TMC Mobility Study

Stakeholder Group
Meeting # 2
April 1st, 2014

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Agenda

- Introductions
- Review of Items Already Completed
  - Background Information Report
  - Stakeholder Interviews & Public Input
  - Study Objectives
  - Initial List of Project Concepts
    - Roadway
    - Parking
    - Transit
    - Fannin LRT Corridor
    - Ped/Bike
- Status of On-Going Work
  - Roadway Functional Classification Update for Complete Streets
  - TMC Mobility Study Report
- Updated Schedule

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Introductions

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Review of Items Already Completed

Background Information Report

1. Introduction
2. Related Studies
3. Roadways
4. Traffic
5. Transit
6. Parking
7. Pedestrian and Bicyclists
8. Travel Demand Management
9. Socioeconomics

- Draft on City's Project website

http://www.publicworks.houstontx.gov/traffic/tmcstudy.html

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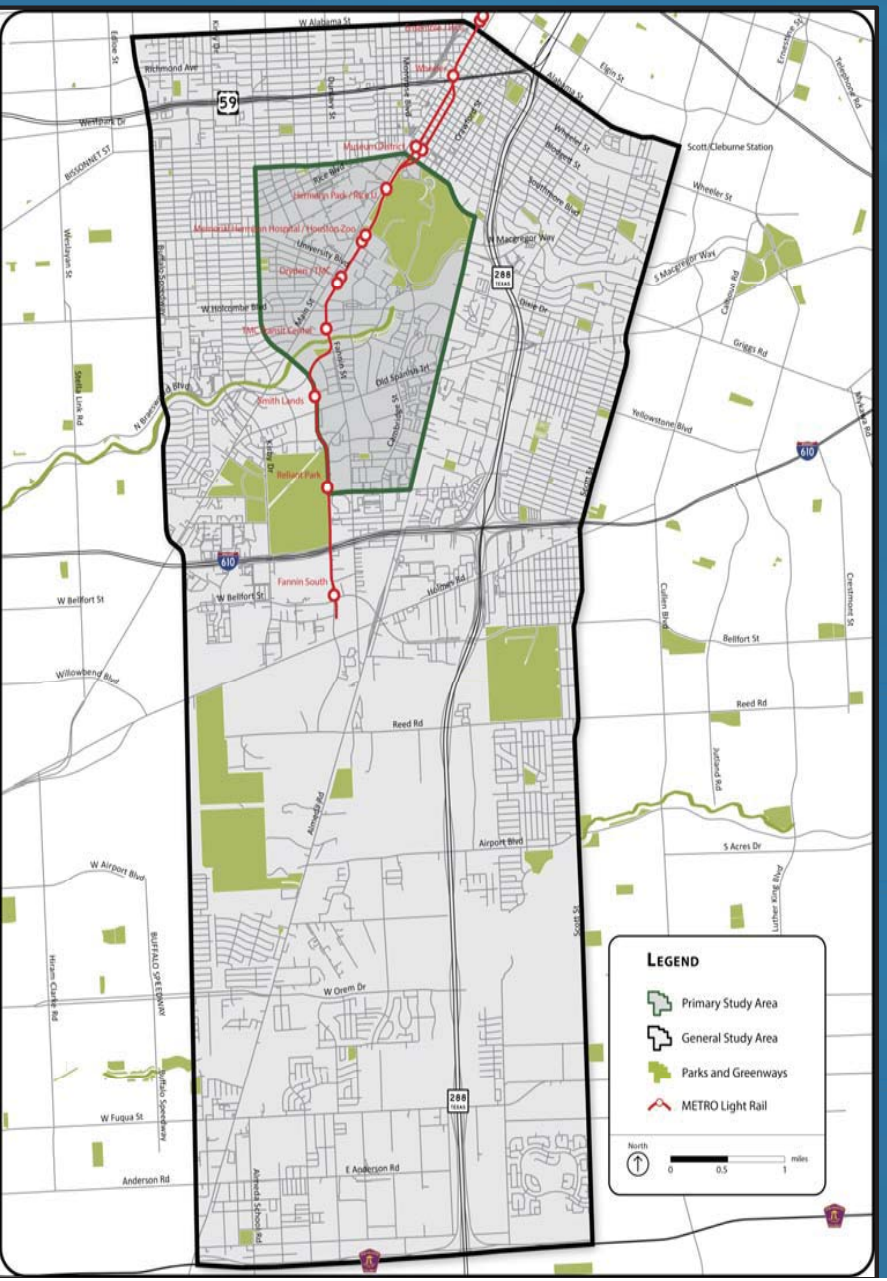
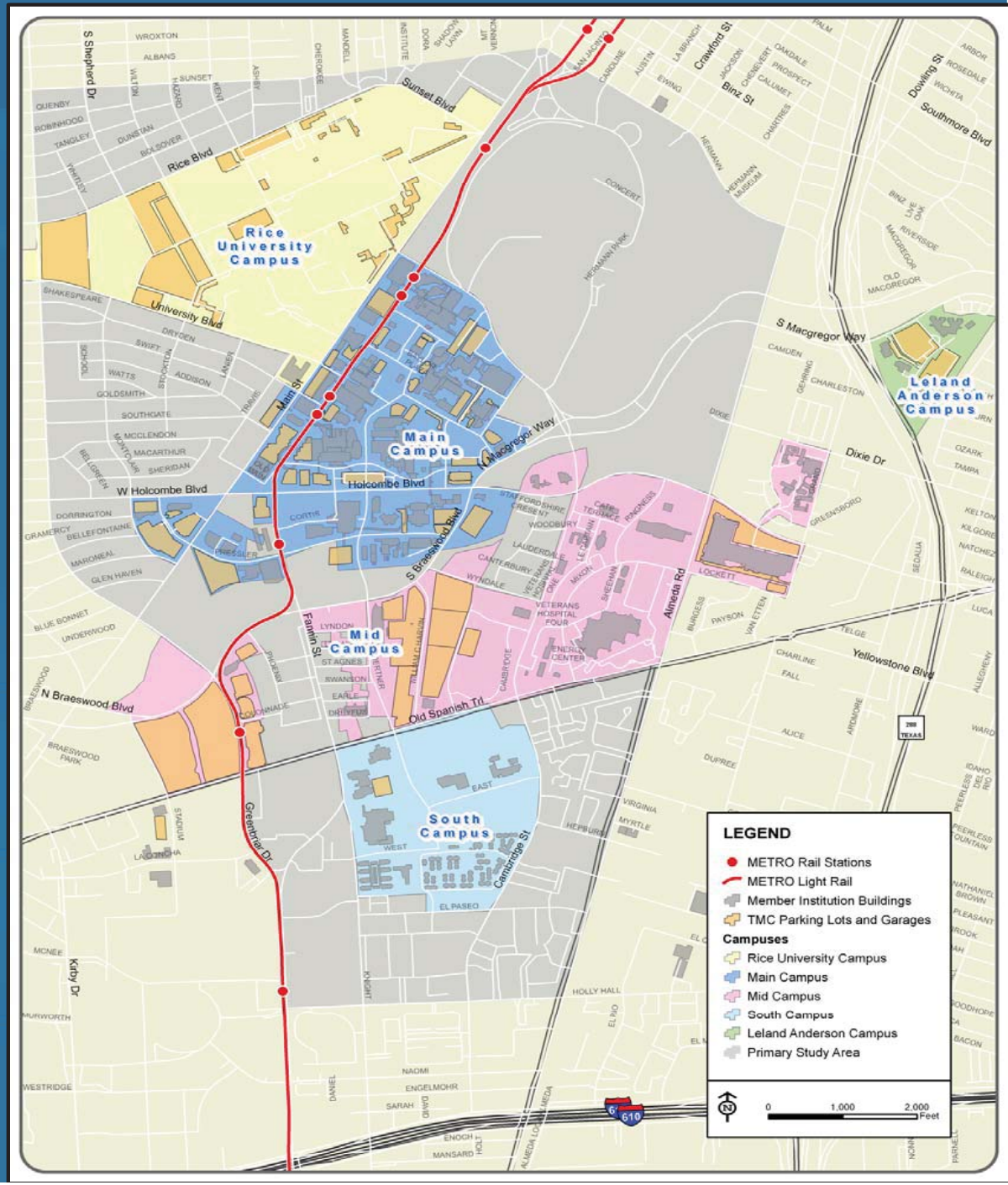
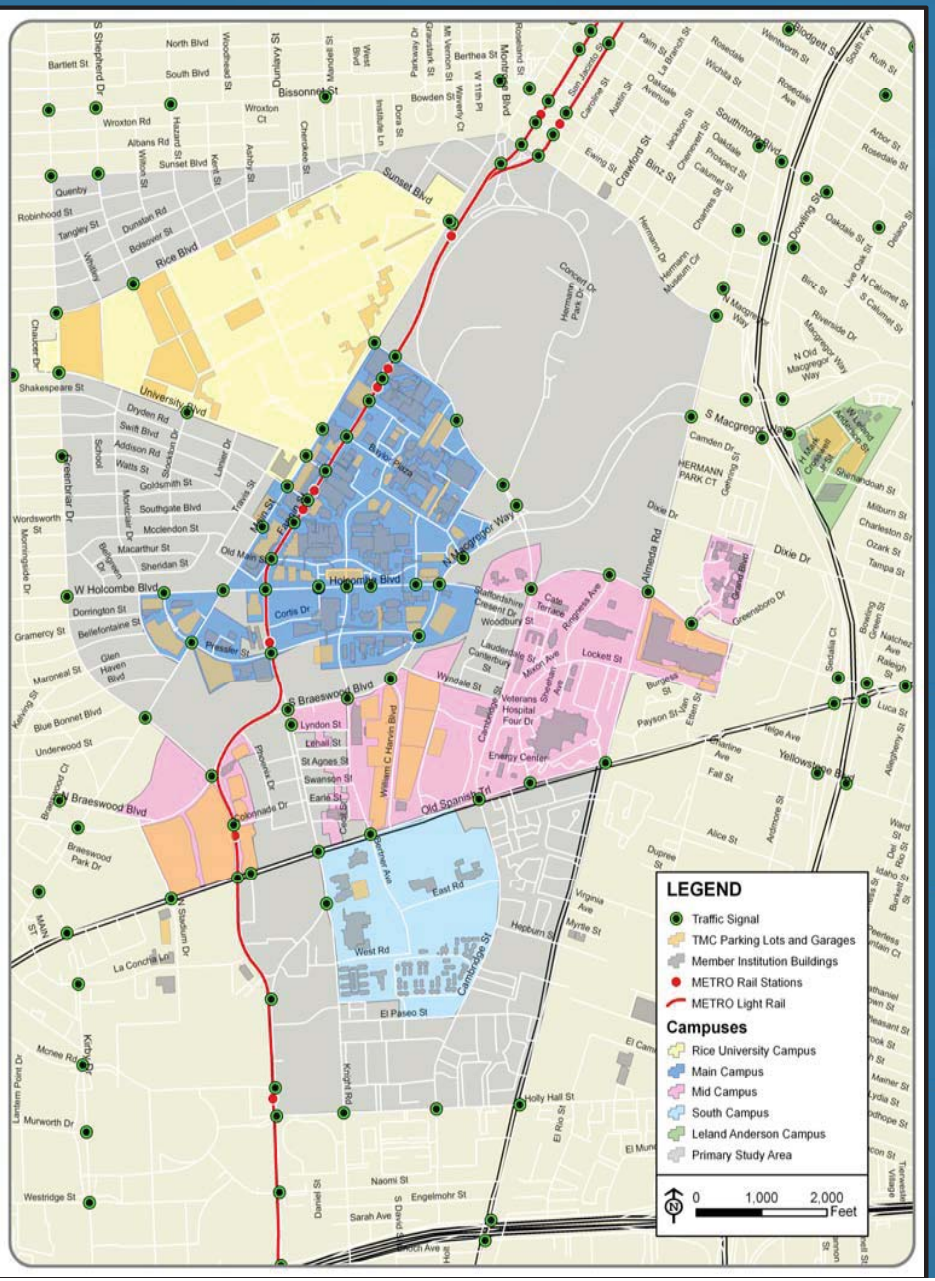
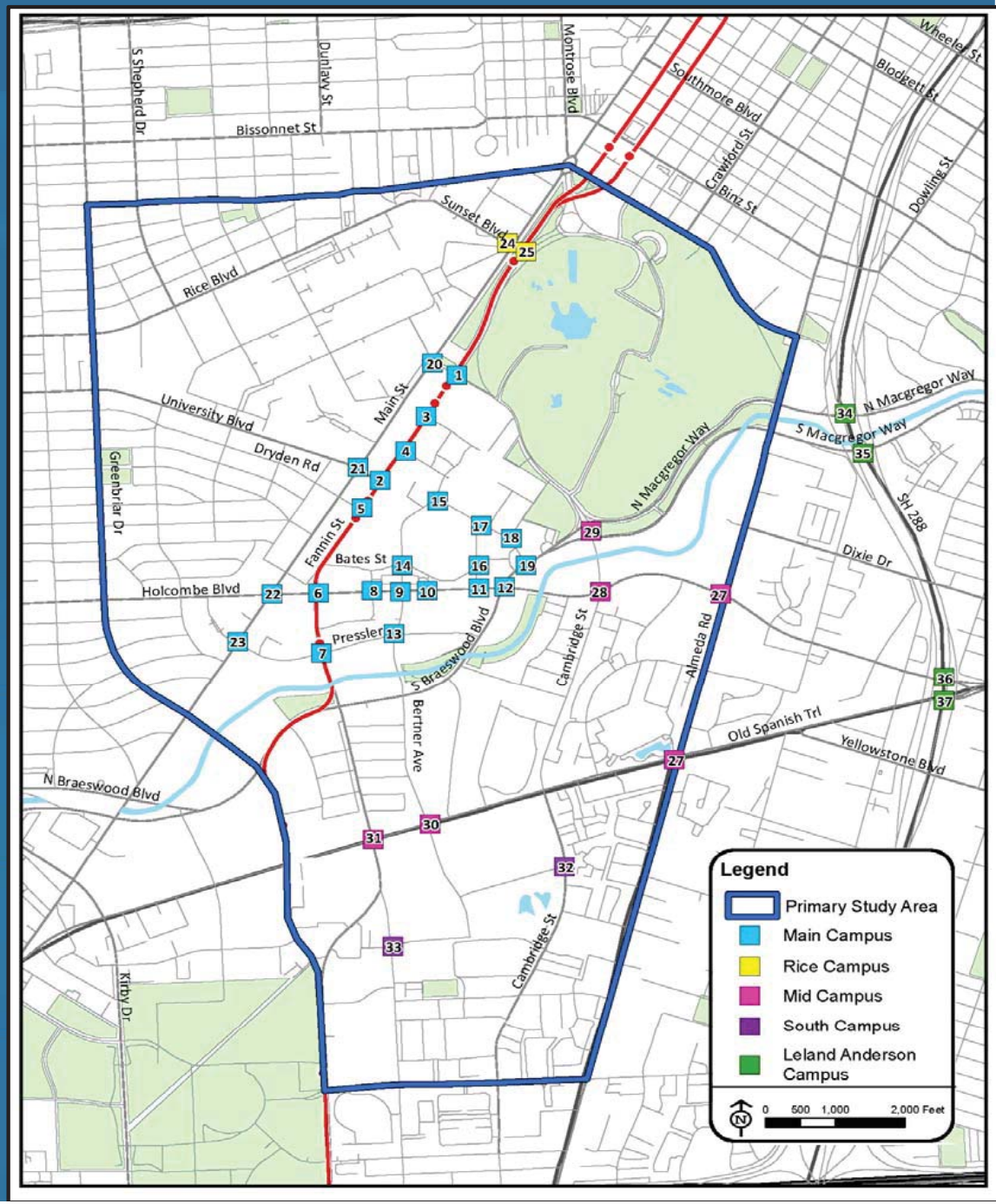
Background Information Report- Study Area





Background Information Report
Traffic Signal Locations





Background Information Report
Weekday Peak Hour LOS

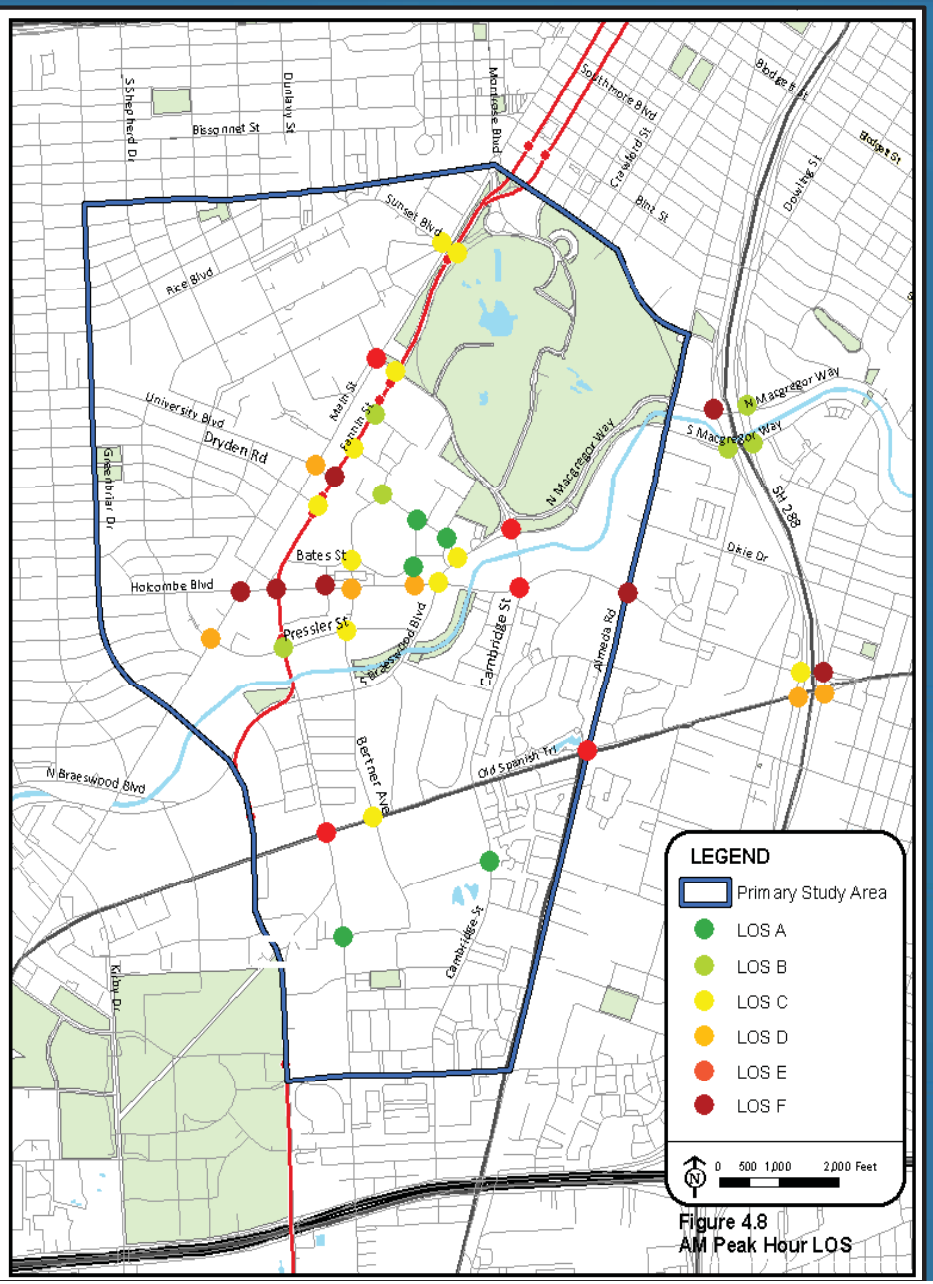


Figure 4.8
AM Peak Hour LOS

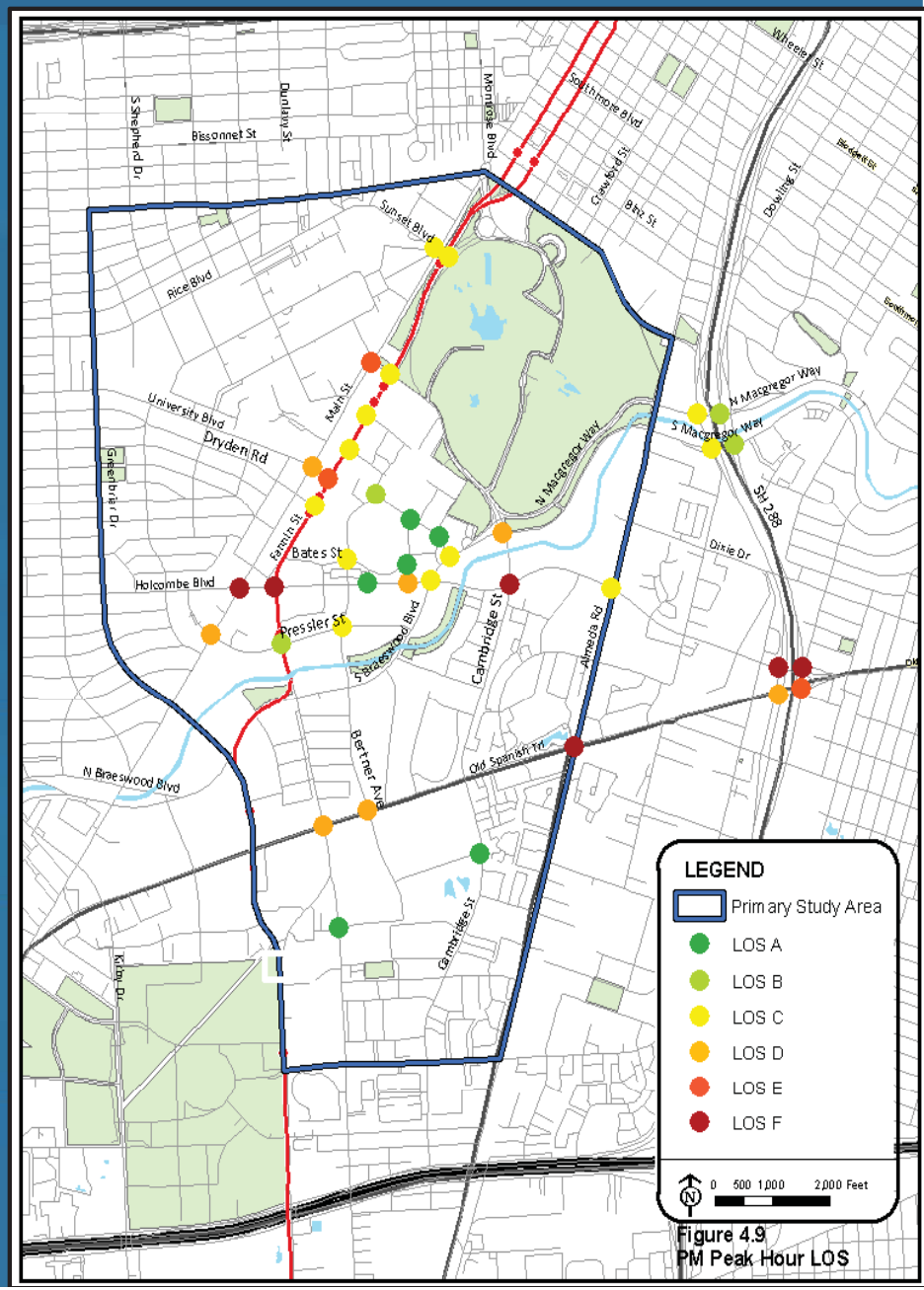
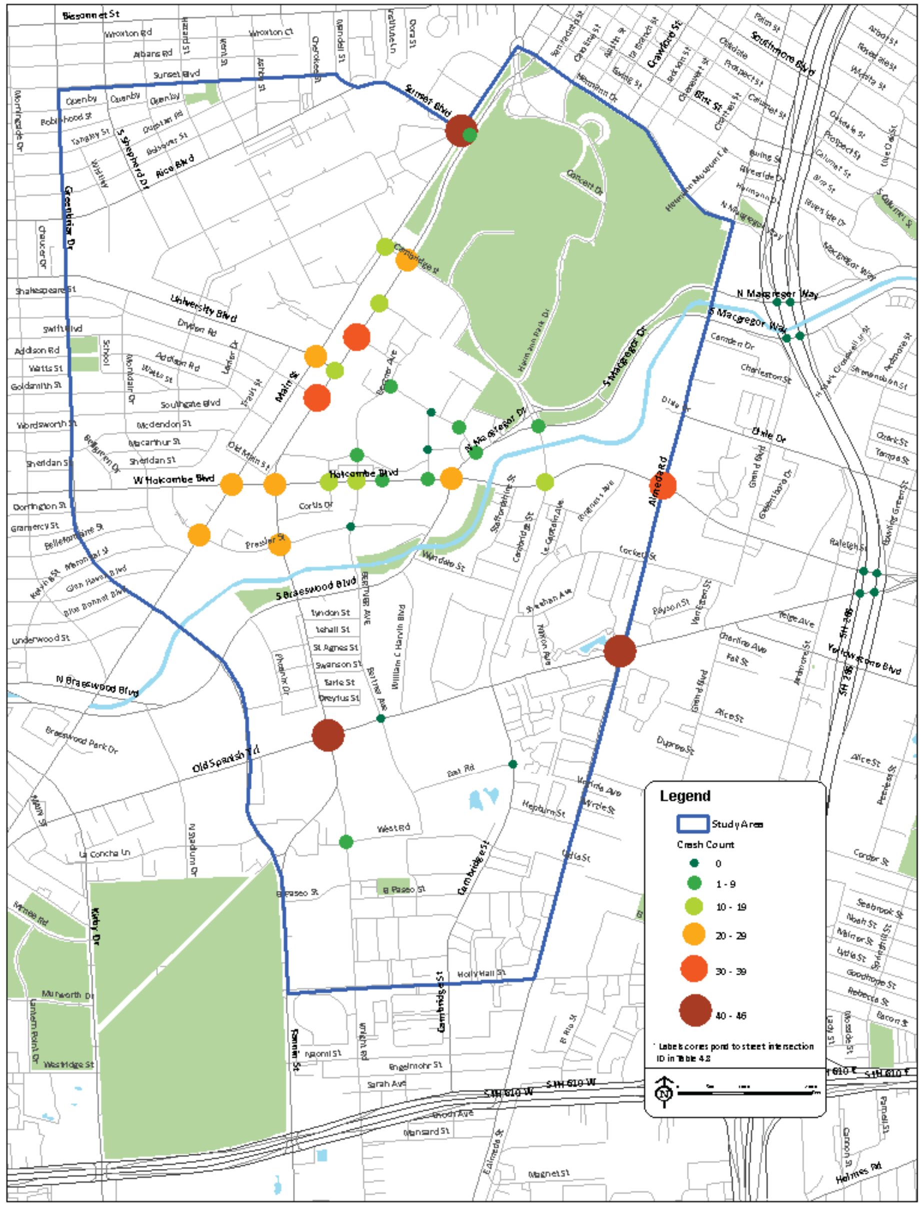


Figure 4.9
PM Peak Hour LOS

Background Information Report- Number of Crashes at Study Intersections From 2007 to 2011



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Review of Items Already Completed

Stakeholder Interviews

Summary Matrix

- 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

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Review of Items Already Completed

Public Comments Received

- Look for multimodal access south of Loop 610
- Increase parking capacity for future
- Improve Greenbriar quality
- Increase HOV
- Increase transit services
- ADA access improvement
- More Stakeholder Involvement
- Minimize impact on neighborhoods
- Access to high-rise on Holcombe
- Bicycle Connectivity issue at several locations
- Spring break traffic complaints

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Modal Analyses
Street Network & Intersection/bottleneck Analysis

- Existing Conditions Analysis completed
- Worked with H-GAC to develop future year model forecasts
- Future Year Analysis
  - Fannin Street Corridor Analysis
  - Systemwide Analysis
  - Refining Project Concepts
- Identified roadway improvement concepts based on existing and future demand

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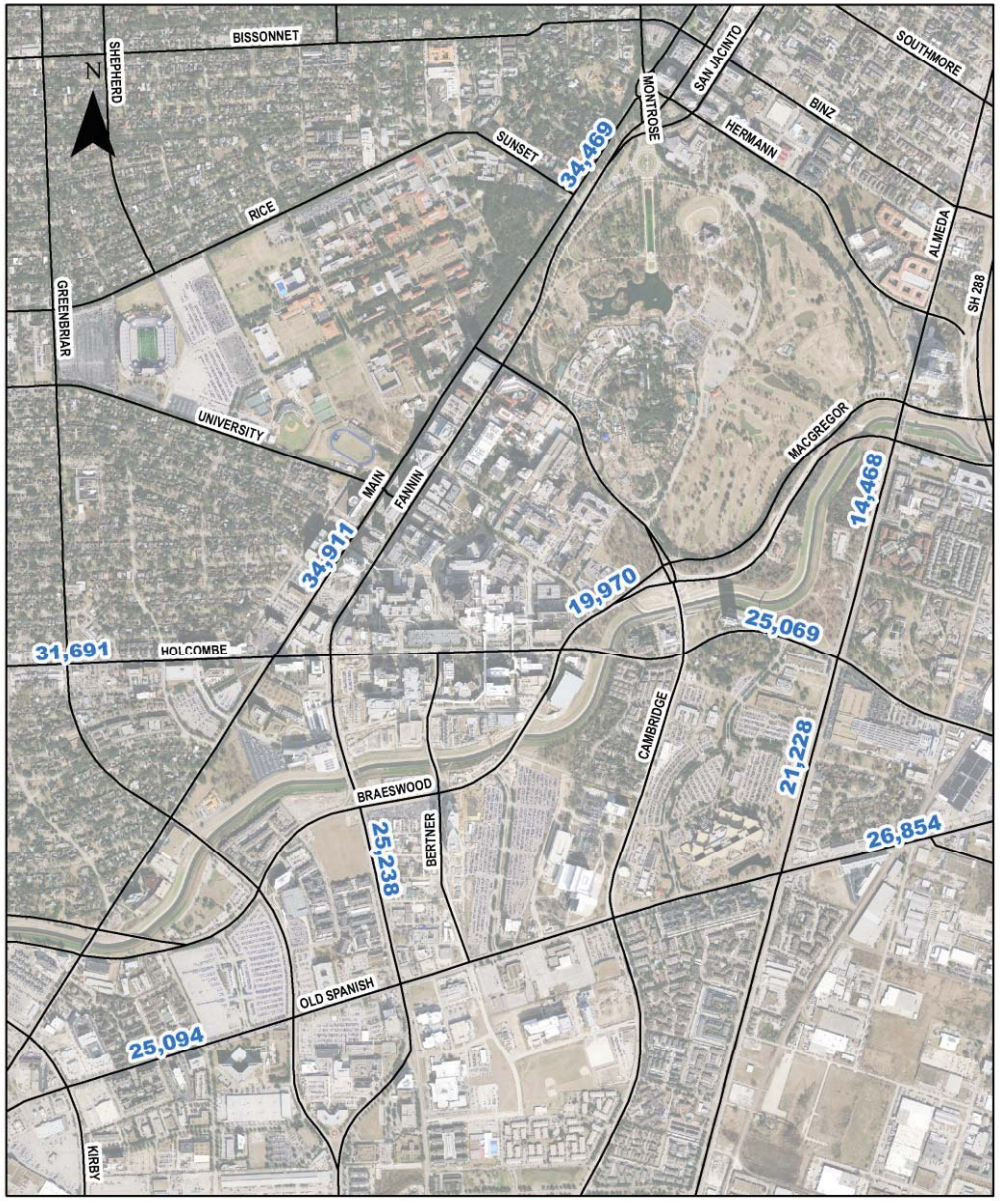
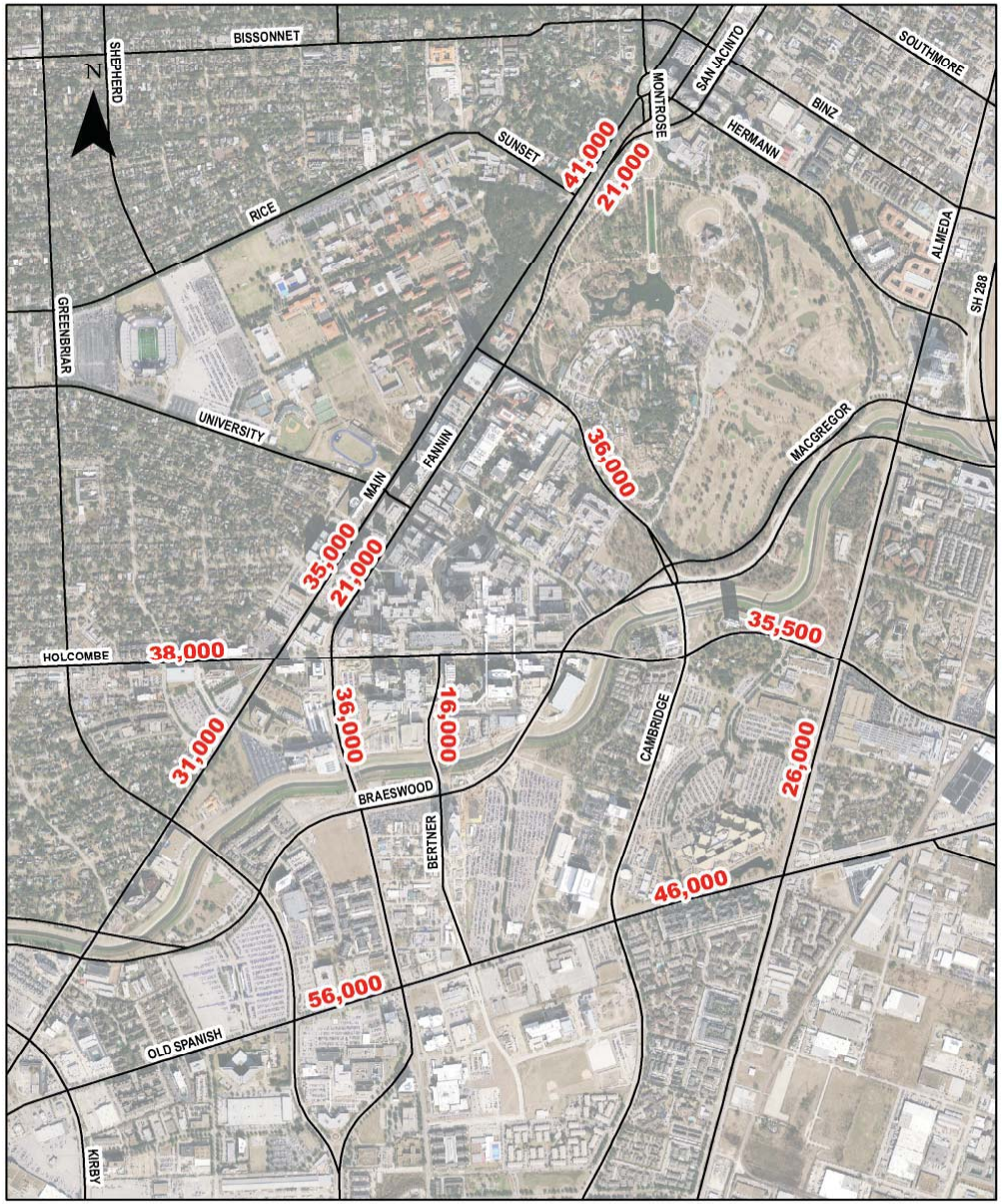
Future Year No-Build Traffic Volume Growth

TEXAS MEDICAL CENTER MOBILITY STUDY
2013 24-Hour Volumes

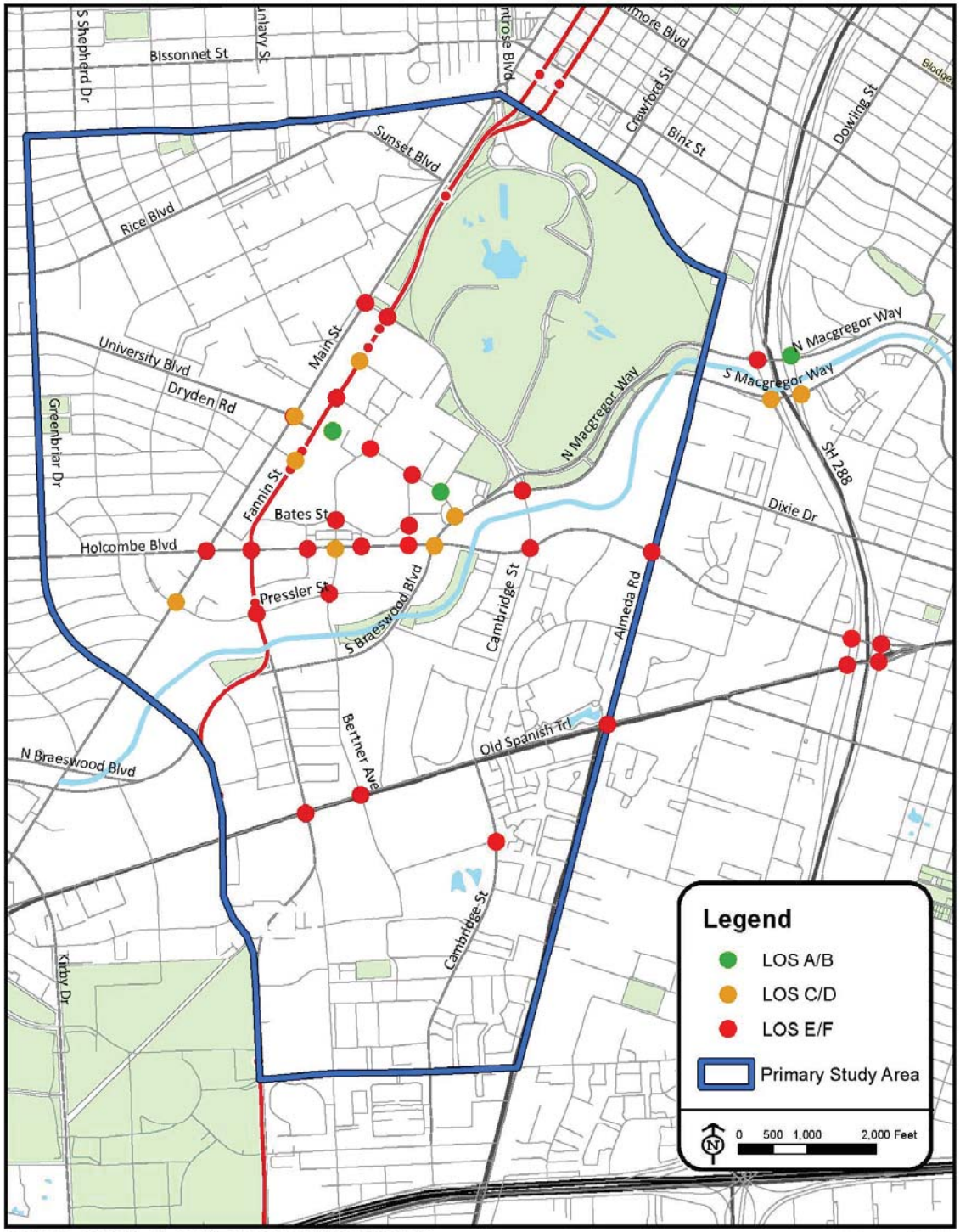


TEXAS MEDICAL CENTER MOBILITY STUDY
2035 24-Hour Volumes



Future Year No-Build Street Network Analysis

2035 FUTURE CONDITIONS - LEVEL OF SERVICE



TEXAS MEDICAL CENTER MOBILITY STUDY

March 2014

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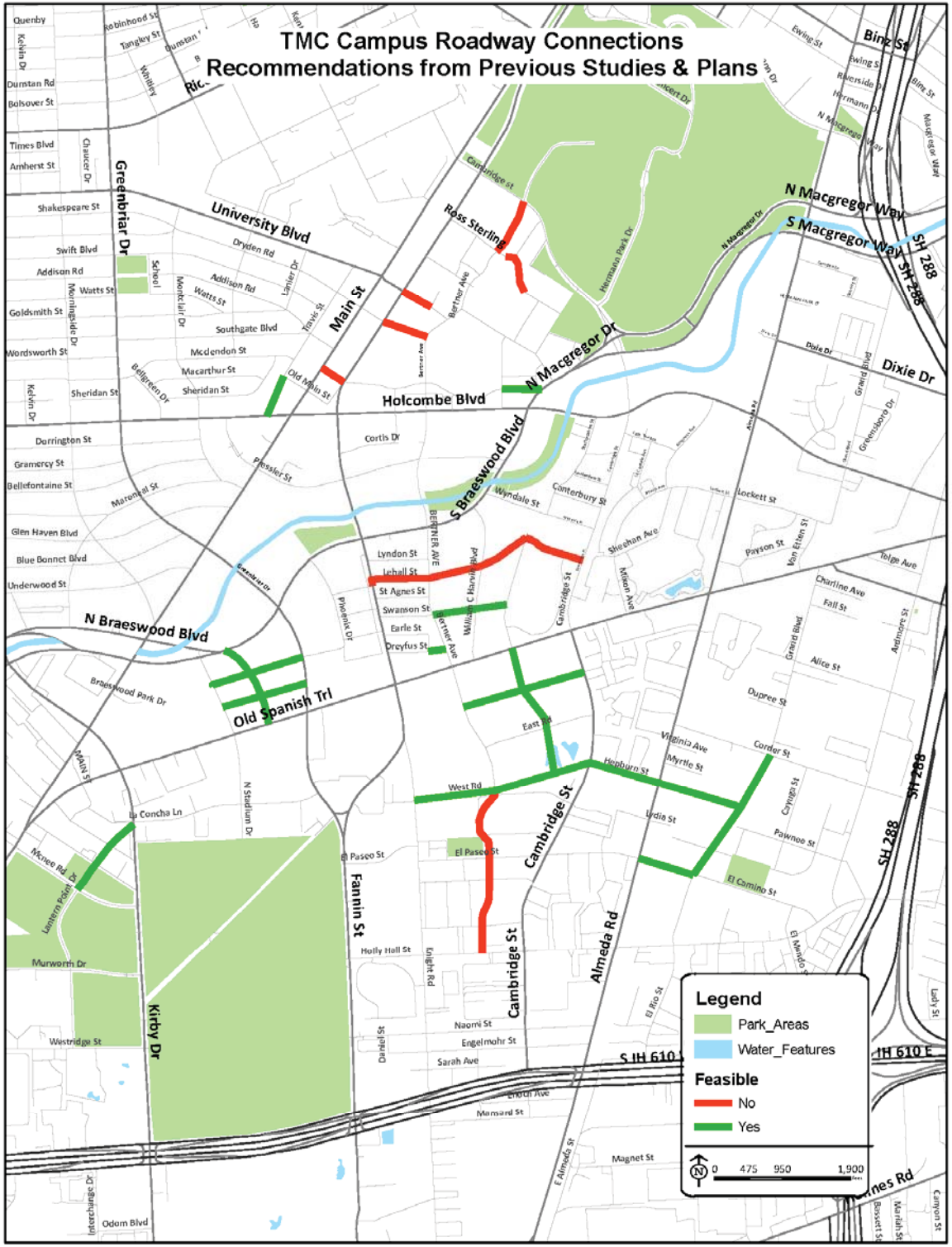
Local Roadway Connections

The Campus connections list was composed by merging such recommendations from all previous TMC studies and plans.



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Street Network
Short-term Improvements

- **Holcombe @ Main**
  - Turn-bays NBR, EBR, WBR, NBL
- **Holcombe @ Almeda**
  - Turn-bay EBL
  - Protected Phase E/W
- **Fannin at Pressler**
  - Turn-bays EBL, WBL Bay & Signal Timing Improvements (LRT)
- **Main @ Cambridge**
  - Turn-bays NBR, SBR, WBR
- **Almeda @ OST**
  - Turn-bays EBR, NBL dual bay
- **288 NBFR @ OST**
  - WBR bay 150'
  - NBL dual bay 150'
- **288 NBFR @ Holcombe**
  - Turn-bays NBL dual
  - NBT Thru and Thru/Right
- **Corridor Signal Timing Optimization**

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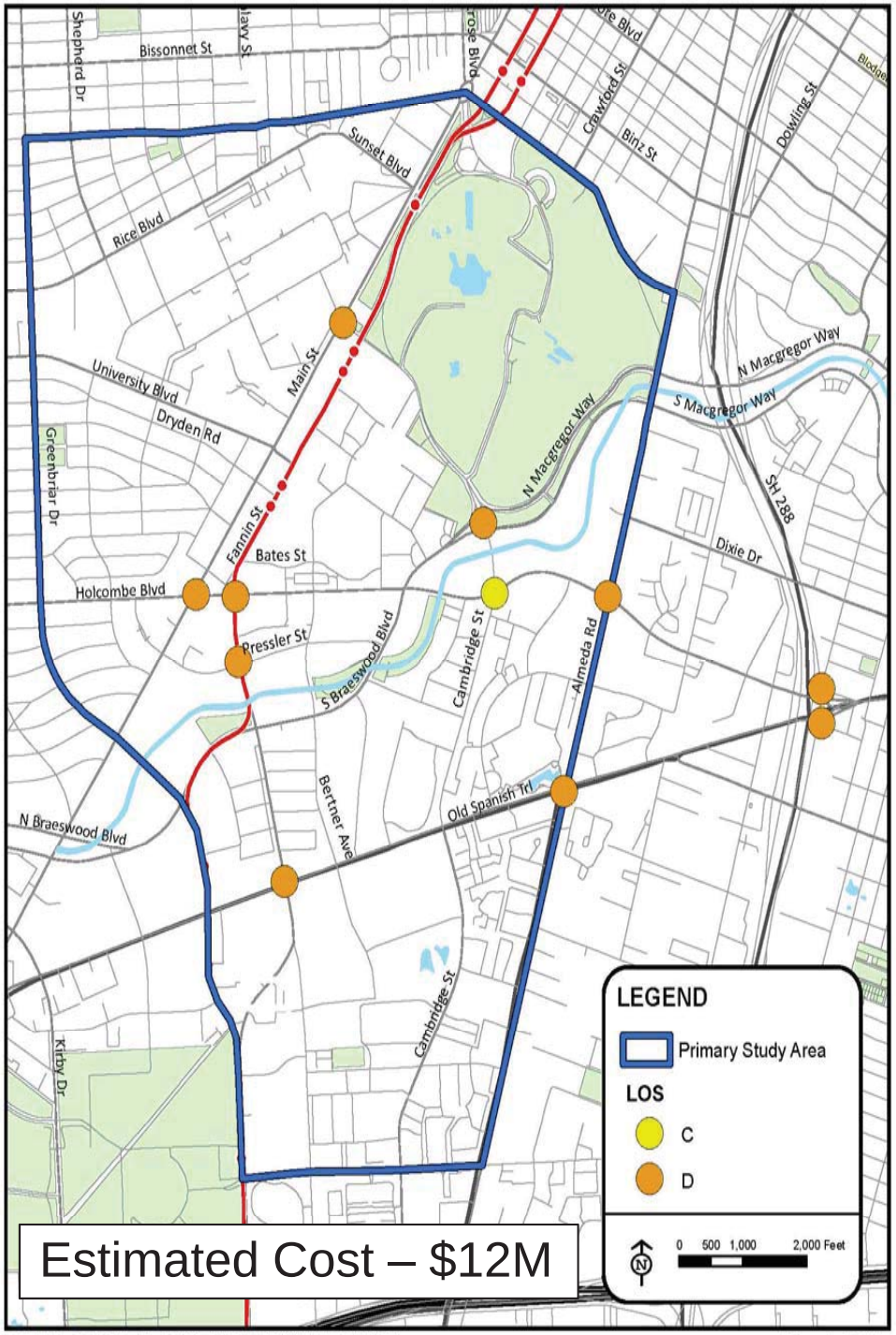
SHORT TERM IMPROVEMENT LOCATIONS



Estimated Cost – $12M

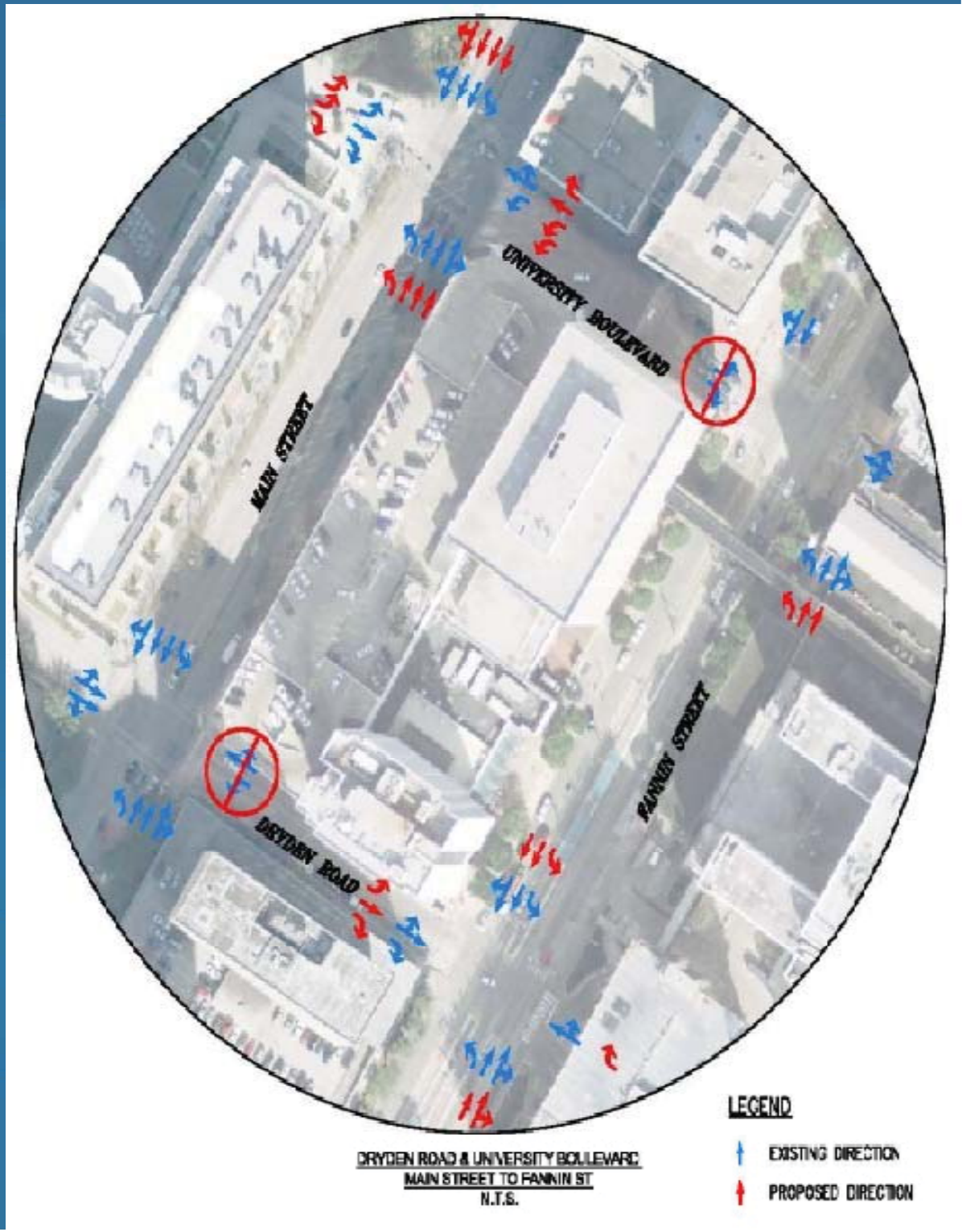
TEXAS MEDICAL CENTER MOBILITY STUDY March 2014

Street Network

Short-term Improvements

Conversion of University/Dryden to One-way Pair

- Local Circulation
- Estimated Cost - $1M



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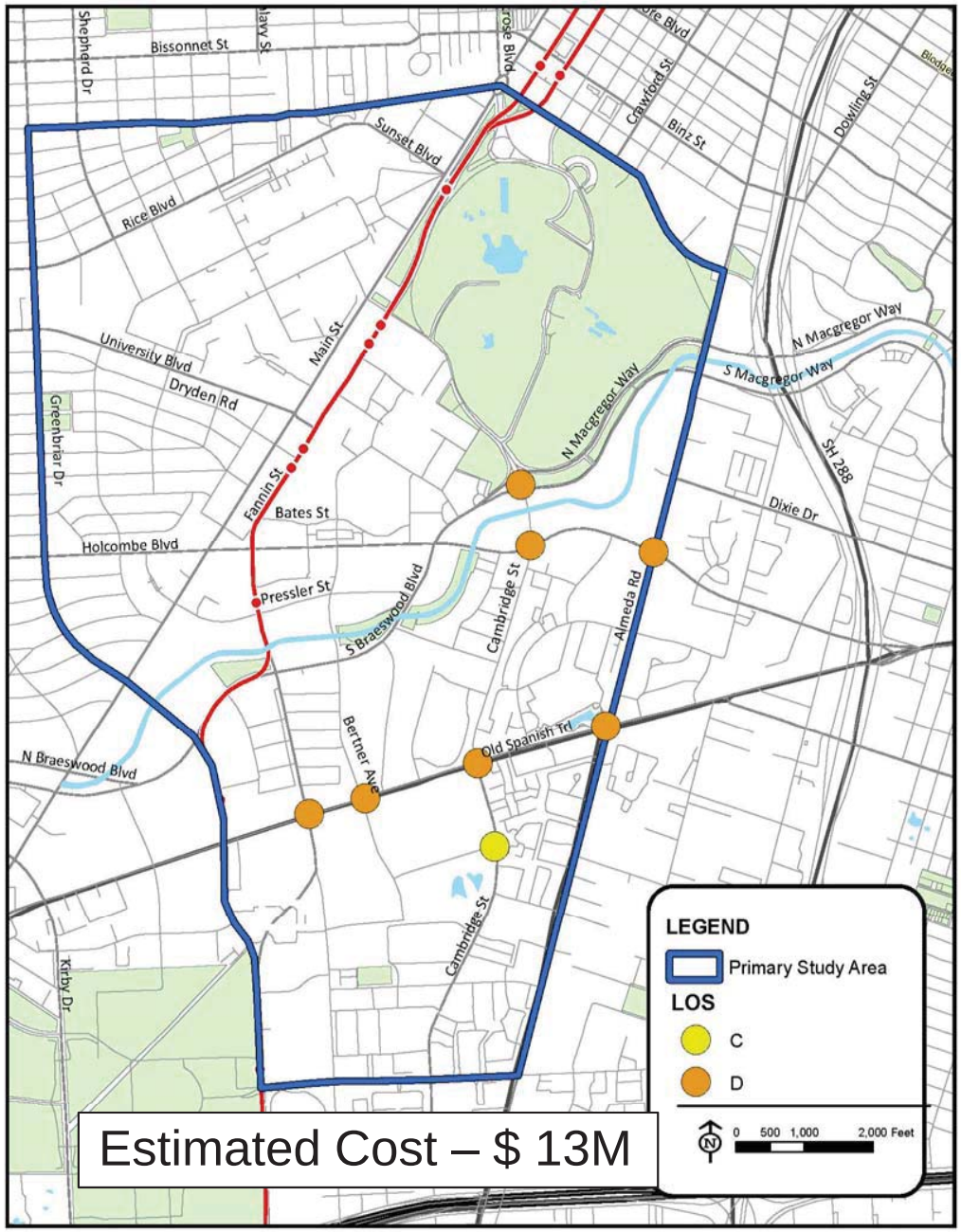
Street Network
Mid-term Improvements

- **Cambridge at East Drive**
  - Possible Signalization
  - Turn Bays – NBL, SBU, EBR dual
- **OST at Fannin**
  - Exclusive Right Turn Bays – NB, SB, EB, WB
- **OST at Bertner**
  - Dual Turn Bays SBL, EBL
  - Dual SBR Turn Bays, WBR Turn Bay
- **OST at Cambridge**
  - Provide additional exclusive right and left turn-lanes
- **OST at Almeda**
  - Turn Bays – WBL dual, SBR, NBR, EBR
- **Cambridge at Holcombe**
  - Turn Bays – WBL, EBL, EBR
- **Cambridge at Braeswood**
  - Turn Bays – WBR Dual
- **Almeda at Holcombe**
  - Turn Bays – NBL Dual, EBL Dual, EBR
- **Main @ Cambridge**
  - Turn-bays NBR



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Roadway – List of Projects

Long-term

Long Term Improvements				
Location	Option	Details	Cost	Right-of-Way
East-West Access Improvements	Holcombe Blvd. - Option 1	Holcombe Blvd. - Transit Center Option	$ 30 Million	RoW cost to be determined
	Holcombe Blvd. - Option 2	Holcombe Blvd. - Grade Separated Express Lanes	$ 120 Million	RoW cost to be determined
	Old Spanish Trail - Option 1	Old Spanish Trail - Grade Separated Express Lanes	$ 85 Million	RoW cost to be determined
North-South Access Improvements	Cambridge 6-Lane Option	Cambridge 6-Lane Option(Betn. Holcombe and Main)	$16 Million	RoW cost to be determined
	Almeda Road - Option 1	Almeda Road - Transportation Terminal	$ 15 Million	RoW Available
	Almeda Road - Option 2	Almeda Road - Direct Connector to Transportation Terminal	$30 Million	RoW Available
		Almeda Road - 8-Lane Option (Betn. IH 610 and N. MacGregor Way)	$ 28 Million	RoW Available

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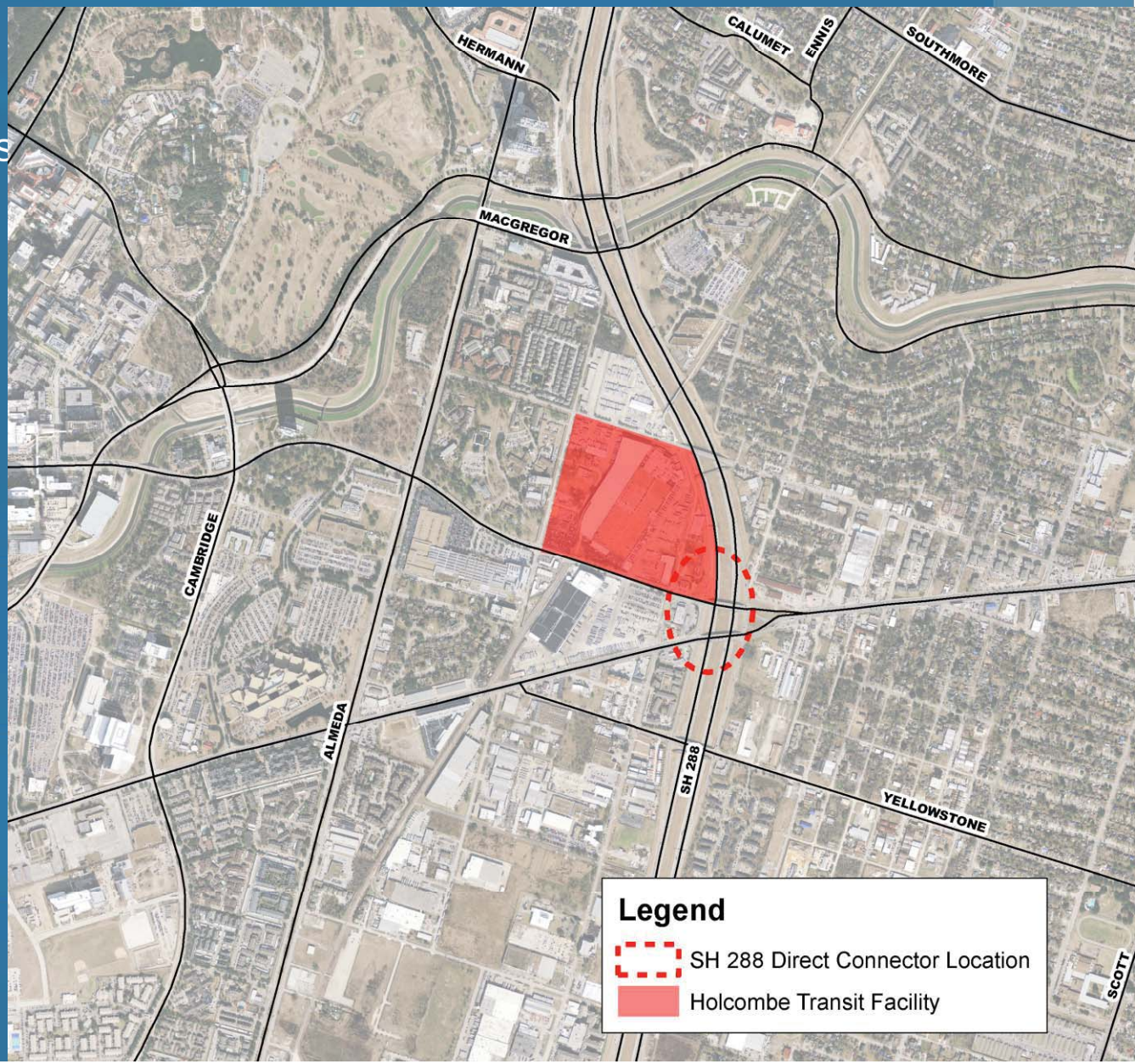
Roadway Long-term Improvements

Holcombe Boulevard Option 1 – Holcombe Transportation Terminal

- 2000 Space Garage
- Local Intersection Improvements
- Estimated Cost - $30M



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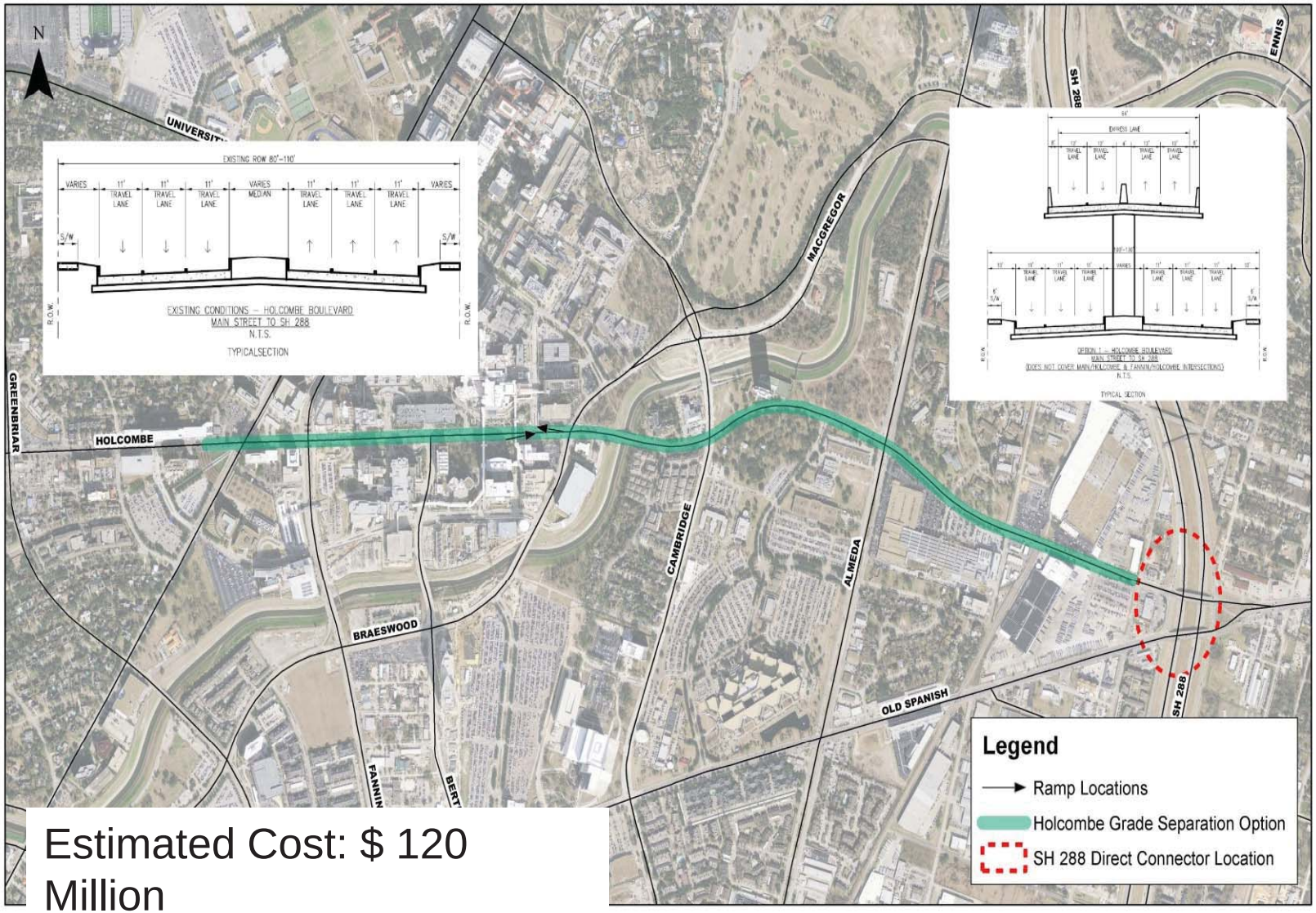
Roadway Long-term Improvements

Holcombe Boulevard Option 2 – Grade Separation



Estimated Cost: $ 120 Million

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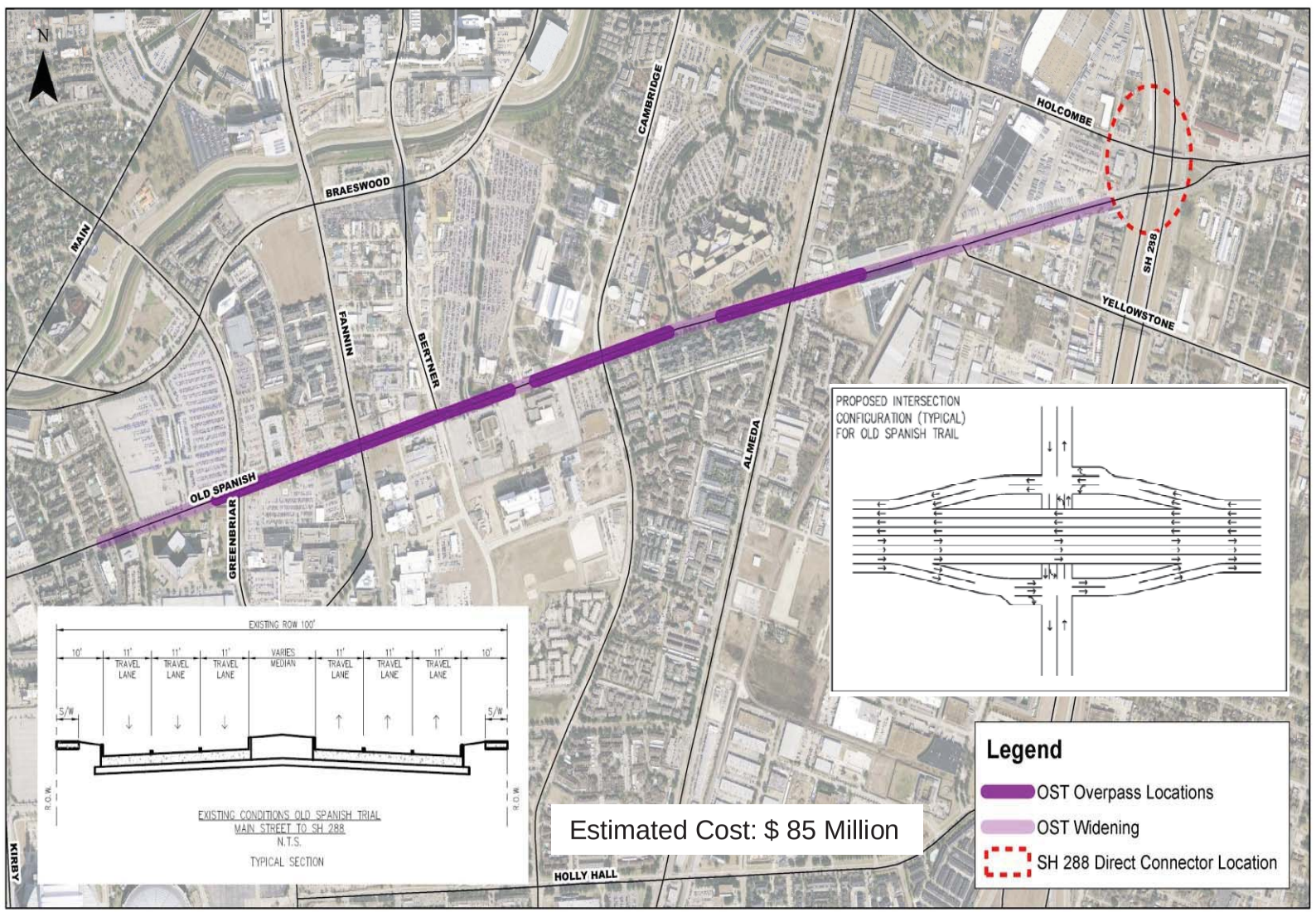
Roadway Long-term Improvements

Old Spanish Trail Option 1
Grade Separation at Critical Intersections



Estimated Cost: $ 85 Million

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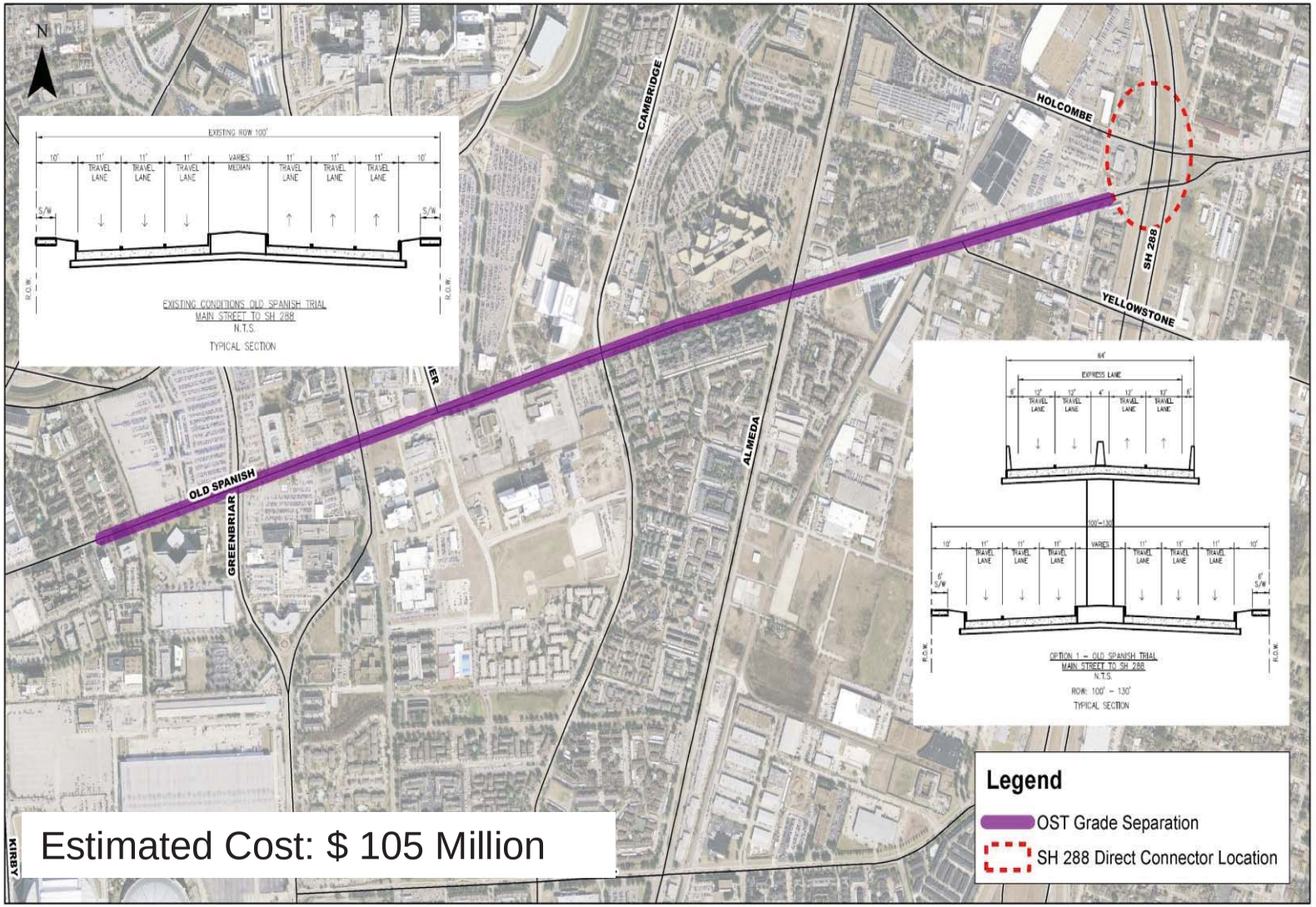
Roadway Long-term Improvements

Old Spanish Trail Option 2 – Grade Separation



Estimated Cost: $ 105 Million

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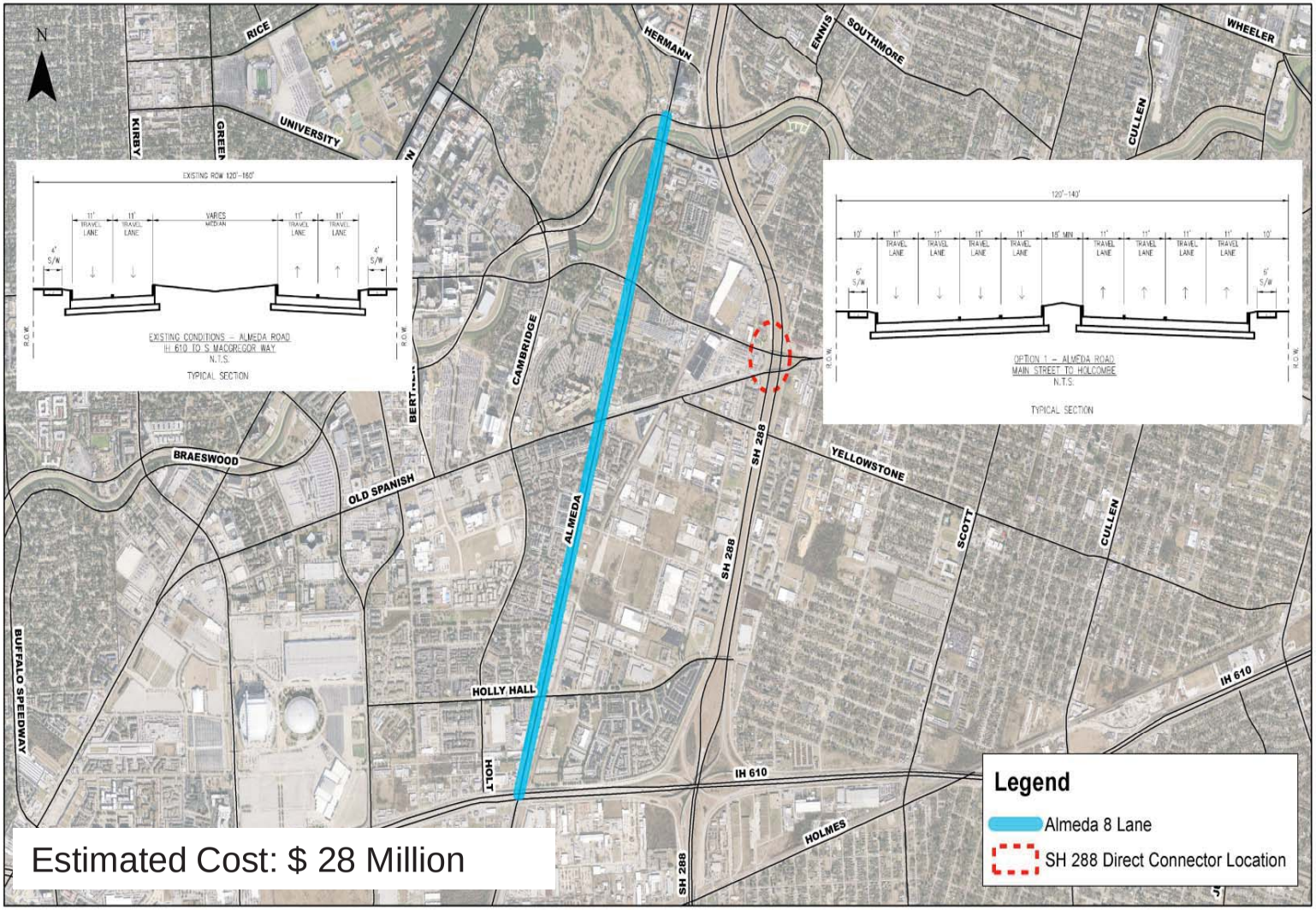
Roadway Long-term Improvements

Almeda Road Option 1 – Eight Lane



Estimated Cost: $ 28 Million

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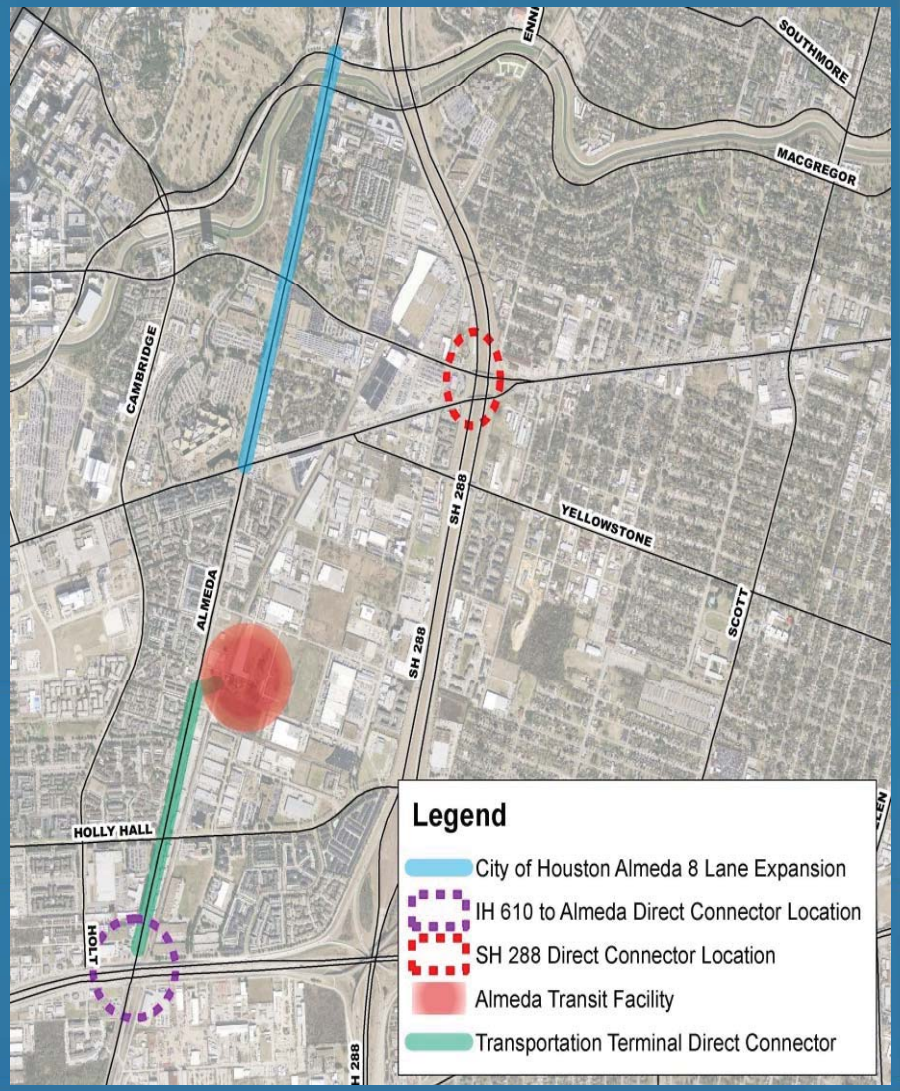
Roadway Long-term Improvements

Almeda Road Option 2 – Almeda Transportation Terminal

- 1000 Space Garage
- Estimated Cost –
  - Direct Connector - $30M
  - Almeda Transportation Terminal - $15M



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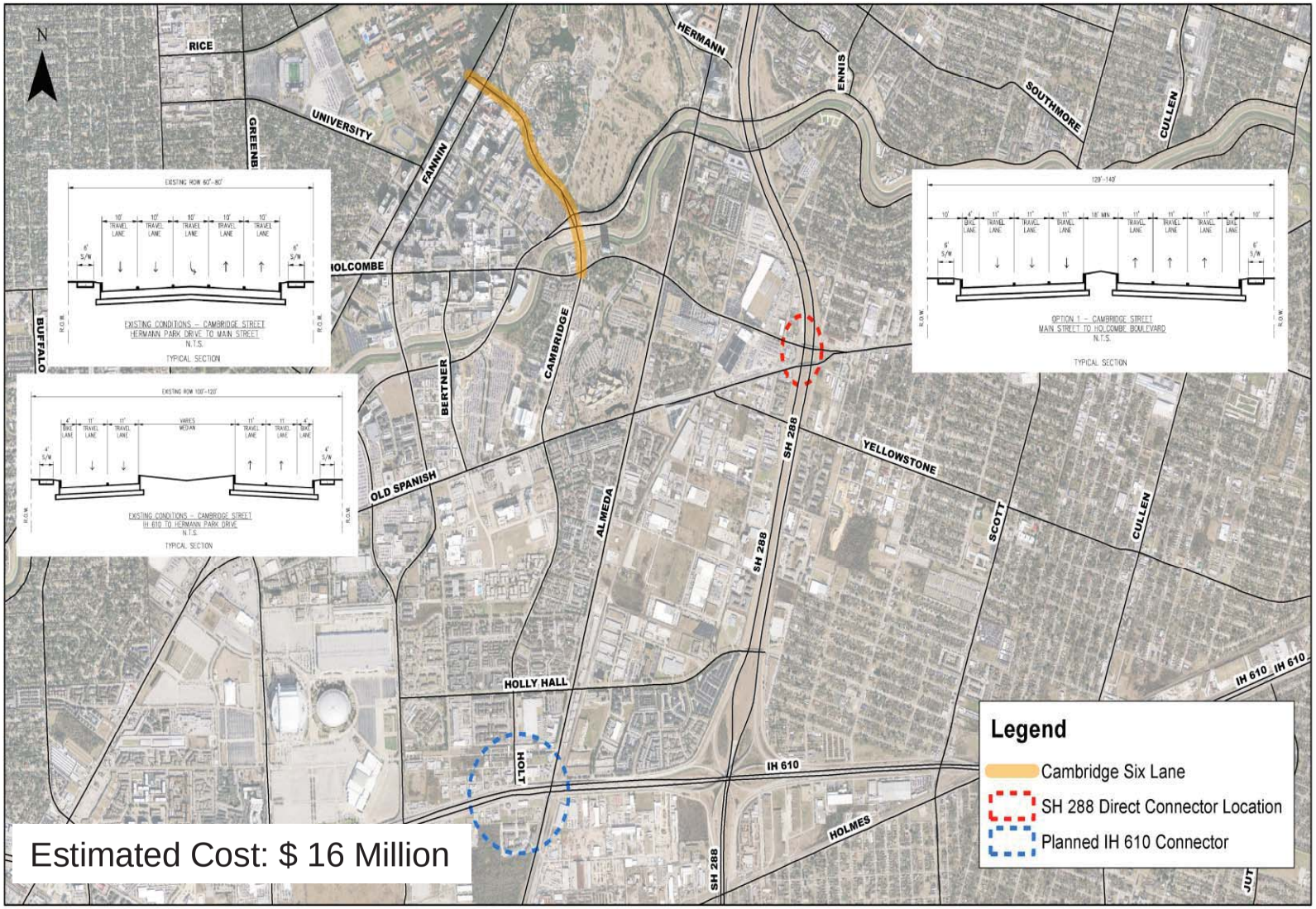
Roadway Long-term Improvements

Cambridge Street Widened to Six Lanes



Estimated Cost: $ 16 Million

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Roadway Long-term Improvements

Comparison of Alternatives

TEXAS MEDICAL CENTER MOBILITY STUDY Measures of Effectiveness - PM Peak Hour				
Scenario	Travel Time (Minutes)		% Travel Time Savings (Minutes)	
	NB/EB	SB/WB	NB/EB	SB/WB
No-Build Holcombe	17.38	19.83	-	-
Holcombe Grade Separation	9.72	10.53	44.1%	46.9%
Holcombe Demand Requirement (10 Lane)	8.76	11.02	49.6%	44.4%
No-Build OST	24.27	16.72	-	-
OST Grade Separation	6.78	7.70	72.1%	54.0%
OST Demand Requirement (10 Lane)	6.46	7.67	73.4%	54.1%
No-Build Cambridge	7.27	12.36	-	-
Cambridge 6 lanes (Main to Holcombe)	6.19	7.59	14.8%	38.6%

Holcombe from SH 288 to Main Street

OST from SH 288 to Fannin

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Roadway List of Projects
Estimated Costs Summary

Short Term Improvements		
Option	**Details**	**Const Cost Only**
Core Area Intersection Improvements	Add Turn Bays	$ 12 Million
University/ Dryden Conversion to One-way Pair	University/ Dryden Conversion to One-way Pair	$ 1 Million
Mid Term Improvements		
Core Area Intersection Improvements	Add Turn Bays	$ 13 Million
Long Term Improvements		
Holcombe Blvd.	Option 1 - Holcombe Transportation Terminal	$ 30 Million
	Option 2 - Grade Separated Express Lanes	$ 120 Million
Old Spanish Trail - Option 1	Option 1 - Grade Separation at Intersections	$ 85 Million
	Option 2 - Grade Separated Express Lanes	$ 105 Million
Cambridge 6-Lane Option	Cambridge 6-Lane Option(Betn. Holcombe and Main)	$16 Million
Almeda Road - Option 1	Almeda Road - Transportation Terminal	$ 15 Million
	Almeda Road - Direct Connector to Transportation Terminal	$30 Million
Almeda Road - Option 2	Almeda Road - 8-Lane Option (Betn. IH 610 and N. MacGregor Way)	$ 28 Million

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Parking

- Existing conditions analysis completed
- Identified future developments in TMC and planned parking garages/lots
- Estimated future parking demand
- Identified a list of project concepts
- Analysis of garage entrance and exit issues (part of Fannin Street Corridor)

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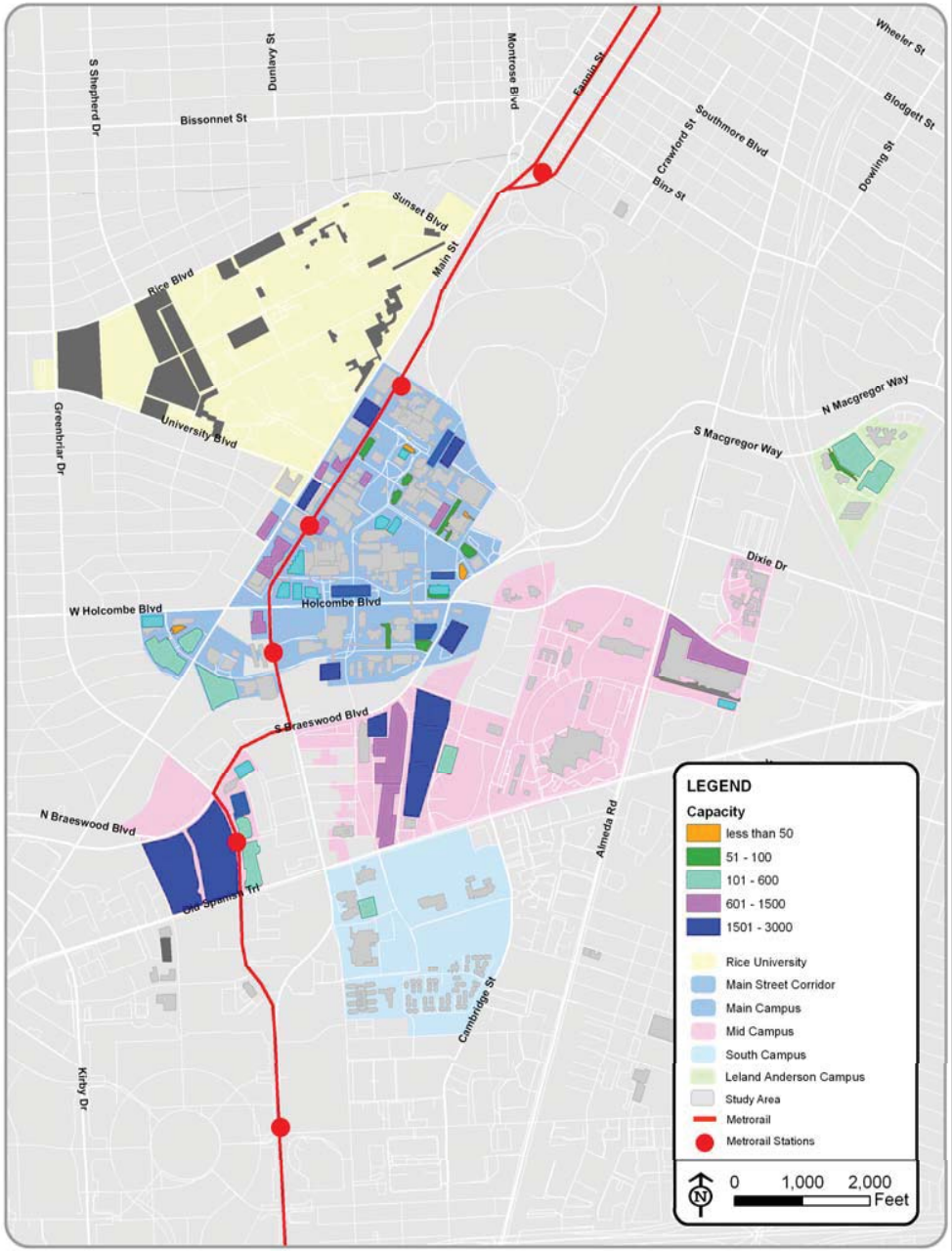
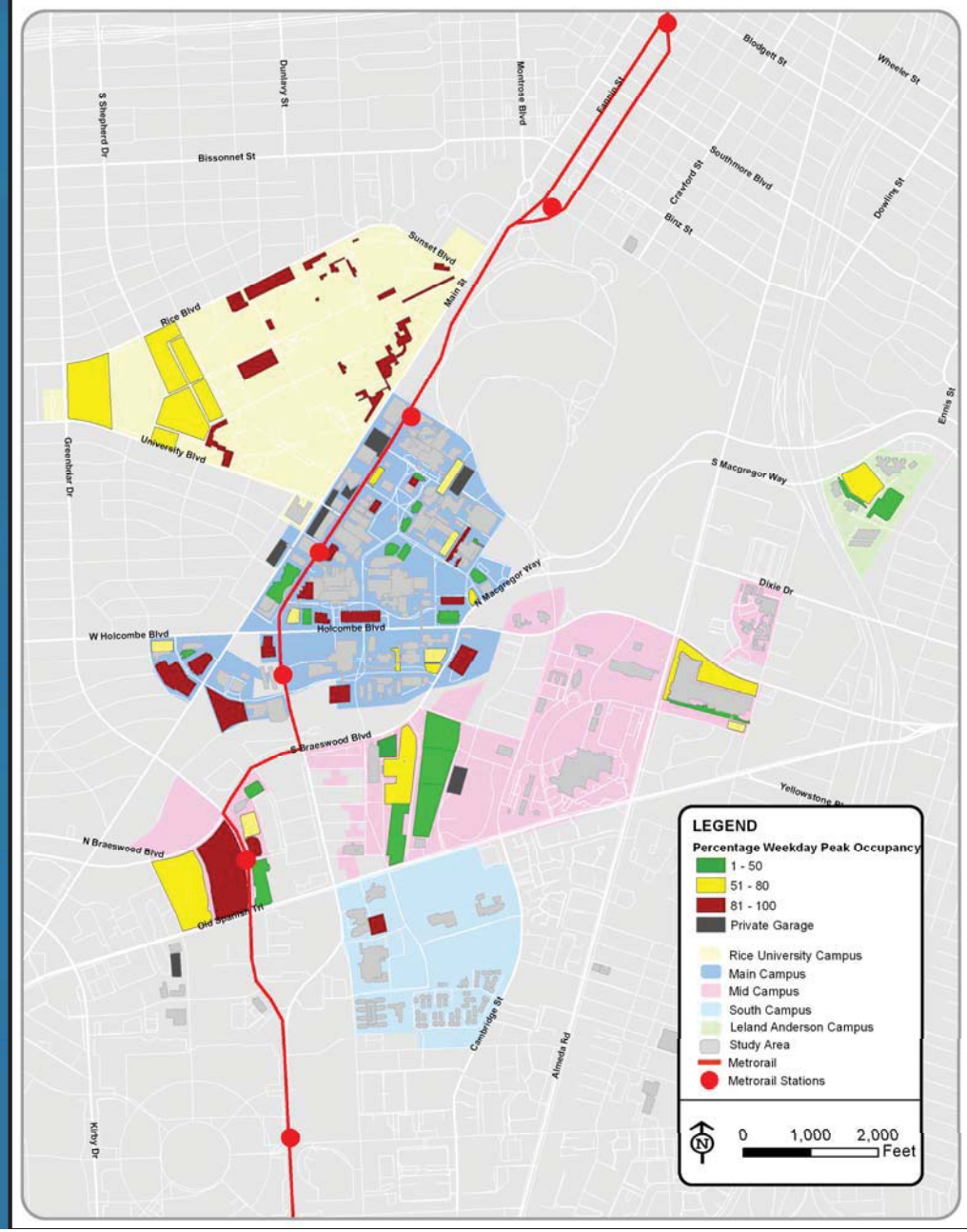
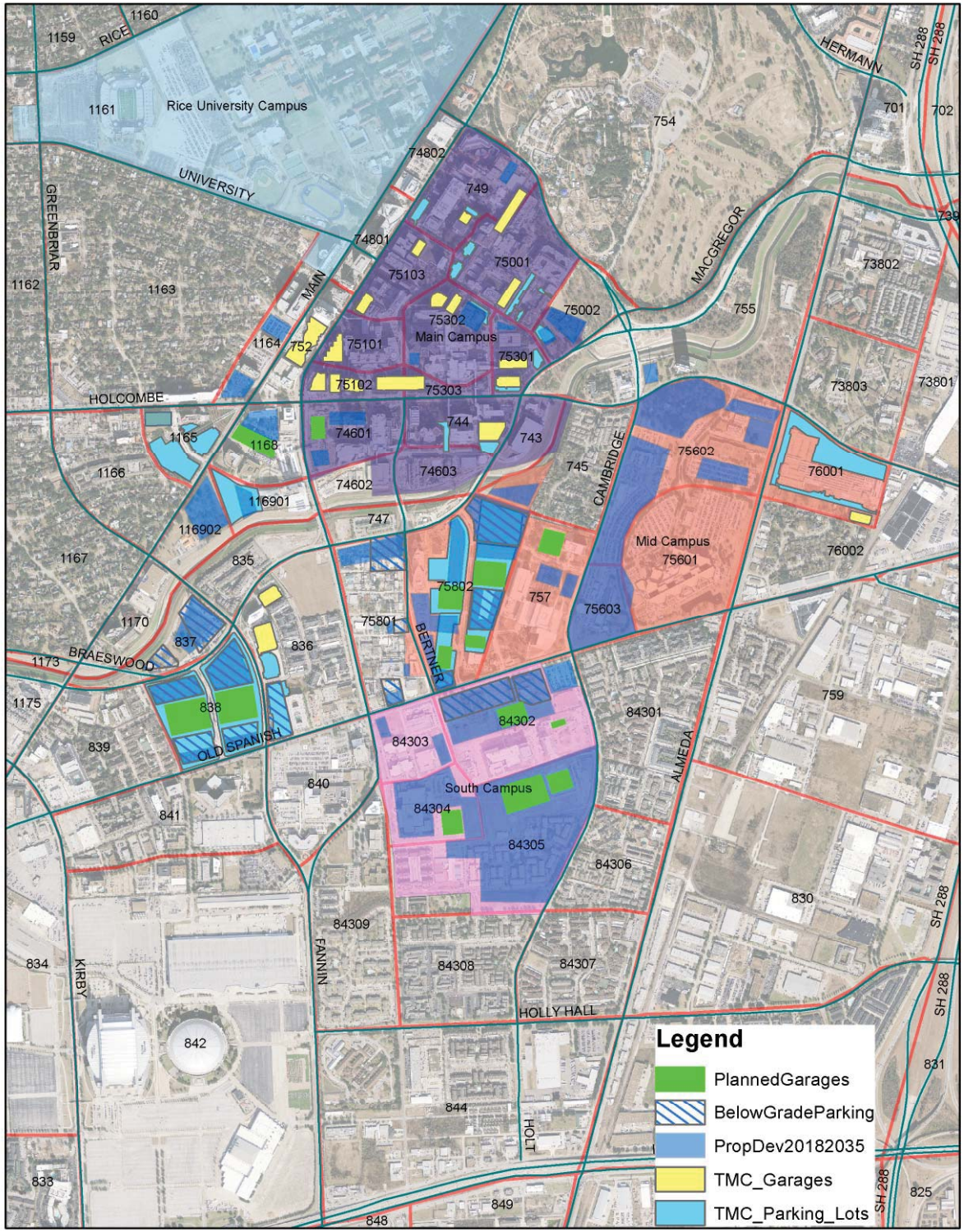
Existing Parking Capacity





Planned Parking Facilities for New Developments



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Parking
New Demand

- 28M square feet New Development
- 50,400 Additional Parking Spaces Needed

Percentage of 28M square feet new development	10%	20%	30%	40%	50%
Additional Parking Spaces Needed	5,040	10,080	15,120	20,160	25,200

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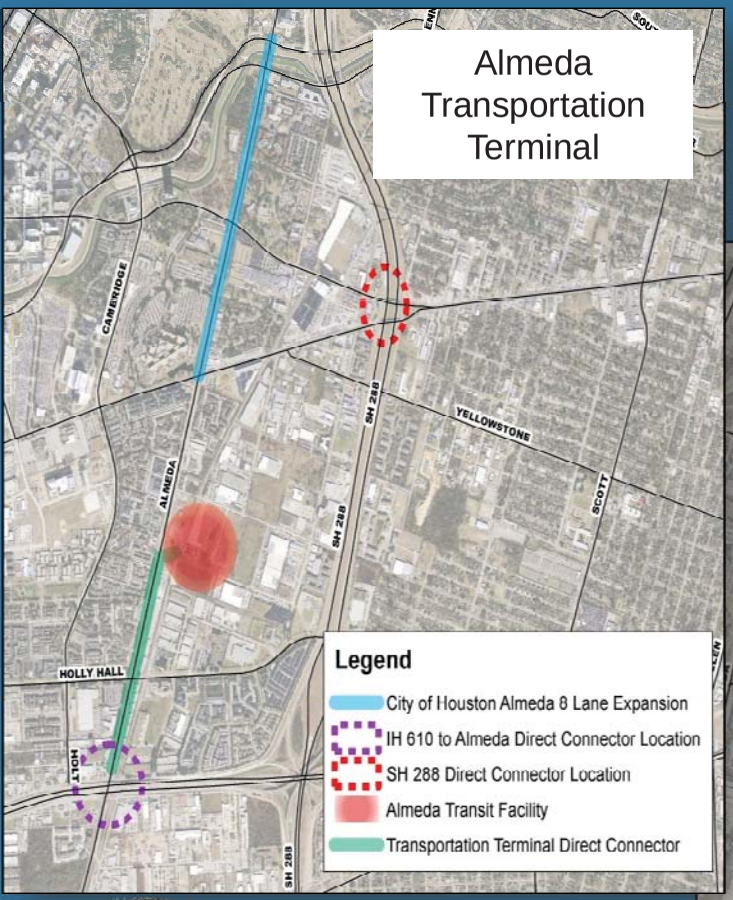
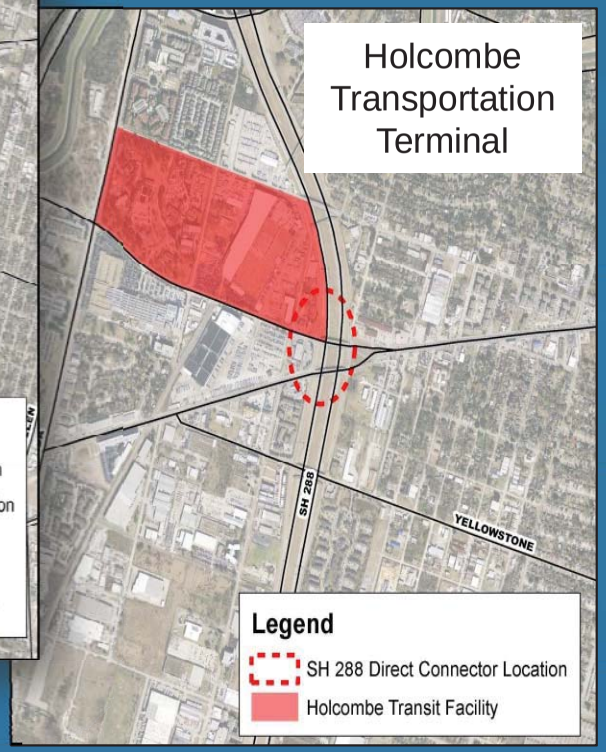
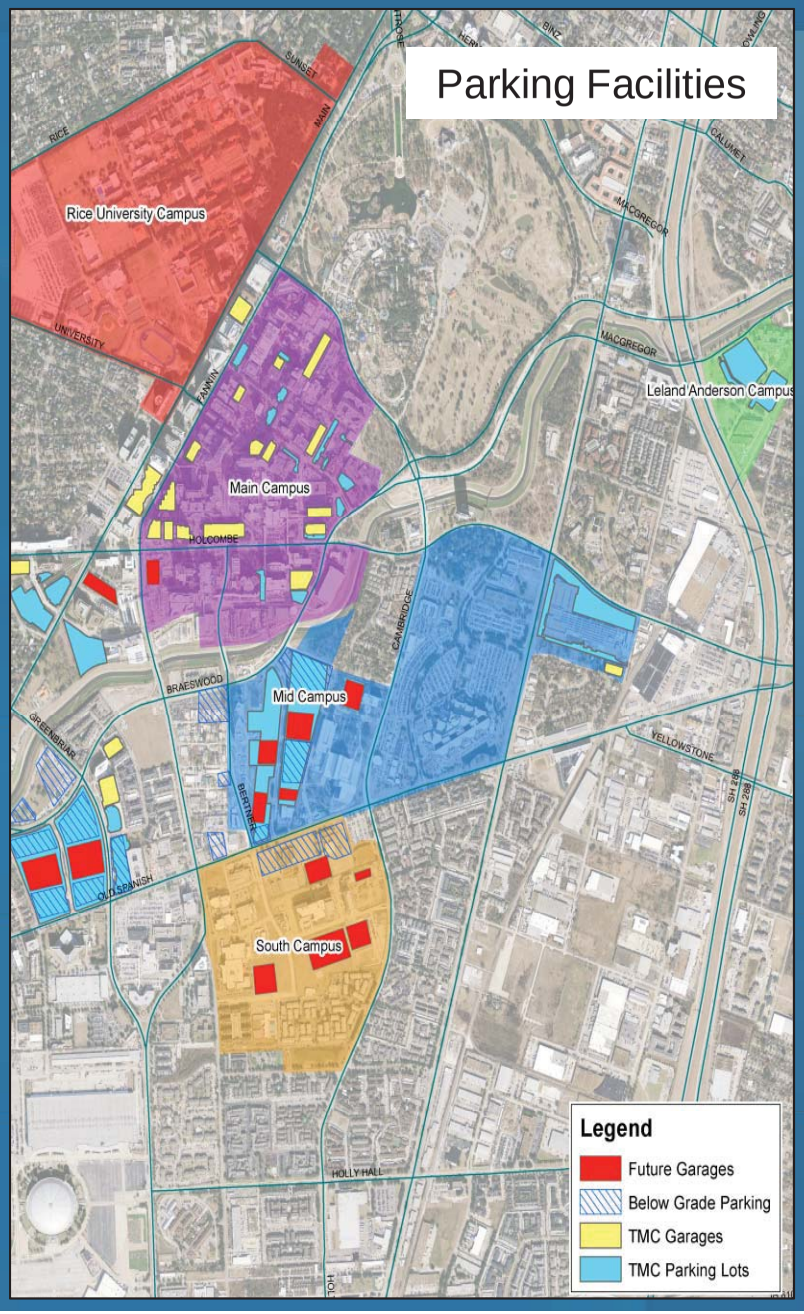
Parking
List of Projects
Transportation Terminal

- 28M Square Feet New Development
- 50,400 Additional Parking Spaces Needed







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Parking
List of Projects

- 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

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Transit

- Status
  - Existing conditions assessment completed
  - Identified initial list of project concepts
  - LRT options identified with Fannin Street Corridor Analysis

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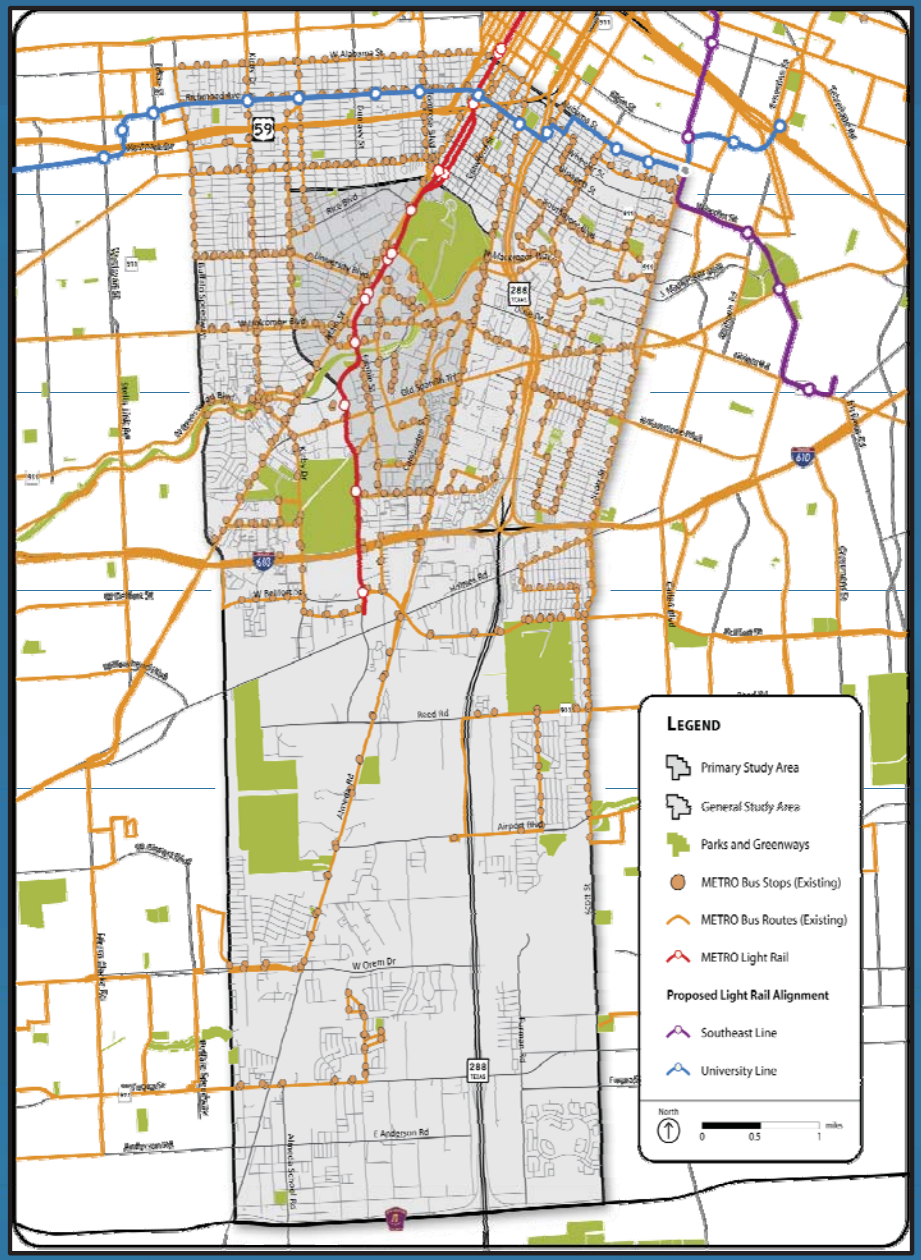
Existing Transit Routes



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Transit Operational / New Service List of Projects

- Re-align route 34 and improve headways.
- Re-route peak-direction route 292 service via Bellaire – Holcombe between US 59 and the Medical Center
- Extend route 402 into the TMC main campus or to the VA Medical Center; consider combining routes 402 and 426.
- Retain the 26/27 routing as it is; modify route 426 to include service to VA Medical Center. Budget permitting, add midday service on route 426. Consider combining route 426 peak-period service with route 402.
- Campus Shuttles for connections to new remote parking/Transportation Facility
- Commuter Rail Corridors – US 90A

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Fannin LRT Corridor

- Conflicts between LRT and left turns into local streets and parking garage driveways
- Inadequate signal timing
- Pedestrian channelization/ADA accessibility
- Substandard LRT platform width

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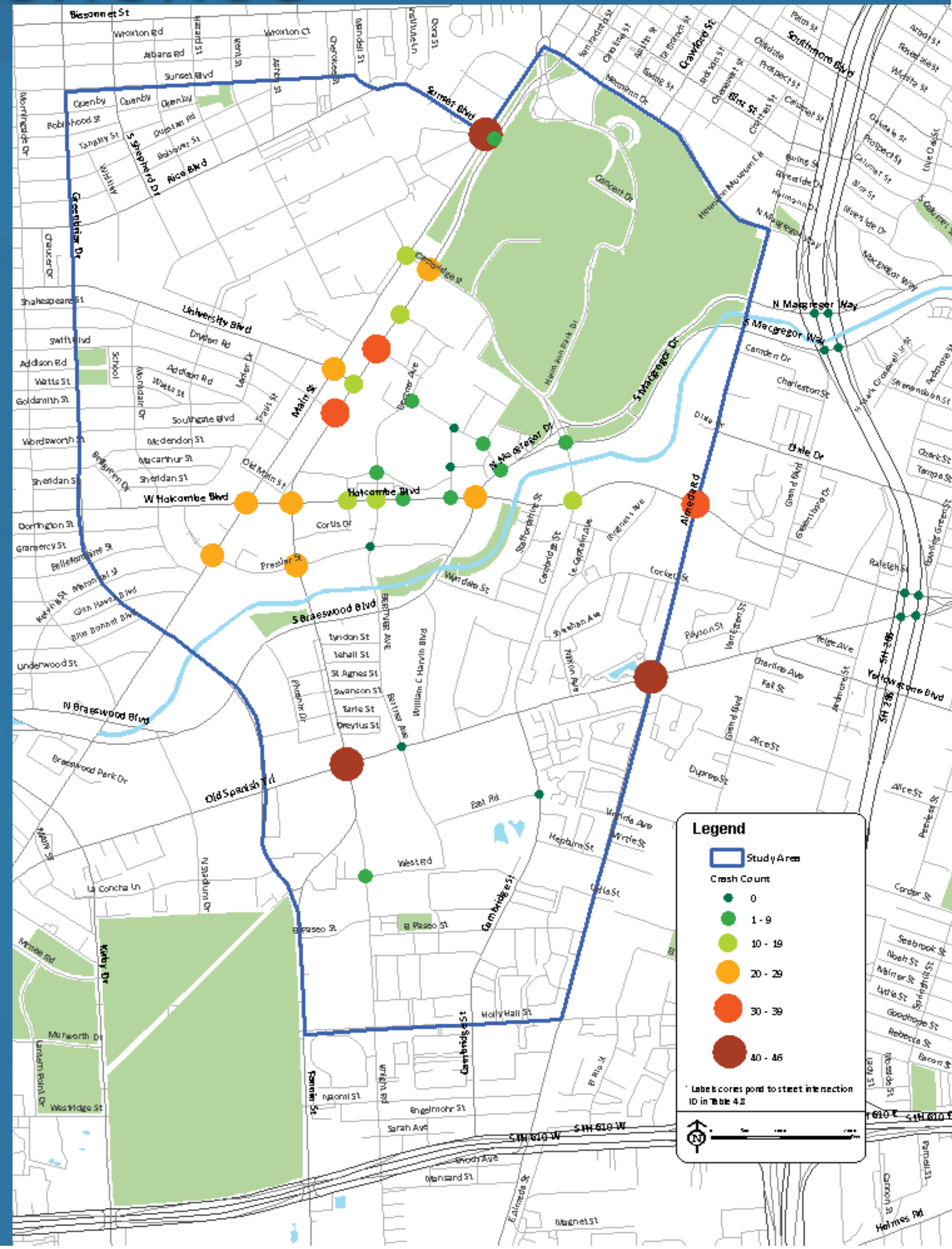
Traffic Conflicts/ Crash Experience

Intersection	Number of Crashes
Fannin @ Cambridge	28
Fannin @ University	11
Fannin @ Ross Sterling	11
Fannin @ John Freeman	30
Fannin @ Dryden	36
Fannin @ Holcombe	27
Fannin @ Pressler	28
Fannin @ Sunset	2
Fannin @ OST	46



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Fannin LRT Corridor
Analysis Approach

- Identify and evaluate existing traffic conditions and conflicts
- Assess LRT relocation alternatives
- Assess roadway/signal system alternatives
- Identify preliminary implementation strategy

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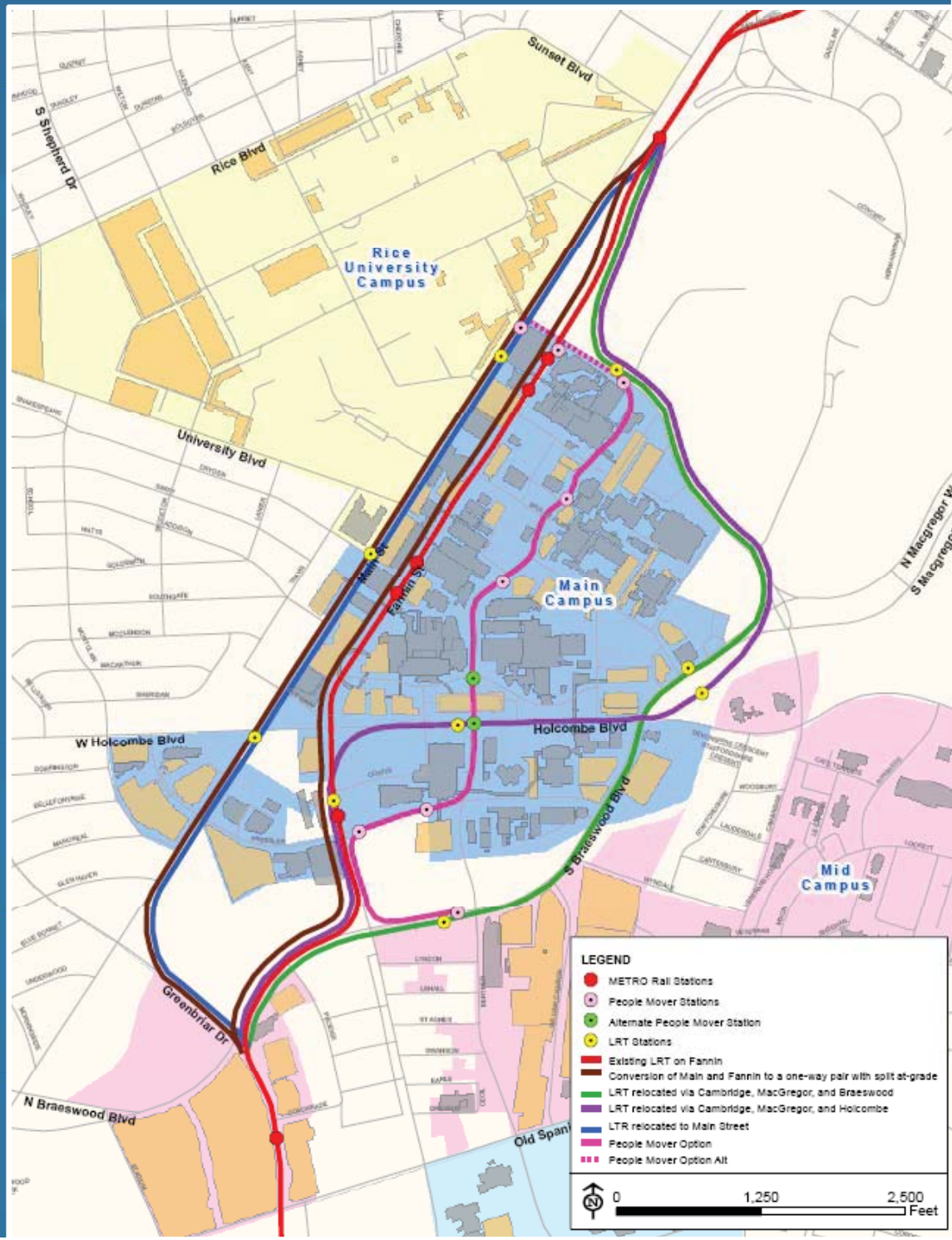
LRT Relocation Alternatives

- West side of Fannin
- Fannin Transit/Pedestrian Mall
- Main/Fannin one-way pair with LRT on both streets (SB on Main, NB on Fannin)
- Two-way on Main
- Subway on Fannin
- Elevated on Fannin
- At-grade via Cambridge, MacGregor, Braeswood
- At-grade via Cambridge, MacGregor, Holcombe



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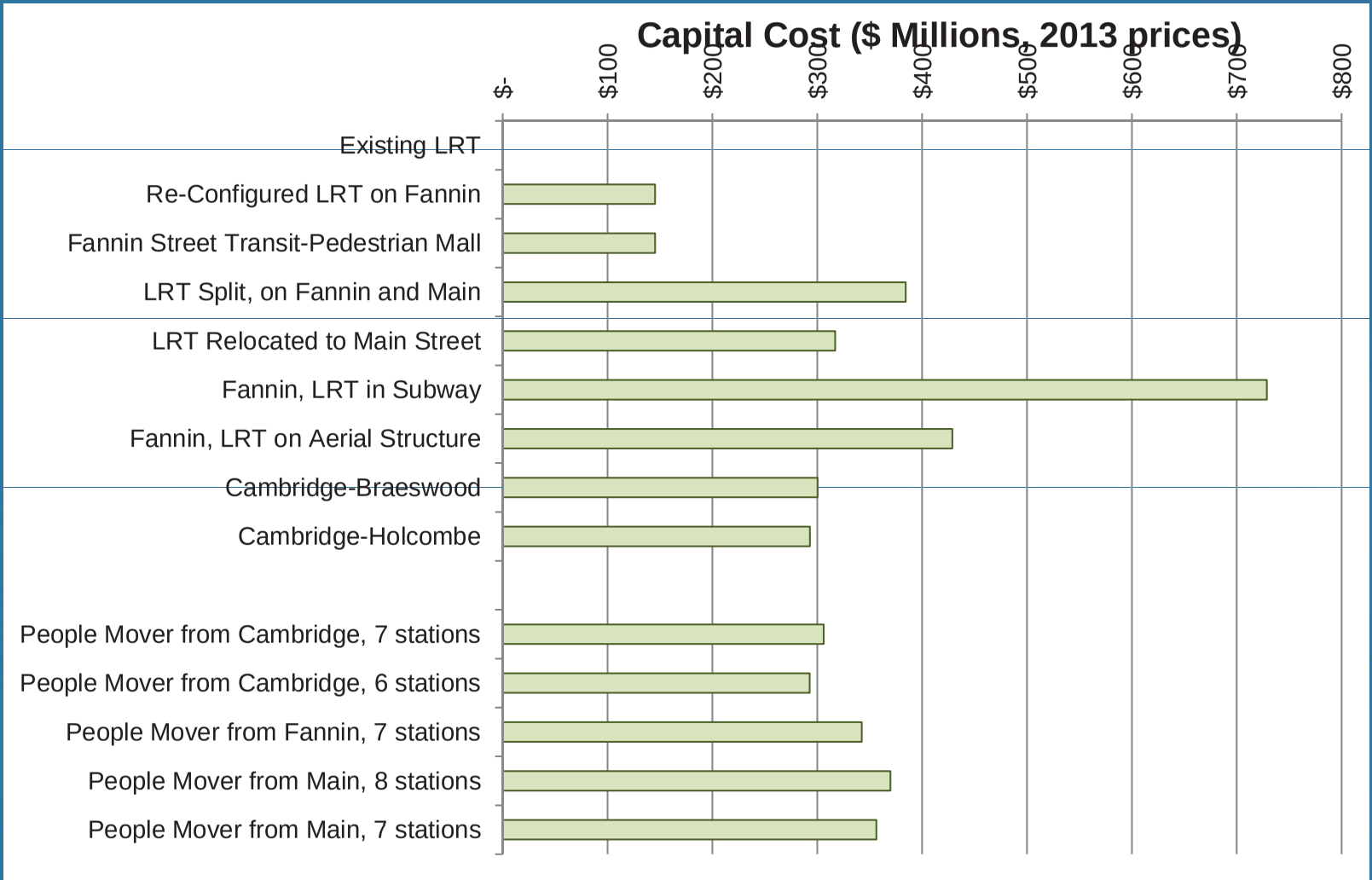
Order of Magnitude Capital Cost Estimate



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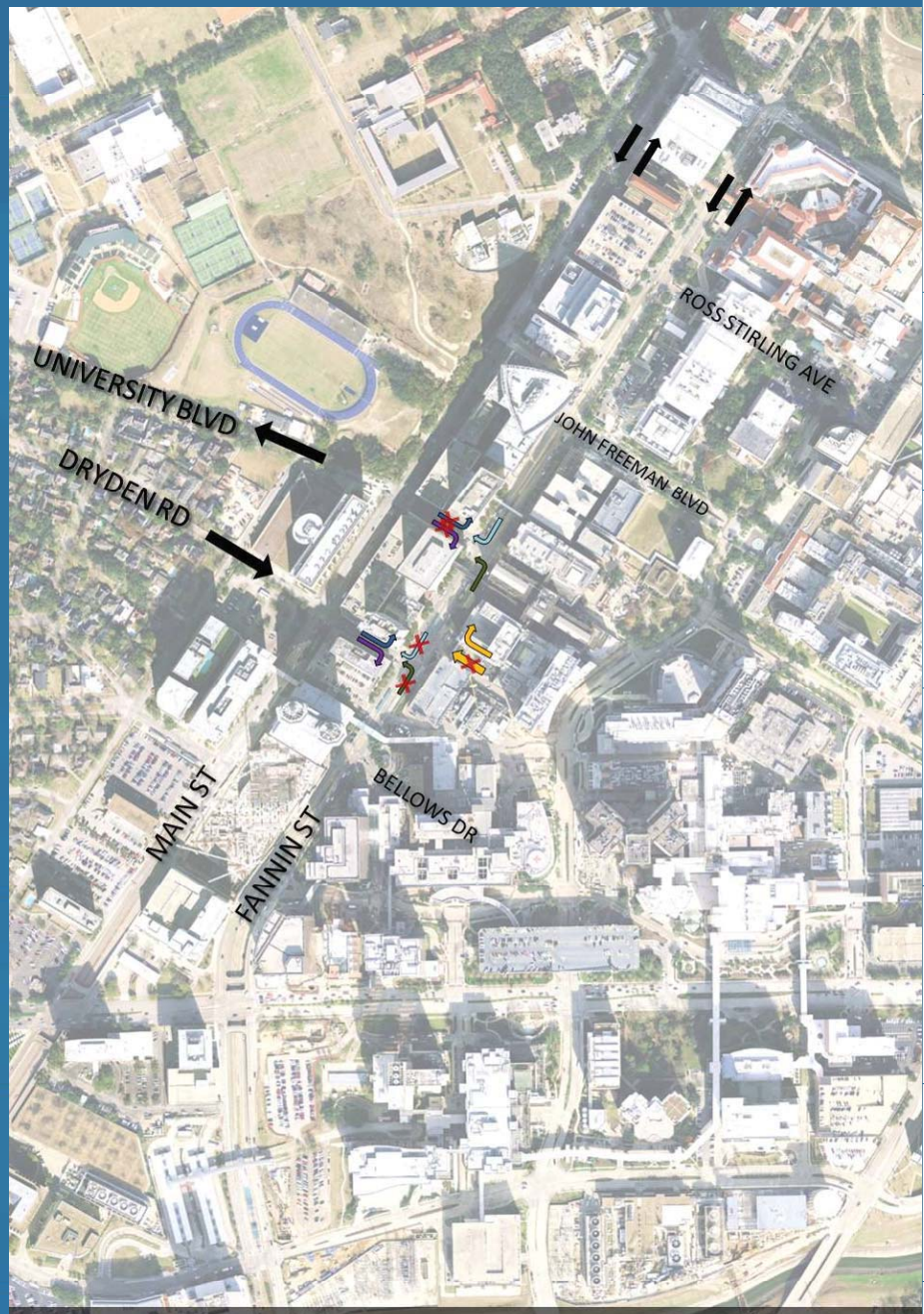
University/Dryden One-Way Pair

- **Dryden - EB one-way**
  - NB approach - NB Left movement eliminated
  - SB approach - No modification
    WB approach - Only left and right turns are allowed
  - Thru movement eliminated
  - EB approach - 4 lane approach

- **University - WB one-way**
  - WB, NB and SB approaches no modifications
  - EB approach converted to WB lanes



SCENARIO 1

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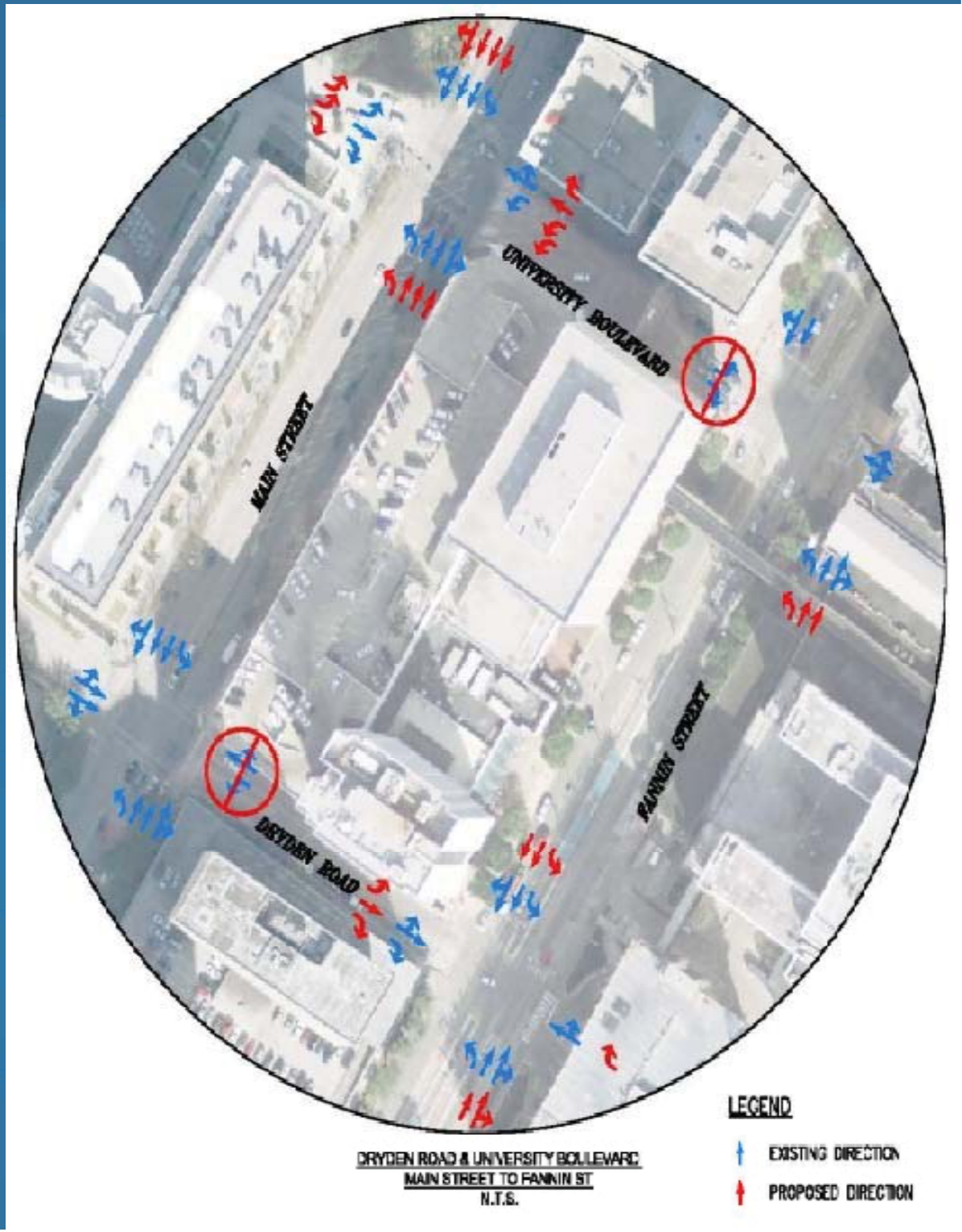
Conversion of University/Dryden to One-way Pair

- Local Circulation
- Estimated Cost - $1M



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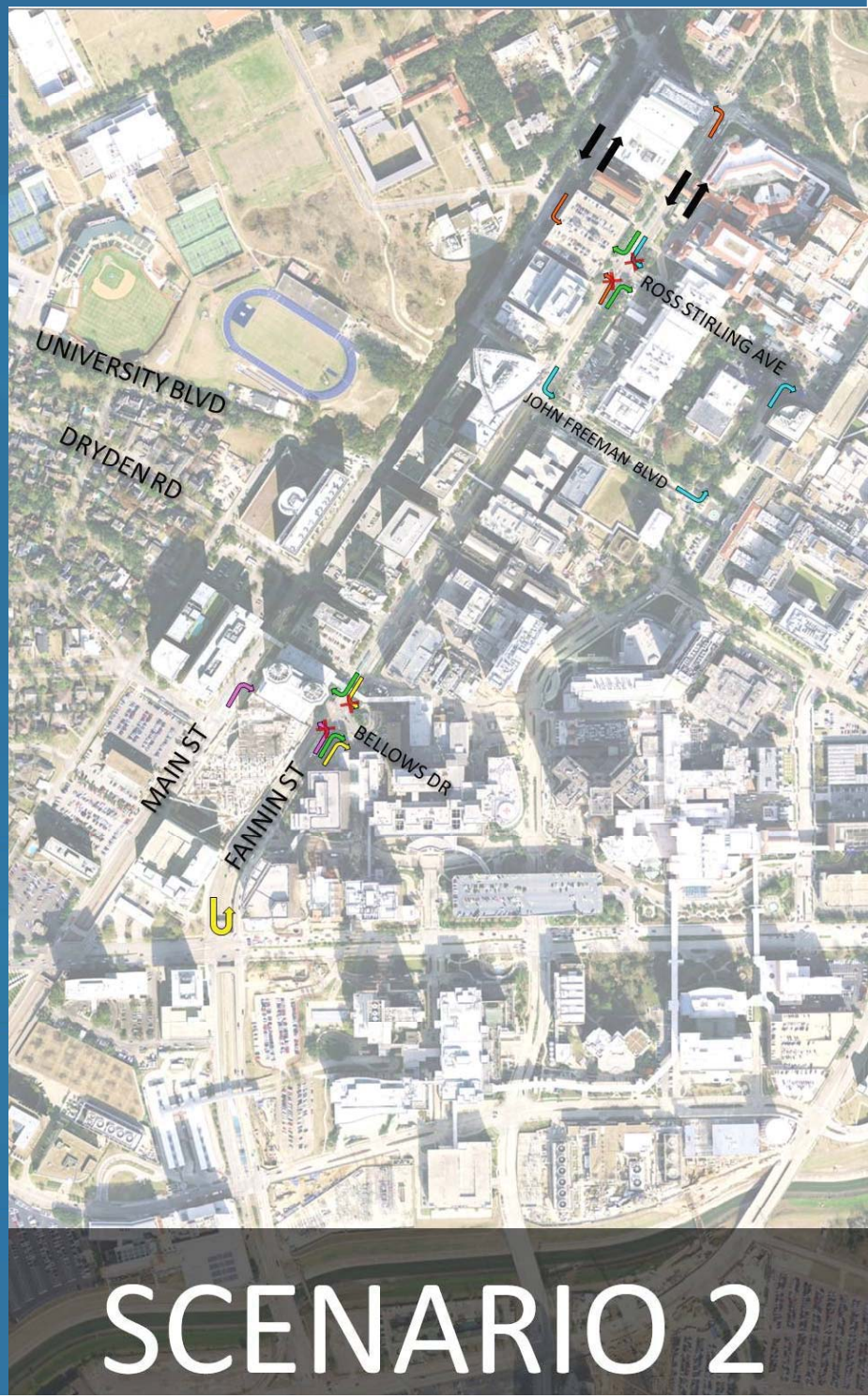
Signal Removal at Ross Sterling and Bellows

- Median closure both intersections
- Right in-Right out only movements allowed
- Bellows
  - SB left turning vehicles have to make U-turn at Holcombe
  - NB left turning vehicles have to use Main Street to access
- Ross Sterling
  - SB left turning vehicles have to make left turn at John Freeman
  - NB left turning vehicles have to turn left at Cambridge to access the parking garage from Main Street



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Fannin Street
List of Projects

- Fannin St. provides best accessibility to TMC Main Campus
- LRT relocation alternatives Cost Range is between $150 million and $725 million
- Lower cost roadway and signal system options effective
  - Consider conversion of University/Dryden to one-way pair
  - Signal removal at Ross Sterling and Bellows
  - ADA accessibility improvements at intersections (Outlined in Ped/Bike list of projects)

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Ped/Bike Connectivity

- Existing conditions gap analysis completed
- Identified locations of new sidewalks based on new developments and stakeholder input
- Developed prioritization criteria
- Identified list of project concepts

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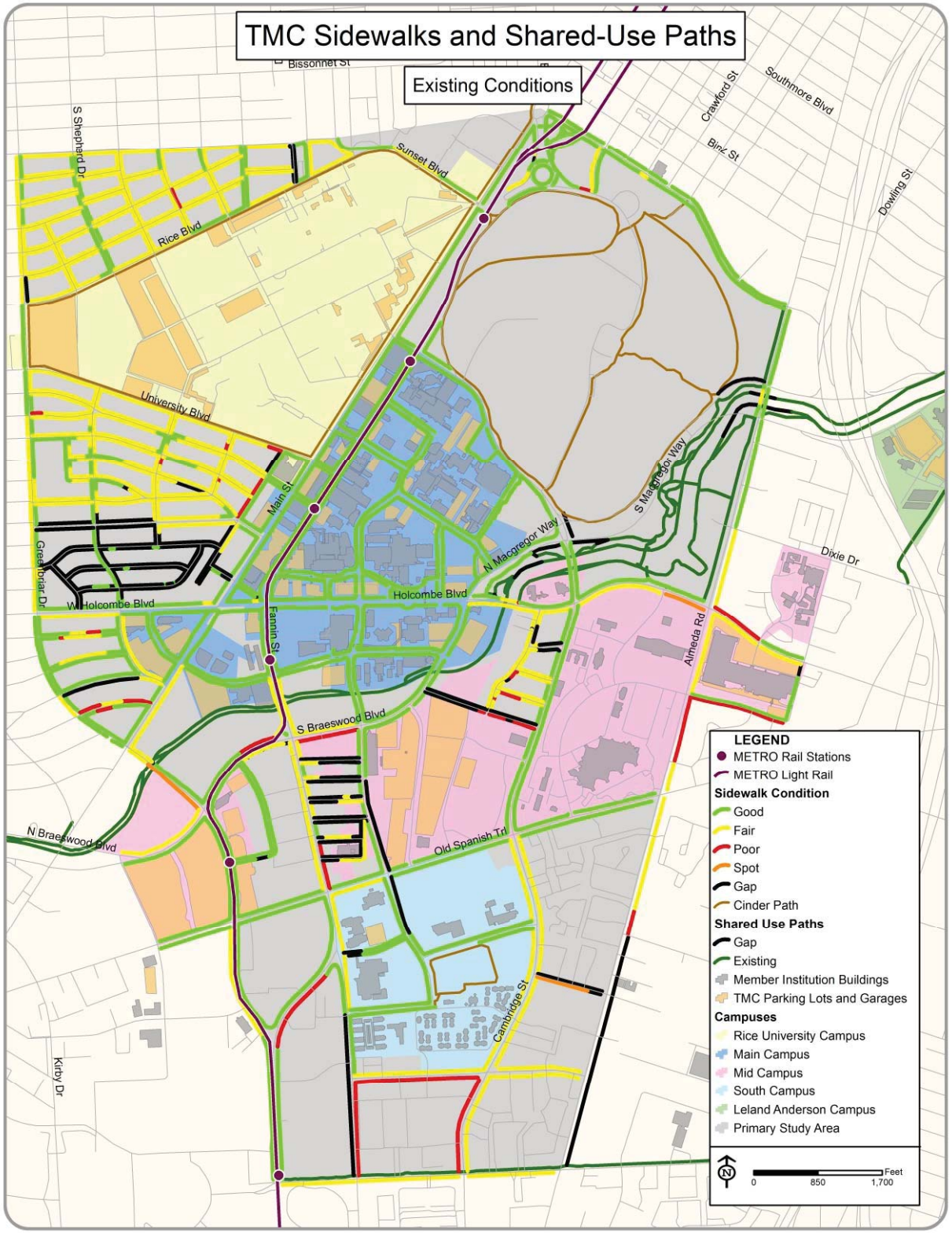
Existing Bikeways and Sidewalks



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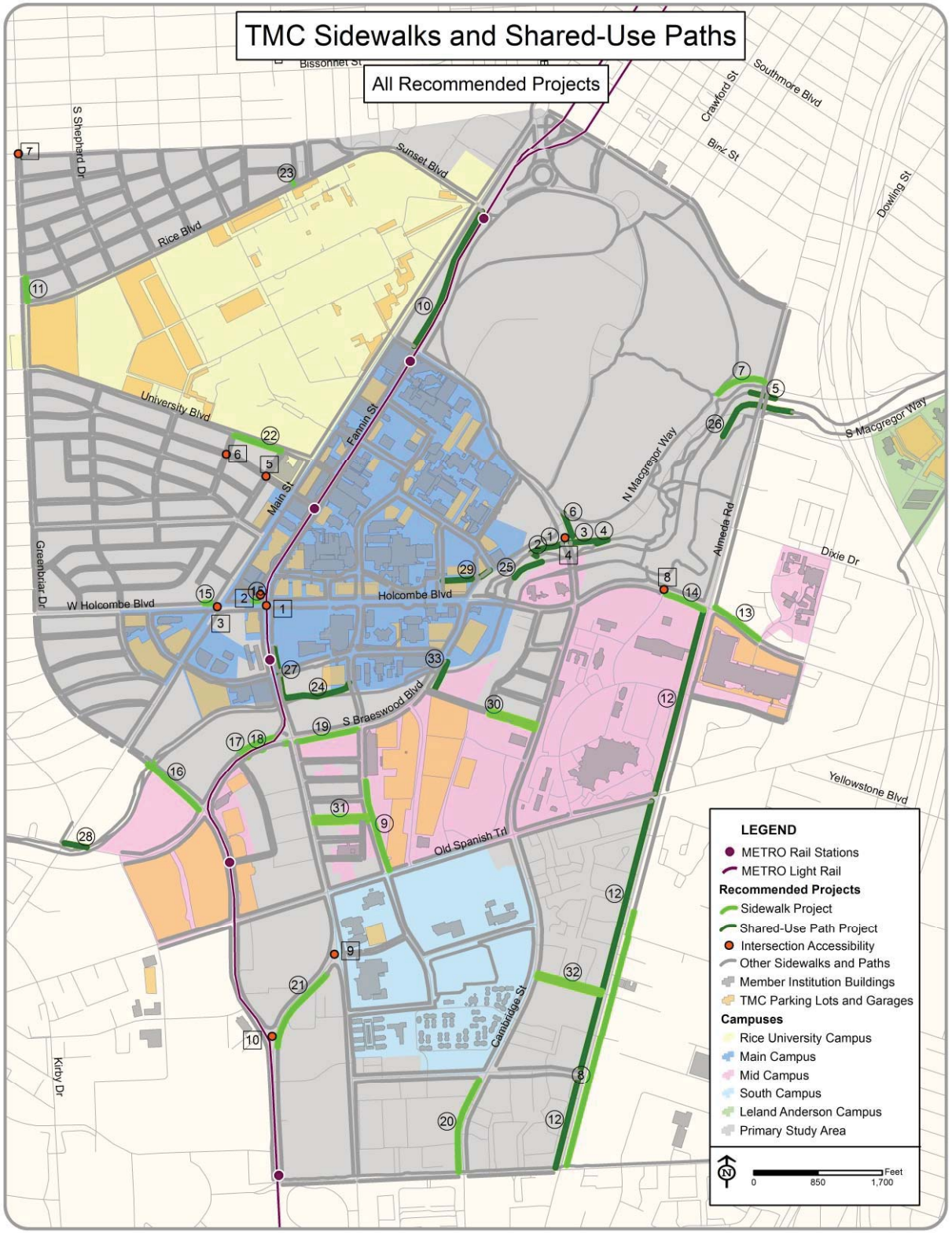
Pedestrian/ Bicycle List of Projects

- Handout for List and Cost
- 33 Sidewalk & Shared Use Path Projects - $3 million
- 10 Intersection Accessibility Projects - $50,000 plus
- 6 Signing & Striping Projects - $61,000
- 2 Potential Skywalk Connections - $5 million



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Updated Schedule

- Public Meeting April 24, 2014
- Final TMC Mobility Plan May 31, 2014

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TMC Mobility Study

Thank you!

pillalamarris@pbworld.com

http://www.publicworks.houstontx.gov/traffic/tmcstudy.html

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