Welcome

Public Meeting # 2

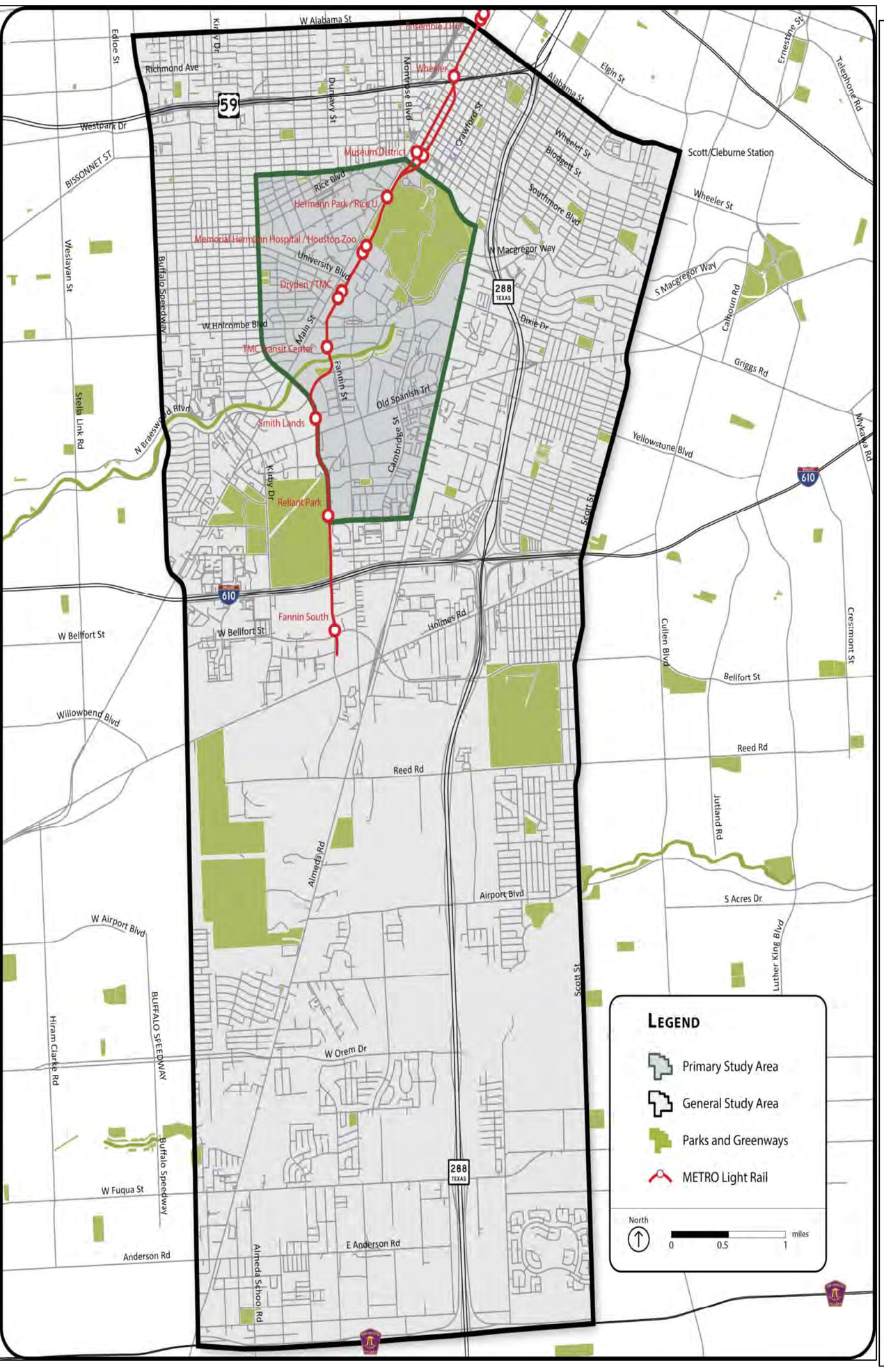
Purpose

- **TMC Mobility Study Scope**
  - To identify a comprehensive set of multi-modal transportation improvements
    - To improve accessibility,
    - To address traffic congestion and
    - To better serve the TMC area
- **Prioritized Objectives**
- **Completed needs assessment**
  - Existing Conditions
  - Background Informational Report
  - Future Year Conditions
- **Developed Improvement Options**
  - Roadways
  - Pedestrian/Bicyclists
  - Parking/ITS
  - Transit/LRT
- **Seeking your Comments and Input on various options**

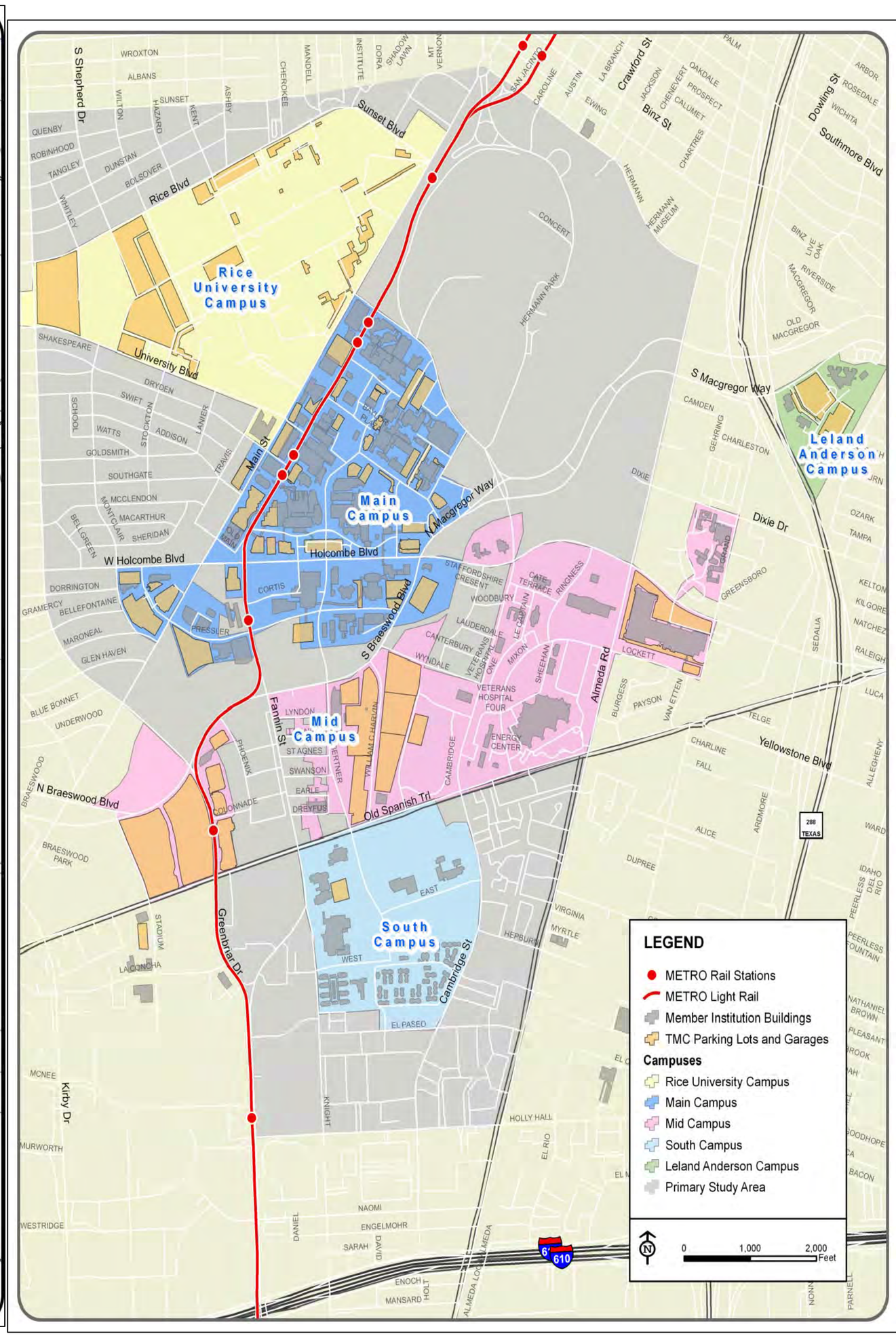
Texas Medical Center Mobility Study
Study Area Map

- **Primary Study Area**
  - extends from Sunset Blvd in the north to Holly Hall Street in the south.
- **Secondary Study Area**
  - extends from Alabama Street in the north to the Sam Houston Tollway in the south.

General and Primary Study Areas



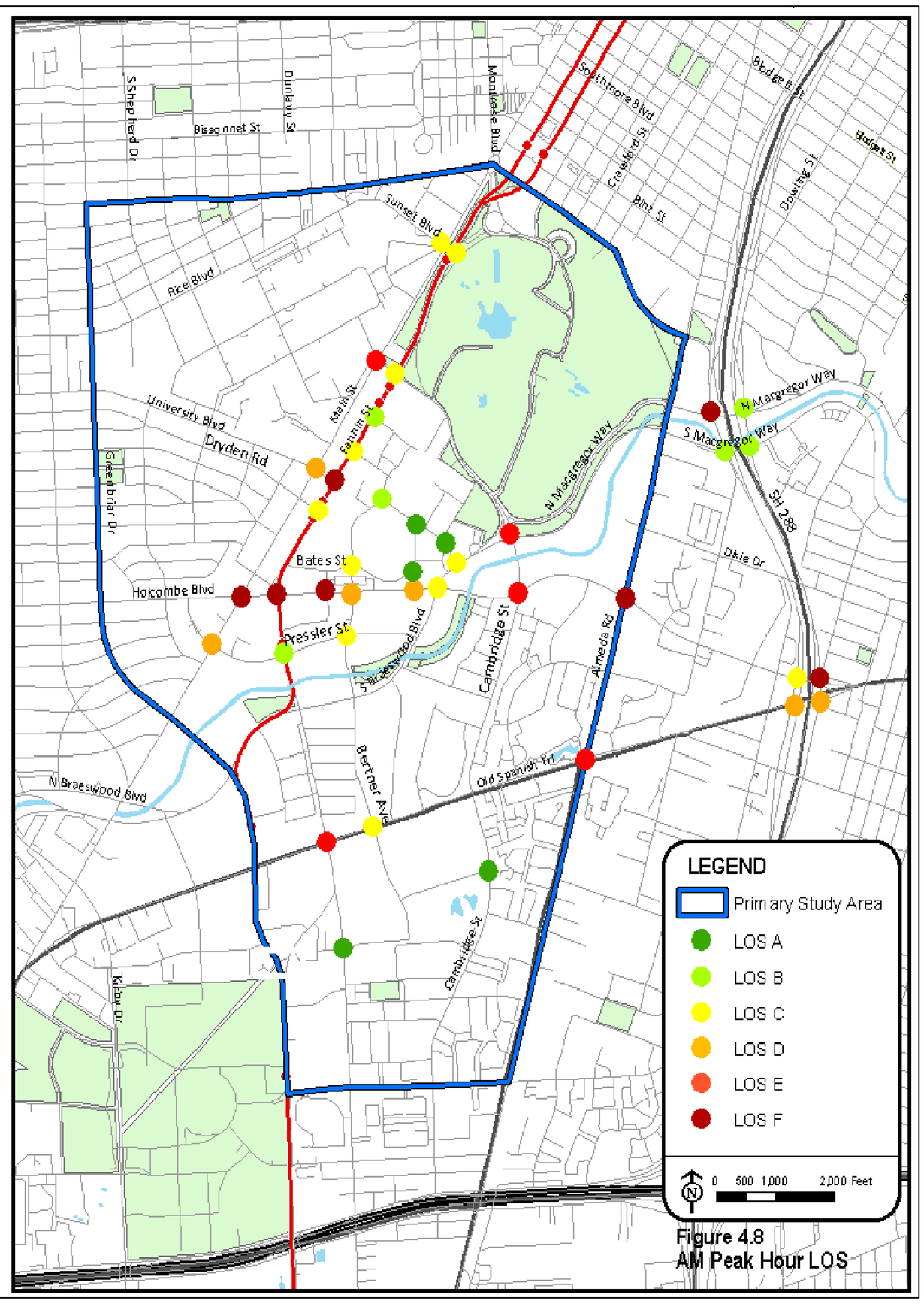
Primary Study Area with TMC Campuses



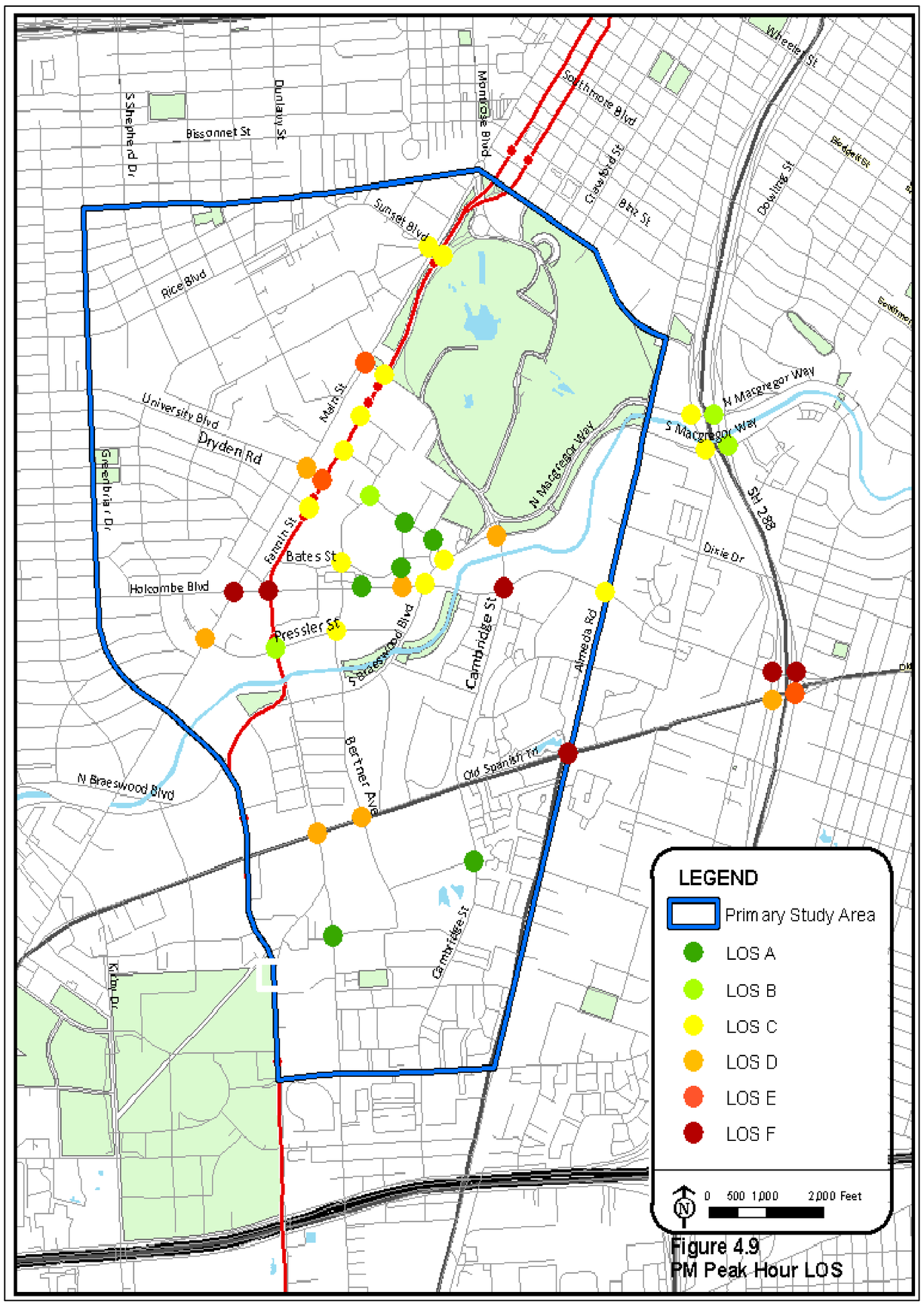
Existing Conditions

- Top priority for the TMC Mobility Study
  - Improve parking access and availability
  - Improve road network mobility
  - Reduce vehicular congestion
  - Improve multimodal safety
  - Improve pedestrian connectivity

Existing Conditions AM Peak Hour Level of Service



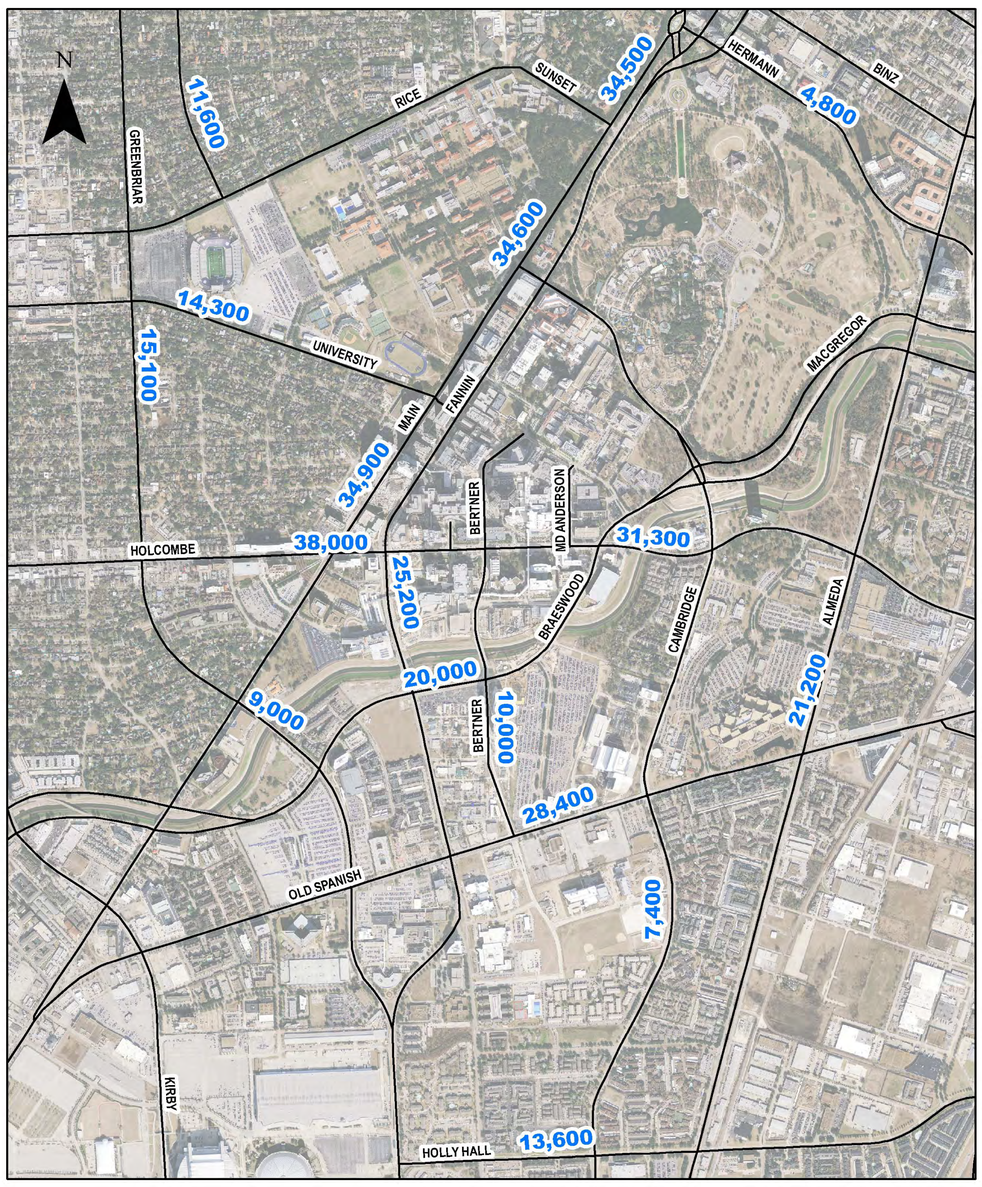
Existing Conditions PM Peak Hour Level of Service



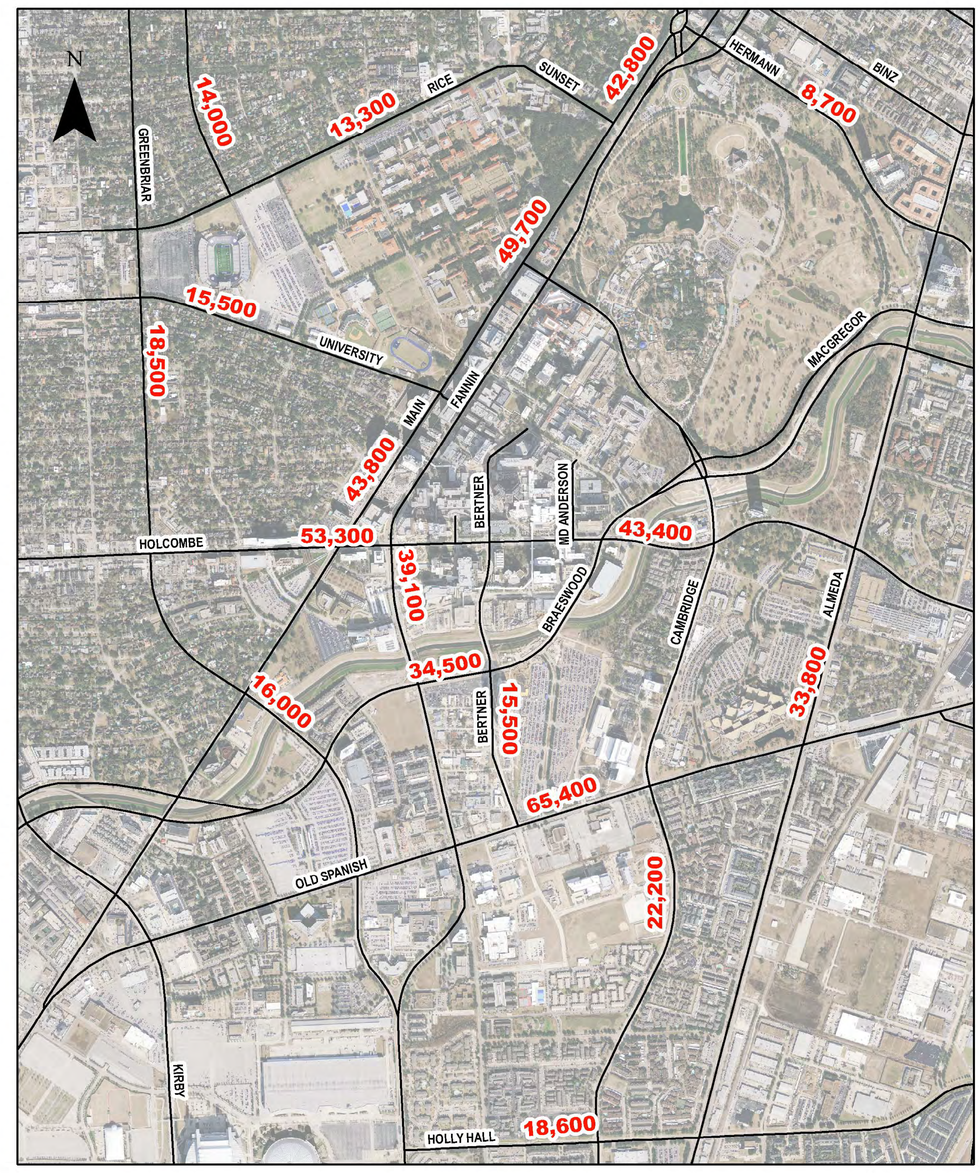
Future Year 2035 Conditions

Texas Medical Center

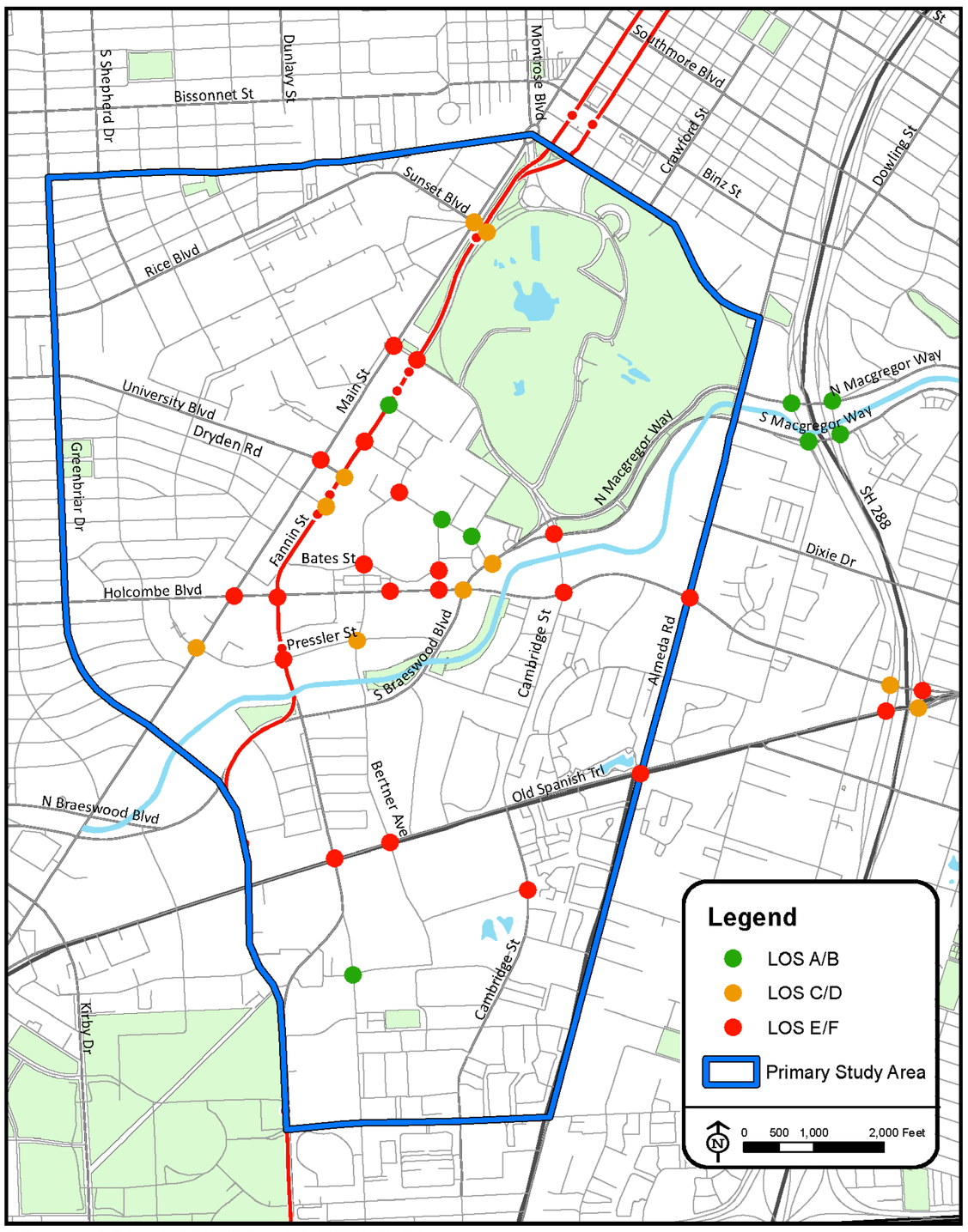
TEXAS MEDICAL CENTER MOBILITY STUDY
2014 24-Hour Volumes



TEXAS MEDICAL CENTER MOBILITY STUDY
2035 24-Hour Volumes

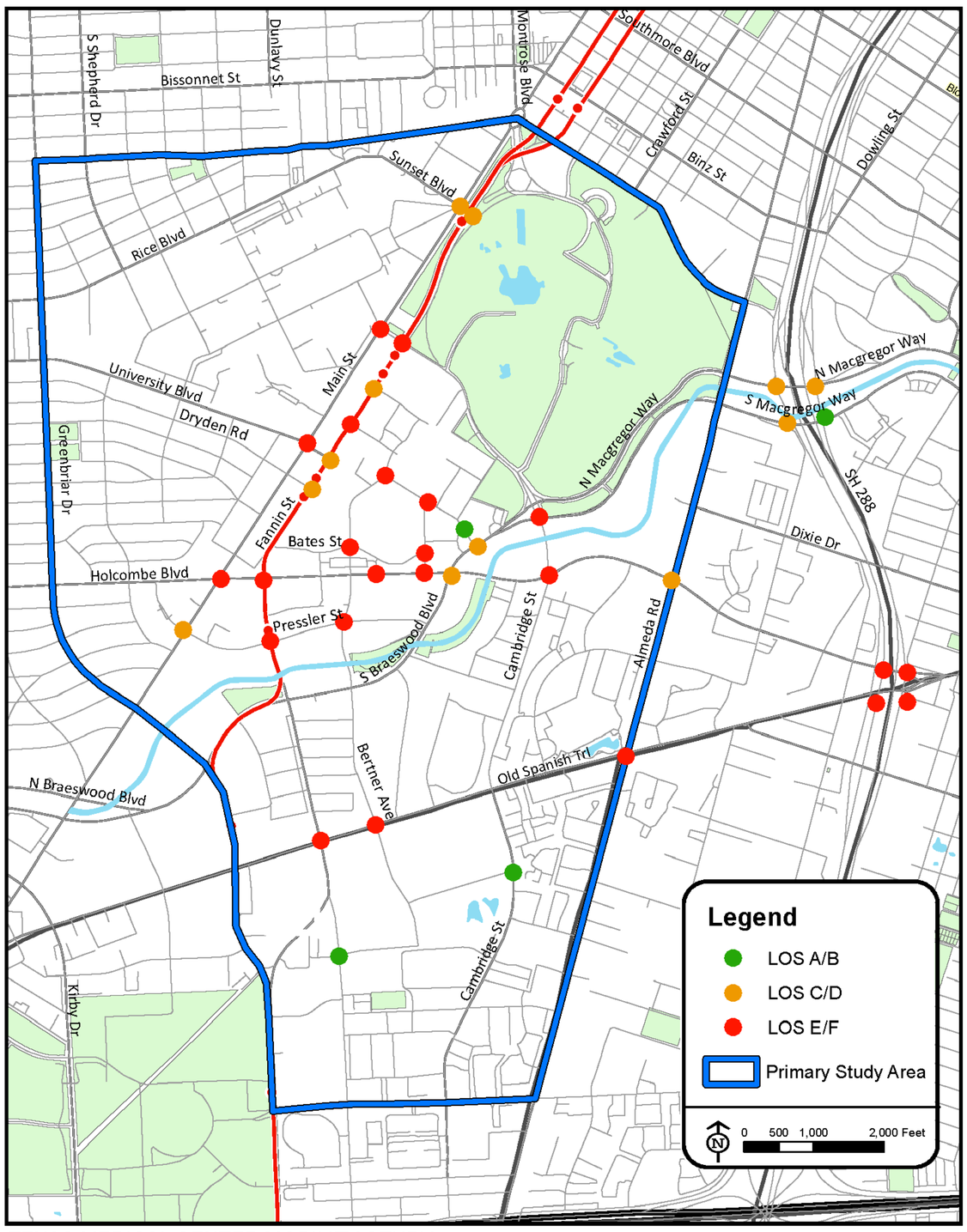


2035 NO BUILD - LEVEL OF SERVICE - AM



TEXAS MEDICAL CENTER MOBILITY STUDY April 2014

2035 NO BUILD - LEVEL OF SERVICE - PM



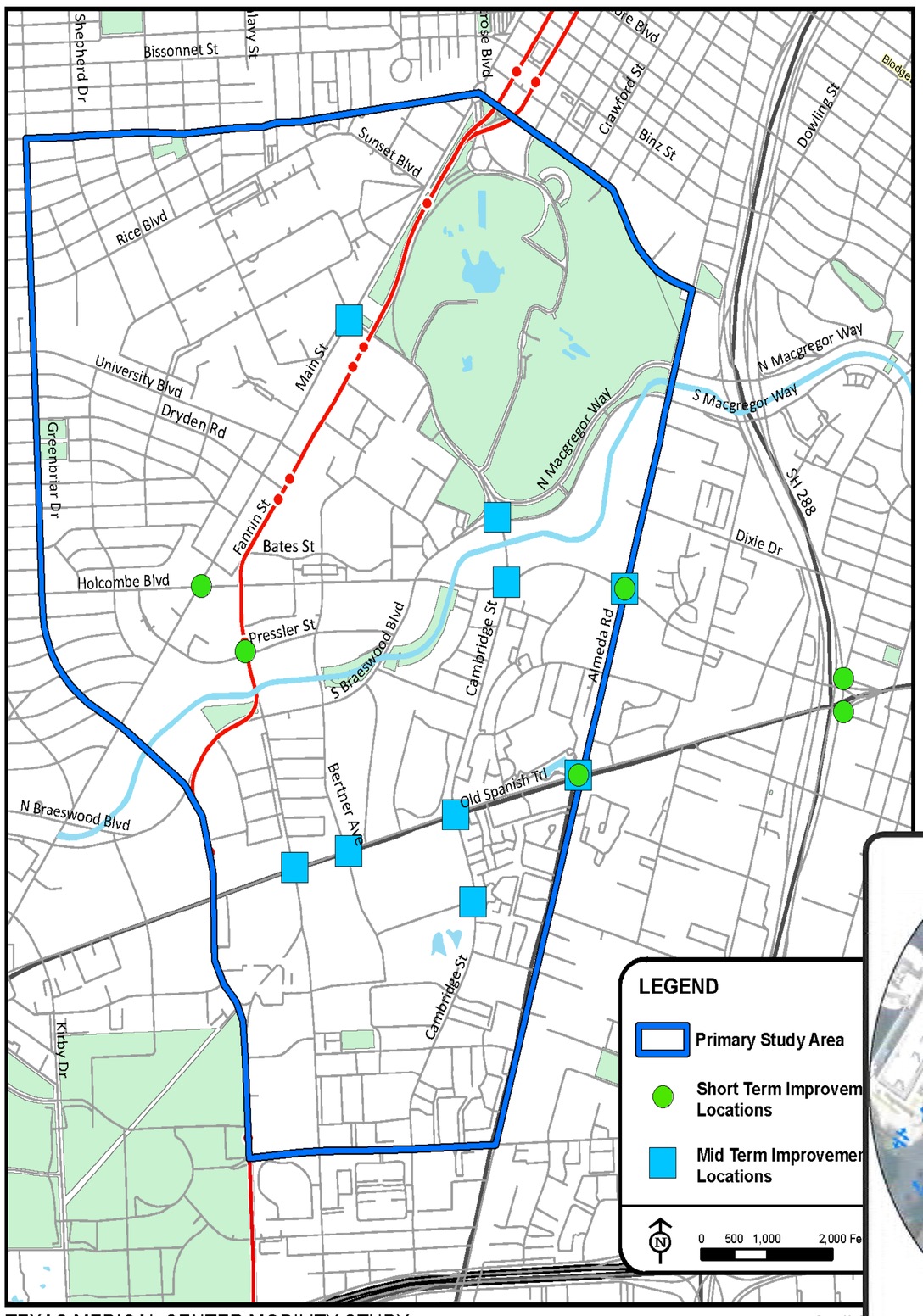
TEXAS MEDICAL CENTER MOBILITY STUDY April 2014

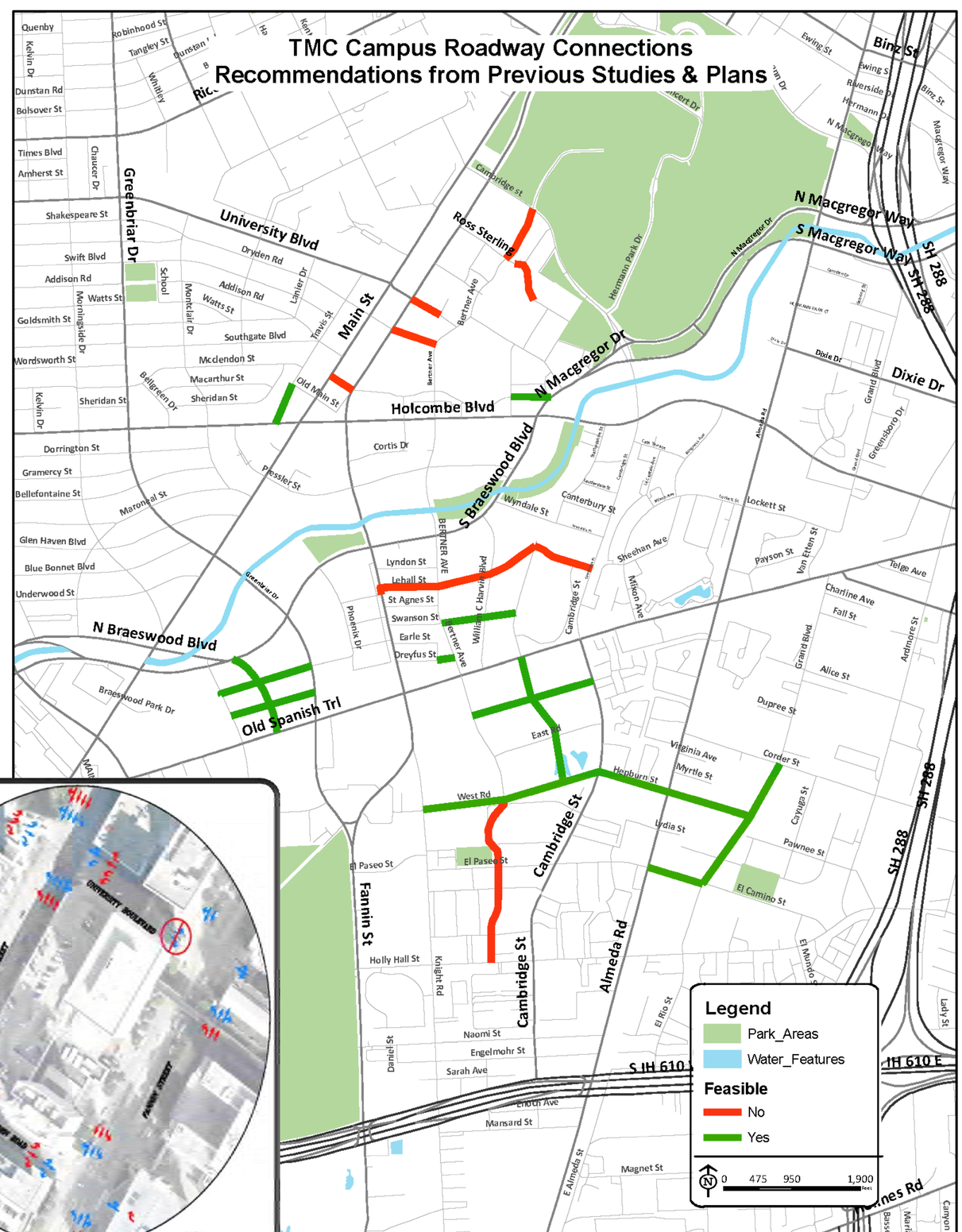
Short-term and Mid-term Roadway Improvement Concepts

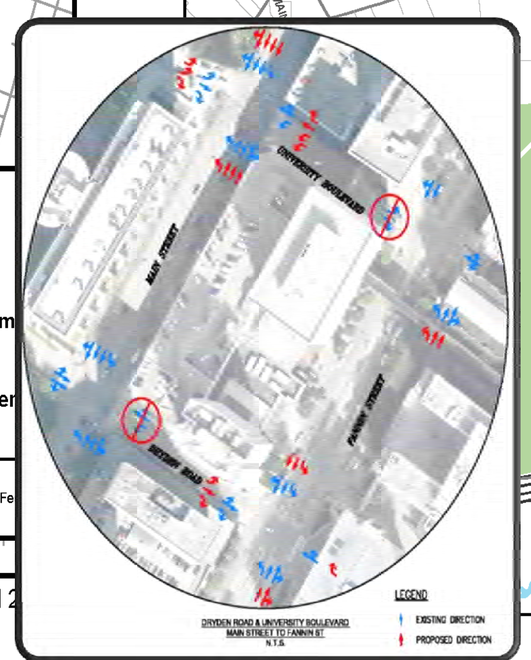
Serial Number	Conceptual Improvement	Limits	Scope of Work	Timeline	Estimated Constr. Cost*	Right-of-Way Needed	Potential Funding Application
				Short/Mid/ Long	(Millions in 2014 Dollars)	(acres)	
1	Local Circulation Improvements	University/Dryden between Main St. and Fannin Street	Convert University St. and Dryden St. to one-way pair between Main St and Fannin St. Modify four(4)	Short	1	N/A	CoH/CMAQ
2	Parking ITS Solutions	TMC Study Area	Provide Parking Guidance Signs , Space Availability Signs at strategic locations. Develop Mobile App to assist TMC patrons.	Short	5	N/A	Private
3	Cambridge at East Drive Intersection Improvements	Intersection approaches	Add exclusive Turn bays at intersection as identified(NBL, SBU, Additional EBR).Conduct Traffic Signal Warrant Study and install traffic signal.	Short/Mid	0.85	0	CoH/CMAQ
4	Cambridge at Braeswood Intersection Improvements	Intersection approaches	Add exclusive Turn bays at intersections as identified (WBR Dual)	Short/Mid	0.4	0	CoH/CMAQ
5	288 NBFR @ OST Intersection Improvements	Intersection approaches	Add exclusive Turn bays at intersection as identified (NBL)	Short/Mid	0.4	0	CoH/CMAQ
6	288 NBFR @ Holcombe Intersection Improvements	Intersection approaches	Add exclusive Turn bays at intersection as identified (NBL)	Short/Mid	0.4	0	CoH/CMAQ
7	Main @ Cambridge Intersection Improvements	Intersection approaches	Add exclusive Turn bay at intersection as identified (NBR)	Short/Mid	0.6	0.08	CoH/CMAQ
8	Fannin at Pressler Intersection Improvements	Intersection approaches	Add exclusive Turn bays at intersection as identified (EBL, WBL) & Signal Timing Improvements (LRT)	Short/Mid	1.2	0.19	CoH/CMAQ
9	Almeda @ OST Intersection Improvements	Intersection approaches	Add exclusive Turn bays at intersections as identified (EBR, Additional NBL bay, Additional WBL, SBR, NBR)	Short/Mid	2	0.17	CoH/CMAQ
10	Cambridge at Holcombe Intersection Improvements	Intersection approaches	Add exclusive Turn bays at intersection as identified (WBL, EBL, EBR)	Short/Mid	2.2	0.29	CoH/CMAQ
11	Holcombe @ Main Intersection Improvements	Intersection approaches	Add exclusive Turn bays at intersection as identified(SBR, WBR, Additional bays EBL and WBL)	Short/Mid	2	0.39	CoH/CMAQ
12	Holcombe @ Almeda Intersection Improvements	Intersection approaches	Add exclusive Turn bays at intersections as identified(WBL, Additional NBL, EBL Dual, EBR)	Short/Mid	2.4	0.39	CoH/CMAQ
13	OST at Fannin Intersection Improvements	Intersection approaches	Add exclusive Turn bays at intersections as identified (NBR, SBR, EBR, WBR)	Short/Mid	0.8	0.39	CoH/CMAQ
14	OST at Bertner Intersection Improvements	Intersection approaches	Add exclusive Turn bays at intersection as identified (Additional bays SBL, EBL Dual SBR, WBR)	Short/Mid	2.6	0.48	CoH/CMAQ
15	OST at Cambridge Intersection Improvements	Intersection approaches	Add exclusive Turn bays at intersection as identified	Short/Mid	2.6	0.39	CoH/CMAQ
16	Corridor Signal Timing Optimization	Intersection approaches	Optimize signal timing for major corridors such as Holcombe, OST, Almeda, Cambridge	Short/Mid	0.3	N/A	CoH/CMAQ

*Costs are estimated Construction Costs Only in 2014 Dollars. Costs shown do not include Right-of-way or Utilities Relocation Costs.

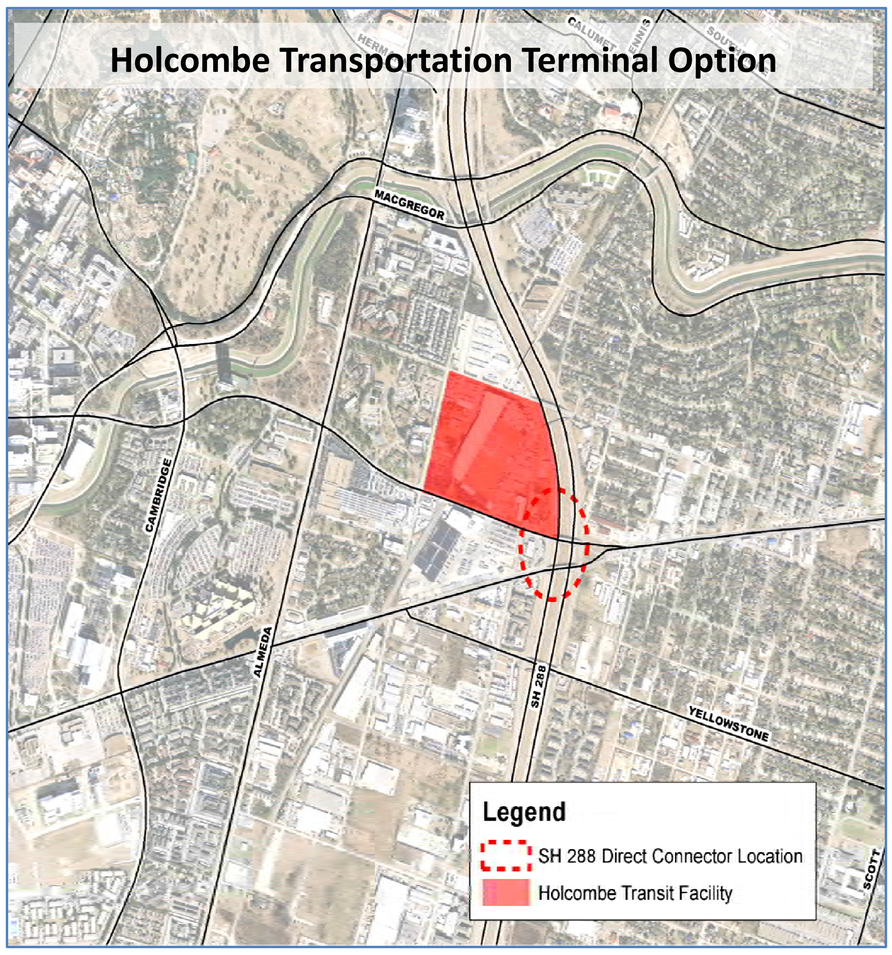
MID AND SHORT TERM IMPROVEMENT LOCATIONS

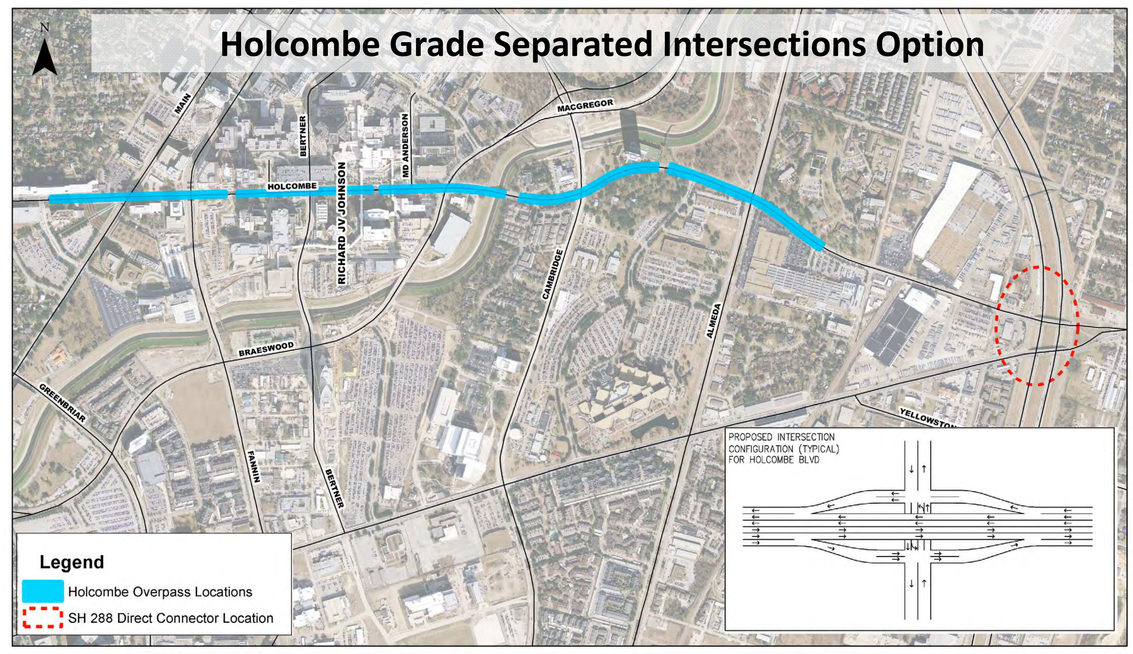


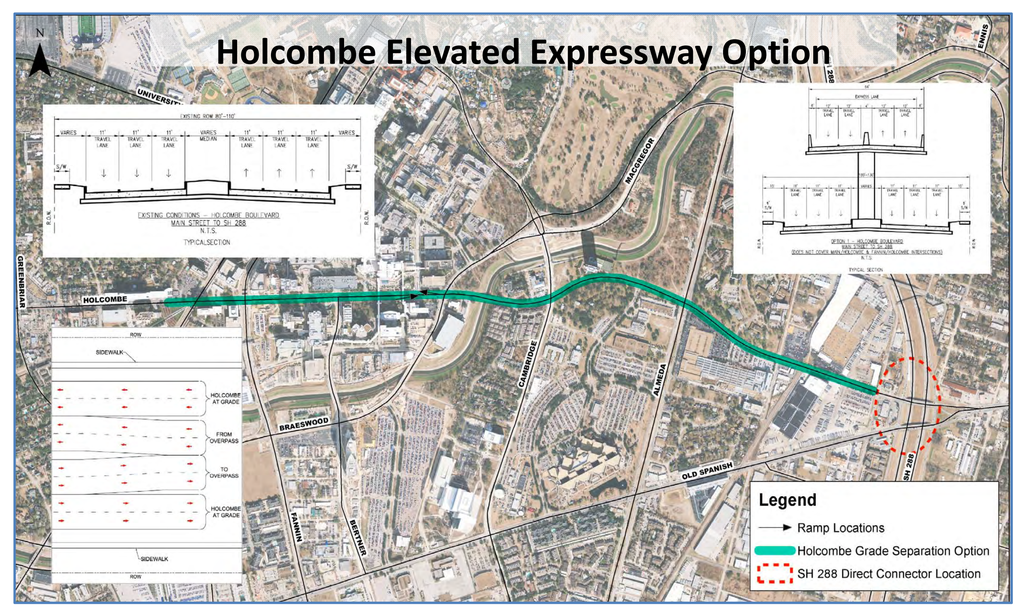




Long-term Improvement Concepts
East/West Roadways







Serial Number	Conceptual Improvement	Limits	Scope of Work	Timeline	Estimated Constr. Cost*	Right-of-Way Needed	Potential Funding Application
				Short/Mid/Long	(Millions in 2014 Dollars)	(acres)	
1	Transportation Terminal on Holcombe Boulevard	At SH 288	Construct a 2000 space parking garage along Holcombe Boulevard at SH 288. This facility may include retail space.	Long	30	7	CoH/CMAQ
2	Overpasses at Major Intersections on Holcombe Blvd.	SH 288 to East of Greenbriar	Construct overpasses at Almeda Rd., Cambridge St., Braeswood Blvd., Bertner Rd. and Main St./Fannin St. Overpasses will have 4 lanes.	Long	85	6.1	STP
3	Grade Separated Express Lanes on Holcombe Blvd.	SH 288 to East of Greenbriar	Construct grade separated express lanes along Holcombe. The elevated strucure will have 4 lanes.	Long	120	3.6	STP
4	Overpasses at Major Intersections on Old Spanish Trail	SH 288 to West of Greenbriar	Construct overpasses at Almeda Rd., Cambridge St., Braeswood Blvd., Bertner Rd. and Bertner Rd../Fannin St. Overpasses will have 4 lanes with a median	Long	85	4.4	STP
5	Grade Separated Express Lanes on Old Spanish Trail	SH 288 to West of Greenbriar	Construct grade separated express lanes along Holcombe. The elevated strucure will have 4 lanes.	Long	105	1.8	STP

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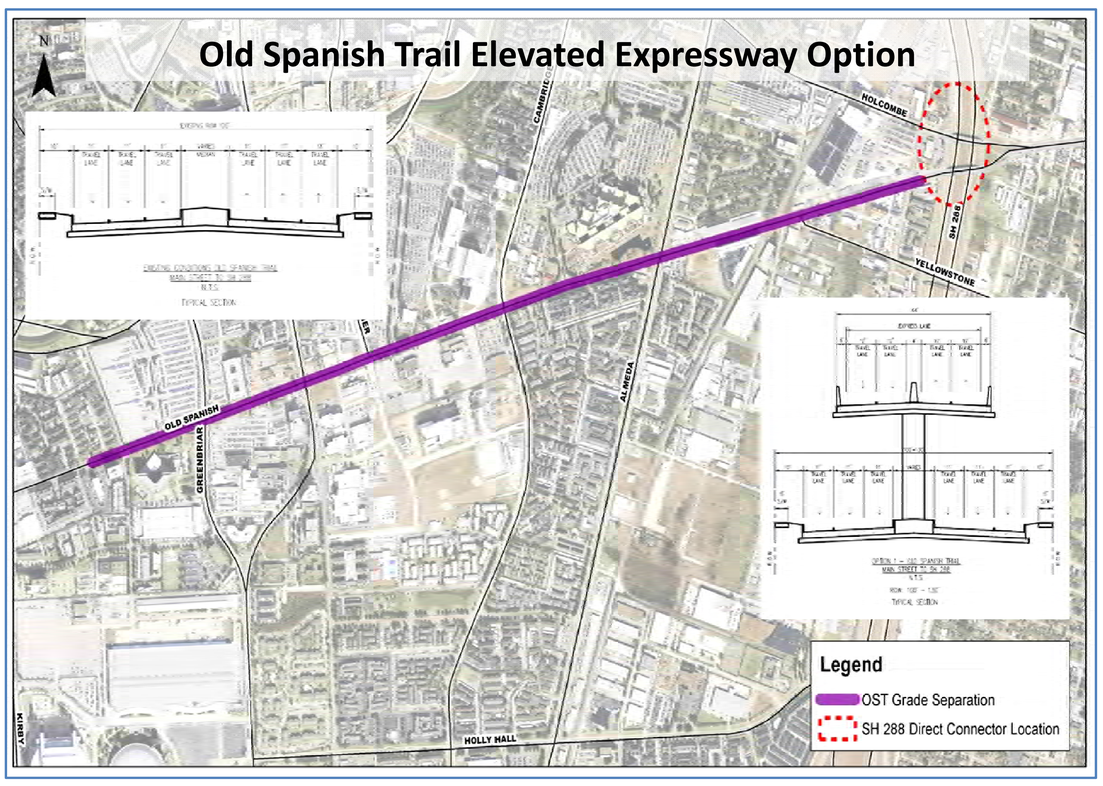
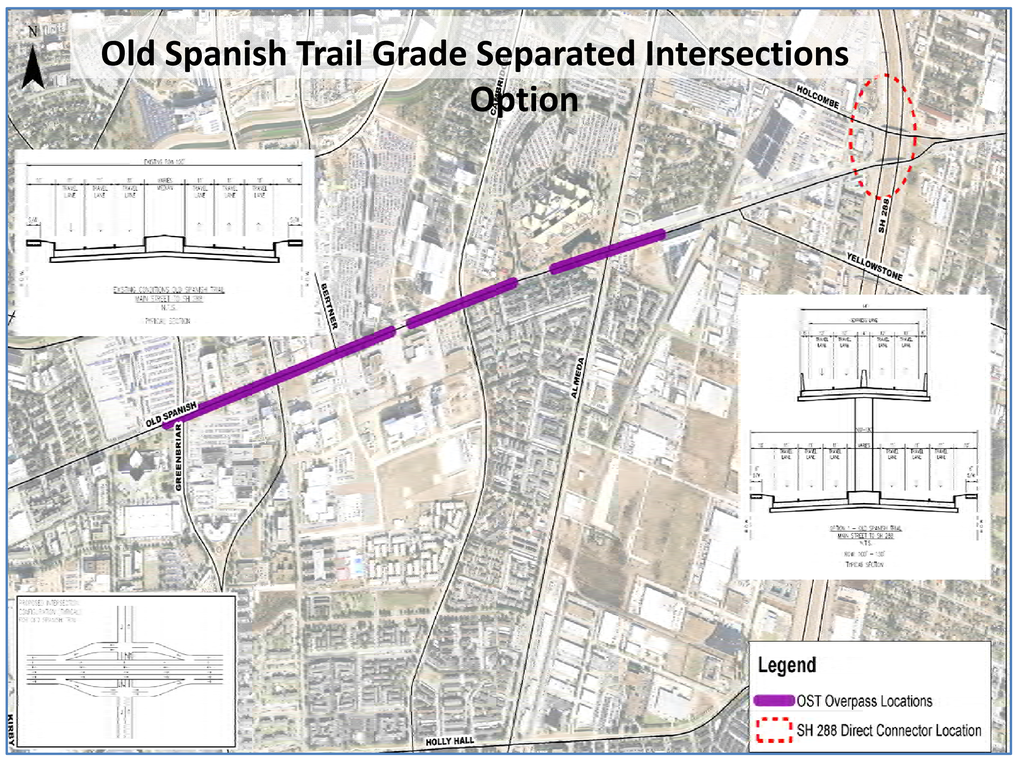
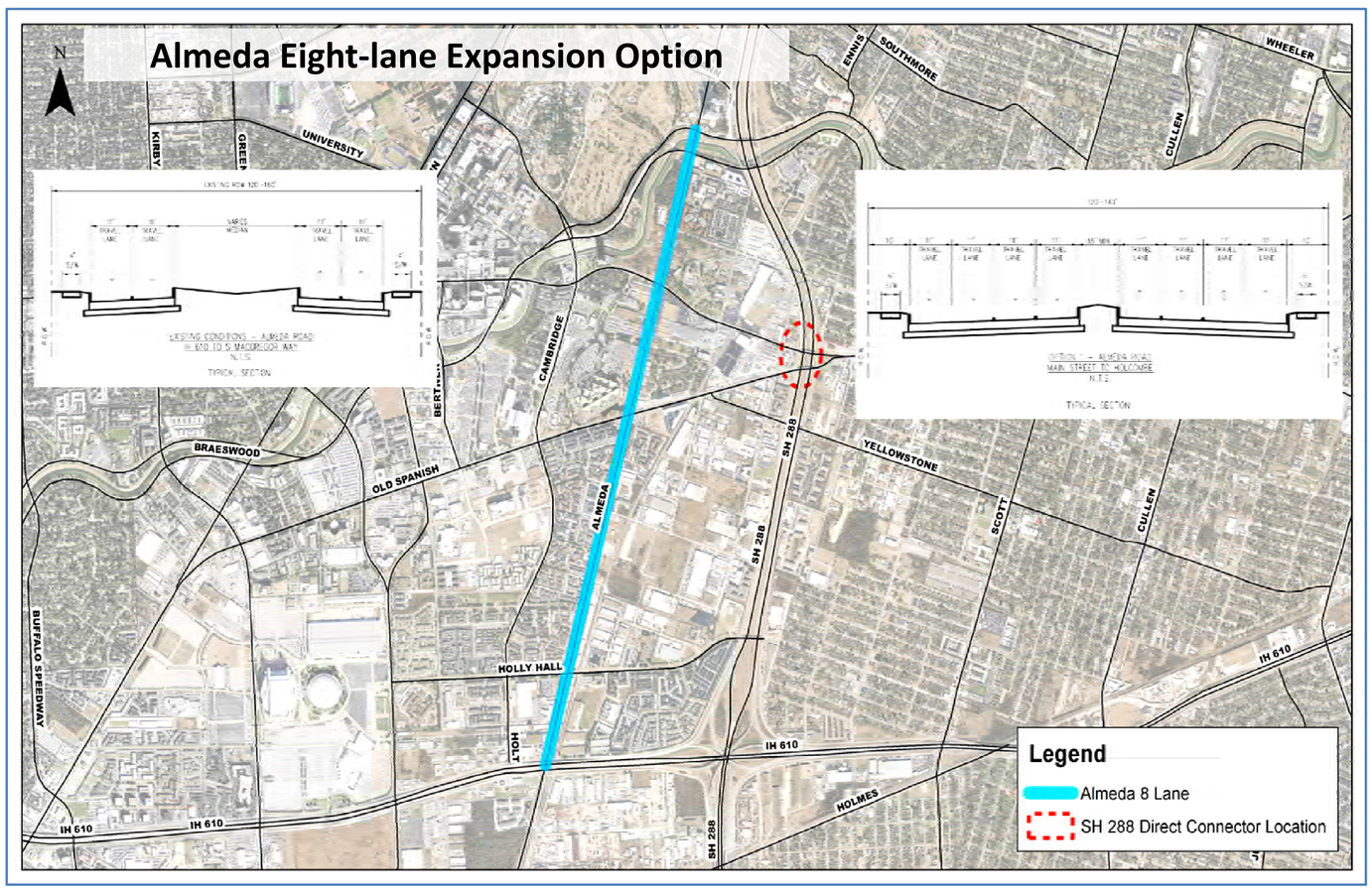
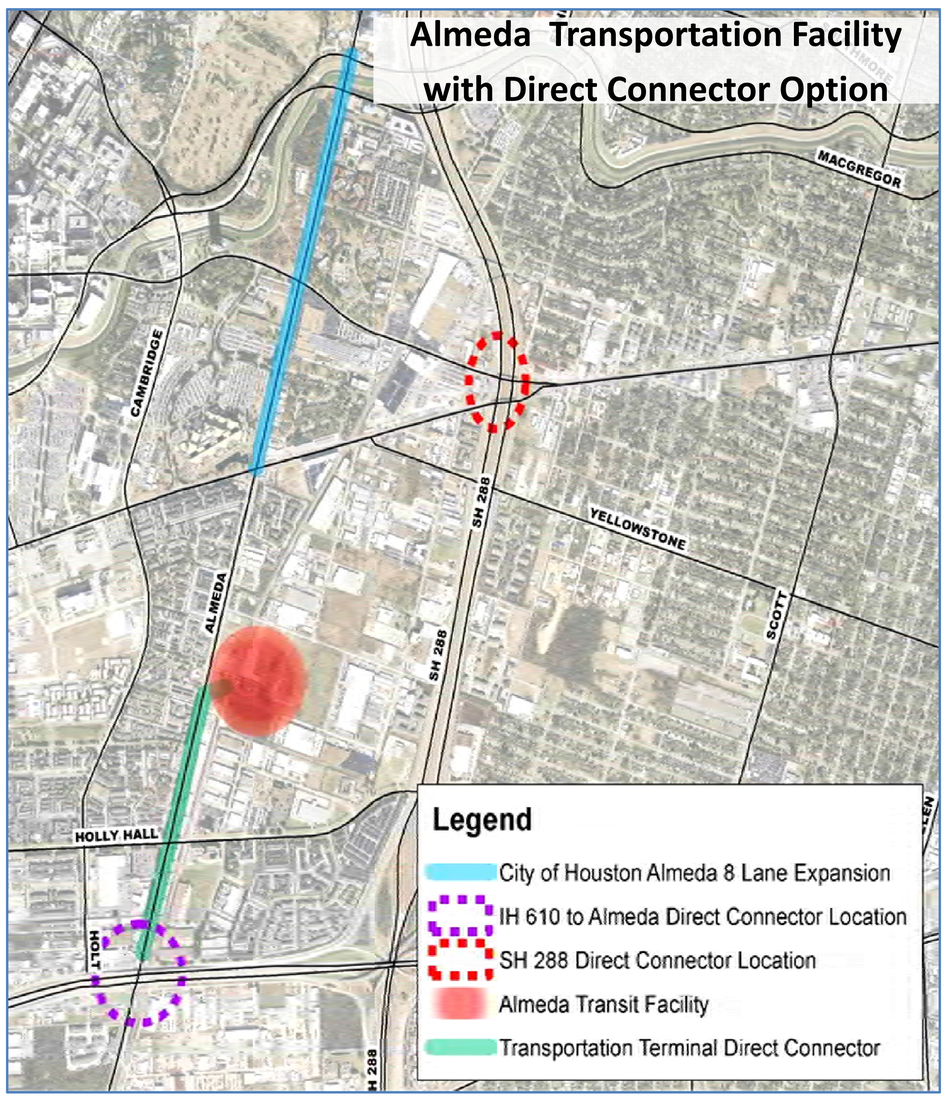




Long-term Improvement Concepts
North/South Roadways





Serial Number	Conceptual Improvement	Limits	Scope of Work	Timeline	Estimated Constr. Cost*	Right-of-Way Needed	Potential Funding Application
				Short/Mid/ Long	(Millions in 2014 Dollars)	(acres)	
1	Transportation Terminal on Almeda Road	At Holly Hall	Construct a 1000 space parking garage along Almeda Road. This facility may include retail space.	Long	15	5	CoH/CMAQ
2	Almeda Road Direct Connector to Transportation Terminal	IH 610 to Holly Hall/Transportation Terminal	Construct a direct connector from IH 610 to the proposed Transportation Terminal. This will be a bi-directional connector with one lane in each direction.	Long	30	0	STP
3	Almeda Road Widening	IH 610 to N. MacGregor Way	Widen Almeda Road to eight lane facility with exclusive turn bays at signalized intersections as identified. The stormwater line needs to be provided.	Long	45	0	STP

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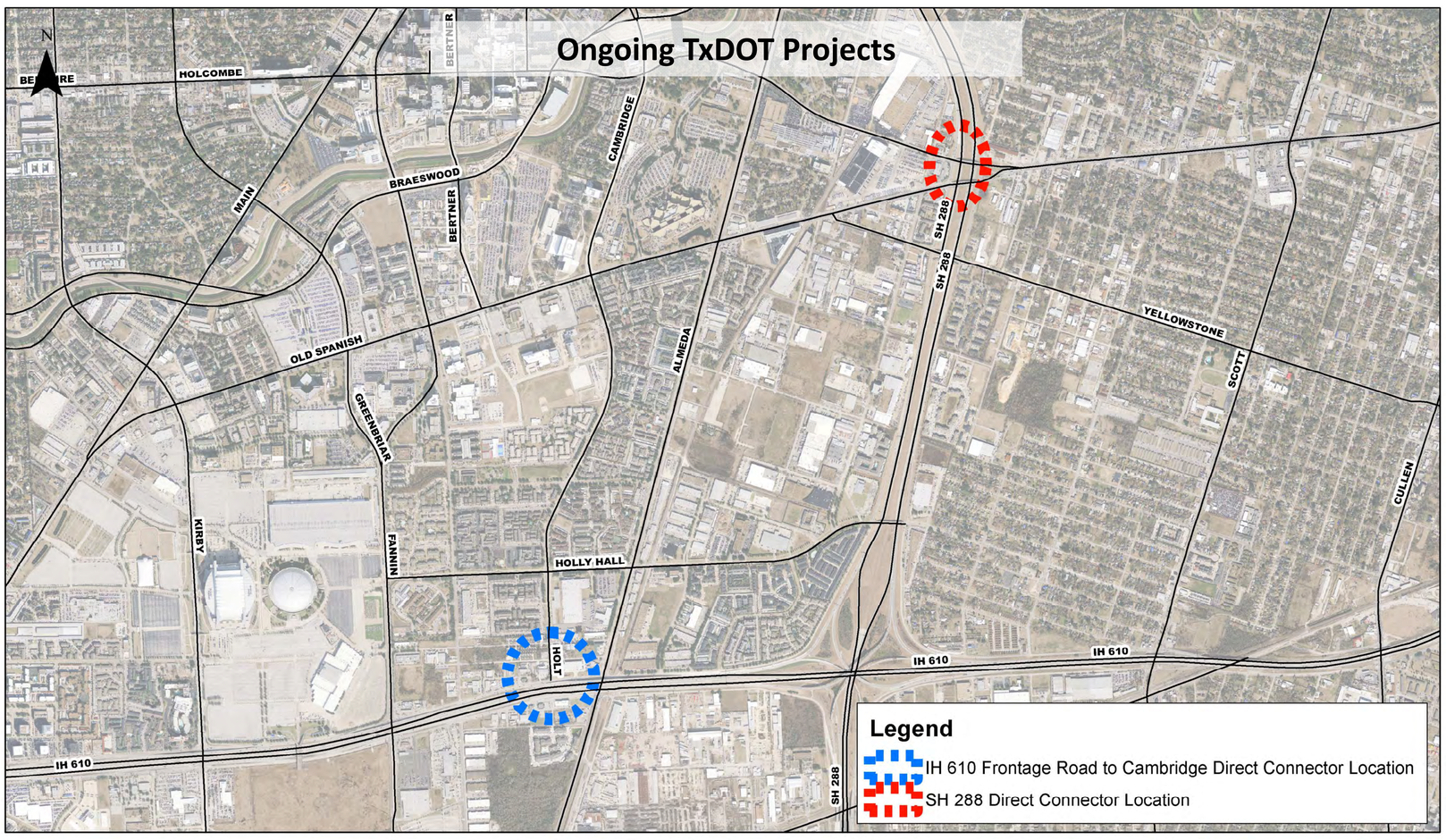
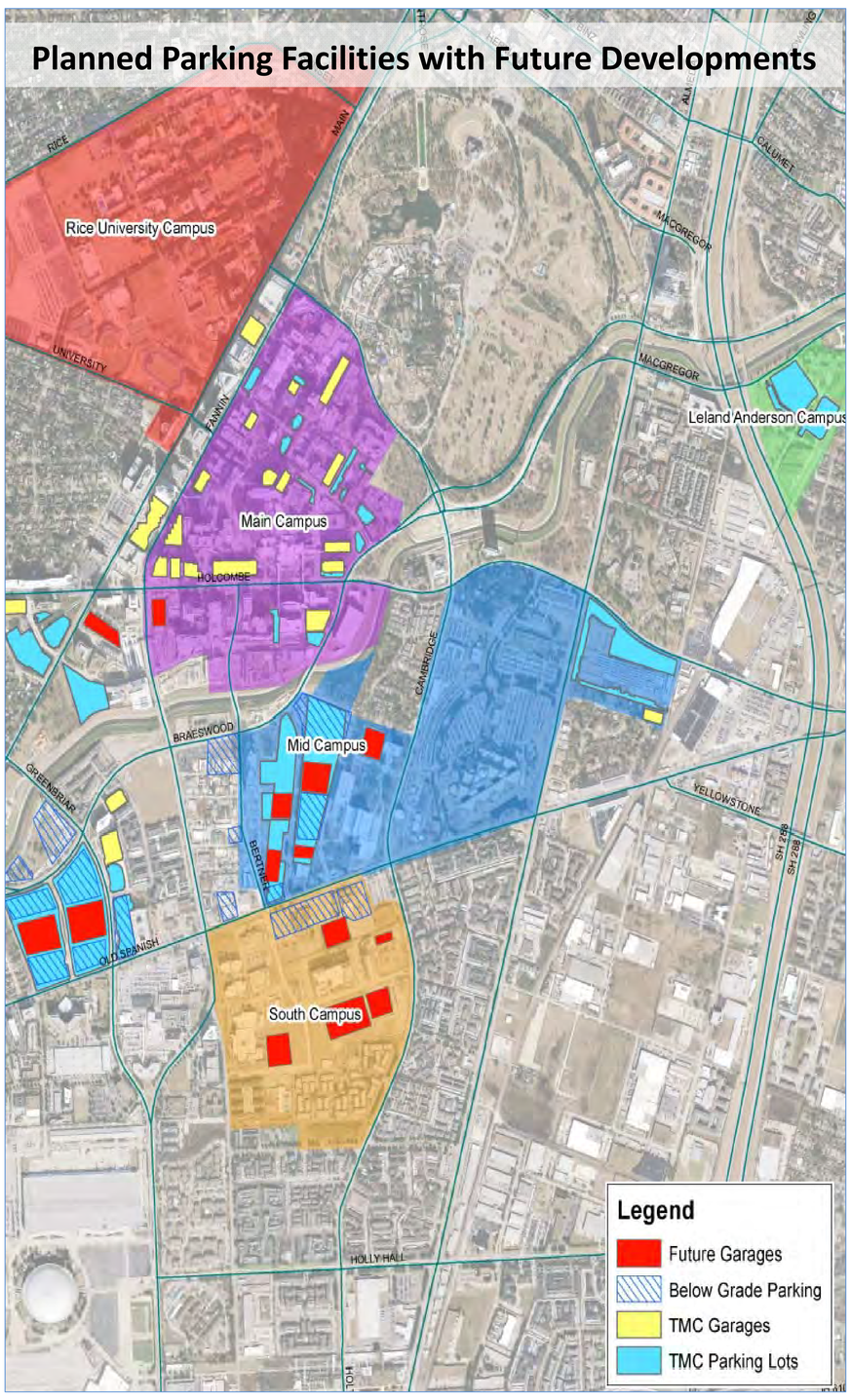
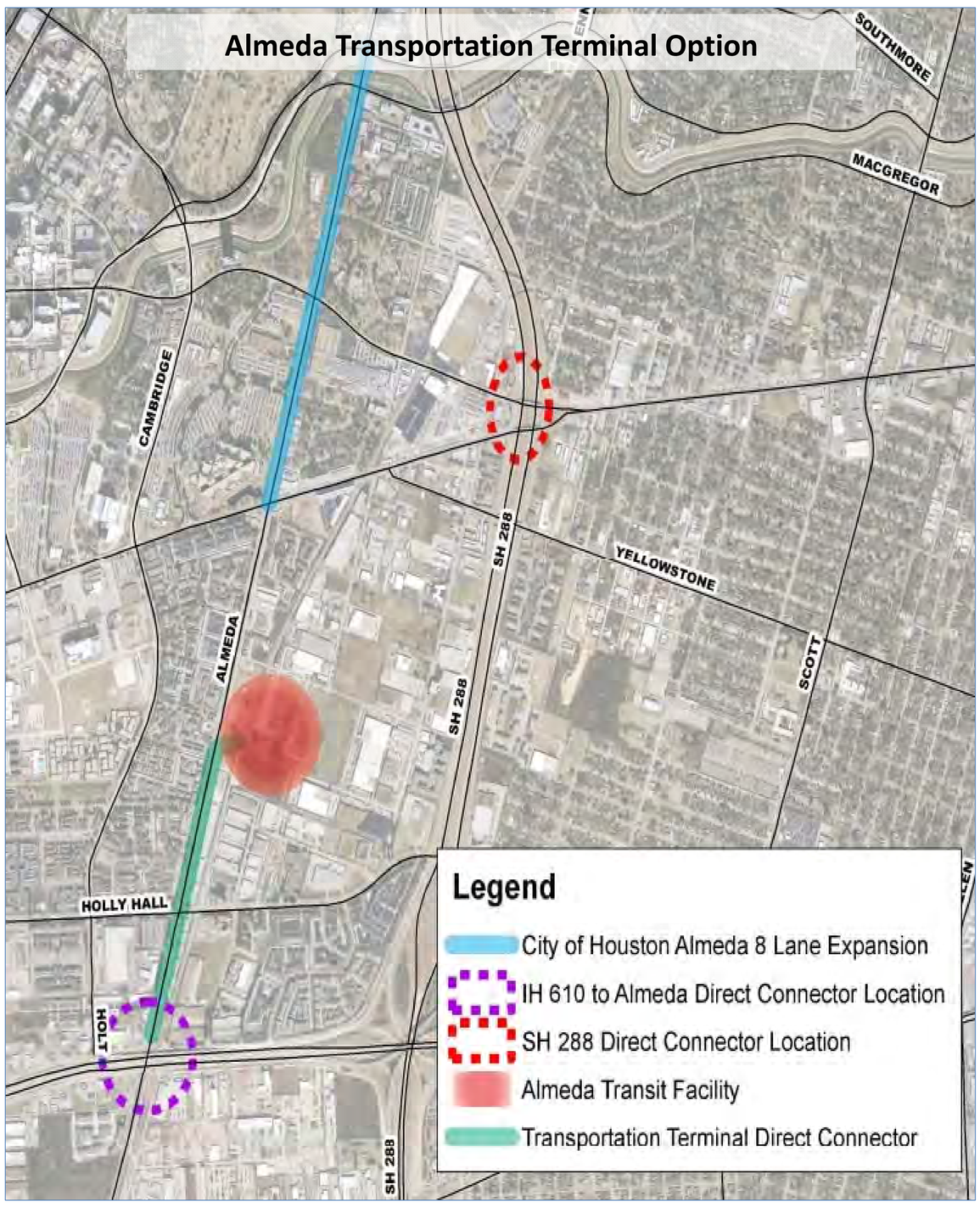
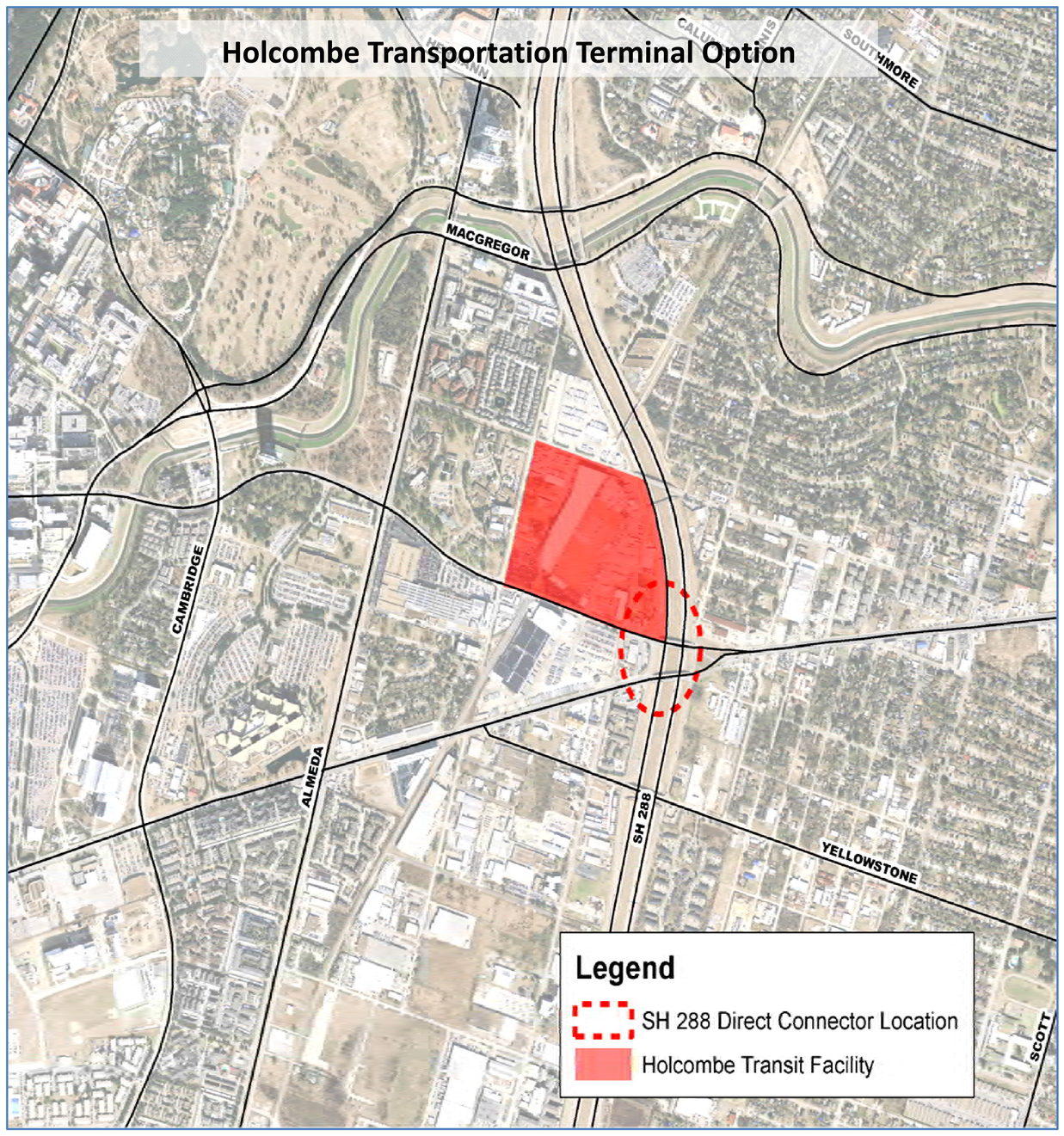


Parking Improvement Concepts

- Transportation Terminal /Remote Parking Options
  - Almeda vicinity
  - Holcombe Vicinity
- Parking Facilities Management
  - Incorporate ITS Solutions
    - Electronic Parking Guidance Signs
    - Display Space Availability
    - Improved Mobile App
  - Alternative Parking Payment Solutions
    - Parking Mobile App
    - EZTag for Payment







Short-term Improvement Concepts Pedestrian/Bicyclist

Bicycle, Pedestrian and Shared-Use Infrastructure Conceptual Improvements

Serial Number	Conceptual Improvement	Limits	Scope of Work	Timeline	Estimated Constr. Cost*
				Short/Mid/ Long	(in 2014 Dollars)
1	S Mac Gregor Way Shared Use Path	Along bayou, west of Cambridge	Shared-use path gap closure • Approx. 462 linear feet • 10 ft. width	Short	$71,818
2	Brays Bayou Shared Use Path	North side, west of Cambridge	Shared-use path gap closure • Approx. 100 linear feet • 10 ft. width	Short	$15,965
3	S Mac Gregor Way Shared Use Path	Along bayou, east of Cambridge	Shared-use path gap closure • Approx. 475 linear feet • 10 ft. width	Short	$73,486
4	Brays Bayou Shared Use Path	North side, east of Cambridge	Shared-use path gap closure • Approx. 90 linear feet • 10 ft. width	Short	$14,681
5	Brays Bayou Shared Use Path	North side, under Almeda	Shared-use path gap closure • Approx. 334 linear feet • 10 ft. width	Short	$52,259
6	Cambridge Sidewalk	East side, N MacGregor to Hermann Park Jogging Trail	Sidewalk gap closure • Approx. 260 linear feet • 8 ft. width • 2 curb ramps	Short	$19,073
7	N MacGregor Sidewalk	North side, Almeda to Hermann Park Jogging Trail	Sidewalk gap closure • Approx. 510 linear feet • 8 ft. width • 4 curb ramps	Short	$37,536
8	Almeda Sidewalk	East side, Holly Hall to 7205 Almeda	New and replacement sidewalk • Approx. 3,155 ft. new sidewalk • Approx. 315 ft. replaced sidewalk • 6 ft width, 10 curb ramps	Short	$176,474
9	Bertner Sidewalk	East side, OST to 7007 Bertner	New sidewalk • Approx. 1,212 ft. new sidewalk • 6 ft. width • 2 curb ramps	Short	$58,538
10	Fannin Shared-use path	West side, Sunset to Cambridge	New shared-use path • Approx. 1,985 ft. new sidewalk • 10 ft. width • 1 curb ramp	Short	$154,602
11	Greenbriar Sidewalk	East side, Rice to Bolsover	New sidewalk• Approx. 305 ft. new sidewalk • 6 ft. width • 2 curb ramps	Short	$17,236
12	Almeda Sidewalk	West side, Holcombe to Holly Hall	Replace sidewalk with shared-use path • 10 ft. width	Short	$652,756
13	Holcombe Sidewalk	North side, Almeda to Grand	Sidewalk replacement • Approx. 1,295 ft. sidewalk replaced • 6 ft. width, 2 curb ramps replaced	Short	$50,405
14	Holcombe Sidewalk	South side, Ringness to Almeda	Sidewalk spot replacement • Approx. 15 ft. sidewalk replaced • 4 ft. existing width	Short	$3,871
15	Holcombe Sidewalk	North side, near Main and Fannin	Sidewalk spot replacement • Two 50-ft. sections replaced • 6 ft. existing width	Short	$5,453
16	Greenbriar Sidewalk	Both sides, Main to S Braeswood	Sidewalk spot replacement • One missing section (north side) • Two uneven sections (south side) • 100 linear ft., 4 ft. existing width	Short	$4,898
17	S Braeswood Sidewalk	North side, Fannin to Phoenix	Sidewalk replacement • Approx. 505 linear ft. replaced • 6 ft. width	Short	$26,037
18	S Braeswood Sidewalk	South side, Fannin to Phoenix	Sidewalk gap closure • Approx. 110 linear ft. added • 4 ft. existing width	Short	$6,648
19	S Braeswood Sidewalk	South side, Fannin to Bertner	Sidewalk replacement • Approx. 825 linear ft. replaced • 6 ft. width • 2 curb ramps replaced	Short	$45,861
20	Cambridge Sidewalk	West side, El Paseo to Holly Hall	Sidewalk replacement • Approx. 1,300 linear ft. replaced • 6 ft. width • 2 curb ramps replaced	Short	$68,805
21	Fannin Sidewalk	East side, Greenbriar to Knight	Sidewalk replacement • Approx. 1,200 linear ft. replaced • 6 ft. width • 2 curb ramps replaced	Short	$64,422
22	University Sidewalk	South side, Travis to Lanier	Sidewalk replacement • Approx. 650 linear ft. replaced • 6 ft. width • 2 curb ramps replaced	Short	$36,580
23	Rice Sidewalk	North side between Cherokee & Ashby	Sidewalk spot replacement • Approx. 165 linear ft. replaced • 4 ft. existing width • 1 curb ramp replaced	Short	$7,661
24	Brays Bayou Shared Use Path	North side between Fannin & Bertner	Shared-use path connection • Approx. 920 linear ft. • 10 ft. width	Short	$139,992
25	Brays Bayou Shared Use Path	North side between Holcombe & Cambridge	Shared-use path connection • Approx. 700 ft. added • 10 ft. width • Includes bike/ped bridge	Short	$400,000
26	Brays Bayou Shared Use Path	South side, under Almeda	Shared-use path connection • Approx. 700 linear feet • 10 ft. width	Short	$105,495
27	Fannin Shared-use path	East side, bayou to TMC TC stair tower	Shared-use path connection • Approx. 640 linear feet • Add 4 ft. for 10 ft. total width	Short	$19,490
28	N Braeswood Shared-use path	North side, bayou to Main	Shared-use path connection • Approx. 250 linear feet • 10 ft. width	Short	$22,062
29	Bates Shared-use path	MD Anderson to MacGregor & Moursund	Shared-use path connection • Approx. 630 linear feet • Replace sidewalk with 10 ft. path	Short	$108,784
30	Wyndale Sidewalk	Both sides, Staffordshire to Cambridge	Sidewalk replacement/ addition • Approx. 1300 linear feet, 6 ft. width • Street under construction; subject to change	Short	$68,805
31	Swanson Sidewalk	Both sides, Fannin to Bertner	Sidewalk addition • Approx. 1300 linear feet, 6 ft. width	Short	$58,538
32	Hepburn Sidewalk	Both sides, Cambridge to Almeda	Sidewalk replacement/ addition • Approx. 1050 linear feet, 6 ft. width	Short	$46,508
33	Braeswood Shared-use path	East side, Wyndale to Pressler	Shared-use path and bridge • Approx. 1000 ft. incl. 300 ft bridge • 10 ft. width	Short	$1,000,000
34	Brays Bayou Shared Use Path	South side between Cambridge and Bertner	Shared-use path • Approx. 3,700 ft.• 10 ft. width	Short	$475,000
35	Bertner Shared Use Path	West side between Bayou and Pressler	Shared-use path •Approx. 300 ft. •8 -10 ft. width	Short	

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**Potential Funding Sources: City of Houston CIP Program, Grant Funds

Intersection Accessibility Conceptual Improvements

Serial Number	Conceptual Improvement	Limits	Scope of Work	Timeline	Estimated Constr. Cost*
				Short/Mid/ Long	(in 2014 Dollars)
1	Holcombe at Fannin Curb ramp	South side	Curb ramp addition • add 2 missing curb ramps between travel lanes of Fannin • Design challenges due to location on bridge structure	Short	$6,000
2	Fannin at Old Main Curb ramp	West side	Curb ramp addition • add 2 missing curb ramps	Short	$3,000
3	Holcombe at Main Curb ramp	South side	Curb ramp addition • add 2 missing curb ramps between travel lanes of Main • Design challenges due to location on bridge structure	Short	$6,000
4	Cambridge at MacGregor Curb ramp	Northwest corner	Curb ramp addition • add 2 missing curb ramps across right turn lane	Short	$3,000
5	Dryden at Travis Curb ramp	West side	Curb ramp addition, stripe crosswalks • add curb ramps to 2 corners where missing	Short	$3,000
6	Dryden at Lanier Curb ramp	Four Corners	Curb ramp addition, stripe crosswalks • add curb ramps to 4 corners where missing	Short	$6,000
7	Greenbriar at Sunset Curb ramp	Four Corners	Curb ramp modifications • modify curb ramps for safety	Short	$6,000
8	Holconbe at Ringness Curb ramp	West side	New curb ramps, crosswalk • add 4 curb ramps to allow crossing of west side of intersection • stripe crosswalk	Short	$3,000

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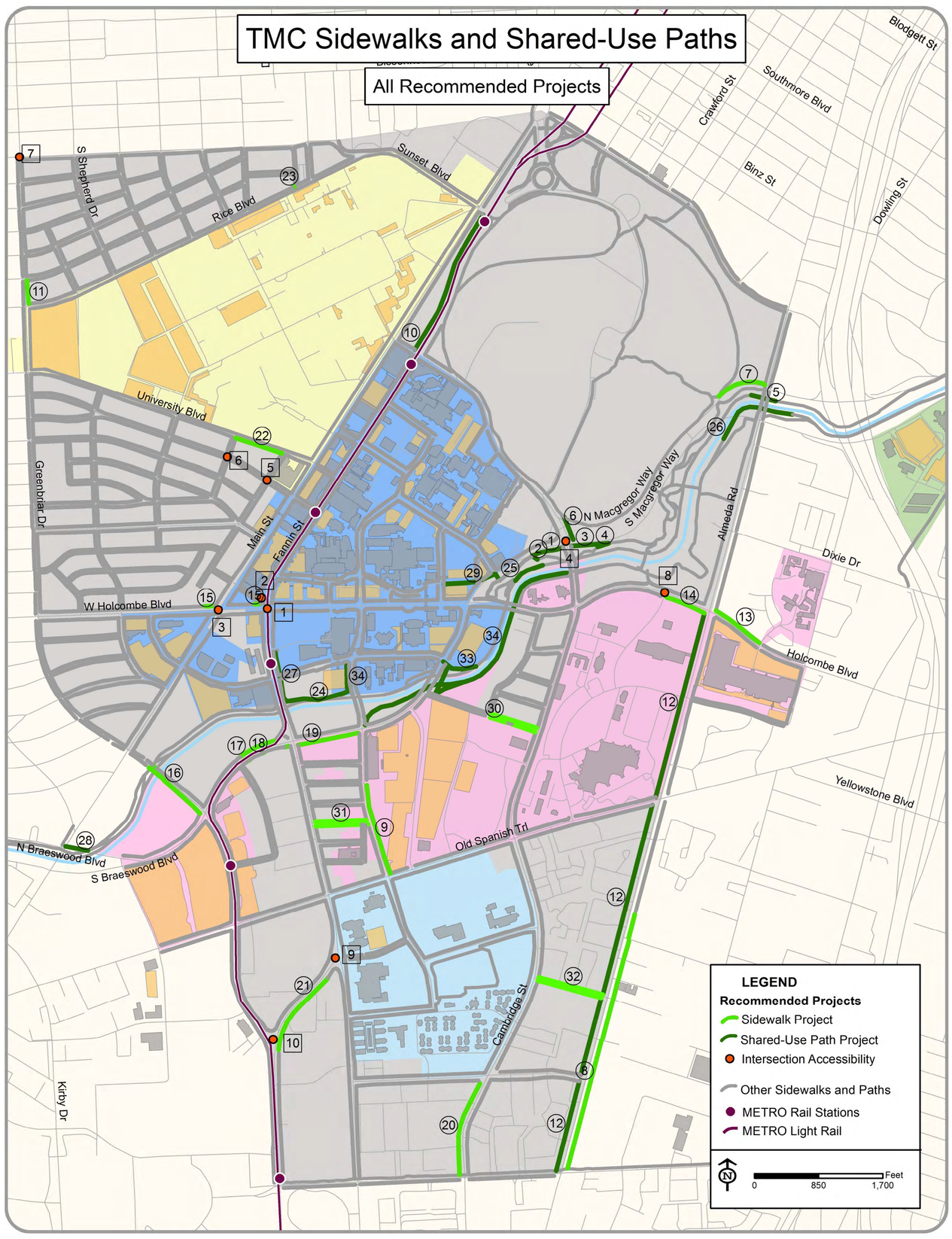

On-Street Bike Facilities Improvement Concepts

Serial Number	Conceptual Improvement	Limits	Scope of Work	Timeline	Estimated Constr. Cost*
				Short/Mid/ Long	(in 2014 Dollars)
1	East-Bertner-Moursund Shared lane	Cambridge to MacGregor	Shared lane • 1.8 mile route • Signs and pavement markings	Short	$34,150
2	Knight-West-Bertner Shared lane	Holly Hall to East	Shared lane • 0.8 mile route • Signs and pavement markings	Short	$12,857
3	Kent-Alumni-path-Freeman-Bertner Signed bike route	Sunset to Moursund	Signed bike route • 1.1 mile route • Signs	Short	$5,046
4	McClendon-Travis Signed bike route	Morningside to Dryden	Signed bike route • 0.8 mile route • Signs and traffic control modifications	Short	$3,924
5	Stockton Signed bike route	University to McClendon	Signed bike route • 0.4 mile route • Signs	Short	$1,682
6	N Stadium – S Braeswood Signed bike route	Reliant Park to bayou	Signed bike route • 0.9 mile route • Signs and intersection modifications	Short	$3,364
7	Pressler Shared Lane	Main Campus	Shared lane • 0.4 mile route • Signs and pavement markings	Short	$6,425
8	Wyndale Signed bike route	Cambridge to Braeswood	Signed bike route • 0.3 mile route • Signs and pavement markings	Short	$4,820

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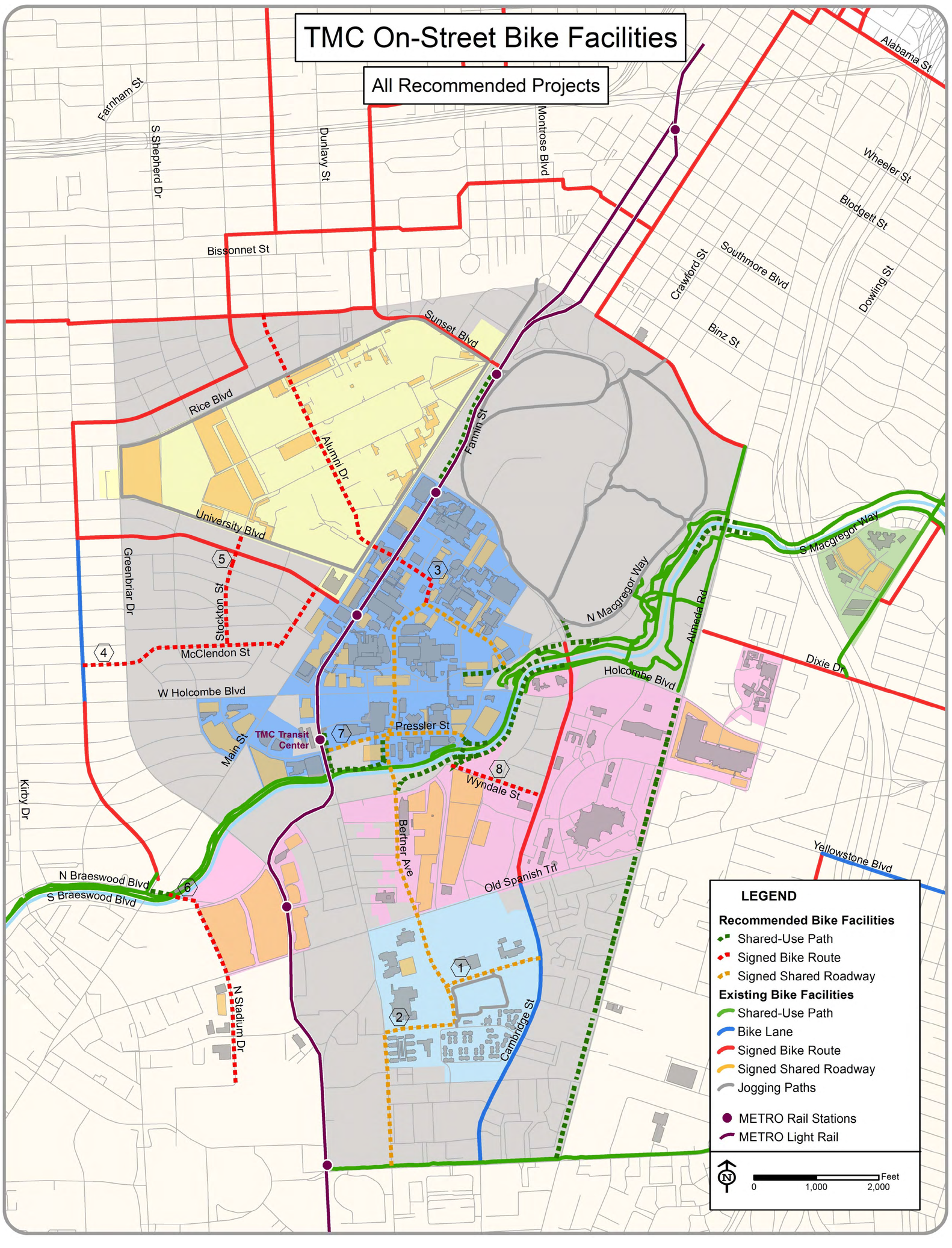
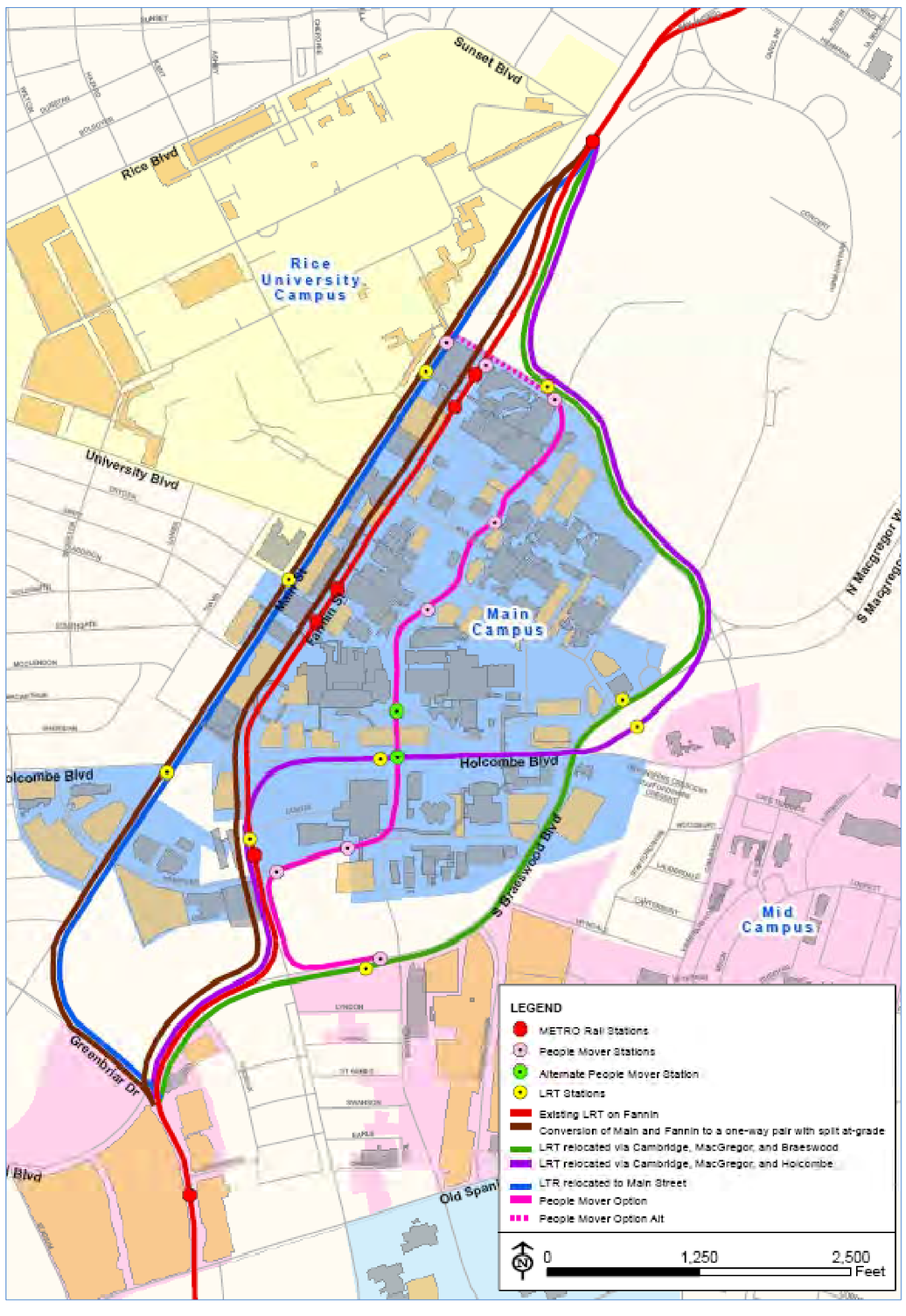
**Potential Funding Sources: City of Houston CIP Program, Grant Funds



Fannin Light Rail Transit Improvement Options

Serial Number	Conceptual Improvement	Limits	Scope of Work	Timeline	Estimated Cost*	Right-of-Way needed	Potential Funding Application
				Short/Mid/Long	(Millions in 2014 Dollars)	(acres)	
1	LRT moved to the west side of Fannin	Breswood Blvd to Sunset Blvd	Improve access to vehicular access points along Fannin. Removal of left turn barrier.	Long Term	$145	N/A	FTA New Starts
2	Conversion of Main and Fannin to a one-way pair with split at-grade LRT	Breswood Blvd to Sunset Blvd	Improve traffic flow by giving vehicular traffic to one of the lanes now occupied by LRT and by operation of both Fannin and Main streets as a one-way pair.	Long Term	$384	3	FTA New Starts
3	LRT relocated to Main Street	Breswood Blvd to Sunset Blvd	Relocate LRT entirely to Main Street where pedestrian activity and traffic turning movements are less intensive	Long Term	$317	3	FTA New Starts
4	LRT realigned in subway on Fannin	Greenbriar to Cambridge	Provide a transition from the current at-grade alignment to a subway alignment at a location sufficiently north of Cambridge Street to pass underneath. Greater opportunity to develop more travel lanes and wider sidewalks on Fannin.	Long Term	$729	N/A	FTA New Starts
5	LRT realigned on elevated structure on Fannin	Greenbriar to Cambridge	Provide a transition from the current at-grade alignment to an elevated alignment at a location sufficiently north of Cambridge Street to pass above. Allows separation of station passenger movements from LRT and street traffic. Greater opportunity to develop more travel lanes on Fannin.	Long Term	$429	N/A	FTA New Starts
6	LRT relocated via Cambridge, MacGregor, and Braeswood	Breswood Blvd to Sunset Blvd	Relocate LRT to maximize the potential for Fannin Street to carry vehicular traffic and accommodate traffic access to TMC parking or passenger drop-off and pickup locations	Long Term	$300	N/A	FTA New Starts
7	LRT relocated via Cambridge, MacGregor, and Holcombe	Breswood Blvd to Sunset Blvd	Relocate LRT to maximize the potential for Fannin Street to carry vehicular traffic and accommodate traffic access to TMC parking or passenger drop-off and pickup locations	Long Term	$293	4	FTA New Starts

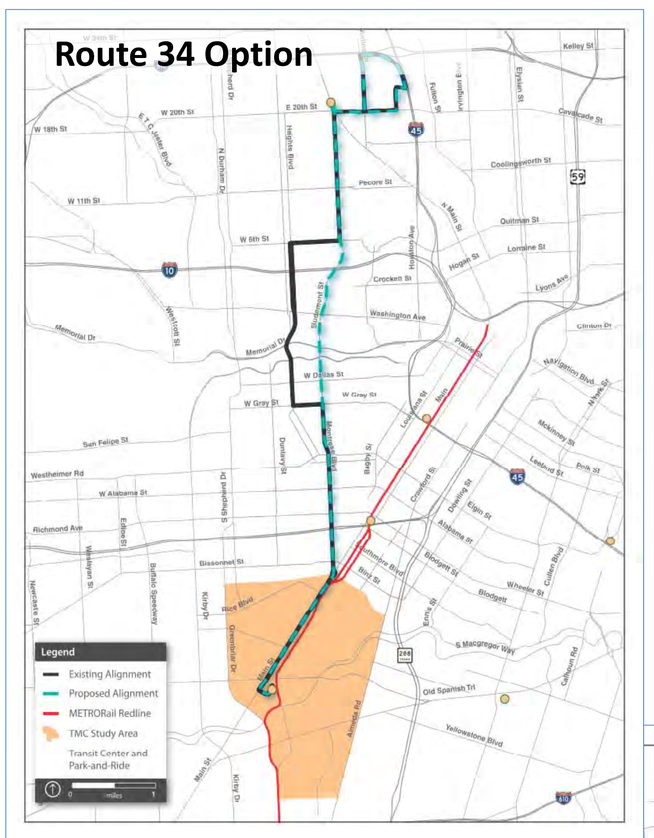
*Costs are estimated Construction Costs Only in 2014 Dollars. Do not include Right-of-way or Utilities Relocation Costs.
**Order of Magnitude Costs

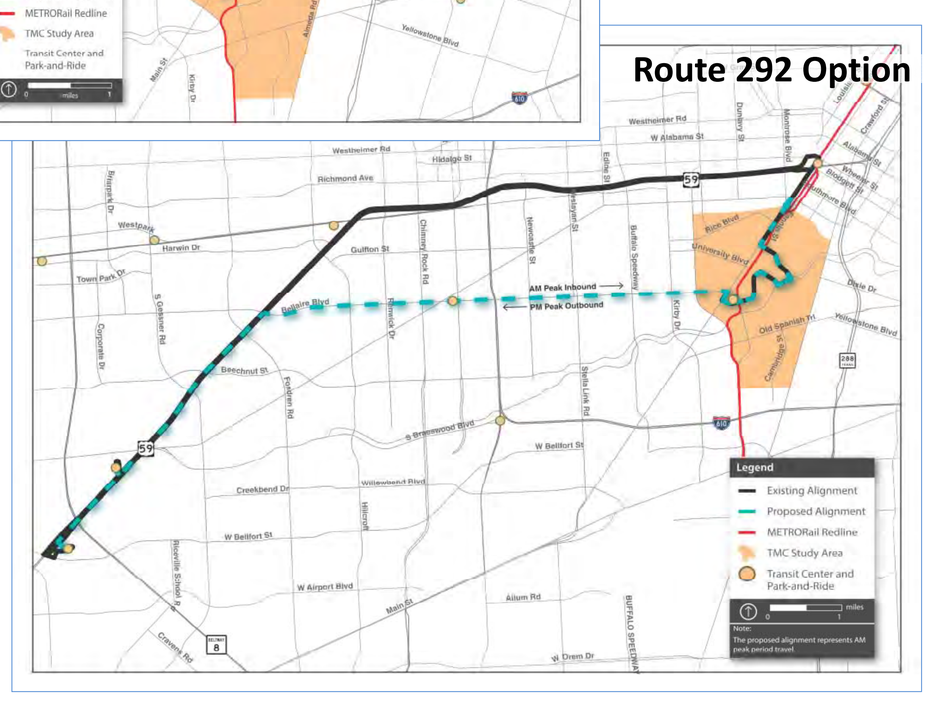


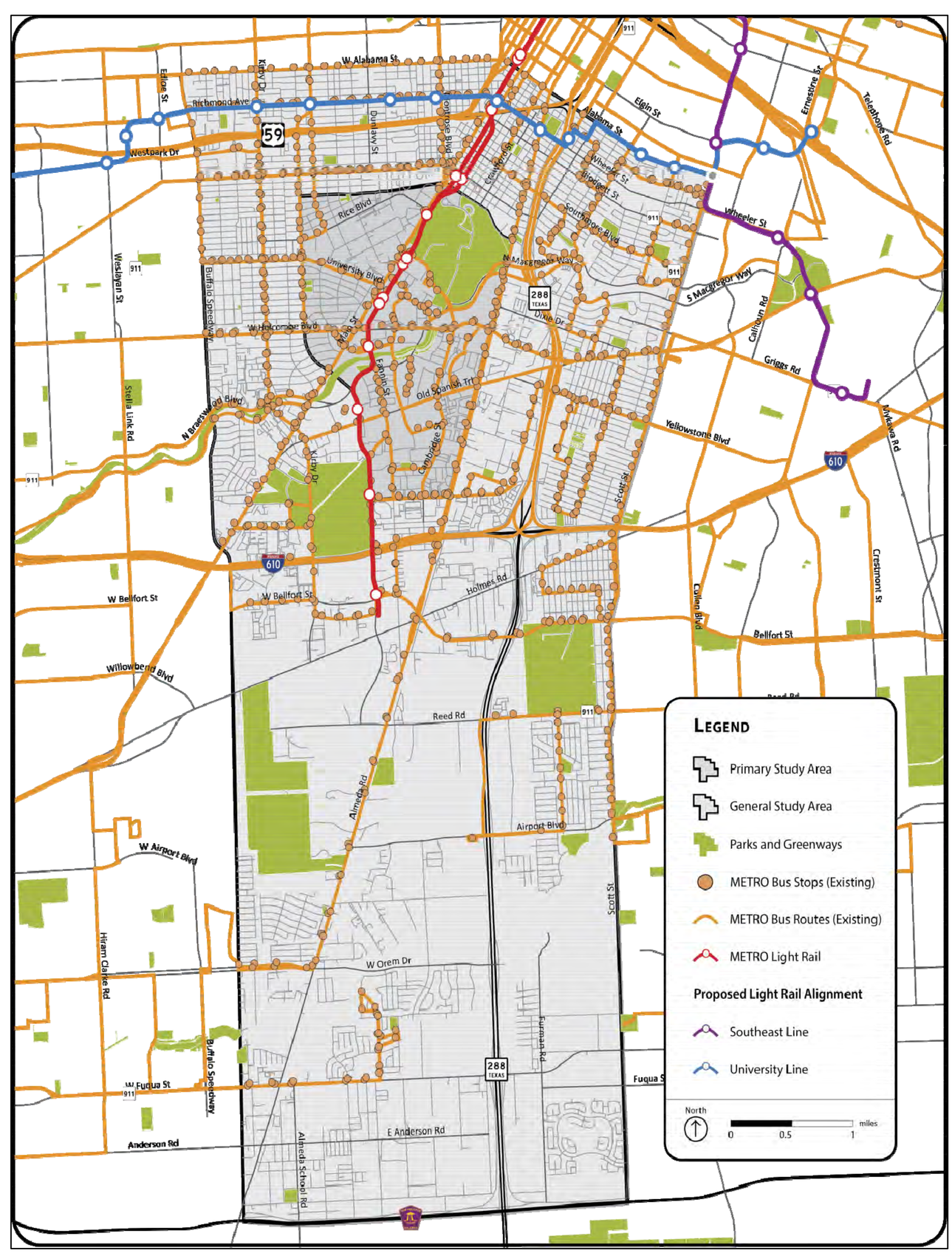
Transit Improvement Options

Operational / New Service

Serial Number	Conceptual Improvement	Limits	Scope of Work	Timeline	Potential Funding Application
				Short/Mid/Long	
1	Re-align route 34 and improve headways		Re-routing to avoid the diversion of the route to Heights Boulevard and Waugh Drive, instead using Studiwood Street, Studemont Street, and Montrose Boulevard. Peak-period headways to be reduced from 25-30 minutes to 20 minutes.	Short Term	METRO
2	Re-route peak-direction route 292 service	US 59 to Medical Center	Route 292 AM Peak trips be re-routed from US 59 to Bellaire Blvd - Holcombe Boulevard Transit Center, and then follow the present afternoon-peak routing through TMC. During PM Peak, revenue service would begin at Main Street and Bissonnet Street, follow the present AM Peak routing to the TMC, and then continue via Holcombe-Bellaire to US 59.	Short Term	METRO
3	Extend route 402 into the TMC main campus or to VA Medical Center	TMC TC terminus to TMC main campus or to VA Medical Center	The effectiveness of this route might be strengthened by extending service beyond its present TMC TC terminus, either farther into the Medical Center main campus or to the VA Medical Center.	Short Term	METRO
4	Retain the 26/27 route as it is; modify route 426 to include service to VA Medical Center		Modification of route 426 to include service to the VA Medical Center increasing passenger market.	Short Term	METRO
5	Campus shuttles for connections to new remote parking /Transportation facility	N/A	New remote parking: privately operated, shared management, METRO	Short Term	TMC
6	Commuter Rail Corridors - US 90A		Needs a separate Study	Long Term	METRO







Your Comments are Important

- Comments Box
- Send email in the next 30 days to tmcpublicmeeting@pbworld.com
- Project Website – http://www.publicworks.houstontx.gov/traffic/tmcstudy.html
- City Project Manager – Mr. Khang Nguyen
- Next Steps
  - Final Report
  - Transit-related recommendations will be forwarded to Metro for consideration
  - Trail-related recommendations will be forwarded to Parks and Recreation Department
  - Sidewalk gaps will be evaluated under the Safe Sidewalk Program
  - Intersection and roadway-related recommendations will be prioritized in accordance with the CIP process