text{City ReBuild Houston Funds}}$			**32.99**

[1] Composite PCI value for corridor is 75.58. Candidate Project Points computed by using the formula: (0.6 X (100-PCI))
[2] Current average daily traffic (based on weighted average of entire corridor) is 20,547
[3] Projected future average daily traffic (based on weighted average of entire corridor) is 26,094
[4] The value for current metro ridership is calculated by summing the total ridership for all routes along the corridor - total ridership is 4,620.

WIRP Rank Calculation

Key Map	Rank	Calculated Value
492H	284	3.6
493E	172	4.2
492M	179	4.1
493J	193	4.1
492R	186	4.1
493N	137	4.3
Total WIRP Areas	1045	Average 4.1

FY 2017 Candidate Projects ($ Thousands)
Street & Traffic Control Program - Thoroughfares

Candidate Project Summary Information			
Need Area:	*N-2016T-0003*	**Alternative No.:**	**Preferred**
Name:	*Waugh Drive/Heights Boulevard/Yale Street*	**Council District:**	**C & H**
Limits:	*IH-10 to Nevada Street/Bomar Street*	**Key Map No.:**	**492 H, 492M, 492R, 493E, 493J, 493N**
Type:	Major Thoroughfare and Collector	**Super Neighborhood:**	Washington Avenue Coalition/Memorial Park and Neartown-Montrose
WBS No.:		**Total No. of Sub-projects:**	**3**
Description:	*Project provides for the ROW acquisition, design, and construction of an urban urban corridor along Waugh Drive, Heights Boulevard, and Yale Street. Project improvements include the construction of concrete roadway with curbs, sidewalks, bikeways, driveways, street lighting, traffic control and necessary underground utilities. Project also includes the transformative reconstruction of the Waugh Drive at Memorial Drive cloverleaf interchange into a Single Point Urban Interchange (SPUI) and the reconstruction of the Buffalo Bayou Bridge and improvements at Allen Parkway. Project improves connectivity and provides an opportunity for expansion of Buffalo Bayou Park.*		
Justification:	*Project will transform the existing Waugh Corridor to match the existing and future context of the inner West Loop area. It will improve access and mobility for all modes and improve drainage in the service area. It will allow for the creation of approximately 16 acres of park space at Buffalo Bayou Park.*		

Implementation - Estimated Cost and Duration

	City Funds	Other Entities Funds	Total	Duration
Total Project Cost	$ 87,226	$ -	$ 87,226	
Acquisition	$ 1,685	$ -	$ 1,685	12 Months
Design	$ 14,624	$ -	$ 14,624	18 Months
Construction	$ 56,244	$ -	$ 56,244	18 Months
Contingency	$ 14,672	$ -	$ 14,672	NA
Private Utility Reloc.	$ -	$ -	$ -	Months
Warranty	$ -	$ -	$ -	12 Months

Candidate Project Priority Scores

Infrastructure Categories	Benefit Scores (Total Maximum 100)	
	Maximum	**Actual**
Streets	**75**	**14.7**
Drainage System	**15**	15.0
Water	**5**	4.1
Wastewater	**5**	**2.0**
Total	**100**	**35.80**
Service Area Benefit score:		35.8
Benefitted Population:		28773
Rebuild Houston Funds:		$ 84,301
Candidate Project Priority Score:		**32.99**
Candidate Project Priority Rank No.:		(To be assigned by the City)

Other Entities & Jurisdictions Coordination

Entities		Coordination For
TxDOT	✓	Historic Bridge, IH-10 approaches
Metro	✓	Optimize stop placement
HCFCD	✓	Construction in floodway
Gulf Coast Railroad District	☐	
Union Pacific Rail Road	✓	Crosses Terminal Sub
Harris County	☐	
Fort Bend County	☐	
Private Utilities	✓	Construction
Buffalo Bayou Partnership	✓	Buffalo Bayou Park enhancements
TIRZ 5	✓	Project coordination
TIRZ 3	✓	Project coordination
Texas Parks and Wildlife	✓	Bat Colony Mitigation

Sequencing Requirements (SR) and Other Considerations

SR:	
Permits:	
Other:	

Maintenance - Estimated Cost and Frequency (By the City)

Asset Categories	Estimated Asset Life	Maintenance Items	Cost	Schedule/Frequency
Streets	40-years	Street Sweeping	$ -	4 Times Annually
		Overlay	$ -	N/A
		Pot Hole Patch	$ -	As needed - typically starts year 25
		Panel Repair	$ -	As needed
Storm Drainage	50-years	Point Repair	$ -	
			$ -	
Water	50-years	Point Repair	$ -	
			$ -	
Wastewater	50-years	Point Repair	$ -	
			$ -	

FY 2017 Candidate Projects ($ Thousands)
Street & Traffic Control Program - Thoroughfares

Candidate Project Summary Information			
Need Area:	*N-2016T-0003*	**Alternative No.:**	**Preferred**
Name:	*Waugh Drive and Heights Boulevard*	**Council District:**	**C & H**
Limits:	*Heights Boulevard from Washington Avenue to Waugh Drive and Waugh Drive from Heights Boulevard to Allen Parkway*	**Key Map No.:**	**492 H, 492M, 493E, 493J**
Type:	Major Thoroughfare	**Super Neighborhood:**	Washington Avenue Coalition/Memorial Park and Neartown-Montrose
WBS No.:		**Sub-project No.:**	1 of 3
Description:	*Subproject 1 (Interchange) provides for the ROW acquisition, design, and construction of Waugh Drive as a 6-lane divided concreted roadway with curbs. Project improvements include the construction of sidewalks, driveways, street lighting, traffic control and necessary underground utilities. Project also includes the realignment of the corridor and the transformative reconstruction of the Waugh Drive at Memorial Drive cloverleaf interchange into a Single Point Urban Interchange (SPUI) and the reconstruction of the Buffalo Bayou Bridge and the bridge over the Allen Parkway underpass. Project includes closure of Feagan Street between Waugh Drive and Heights Boulevard and the construction of signals at Waugh Drive at Feagan Street, Heights Boulevard at Willia Street, and Waugh Drive at Heights Boulevard.*		
Justification:	*Project will transform the existing Waugh Corridor to match the exiting and future context of the inner West Loop area. It will improve access and mobility for all modes and improve drainage in the service area. It will allow for the creation of approximately 16 acres of additional park space to Buffalo Bayou Park.*		

Implementation - Estimated Cost and Duration

	City Funds	Other Entities Funds	Total	Duration
Total Project Cost	$ 65,243	$ -	$ 65,243	
Acquisition	$ 578	$ -	$ 578	12 Months
Design	$ 11,055	$ -	$ 11,055	18 Months
Construction	$ 42,519	$ -	$ 42,519	18 Months
Contingency	$ 11,092	$ -	$ 11,092	NA
Private Utility Reloc.	$ -	$ -	$ -	Months
Warranty	$ -	$ -	$ -	12 Months

Candidate Project Priority Scores

Infrastructure Categories	Benefit Scores (Total Maximum 100)	
	Maximum	**Actual**
Streets	**75**	**N/A**
Drainage System	**15**	**N/A**
Water	**5**	**N/A**
Wastewater	**5**	**N/A**
Total	**100**	**N/A**
Service Area Benefit score:		N/A
Benefitted Population:		N/A
Rebuild Houston Funds:		N/A
Candidate Project Priority Score:		**N/A**
Candidate Project Priority Rank No.:		(To be assigned by the City)

Other Entities & Jurisdictions Coordination

Entities		Coordination For
TxDOT	✓	Historic Bridge
Metro	✓	Optimize stop placement
HCFCD	✓	Construction in floodway
Gulf Coast Railroad District	☐	
Union Pacific Rail Road	☐	
Harris County	☐	
Fort Bend County	☐	
Private Utilities	✓	Construction
Buffalo Bayou Partnership	✓	Buffalo Bayou Park enhancements
TIRZ 5	✓	Project coordination
TIRZ 3	✓	Project coordination
Texas Parks and Wildlife	✓	Bat Colony Mitigation

Sequencing Requirements (SR) and Other Considerations

SR:	
Permits:	
Other:	

Maintenance - Estimated Cost and Frequency (By the City)

Asset Categories	Estimated Asset Life	Maintenance Items	Cost	Schedule/Frequency
Streets	40-years	Street Sweeping	$ -	4 Times Annually
		Overlay	$ -	N/A
		Pot Hole Patch	$ -	As needed - typically starts year 25
		Panel Repair	$ -	As needed
Storm Drainage	50-years	Point Repair	$ -	
			$ -	
Water	50-years	Point Repair	$ -	
			$ -	
Wastewater	50-years	Point Repair	$ -	

FY 2017 Candidate Projects ($ Thousands)
Street & Traffic Control Program - Thoroughfares

Candidate Project Summary Information			
Need Area:	*N-2016T-0003*	**Alternative No.:**	**Preferred**
Name:	*Waugh Drive and Commonwealth Street*	**Council District:**	**C**
Limits:	*South of Allen Parkway to Nevada Street/Bomar Street*	**Key Map No.:**	**492M, 492R, 493J, 493N**
Type:	Major Thoroughfare and Major Collector	**Super Neighborhood:**	Neartown-Montrose
WBS No.:	(To be assigned by the City)	**Sub-project No.:**	2 of 3
Description:	*Subproject 2 (South of Interchange) provides for the ROW acquisition, design and construction of Waugh Drive south of Allen Parkway as a 4 to 6-Lane Divided concrete roadway with curbs, sidewalks, bikeways, driveways, street lighting, traffic control and necessary underground utilities. Project includes the reconstruction of existing signals and the installation of a new signal at the West Clay Street intersection.*		
Justification:	*Project will transform a street that has been deteriorated beyond economical repair and normal maintenance. It will improve traffic circulation, multimodal mobility, and drainage in service area. These improvements will better align existing roadway to MTFP standards as well as the existing and future context of the corridor.*		

Implementation - Estimated Cost and Duration

	City Funds	Other Entities Funds	Total	Duration
Total Project Cost	$ 13,067	$ -	$ 13,067	
Acquisition	$ 1,108	$ -	$ 1,108	12 Months
Design	$ 2,045	$ -	$ 2,045	12 Months
Construction	$ 7,864	$ -	$ 7,864	12 Months
Contingency	$ 2,051	$ -	$ 2,051	NA
Private Utility Reloc.	$ -	$ -	$ -	Months
Warranty	$ -	$ -	$ -	12 Months

Candidate Project Priority Scores

Infrastructure Categories	Benefit Scores (Total Maximum 100)	
	Maximum	**Actual**
Streets	**75**	**N/A**
Drainage System	**15**	**N/A**
Water	**5**	**N/A**
Wastewater	**5**	**N/A**
Total	**100**	**N/A**
Service Area Benefit score:		N/A
Benefitted Population:		N/A
Rebuild Houston Funds:		N/A
Candidate Project Priority Score:		**N/A**
Candidate Project Priority Rank No.:		(To be assigned by the City)

Other Entities & Jurisdictions Coordination

Entities		Coordination For
TxDOT	☐	
Metro	✓	Optimize stop placement
HCFCD	✓	Buffalo Bayou Park/Trail access
Gulf Coast Railroad District	☐	
Union Pacific Rail Road	☐	
Harris County	☐	
Fort Bend County	☐	
Private Utilities	✓	Construction
Buffalo Bayou Partnership	✓	Buffalo Bayou Park access
TIRZ 5	✓	Project coordination
TIRZ 3	✓	Project coordination

Sequencing Requirements (SR) and Other Considerations

SR:	
Permits:	
Other:	

Maintenance - Estimated Cost and Frequency (By the City)

Asset Categories	Estimated Asset Life	Maintenance Items	Cost	Schedule/Frequency
Streets	40-years	Street Sweeping	$ -	4 Times Annually
		Overlay	$ -	N/A
		Pot Hole Patch	$ -	As needed - typically starts year 25
		Panel Repair	$ -	As needed
Storm Drainage	50-years	Point Repair	$ -	
			$ -	
Water	50-years	Point Repair	$ -	
			$ -	
Wastewater	50-years	Point Repair	$ -	
			$ -	

FY 2017 Candidate Projects ($ Thousands)
Street & Traffic Control Program - Thoroughfares

Candidate Project Summary Information			
Need Area:	*N-2016T-0003*	**Alternative No.:**	**Preferred**
Name:	*Waugh Drive, Heights Boulevard, Yale Street, and Waughford Street*	**Council District:**	**C & H**
Limits:	*Heights Boulevard from IH-10 to Washington Avenue and Waugh Drive/Yale Street from IH-10 to Feagan Street*	**Key Map No.:**	**492M, 492R, 493E, 493J, 493N**
Type:	Major Thoroughfare	**Super Neighborhood:**	Washington Avenue Coalition/Memorial Park
WBS No.:		**Sub-project No.:**	3 of 3
Description:	*Subproject 3 (North of Interchange) provides for the design and construction of Yale Street and Heights Boulevard north of Washington and Waugh Drive between Washington Avenue and Feagan Street as concrete roadways with curbs, sidewalks, bikeways, driveways, street lighting, traffic control and necessary underground utilities. Project includes the closure of Waughford Street at Washington Avenue and the reconfiguration of adjacent roadway intersections to support connectivity.*		
Justification:	*Project will replace streets that has been deteriorated beyond economical repair and normal maintenance. It will improve traffic circulation, multimodal mobility and drainage in service area. These improvements will upgrade existing roadway to match existing and future context of the corridor.*		

Implementation - Estimated Cost and Duration

	City Funds	Other Entities Funds	Total	Duration
Total Project Cost	$ 8,915	$ -	$ 8,915	
Acquisition	$ -	$ -	$ -	12 Months
Design	$ 1,524	$ -	$ 1,524	12 Months
Construction	$ 5,862	$ -	$ 5,862	12 Months
Contingency	$ 1,529	$ -	$ 1,529	NA
Private Utility Reloc.	$ -	$ -	$ -	Months
Warranty	$ -	$ -	$ -	12 Months

Candidate Project Priority Scores

Infrastructure Categories	Benefit Scores (Total Maximum 100)	
	Maximum	**Actual**
Streets	**75**	**N/A**
Drainage System	**15**	**N/A**
Water	**5**	**N/A**
Wastewater	**5**	**N/A**
Total	**100**	**N/A**
Service Area Benefit score:		N/A
Benefitted Population:		N/A
Rebuild Houston Funds:		N/A
Candidate Project Priority Score:		**N/A**
Candidate Project Priority Rank No.:		(To be assigned by the City)

Other Entities & Jurisdictions Coordination

Entities		Coordination For
TxDOT	✓	IH-10 approaches
Metro	✓	Optimize stop placement
HCFCD	☐	
Gulf Coast Railroad District	☐	
Union Pacific Rail Road	✓	Crosses Terminal Sub
Harris County	☐	
Fort Bend County	☐	
Private Utilities	✓	Construction
TIRZ 5	✓	Project coordination

Sequencing Requirements (SR) and Other Considerations

SR:	
Permits:	
Other:	

Maintenance - Estimated Cost and Frequency (By the City)

Asset Categories	Estimated Asset Life	Maintenance Items	Cost	Schedule/Frequency
Streets	40-years	Street Sweeping	$ -	4 Times Annually
		Overlay	$ -	N/A
		Pot Hole Patch	$ -	As needed - typically starts year 25
		Panel Repair	$ -	As needed
Storm Drainage	50-years	Point Repair	$ -	
			$ -	
Water	50-years	Point Repair	$ -	
			$ -	
Wastewater	50-years	Point Repair	$ -	
			$ -	

SAMPLE 410

NEED AREA:	N-2016T-0006	**BID FORM**
CANDIDATE PROJECT	Waugh Drive/Heights Boulevard/Yale Street	**PART B**

Document 00410B Note 1

BID FORM - PART B

1.0 TOTAL BID PRICE HAS BEEN CALCULATED BY BIDDER, USING THE FOLLOWING COMPONENT PRICES AND PROCESS (PRINT OR TYPE NUMERICAL AMOUNTS

A. STIPULATED PRICE **$ N/A**

(Total Bid Price; minus Base Unit Prices, Extra Unit Process, Cash Allowance and All Alternates, if any)

B. BASE UNIT PRICE TABLE:

Item No.	Item Reference No. Note 2	Spec No.	Item Description	Unit Measure	Unit Quantity	Unit Price (this column controls)	Total in Figures
UNIT PRICES - PAVING ITEMS							
1			Prep ROW	AC	9	$15,000.00	$135,000.00
2	222101	02221	Remove/Dispose Reinforced Concrete with Asph Overlay/ with or without Base	SY	97,091	$6.00	$582,546.00
3	222102, 222102	02221	Remove/Dispose Conc Driveway 6-Inch Thick/More and Conc Sidewalk 4-Inch Thick/More	SY	26,771	$5.00	$133,855.00
4			Remove Bridge Structure 0-499	EA	3	$100,000.00	$300,000.00
5			Remove Bridge Structure 500-999	EA	2	$85,000.00	$170,000.00
6	275105	2751	Reinforced Concrete Pavement 11-Inch Thick	SY	102,179	$70.00	$7,152,530.00
7	233601	02336	Lime Stabilized Subgrade 8-Inch Thick	SY	105,463	$4.00	$421,852.00
8	233603	02336	Lime for Lime Stabilized Subgrade (DRY WEIGHT)	TON	2,285	$160.00	$365,600.00
9	277101	02771	6-Inch Curb	LF	55,297	$4.00	$221,188.00
10	275201	02752	Board Expansion Joint w/ Load Transfer Device	LF	13,438	$8.00	$107,504.00
11	275401	02754	Concrete Driveways Including Excavation 6-Inch Thick	SF	38,830	$8.00	$310,640.00
12	277501	02775	Sidewalk 4-1/2-Inch Thick	SF	216,034	$7.00	$1,512,238.00
13	292201		Sodding	SY	45,016	$5.00	$225,080.00

Bidders Initials [ ]

SAMPLE 410

NEED AREA: N-2016T-0006 **BID FORM**
CANDIDATE PROJECT Waugh Drive/Heights Boulevard/Yale Street **PART B**

14	289301	2893	Traffic Signal / Intersection	EA	14	$300,000.00	$4,200,000.00
15			Install OH Sign Structure	EA	10	$60,000.00	$600,000.00
16			Small Signs	MI	0.4	$5,000.00	$2,000.00
17			Pavement Marking	MI	0.4	$10,000.00	$4,000.00
18			Bat Bridge Structure	SF	51,207	$150.00	$7,681,050.00
19			Pre-Stressed I Girder Bridge Structure	SF	53,413	$78.00	$4,166,214.00
20			Embankment	CY	83,333	$15.00	$1,249,995.00
21			SW3P	AC	9	$30,000.00	$270,000.00
22			Retaining Wall (MSE) w/wave scheme	SF	87,220	$65.00	$5,669,300.00
23			FEMA Flood Study	LS	1	$100,000.00	$100,000.00
24			Flash Flood Warning Devices (Allen Parkway)	LS	1	$100,000.00	$100,000.00
25			Ilumination	EA	33	$20,000.00	$660,000.00
26			Tree Relocation	EA	5	$90,000.00	$450,000.00
27			SSTR Rail w/Bike/Ped Safety	LF	7,346	$35.00	$257,110.00
28			Engineer's Best Estimate for Street Lights Including Cash Allowances	EA	90	$1,000.00	$90,000.00
29	-	-	Ancillary items	LS	1	10.00%	$3,713,770.20
30	-	-	Sub-total of Paving Items	LS	1		$40,851,472.20
31	-	-	General Items (10% of Paving Sub-total)	LS	1	10.00%	$4,085,147.22
TOTAL - PAVING ITEMS							**$44,936,619.42**

Item No.	Item Reference No. Note 2	Spec No.	Item Description	Unit Measure	Unit Quantity	Unit Price (this column controls)	Total in Figures

00410B-2
02-01-2010

Bidders Initials [ ]

SAMPLE 410

NEED AREA: N-2016T-0006 **BID FORM**
CANDIDATE PROJECT Waugh Drive/Heights Boulevard/Yale Street **PART B**

UNIT PRICES - STORM SEWER ITEMS							
1	222106	02221	Remove /Dispose Manholes All Sizes/Depth	EA	46	$390.00	$17,940.00
2	222105	02221	Remove/Dispose Inlets All Sizes/Depth	EA	102	$370.00	$37,740.00
3	222103	02221	Remove and Dispose of Pipe Culverts, Sewers, And Sewer Leads	LF	8,820	$20.00	$176,400.00
4	222104	02221	Remove/Dispose Storm Sewer Box Culvert	LF	0	$35.00	$0.00
5	263301	02633	Curb Inlet	EA	102	$2,780.00	$283,560.00
6	208201	02081/02082/ 02087	Type C Manhole for 42-Inch Diameter and Smaller Sewers	EA	33	$3,470.00	$114,510.00
7	208202	02081/02082/ 02087	Type C Manhole for 48-Inch to 72-Inch Diameter Sewers	EA	13	$6,000.00	$78,000.00
8	263101	02631	24-Inch Diameter Storm Sewer	LF	3,261	$95.00	$309,795.00
9	263102	02631	30-Inch Diameter Storm Sewer	LF	525	$120.00	$63,000.00
10	263105	02631	48-Inch Diameter Storm Sewer	LF	2,331	$210.00	$489,510.00
11		02631	5-Foot by 5-Foot Box Storm Sewer	LF	755	$345.00	$260,475.00
12	-	-	Junction Box	EA	2	$5,000.00	$10,000.00
13	-	-	Ancillary items	LS	1	10.00%	$184,093.00
14	-	-	Sub-total of Storm Sewer Items	LS	1		$2,025,023.00
15	-	-	General Items (10% of Storm Sewer Sub-total)	LS	1	10.00%	$202,502.30
TOTAL UNIT PRICES - STORM SEWER ITEMS							**$2,227,525.30**

Item No.	Item Reference No. Note 2	Spec No.	Item Description	Unit Measure	Unit Quantity	Unit Price (this column controls)	Total in Figures
UNIT PRICES - WASTEWATER							
1	253102	02448	8-Inch Diameter Sanitary Sewer	LF	245	$120.00	$29,400.00

00410B-3
02-01-2010

Bidders Initials [ ]

SAMPLE 410

NEED AREA: N-2016T-0006 **BID FORM**
CANDIDATE PROJECT Waugh Drive/Heights Boulevard/Yale Street **PART B**

2	253105	02448	15-Inch Diameter Sanitary Sewer	LF	1,385	$225.00	$311,625.00
3	-	-	Ancillary Items	LS	1	20.00%	$68,205.00
4	-	-	Sub-total of Wastewater Items	LS	1		$409,230.00
5	-	-	General Items (10% of Wastewater Sub-total)	LS	1	10.00%	$40,923.00
TOTAL UNIT PRICES - WASTEWATER							**$450,153.00**

Item No.	Item Reference No. Note 2	Spec No.	Item Description	Unit Measure	Unit Quantity	Unit Price (this column controls)	Total in Figures
UNIT PRICES - WATER							
1	251102	02511	8-Inch Diameter Water Line	LF	1,550	$100.00	$155,000.00
2	251104	02511	12-Inch Diameter Water Line	LF	600	$125.00	$75,000.00
3	251105	02511	16-Inch Diameter Water Line	LF	3,488	$170.00	$592,960.00
4	252002	02520	Fire Hydrant Assembly, All Depths, Including 6-Inch Diameter Gate Valve, Box, and Branch	EA	15	$5,400.00	$81,000.00
5	251201	02512	3/4-Inch to 2-Inch Diameter Water Taps and Copper Service Line With Meter Box, Short or Long Side	EA	16	$1,360.00	$21,760.00
6	-	-	Ancillary items	LS	1	20.00%	$185,144.00
7	-	-	Sub-total of Water Items	LS	1		$1,110,864.00
8	-	-	General Items (10% of Water Sub-total)	LS	1	10.00%	$111,086.40
TOTAL UNIT PRICES - WATER							**$1,221,950.40**

Item No.	Item Reference No. Note 2	Spec No.	Item Description	Unit Measure	Unit Quantity	Unit Price (this column controls)	Total in Figures
UNIT PRICES - DETENTION							

00410B-4
02-01-2010

Bidders Initials [ ]

9	500001	-	Excavation (Detention Pond) (Dry)	AC-FT	3.6	$20,000.00	$72,000.00
10	500002	-	Excavation (Detention Pond) (Wet)	AC-FT	0.0	$25,000.00	$0.00
TOTAL UNIT PRICES - DETENTION							**$72,000.00**

TOTAL BASE UNIT PRICE: **$48,908,248.12**

C. EXTRA UNIT PRICE TABLE:

Item No.		Spec No.	Item Description	Unit Measure	Unit Quantity	Unit Price (this column controls)	Total in Figures
UNIT PRICES - EXTRA UNIT PRICE TABLE ITEMS							
TOTAL UNIT PRICES - EXTRA UNIT PRICE TABLE ITEMS							**$0**

D. CASH ALLOWANCE TABLE:

Item No.		Spec No.	Cash Allowance Short Table		Cash Allowance in Figures (1)
TOTAL CASH ALLOWANCES					**$0**

E. ALTERNATES TABLE:

Item No.		Spec No.	Alternate Short Tittle	Unit Measure	Unit Quantity	Unit Price (this column controls)	Total Price for Alternates in Figures

SAMPLE 410

NEED AREA:	N-2016T-0006	**BID FORM**
CANDIDATE PROJECT	Waugh Drive/Heights Boulevard/Yale Street	**PART B**

TOTAL CASH ALLOWANCES	**$0**

Note:

1. This is not a Standard Document 00410B (Form 410). The Form 410 was modified for the purpose of planning level cost estimates for Pre-Engineering Studies.
2. The "Item Reference No." shall be designated for each item listed. The numbers serve as reference and will be used for the future cost updates.

SUB-PROJECT 410

Item No.		Spec No.	Alternate Short Tittle	Unit Measure	Unit Quantity	Unit Price (this column controls)	Total Price for Alternates in Figures
UNIT PRICES - WASTEWATER SUBSTITUTE SERVICES							
1			Abandon and Fill Existing Sanitary Sewer Manhole	EA	0	$1,000.00	$0.00
2			Abandon and Fill Existing Sanitary Sewer Pipe (All Szes)	LF	0	$20.00	$0.00
3			Service Stub and Connection to Back Lot Services	EA	0	$5,000.00	$0.00
TOTAL WASTEWATER SUBSTITUTE SERVICES							**$0**

Note:

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00410B-6
02-01-2010

Bidders Initials [ ]

Document 00410B [Note 1]

BID FORM - PART B

1.0 TOTAL BID PRICE HAS BEEN CALCULATED BY BIDDER, USING THE FOLLOWING COMPONENT PRICES AND PROCESS (PRINT OR TYPE NUMERICAL AMOUNTS

A. STIPULATED PRICE **$ N/A**

(Total Bid Price; minus Base Unit Prices, Extra Unit Process, Cash Allowance and All Alternates, if any)

B. BASE UNIT PRICE TABLE:

Item No.	Item Reference No. [Note 2]	Spec No.	Item Description	Unit Measure	Unit Quantity	Unit Price (this column controls)	Total in Figures
UNIT PRICES - PAVING ITEMS							
1			Prep ROW	AC	9	$15,000.00	$135,000.00
2	222101	02221	Remove/Dispose Reinforced Concrete with Asph Overlay/ with or without Base	SY	51,019	$6.00	$306,114.00
3	222102, 222102	02221	Remove/Dispose Conc Driveway 6-Inch Thick/More and Conc Sidewalk 4-Inch Thick/More	SY	7,115	$5.00	$35,575.00
4			Remove Bridge Structure 0-499	EA	3	$100,000.00	$300,000.00
5			Remove Bridge Structure 500-999	EA	2	$85,000.00	$170,000.00
6	275105	2751	Reinforced Concrete Pavement 11-Inch Thick	SY	53,696	$70.00	$3,758,720.00
7	233601	02336	Lime Stabilized Subgrade 8-Inch Thick	SY	56,980	$4.00	$227,920.00
8	233603	02336	Lime for Lime Stabilized Subgrade (DRY WEIGHT)	TON	1,058	$160.00	$169,280.00
9	277101	02771	6-Inch Curb	LF	19,250	$4.00	$77,000.00
10	275201	02752	Board Expansion Joint w/ Load Transfer Device	LF	2,963	$8.00	$23,704.00
11	275401	02754	Concrete Driveways Including Excavation 6-Inch Thick	SF	6,170	$8.00	$49,360.00
12	277501	02775	Sidewalk 4-1/2-Inch Thick	SF	87,690	$7.00	$613,830.00

Bidders Initials [ ]

SAMPLE 410

NEED AREA: N-2016T-0003 **BID FORM**
SUBPROJECT 1 Interchange **PART B**

13	292201		Sodding	SY	45,016	$5.00	$225,080.00
14	289301	2893	Traffic Signal / Intersection	EA	8	$300,000.00	$2,400,000.00
15	231501	2315	Roadway Excavation	CY		$15.00	$0.00
16			Install OH Sign Structure	EA	10	$60,000.00	$600,000.00
17			Small Signs	MI	0	$5,000.00	$2,000.00
18			Pavement Marking	MI	0	$10,000.00	$4,000.00
19			Bat Bridge Structure	SF	51,207	$150.00	$7,681,050.00
20			Pre-Stressed I Girder Bridge Structure	SF	53,413	$78.00	$4,166,214.00
21			Embankment	CY	83,333	$15.00	$1,249,995.00
22			SW3P	AC	9	$30,000.00	$270,000.00
23			Retaining Wall (MSE) w/wave scheme	SF	87,220	$65.00	$5,669,300.00
24			FEMA Flood Study	LS	1	$100,000.00	$100,000.00
25			Flash Flood Warning Devices (Allen Parkway)	LS	1	$100,000.00	$100,000.00
26			Ilumination	EA	33	$20,000.00	$660,000.00
27			Tree Relocation	EA	5	$90,000.00	$450,000.00
28			SSTR Rail w/Bike/Ped Safety	LF	7,346	$35.00	$257,110.00
29			Engineer's Best Estimate for Street Lights Including Cash Allowances	EA	27	$1,000.00	$27,000.00
30	-	-	Ancillary items	LS	1	10.00%	$2,972,825.20
31	-	-	Sub-total of Paving Items	LS	1		$32,701,077.20
32	-	-	General Items (10% of Paving Sub-total)	LS	1	10.00%	$3,270,107.72
TOTAL - PAVING ITEMS							**$35,971,184.92**

00410B-2
02-01-2010

Bidders Initials [ ]

SAMPLE 410

NEED AREA: N-2016T-0003 **BID FORM**
SUBPROJECT 1 Interchange **PART B**

Item No.	Item Reference No. Note 2	Spec No.	Item Description	Unit Measure	Unit Quantity	Unit Price (this column controls)	Total in Figures
UNIT PRICES - STORM SEWER ITEMS							
33	222106	02221	Remove /Dispose Manholes All Sizes/Depth	EA	7	$390.00	$2,730.00
34	222105	02221	Remove/Dispose Inlets All Sizes/Depth	EA	36	$370.00	$13,320.00
35	222103	02221	Remove and Dispose of Pipe Culverts, Sewers, And Sewer Leads	LF	3,244	$20.00	$64,880.00
36	222104	02221	Remove/Dispose Storm Sewer Box Culvert	LF	0	$35.00	$0.00
1	263301	02633	Curb Inlet	EA	36	$2,780.00	$100,080.00
2	208202	02081/02082/ 02087	Type C Manhole for 48-Inch to 72-Inch Diameter Sewers	EA	7	$6,000.00	$42,000.00
3	263101	02631	24-Inch Diameter Storm Sewer	LF	1,892	$95.00	$179,740.00
4	263105	02631	48-Inch Diameter Storm Sewer	LF	899	$210.00	$188,790.00
5	-	-	Ancillary items	LS	1	10.00%	$59,154.00
6	-	-	Sub-total of Storm Sewer Items	LS	1		$650,694.00
7	-	-	General Items (10% of Storm Sewer Sub-total)	LS	1	10.00%	$65,069.40
TOTAL UNIT PRICES - STORM SEWER ITEMS							**$715,763.40**

Item No.	Item Reference No. Note 2	Spec No.	Item Description	Unit Measure	Unit Quantity	Unit Price (this column controls)	Total in Figures
UNIT PRICES - WASTEWATER							
1							
2	-	-	Ancillary Items	LS	1	20.00%	$0.00

00410B-3
02-01-2010

Bidders Initials [ ]

3	-	-	Sub-total of Wastewater Items	LS	1		$0.00
4	-	-	General Items (10% of Wastewater Sub-total)	LS	1	10.00%	$0.00
TOTAL UNIT PRICES - WASTEWATER							**$0.00**

Item No.	Item Reference No. Note 2	Spec No.	Item Description	Unit Measure	Unit Quantity	Unit Price (this column controls)	Total in Figures
UNIT PRICES - WATER							
1	251102	02511	8-Inch Diameter Water Line	LF	1,350	$100.00	$135,000.00
2	252002	02520	Fire Hydrant Assembly, All Depths, Including 6-Inch Diameter Gate Valve, Box, and Branch	EA	4	$5,400.00	$21,600.00
3	251201	02512	3/4-Inch to 2-Inch Diameter Water Taps and Copper Service Line With Meter Box, Short or Long Side	EA	4	$1,360.00	$5,440.00
4	-	-	Ancillary items	LS	1	20.00%	$32,408.00
5	-	-	Sub-total of Water Items	LS	1		$194,448.00
6	-	-	General Items (10% of Water Sub-total)	LS	1	10.00%	$19,444.80
TOTAL UNIT PRICES - WATER							**$213,892.80**

Item No.	Item Reference No. Note 2	Spec No.	Item Description	Unit Measure	Unit Quantity	Unit Price (this column controls)	Total in Figures
UNIT PRICES - DETENTION							
7	500001	-	Excavation (Detention Pond) (Dry)	AC-FT	3.6	$20,000.00	$72,000.00
8	500002	-	Excavation (Detention Pond) (Wet)	AC-FT	0.0	$25,000.00	$0.00
TOTAL UNIT PRICES - DETENTION							**$72,000.00**

Bidders Initials [ ]

NEED AREA: N-2016T-0003 **BID FORM**
SUBPROJECT 1 Interchange **PART B**

TOTAL BASE UNIT PRICE: **$36,972,841.12**

C. EXTRA UNIT PRICE TABLE:

Item No.		Spec No.	Item Description	Unit Measure	Unit Quantity	Unit Price (this column controls)	Total in Figures
UNIT PRICES - EXTRA UNIT PRICE TABLE ITEMS							
TOTAL UNIT PRICES - EXTRA UNIT PRICE TABLE ITEMS							**$0**

D. CASH ALLOWANCE TABLE:

Item No.		Spec No.	Cash Allowance Short Table		Cash Allowance in Figures (1)
TOTAL CASH ALLOWANCES					**$0**

E. ALTERNATES TABLE:

Item No.		Spec No.	Alternate Short Tittle	Unit Measure	Unit Quantity	Unit Price (this column controls)	Total Price for Alternates in Figures
TOTAL CASH ALLOWANCES							**$0**

Note:
1. This is not a Standard Document 00410B (Form 410). The Form 410 was modified for the purpose of planning level cost estimates for Pre-Engineering Studies.

00410B-5
02-01-2010

Bidders Initials [ ]

2. The "Item Reference No." shall be designated for each item listed. The numbers serve as reference and will be used for the future cost updates.

SUB-PROJECT 410

Item No.		Spec No.	Alternate Short Tittle	Unit Measure	Unit Quantity	Unit Price (this column controls)	Total Price for Alternates in Figures
UNIT PRICES - WASTEWATER SUBSTITUTE SERVICES							
1			Abandon and Fill Existing Sanitary Sewer Manhole	EA	0	$1,000.00	$0.00
2			Abandon and Fill Existing Sanitary Sewer Pipe (All Szes)	LF	0	$20.00	$0.00
3			Service Stub and Connection to Back Lot Services	EA	0	$5,000.00	$0.00
TOTAL WASTEWATER SUBSTITUTE SERVICES							**$0**

Note:

1. This is not a Standard Document 00410B (Form 410). The Form 410 was modified for the purpose of planning level cost estimates for Pre-Engineering Studies.
2. The "Item Reference No." shall be designated for each item listed. The numbers serve as reference and will be used for the future cost updates.

Bidders Initials [ ]

Document 00410B [Note 1]

BID FORM - PART B

1.0 TOTAL BID PRICE HAS BEEN CALCULATED BY BIDDER, USING THE FOLLOWING COMPONENT PRICES AND PROCESS (PRINT OR TYPE NUMERICAL AMOUNTS

A. STIPULATED PRICE **$ N/A**

(Total Bid Price; minus Base Unit Prices, Extra Unit Process, Cash Allowance and All Alternates, if any)

B. BASE UNIT PRICE TABLE:

Item No.	Item Reference No. [Note 2]	Spec No.	Item Description	Unit Measure	Unit Quantity	Unit Price (this column controls)	Total in Figures
UNIT PRICES - PAVING ITEMS							
1	222101	02221	Remove/Dispose Reinforced Concrete with Asph Overlay/ with or without Base	SY	26,170	$6.00	$157,020.00
2	222102, 222102	02221	Remove/Dispose Conc Driveway 6-Inch Thick/More and Conc Sidewalk 4-Inch Thick/More	SY	12,025	$5.00	$60,125.00
3	275106	2751	11" Reinforced Concrete Pavement (Complete in Place)	SY	30,424	$70.00	$2,129,680.00
4	233601	02336	Lime Stabilized Subgrade 8-Inch Thick	SY	30,424	$4.00	$121,696.00
5	233603	02336	Lime for Lime Stabilized Subgrade (DRY WEIGHT)	TON	770	$160.00	$123,200.00
6	277101	02771	6-Inch Curb	LF	16,100	$4.00	$64,400.00
7	275201	02752	Board Expansion Joint w/ Load Transfer Device	LF	6,754	$8.00	$54,032.00
8	275401	02754	Concrete Driveways Including Excavation 6-Inch Thick	SF	23,250	$8.00	$186,000.00
9	277501	02775	Sidewalk 4-1/2-Inch Thick	SF	50,579	$7.00	$354,053.00
10	289301	2893	Traffic Signal / Intersection	EA	4	$300,000.00	$1,200,000.00
11			Engineer's Best Estimate for Street Lights Including Cash Allowances	EA	40	$1,000.00	$40,000.00
12	-	-	Ancillary items	LS	1	10.00%	$449,020.60

Bidders Initials [ ]

13	-	-	Sub-total of Paving Items	LS	1		$4,939,226.60
14	-	-	General Items (10% of Paving Sub-total)	LS	1	10.00%	$493,922.66
TOTAL - PAVING ITEMS							**$5,433,149.26**

Item No.	Item Reference No. Note 2	Spec No.	Item Description	Unit Measure	Unit Quantity	Unit Price (this column controls)	Total in Figures
UNIT PRICES - STORM SEWER ITEMS							
1	222106	02221	Remove /Dispose Manholes All Sizes/Depth	EA	25	$390.00	$9,750.00
2	222105	02221	Remove/Dispose Inlets All Sizes/Depth	EA	35	$370.00	$12,950.00
3	222103	02221	Remove and Dispose of Pipe Culverts, Sewers, And Sewer Leads	LF	3,586	$20.00	$71,720.00
4	222104	02221	Remove/Dispose Storm Sewer Box Culvert	LF	0	$35.00	$0.00
5	263301	02633	Curb Inlet	EA	35	$2,780.00	$97,300.00
6	208201	02081/02082/ 02087	Type C Manhole for 42-Inch Diameter and Smaller Sewers	EA	23	$3,470.00	$79,810.00
7	208202	02081/02082/ 02087	Type C Manhole for 48-Inch to 72-Inch Diameter Sewers	EA	2	$6,000.00	$12,000.00
8	263101	02631	24-Inch Diameter Storm Sewer	LF	1,050	$95.00	$99,750.00
9	263102	02631	30-Inch Diameter Storm Sewer	LF	525	$120.00	$63,000.00
10	-	-	Ancillary items	LS	1	10.00%	$44,628.00
11	-	-	Sub-total of Storm Sewer Items	LS	1		$490,908.00
12	-	-	General Items (10% of Storm Sewer Sub-total)	LS	1	10.00%	$49,090.80
TOTAL UNIT PRICES - STORM SEWER ITEMS							**$539,998.80**

Bidders Initials [ ]

SAMPLE 410

NEED AREA: N-2016T-0003 **BID FORM**
SUBPROJECT 2: South of Interchange **PART B**

Item No.	Item Reference No.[Note 2]	Spec No.	Item Description	Unit Measure	Unit Quantity	Unit Price (this column controls)	Total in Figures
UNIT PRICES - WASTEWATER							
1				LF	0		$0.00
2	-	-	Ancillary Items	LS	1	20.00%	$0.00
3	-	-	Sub-total of Wastewater Items	LS	1		$0.00
4	-	-	General Items (10% of Wastewater Sub-total)	LS	1	10.00%	$0.00
TOTAL UNIT PRICES - WASTEWATER							**$0.00**

Item No.	Item Reference No.[Note 2]	Spec No.	Item Description	Unit Measure	Unit Quantity	Unit Price (this column controls)	Total in Figures
UNIT PRICES - WATER							
1	251105	02511	16-Inch Diameter Water Line	LF	3,488	$170.00	$592,960.00
2	252002	02520	Fire Hydrant Assembly, All Depths, Including 6-Inch Diameter Gate Valve, Box, and Branch	EA	9	$5,400.00	$48,600.00
3	251201	02512	3/4-Inch to 2-Inch Diameter Water Taps and Copper Service Line With Meter Box, Short or Long Side	EA	10	$1,360.00	$13,600.00
4	-	-	Ancillary items	LS	1	20.00%	$131,032.00
5	-	-	Sub-total of Water Items	LS	1		$786,192.00
6	-	-	General Items (10% of Water Sub-total)	LS	1	10.00%	$78,619.20
TOTAL UNIT PRICES - WATER							**$864,811.20**

Item No.	Item Reference No.[Note 2]	Spec No.	Item Description	Unit Measure	Unit Quantity	Unit Price (this column controls)	Total in Figures
UNIT PRICES - DETENTION							

1	500001	-	Excavation (Detention Pond) (Dry)	AC-FT	0.0	$20,000.00	$0.00
2	500002	-	Excavation (Detention Pond) (Wet)	AC-FT	0.0	$25,000.00	$0.00
TOTAL UNIT PRICES - DETENTION							**$0.00**

TOTAL BASE UNIT PRICE: **$6,837,959.26**

C. EXTRA UNIT PRICE TABLE:

Item No.		Spec No.	Item Description	Unit Measure	Unit Quantity	Unit Price (this column controls)	Total in Figures
UNIT PRICES - EXTRA UNIT PRICE TABLE ITEMS							
TOTAL UNIT PRICES - EXTRA UNIT PRICE TABLE ITEMS							**$0**

D. CASH ALLOWANCE TABLE:

Item No.		Spec No.	Cash Allowance Short Table		Cash Allowance in Figures (1)
TOTAL CASH ALLOWANCES					**$0**

E. ALTERNATES TABLE:

Item No.		Spec No.	Alternate Short Tittle	Unit Measure	Unit Quantity	Unit Price (this column controls)	Total Price for Alternates in Figures

TOTAL CASH ALLOWANCES							**$0**

Note:
1. This is not a Standard Document 00410B (Form 410). The Form 410 was modified for the purpose of planning level cost estimates for Pre-Engineering Studies.
2. The "Item Reference No." shall be designated for each item listed. The numbers serve as reference and will be used for the future cost updates.

SUB-PROJECT 410

Item No.		Spec No.	Alternate Short Tittle	Unit Measure	Unit Quantity	Unit Price (this column controls)	Total Price for Alternates in Figures
UNIT PRICES - WASTEWATER SUBSTITUTE SERVICES							
1			Abandon and Fill Existing Sanitary Sewer Manhole	EA	0	$1,000.00	$0.00
2			Abandon and Fill Existing Sanitary Sewer Pipe (All Szes)	LF	0	$20.00	$0.00
3			Service Stub and Connection to Back Lot Services	EA	0	$5,000.00	$0.00
TOTAL WASTEWATER SUBSTITUTE SERVICES							**$0**

Note:
1. This is not a Standard Document 00410B (Form 410). The Form 410 was modified for the purpose of planning level cost estimates for Pre-Engineering Studies.
2. The "Item Reference No." shall be designated for each item listed. The numbers serve as reference and will be used for the future cost updates.

Document 00410B [Note 1]

BID FORM - PART B

1.0 TOTAL BID PRICE HAS BEEN CALCULATED BY BIDDER, USING THE FOLLOWING COMPONENT PRICES AND PROCESS (PRINT OR TYPE NUMERICAL AMOUNTS

A. STIPULATED PRICE **$ N/A**

(Total Bid Price; minus Base Unit Prices, Extra Unit Process, Cash Allowance and All Alternates, if any)

B. BASE UNIT PRICE TABLE:

Item No.	Item Reference No. [Note 2]	Spec No.	Item Description	Unit Measure	Unit Quantity	Unit Price (this column controls)	Total in Figures
UNIT PRICES - PAVING ITEMS							
1	222101	02221	Remove/Dispose Reinforced Concrete with Asph Overlay/ with or without Base	SY	19,902	$6.00	$119,412.00
2	222102, 222102	02221	Remove/Dispose Conc Driveway 6-Inch Thick/More and Conc Sidewalk 4-Inch Thick/More	SY	7,631	$5.00	$38,155.00
3	275106	2751	11" Reinforced Concrete Pavement (Complete in Place)	SY	18,059	$70.00	$1,264,130.00
4	233601	02336	Lime Stabilized Subgrade 8-Inch Thick	SY	18,059	$4.00	$72,236.00
5	233603	02336	Lime for Lime Stabilized Subgrade (DRY WEIGHT)	TON	457	$160.00	$73,120.00
6	277101	02771	6-Inch Curb	LF	19,947	$4.00	$79,788.00
7	275201	02752	Board Expansion Joint w/ Load Transfer Device	LF	3,721	$8.00	$29,768.00
8	275401	02754	Concrete Driveways Including Excavation 6-Inch Thick	SF	9,410	$8.00	$75,280.00
9	277501	02775	Sidewalk 4-1/2-Inch Thick	SF	77,765	$7.00	$544,355.00
10	289301	2893	Traffic Signal / Intersection	EA	2	$300,000.00	$600,000.00
11			Engineer's Best Estimate for Street Lights Including Cash Allowances	EA	23	$1,000.00	$23,000.00
12	-	-	Ancillary items	LS	1	10.00%	$291,924.40

Bidders Initials [ ]

13	-	-	Sub-total of Paving Items	LS	1		$3,211,168.40
14	-	-	General Items (10% of Paving Sub-total)	LS	1	10.00%	$321,116.84
TOTAL - PAVING ITEMS							**$3,532,285.24**

Item No.	Item Reference No. Note 2	Spec No.	Item Description	Unit Measure	Unit Quantity	Unit Price (this column controls)	Total in Figures
UNIT PRICES - STORM SEWER ITEMS							
1	222106	02221	Remove /Dispose Manholes All Sizes/Depth	EA	14	$390.00	$5,460.00
2	222105	02221	Remove/Dispose Inlets All Sizes/Depth	EA	31	$370.00	$11,470.00
3	222103	02221	Remove and Dispose of Pipe Culverts, Sewers, And Sewer Leads	LF	1,990	$20.00	$39,800.00
4	222104	02221	Remove/Dispose Storm Sewer Box Culvert	LF	0	$35.00	$0.00
5	263301	02633	Curb Inlet	EA	31	$2,780.00	$86,180.00
6	208201	02081/02082/ 02087	Type C Manhole for 42-Inch Diameter and Smaller Sewers	EA	10	$3,470.00	$34,700.00
7	208202	02081/02082/ 02087	Type C Manhole for 48-Inch to 72-Inch Diameter Sewers	EA	4	$6,000.00	$24,000.00
8	263101	02631	24-Inch Diameter Storm Sewer	LF	319	$95.00	$30,305.00
9	263105	02631	48-Inch Diameter Storm Sewer	LF	1,432	$210.00	$300,720.00
10	263128	02631	5-Foot by 5-Foot Box Storm Sewer	LF	755	$345.00	$260,475.00
11	-	-	Junction Box	EA	2	$5,000.00	$10,000.00
12	-	-	Ancillary items	LS	1	10.00%	$80,311.00
13	-	-	Sub-total of Storm Sewer Items	LS	1		$883,421.00
14	-	-	General Items (10% of Storm Sewer Sub-total)	LS	1	10.00%	$88,342.10
TOTAL UNIT PRICES - STORM SEWER ITEMS							**$971,763.10**

Bidders Initials [ ]

SAMPLE 410

NEED AREA: N-2016T-0003 **BID FORM**
SUBPROJECT 3 North of Interchange **PART B**

Item No.	Item Reference No. Note 2	Spec No.	Item Description	Unit Measure	Unit Quantity	Unit Price (this column controls)	Total in Figures
UNIT PRICES - WASTEWATER							
1	253102	02448	8-Inch Diameter Sanitary Sewer	LF	245	$120.00	$29,400.00
2	253105	02448	15-Inch Diameter Sanitary Sewer	LF	1,385	$225.00	$311,625.00
2	-	-	Ancillary Items	LS	1	20.00%	$68,205.00
3	-	-	Sub-total of Wastewater Items	LS	1		$409,230.00
4	-	-	General Items (10% of Wastewater Sub-total)	LS	1	10.00%	$40,923.00
TOTAL UNIT PRICES - WASTEWATER							**$450,153.00**

Item No.	Item Reference No. Note 2	Spec No.	Item Description	Unit Measure	Unit Quantity	Unit Price (this column controls)	Total in Figures
UNIT PRICES - WATER							
1	251102	02511	8-Inch Diameter Water Line	LF	200	$100.00	$20,000.00
2	251104	02511	12-Inch Diameter Water Line	LF	600	$125.00	$75,000.00
3	252002	02520	Fire Hydrant Assembly, All Depths, Including 6-Inch Diameter Gate Valve, Box, and Branch	EA	2	$5,400.00	$10,800.00
4	251201	02512	3/4-Inch to 2-Inch Diameter Water Taps and Copper Service Line With Meter Box, Short or Long Side	EA	2	$1,360.00	$2,720.00
5	-	-	Ancillary items	LS	1	20.00%	$21,704.00
6	-	-	Sub-total of Water Items	LS	1		$130,224.00
7	-	-	General Items (10% of Water Sub-total)	LS	1	10.00%	$13,022.40
TOTAL UNIT PRICES - WATER							**$143,246.40**

Bidders Initials [ ]

Item No.	Item Reference No. Note 2	Spec No.	Item Description	Unit Measure	Unit Quantity	Unit Price (this column controls)	Total in Figures
UNIT PRICES - DETENTION							
1	500001	-	Excavation (Detention Pond) (Dry)	AC-FT	0.0	$20,000.00	$0.00
2	500002	-	Excavation (Detention Pond) (Wet)	AC-FT	0.0	$25,000.00	$0.00
TOTAL UNIT PRICES - DETENTION							**$0.00**

TOTAL BASE UNIT PRICE: **$5,097,447.74**

C. EXTRA UNIT PRICE TABLE:

Item No.		Spec No.	Item Description	Unit Measure	Unit Quantity	Unit Price (this column controls)	Total in Figures
UNIT PRICES - EXTRA UNIT PRICE TABLE ITEMS							
TOTAL UNIT PRICES - EXTRA UNIT PRICE TABLE ITEMS							**$0**

D. CASH ALLOWANCE TABLE:

Item No.		Spec No.	Cash Allowance Short Table		Cash Allowance in Figures (1)
TOTAL CASH ALLOWANCES					**$0**

SAMPLE 410

E. ALTERNATES TABLE:

Item No.		Spec No.	Alternate Short Tittle	Unit Measure	Unit Quantity	Unit Price (this column controls)	Total Price for Alternates in Figures
TOTAL CASH ALLOWANCES							**$0**

Note:

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2. The "Item Reference No." shall be designated for each item listed. The numbers serve as reference and will be used for the future cost updates.

SUB-PROJECT 410

Item No.		Spec No.	Alternate Short Tittle	Unit Measure	Unit Quantity	Unit Price (this column controls)	Total Price for Alternates in Figures
UNIT PRICES - WASTEWATER SUBSTITUTE SERVICES							
1			Abandon and Fill Existing Sanitary Sewer Manhole	EA	0	$1,000.00	$0.00
2			Abandon and Fill Existing Sanitary Sewer Pipe (All Szes)	LF	0	$20.00	$0.00
3			Service Stub and Connection to Back Lot Services	EA	0	$5,000.00	$0.00
TOTAL WASTEWATER SUBSTITUTE SERVICES							**$0**

Note:

1. This is not a Standard Document 00410B (Form 410). The Form 410 was modified for the purpose of planning level cost estimates for Pre-Engineering Studies.
2. The "Item Reference No." shall be designated for each item listed. The numbers serve as reference and will be used for the future cost updates.

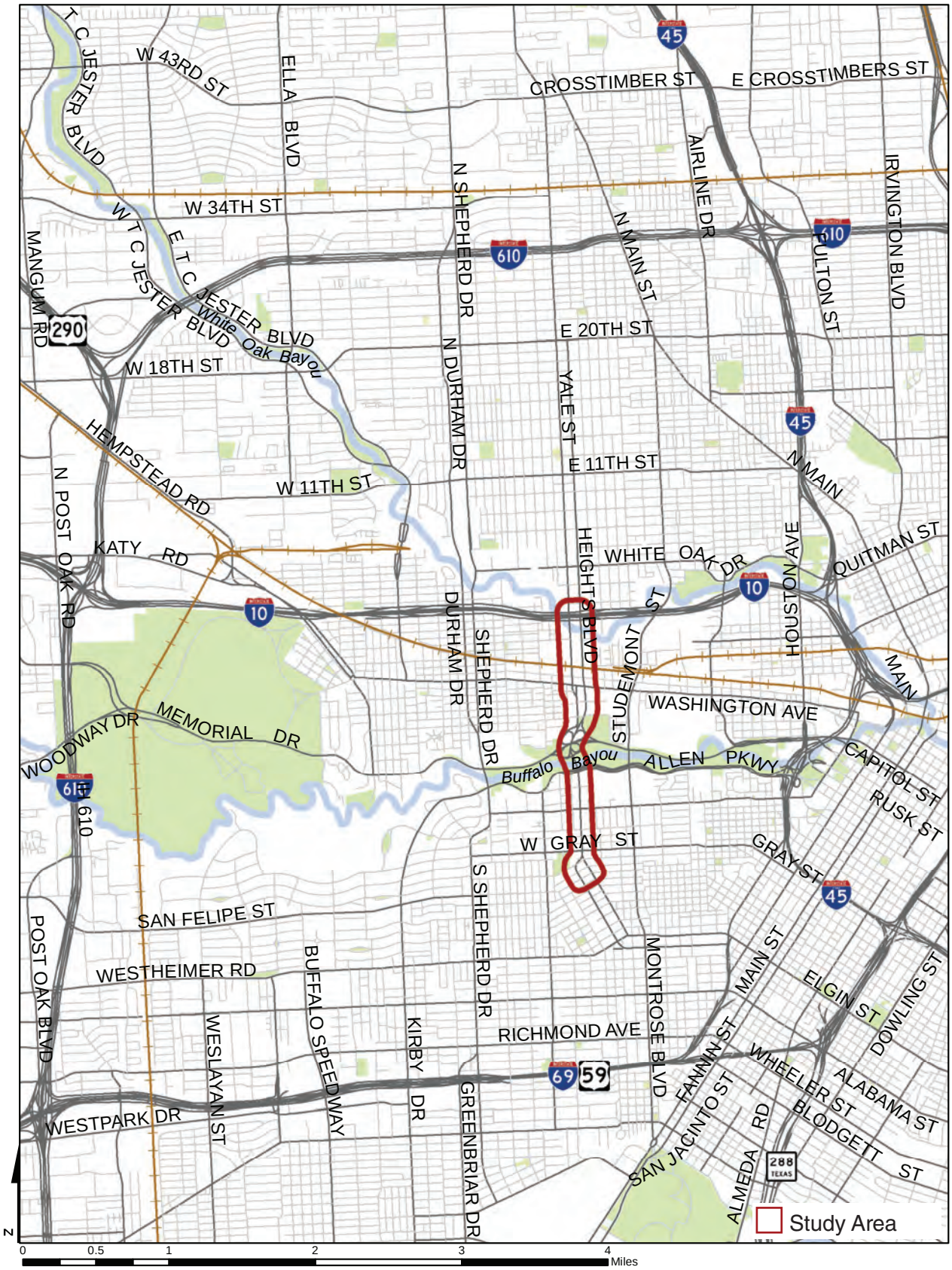
00410B-5
02-01-2010

Bidders Initials [ ]

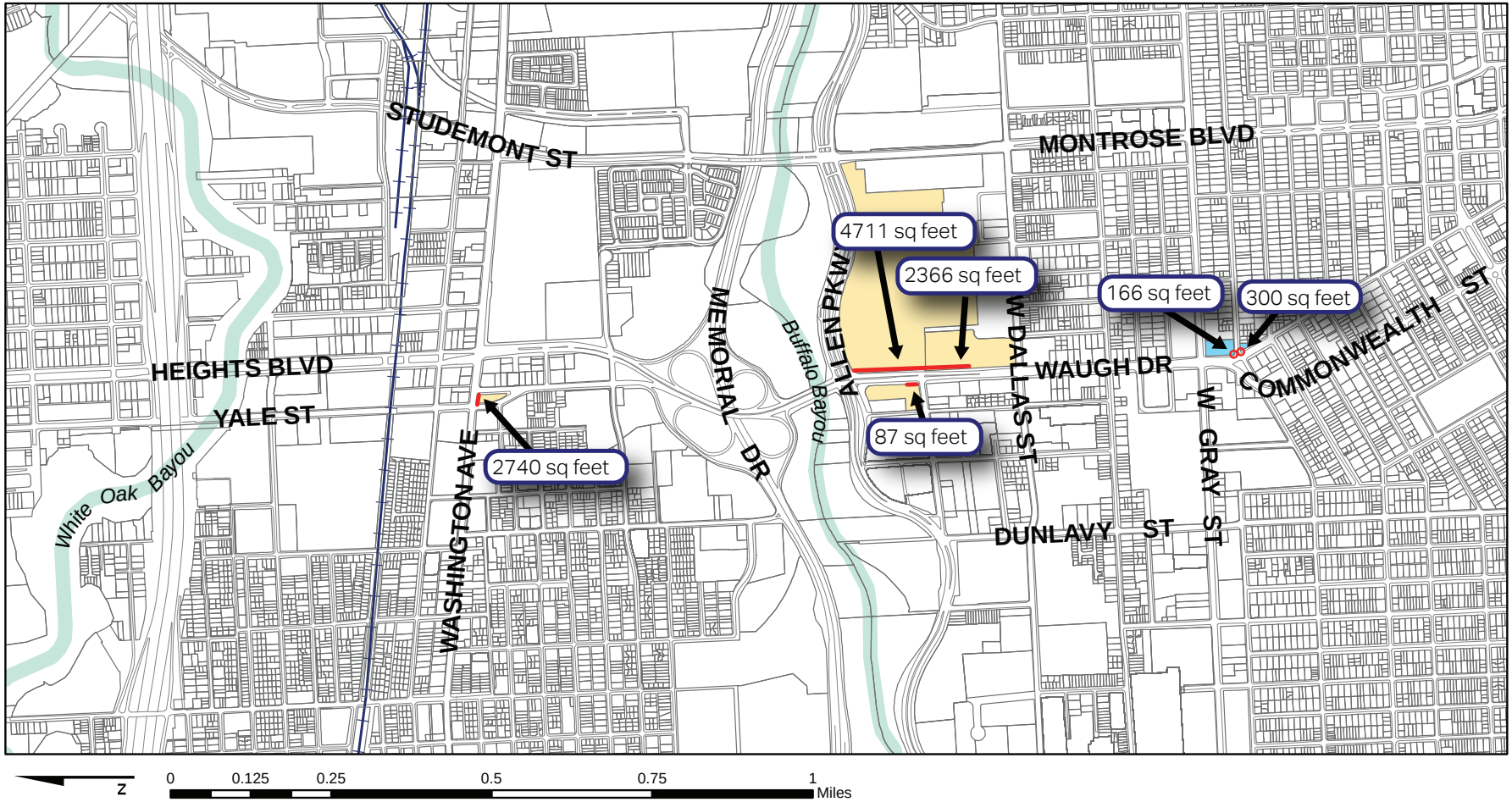
Planning 3 - Appendix 2
Location Map

WAUGH DRIVE/HEIGHTS BOULEVARD/YALE STREET

PROJECT LOCATION (N-2016T-0003)



Planning 3 - Appendix 3
Land Acquisition Map



N

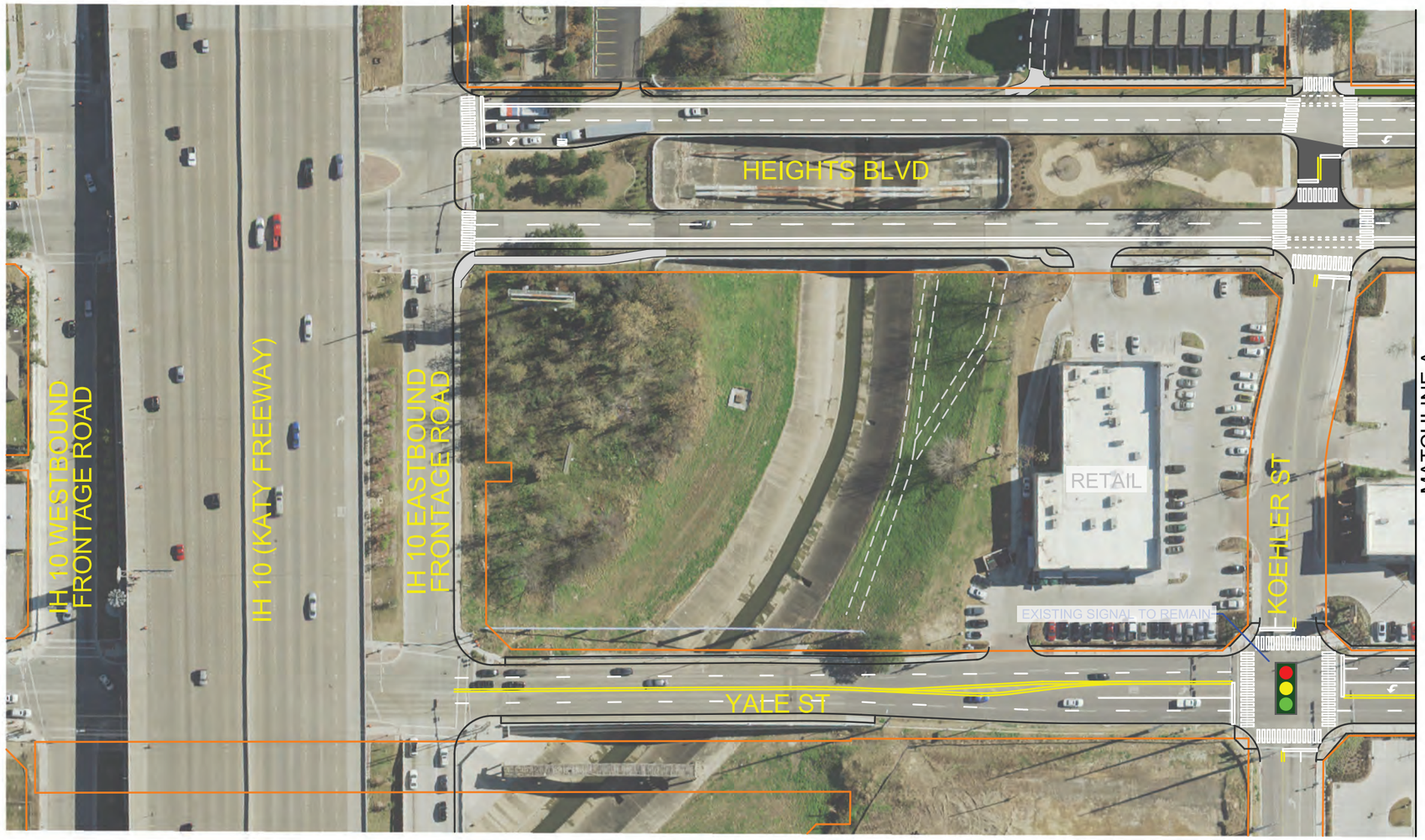
0 0.125 0.25 0.5 0.75 1 Miles

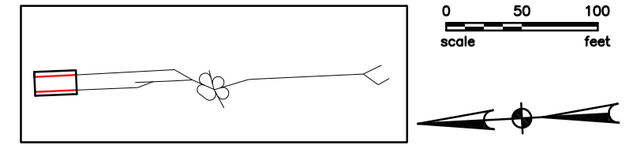
Land Acquisition

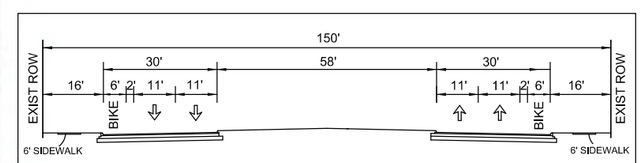
- Parcels
- Parcel for Corner Clip
- Corner Clip Location
- Parcel for Strip Take
- Strip Take Location

Planning 3 - Appendix 4
Candidate Project Schematic

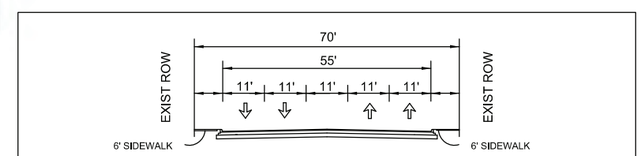
RESTRIPE ONLY -
THIS SECTION OF HEIGHTS







PROPOSED TYPICAL HEIGHTS BOULEVARD ROADWAY SECTION
FROM KATY FREEWAY TO UPRR
SCALE: 1"=40'



PROPOSED TYPICAL YALE STREET ROADWAY SECTION
KOEHLER STREET TO WAL*MART DRIVEWAY
SCALE: 1"=40'

CITY OF HOUSTON
DEPT. OF PUBLIC WORKS AND ENGINEERING

Texas Board of Professional Engineers
Registration No. F-3158

801 Congress Street, Suite 325
Houston, Texas 77002
Phone: 713.270.8145
Fax: 281.809.0807

Waugh Drive / Heights Boulevard
Katy Freeway to Nevada Street
Candidate Project
Sheet 1

WBS No.
N-320100-00016-3

City of Houston PM
Jing Chen, PE, CFM

2/2/2017

Legend
- Right-of-Way
- Proposed Pavement Rehab
- Proposed New Pavement
- Proposed Sidewalk/Shared Path
- Proposed Curb Line
- Proposed Landscape Strips
- Potential ROW Acquisition
- Concrete Pavement for Bus Stop
- Proposed Bus Shelter

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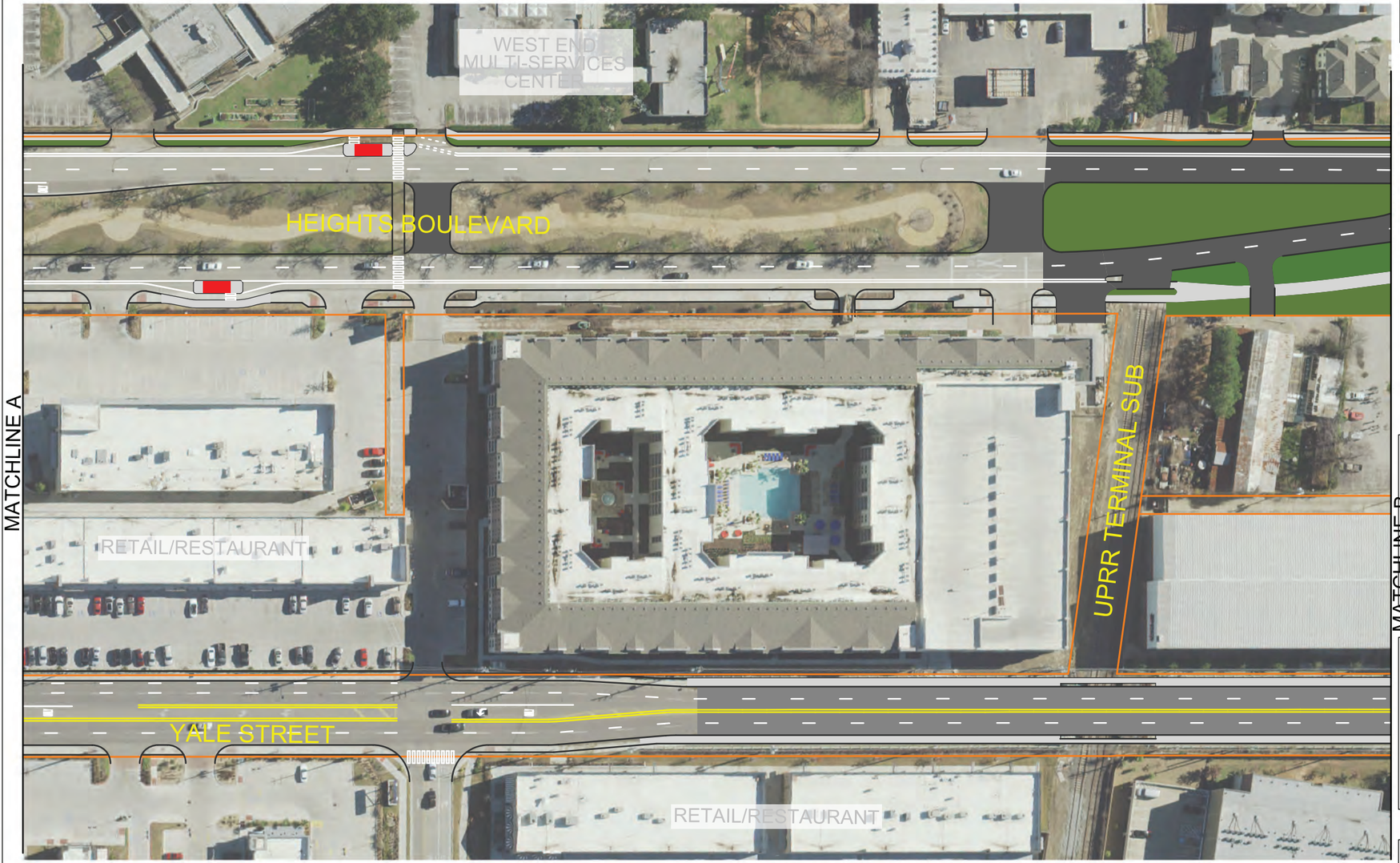
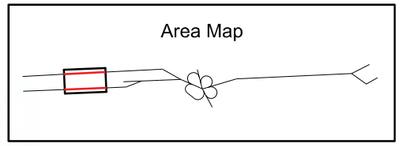
RESTRIPE ONLY -
THIS SECTION OF HEIGHTS



MATCHLINE A

MATCHLINE B



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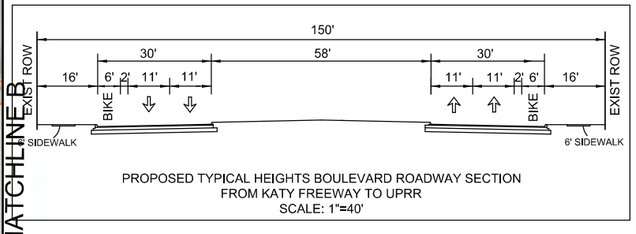
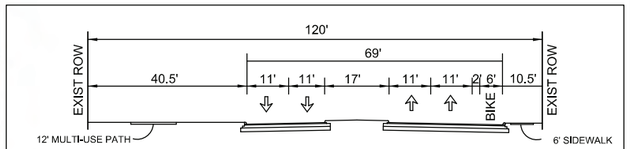
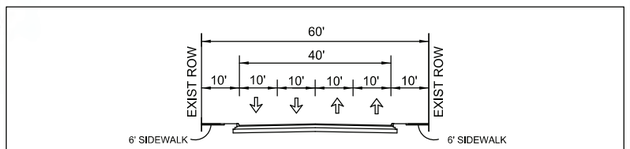
scale feet



PROPOSED TYPICAL HEIGHTS BOULEVARD ROADWAY SECTION
FROM KATY FREEWAY TO UPRR
SCALE: 1"=40'



PROPOSED TYPICAL HEIGHTS BOULEVARD ROADWAY SECTION
FROM UPRR TO WASHINGTON AVENUE
SCALE: 1"=40'



PROPOSED TYPICAL YALE STREET ROADWAY SECTION
FROM WAL*MART DRIVEWAY TO WASHINGTON AVENUE
SCALE: 1"=40'

CITY OF HOUSTON
DEPT. OF PUBLIC WORKS AND ENGINEERING

Texas Board of Professional Engineers
Registration No. F-3158

801 Congress Street, Suite 325
Houston, Texas 77002
Phone: 713.270.8145
Fax: 281.809.0807

Waugh Drive / Heights Boulevard
Katy Freeway to Nevada Street
Candidate Project
Sheet 2

WBS No.
N-320100-00016-3

City of Houston PM
Jing Chen, PE, CFM

1/20/2017

Legend
- Right-of-Way
- Proposed Pavement Rehab
- Proposed New Pavement
- Proposed Sidewalk/Shared Path
- Proposed Curb Line
- Proposed Landscape Strips
- Potential ROW Acquisition
- Concrete Pavement for Bus Stop
- Proposed Bus Shelter

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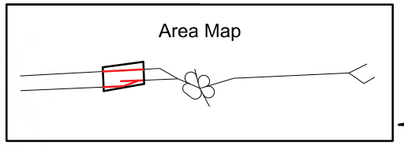
Area Map



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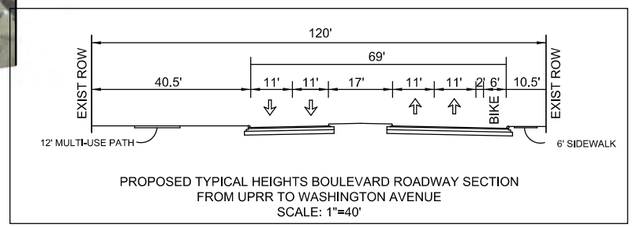
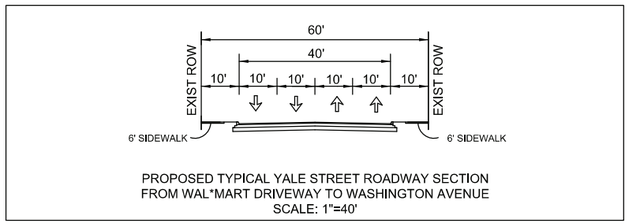


PROPOSED TYPICAL HEIGHTS BOULEVARD ROADWAY SECTION
FROM UPRR TO WASHINGTON AVENUE
SCALE: 1"=40'



PROPOSED TYPICAL YALE STREET ROADWAY SECTION
FROM WAL*MART DRIVEWAY TO WASHINGTON AVENUE
SCALE: 1"=40'

CITY OF HOUSTON
DEPT. OF PUBLIC WORKS AND ENGINEERING

Texas Board of Professional Engineers
Registration No. F-3158

801 Congress Street, Suite 325
Houston, Texas 77002
Phone: 713.270.8145
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Waugh Drive / Heights Boulevard
Katy Freeway to Nevada Street
Candidate Project
Sheet 3

WBS No.
N-320100-00016-3

City of Houston PM
Jing Chen, PE, CFM

2/2/2017

Legend
- Right-of-Way
- Proposed Pavement Rehab
- Proposed New Pavement
- Proposed Sidewalk/Shared Path
- Proposed Curb Line
- Proposed Landscape Strips
- Potential ROW Acquisition
- Concrete Pavement for Bus Stop
- Proposed Bus Shelter

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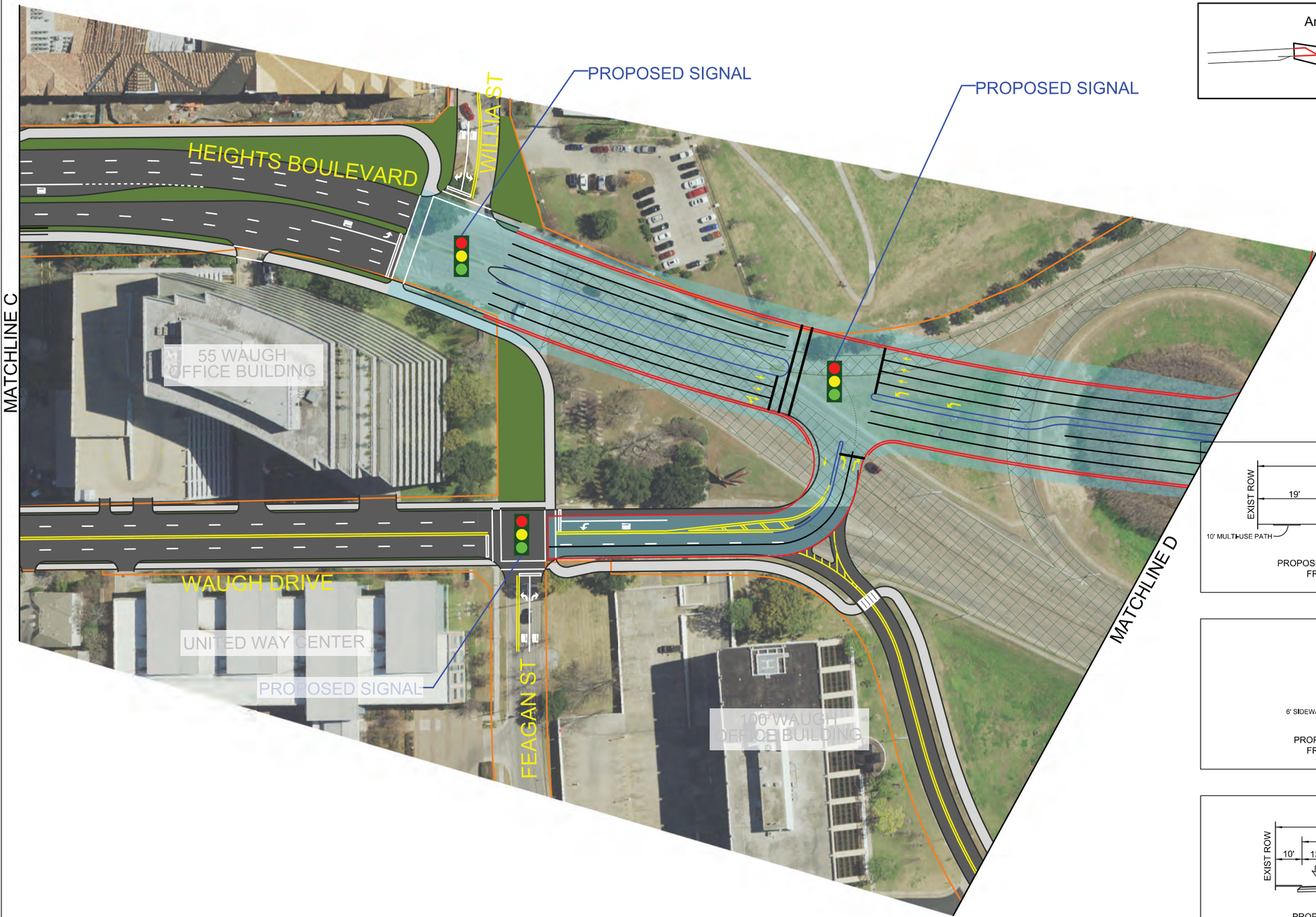

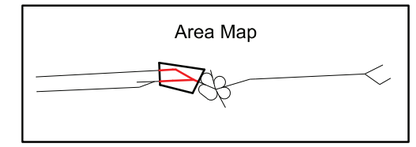

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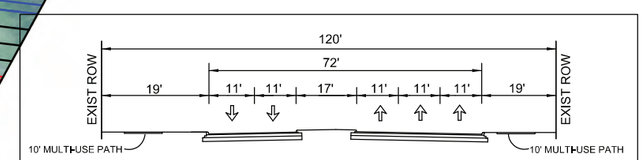
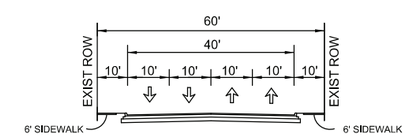
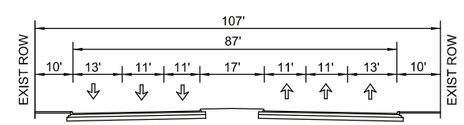


PROPOSED TYPICAL HEIGHTS BOULEVARD ROADWAY SECTION
FROM WASHINGTON AVENUE TO FEAGAN STREET
SCALE: 1"=40'



PROPOSED TYPICAL WAUGH DRIVE ROADWAY SECTION
FROM WASHINGTON AVENUE TO FEAGAN STREET
SCALE: 1"=40'



PROPOSED TYPICAL WAUGH DRIVE OVERPASS SECTION
FROM FEAGAN STREET TO ALLEN PARKWAY
SCALE: 1"=40'

CITY OF HOUSTON
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Waugh Drive / Heights Boulevard
Katy Freeway to Nevada Street
Candidate Project
Sheet 4

WBS No.
N-320100-00016-3

City of Houston PM
Jing Chen, PE, CFM

1/20/2017

Legend
- Right-of-Way
- Proposed Pavement Rehab
- Proposed New Pavement
- Proposed Sidewalk/Shared Path
- Proposed Curb Line
- Proposed Landscape Strips
- Potential ROW Acquisition
- Concrete Pavement for Bus Stop
- Proposed Bus Shelter

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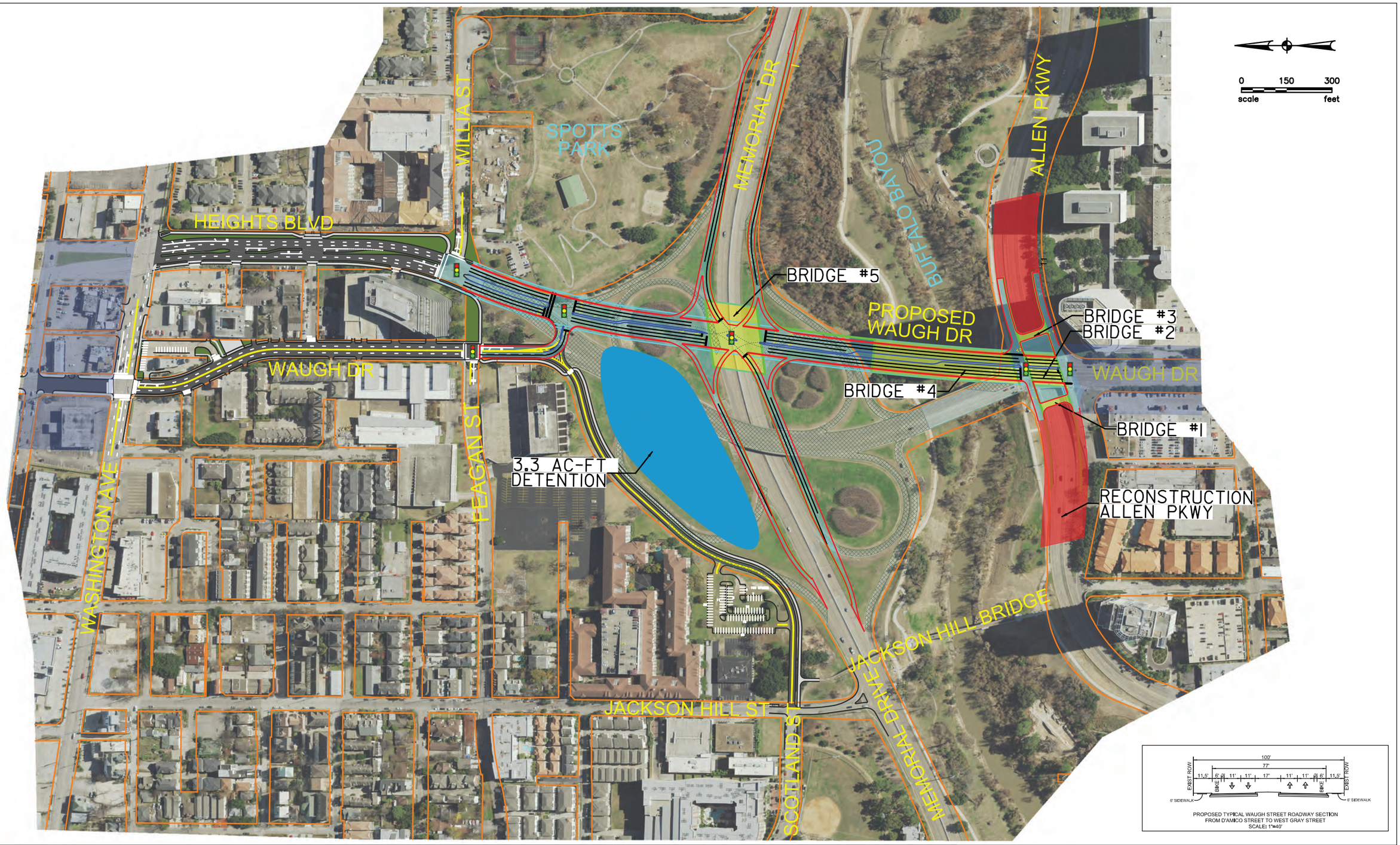

CITY OF HOUSTON
DEPT. OF PUBLIC WORKS AND ENGINEERING

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TranSystems

Waugh Drive / Heights Boulevard
Katy Freeway to Nevada Street
Candidate Project
Sheet 5

WBS No.
N-320100-00016-3

City of Houston PM
Jing Chen, PE, CFM

1/20/2017

LEGEND

- PROPOSED ROADWAY
- PROPOSED BRIDGES
- RECONSTRUCTION
- BRIDGE TO REMAIN
- REMOVAL
- RETAINING WALL

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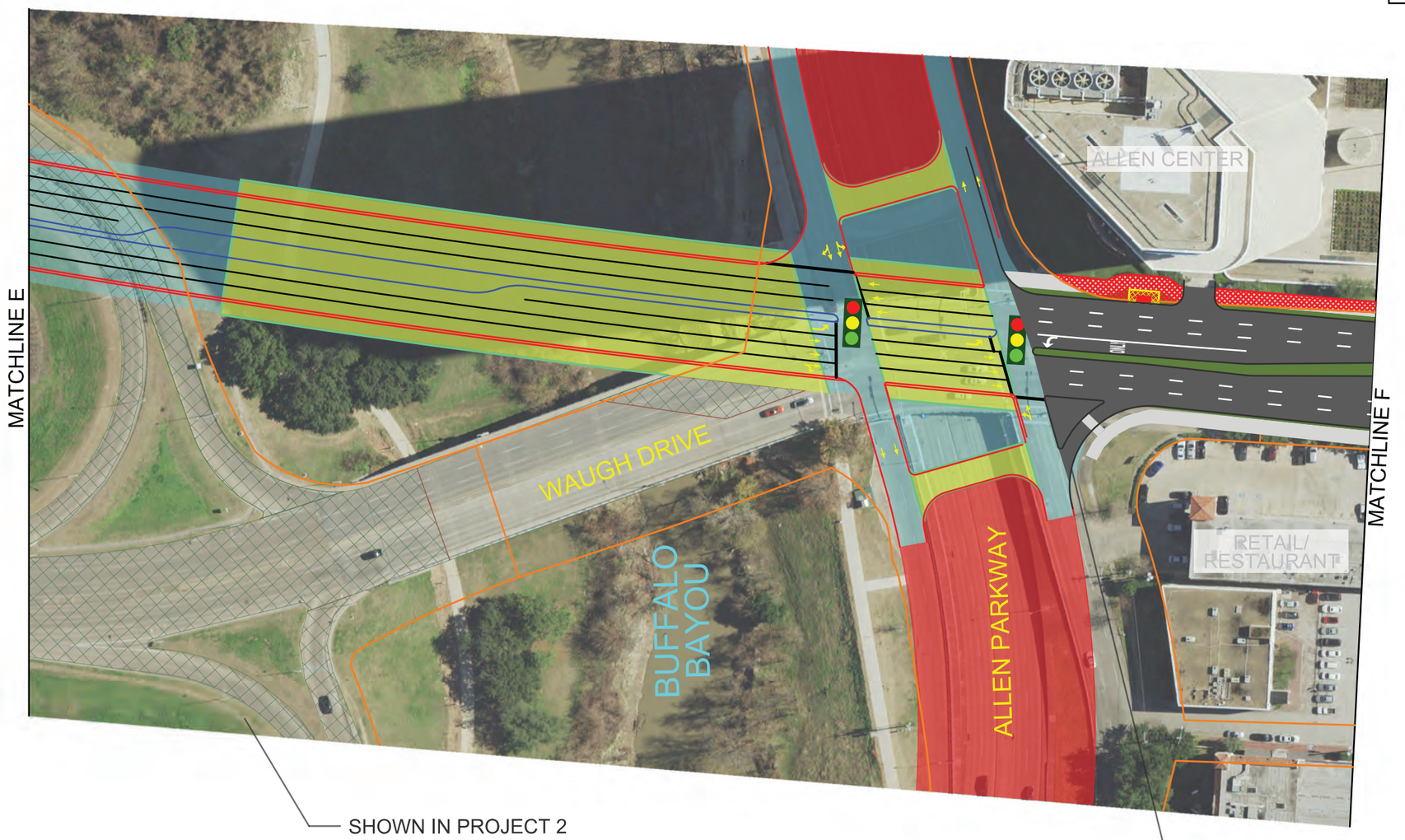
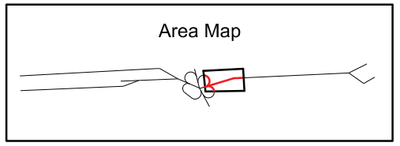


Area Map



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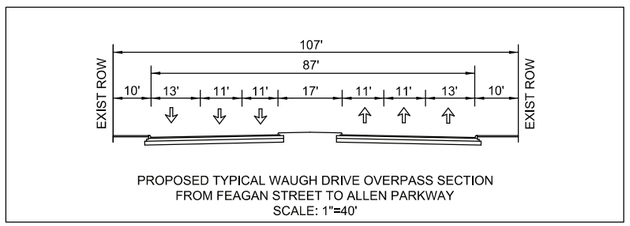
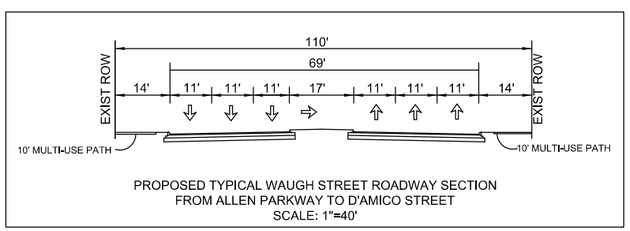


PROPOSED TYPICAL WAUGH DRIVE OVERPASS SECTION
FROM FEAGAN STREET TO ALLEN PARKWAY
SCALE: 1"=40'



PROPOSED TYPICAL WAUGH STREET ROADWAY SECTION
FROM ALLEN PARKWAY TO D'AMICO STREET
SCALE: 1"=40'

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Waugh Drive / Heights Boulevard
Katy Freeway to Nevada Street
Candidate Project
Sheet 6

WBS No.
N-320100-00016-3

City of Houston PM
Jing Chen, PE, CFM

1/20/2017

Legend
- Right-of-Way
- Proposed Pavement Rehab
- Proposed New Pavement
- Proposed Sidewalk/Shared Path
- Proposed Curb Line
- Proposed Landscape Strips
- Potential ROW Acquisition
- Concrete Pavement for Bus Stop
- Proposed Bus Shelter

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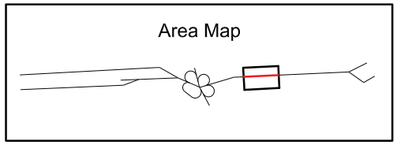

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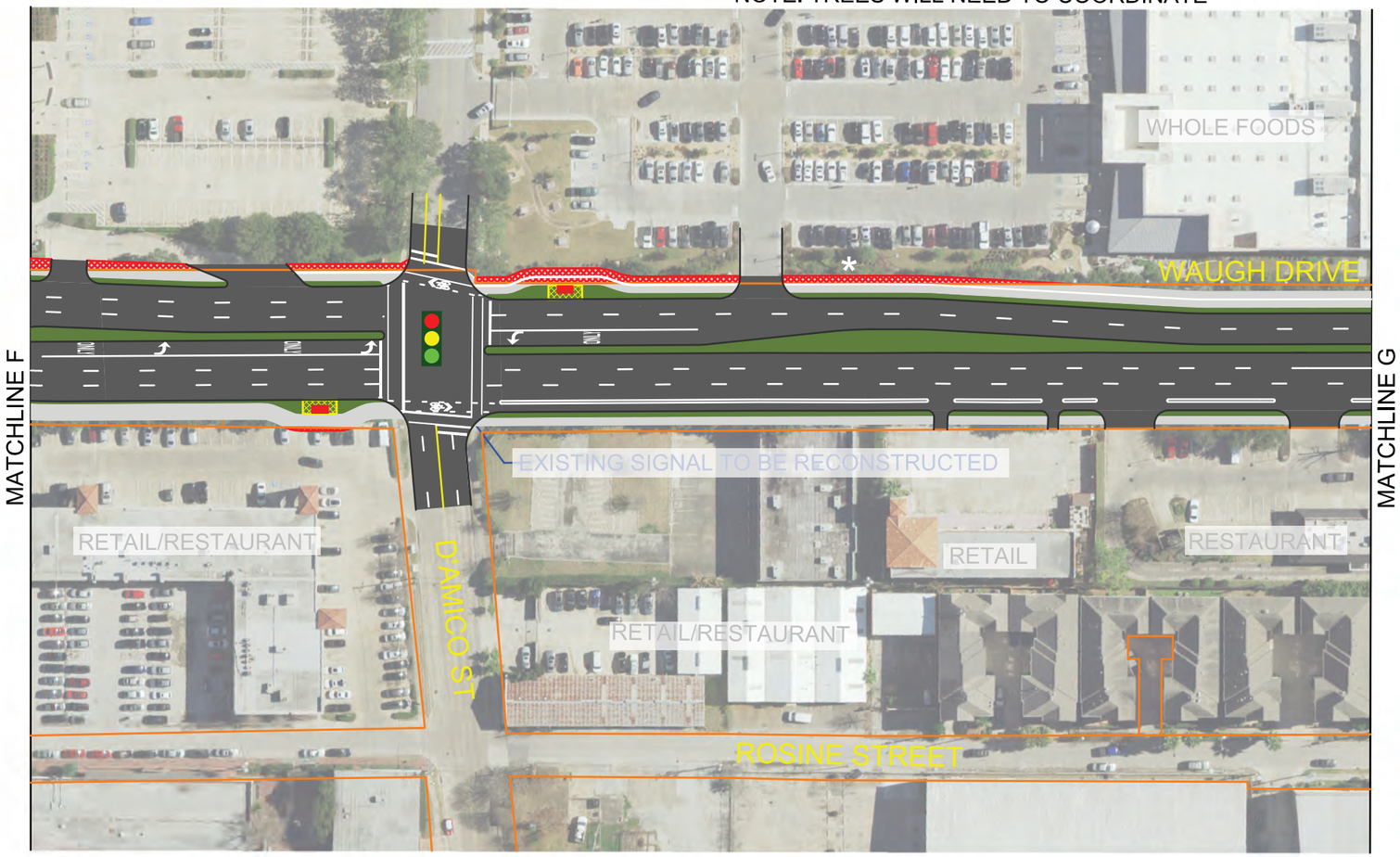
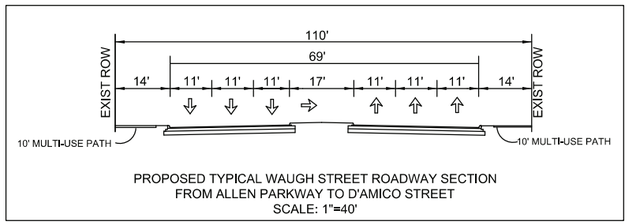
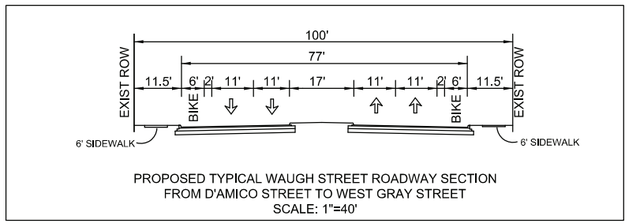
* NOTE: TREES WILL NEED TO COORDINATE





PROPOSED TYPICAL WAUGH STREET ROADWAY SECTION
FROM ALLEN PARKWAY TO D'AMICO STREET
SCALE: 1"=40'



PROPOSED TYPICAL WAUGH STREET ROADWAY SECTION
FROM D'AMICO STREET TO WEST GRAY STREET
SCALE: 1"=40'

CITY OF HOUSTON
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Waugh Drive / Heights Boulevard
Katy Freeway to Nevada Street
Candidate Project
Sheet 7

WBS No.
N-320100-00016-3

City of Houston PM
Jing Chen, PE, CFM

2/2/2017

Legend
- Right-of-Way
- Proposed Pavement Rehab
- Proposed New Pavement
- Proposed Sidewalk/Shared Path
- Proposed Curb Line
- Proposed Landscape Strips
- Potential ROW Acquisition
- Concrete Pavement for Bus Stop
- Proposed Bus Shelter

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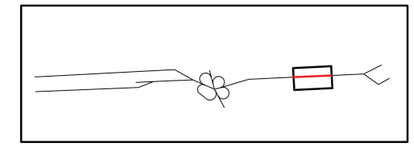
Area Map



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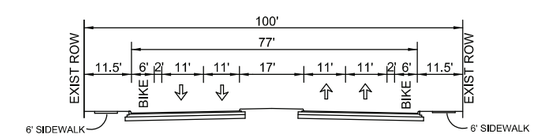

PROPOSED TYPICAL WAUGH STREET ROADWAY SECTION
FROM D'AMICO STREET TO WEST GRAY STREET
SCALE: 1"=40'

CITY OF HOUSTON
DEPT. OF PUBLIC WORKS AND ENGINEERING

Texas Board of Professional Engineers
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Waugh Drive / Heights Boulevard
Katy Freeway to Nevada Street
Candidate Project
Sheet 8

WBS No.
N-320100-00016-3

City of Houston PM
Jing Chen, PE, CFM

2/2/2017

Legend
- Right-of-Way
- Proposed Pavement Rehab
- Proposed New Pavement
- Proposed Sidewalk/Shared Path
- Proposed Curb Line
- Proposed Landscape Strips
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- Concrete Pavement for Bus Stop
- Proposed Bus Shelter

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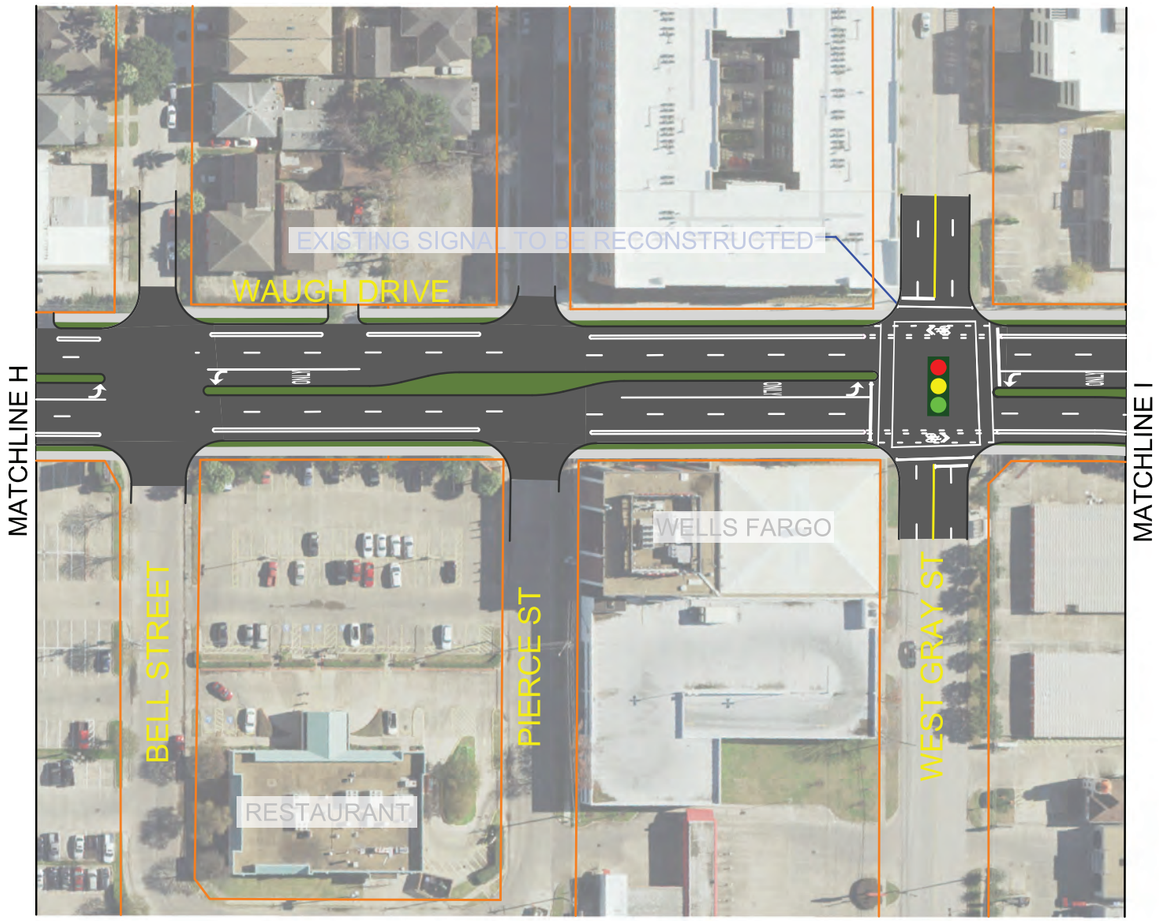

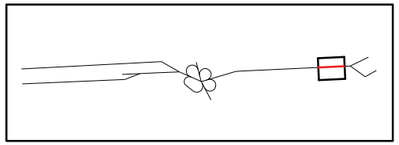

Area Map

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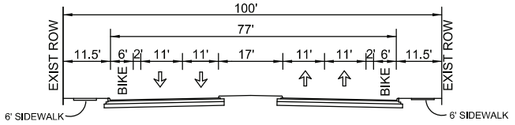

PROPOSED TYPICAL WAUGH STREET ROADWAY SECTION
FROM D'AMICO STREET TO WEST GRAY STREET
SCALE: 1"=40'

CITY OF HOUSTON
DEPT. OF PUBLIC WORKS AND ENGINEERING

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Waugh Drive / Heights Boulevard
Katy Freeway to Nevada Street
Candidate Project
Sheet 9

WBS No.
N-320100-00016-3

City of Houston PM
Jing Chen, PE, CFM

1/20/2017

Legend

- Right-of-Way
- Proposed Pavement Rehab
- Proposed New Pavement
- Proposed Sidewalk/Shared Path
- Proposed Curb Line
- Proposed Landscape Strips
- Potential ROW Acquisition
- Concrete Pavement for Bus Stop
- Proposed Bus Shelter

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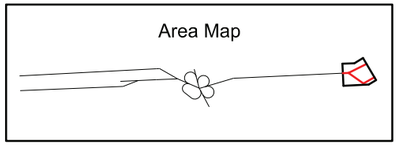

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Waugh Drive / Heights Boulevard
Katy Freeway to Nevada Street
Candidate Project
Sheet 10

WBS No.
N-320100-00016-3

City of Houston PM
Jing Chen, PE, CFM

1/20/2017

Legend
- Right-of-Way
- Proposed Pavement Rehab
- Proposed New Pavement
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- Proposed Curb Line
- Proposed Landscape Strips
- Potential ROW Acquisition
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- Proposed Bus Shelter

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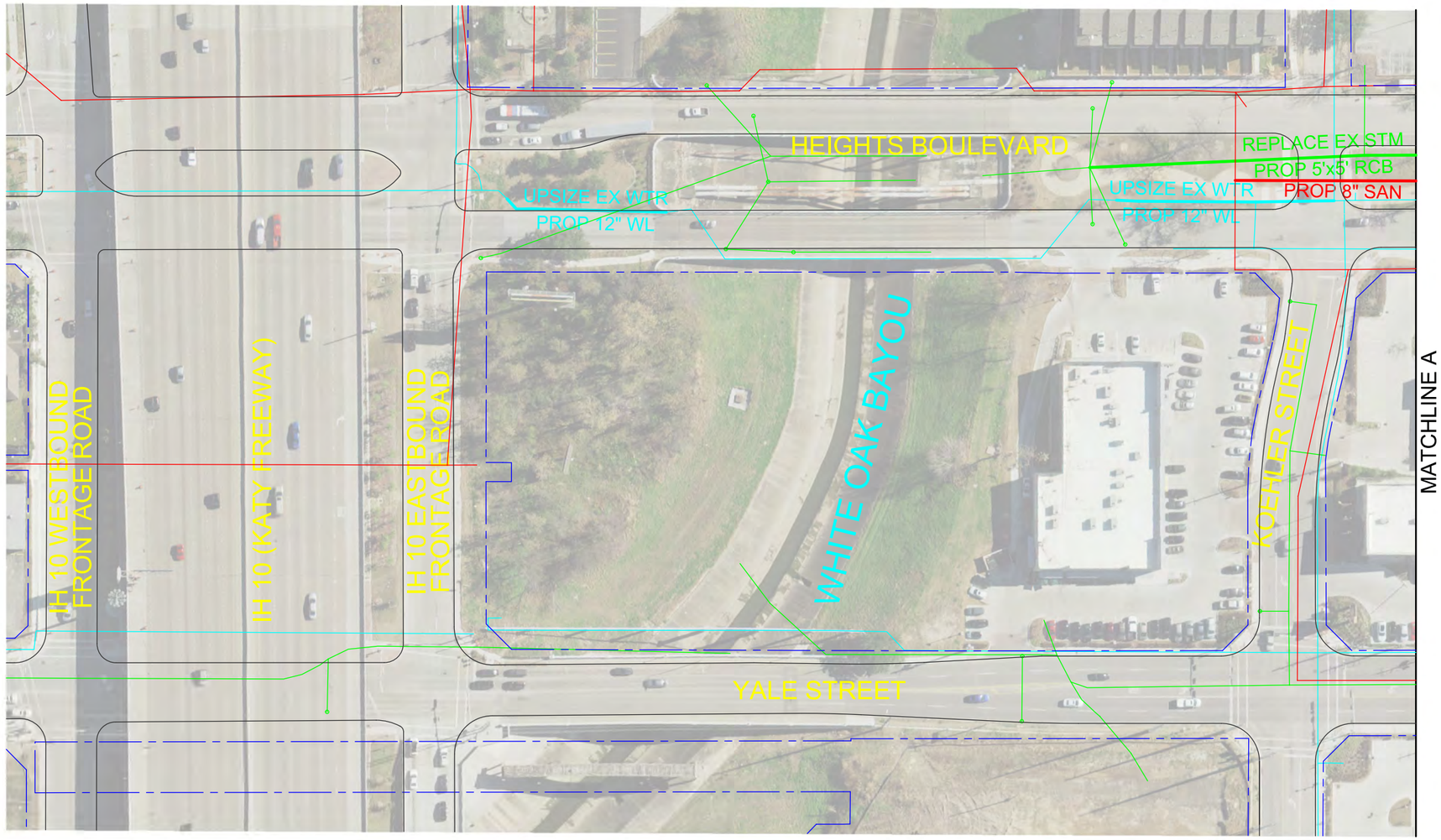

Area Map

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CITY OF HOUSTON
DEPT. OF PUBLIC WORKS AND ENGINEERING

TEI TRAFFIC ENGINEERS, INC.

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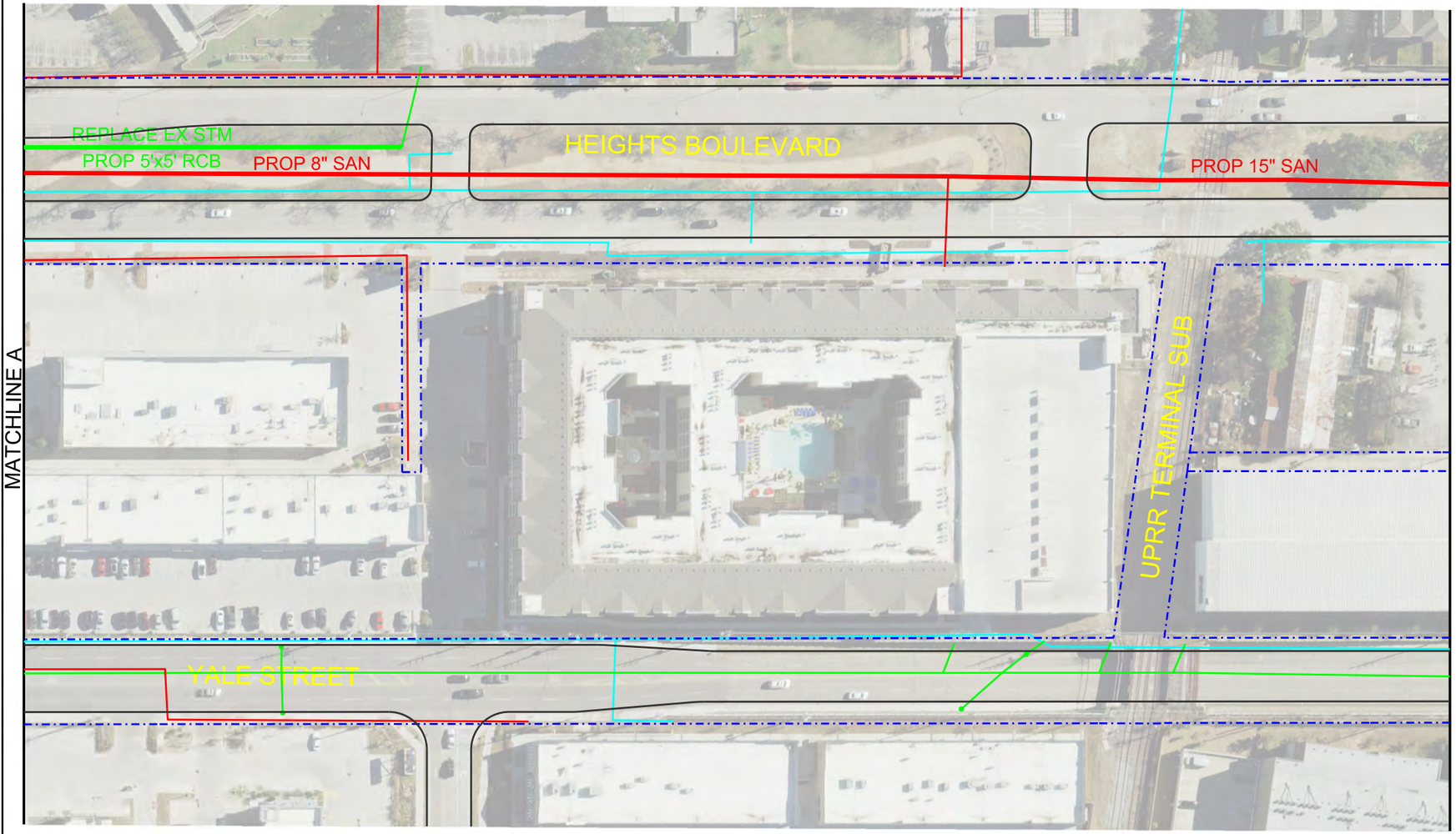
Waugh Drive / Heights Boulevard
Katy Freeway to Nevada Street
Candidate Project
Proposed Storm & Utility Layout
Sheet 1 of 10

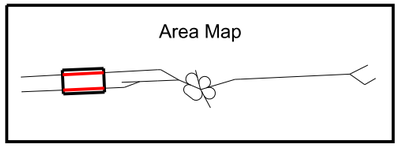
WBS No.
N-320100-0016-3

City of Houston PM
Jing Chen, PE

12/19/2016

Legend
- Storm Main (Existing to Remain)
- Storm Main (Proposed)
- Storm Manhole/Inlet
- Water Main (Existing to Remain)
- Water Main (Proposed)
- Sanitary Line (Existing)
- Sanitary Line (Proposed)
- Existing Right-of-Way
- Proposed Right-of-Way
- Existing Curb Line





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CITY OF HOUSTON
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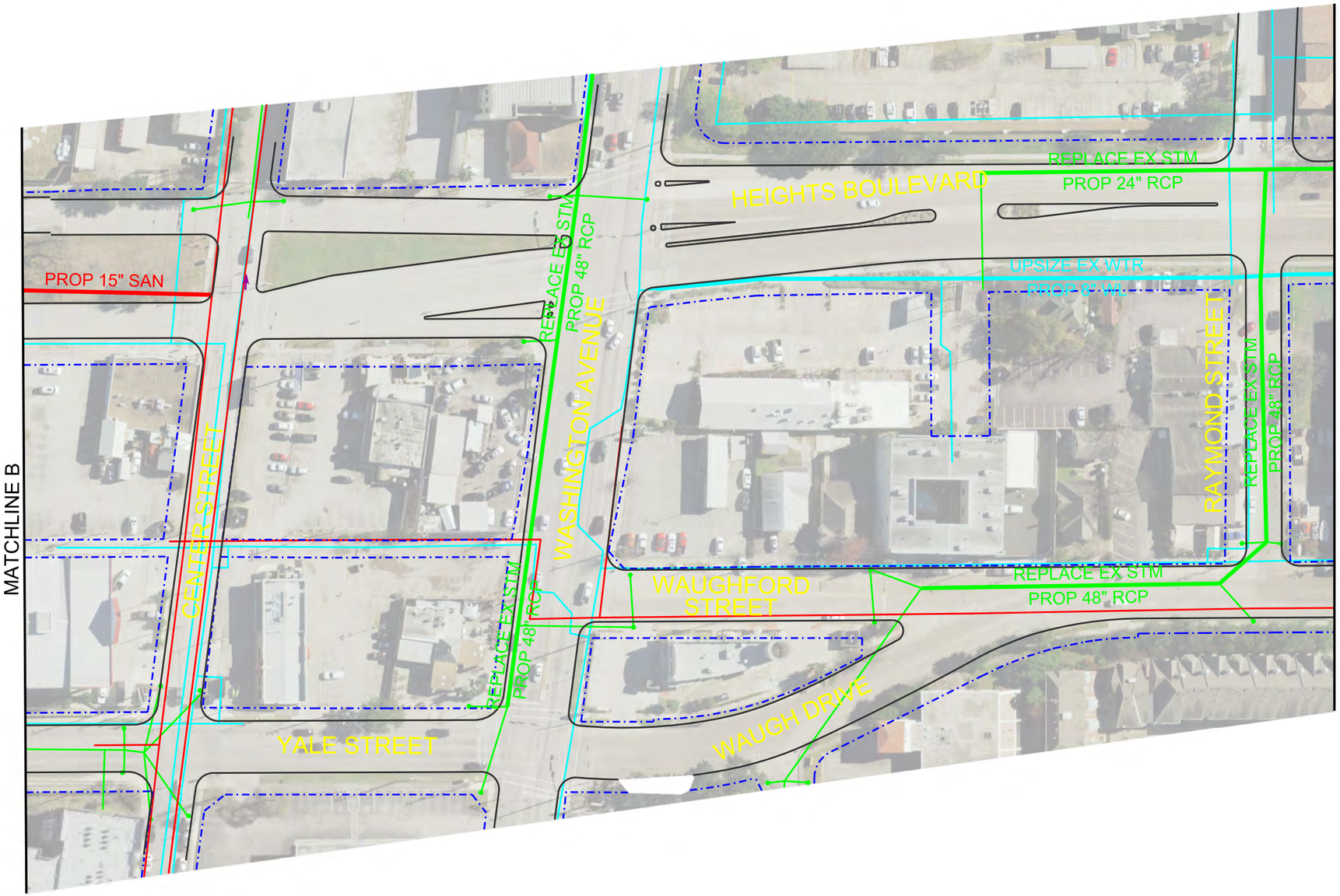
Waugh Drive / Heights Boulevard
Katy Freeway to Nevada Street
Candidate Project
Proposed Storm & Utility Layout
Sheet 2 of 10

WBS No.
N-320100-0016-3

City of Houston PM
Jing Chen, PE

12/19/2016

Legend
- Storm Main (Existing to Remain)
- Storm Main (Proposed)
- Storm Manhole/Inlet
- Water Main (Existing to Remain)
- Water Main (Proposed)
- Sanitary Line (Existing)
- Sanitary Line (Proposed)
- Existing Right-of-Way
- Proposed Right-of-Way
- Existing Curb Line



Area Map

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CITY OF HOUSTON
DEPT. OF PUBLIC WORKS AND ENGINEERING

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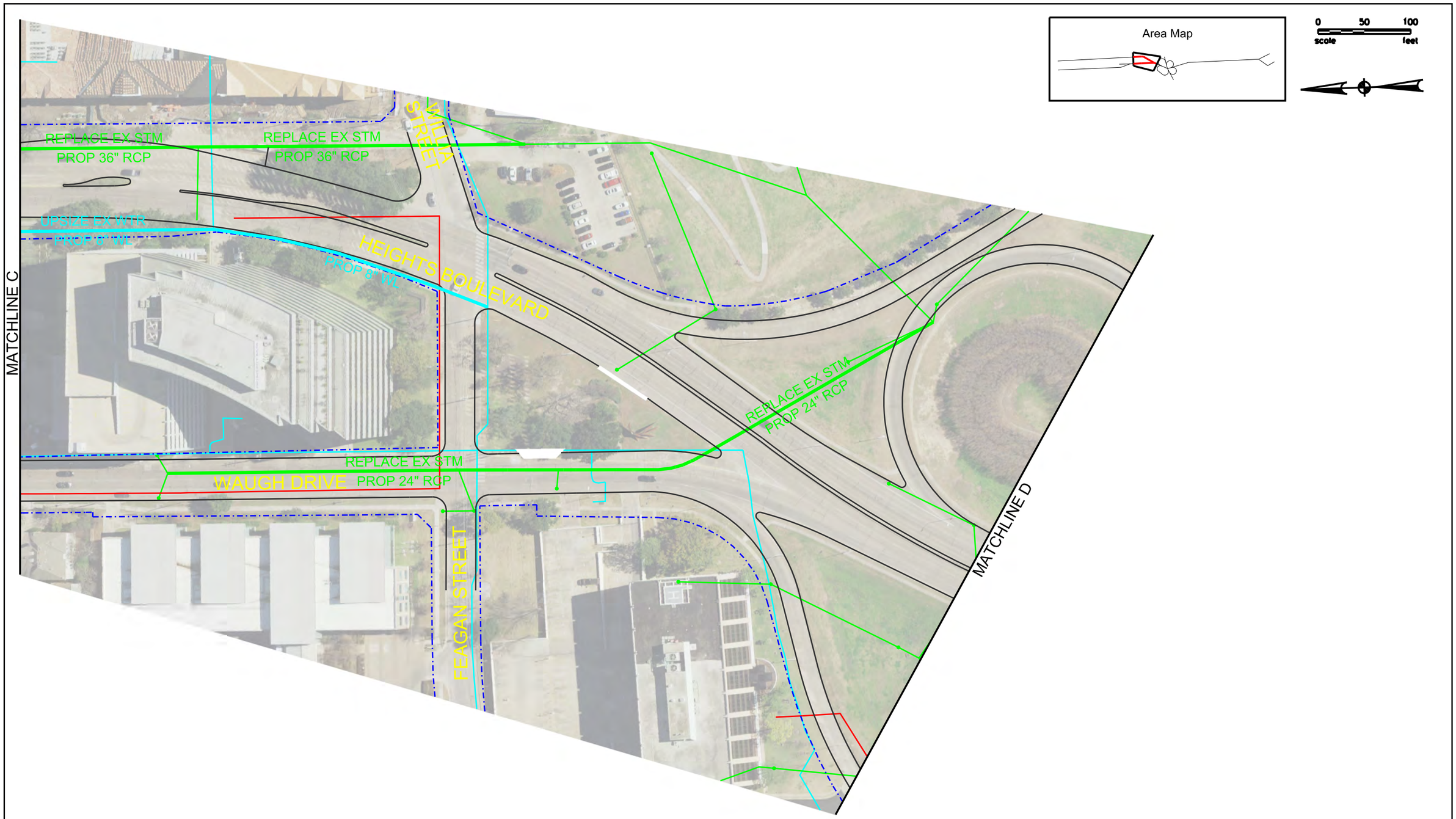
Waugh Drive / Heights Boulevard
Katy Freeway to Nevada Street
Candidate Project
Proposed Storm & Utility Layout
Sheet 3 of 10

WBS No.
N-320100-0016-3

City of Houston PM
Jing Chen, PE

12/19/2016

Legend
- Storm Main (Existing to Remain)
- Storm Main (Proposed)
- Storm Manhole/Inlet
- Water Main (Existing to Remain)
- Water Main (Proposed)
- Sanitary Line (Existing)
- Sanitary Line (Proposed)
- Existing Right-of-Way
- Proposed Right-of-Way
- Existing Curb Line



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CITY OF HOUSTON
DEPT. OF PUBLIC WORKS AND ENGINEERING

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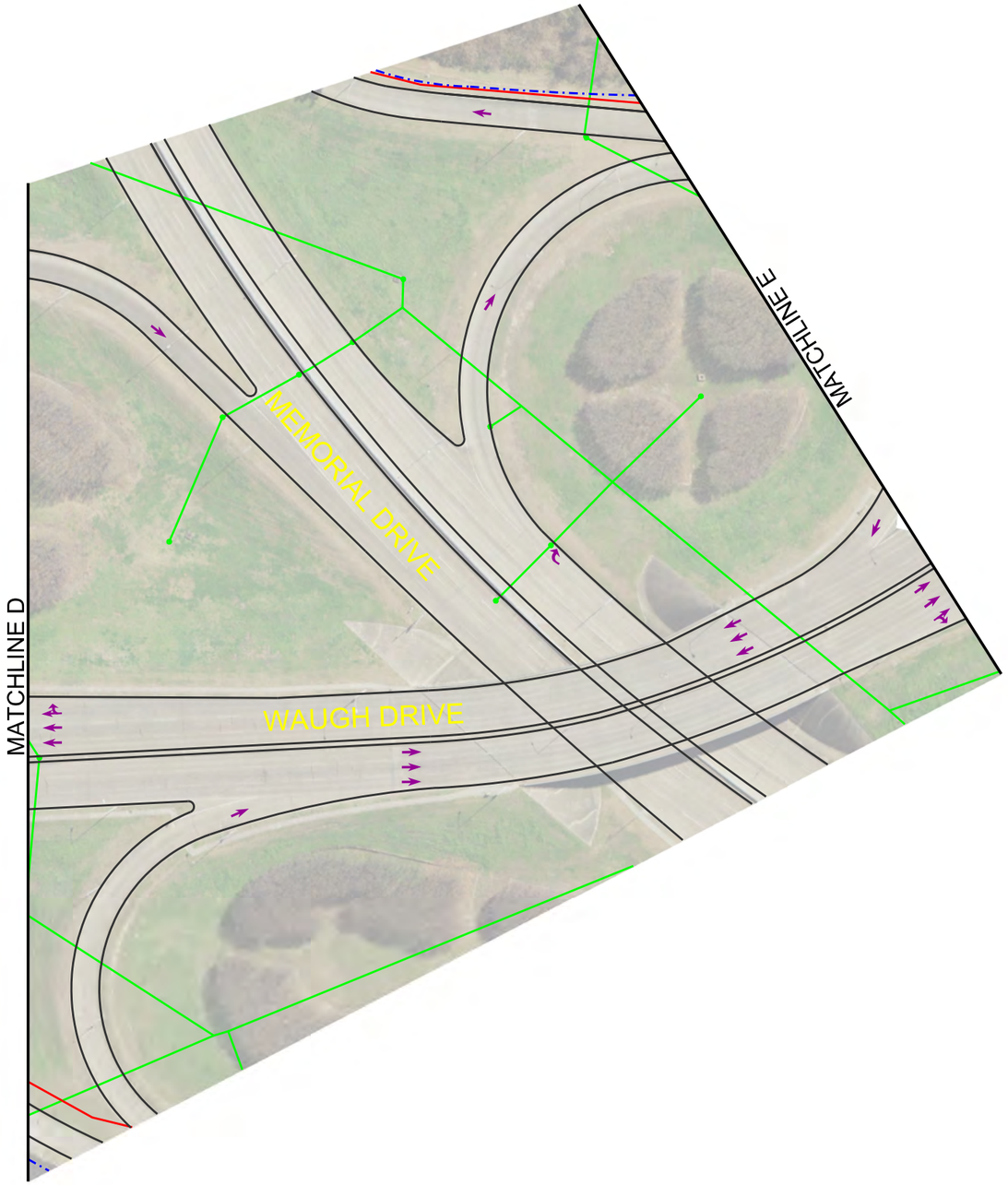
Waugh Drive / Heights Boulevard
Katy Freeway to Nevada Street
Candidate Project
Proposed Storm & Utility Layout
Sheet 4 of 10

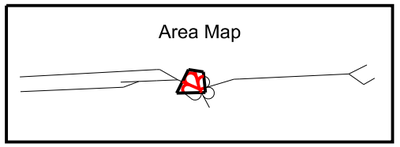
WBS No.
N-320100-0016-3

City of Houston PM
Jing Chen, PE

12/19/2016

Legend
- Storm Main (Existing to Remain)
- Storm Main (Proposed)
- Storm Manhole/Inlet
- Water Main (Existing to Remain)
- Water Main (Proposed)
- Sanitary Line (Existing)
- Sanitary Line (Proposed)
- Existing Right-of-Way
- Proposed Right-of-Way
- Existing Curb Line





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CITY OF HOUSTON
DEPT. OF PUBLIC WORKS AND ENGINEERING

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Waugh Drive / Heights Boulevard
Katy Freeway to Nevada Street
Candidate Project
Proposed Storm & Utility Layout
Sheet 5 of 10

WBS No.
N-320100-0016-3

City of Houston PM
Jing Chen, PE

12/19/2016

Legend
- Storm Main (Existing to Remain)
- Storm Main (Proposed)
- Storm Manhole/Inlet
- Water Main (Existing to Remain)
- Water Main (Proposed)
- Sanitary Line (Existing)
- Sanitary Line (Proposed)
- Existing Right-of-Way
- Proposed Right-of-Way
- Existing Curb Line

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$TIME$
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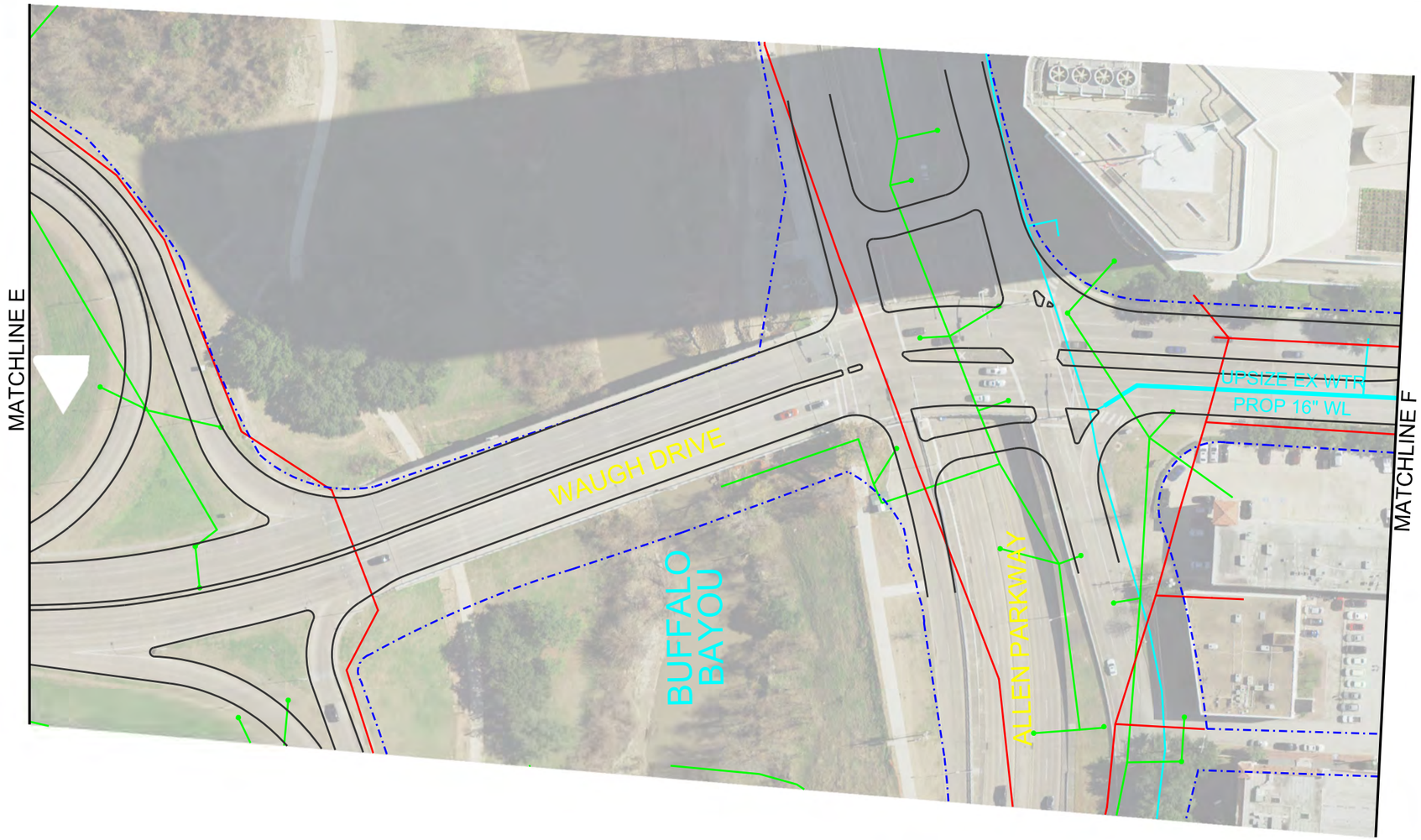
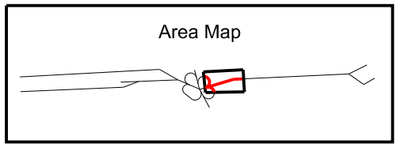
FILE: $FILE$





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scale feet

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CITY OF HOUSTON
DEPT. OF PUBLIC WORKS AND ENGINEERING

TEI TRAFFIC ENGINEERS, INC.

Texas Board of Professional Engineers
Registration No. F-3158

801 Congress Street, Suite 325
Houston, Texas 77002
Phone: 713.270.8145
Fax: 281.809.0807

Waugh Drive / Heights Boulevard
Katy Freeway to Nevada Street
Candidate Project
Proposed Storm & Utility Layout
Sheet 6 of 10

WBS No.
N-320100-0016-3

City of Houston PM
Jing Chen, PE

12/19/2016

Legend
- Storm Main (Existing to Remain)
- Storm Main (Proposed)
- Storm Manhole/Inlet
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- Sanitary Line (Proposed)
- Existing Right-of-Way
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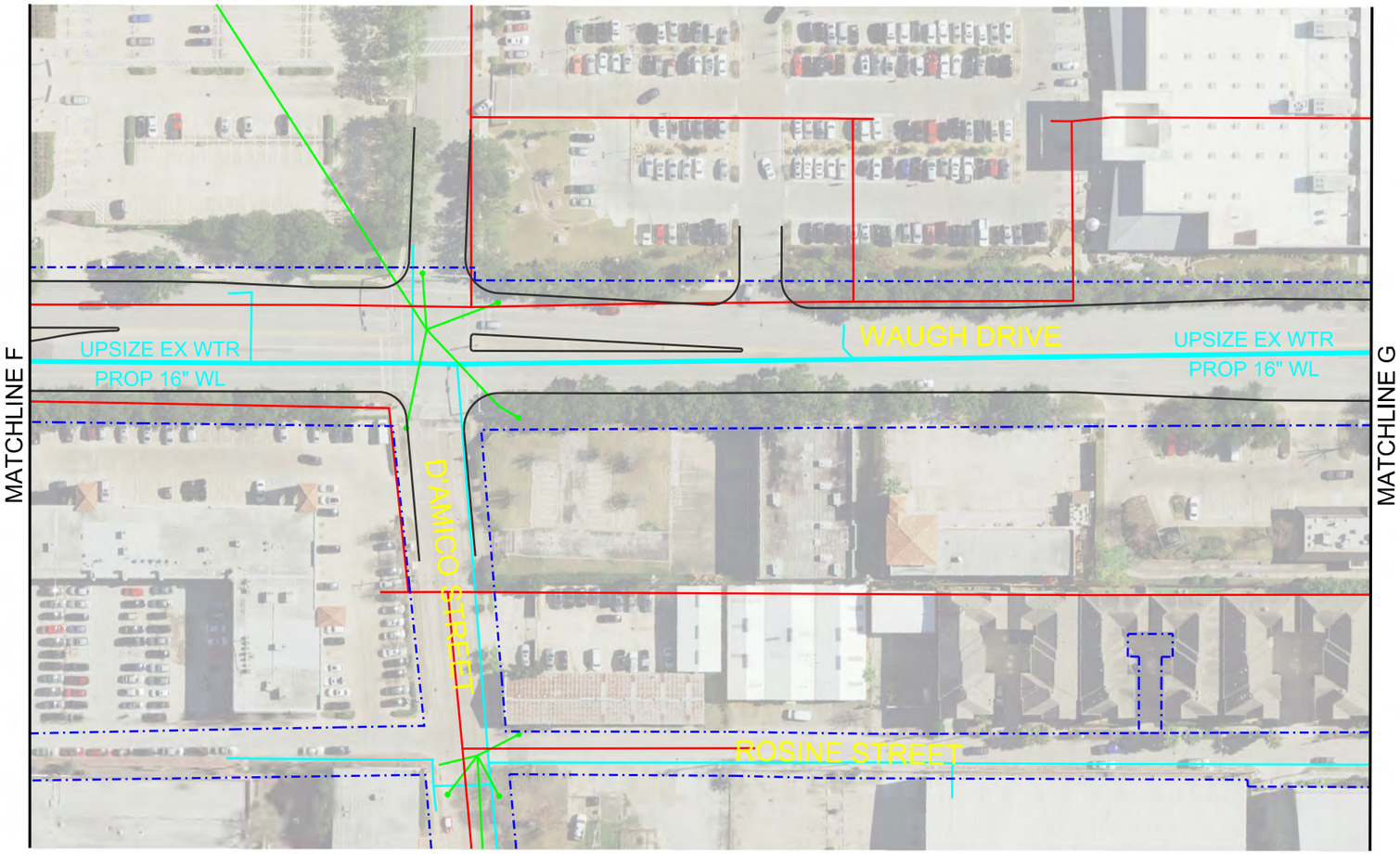

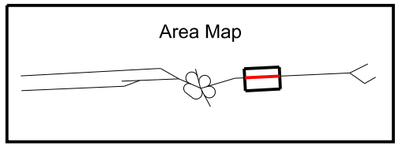

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scale feet

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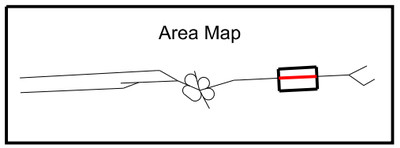
Area Map



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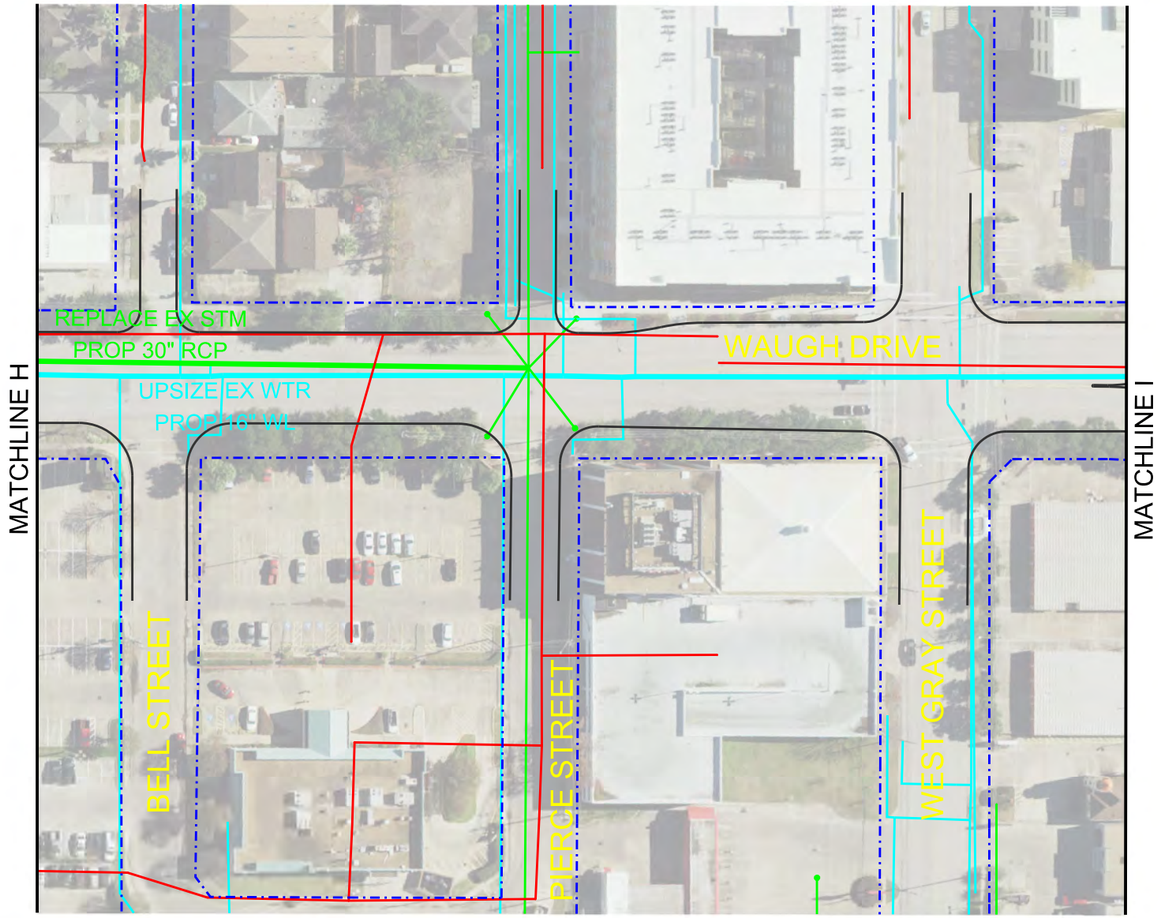

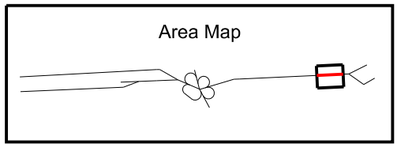

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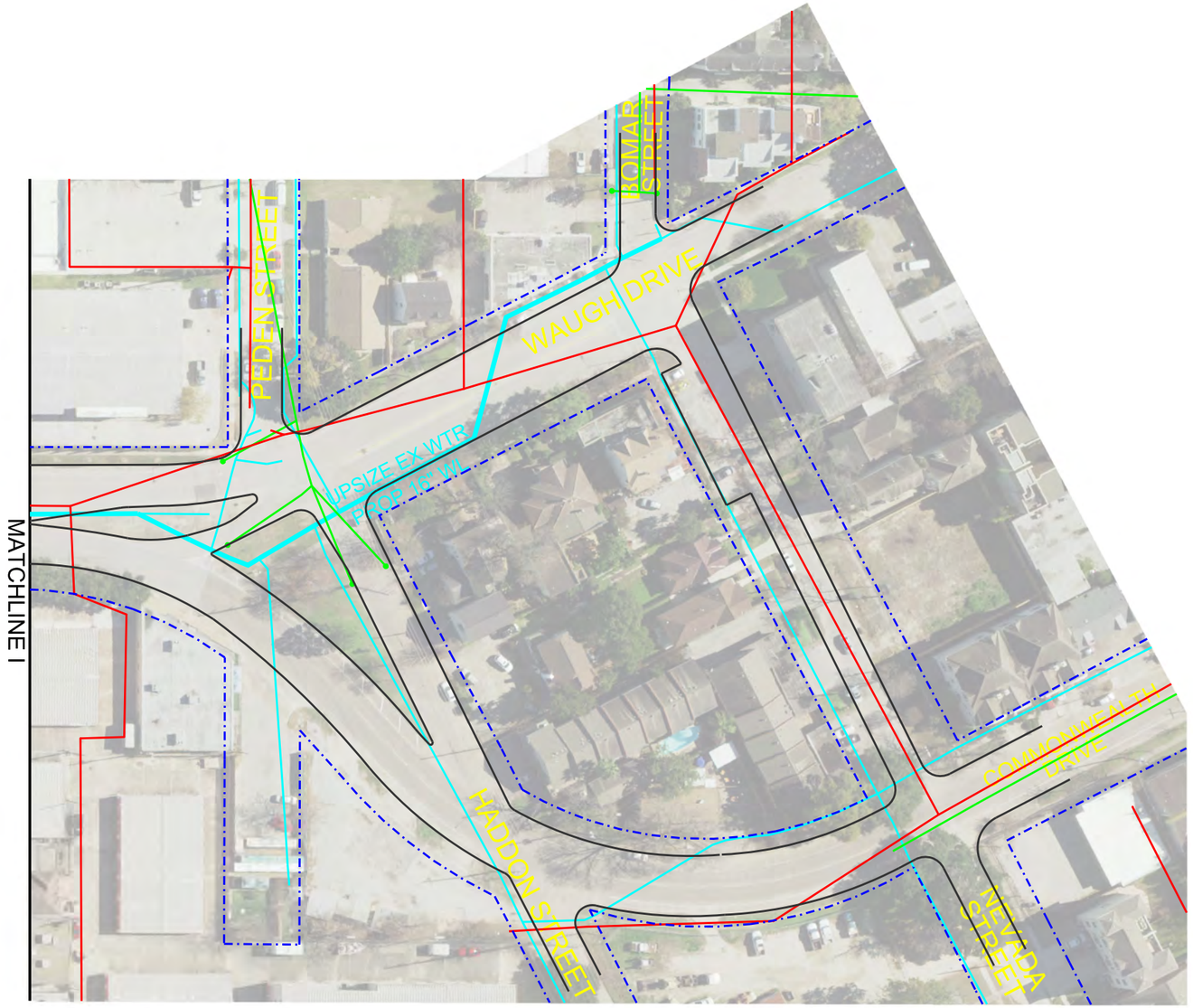

Area Map

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scale feet

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