

VII. Outcomes

The previous chapter explored design examples and related key factors for consideration at a micro level. However, how these recommendations translate to the greater system is more evident at the macro level where various systems interact. As such, this chapter of the Report represents the system improvement recommendations for the Study Area as it pertains to the subregional network. The resulting “network maps” represent a plan that identifies system gaps and highlights potential modifications for improvements both on the MTFP and MMC classifications. The resulting networks depicted work to connect the different facilities to enhance the efficient movement of people throughout the Study Area, achieving the purpose of this study.

The following sections represent the new networks for automobile, pedestrian, bicycle, and transit facilities. The maps listed below are shown on the following pages and present a comprehensive look at the Heights and Near-Northside areas.

- 2035 Major Thoroughfare and Freeway Plan
- Bike Vision Map
- Intersection Analysis
- Transit and Pedestrian Vision Map

7.1 2035 Major Thoroughfare and Freeway Plan

As explained in the Existing Conditions section of this report, the Major Thoroughfare and Freeway Plan (MFTP) is the City of Houston’s guiding document for future corridors. Based on the provided function classification, the MFTP provides the City with essential data regarding the future capacity need of the corridor. Without this roadmap, identifying projects, funding needs, and priorities would be difficult.

The Heights and Northside areas are both ‘built-out’, meaning the likelihood of constructing additional or new roads is low. The network within these two Heights and Northside areas is a well developed grid pattern. The updated MFTP looks at ways to adjust the existing corridors to better suit the communities’ needs. This is accomplished by reclassifying certain corridors and planning for the expansion of corridors by adding or re-purposing lanes.

An updated Major Thoroughfare and Freeway Plan is shown in the adjoining map. Although not exhaustive, the provided table provides a quick snapshot of the prominent changes recommended for the MFTP, but does not highlight those corridors where only ROW designations were recommended. For a full list of recommendations, please visit the detailed corridor sheets and associated matrix provided in [Chapter VI. A Balanced Approach](#) of this Report.

Corridor	Current	Proposed Improvement
Heights Blvd	T-4-140/150	T-2-140/150
Patton	C-4-60/70	-Irvington to Fulton: C-3-60 -Fulton to IH 45: C-4-60 -West of IH 45: C-3-70
11 th Street (Studewood - Michaux)	C-4-70	C-2-70
W 6 th Street (Shepherd - Yale)	T-2-60	Removed from MFTP
W 6 th Street (Yale-Heights)	T-2-60	C-2-60
Quitman	T-2-50/60	C-2-50/60
Fulton	T-4-60/70	C-2-60/70
White Oak	T-2-70	C-2-70
Hardy	T-4-50/60 (Couplet)	C-2-50/60 (2-way Traffic)
Elysian	T-4-60 (Couplet)	T-4-60 (2-way Traffic)

Minor Collectors

- 30 roadways identified
- Predominately local streets reclassified

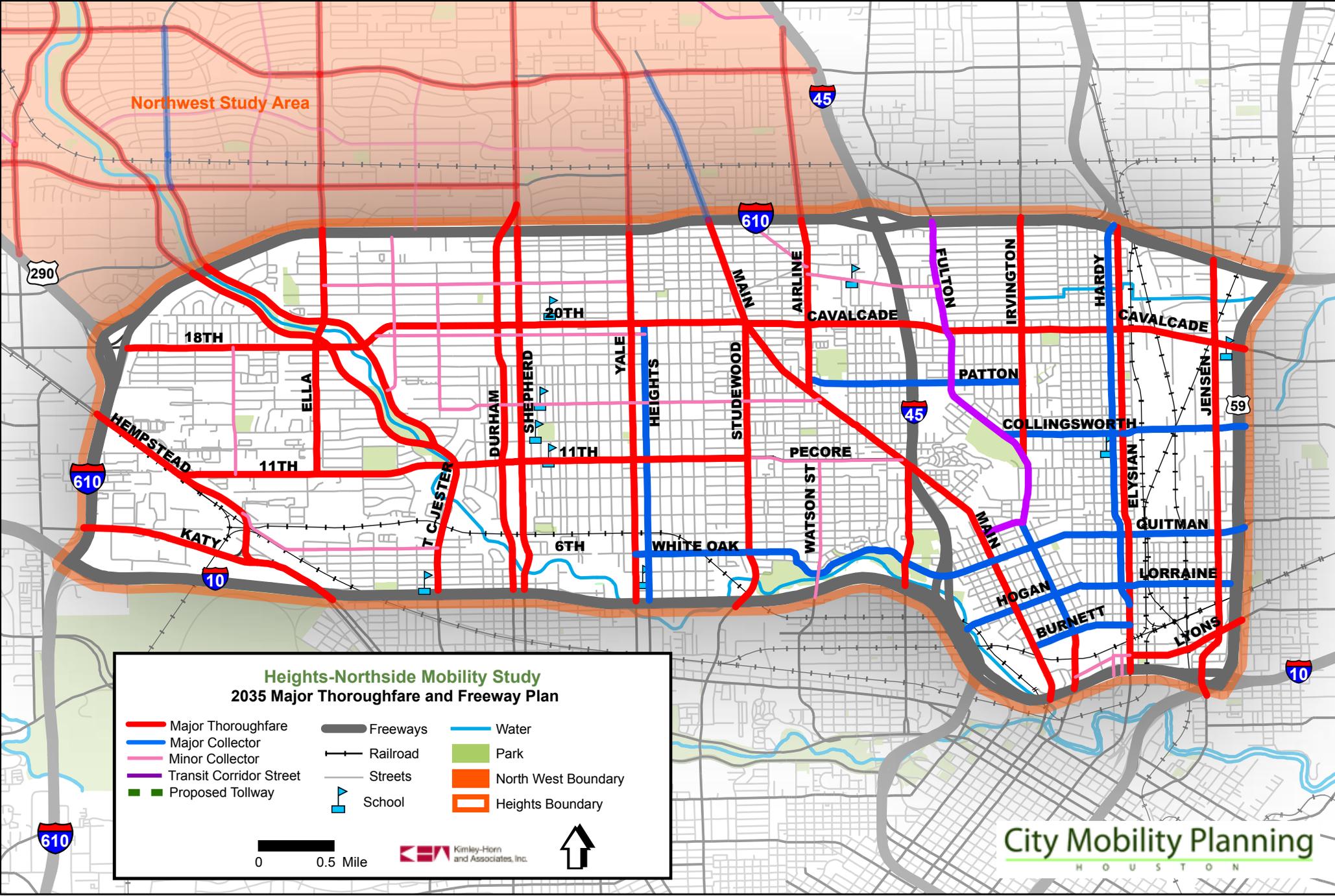


FIGURE 7.1

7.2 Intersection Analysis

Development of Future Intersection Conditions

The traditional traffic engineering approach for growing traffic volumes across a network of streets is to simply start from a point in time at which intersection-specific information is collected, and then grow volumes at a consistent growth rate over the planning horizon. The largest challenge to this approach - within a study area of this larger size - is that over time redevelopment and traffic patterns shift. This causes the steady rate of growth to be over/under estimated for more localized conditions. This study attempts to estimate the future operating conditions at the intersections by using the existing traffic counts as a baseline, and growing them based upon the growth witnessed in the travel demand model. Doing so may allow for intersection improvements to be made that meet future needs.

Intersection data for the Northside area was not collected for this study as the area was undergoing light-rail construction during the time frame of this Report. Count-based recommendations are not provided. Intersection analysis for the Heights area can be found in the following charts. Additionally, analysis of the intersections with the bounding Interstates and State Highways was not included in the scope of this study due to ongoing major reconstruction projects along US 290 and IH 610. Additionally, the IH 45 corridor is currently being studied by TxDOT for a future consideration. As such, this study acknowledges that intersections with the freeways are typically congested and in need of mitigation, but projections for these intersections will be altered greatly once reconstruction is completed. This is due to many factors, including that traffic patterns typically normalize one-year after construction is finished.

Analyzing Future Conditions

The general level of congestion within larger corridors suggests that overall intersection level of service will be manageable in 2035. Figure 7.5 illustrates the intersection congestion levels for the AM peak in 2035. Due to its grid network, intersections within

the Heights area operate well. Future Mitigated AM peak has only one major signalized intersection rating an LOS of E. The remaining intersections are ranked A-D. The PM peak period show a similar result. However, there are a few more intersections graded at LOS C-D for the 2035 Mitigated PM Peak Hours. The intersection of North Main/ Studewood and 20th/Cavalcade for the 2035 Mitigated PM Peak hours also has the LOS rating of E. This is a six-prong intersection of two major corridors. Further analysis of this intersection can be found in the intersection policy section.

Mitigating the Near Term Conditions

Specific projects have been identified for the near term at intersections to help mitigate congestion that exist today. These planning-level concepts are provided with specific recommendations and their improvements will help with congestion levels during peak hours and throughout the day as well.

Mitigating the Long Term Conditions

The mitigation opportunities for the 2035 scenario are limited by the existing and proposed right-of-way available for the Heights area. LOS ratings for these intersections were only slightly enhanced by mitigation. Any significant change would require physical improvements and likely involve right-of-way acquisition.

Intersection Improvement Recommendations

Figure 7.1 and the adjoining table indicate the intersections with recommended near- and long-term mitigation improvements. The project team identified improvements based on several variables which include growth rates, existing traffic counts, projected traffic volumes, land use, and the MTFP. The labeled intersection corresponds to the ID number on the following tables.

ID Number	Intersection	Proposed Near Term Mitigation	Proposed Long Term Mitigation	Alternative Mitigation Improvements
1	11th @ Durham	Optimize Offsets Optimize Splits Modify Westbound left-turn phase to permissive/protected on 11th St		
2	11th @ Shepherd	Optimize Offsets Optimize Splits Modify Eastbound left-turn phase to permissive/protected on 11th St		
3	11th @ TC Jester	Optimize Offsets Optimize Splits	Add Westbound right-turn bay on 11th St Add additional Southbound left-turn bay to make dual left-turns on TC Jester	
4	18th @ Ella	Optimize Offsets		
5	18th @ TC Jester		Add Northbound right-turn bay on 18th St	
6	20th/Cavalcade @ Main/Studewood	Optimize Offsets Optimize Splits Modify East and Westbound left-turn phases to permissive/protected phases on 20th/Cavalcade St	Add additional Southbound thru lane on Main St	Installation of 2 lane roundabout could be considered at this intersection
7	20th @ Durham	Optimize Offsets Optimize Splits	Add Additional Westbound thru lanes on 20th St Add two additional Eastbound thru lanes on 20th St Add Eastbound thru lane on 20th St Add exclusive right-turn lane on 20th St	
8	20th @ Yale		Add additional Westbound thru lane on 20th Add Westbound right-turn bay on 20th St Add exclusive left-turn lane on 20th St Add exclusive right-turn lane on 20th St	Add additional Eastbound thru lane on 20th St Add additional Northbound thru lane on Yale Add additional Southbound thru lane on Yale
9	20th @ E TC Jester	Installation of signal for intersection		
10	Gibbs @ Airline			Installation of 2 lane roundabout could be considered at this intersection
11	Service @ Airline			Installation of 2 lane roundabout could be considered at this intersection
12	N Main @ Airline			Consider realigning Airline Drive to avoid the offset at the intersection
13	Heights at 11th			Analysis of a Michigan U-Turn concept

TABLE 7.1 SHORT-TERM INTERSECTION IMPROVEMENTS

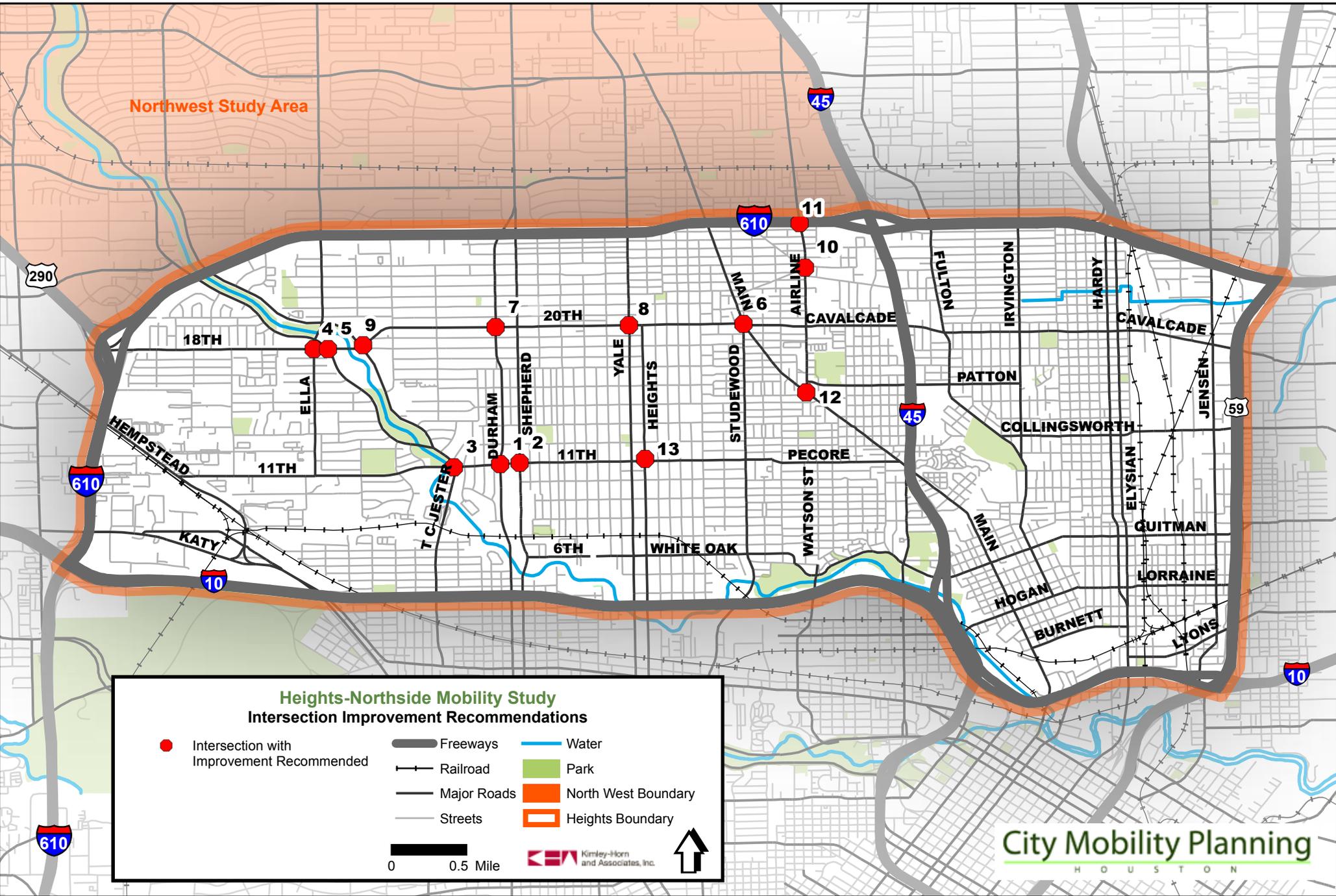


FIGURE 7.2

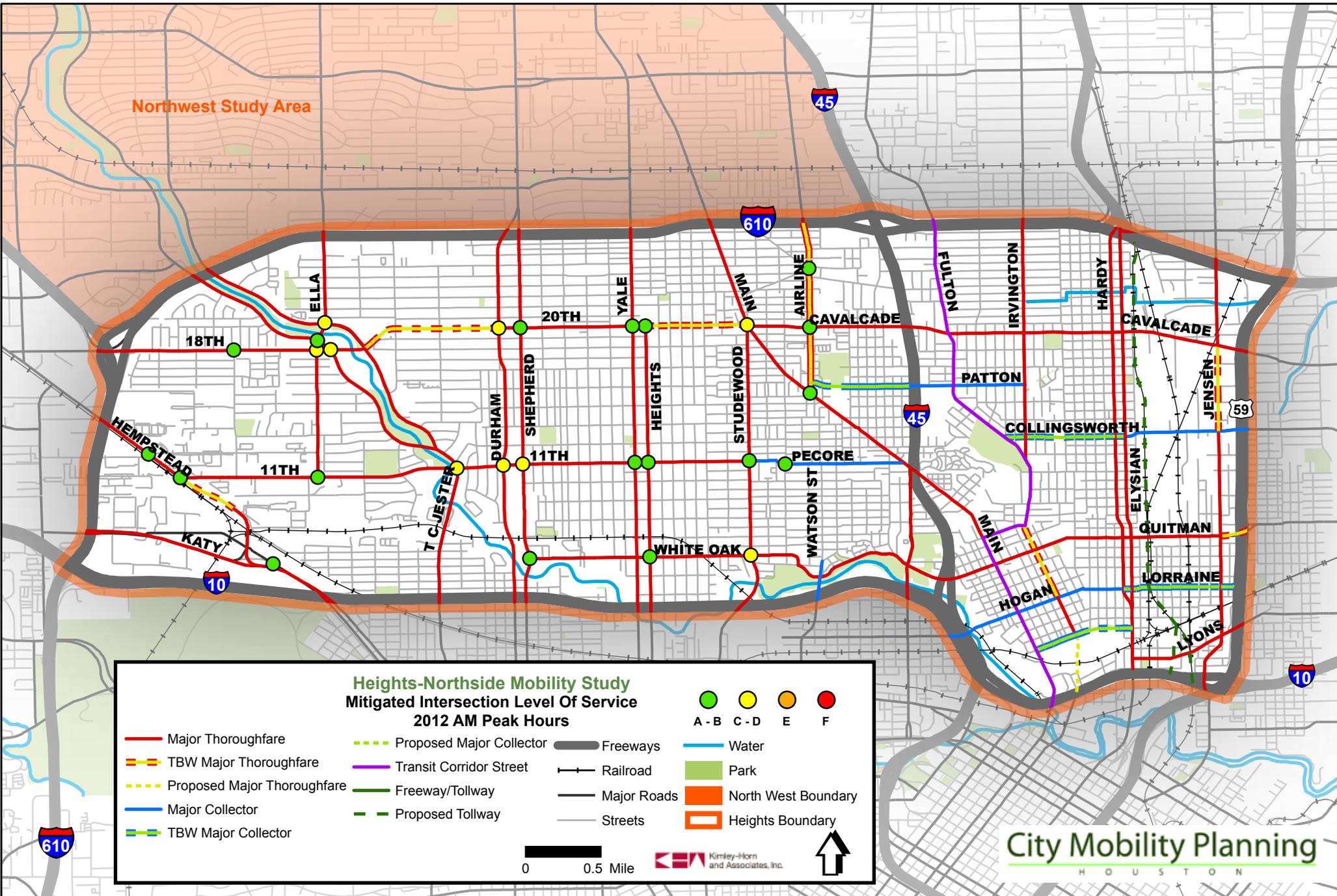


FIGURE 7.3

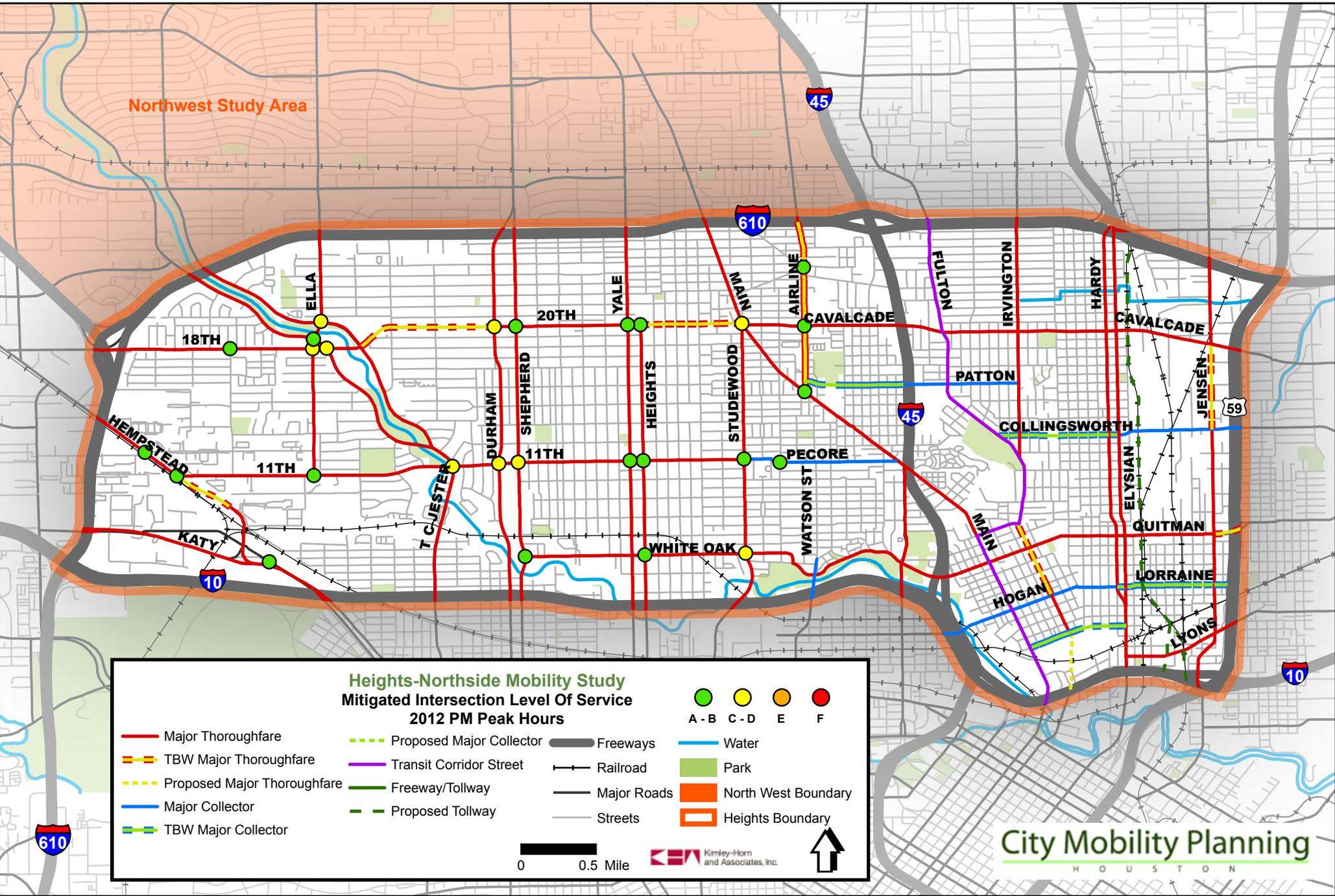


FIGURE 7.4

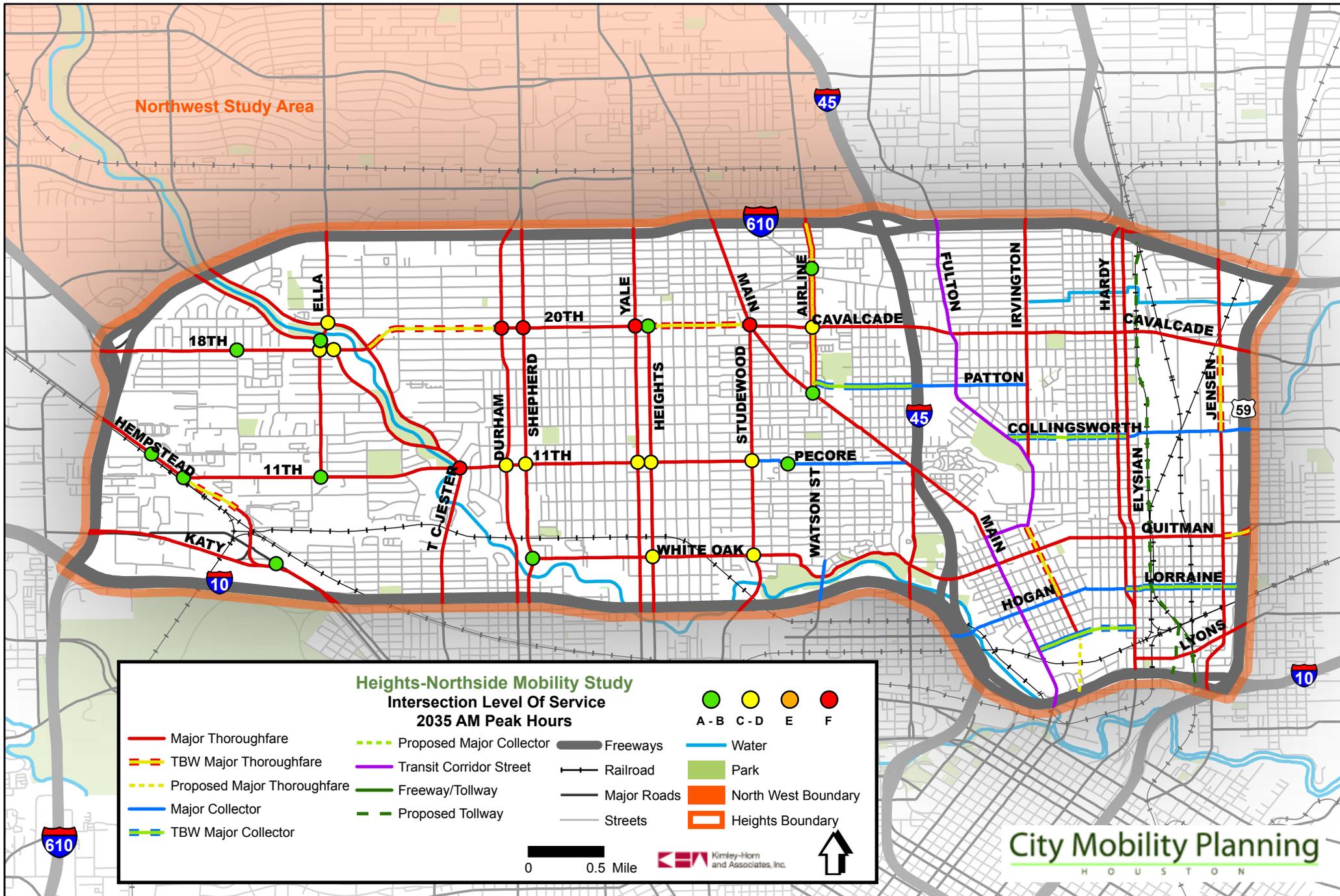


FIGURE 7.5

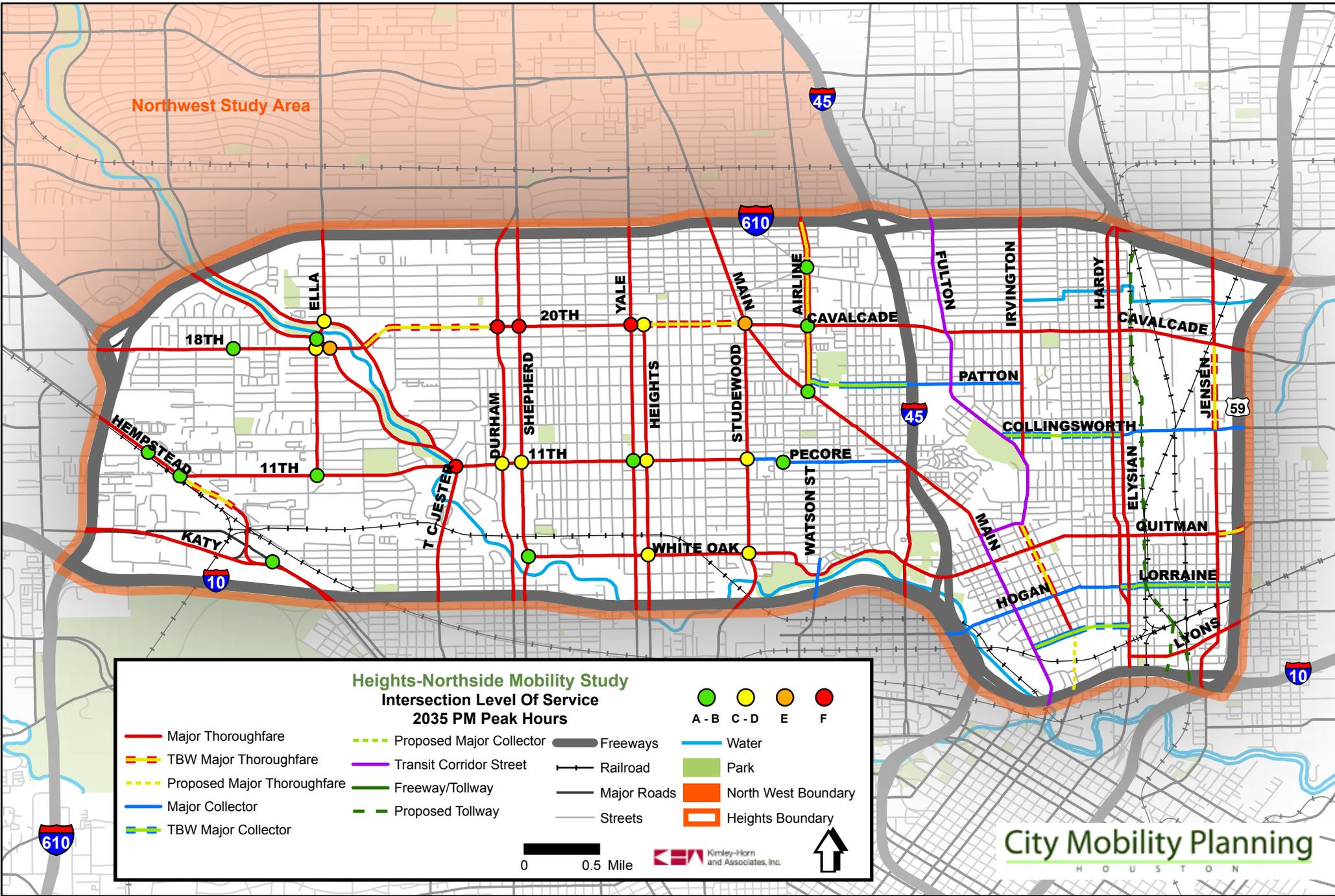


FIGURE 7.6

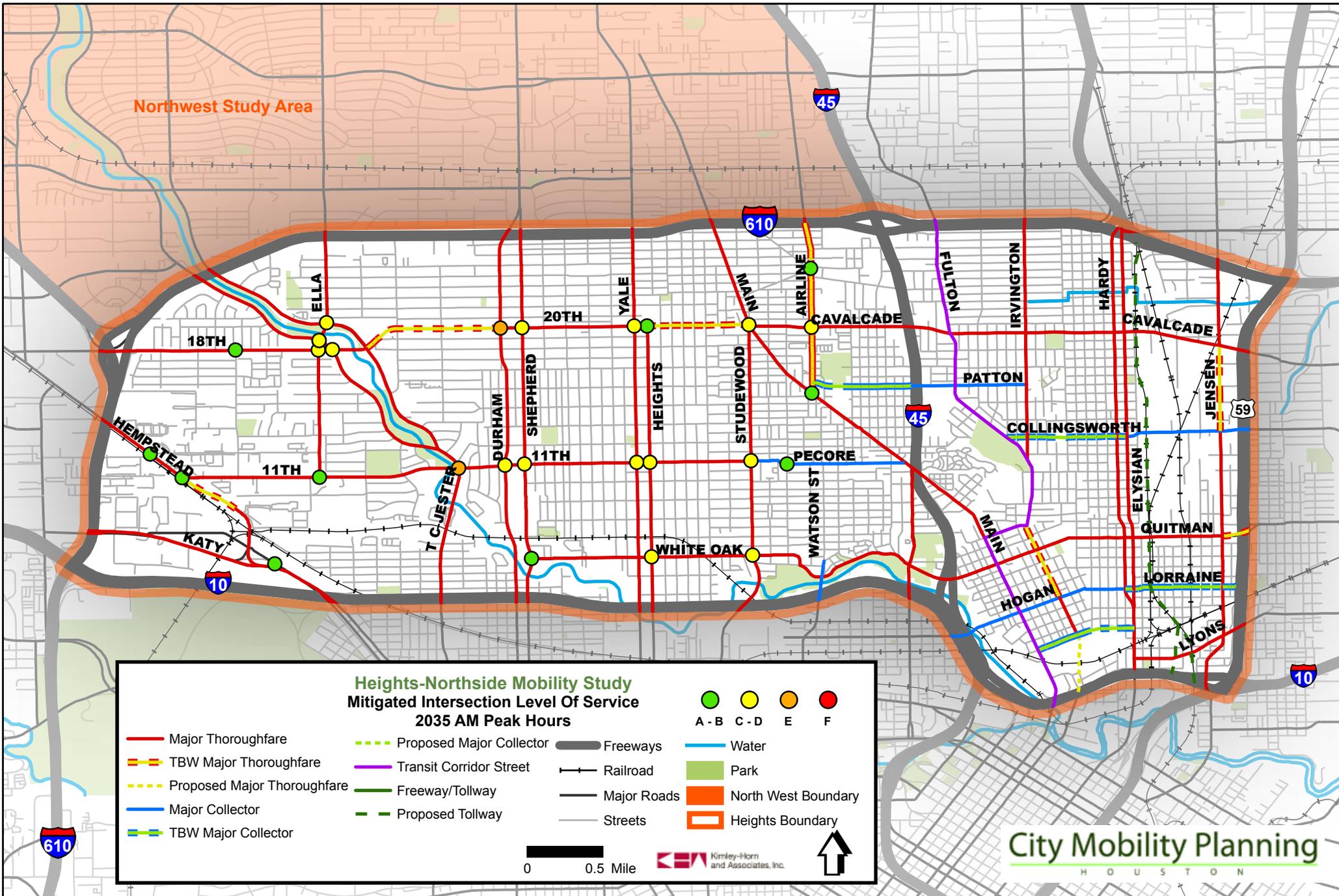


FIGURE 7.7

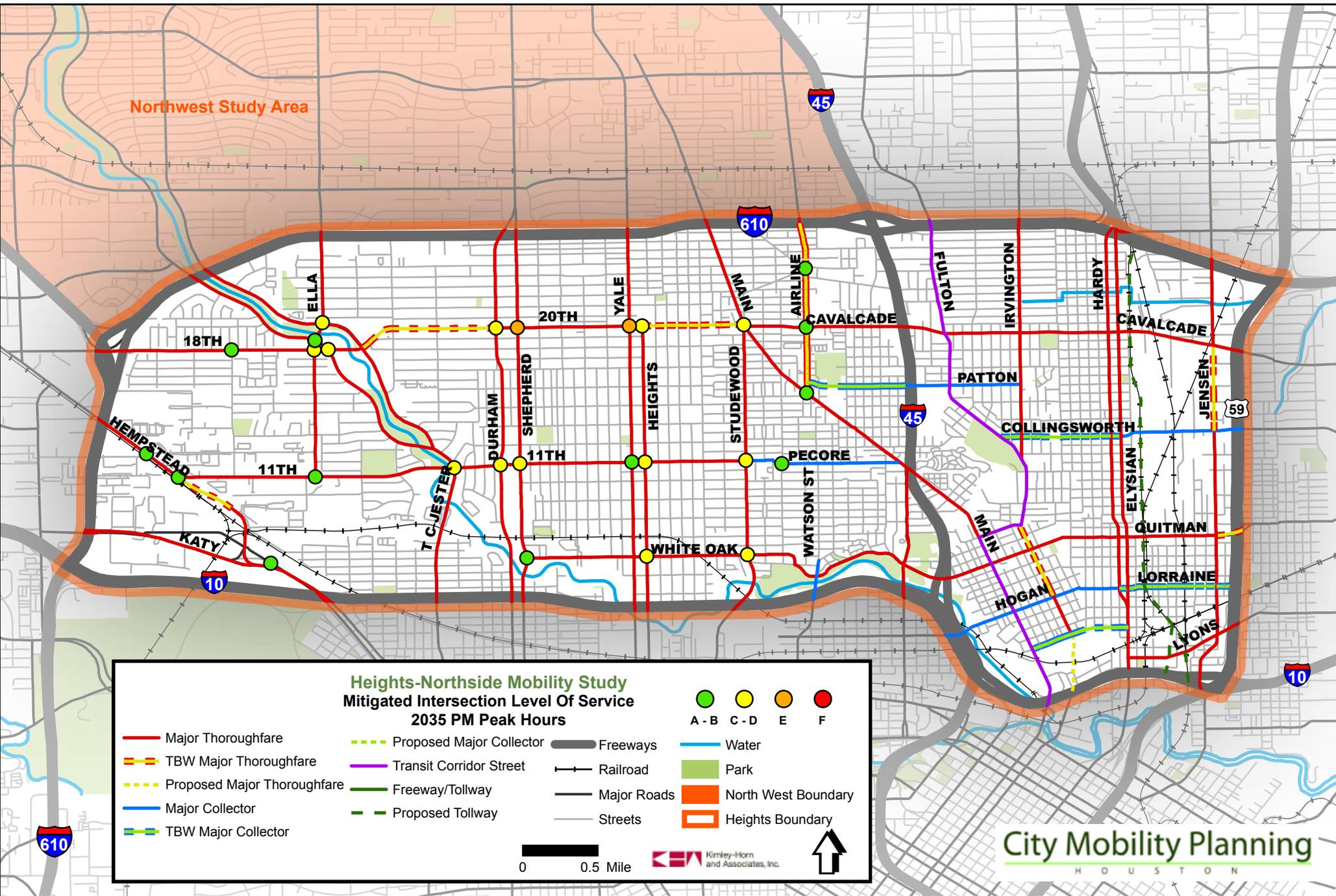


FIGURE 7.8

7.3 Bike System Gaps and Vision

The current bicycle network within the Heights and Northside areas is apparent, but room for expansion is evident. Planning for future facilities as streets redevelop, in addition to working with existing corridor design to create viable bicycle facilities, is essential in creating a well-connected network. **Trail heads** - or key access points from on-street to off-street biking facilities - are identified on the following system map for bike facilities; however, this list is in no way exhaustive and instead meant to start discussion concerning where and when such transition points are warranted.

Heights area

The Heights area is unique in regards to bicycle facilities. Unlike many communities, the Heights has embraced the use of bicycles for commuter purposes in addition to recreational. Local residents encourage the expansion of the network in this area. The Heights area is well suited for developing an extensive bike network since the White



PHOTO PROVIDED COURTESY CITY OF HOUSTON.

Oak Bayou Trail cuts through the middle of the community. Bike facilities are able to connect to this existing trail to assist in the movement of bicyclist.

Northside area

The Northside area has several on-street bike facilities as well. Local residents were vocal in their desire to expand the bike network within their area. The area has many neighborhoods and schools that could benefit by having some type of bicycle facility connecting them. With this, the expansion of the bike network is seen in the adjoining map.

Due to restricted right-of-way in both of these sub-areas, special consideration of facility type needs to be undertaken when deciding which is most appropriate for a corridor. The proposed bicycle facilities indicated in this map are described in Chapter VI, Bicycle Facility considerations.



PHOTO PROVIDED COURTESY CITY OF HOUSTON

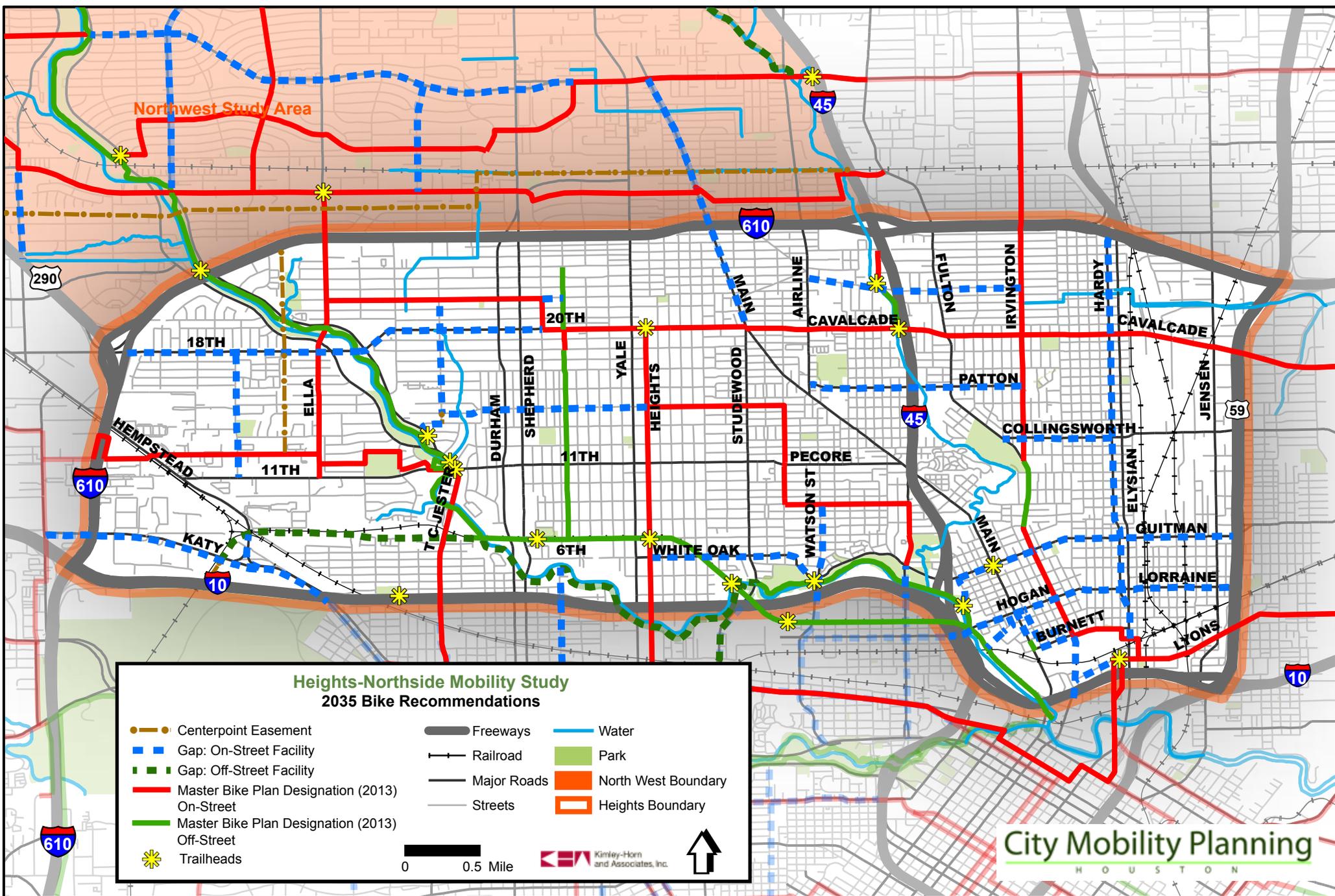


FIGURE 7.9

7.4 New Transit and Pedestrian Vision Map

In addition to the automobile and bicycle, two other forms of transportation are heavily used within the Heights and Northside. Pedestrians and transit riders are found abundantly throughout the Study Areas.

The light-rail line within the Northside area is a great draw for local commuters. The opening of this extension in December of 2013 encourages residents to commute to work and other destination centers via a mode other than the personal automobile.

The transit network within the Heights area is already extensive, as seen in Chapter II, Existing Conditions. In order to identify if any changes should be recommended, the sub-region underwent the analysis found in the Transit Analysis section of Chapter VI. From that process, the resulting map identified the areas in high need of transit facilities. Based on that data (and the Scenario 5 street network), recommendations for Local Bus Routes (standard bus routes with many stops) and Bus Rapid Transit (BRT) (routes that facilitate the movement of larger numbers of persons across greater distances with less stops) are provided in Figure 7.10.

With the expansion of the transit network (including the opening of the light-rail line) enhancements to pedestrian facilities within the Study Area are also important. Pedestrian facilities are necessary on the corridors with high transit use (recommended facilities). The motivation behind this concept is that every transit user (whether bus or light-rail) is a pedestrian at some point. This means that they will have to travel additional distances on-foot to arrive at their intended destination. This study's recommendations on wider sidewalks can be found in Chapter VI.



BUS RAPID TRANSIT (BRT)



LIGHT-RAIL



LOCAL BUS

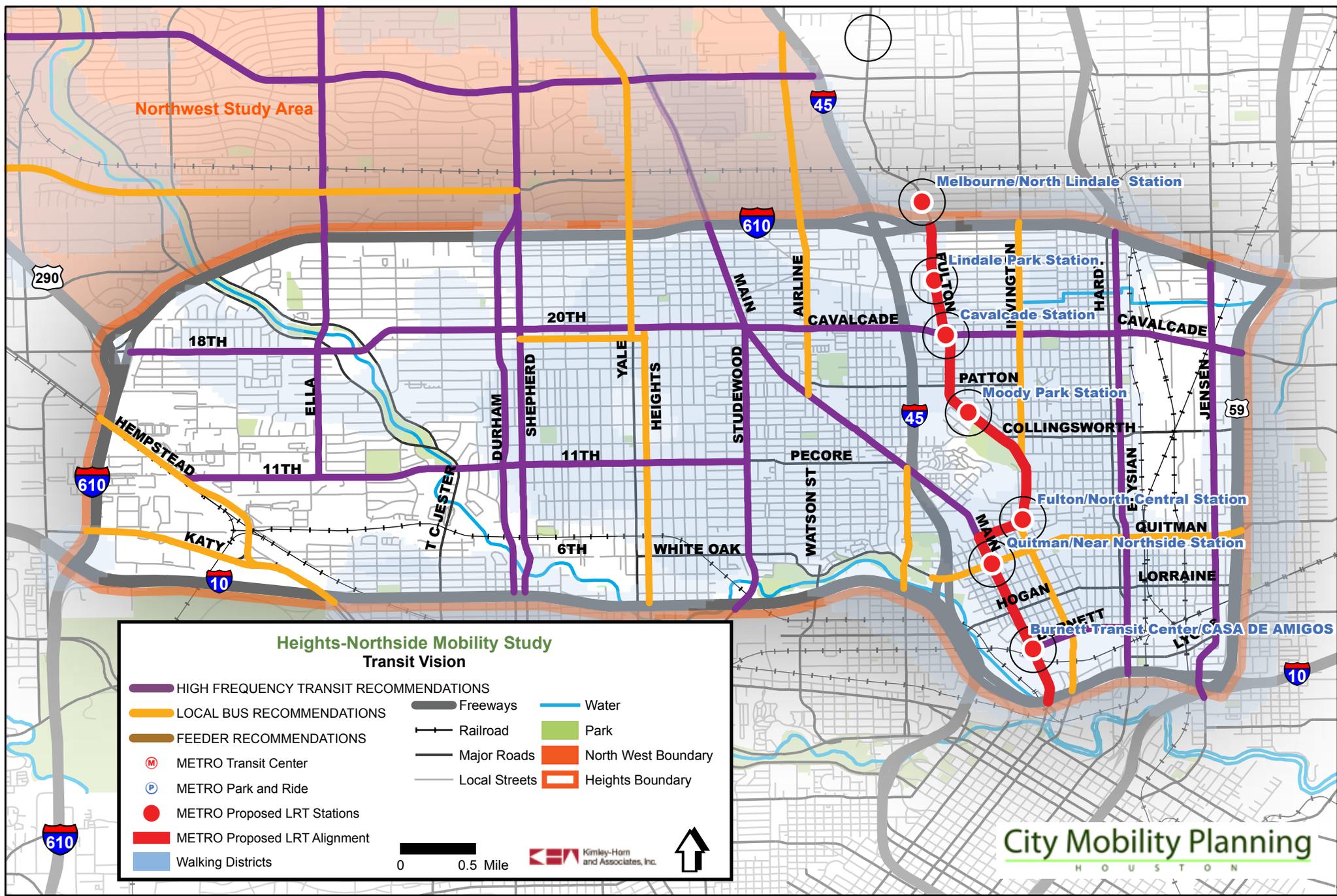


FIGURE 7.10

7.5 Multi-Modal Classification Map

The multi-modal Classification (MMC) Map is a product of the first Houston Mobility Study. In that study, new classifications were developed for corridors based on right-of-way, modal types, and volumes. The multi-modal Classifications can be found in Chapter 10 of the Design Manual for Street Paving Design Requirements.

Each corridor within the Study Area was evaluated based on public input, model analysis, and other variables. These variables culminated to create a plan for the major corridors from the consultant and project teams evaluation, and can be viewed in the section with the Corridor Design Example sheets. With this information, the project team evaluated and determined the Multi-modal Classification best suited for the future of the corridor.

The Multi-modal Classification identifies the options for widths of the road based on the modal uses. These considerations were developed along with the City of Houston's Public Works and Engineering Department (PWE) and Planning and Development Department (PDD) to identify a realistic design example for the corridor.

Corridors with limited right-of-way and no foreseeable acquisition of additional right-of-way need flexibility in their design. These can be seen on a corridor-by-corridor basis in Chapter 7. The MMC Map shown in Figure 7.11 is representative of the 2035 MTFP network and not the existing roadway network.

During evaluation of the corridors, it became apparent that the existing definitions currently located in Chapter 10, Appendix 2 of the City of Houston Infrastructure Design Manual needs to be updated to more accurately reflect the design considerations as they pertain to the City of Houston. Specific considerations for Right-of-Way distinctions should be specifically addressed, where ROW of 100' does not necessarily properly reflect required designations of a "Boulevard" nor does 80' ROW necessarily designate an "Avenue".

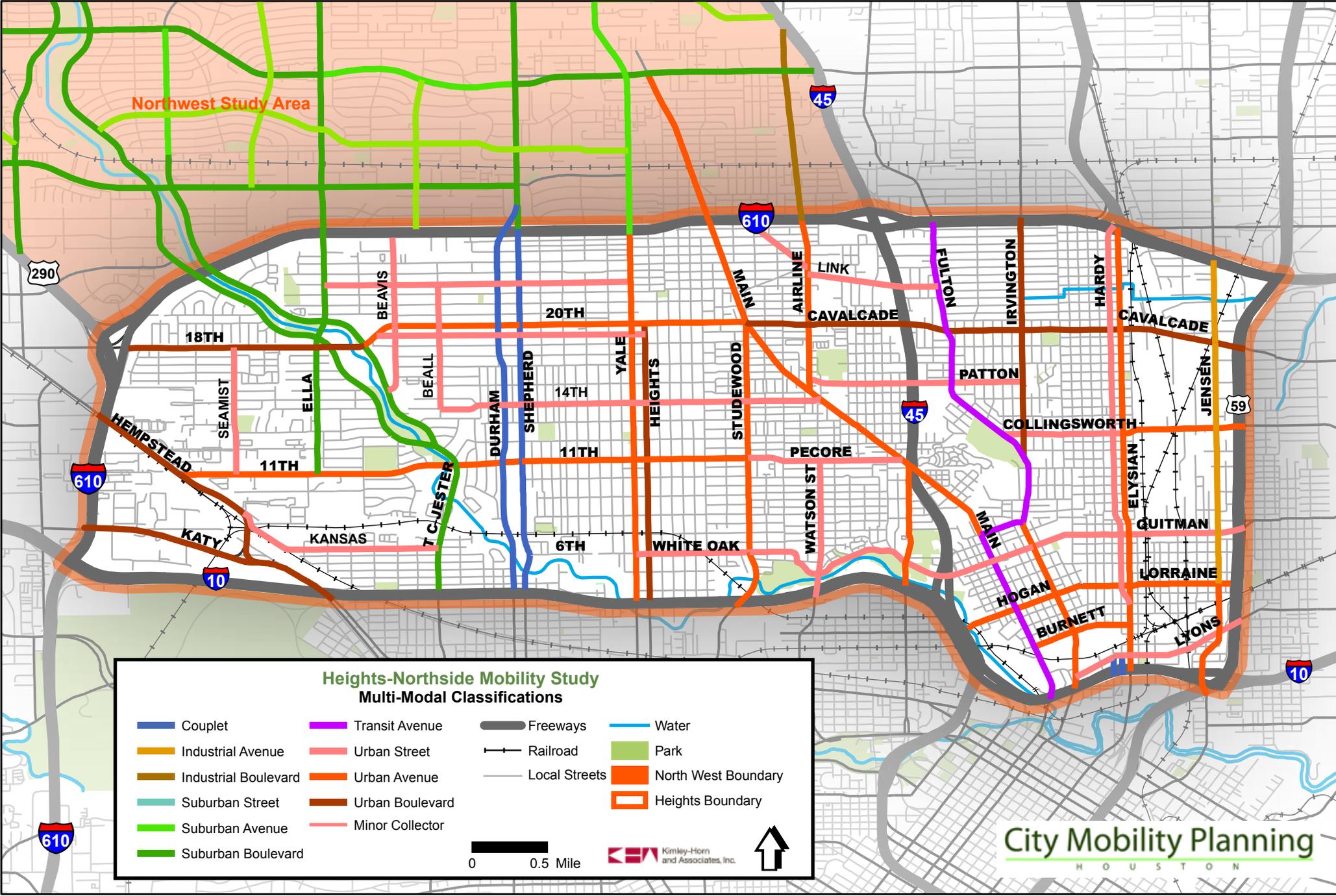


FIGURE 7.11

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