I. Introduction

In 2009, the City of Houston adopted the City Mobility Plan or CMP Phase I, which proposed a new process for developing mobility solutions. These solutions focused on enhancing the capitalized investment made in transportation infrastructure projects by identifying multi-modal system improvements that could be made at the time of corridor development or redevelopment (i.e. CIP, Rebuild Houston, TIP, etc.). The idea was that as the City invested in certain utility improvements – such as sewer or storm water upgrades – a systematic approach could also be made to increase the general capacity or number of users in a corridor via multi-modal considerations.

One of the outcomes of the CMP Phase 1 was a series of technical memorandums, one of which – Technical Memorandum 3: Functional Street Classification – highlighted and further illustrated corridor considerations as they pertained to bicycle, pedestrian, freight and transit considerations. The corridor considerations were eventually adopted into Appendix 2 of the City's Infrastructure Design Manual. Similarly, this also resulted in the Model Verification and Validation process as highlighted in Technical Memorandum 4, which today is used as one of the many analytical tools for sub-regional corridor evaluations.

The City wants to move the greatest number of people and goods in the most efficient manner along its corridors. CMP Phase II focuses on sub-regional studies located throughout the City in which multi-modal classifications can be further evaluated. Although not exhaustive, Figure 1.1 represents those studies which have either been completed or are pending completion in the near future.

In short, the purpose of CMP Phase II and the sub-regional studies is to take a deeper assessment of the corridor network to ensure those recommendations developed during Phase 1 of the CMP process are appropriate at not only the regional level, but the neighborhood level as well. The project team worked extensively with sub-regional stakeholders such as local agencies, management entities and other interest groups to ensure concerns and related visions for development within the area were fully understood before recommendations were formulated. The result is an intricate set of recommendations that look at both the individual corridor (See Chapter VI. A Balanced Approach) as well as the greater transportation network as it pertains to individual systems such as the bicycle and transit networks (See Chapter VII. Outcomes).

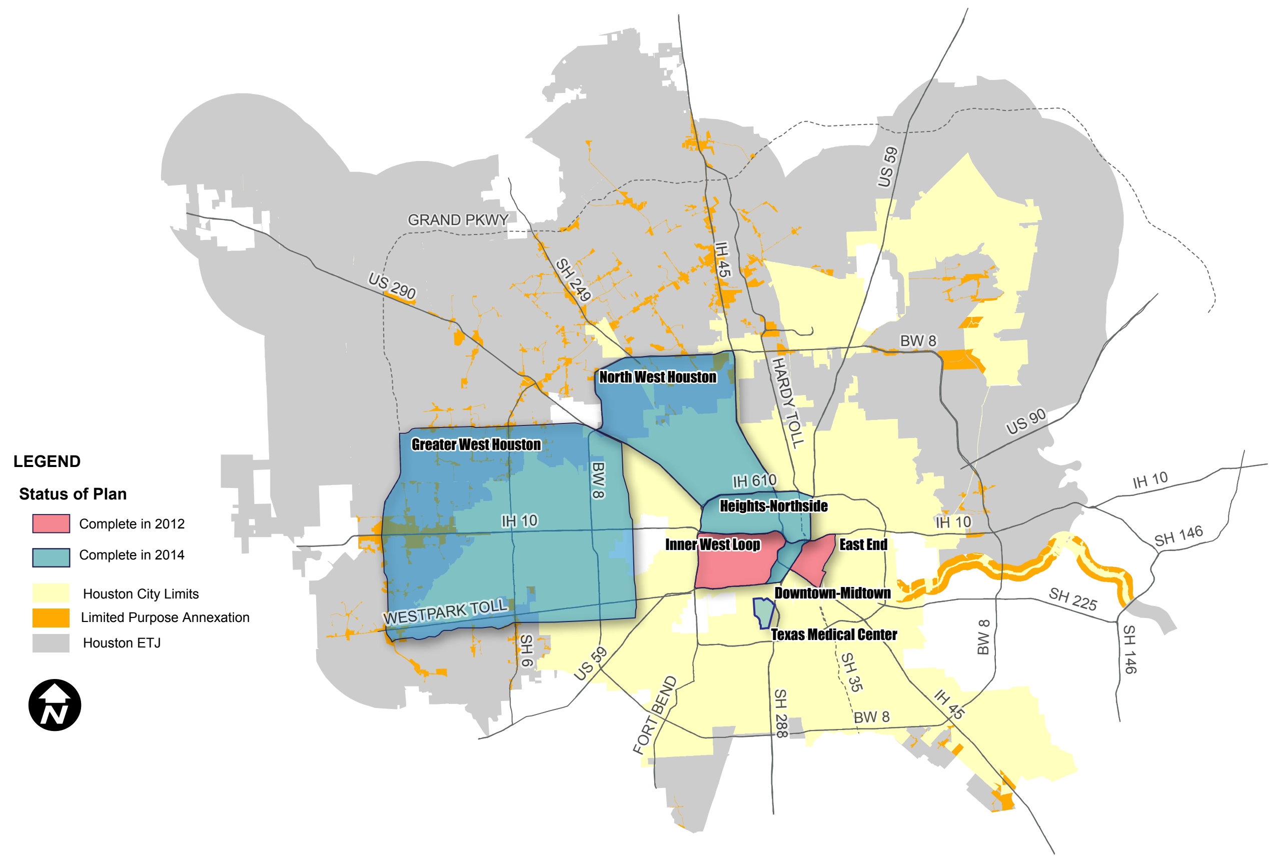


FIGURE 1.1. CMP II: SUBREGIONAL PLANS

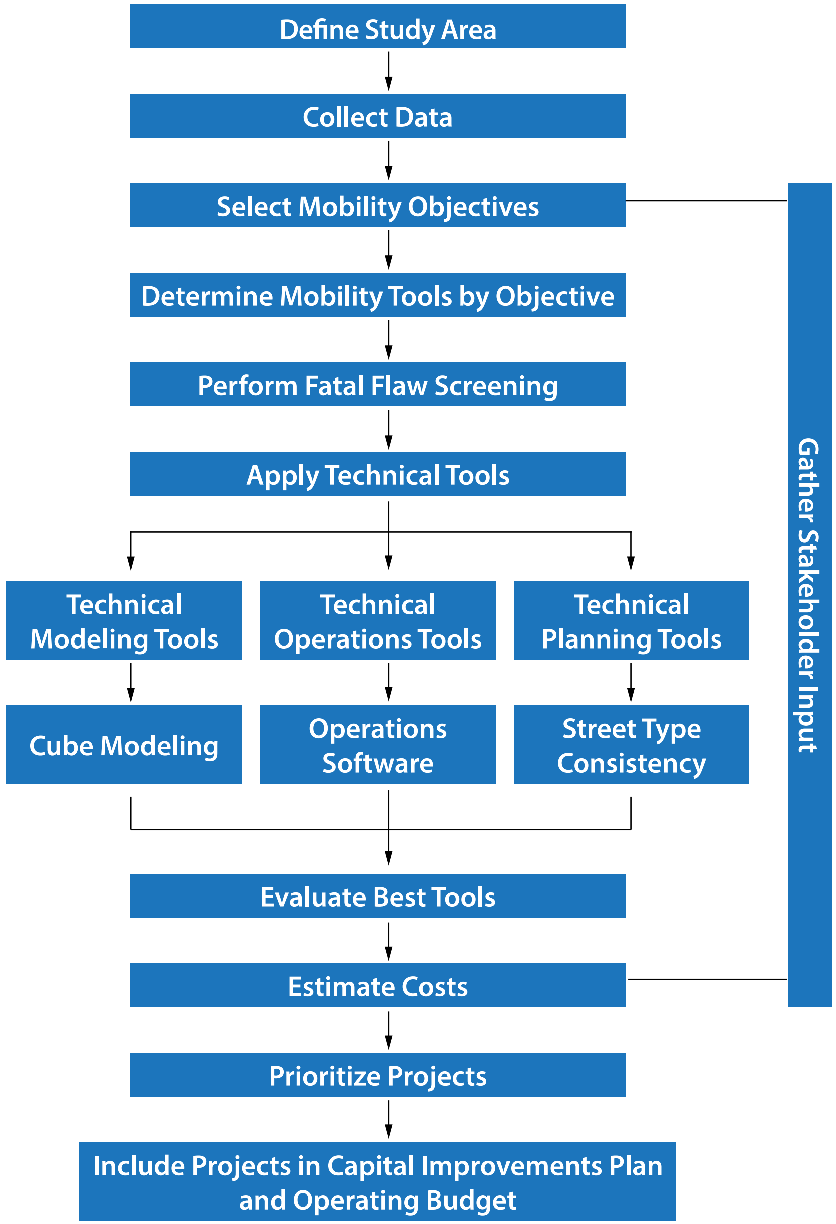


FIGURE 1.2

The flow chart on the left specifies the process to identify specific mobility projects within the Heights-Northside study area. The process starts with defining the study area and moves to data collection. Once those steps are complete, the process continues to selecting mobility objectives and mobility tools. This is followed by performing a fatal flaw screening of the selected objectives and tools. Public and stakeholder input is gathered throughout all of these steps. Once the fatal flaw screening is complete, we will use technical modeling tools, technical operations tools, and technical planning tools to develop a series of mobility options. These tools provide an opportunity to evaluate the mobility needs in the sub-area and provide additional analysis that can be used to prioritize preliminary intersection projects with respect to cost and benefit. The direct output from this process is a prioritized list of intersection improvement projects and a vision of the major thoroughfares for the sub-area that can be integrated into the Capital Improvements Plan (CIP) and operating budget.

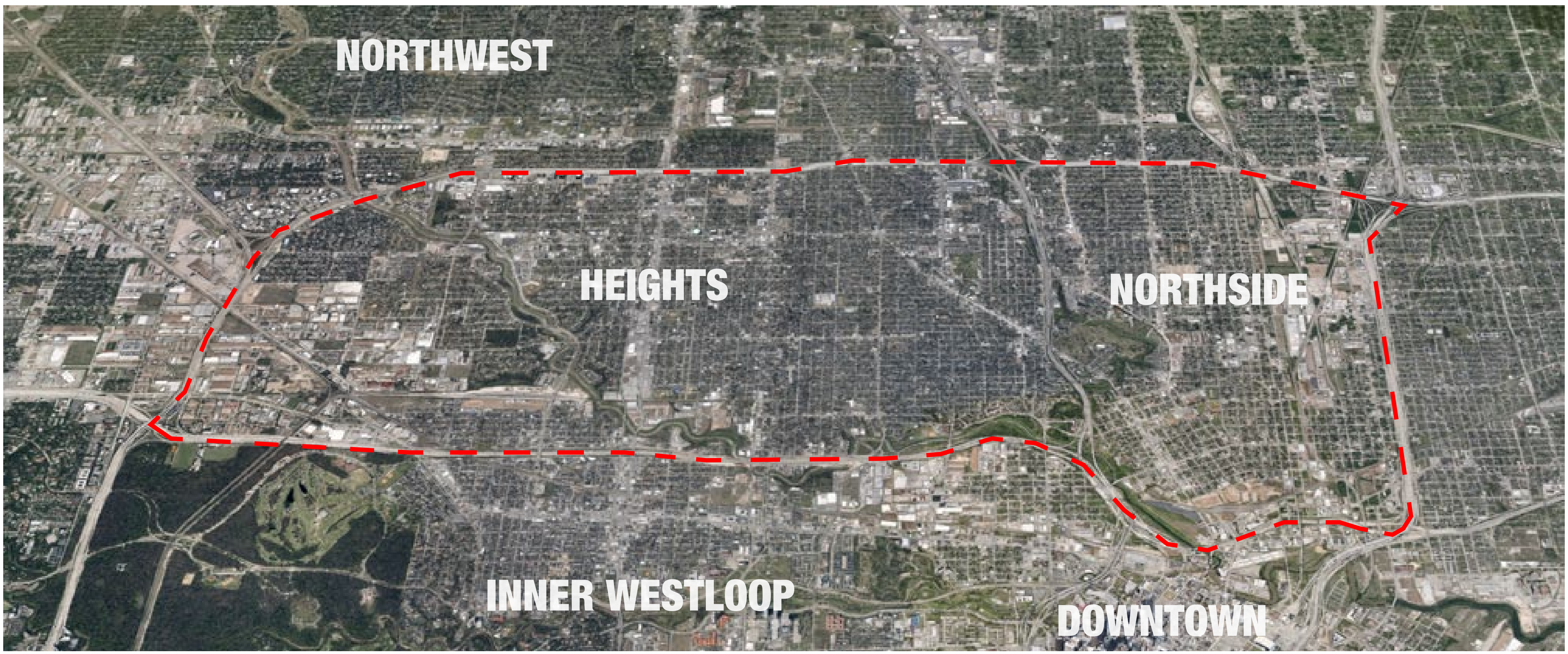
The overall project development process does not stop once funding is programmed; rather a new process for design and construction of the corridor improvements takes control of the specifics for each project. That information is beyond the scope of this planning study, however, guidelines are established later in this document that demonstrate appropriate points of stakeholder involvement in that design process.

1.1 The Study Area

The Height-Northside study area is bounded by Interstate 610 (North Loop Freeway); to the south, Interstate 10 (Katy Freeway); and to the west, U.S. Highway 59 (Southwest Freeway). Interstate 45, or the North Freeway, separate the communities most commonly referred to the Heights and Northside which are located just west and east of the interstate, respectively.

The Heights-Northside area is unique in terms of its proximity to downtown, where regional automobile traffic and local competing interests (such as increasing bike and pedestrian traffic) present an interesting challenge when evaluating current and future efficiency of the greater transportation network. The challenge of this study is evaluating the best way to move automobiles while also providing options for users of other modes of transportation. Given these communities represent some of the first residential suburbs built in Houston, and its relative distance to downtown, the area bears a well-connected grid network of streets characteristic of a more urban context.

Over the next several years, the provided study area is only expected to become denser as the two communities continue to attract new residential and commercial interest to the area. However, given the relative high grid-like connectivity of the area, as well as increased connectivity via the bayou network, the study area maintains ample opportunity for multi-modal improvements and considerations.



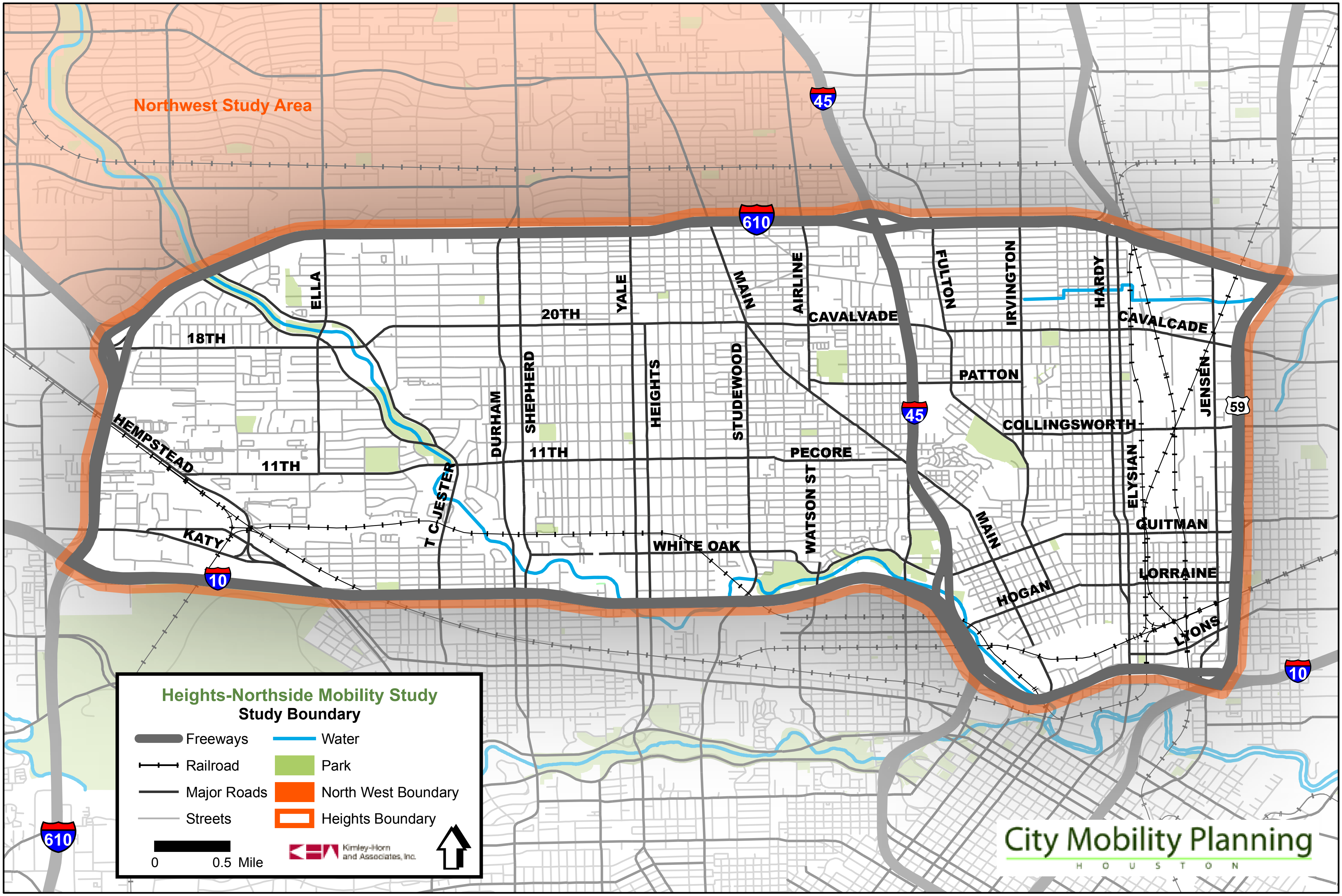

Northwest Study Area
45
610
ELLA
YALE
20TH
MAIN
AIRLINE
CAVALVADE
FULTON
IRVINGTON
HARDY
CAVALCADE
18TH
PATTON
JENSEN
59
DURHAM
SHEPHERD
HEIGHTS
STUDEWOOD
COLLINGSWORTH
HEMPSTEAD
11TH
PECORE
ELYSIAN
T C JESTER
WATSON ST
QUITMAN
KATY
WHITE OAK
LORRAINE
10
HOGAN
LYONS
Heights-Northside Mobility Study
Study Boundary
Freeways
Water
Railroad
Park
Major Roads
North West Boundary
Streets
Heights Boundary
0
0.5 Mile
Kimley-Horn and Associates, Inc.
City Mobility Planning
HOUSTON

FIGURE 1.3

1.2 Study Area Objectives and Tools

A number of mobility objectives resulted from the 2009 City Mobility Plan (CMP) which provide the foundation to the underlining assumptions and analytical tools utilized for the purpose of this study. CMP Goals and Objectives include:

- Increased access to transit facilities
- Increased access to pedestrian facilities
- Increased access to bicycle facilities
- Improved connectivity of the system
- Better accommodations for the movement of freight
- Cost efficiency
- Minimized travel times
- Reliable commuting options
- Reduction in congestion
- Minimized conflict points within the network
- Safe and secure environment for pedestrians and bicyclists
- Neighborhood traffic
- Air quality conformity to State standard
- Improved ability to maintain infrastructure
- Maintain a system that is energy efficient
- Improved corridor aesthetics
- Enhanced pedestrian amenities
- Pedestrian-scaled streets
- Facilitation of all modes of travel

The public outreach portion of the process for this plan identified several goals from various stakeholders:

- Enhance safety
  - » At intersections
  - » For pedestrians and bicyclists
- Increase multi-modal alternatives
- Improve and increase connections to destinations

Associated tools that related to the defined goals and objectives have been sorted into three categories below:

- Technical Modeling Solutions – those that can be analyzed using the Regional Travel Demand Model;
- Technical Operations Solutions – those that can be analyzed using traffic analysis software such as SYNCHRO; and
- Technical Planning Solutions – those that are not represented well within either modeling platform whose results are often qualitative in nature.

Where appropriate, potential solutions may be geared for motorized, non-motorized, or alternative transport options such as mass transit. As list of these tool types can be seen in Figure 1.4

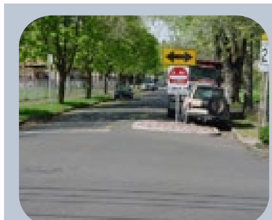
City Mobility Planning Toolbox

Motorized Tools

Traffic calming slows or reduces automobile traffic, improving the safety for pedestrians and cyclists. Techniques include speed humps, textured paving, curb extension, pedestrian crossing islands, traffic circles, and reduced turning radii.

Intersection design controls traffic movement where two or more streets cross. Improvements include left-turn bays, right-turn slip lanes, flared lanes to increase intersection capacity, reduced turning radii to increase intersection awareness, and protected bicycle turn spaces.

Signal timing is coordinating the sequence and timing of traffic signal phases. Signal timing can increase the efficiency of the street by allowing for the greatest number of vehicles to cross the intersection in the shortest time.



Access management techniques help increase the mobility and safety of a particular corridor by consolidating driveways and controlling access to adjacent land uses by influencing access location, design, spacing and operation.

Medians are traffic islands installed to prevent or ensure certain turning movements at intersections. They also provide a separation between opposing traffic lanes. Medians eliminate cut-through traffic, change driving patterns, beautify streets with greenery, and increase pedestrian safety for crossing streets.

Non-Motorized Tools

Sidewalks are important to the pedestrian traveler. Wider sidewalks in commercial areas facilitate a mix of uses. The addition of streetscaping can promote pedestrian use.

Bike lanes are located on the edge of a street or between the travel lanes and parking lanes. Typically, they are 5-6 feet wide and allow cyclist to have a protected space on the street.

Streetscaping refers to the use of planted areas and other beautifying techniques along corridors that can attract pedestrians and make pedestrian and bicycle use more pleasant.

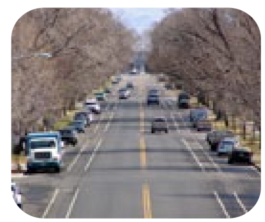
Pedestrian crossings connect neighborhoods and can be at intersections or mid-block. Signal timing and pedestrian "islands" can improve safety for walkers.

Sharrows are special lane markings for roads too narrow to accomodate a separate bike lane. These markings alert drivers to the likelihood of encountering bicyclists.

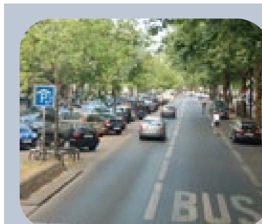
Alternative Transport Tools

Rapid transit comes in two forms: Light Rail Transit (LRT) and Bus Rapid Transit (BRT). Bus Rapid Transit has the unique ability to function in either an exclusive right-of-way (ROW) or in mixed traffic. However, the most common application assumes an exclusive ROW for operational efficiency and safety.

Commuter rail service connects the large master planned communities around the region, the surrounding towns, and even nearby cities, with the urban core.



Road space rationing or reallocation reserves parking and other road uses for preferred modes such as carpools, vanpools, energy-efficient vehicles, and public transit vehicles.



Travel demand management refers to a set of strategies to reduce the use of city roadways to decrease congestion and the infrastructural burden of intense use, especially by single-occupancy vehicles.

Park and ride lots encourage transit usage for people who are not within walking distance of a transit station. These lots typically adjoin suburban bus and rail stations to reduce the number of cars in the urban core.

FIGURE 1.4

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