TEXAS TRANSPORTATION COMMISSION

VARIOUS Counties

MINUTE ORDER

VARIOUS Districts

Rider 42 to the appropriations to the Texas Department of Transportation (department) in the General Appropriations Act (House Bill 1, 82nd Legislature, Regular Session) requires the department to use $300 million of Proposition 12 bond proceeds to acquire right of way, conduct feasibility studies and project planning, and outsource engineering work for the most congested roadway segments in each of the four most congested regions of the state (Dallas-Fort Worth, Houston, Austin and San Antonio metropolitan areas).

Rider 42 further requires that the Texas Transportation Institute (TTI) serve as a facilitator and project coordinator of studies conducted by the four most congested regions to: (1) determine which projects would have the greatest impacts considering such factors as congestion, economic benefits, user costs, safety and pavement quality; (2) identify funding options to support completion of the projects and suggest the best use of future revenues for the projects; (3) include implementation of best traffic and demand management practices; (4) ensure open and transparent public participation; and (5) make recommendations to the department at each major decision point for the projects.

The Mobility Investment Priorities Early Recommendations Report, which is set forth in Exhibit A, contains TTI's initial recommendations to the Texas Transportation Commission (commission) for the use of the bond proceeds.

IT IS THEREFORE ORDERED that the Mobility Investment Priorities Early Recommendations Report, as set out in Exhibit A, is accepted by the commission.

IT IS FURTHER ORDERED that selection and authorization of projects to be funded from Proposition 12 bond proceeds shall be made in accordance with Minute Order 112823.

Submitted and reviewed by:

Chief Planning and Project Officer

Recommended by:

Executive Director

112996 FEB 23 12

Minute Number | Date Passed

Exhibit A

Mobility Investment Priorities Project

Early Recommendations Report

February 2012

mobility
INVESTMENT PRIORITIES

Texas Transportation Institute
A Member of The Texas A&M University System
Saving Lives, Time and Resources

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Austin

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Capital Metro
Central Texas Regional Mobility Authority
City of Austin
Greater Austin Chamber of Commerce
Downtown Austin Alliance
Downtown Transportation Management Association
Texas Transportation Institute

Houston

TxDOT–Houston District
Houston-Galveston Area Council
City of Houston
Harris County
Houston METRO
Houston TranStar
Harris County Toll Road Authority
Texas Transportation Institute

Dallas-Fort Worth

TxDOT–Dallas and Fort Worth Districts
North Central Texas Council of Governments
North Texas Tollway Authority
City of Dallas
City of Ft Worth
Dallas Area Rapid Transit
Fort Worth Transportation Authority
Denton County Transportation Authority
City of North Richland Hills
City of Richardson
City of Haltom City
Texas Transportation Institute

San Antonio

TxDOT–San Antonio District
San Antonio-Bexar County Metropolitan Planning Organization
Alamo Area Council of Governments
City of San Antonio
Alamo Regional Mobility Authority
Bexar County
VIA Metropolitan Transit
Texas Transportation Institute

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INTRODUCTION

Traffic congestion has been a significant problem in Texas' major metropolitan areas for many years, directly affecting the state's economic growth and quality of life. About two-thirds of Texas residents live in urban areas that are ranked in the 40 most congested U.S. metro areas, and three metro areas (Houston, Dallas-Fort Worth, and Austin) are in the top 15. Perhaps more disturbing, however, is the fact that not only is congestion high, but Texas traffic problems are also increasing faster than in similar U.S. areas. The four largest metro areas (including San Antonio) rank in the 15 fastest growing congested areas in the U.S. over the last 15 years (1).

Funding for many of the traditional solutions in Texas' large metro areas is not scheduled to increase and congestion will continue to worsen (2). However, there is a generally accepted path toward improvement involving these elements among other planning steps (3):

- First and foremost, state and local transportation agencies must be perceived as doing a good job with the funding and priorities they have. They must be effective and efficient.
- The agencies must have a coherent plan with sufficient information to convince the public that any additional funding will generate significant benefits and be spent on the most important problems. They must be accountable and transparent.
- The financing plan must take maximum advantage of all the options that the public will support.
- The public must understand and support any set of projects, programs, and plans that are developed from the process.

As a part of the General Appropriations Act, 82nd Texas Legislature, 2011 (H.B. 1, TxDOT Rider 42), the Texas Transportation Institute (TTI) was directed to provide assistance to the metropolitan planning organizations, the TxDOT District offices and other project partners in their development of projects and programs to address mobility concerns and to report to the Texas Legislature and the Transportation Commission.

Specifically, TTI is serving as facilitator and coordinator of studies to provide assurance that:

1. Projects addressed have the greatest impact considering factors including congestion, economic benefits, user costs, safety, and pavement quality.
2. The best traffic and demand management principles are being applied to the projects.
3. The funding scenarios take advantage of all feasible options so that public funds provide the greatest "bang for the buck."
4. Public participation in concept development ensures the most inclusive planning process possible.
5. Recommendations are made to the department of transportation at each major decision point for the projects.

The Mobility Investment Priorities project complements existing planning and project development activities in the metro areas. The project assists the agencies in prioritizing and targeting additional mobility improvement funds; it is not intended to replace or supersede existing planning processes and products or current funding allocations for other programs. **Each metro area is developing its own set of projects, programs, and plans to address the most congested sections of road; the mix of strategies will be different in each area.** The intent of Rider 42 is to ensure that the metro areas are incorporating all of the best congestion reduction practices so that it is clear that funding is being spent as effectively and efficiently as possible while addressing the state's most congested roadways. Each area's goals and vision will result in different approaches; if the best public communication principles are used, each of them will reflect the public interests and the best congestion reduction practices.

Purpose of the Early Recommendations Report

This report describes interim conclusions from the first few months of a two-year project. There will be other reports, additional recommendations, and other project ideas over the remaining time. A detailed summary of the possible near-term actions is presented for each metropolitan area. These initial findings may be modified upon more investigation, but this early report identifies projects that are likely to meet the standards identified in the Rider (e.g., significantly reduce congestion in a cost effective manner with a project that makes maximum usage of the possible management and financial options) and allow agencies to continue with project development activities.

The Congestion Growth Problem

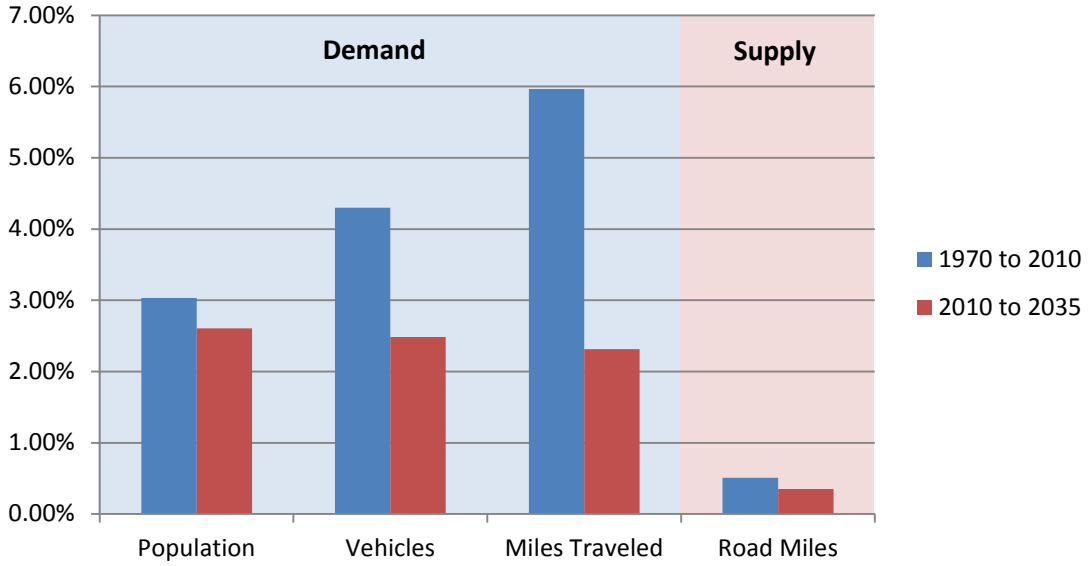
The state's transportation needs are a product of the state's good business environment, quality of life, and relatively low cost of living; many states would like to have these good aspects of Texas' congestion problem. Since 1970, growth in population, the number of registered vehicles, and the number of miles traveled on Texas roads have increased much more rapidly than the Texas transportation system has expanded (2). Texas is predicted to grow from 25 million people now to 40 million people by 2035 (4). Population and job growth will bring greater travel demands between homes, jobs, shops, schools, medical facilities, and other destinations and, therefore, more congestion to urban areas.

The Texas 2030 Committee Report, *It's About Time: Investing in Transportation to Keep Texas Economically Competitive* (2) outlined the causes and effects of these growth challenges. Exhibit 1 compares the past trends and future expectations for three key demand components and a key indicator of supply. In the period before 1970, these factors were much more closely aligned and congestion was relatively light in 1970. Even though it appears the demand factors will increase at a slower rate from now to 2035, all the demand indicators continue to increase faster than the roadway supply that handles the growth. In contrast to 1970 when congestion was at low levels, the four largest metropolitan areas must address the growth challenges of the next few decades beginning with a significant congestion problem.

The recommendations concern more than half of the 50 most congested Texas corridors. This report includes several actions identified through a collaborative process among the agencies and the Texas

Transportation Institute. These actions will contribute to congestion relief by either improving transportation conditions or developing a longer-term congestion relief project by allowing the purchase of right-of-way or the performance of engineering or design studies.

Exhibit 1. Growth in Transportation Demand and Supply in Texas, Annual Percent Increase from 1970 to 2035



Source: 2030 Committee Report, *It's About Time: Investing in Transportation to Keep Texas Economically Competitive, March 2011*

The congestion growth trends for three of the metro areas detailed in the 2030 Committee Report (based on data from 2010) were projected to continue for the next decade and then get much worse after that (Exhibit 2). Congestion in the four largest metropolitan areas will grow slowly over the next three years due to a combination of forces: the relatively slow economic recovery since 2009, the implementation of the last installment of projects funded by Proposition 12, and the comprehensive development agreement projects creating capacity expansions in important corridors. Austin, in particular, was estimated to benefit from state and toll road spending as well as local bond election funding. As detailed elsewhere in this report, however, many of the most congested Texas corridors will not be improved. Beyond 2020, congestion is projected to grow much faster.

Exhibit 2. Delay Hours per Commuter

Year	Austin	Dallas-Fort Worth	Houston	San Antonio
2010	33	50	53	30
2015	30	59	61	38
2020	28	70	67	47
2025	35	107	97	58

Source: 2030 Committee Report, *It's About Time: Investing in Transportation to Keep Texas Economically Competitive, March 2011*

The cost of congestion for Texas households will also rise in the future. Congestion means not only extra travel time but also extra fuel burned in stop-and-go traffic. The cost of congestion per household in the 2030 Report (Exhibit 3) shows costs increasing between 28 percent and 60 percent between 2010 and 2020 in the three areas with increasing congestion (2). The total cost of congestion in Exhibit 4 increases by 72 to 88 percent from 2010 to 2020 in the three largest areas, and by 9 percent in Austin. These are larger increases than the cost per household because the values include the multiplier effects of growth—more people traveling slower—and also include the extra costs for trucks to move freight. These are conservative values; the extra costs do not include many other real congestion costs to businesses such as the additional distribution centers and trucks needed to serve the same area as travel times lengthen. The costs also do not reflect the operational changes necessitated by the unreliable transportation networks such as additional warehouse space required to accommodate uncertain shipping times, meetings that start late or are cancelled, and time spent in airports, lobbies and waiting areas due to early arrival when the too-frequent crash or stalled vehicle does not happen.

Exhibit 3. Congestion Cost per Household (2010 dollars)

Year	Austin	Dallas-Fort Worth	Houston	San Antonio
2010	$610	$1,100	$1,390	$470
2015	570	1,330	1,640	620
2020	530	1,570	1,780	750
2025	640	2,310	2,500	900

Source: 2030 Committee Report, *It's About Time: Investing in Transportation to Keep Texas Economically Competitive, March 2011*

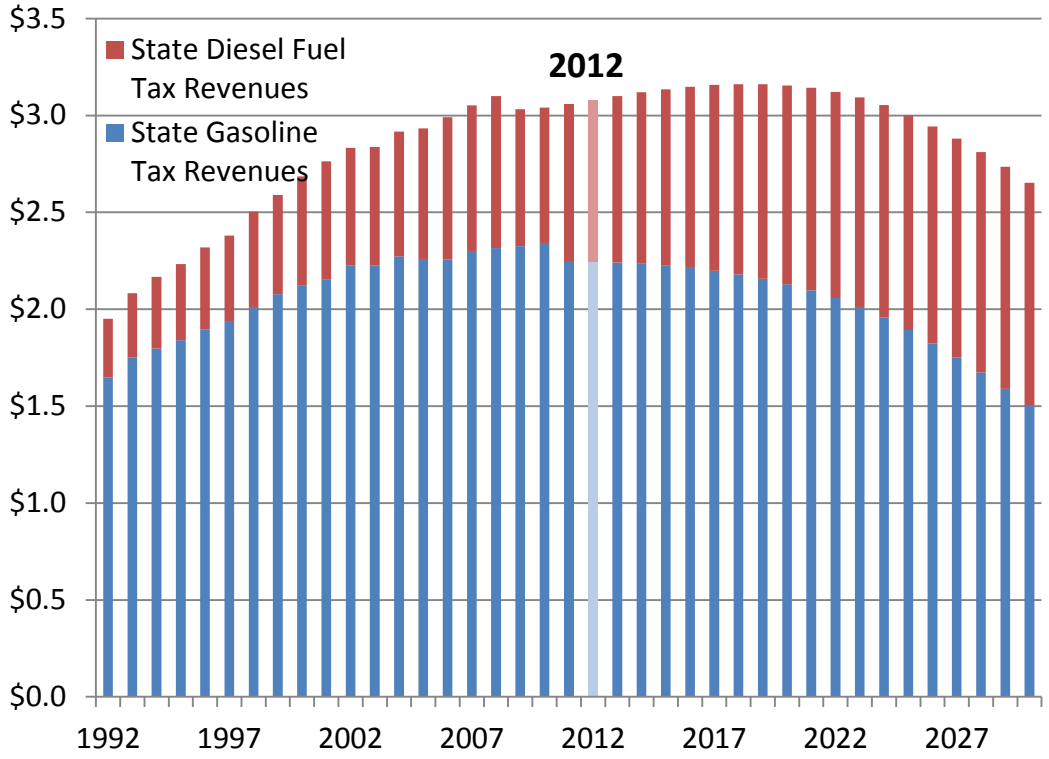
Exhibit 4. Areawide Total Congestion Cost (millions of 2010 dollars)

Year	Austin	Dallas-Fort Worth	Houston	San Antonio
2010	$690	$4,370	$4,430	$550
2015	720	5,810	6,440	770
2020	750	7,530	8,350	1,000
2025	1,050	12,500	13,190	1,280

Source: 2030 Committee Report, *It's About Time: Investing in Transportation to Keep Texas Economically Competitive, March 2011*

In addition to the funding and growth challenges, the more fuel-efficient cars and trucks of today pay lower fuel taxes per mile than when the tax rates were set almost two decades ago (2). While these cleaner and more efficient vehicles offer environmental and energy benefits, they also generate less revenue from motor fuel taxes. Not only will the gasoline and diesel fuel tax receipts increase at a slower rate than in the past, as Exhibit 5 shows, Texans will see declines in fuel tax revenues after 2020.

Exhibit 5. Texas Motor Fuel Revenue (billions of 2010 dollars)



Source: 2030 Committee Report, *It's About Time: Investing in Transportation to Keep Texas Economically Competitive, March 2011*

The combination of these two trends—increased travel demand and reduced revenue from the motor fuel tax—defines the transportation challenge that Rider 42 and the Mobility Investment Priorities project will address.

Texas' Congested Corridors

The Rider 42 activities are focused on the 50 most congested corridors; these are a mix of freeways and major streets located near downtowns and in the suburbs. The corridors are in Texas' four largest metropolitan areas. The solutions involve examining several improvement strategies, including a study of parallel and intersecting roads that may offer solutions. Exhibit 6 presents an overview of the congested sections in the four metropolitan areas (5). More information is included in each metropolitan area chapter.

Exhibit 6. 50 Most Congested Roadway Segments in Texas – 2010

2010 Rank	Roadway	County	From	To	Annual Hrs of Delay per mile	Annual Hrs of Delay	Annual Cost of Delay
1	IH 45	HARRIS	SL 8 North	IH 610	484,630	4,507,059	$98.0 million
2	US 59	HARRIS	IH 610 West	SH 288	440,416	2,422,287	$52.7 million
3	IH 635	DALLAS	IH 35E	US 75	432,244	3,414,730	$74.3 million
4	IH 35	TRAVIS	SH 71	US 183	421,778	3,880,359	$84.4 million
5	Woodall Rodgers Freeway	DALLAS	IH 35	US 75	397,861	636,577	$13.9 million
6	IH 45	HARRIS	IH 10	IH 610 South	366,486	2,858,589	$62.2 million
7	IH 45	HARRIS	IH 610 North	IH 10	342,303	1,061,140	$23.1 million
8	IH 35W	TARRANT	IH 30	SH 183	339,507	1,120,373	$24.4 million
9	US 75	DALLAS	IH 635	Woodall Rodgers Freeway	337,201	3,304,567	$71.9 million
10	US 59	HARRIS	IH 10	SH 288	314,106	973,729	$21.2 million
11	US 290	HARRIS	FM 529	IH 610	313,584	2,853,617	$62.1 million
12	IH 35E	DALLAS	IH 30	SH 183	313,318	1,723,248	$37.5 million
13	IH 610	HARRIS	IH 10	IH 45 North	303,228	1,880,016	$40.9 million
14	IH 820	TARRANT	I35W	SH 183	288,238	2,219,431	$48.3 million
15	US 75	DALLAS	PGBT	IH 635	257,055	1,773,680	$38.6 million
16	IH 30	DALLAS	IH 35E	SH 12 East	254,440	2,035,516	$44.3 million
17	IH 35E	DALLAS	US 67	IH 30	251,532	1,157,045	$25.2 million
18	IH 610	HARRIS	UA 90	IH 10	245,117	2,157,029	$46.9 million
19	IH 35E	DALLAS	SL 12	IH 635	242,208	581,299	$12.6 million
20	US 59	HARRIS	SL 8	IH 610 West	235,349	1,835,724	$39.9 million
21	IH 35W	TARRANT	SH 183	US 81	234,810	1,502,785	$32.7 million
22	IH 10	HARRIS	SL 8	IH 610 West	205,249	1,354,641	$29.5 million
23	SL 1604	BEXAR	SH 16	FM 471	197,021	945,701	$20.6 million
24	N Lamar	TRAVIS	W 45th Street	W 6th Street	195,573	664,947	$14.5 million
25	US 290	HARRIS	FM 1960	FM 529	187,048	785,601	$17.1 million
26	IH 45	HARRIS	SL 8	IH 610 South	174,824	1,433,556	$31.2 million
27	SH 288	HARRIS	IH 45	IH 610	172,958	830,196	$18.1 million
28	Westheimer (FM 1093)	HARRIS	SH 6	Post Oak Boulevard	168,249	1,884,390	$41.0 million
29	IH 30	DALLAS	Hampton	IH 35E	167,825	520,256	$11.3 million
30	IH 345	DALLAS	Woodall Rodgers Freeway	IH 30	162,567	227,594	$5.0 million

2010 Rank	Roadway	County	From	To	Annual Hrs of Delay per mile	Annual Hrs of Delay	Annual Cost of Delay
31	IH 10	HARRIS	IH 45	US 59	161,898	242,848	$5.3 million
32	IH 635	DALLAS	SH 78	IH 30	159,692	638,769	$13.9 million
33	IH 45	HARRIS	FM 528 / NASA 1	SL 8	157,824	1,073,200	$23.3 million
34	FM 1960	HARRIS	US 290	IH 45	157,776	2,161,525	$47.0 million
35	IH 10	HARRIS	IH 610 West	IH 45	157,762	899,242	$19.6 million
36	SL 12	DALLAS	SH 356	IH 35E	154,540	726,340	$15.8 million
37	SH 360	TARRANT	SH 183	IH 20	150,086	1,680,962	$36.6 million
38	US 281	BEXAR	SH 1604	Comal County Line	149,368	1,180,003	$25.7 million
39	SL 1	TRAVIS	US 183	US 290	146,130	1,753,560	$38.1 million
40	IH 635	DALLAS	US 75	SH 78	145,212	1,001,962	$21.8 million
41	IH 35E	DALLAS	IH 635	BS 121H	142,654	1,512,130	$32.9 million
42	SL 360	TRAVIS	SL 1	US 290	137,546	178,810	$3.9 million
43	US 290	TRAVIS	SL 1	RM 1826	136,493	518,673	$11.3 million
44	South Lamar/ 1st Street	TRAVIS	0.17 mile west of US 290	IH 35	135,550	704,859	$15.3 million
45	Bellaire	HARRIS	Puerta Vista Lane	US 59	133,919	857,082	$18.6 million
46	Bissonnet	HARRIS	US 59	Dairy Ashford	128,943	554,457	$12.1 million
47	SL 12	DALLAS	SH 356	IH 30	117,636	352,908	$7.7 million
48	IH 35	BEXAR	Loop 353/ Nogalitos	US 281	116,342	488,637	$10.6 million
49	IH 35	BEXAR	FM 1518	SL 1604	116,202	255,644	$5.6 million
50	Culebra Rd (FM 3487)	BEXAR	SH 471	IH 410	115,093	379,808	$8.3 million

Source: *100 Most Congested Roadway Segments in Texas*, Texas Department of Transportation, 2010

CONGESTION REDUCTION STRATEGY SUMMARY

Rider 42 recognized the role that traffic operations and travel option strategies will play in Texas' future. The size of the congestion problem in the largest metropolitan areas is more significant than these actions will be able to address alone, but they represent a part of the solution. These strategies were included in the 2030 Committee's *Transportation Action Program,* a combination of business, commuter, and agency actions that reduce peak-hour vehicle trips and efficiently use the existing roads.

Many of these strategies are relatively low-cost projects and programs; they have broad public support and can be rapidly implemented. These ideas require innovation, constant attention, and adjustment, but they pay dividends in faster, safer, and more reliable travel, better air quality, and improved economic conditions. Rapidly removing crashed vehicles, timing the traffic signals so that more vehicles see green lights, improving road and intersection designs, or adding a short section of roadway are relatively simple actions with big payoffs. The strategies are more fully described on the Mobility Investment Priorities website (mobility.tamu.edu/mip).

The language in Rider 42 focused the effort on addressing the congestion problems. *A critical concept to understand is that congestion on a segment may be caused by a problem on another segment. And likewise, solutions to congestion may lie beyond the bounds of a particular congested highway segment.* The solutions to congested corridors may not be on those roadways; there are many methods, projects, and programs to achieve the congestion benefits. The strategies summarized here and mentioned in each metropolitan area discussion can create congestion benefits if they are implemented on the congested road and on many parallel and intersecting roads, lanes, or transit routes.

The array of possible congestion reducing strategies has a variety of implementation timelines. Larger construction projects typically require longer time—in many cases more than 15 years from the idea stage to ribbon cutting. The typical time required for design, environmental clearance, acquisition of right-of-way, and construction can exceed four years in the best of circumstances (6). The Rider 42 project development funds seek to move large projects closer to implementation, but in the interim there are a variety of other congestion relief projects and programs that can be used to reduce stop-and-go traffic on freeways and major streets.

Additional Capacity

Adding capacity is the most frequently cited approach to congestion reduction and is achieved by adding traffic lanes, constructing new roadways, managed lanes, or improving designs. Additional traffic lanes have the ability to alleviate a congested corridor, particularly in bottleneck areas. Constructing new roadways reduces congestion; however, limited right-of-way in congested urban corridors makes this a costly approach. Managed lanes (also called express lanes, high-occupancy vehicle lanes, and high-occupancy toll lanes) can mitigate congestion by designating lanes for trucks or buses. Improvements to roadway and intersection designs increase the number of vehicles that can use the road, alleviating traffic congestion and improving safety. Grade separating roadways (building overpasses and underpasses) can reduce congestion by ensuring continuous traffic flow and removing conflict points.

Added Capacity Strategies

- Acceleration/Deceleration Lane
- Adding Lanes or Roads
- Adding New Toll Lanes or Toll Roads
- Commercial Vehicle Accommodations
- Displaced Left Turns
- Diverging Diamond
- Grade Separation
- Innovative Intersections
- Intersection Improvements
- Loop Ramps Eliminating Left Turns
- Managed Lanes (also High-Occupancy Vehicle [HOV] or High-Occupancy Toll Lane [HOT])
- Median U-Turns
- Modern Roundabout
- One-Way Street
- Quadrant Intersections
- Super Street

For more information go to mobility.tamu.edu/mip/strategies

These types of improvements are implemented by public agencies, private companies, or public-private partnerships. Implementation of additional capacity, whether it be expanding the roadway or converting regular lanes into managed lanes, is difficult and can be costly and time consuming.

Traffic Management

Traffic management is an essential component of congestion mitigation and primarily an agency responsibility. It can help improve the efficiency of the system by rapidly clearing collisions and stalled vehicles, improving signal coordination so that travelers see green lights as they move in the peak direction, installing turn lanes, combining driveways, removing chokepoints, and incorporating active traffic management principles such as variable speed limits, providing real-time traffic information that allows instant rerouting and restrictions that maintain a truck-free lane among other strategies.

Agencies are traditionally the technology implementers, but companies can help employees identify options for more efficient travel and offer incentives that build on agency actions.

Traffic Management Strategies

- Access Management
- Aggressive Incident Clearance
- Bottleneck Removal
- Dynamic Merge Control
- Electronic Toll Collection Systems
- Express Bus Service
- Freight Rail Improvements
- Multimodal Transportation Centers
- Park and Ride Lots
- Queue Warning
- Ramp Configurations
- Ramp Flow Control
- Reversible Traffic Lanes
- Signal Operations and Management
- Special Event Traffic Management
- Temporary Shoulder Use
- Traveler Information Systems
- Truck Lane Restrictions
- Variable Speed Limits
- Construction Contracting Options
- Reducing Construction & Maintenance Interference
- Pavement Recycling
- Shoulder Pavement Upgrade
- Sustainable Pavements

For more information go to mobility.tamu.edu/mip/strategies

Travel Options

Travel options during peak periods of travel can reduce congestion at very low cost. The physical structure of the transportation network of many large cities can compound congestion as widely distributed workers commute along congested corridors to major activity centers. Reducing single occupant vehicle trips by encouraging practices such as ridesharing or vanpooling can reduce roadway congestion. This encouragement is often helped by implementing parking management and variable pricing on roadways near the major activity centers. The peak-period trips associated with the 8 a.m. to 5 p.m. schedule not only saturate freeway corridors but also clog downtown streets, urban arterials, and parking facilities. Other strategies like telecommuting and flexible work schedule also reduce roadway congestion.

Travel options are implemented by public agencies and private companies depending on the type of program. Public agencies may determine a variable pricing system or create management plans or ordinances that guide efforts to reduce rush hour traffic. Private companies play the key role in offering employee options such as flexible work hours, compressed work weeks, and telecommuting. Shipping companies may also participate by, for example, choosing to transport goods overnight in an effort to meet their deadlines while also reducing roadway congestion during peak travel periods.

Travel Option Strategies

- Telecommuting
- Compressed Work Week
- Variable Pricing
- Parking Management
- Vanpool
- Trip Reduction Ordinances
- Land Use Planning
- Flexible Work Hours

For more information go to mobility.tamu.edu/mip/strategies

Funding Strategies

Funding is a critical aspect of transportation improvements. Projects and roadway improvements will not become reality without a funding mechanism in place. Traditional funding mechanisms such as the motor fuel tax, general revenue funds, and bonds still fund many transportation improvement projects; however, other funding opportunities or mixes of existing finance ideas should be identified in an effort to maximize flexibility in financing improvements.

There are a number of funding strategies that may be used such as pass-through financing, fuel tax, vehicle-miles traveled fee, vehicle sales tax, increased vehicle registration fees, or tax increment financing. Each new or increased fee strategy should be targeted to transportation.

Funding Strategies

- Fuel Tax – Statewide and Local
- Indexed Fuel Tax
- Vehicle Registration Fee – Statewide and Local
- Public-Private Partnership
- Comprehensive Development Agreement
- Pass Through Financing
- Driver's License Surcharge
- Vehicle-Miles Traveled Fee
- Vehicle Sales Tax
- Fuel Sales Tax
- Tax Increment Financing

For more information go to mobility.tamu.edu/mip/strategies

Public Engagement

Public engagement is a crucial aspect of transportation planning, particularly when voter approved funding mechanisms are considered to finance project costs. Public opinion of a proposed project can determine the success or failure of the project. Studies agree that public outreach is a necessary component of successful project planning and can ultimately benefit the decision-making process (7, 8).

Public engagement strategies are implemented by the public agency or a private consulting firm hired to conduct project meetings. The following strategies have a range of costs, but all have been shown to be cost-effective approaches.

Public Engagement Strategies

- Citizens Advisory Committee
- Crowdsourcing
- Electronic Update
- Fact Sheet
- Opinion Research
- Project Newsletter
- Project Website
- Public Hearings And Meetings
- Social Media
- Virtual Public Meeting

For more information go to mobility.tamu.edu/mip/strategies

RECOMMENDATION SUMMARY

This first recommendations report identifies the initial results of activities being undertaken by the Texas Transportation Institute related to coordinating studies in the four most congested areas of the state. The 82nd Legislature allocated $300 million in Proposition 12 bond proceeds for right-of-way acquisition, feasibility studies and project planning, and engineering work for projects that will relieve congestion on the most congested road segments in the Dallas-Fort Worth, Houston, Austin, and San Antonio metropolitan areas. TTI was directed by the legislature to coordinate studies to ensure the most effective use of these funds, as well as to ensure public participation, to consider the fullest possible range of funding options for project concepts generated under these studies, and to make recommendations to the department at major decision points.

The Mobility Investment Priorities Study has worked with agencies in each of the four metropolitan areas to identify studies, design efforts, or purchases of rights-of-way that meet the goals of Rider 42. This section summarizes the recommendations that will move major projects closer to completion and improve mobility in the four metropolitan areas. More information is included in each corridor summary in previous chapters. Most of these studies or right-of-way purchases can be funded by Proposition 12 bond funds. All of the studies will improve the knowledge of the costs and benefits of major transportation improvements.

Two environmental study types are used throughout the recommendations; a brief description of these two is provided below.

- **Planning and Environmental Linkages Study --** Planning and Environment Linkages (PEL) studies are an approach to transportation decision making that considers environmental, community, and economic goals early in the planning stage and carries them through project development, design, and construction (9).

  A PEL study is typically conducted for either a corridor or a subarea and will examine the needs and potential solution concepts using previous corridor/subarea studies. The PEL process involves a very proactive public involvement process involving all the appropriate stakeholders and transportation partners. The PEL allows the relatively rapid consideration of all available studies and narrows the list of alternatives to those likely to address the diverse travel, economic, social and safety needs of the community and focuses subsequent environmental studies.

- **National Environmental Policy Act (NEPA) Study --** A National Environmental Policy Act (NEPA) study assesses the environmental impacts of the action and must be completed prior to any improvements being constructed. Various levels of NEPA analysis may be required depending upon the anticipated impacts; these can be determined in the Planning and Environment Linkages Study (10).

- An Environmental Impact Statement (EIS) is conducted whenever it is anticipated that the federal action will significantly affect the quality of the natural or human environment. An EIS includes consideration of a range of reasonable alternatives, analyzes the potential impacts resulting from the alternatives, and demonstrates compliance with applicable environmental laws, rules, and executive orders.
- An Environmental Assessment (EA) is conducted when it is anticipated that a significant impact will not occur. If the assessment indicates, a Finding of No Significant Impact (FONSI) is issued. If a FONSI is not appropriate, additional mitigation or analysis may be required.

Most of the funding recommended in this report is allocated to purchase right-of-way in a few corridors. This is appropriate for the current development stage in those corridors. The corridors and projects are noted; the specific parcels will be identified in subsequent requests by TxDOT. The studies and design efforts will likewise be specified and consultants hired (or in-house work begun) as appropriate for each item.

Austin

The City of Austin has nearly doubled in size every 20 years since World War II. The rapid growth of the city has exacerbated traffic congestion in the area. IH 35, North Lamar, and MoPac—the three most congested sections in the metro area—are parallel north-south routes and are, essentially, the same problem. Improvements made to IH 35, for example, will likely reduce congestion on North Lamar and MoPac.

The Austin area has $31,280,000 in Rider 42 funds available to support engineering, feasibility studies, and right-of-way acquisition on the congested corridors in Austin ranking in the top 50 in the state. Exhibit 7 identifies the $18.5 million requested for priority studies and design efforts that are recommended as the first funding request; other studies, design efforts, or right-of-way purchases will be recommended in future reports. The affected corridor, the recommended action, and the funding requested for each action are listed in Exhibit 7 and illustrated in Exhibit 8.

Exhibit 7. Austin Area Recommendations for Proposition 12 Bond Funding, February 2012

Rank	Corridor	Recommended Early Action	Proposition 12 Funding Request
39	Loop 1 South Managed Lanes	Engineering (environmental clearance, final design, and preparation for letting) for tolled express lanes	$16,500,000
4	IH 35 Study Extension	Expand study limits and scope to address potential express lane operations and to assess travel option strategies for IH 35 commuters	$1,200,000
	All congested corridors – Integrated Traffic Management	Engineering study to develop an integrated system management & operation project that includes comprehensive incident management	$800,000
Total Request, February 2012			$18,500,000*

*Remaining Austin area Rider 42 allocation: $12,780,000.

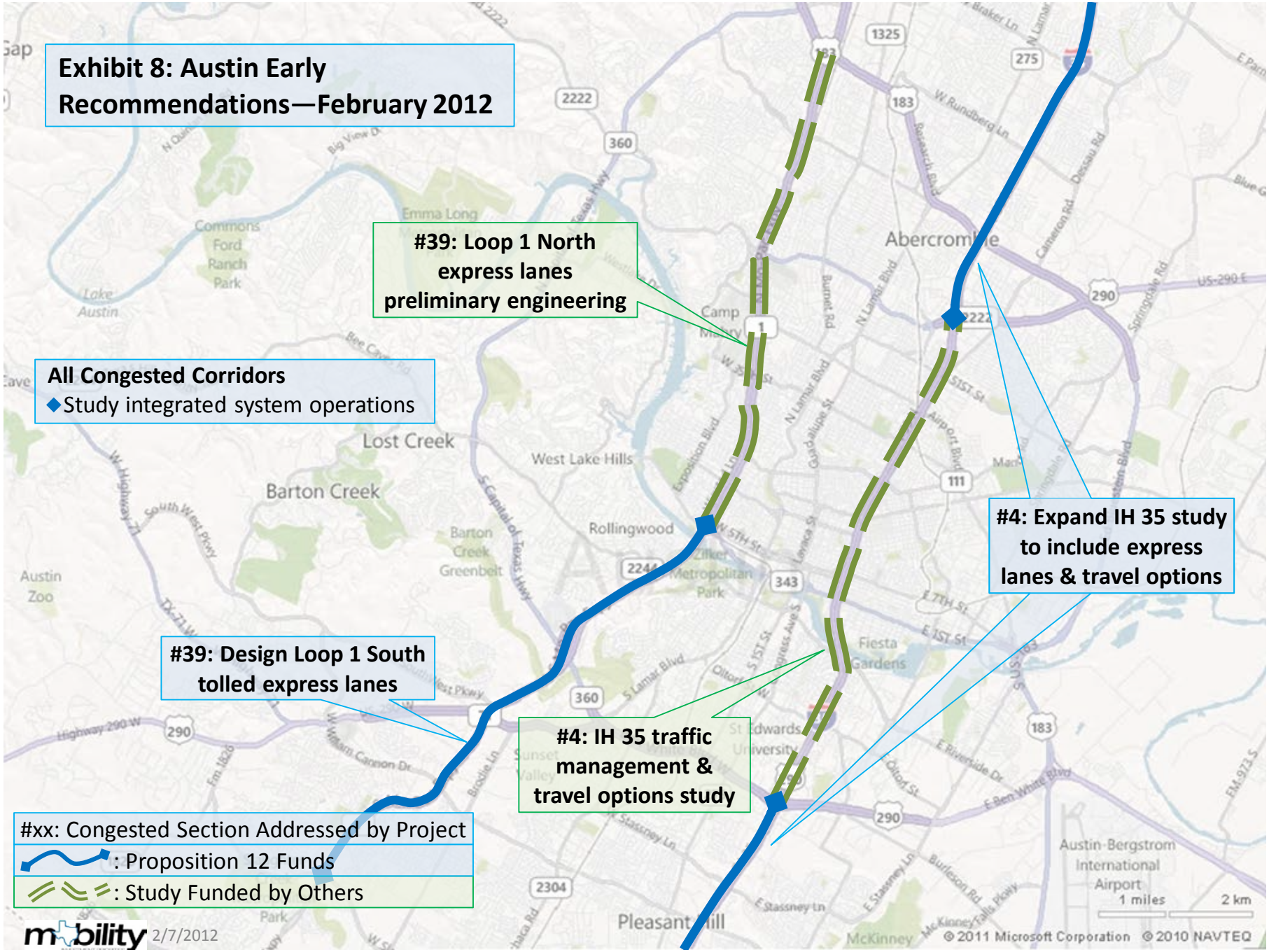


Exhibit 8: Austin Early Recommendations—February 2012
#39: Loop 1 North express lanes preliminary engineering
All Congested Corridors
◆Study integrated system operations
#4: Expand IH 35 study to include express lanes & travel options
#39: Design Loop 1 South tolled express lanes
#4: IH 35 traffic management & travel options study
#xx: Congested Section Addressed by Project
: Proposition 12 Funds
: Study Funded by Others
2/7/2012
Abercrombie
Lost Creek
Barton Creek
West Lake Hills
Rollingwood
Camp Mabry
Austin Zoo
Fiesta Gardens
Austin-Bergstrom International Airport
Pleasant Hill
McKinney
1 miles
2 km
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All Congested Corridors

All of the major capacity-adding projects will require a few years to implement. There are several tactics that can be implemented in the interim to improve traffic congestion before, during, and after construction.

Traffic Management System

The traffic system management and operations practices should be examined and recommendations identified to determine the set of equipment, technologies, policies, practices, facilities, staffing, and/or system needed to achieve integrated, regional transportation management response to recurring and non-recurring traffic events. The need to coordinate actions between regional partners to actively provide multimodal, cross-jurisdictional system management and operations requires that the regional transportation stakeholders, including TxDOT, City of Austin, the Central Texas Regional Mobility Authority (CTRMA), and other local agencies, have the ability to monitor the state of the transportation system, share information, and coordinate traffic management responses across jurisdictional boundaries. Recommendations will also be prepared as to what agreements, institutional arrangements, memoranda of understanding, and procedures are needed for the local agencies to provide better coordination and management of traffic from a regional perspective. Public engagement in developing and finalizing the alternatives, implementation of active traffic management, and travel option strategies will be a major component of the phase.

- Proposition 12 bond funds should be used to conduct feasibility and engineering studies related to expanding the traffic system management and operations program for the congested corridors in Austin.
    - Requested Funding: $800,000 for an engineering and feasibility study.

IH 35, SH 71 (Ben White Blvd.) to US 183 North (Statewide Congestion Rank #4)

The City of Austin's IH 35 Corridor Development Program addresses a wide range of potential short and mid-term traffic and demand management strategies to improve the operation of the IH 35 section within the existing freeway footprint from Ben White Boulevard to US 290 East. The study should be extended to cover IH 35 from SH 45 to the south and SH 45 to the north. Initial feedback to the City of Austin from partner jurisdictions (including the Texas Department of Transportation, Capital Metro, and Williamson County) indicates that a bidirectional, concurrent flow managed lane facility should be provided beyond the central Austin corridor, connecting with a potential complementary facility on each end in Williamson County and/or Hays County.

The extended feasibility effort would develop conceptual alternatives for continuous express lanes (the local term for the treatment also known as managed lanes), including ingress/egress and lane separation strategies. An operational concept would be prepared for the preferred alternative, to include system use policies, transit/rideshare features, enabling technologies, system operations procedures, marketing and education, and other required components to deploy a managed lane system solution on IH 35. The study would also identify options that are publicly acceptable through a rigorous public engagement

process. In addition, the travel option strategies needed to support the use of the express lanes and a performance monitoring program to ensure the effective operation of all corridor congestion reduction strategies will be developed.

- Proposition 12 bond funds should be used to extend the limits of the City's IH 35 study north of SH 45 in Williamson County to south of SH 45 in Hays County. This study includes the investigation of the feasibility of express lanes in the corridor and the development of operations improvements and travel options required to support congestion reduction in the corridor.
    - Requested Funding: $1,200,000 for a project feasibility study.

MoPac/Loop 1, US 183 North to US 290 West (Statewide Congestion Rank #39)

The Central Texas Regional Mobility Authority (CTRMA) and TxDOT are developing tolled express lanes on the north section of Loop 1 between Cesar Chavez Street and Parmer Lane; these activities should be expanded to South MoPac. Public engagement is a key part of the process. The Capital Area Metropolitan Planning Organization (CAMPO) 2035 Regional Transportation Plan calls for tolled managed lanes on this section of Loop 1, with one managed lane in each direction. In cooperation with Capital Metropolitan Transportation Authority (CapMetro), the public transit authority for the metro area, the express lanes will also provide a dedicated transit corridor for buses and registered van pools.

- Proposition 12 bond funds should be used for an environmental study, preliminary engineering, and final design to add northbound and southbound express lanes on South MoPac/South Loop 1 from the Cesar Chavez interchange to Slaughter Lane.
    - Requested Funding: $16,500,000 for an environmental study, preliminary engineering, final design, and preparation for project letting for a system of express lanes for the South MoPac (Loop 1) corridor between Cesar Chavez Street and Slaughter Lane.

Dallas – Fort Worth

The 11 most congested Dallas-Fort Worth Metroplex corridors were intensively examined in the first few months of the Mobility Investment Priorities project. The Metroplex has aggressively pursued large congestion reduction projects using a combination of traditional funding and innovative financing including comprehensive development agreements (CDA). The beneficial effect of these projects is illustrated by the recommendations offered in this report; there are no recommendations about the CDA corridors because major roadway improvements are under construction by the private developers. Other corridors such as Woodall Rodgers, North Central Expressway, and SH 360 either have relatively few large scale improvement options available due to physical, community, or financial constraints or may have their congestion levels reduced by construction projects that have already begun; these corridors will largely rely on operational improvements and travel options to provide additional congestion relief.

Two large projects are recommended for Proposition 12 funding. The two projects listed in Exhibit 9 combine to use the full Dallas-Fort Worth Proposition 12 project development allocation of $118,750,000. Other studies are suggested in this Early Recommendations Report (see Exhibits 10, 11 and 12) and additional recommendations will be made over the remaining period of the Mobility Investment Priorities Project.

Exhibit 9. Dallas-Fort Worth Area Recommendations for Proposition 12 Bond Funding, February 2012

Rank	Corridor	Recommended Early Action	Proposition 12 Funding Request
12, 17, 29	IH 30 and IH 35E Freeways	Purchase right-of-way, adjust utilities and develop engineering plans to construct the Horseshoe Project (the first stage of Project Pegasus).	$100,750,000
12, 16, 17, 29	Trinity Parkway Phase 1 (parallel to IH 30 Freeway)	Purchase right-of-way, adjust utilities and develop engineering plans to construct Phase 1 of the Trinity Parkway Project (re-aligning the US 175 Freeway).	$18,000,000

The 11 most congested Metroplex corridors are where congestion problems and solutions are most difficult. Capacity has been added in several corridors; those congested sections will rely on improvements in other corridors, traffic management and travel option strategies to help reduce congestion. Resource constraints dictate that many of the less congested corridors will not be comprehensively examined over the course of the Mobility Investment Priorities project. Many of the solutions to the most congested corridors, however, will apply to those corridors lower on the list of the 50 most congested sections.

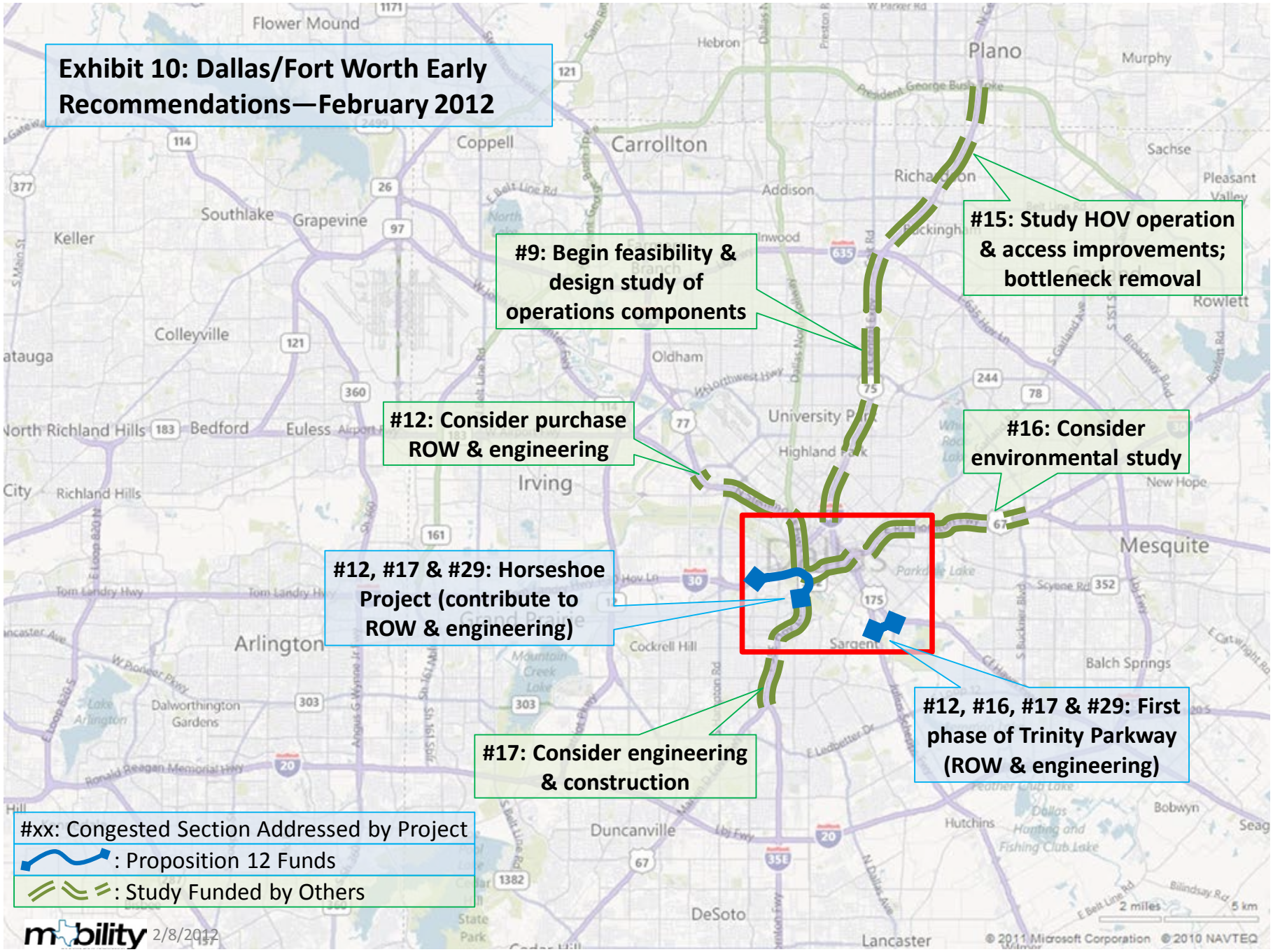
Exhibit 10: Dallas/Fort Worth Early Recommendations—February 2012
#9: Begin feasibility & design study of operations components
#15: Study HOV operation & access improvements; bottleneck removal
#12: Consider purchase ROW & engineering
#16: Consider environmental study
#12, #17 & #29: Horseshoe Project (contribute to ROW & engineering)
#12, #16, #17 & #29: First phase of Trinity Parkway (ROW & engineering)
#17: Consider engineering & construction
#xx: Congested Section Addressed by Project
: Proposition 12 Funds
: Study Funded by Others
Flower Mound
Plano
Murphy
Hebron
Coppell
Carrollton
Sachse
Addison
Southlake
Grapevine
Keller
Colleyville
Oldham
Rowlett
North Richland Hills
Bedford
Euless
University Park
Highland Park
Irving
New Hope
Richland Hills
Mesquite
Arlington
Cockrell Hill
Balch Springs
Dalworthington Gardens
Duncanville
Hutchins
Bobwyn
DeSoto
Lancaster
2 miles
5 km
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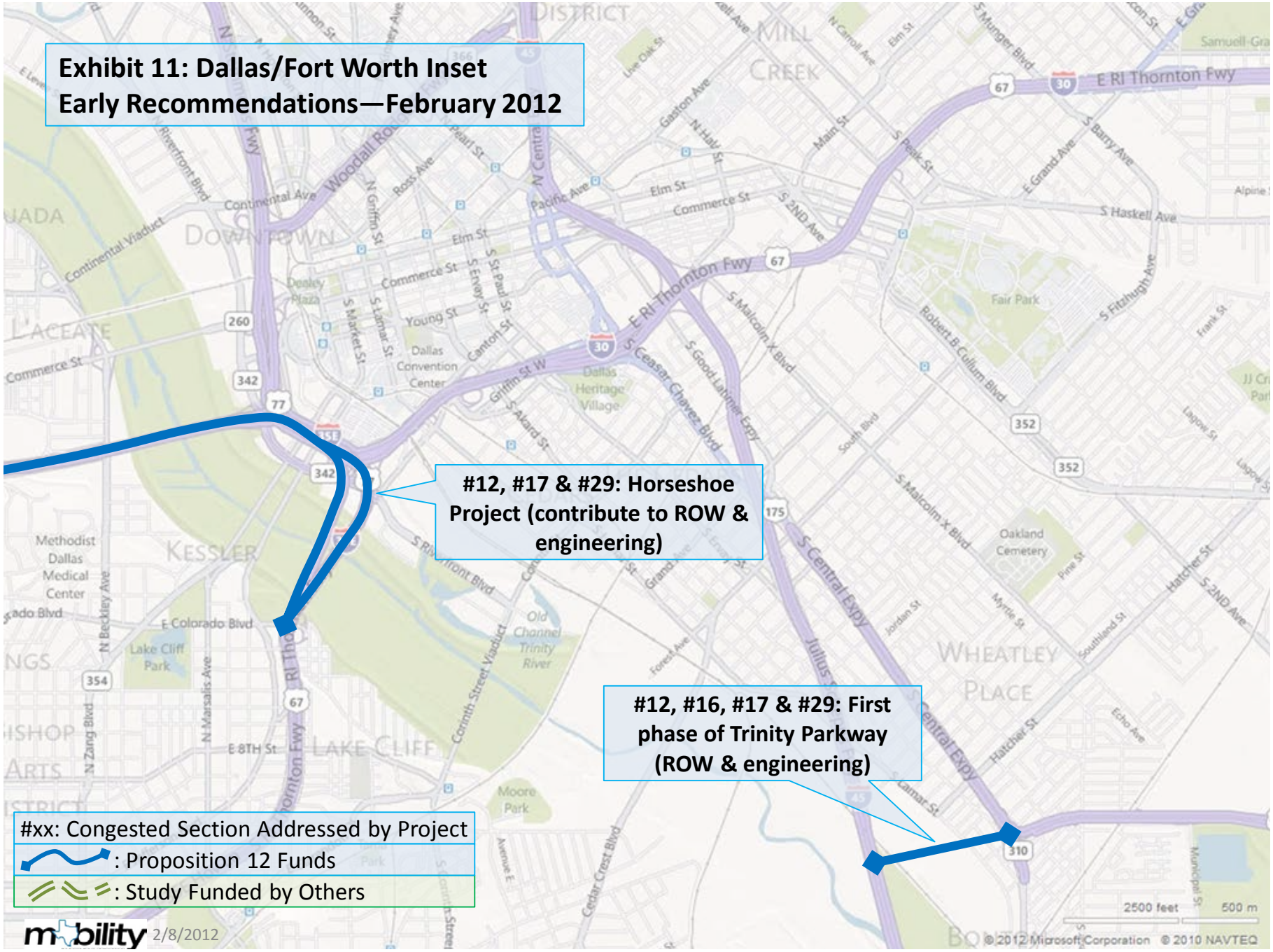
Exhibit 11: Dallas/Fort Worth Inset
Early Recommendations—February 2012
#12, #17 & #29: Horseshoe Project (contribute to ROW & engineering)
#12, #16, #17 & #29: First phase of Trinity Parkway (ROW & engineering)
#xx: Congested Section Addressed by Project
: Proposition 12 Funds
: Study Funded by Others
mobility 2/8/2012
E RL Thornton Fwy
S Central Expy
S Ceasar Chavez Blvd
Downtown
Kessler
Lake Cliff
Wheatley Place
Fair Park
Dallas Convention Center
Dallas Heritage Village
Oakland Cemetery
Methodist Dallas Medical Center
Lake Cliff Park
Old Channel Trinity River
Moore Park
2500 feet
500 m
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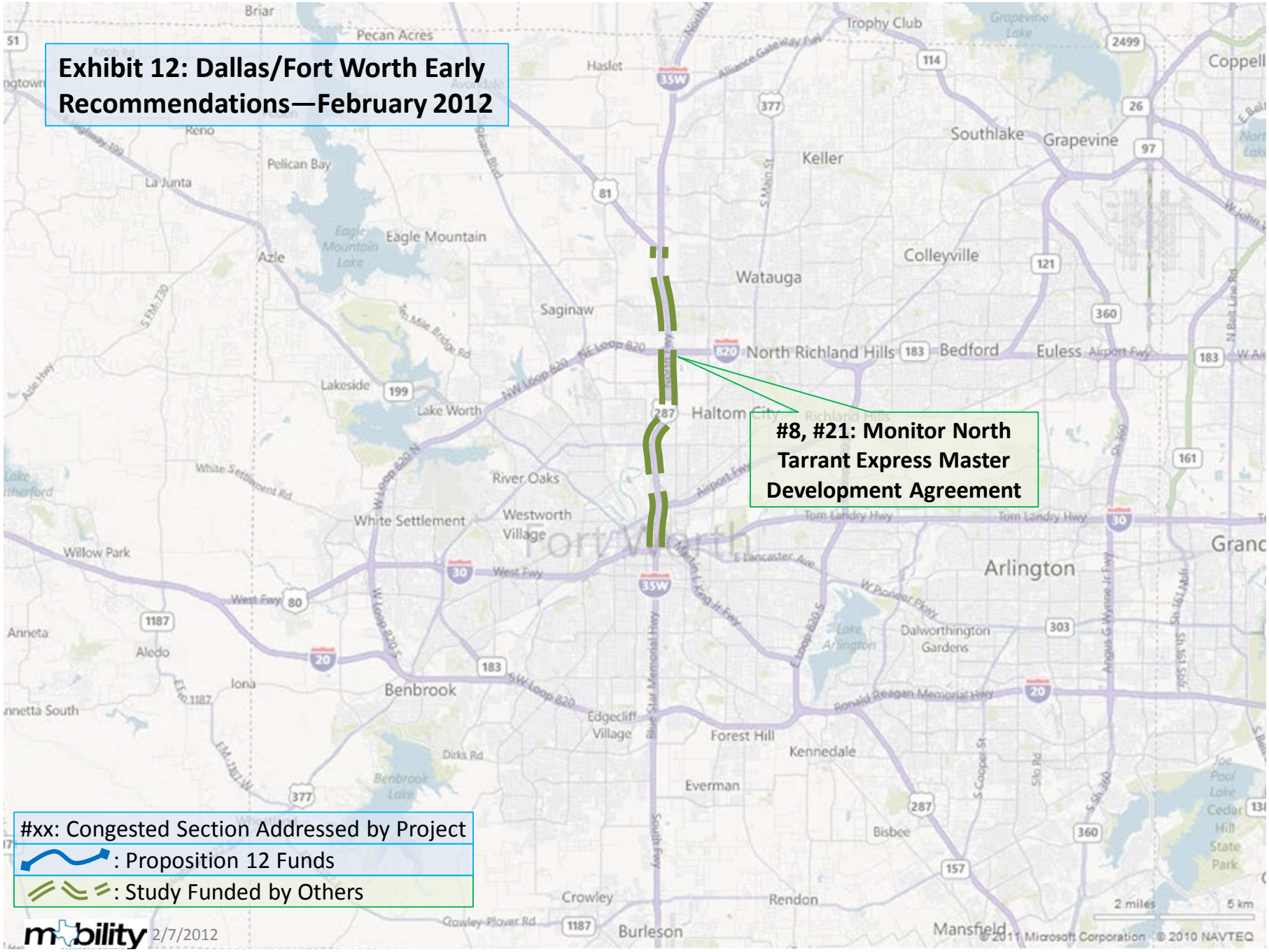
Exhibit 12: Dallas/Fort Worth Early Recommendations—February 2012
#8, #21: Monitor North Tarrant Express Master Development Agreement
#xx: Congested Section Addressed by Project
: Proposition 12 Funds
: Study Funded by Others
mobility 2/7/2012
Briar
Pecan Acres
Trophy Club
Haslet
Coppell
Reno
Southlake
Grapevine
Keller
Pelican Bay
La Junta
Eagle Mountain
Azle
Colleyville
Watauga
Saginaw
North Richland Hills
Bedford
Euless
Lakeside
Lake Worth
Haltom City
River Oaks
White Settlement
Westworth Village
Fort Worth
Willow Park
Arlington
Anneta
Aledo
Iona
Benbrook
Dalworthington Gardens
Edgecliff Village
Forest Hill
Kennedale
Everman
Bisbee
Crowley
Rendon
Burleson
Mansfield
2 miles
5 km
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LBJ Freeway (IH 635), IH 35E (Stemmons Freeway) to US 75 (North Central Expressway) (Statewide Congestion Rank #3)

LBJ Infrastructure Group will construct, operate and maintain the managed lanes roadway under a comprehensive development agreement (CDA). As such, there may be no ability for any other entity to make operational changes, suggest changes, or enact improvements. This issue will be studied in future months.

Woodall Rodgers Freeway, IH 35E (Stemmons Freeway) to US 75 (North Central Expressway) (Statewide Congestion Rank #5)

Deficiencies with Woodall Rodgers Freeway are not the principal cause of the congestion. Stemmons Freeway and North Central Expressway, the two freeways on the ends of Woodall Rodgers, are congested and do not allow traffic to efficiently enter and exit those roadways. Adding capacity to Woodall Rodgers would only offer more space for traffic to queue, it would not relieve congestion. There are no specific plans or projects on this roadway beyond the western extension that is under construction, but other solutions will be examined over the next several months.

IH 35W North Freeway, IH 30 (East Freeway) to SH 183 (NE 28th St.) (Statewide Congestion Rank #8)

IH 35W is part of the North Tarrant Express CDA Master Development Agreement. It is not part of the ongoing construction efforts but an agreement to include this facility in the construction efforts is being pursued. This project should have environmental and schematic clearance by mid-2012. Regional planners will monitor IH 35W's addition to the North Tarrant Express CDA and initiation of construction. If added to the CDA, further planned improvement to the corridor will be reviewed.

- The conclusions of the North Tarrant Express Master Development Agreement should be monitored. If construction will not be performed by North Tarrant Express Mobility Partners, additional actions may be required.

US 75 Central Expressway, IH 635 (LBJ Freeway) to Woodall Rodgers Freeway (Statewide Congestion Rank #9)

The current configuration of US 75 will remain for the next few decades. A significant widening was accomplished in the 1990s. Some of the corridor is below ground level and most of the length is surrounded by multi-storied commercial buildings and neighborhoods; Southern Methodist University abuts a portion of the corridor. As there are no plans for additional capacity, this corridor will address congestion through use of light-rail transit capacity and additional traffic management and travel demand management efforts through the FHWA Integrated Corridor Management (ICM) program. The ICM is a comprehensive operations strategy that will integrate systems (freeway, transit, and arterials) to get the full use out of the available capacity. In addition, a traveler information program that gives traffic information to drivers could be developed as part of this project.

- A feasibility study and design of the operations components identified in the Integrated Corridor Management study should be conducted. Any road construction needed to implement the feasible components along the US 75 corridor should be considered.

IH 35E Stemmons Freeway, IH 30 (Tom Landry Highway) to SH 183 (Airport Freeway) (Statewide Congestion Rank #12)

Additional freeway/high occupancy vehicle (HOV)/managed lane capacity has been recommended in this corridor since 1986 in the Mobility 2000 Plan. A subarea study was undertaken in 1989, which refined the recommended improvement strategy and this portion of IH 35E was included in the Trinity Parkway Major Investment Study (conducted 1996 to 1998) that also confirmed the need for additional freeway and managed lane capacity. The section of freeway from Jefferson Viaduct to Colorado Street is part of a Texas Transportation Commission approved design-build project named the Horseshoe. TxDOT began the procurement for a design-build contractor on the Horseshoe Project (a short, but important bridge rebuilding and bottleneck removal project that is the first stage of Project Pegasus—see www.projectpegasus.org) in December 2011. This project will replace the rapidly deteriorating IH 30 and IH 35E bridges that cross the Trinity River, as well as the connecting roadways where they converge near the Dallas Central Business District.

Due to requirements that the long-range plan must be limited to projects with identified funding, and since this facility was parallel to the proposed Trinity Parkway, it was removed from the financially constrained section of the Mobility 2035 Plan but remains in the vision component of the plan for consideration if additional funding is realized. The project was environmentally cleared through a Finding of No Significant Impact (FONSI) in July 2005. No engineering or right-of-way (ROW) work is being performed for the project.

- Proposition 12 bond funds should be used to complete the engineering and right-of-way acquisition for the Horseshoe project. The project will decrease congestion levels on sections of Stemmons, Tom Landry, and South R.L. Thornton Freeways (ranked #12, #17, and #29). Construction funding has been allocated from a variety of other sources including other portions of Proposition 12.
    - Required Funding: $47,000,000 in funding for right-of-way purchase/utility relocation and $53,750,000 in engineering funding should be allocated.
- If it appears possible to gain a community consensus that construction should proceed on a congestion reduction project for the entire corridor, ROW purchase and engineering along the IH 35E corridor should be started.

IH 820 (Northeast Loop), IH 35W (North Freeway) to SH 183 (Airport Freeway) (Statewide Congestion Rank #14)

North Tarrant Express Mobility Partners will construct, operate and maintain this section of IH 820 under a comprehensive development agreement. This should significantly mitigate the congestion on the roadway. Regional and local planners will monitor areas near the corridor during and after construction to address any resulting congestion.

US 75 Central Expressway, SH 190 to IH 635 (LBJ Freeway) (Statewide Congestion Rank #15)

Construction of this corridor was completed in the late 1980s. TxDOT will soon begin the process of hiring a consultant to study possible improvements in this corridor. Congestion can be partially addressed through additional traffic management, travel options, and bottleneck removal efforts on both the freeway and the HOV lane through the FHWA Integrated Corridor Management (ICM) program. TxDOT is also working on the design of interchange improvements on US 75 at the SH 190 interchange that will widen direct-connect ramps and construct auxiliary lanes.

- A project planning study and feasibility analysis should be conducted to identify potential HOV lane operations and access improvements on the US 75 corridor. In addition, the feasibility of interchange improvements and bottleneck removal projects at the US 75/SH 190 interchange should also be studied. This might include widening direct-connect ramps, adding short road sections to improve traffic flow or other relatively limited projects.

IH 30 East RL Thornton Freeway, Jefferson Viaduct to SL 12 East (Statewide Congestion Rank #16)

The North Central Texas Council of Governments (NCTCOG) states that improvements on IH 30 from the Jefferson Viaduct to SL 12 East are warranted based on 2035 traffic projections. However, because of financial limitations, this project was not included in Mobility 2035 recommendations but remains in the vision component of the plan for consideration if additional funding is realized. The East Corridor Transportation Study was started in 2004 with preliminary engineering and feasibility. Planned improvements included reconstruction, lane expansion, and new or enhanced HOV/managed lane facilities. The project never completed the formal environmental assessment process.

The Trinity Parkway alignment and funding has not been determined, but when completed it will provide an alternate route to the very congested IH 30 section south of downtown (locally known as the Canyon). The first phase of the Trinity Parkway involves re-aligning the US 175 Freeway to intersect IH 45 in the Trinity River basin. In addition, this will provide safety and community benefits to the US 175 Freeway.

- Proposition 12 bond funds should be used to complete engineering and right-of-way acquisition for the Trinity Parkway, Phase 1 project. The project is a key component of the Trinity Parkway Project that will decrease congestion levels on sections of East R.L. Thornton, Stemmons, Tom Landry, and South R.L. Thornton Freeways (ranked #12, #16, #17, and #29). Area agencies indicate that the Trinity Parkway must be operating as an alternate route for construction traffic for the Canyon construction project. Construction funding has been allocated from a variety of other sources including other sections of Proposition 12.
    - Required Funding: $5,600,000 in funding for right-of-way purchase/utility relocation and $12,400,000 in engineering funding should be allocated.
- The environmental study along the East IH 30 corridor should be completed if it appears possible to gain a community consensus that construction should proceed on a congestion reduction project in this corridor.

IH 35E South RL Thornton Freeway, US 67 to Jefferson Viaduct (Statewide Congestion Rank #17)

In 2002, a Major Investment Study (MIS) was initiated that resulted in recommendations for the corridor. The project to widen IH 35E from SH 183 to 8th Street was environmentally cleared through a Finding of No Significant Impact (FONSI) in July 2005. The section of freeway from Jefferson Viaduct to Colorado Street is part of a Texas Transportation Commission approved design-build project named the Horseshoe. TxDOT began the procurement for a design-build contractor on the Horseshoe Project (a short but important bridge rebuilding and bottleneck removal project) in December 2011. Funding has been identified for the section of IH 35E from Reunion Boulevard to south of Colorado Street (including the IH 35E bridges over Trinity River). No funding source has been identified for the approximately $300 million of the Southern Gateway Project section from south of Colorado Street to US 67.

- IH 35E from 8th Street to US 67 was environmentally approved in June 2006 through a FONSI. If it appears possible to gain a community consensus that construction should proceed on a congestion reduction project in this entire corridor, engineering work on this section of IH 35E should begin.

IH 35E Stemmons Freeway, SL 12 (Walton Walker Freeway) to IH 635 (LBJ Freeway) (Statewide Congestion Rank #19)

Reconstruction of this section of IH 35E and the addition of managed lanes and connections to LBJ Freeway began in 2011 as part of the LBJ Express project. NCTCOG, TxDOT, and municipalities will continue to monitor congestion and identify and analyze possible improvements to the corridor during construction and completion of the LBJ Express.

IH 35W (North Freeway), SH 183 (N. 28th St.) to US 287 (US 81) (Statewide Congestion Rank #21)

IH 35W is part of the North Tarrant Express CDA Master Development Agreement. It is not part of the ongoing construction efforts, but an agreement to include this facility in the construction efforts is being pursued. This project should have environmental and schematic clearance by mid-2012. Regional planners will monitor IH 35W's addition to the North Tarrant Express CDA and initiation of construction. If added to the CDA, further planned improvement to the corridor will be reviewed.

The section of IH 35W from IH 820 to US 287 will be traditionally let through TxDOT. The estimated construction cost is $140 million. Letting for this project is anticipated in late 2012.

- The conclusions of the North Tarrant Express Master Development Agreement should be monitored. If construction will not be performed by North Tarrant Express Mobility Partners, additional actions may be required.

Houston

Most of Houston's most congested sections are in the area between downtown and the IH 610 Loop. The Houston metro area has been allocated $116,224,000 in Rider 42 funds to support engineering, feasibility studies, and right-of-way acquisition on the congested corridors in Houston ranking in the top 50 in the state. For the first round of Rider 42 funding, Exhibit 13 summarizes the recommended right-of-way needs, priority studies, and design efforts (also displayed in Exhibit 14).

Exhibit 13. Houston Area Recommendations for Proposition 12 Bond Funding, February 2012

Rank	Corridor	Recommended Early Action	Proposition 12 Funding Request
11, 25	US 290 Northwest Freeway	Purchase right-of-way and adjust utilities to reconstruct the mainlanes between W. Little York and FM 529 and the interchange of US 290 with Sam Houston Tollway	$78,000,000
2, 6, 7, 10, 27, 31, 35	IH 45, US 59 and SH 288 corridors – Downtown Redesign Planning Study	A comprehensive feasibility study to develop viable and long-term solutions to all the congested freeway sections within the IH 610 Loop. The proposed solutions would be based on an evaluation of the origin-destination travel patterns on these segments.	$5,000,000
1, 7	IH 45 North Freeway	Feasibility study and design of mobility improvements along major streets parallel to IH 45 North.	$2,000,000
	All congested corridors - Operational improvements	Engineering study to identify potential freeway locations that can benefit from operational treatments such as comprehensive incident management, dynamic rerouting, variable speed limits, time of day ramp closures, etc. Identify the cost of implementing these strategies, Implementation funding sources and benefits.	$850,000
	All congested corridors – Travel Options	Engineering study to examine the effect on needed highway improvements by implementation of travel option strategies along most congested corridors.	$500,000
Total Request, February 2012			$86,350,000

*Remaining Houston area Rider 42 allocation: $29,874,000.

Many of the recommendations focus on studies and planning efforts that will assist the agencies in reducing congestion by getting more productivity out of the existing system and by offering travel options for peak period commuters. In some cases, these will improve conditions until larger projects can be implemented and, in other corridors with fewer construction options, the strategies may be the best method to reduce congestion in the next several years. The studies can allow Houston to take advantage of the characteristics of the denser activity centers in downtown, the Texas Medical Center, Greenway Plaza, and Uptown where many jobs can be at least partially accomplished using electronic means. In addition, other studies will identify methods to expand the use of proven operational treatments.

The most congested corridors were examined in the first few months of the Mobility Investment Priorities project, but many of the lower-ranking corridors were not studied. Due to resource constraints and the extent of congestion in Houston, it is likely that many of the less congested corridors will not be comprehensively examined over the course of the Mobility Investment Priorities project. Many of the solutions to the most congested corridors, however, will apply to those corridors lower on the list of the 50 most congested sections.

The two congestion reduction projects that are closest to being implemented are the extension of the Hardy Toll Road from the IH 610 Loop to downtown and the expansion of the US 290 Northwest Freeway. These projects have environmental clearance and a clear indication of significant benefits from the projects. The Hardy project is in the design phase and the estimated $400 million project is being considered by the Harris County Toll Road Authority. The US 290 expansion has begun with improvements to the US 290/IH 610 interchange, but funding for other improvements has not been identified.

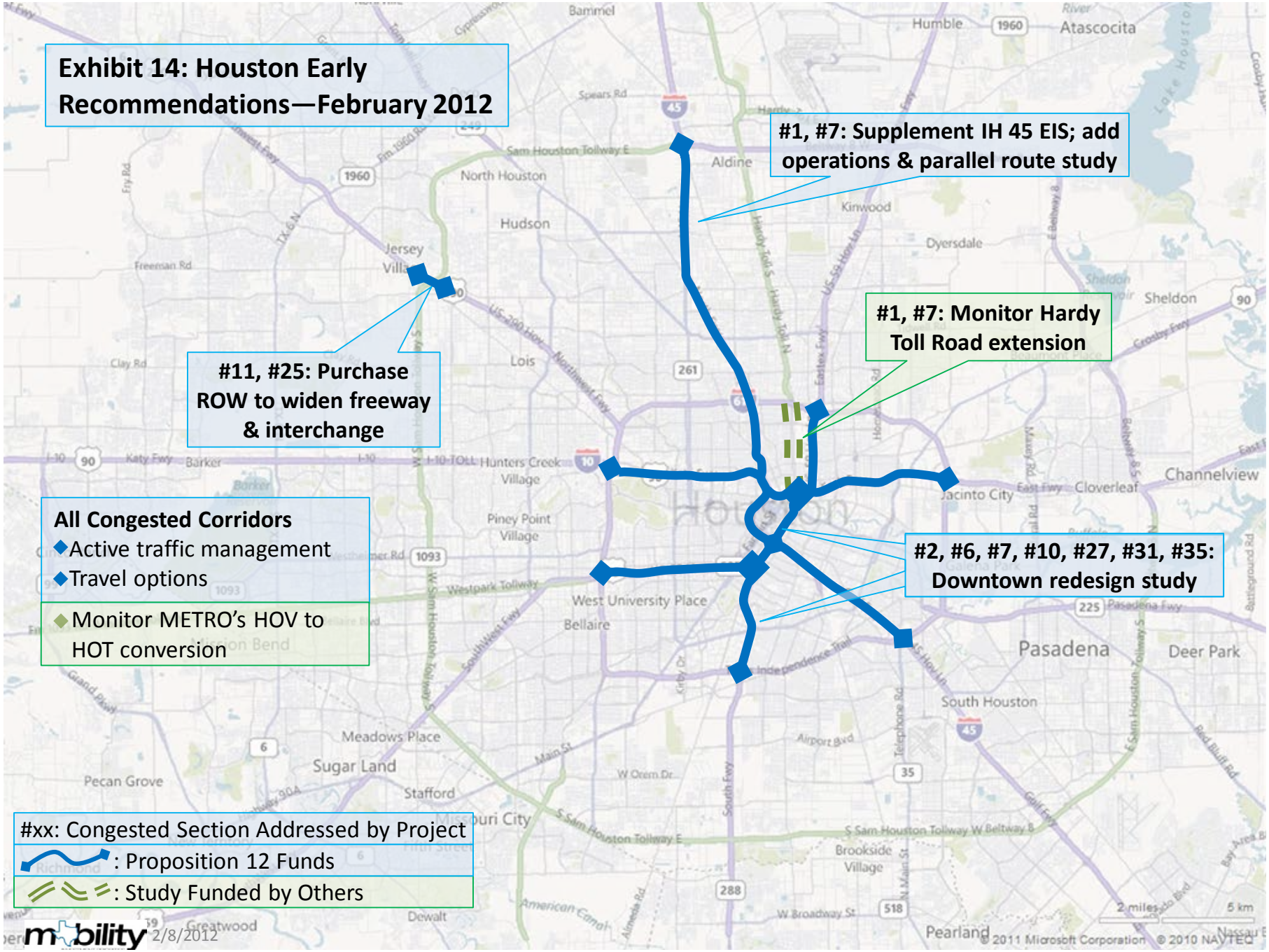
Exhibit 14: Houston Early Recommendations—February 2012
#1, #7: Supplement IH 45 EIS; add operations & parallel route study
#1, #7: Monitor Hardy Toll Road extension
#11, #25: Purchase ROW to widen freeway & interchange
#2, #6, #7, #10, #27, #31, #35: Downtown redesign study
All Congested Corridors
Active traffic management
Travel options
Monitor METRO's HOV to HOT conversion
#xx: Congested Section Addressed by Project
: Proposition 12 Funds
: Study Funded by Others
Bammel
Humble
Atascocita
Aldine
North Houston
Hudson
Kinwood
Dyersdale
Sheldon
Jersey Village
Lois
Hunters Creek Village
Piney Point Village
Barker
Cloverleaf
Channelview
Jacinto City
West University Place
Bellaire
Pasadena
Deer Park
South Houston
Meadows Place
Sugar Land
Pecan Grove
Stafford
Missouri City
Brookside Village
Pearland
Greatwood
Dewalt
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All Congested Corridors

Downtown Redesign Planning Study

Many of Houston's most congested sections are on the downtown freeways. Because of their intertwined nature, improving mobility on only one section can adversely affect mobility on a different section. In order to fully understand the problem and identify long-term solutions to the congested segments in the downtown area, a comprehensive planning study that encompasses all freeways within the IH 610 Loop/inner core of Houston is needed.

The initial portion of this study would identify freeway travel patterns. Knowledge about origin-destination patterns helps engineers and planners develop alternatives that can address the needs of both pass-through and local traffic. For example, providing express lanes through downtown could improve mobility by reducing weaving volumes and allowing more efficient use of the available capacity.

The second portion of the study will develop and evaluate alternatives based on the origin-destination patterns. In addition to conventional capacity improvement alternatives, the study would evaluate innovative capacity improvements, active traffic management strategies, and promotion of travel option strategies to improve mobility as an integral component. Public engagement in developing and finalizing the alternatives, implementation of active traffic management, and travel option strategies will be a major component of this phase. The study would also incorporate the recommendations/results of IH 45 North EIS study in developing and analyzing alternatives.

- Proposition 12 funds should be used to conduct a study of the downtown freeway traffic and design options.
    - Recommended funds: $5,000,000 for the study of travel patterns in the corridor, the development of mobility improvement strategies on the freeways and a significant public engagement effort to maximize the usefulness of the information developed in the IH 45 environmental impact study.

Feasibility Study for Implementing Active Traffic Management Strategies

A study of the possible implementation of active traffic management strategies would identify the appropriate locations along each congested freeway section. Operational treatments such as aggressive incident management, dynamic rerouting, dynamic traveler information, and variable speed limits can play a role in reducing congestion and be implemented quicker and at lower costs than larger capacity-increasing projects. Elements of the study would include:

- Cost/benefit of implementing the best practices along each congested corridor.
- Funding sources for the program.
- Public engagement strategies to identify which strategies are appropriate and where they can be successful.

- Proposition 12 funds should be used to examine the active traffic management strategies that would improve the congested freeway sections.
    - Recommended funds: $850,000 for a project planning and feasibility study.

Feasibility Study for Implementing Travel Option Strategies

This early action feasibility study would examine the implementation of travel option strategies and the potential benefits and effects on needed highway improvements in the congested corridors. These strategies include but are not limited to flextime, carpooling, and employer sponsored vanpooling, transit, and parking incentives, along the most congested Houston corridors.

- Proposition 12 funds should be used to examine the travel option strategies that would improve the congested freeway sections.
    - Recommended funds: $500,000 for a feasibility study.

IH 45 North Freeway, Sam Houston Tollway (Beltway 8) to IH 610 (North Loop) and from IH 610N (North Loop) to IH 10 (Katy Freeway) (Statewide Congestion Ranks #1 and #7)

An early action feasibility study to identify mobility improvements along major streets parallel to IH 45 North can make these surface streets more viable alternative routes. The design of these streets and the adjacent developments can be improved. Active traffic management strategies such as variable speed limits, dynamic rerouting using improved surface streets, improved traffic signal systems, and traveler information should also be examined.

- Proposition 12 funds should be used to examine mobility improvements including both capacity improvements (wherever possible) and operational treatments on major streets in the IH 45 corridor.
    - Recommended funds: $2,000,000 for a feasibility study.

The reversible high occupancy vehicle (HOV) lane from Beltway 8 to IH 610 (North Loop) is not heavily used outside of the peak hours. The operation is being transitioned to a managed high-occupancy toll lane that would offer access to single-occupant vehicles for a toll.

- METRO's dynamic pricing project on the HOV lanes on IH 45 should be monitored.

The Harris County Toll Road Authority (HCTRA) is considering the construction of an extension of the Hardy Toll Road into downtown. There may be a need for additional right-of-way and a role for TxDOT in assisting in implementation.

- Decisions related to the extension of Hardy Toll Road from the current terminus at IH 610 to downtown (construction and operations would be conducted by HCTRA) should be monitored and additional action taken if it appears that HCTRA will not construct the extension.
- This section of freeway is included in the Downtown Redesign Planning Study.

US 59 Southwest Freeway, IH 610 (West Loop) to SH 288 (South Freeway) (Statewide Congestion Rank #2)

The reversible HOV lane is not heavily used outside of the peak hours. The operation is being transitioned to a managed high-occupancy toll lane that would offer access to single-occupant vehicles for a toll.

- METRO's dynamic pricing project on the HOV lanes on IH 45 should be monitored.
- This section of freeway is included in the Downtown Redesign Planning Study.

Four parallel streets offer options to travel on US 59, especially for shorter trips. The design of these streets and the adjacent developments can be improved to make these routes more attractive. The street improvement strategies can be evaluated and acceptable concepts identified through public engagement for additional improvements.

- This section of freeway is included in the Downtown Redesign Planning Study. Upon substantial completion of that study, there may be additional study of the major streets in the corridor.

IH 45 Gulf Freeway, IH 10 (Katy Freeway) to IH 610S (South Loop) (Statewide Congestion Rank #6)

The reversible HOV lane is not heavily used outside of the peak hours. The operation is being transitioned to a managed high-occupancy toll lane that would offer access to single-occupant vehicles for a toll.

- METRO's dynamic pricing project on the HOV lanes on IH 45 should be monitored.
- This section of freeway is included in the Downtown Redesign Planning Study.

Two parallel streets offer options to travel on IH 45 South, especially for shorter trips. The design of these streets and the adjacent developments can be improved to make these routes more attractive.

The street improvement strategies can be evaluated and acceptable concepts identified through public engagement for additional improvements.

- This section of freeway is included in the Downtown Redesign Planning Study. Upon substantial completion of that study, there may be additional study of the major streets in the corridor.

US 59 Eastex Freeway, IH 10 (East Freeway) to SH 288 (South Freeway) (Statewide Congestion Rank #10)

This section of Eastex Freeway has a planned widening from 8 to 10 mainlanes and rebuilding the US 59/IH 45 interchange (from IH 45 to SH 288), but there is no funding. Just south of this section, from SH 288 to Spur 527 a widening to six main lanes with auxiliary lanes and four managed lanes is planned but does not have funding.

- This section of freeway is included in the Downtown Redesign Planning Study.

US 290 Northwest Freeway, FM 529 (Spencer Rd.) to IH 610 (North Loop) (Statewide Congestion Rank #11)

The US 290 Program improvement project includes the reconstruction of US 290 and construction of Hempstead Tollway. The vision of the program includes freeway capacity improvements, addition of managed toll lanes and possible commuter rail along this corridor. Preliminary engineering and the environmental studies have been completed. Final design for certain sections of the corridor has also been completed, but right-of-way has not been purchased.

There are major bottlenecks along the corridor at the interchange of US 290 and Sam Houston Tollway and at the interchange of US 290 and IH 610. (Construction is underway for the reconstruction of IH 610 and US 290). The early action project would provide funding for right-of-way purchase and utility adjustments for planned construction near the interchange of US 290 and Sam Houston Tollway. Construction near the interchange will include additional mainlanes with auxiliary lanes, frontage roads, and grade separations. Construction of frontage roads along Beltway 8 over Union Pacific Railroad and Hempstead Road has been funded by Houston-Galveston Area Council (H-GAC) with Proposition 12 mobility funds.

- Proposition 12 funds should be used to purchase right-of-way and relocate utilities near the US 290/Beltway 8 interchange as an early action to allow this project to move forward at a faster pace and address congestion along this segment.
    - Recommended funds: $78,000,000 for the purchase of right-of-way and utility adjustment.

San Antonio

Initial investigation of the five San Antonio corridors in the 50 most congested corridors resulted in the identification of several on-going efforts that should be monitored, some modifications to those studies that would position them to address the Rider 42 issues more comprehensively and a few new study ideas that may accelerate the development of corridor solutions. There are also several actions that have been taken in the past two years that can provide examples of successful approaches to congestion reduction. Exhibit 15 describes the use of the initial set of funding from the $33,740,000 allocated to the San Antonio area (also shown in Exhibit 16).

Exhibit 15. San Antonio Area Recommendations for Proposition 12 Bond Funding, February 2012

Rank	Corridor	Recommended Early Action	Proposition 12 Funding Request
49	IH 35 Northeast (IH 37 to FM 1103)	Conduct either an Environmental Impact Statement (EIS) or Environmental Assessment (EA) as determined by the Planning and Environment Linkage (PEL) study	$13,000,000
38	US 281/Loop 1604 Interchange	Design four northern Direct Connector ramps	$6,000,000
48	IH 35 Central (US 90 to IH 37)	Planning and Environment Linkage (PEL) study to examine the universe of alternatives	$1,000,000
48, 49	South Alternative Routes to Bypass IH 35 Inside Loop 410	Planning and Environment Linkage (PEL) study to define the needs and evaluate alternative improvements to sections of IH 410 Southeast, IH 10 East, & Loop 1604 Northeast	$2,500,000
48, 49	IH 410 Southwest (IH 35 S to FM 3487)	Planning and Environment Linkage (PEL) study to define the needs and evaluate alternative improvements to Loop 410 Southwest to make this an alternative to IH 35	$500,000
	All Congested Corridors -- Transportation Management Study	Project planning and feasibility study to design the policies and supporting practices to implement enhanced traffic management strategies in the congested corridors	$1,000,000
	All Congested Corridors --Parking Management Study	Project planning and feasibility study to facilitate parking management in downtown and congested corridors	$300,000
	All Congested Corridors -- Enhancing Travel Option Strategies	Engineering study to examine the effect on needed highway improvements by implementation of travel option strategies at major San Antonio employers along most congested corridors.	$300,000
Total Request, February 2012			**$24,600,000**

*Remaining San Antonio area Rider 42 allocation: $9,140,000.

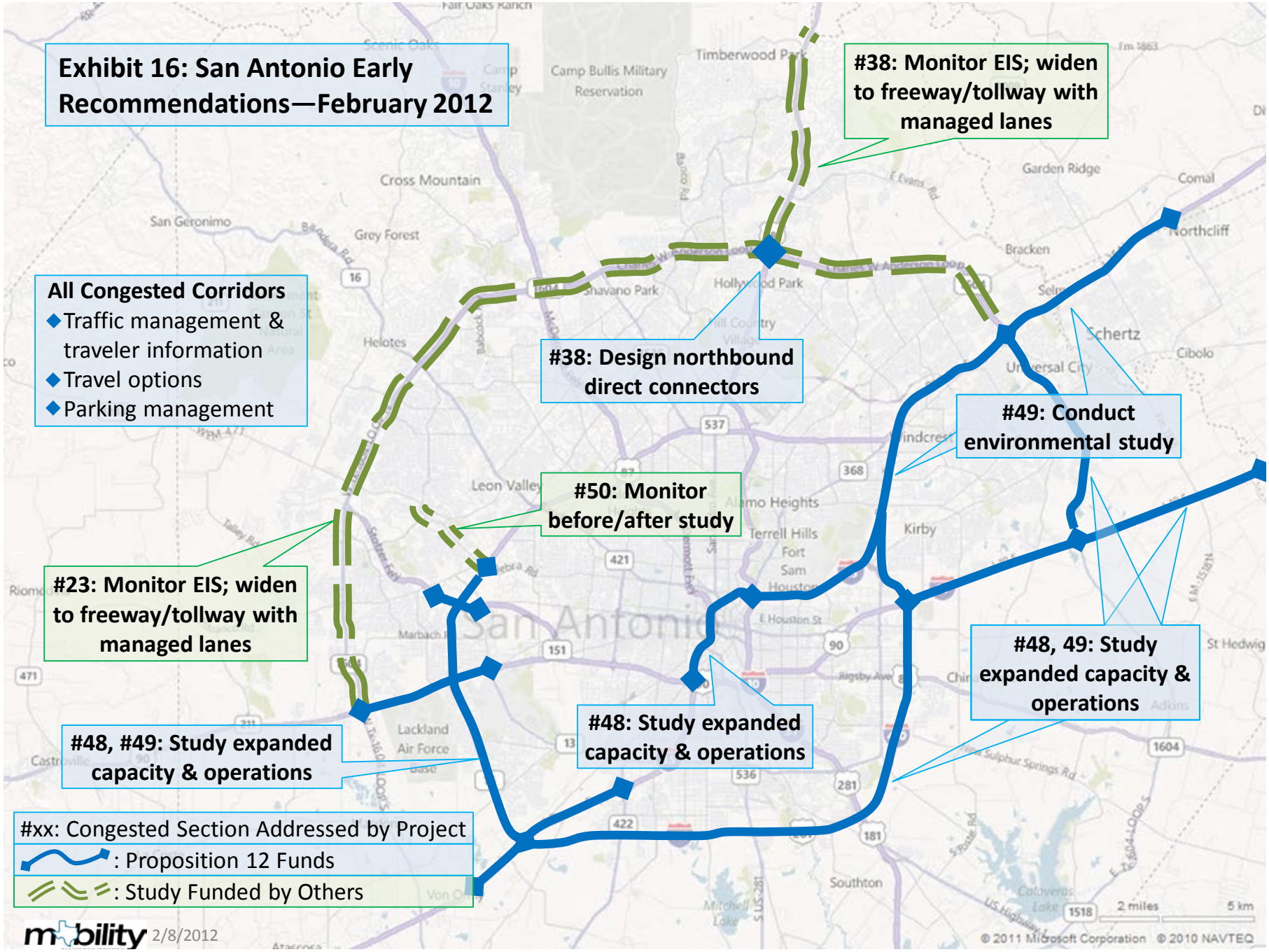
Exhibit 16: San Antonio Early Recommendations—February 2012
#38: Monitor EIS; widen to freeway/tollway with managed lanes
All Congested Corridors
Traffic management & traveler information
Travel options
Parking management
#38: Design northbound direct connectors
#49: Conduct environmental study
#50: Monitor before/after study
#23: Monitor EIS; widen to freeway/tollway with managed lanes
#48, 49: Study expanded capacity & operations
#48: Study expanded capacity & operations
#48, #49: Study expanded capacity & operations
#xx: Congested Section Addressed by Project
: Proposition 12 Funds
: Study Funded by Others
mobility 2/8/2012
Camp Bullis Military Reservation
Timberwood Park
Cross Mountain
San Geronimo
Grey Forest
Garden Ridge
Comal
Northcliff
Bracken
Hollywood Park
Helotes
Schertz
Cibolo
Leon Valley
Alamo Heights
Terrell Hills
Fort Sam Houston
Kirby
San Antonio
Lackland Air Force Base
Southton
St Hedwig
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All Congested Corridors

Corridor Parking Management Study

A parking management study should be conducted for public and publicly accessible parking facilities within Downtown San Antonio and for major employers in highly congested travel corridors, including IH 35 (US 90 West to Fort Sam Houston), IH 10 (IH 35 to IH 37), and IH 37 (IH 10 to IH 35). The study will focus on the effect of parking policies on the need for highway improvements and also include factors such as: parking pricing and regulation; park & ride programs; methods to maximize the use, effectiveness and management of current parking facilities; parking facility urban design; special event parking management, and parking collection systems.

- Proposition 12 bond funds should be used for a project planning and feasibility study to identify the role of parking management on reducing the need for road improvements in the congested corridors.
    - Requested Funding: $300,000 is requested to fund the planning and feasibility study.

Enhancing Travel Option Strategies among Regional Employers

The effect of travel option strategies such as telecommuting, flextime, and compressed work weeks on the amount of highway improvements required in the congested corridors should be examined. Partnering with major employers in the most congested San Antonio area roadways is one component of a congestion mitigation plan. Surveys of major employers conducted in 2001 and 2004 by the Alamo Area Council of Governments (AACOG) showed relatively low usage of these strategies by major area employers, but the surveys provided no information that would assist AACOG's outreach staff to understand how, and particularly with whom at these organizations, they could work to initiate or expand travel options. When the groundwork done by a consultant has been completed, AACOG's Commute Solutions program would be in a strong position to maintain and further expand its employer program.

- Proposition 12 bond funds should be used for a two-year project planning and feasibility study to determine the current status of travel option strategies in the San Antonio area and to identify the possible travel option champions at major San Antonio employers (those with substantial travel on the most congested roadways), to assist in initial outreach efforts and to determine the effect of the recommended strategies on the highway improvement needs.
    - Requested Funding: $300,000 is requested to fund a planning and feasibility study to conduct a survey, interview key stakeholders, develop and utilize informational materials, and identify the costs and benefits to employers, the workforce and the transportation network.

Transportation Management System Upgrade Feasibility Study

Much of San Antonio TransGuide Intelligent Transportation System (ITS) is outdated or in a severe state of disrepair. TxDOT's ability to monitor travel conditions and to actively manage congested freeway corridors and traffic crash scenes is severely hampered by a decaying and outdated traffic detection and

surveillance technologies; incomplete or malfunctioning communications infrastructure; and insufficient maintenance resources.

The purpose of this study would be to conduct an engineering study to determine what types of improvements are needed to bring the ITS and traffic management strategies that have been deployed in the San Antonio area to the current design specifications and requirements, the costs, resources, and institutional arrangements. Working with the local incident management and transportation agencies, the engineering study should:

- Improve traffic management practices among the San Antonio area's transportation agencies, law enforcement and emergency responders, towing contractors, and other stakeholders.
- Improve agency interaction, coordination, and communication for severely congested roads, incidents and special events.
- Improve agency practices and communication to facilitate rapid response and clearance for congestion-causing events.
- Identify and assess viable alternate routes for diverting traffic when incidents occur in different sections of each freeway facility.
- Public engagement in developing and finalizing the alternatives, implementation of active traffic management, and travel option strategies should be a major component of this study.

➢ Proposition 12 bond funds should be used for a project planning and feasibility study to facilitate traffic management in the congested corridors.
    - Requested Funding: $1,000,000 is requested to fund the planning and feasibility study.

IH 35 Northeast, US 281/IH 37 to FM 1103 (Statewide Congestion Rank #49)

A Planning and Environment Linkage (PEL) study is being managed by TxDOT and Alamo RMA and is scheduled to be completed in July 2012. The outcome of the study is anticipated to be a refined list of alternatives that would address the long-term needs of the IH 35 Northeast corridor; those alternatives would describe the scope of a following National Environmental Policy Act (NEPA) study. This NEPA study would incorporate a study of the origin-destination travel patterns within the IH 35 corridor to determine alternative travel routes.

➢ Proposition 12 bond funds should be used in this corridor for either an Environmental Impact Statement (EIS) or Environmental Assessment (EA) as determined by the Planning and Environment Linkage (PEL) study. A proactive public engagement plan should be a major component of this effort.
    - Requested Funding: $13,000,000 is requested to fund the most extensive analysis that might be required by the findings of the PEL study.

IH 35 Central, US 90 to US 281/IH 37 (Statewide Congestion Rank #48)

A Planning and Environment Linkage (PEL) study should examine the needs and associated conceptual alternatives by researching and integrating previous studies performed in the IH 35 Central corridor and determine their relationship to the current conditions. Alternatives would be evaluated against the

prevailing environmental constraints as well as the alternative measures of effectiveness and project cost. An extensive public engagement process would be used throughout the duration.

- Proposition 12 bond funds should be used in this corridor for a Planning and Environment Linkage (PEL) study to examine the universe of alternatives including adding capacity, travel demand management strategies, support of multimodal options/priority, etc. Due to the elevated section already being in place along with many obvious constraints downtown, considerable innovation will be required to accomplish significant mobility improvements in this section. A proactive public engagement plan should be a major component of this effort to identify publicly acceptable solutions.
    - Requested Funding: $1,000,000 is requested to fund the PEL study.

Southern Alternative Routes to Bypass IH 35 Inside Loop 410 (Statewide Congestion Ranks #48 & 49)

The following three studied sections together serve as an alternate route for motorists wishing to bypass the congested areas on IH 35 inside Loop 410. The routes are also important as alternative routes for trucks; the City of San Antonio is currently exploring analysis options for restricting through truck traffic from IH 35 near downtown. Alternatives would be evaluated against the prevailing environmental constraints as well as the alternative measures of effectiveness and project cost. An extensive public engagement process would be used throughout the duration of the study. The three study sections are:

- IH 410 Southeast: IH 35 Southwest to IH 10 East
- IH 10 East: IH 410 to Bexar/Guadalupe County Line.
- Loop 1604 Northeast: From IH 10 East to IH 35 Northeast.

- Proposition 12 bond funds should be used for a PEL study to define the needs and evaluate alternative improvements to the sections of IH 410 Southeast, IH 10 East, and Loop 1604 Northeast in order to make this route a more attractive alternate to IH 35 and improve overall network mobility. One aspect of developing the corridors as the IH 35 alternative route is to support through truck traffic currently using IH 35 through downtown San Antonio.
    - Requested Funding: $2,500,000 is requested to fund the PEL study.

IH 410 Southwest: IH 35 South to FM 3487 (Culebra Road) (Statewide Congestion Ranks #48 & 49)

This section of IH 410 can serve as another alternate route for motorists wishing to bypass the congested downtown areas on IH 35 inside Loop 410 by routing around the southwest and north side of San Antonio and connecting to the recently improved IH 410 on the north side of San Antonio to IH 35 North or IH 10 West. Alternatives in a PEL study would be evaluated against the prevailing environmental constraints as well as the alternative measures of effectiveness and project cost. An extensive public engagement process would be used throughout the duration of the study.

- Proposition 12 bond funds should be used for a PEL study to define the needs and evaluate alternative improvements to Loop 410 Southwest in order to make this route a more attractive alternate to IH 35 and improve overall network mobility. Some previous work has been

completed for this corridor in regard to alternatives analysis, schematic design, and environmental analysis; it is expected that the work effort required would be less than some of the other PEL's suggested for the San Antonio area. These past study efforts will serve as research and background material for the PEL conducted in the Loop 410 Southwest corridor.

- Requested Funding: $500,000 is requested to fund the PEL study.

US 281/Loop 1604 Interchange (Statewide Congestion Ranks #38)

The construction of four northern direct connectors in conjunction with adding capacity on US 281 is expected to improve mobility along this corridor. This improvement will complement the four southern direct connectors being constructed at this interchange by the Alamo Regional Mobility Authority (RMA). Construction funding is available from a combination of sources and environmental clearance has been obtained, but the design work has not been completed.

- Proposition 12 bond funds should be used to complete the detailed design of the northern connectors and the completion of the interchange.
  - Requested Funding: $6,000,000 is requested to fund the required design work. The cost estimate is based on 10 percent of the estimated construction cost of $60 million for the four northern director connectors.

SL 1604, SH 16 (Bandera Rd.) to FM 471 (Culebra Rd.) (Statewide Congestion Rank #23)

Superstreet operation was implemented in 2011. The project should be monitored and signal timing adjusted in the SL 1604 corridor to ensure the best possible operation of the existing road.

- The signal timing along SL 1604 should be monitored, and the need for additional improvements evaluated.

US 281, Comal County Line to SL 1604 (Anderson Loop) (Statewide Congestion Rank #38)

Superstreet operation was implemented in 2010 on the southern part of this congested corridor. The project should be monitored and signal timing adjusted in the US 281 corridor to ensure the best possible operation of the existing road.

- The signal timing along US 281 should be monitored, and the need for additional improvements evaluated.

Culebra Rd. FM 3487, SH 741 (Grissom Rd.) to IH 410 (Statewide Congestion Rank #50)

Culebra Road was widened and operations were improved in 2010 and 2011.

- The before-and-after comparison study by the City of San Antonio should be monitored and next steps determined on the remaining congestion on Culebra Road.

METROPOLITAN AREA DETAIL

AUSTIN

The most congested sections of Austin roadways are basically the same problem—traveling north-south in the central Austin area (Exhibit A-1). As such, a project that addresses congestion on one of the corridors will also address several others. A few of the major congestion reduction projects that have been accomplished in recent years or are under construction are illustrated in Exhibit A-2. They have addressed some of the interchange bottlenecks and operations problems. In addition the extension of SH 130 to IH 10 near Seguin may attract some long distance traffic away from IH 35.

Significant right-of-way constraints on IH 35 north of downtown make expanding the roadway "footprint" difficult, but expanding parallel roads may provide reasonable alternatives. MoPac, US 183, and SH 130 provide opportunities to either expand the roads or the travel markets served (and therefore the volume of people and freight moved on those roads). Some of the ideas from the My35 study offer several alternatives ranging from adding capacity to other roads to switching the designations of IH 35 and SH 130 and managing the travel volume on the existing IH 35 roadway using demand-based pricing or tolling.

Other concepts involve a combination of incentives for freight or multi-occupant vehicles (carpools or buses) to change departure times or routes and operational alternatives that seek to gain as much service from the existing infrastructure and funding as possible.

Other Highlights

- The MoPac Improvement project is proposing two new toll express lanes north of downtown and may also include intelligent transportation system infrastructure and traffic management strategies (including Active Traffic Management) to improve the operation of the general purpose lanes. It may also be possible to extend the express lanes to MoPac south of downtown.
- Incident clearance has benefitted from the HERO program on IH 35.
- US 183 South has the potential to serve as an alternate route to IH 35 (as identified in the My35 study); the expansion project includes six toll lanes and six lanes of frontage roads.

A summary and map of the recommended actions that will affect each congested corridor is included in Exhibits A-3 and A-4 after the individual corridor summaries. Information regarding large projects with significant congestion reduction potential, their estimated implementation cost, and implementation timeframe is included in Exhibit A-5.

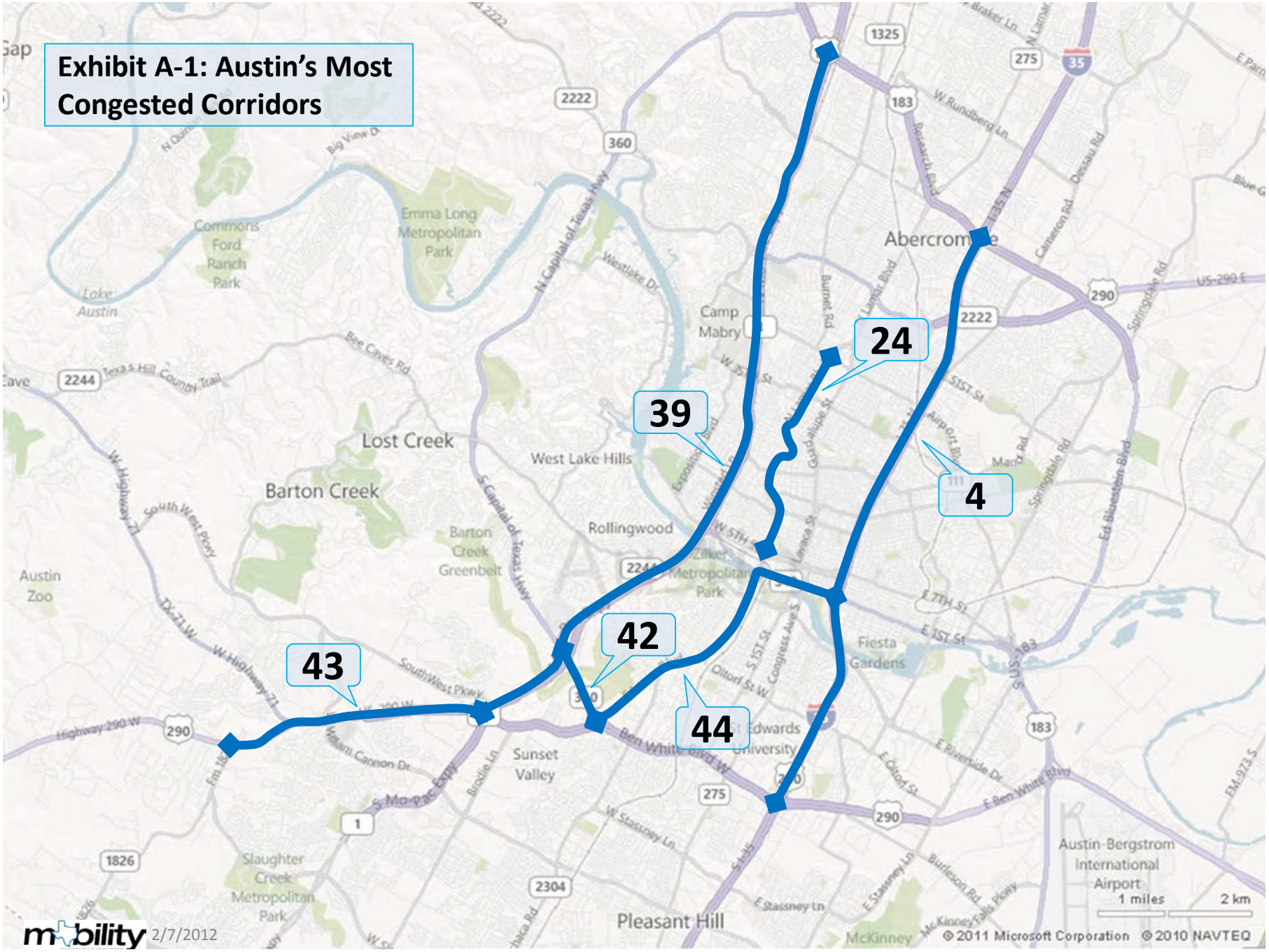
Exhibit A-1: Austin's Most Congested Corridors
24
39
4
42
43
44
Lost Creek
Barton Creek
West Lake Hills
Rollingwood
Camp Mabry
Abercrombie
Sunset Valley
Pleasant Hill
Fiesta Gardens
Austin Zoo
Austin-Bergstrom International Airport
Emma Long Metropolitan Park
Commons Ford Ranch Park
Lake Austin
Barton Creek Greenbelt
Zilker Metropolitan Park
Slaughter Creek Metropolitan Park
1 miles
2 km
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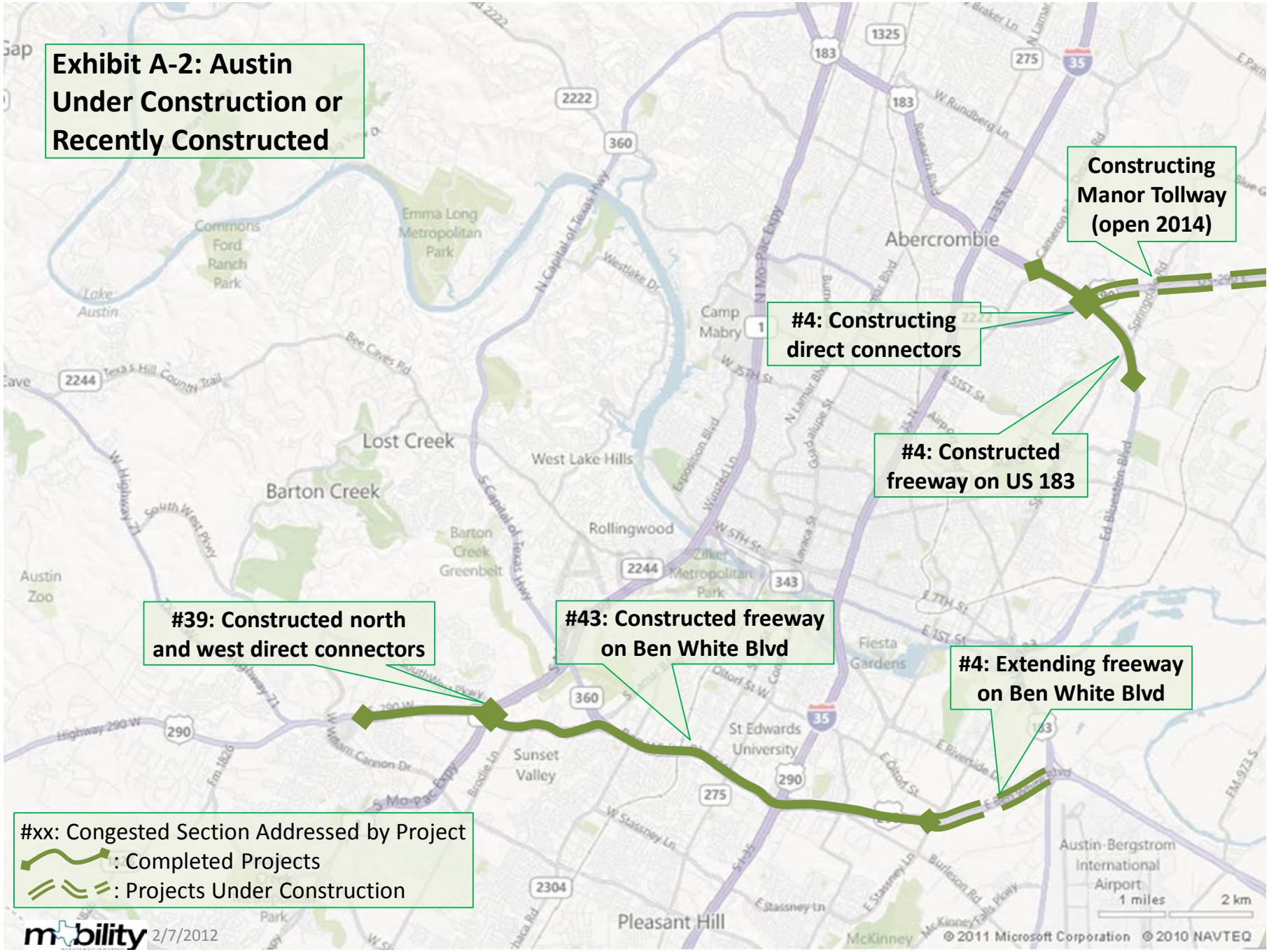
Exhibit A-2: Austin Under Construction or Recently Constructed
Constructing Manor Tollway (open 2014)
#4: Constructing direct connectors
#4: Constructed freeway on US 183
#39: Constructed north and west direct connectors
#43: Constructed freeway on Ben White Blvd
#4: Extending freeway on Ben White Blvd
#xx: Congested Section Addressed by Project
: Completed Projects
: Projects Under Construction
Abercrombie
Camp Mabry
Lost Creek
Barton Creek
West Lake Hills
Rollingwood
Zilker Metropolitan Park
Fiesta Gardens
St Edwards University
Sunset Valley
Pleasant Hill
Austin-Bergstrom International Airport
Emma Long Metropolitan Park
Commons Ford Ranch Park
Lake Austin
Barton Creek Greenbelt
Austin Zoo
1 miles
2 km
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2/7/2012

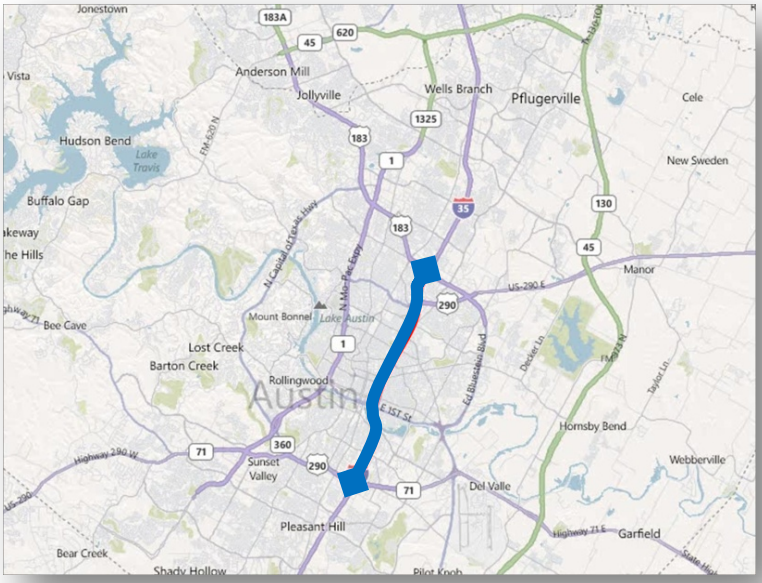
IH 35

SH 71 (Ben White Blvd) to US 183

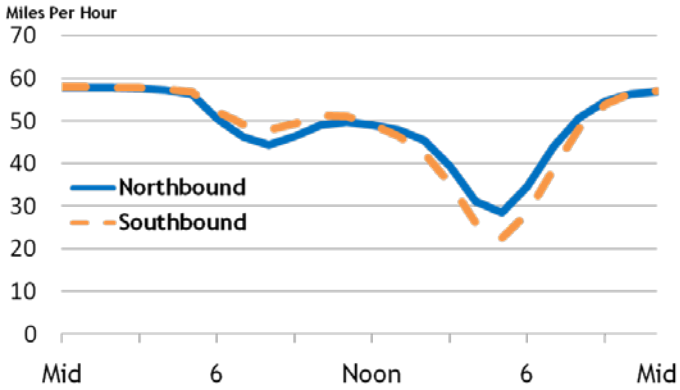
Current Conditions

Between US 183 and Airport Boulevard in Austin, IH 35 operates with four lanes in each direction. At Airport Boulevard, IH 35 converts to an upper/lower deck split, with two lanes in each direction on each deck to Martin Luther King (MLK) Boulevard. South of the split, IH 35 operates with three lanes in each direction. This portion of IH 35 experiences near equal congestion in both directions throughout the day. Slowdowns are heaviest in both directions during the evening rush hour period with only light slowdowns in the mornings.

- Segment Length: 10.2 miles
- Road Type: 6- to 8-Lane freeway
- Annual Hours of Delay: 4,642,000
- Texas Congestion Index: 1.73
- Commuter Stress Index: 2.15



Rank: 4	
Annual Hrs of Delay/Mile:	422,000
Congestion Time:	6 Hours
Annual Cost of Delay:	$114 million
Average Daily Traffic:	180,000 Vehicles



Possible Congestion Causes

Most of IH 35 was originally constructed in the 1950s, and has not been substantially improved since the original construction. In 1975, a second deck was added for a two-mile stretch north of downtown, and lanes were added to the north of the upper/lower split. IH 35 suffers from heavy traffic volumes, poor design, and a large volume of truck traffic. The rapid growth of Austin over the last several decades has exacerbated traffic congestion on IH 35 as the city has nearly doubled in size every 20 years. Land uses, including commercial and retail developments, contribute to the limited right-of-way, complicating expansion plans. Significant choke points exist in the following locations:

- Lower deck (North and Southbound) from MLK to Airport Boulevard
- Merging of US 290 East onto IH 35 Southbound
- IH 35 Northbound from Woodward to Riverside

Projects in Progress or Completed

Direct Connector Ramps

Four direct connectors at the IH 35 and SH 71 (Ben White) interchange completed and open to traffic in December 2011.

HERO Patrols

The HERO patrol, minimizing congestion and improving safety by clearing damaged or disabled vehicles from the roadway.

Tolled SH 130
Construct a 4-lane tolled freeway with intermittent frontage roads on SH 130 from SH 45 to IH 10 near Seguin.

Planning Efforts to Date

Corridor Development Study
The City of Austin and TxDOT are undertaking a corridor development study (including public engagement) focusing on transportation management and multimodal treatments between SH 71 and US 290E.

My35
The My35 Program uses a holistic approach to addressing needs on the entire corridor:

- Use SH 45SE and SH 130 as alternative routes by converting one general purpose lane on IH 35 in each direction to a dynamically priced managed lane and re-designating IH 35 to a non-interstate facility. SH 130 (from US 195 to SH 45SE) and SH 45SE (from Mustang Ridge to I-35) will have tolls removed and be re-designated as IH 35.
- Upgrade US 183 from US 290 to SH 45SE to a 4-lane freeway (Total cost: $550-$800 million).
- Widen IH 35 from the Williamson/Bell County line to IH 10 in San Antonio to at least an 8-lane freeway ($2.7-$3.85 billion).

Transit Alternatives
Capital Metro is currently studying transit alternatives to IH 35 including a new spur on the Red Line, managed lanes, Lone Star rail, bus rapid transit, and the MoKan corridor.

US 183 Expansion
Expansion of US 183 between Springdale Rd. and Patton Ave. to a 6-lane turnpike with non-toll frontage roads.

Travel Options Marketing
The Downtown Transportation Management Association (TMA) has initiated a transportation demand management marketing program to reduce single occupancy vehicles. The TMA will assist with trip planning and travel coaching.

Freight Alternatives
Incentivizing freight to take alternate routes like SH 45SE and SH 130 instead of IH 35.

Land Use Planning
The City of Austin, TxDOT, Capital Metro, and other agencies are evaluating current land use along the corridor and parallel routes for accessibility, the implementation of form-based code, transit-oriented development, and other bike and transit options.

IH 35 HOV Lane Study
The IH 35 Major Investment Study (1998) analyzed the construction of HOV lanes (either separate from the roadway or within the median) and reconfiguring the upper and lower decks.

Public Engagement/Communication in the Austin Region

The Capital Regional Metropolitan Planning Organization (CAMPO) engages in regular public outreach activities when developing and amending the long range plan, the transportation improvement plan, and the unified planning work program. Recently, CAMPO has undertaken a tiered approach to public input that identifies and refines the best methods to solicit public participation in planning efforts. A tiered approach allows minor plan, project, or funding changes to be expedited through the planning process. More concentrated efforts can be focused on projects or plans that have more substantial changes. The intent of this approach is to more effectively utilize limited resources.

Public Engagement in IH 35

Outreach in Austin's IH 35 corridor has benefited from two efforts. The first effort was the result of action by the Texas Transportation Commission in the formation of an IH 35 Advisory Committee and four segment committees that reported to the Advisory

Committee. The segment committees were tasked with examining the corridor challenges from a local perspective, identifying possible solutions and offering recommendations to the committee. The committee engaged local stakeholders, citizens and community leaders in developing options and alternatives in the Austin area. This 'from the ground-up' approach with significant public involvement activities resulted in a plan that reflects the interests and concerns of citizens through local and regional recommendations for meeting the mobility needs along Texas' IH 35 corridor. The recommendations are documented in the August 2011 IH 35 Corridor Advisory Committee Plan.

The City of Austin is undertaking an IH 35 corridor development study. The study has a robust public engagement component. The study began with a needs assessment conducted by key city staff and consultants. In this assessment, problems were identified and key roadblocks were addressed. The project sponsors held an open house to brief the public on the project in downtown Austin on September 28, 2011. The open house was designed to allow for small group discussion by having people sign up for group session times that began each half hour. Reservations were requested but not required. This new approach was designed to provide an opportunity for interested participants to engage in a focused discussion regarding potential solutions in the corridor. Using a smaller, more focused discussion may elicit more feedback, especially from those that may be reluctant to speak in a large group setting. Each of these efforts is a "good practice" approach early in a project. However, attendance at this event was very low. An inconvenient location and difficult accessibility may have led to a low turnout. The consultant has since engaged in several smaller group meetings with representatives from neighborhoods, universities, business, and civic groups. A technical steering committee also guides outreach activities.

Other planned outreach/communication activities include:

- Development of context sensitive solution (CSS) strategy and process.
- Establishment of a stakeholder working group (SWG) representing different travel markets, communities and interests.
- Creation of communication materials – hard copy, electronic, or social media.

Next Steps

- The City of Austin's IH 35 Corridor Development Program covers a wide range of potential short and mid-term traffic and demand management strategies to improve the operation of the IH 35 section within the existing freeway footprint. The **study scope should be extended** to encompass the bottleneck at the IH 35/US 183 interchange and address potential managed lane operations in connecting segments.
- Aggressive incident clearance is one practice that is not sufficiently addressed in the scope of the IH 35 Corridor Development Program. The AIMHigh Program is a locally sponsored effort that has identified tools and strategies for improving incident clearance; however, resources and support for implementation are required to advance the strategies. The AIM High program has identified the **development of a pre-positioning plan for incident management equipment and preparation of incident diversion plans for IH 35 and other congested corridors** as a high priority. Additionally, there is a need for integrated system management and operation to ensure that an institutional framework is in place to operate IH 35 and other congested corridors in a seamless way under both recurring and non-recurring congestion.
- Austin is lagging behind its peers in the application of traditional and innovative demand management strategies. The formation of the **Downtown TMA will support employer outreach** for downtown commuters and should be closely linked and coordinated with the University of Texas program, Commute Solutions (to reach employers outside of the central area that may have employees who utilize IH 35 for commuting), and State government, which employs over 24,000 people in the urban core.
- **US 183 South has the potential to serve as an alternate route to IH 35** as identified in the My35 study, and funding should be dedicated to conduct engineering associated with the planned expansion to 6 toll lanes and 6 lanes of frontage roads. As a potential alternate to IH 35, connectivity to downtown and at north and south ends should be examined and addressed.
- The IH 35 Corridor Development Program will examine actions with a life of up to 10 years, but beyond 10 years the plan is unclear. **The IH 35 Corridor is a candidate for advanced modeling to assess long-term conditions with a mix of solutions** (alternate routes, transit, freight, land use, etc.), incorporating multiple strategies within a limited footprint expansion.
- There is an opportunity for **agencies to work together to provide public information and strategic outreach on actions related to the development and potential changes to IH-35 and other congested corridors via web-based strategies**. Providing project updates would allow all of the agencies involved to offer the same level and detail of information at a single source, simplifying the message and ensuring consistent communication.

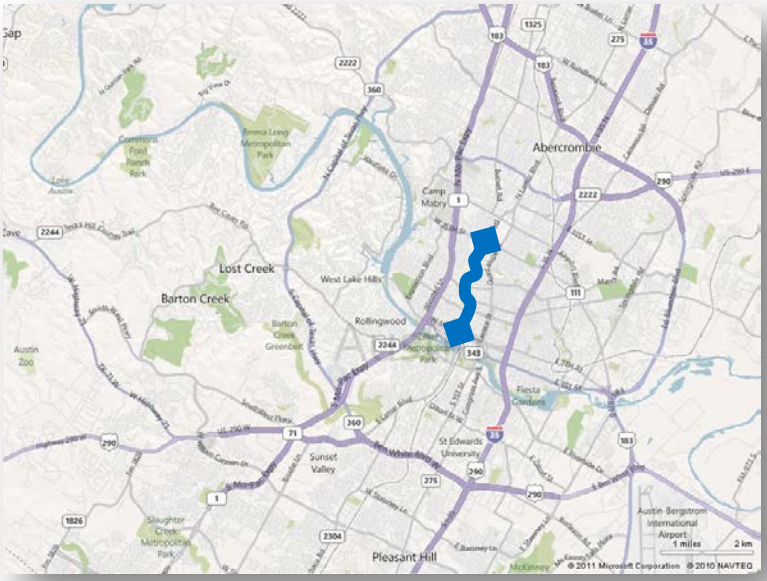
NORTH LAMAR

West 45th St. to West 6th St.

Current Conditions

North Lamar is a major arterial in central Austin, running from North IH 35 to Ben White Boulevard (Highway 71) on the south side. Lamar is a five-lane arterial with two lanes in both directions and a center turn lane. Much of the road is flanked with commercial development, and the section from 30th to 15th streets borders a greenbelt that contains parks and a running trail. North Lamar does not experience the drastic speed decreases of other congested freeways, but rather remains congested for most of the day. The street does experience additional slowdowns in the evening with both north- and southbound directions matching each other throughout the day.

- Segment Length: 3.4 miles
- Road Type: 4- to 6-Lane street
- Annual Hours of Delay: 430,000
- Texas Congestion Index: 1.36
- Commuter Stress Index: 1.44

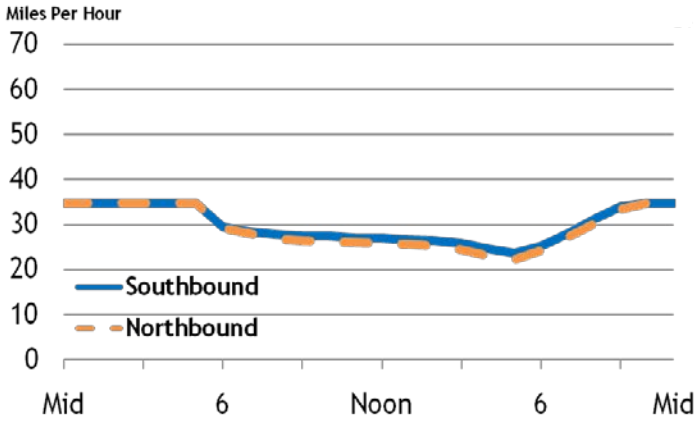


Rank: 24

Annual Hrs of Delay/Mile:	**127,000**
Congestion Time:	**2 Hours**
Annual Cost of Delay:	**$10.8 million**
Average Daily Traffic:	**36,000 Vehicles**

Possible Congestion Causes

Lamar is a viable alternative to MoPac through central Austin, although the roadway experiences heavy congestion throughout the day, particularly during the AM and PM commuter rush. Additionally, the section of Lamar from 45th to 5th Street has limited potential for expansion due to the greenbelt between 30th and 15th Streets, and commercial developments that abut the road from 45th to 30th and 15th to 6th Streets. There are numerous driveways servicing the commercial developments that create access/egress congestion points. Traffic backs up in both left turn lanes at 29th and 24th streets where access is provided to the University of Texas campus.



Projects in Progress or Completed

Bus Rapid Transit

A bus rapid transit line on North Lamar running from downtown via Guadalupe that includes traffic signal priority, limited stops and articulated buses. Capital Metro expects service to begin in 2013.

Signal Timing

The city has made downtown signal timing improvements that will alleviate some congestion.

Planning Efforts to Date

Loop 1 Express Lanes

Add express lanes to Loop 1 (MoPac) to provide a suitable alternate route for traffic.

Roadway Improvements

The City of Austin plans to install full bike lanes from Guadalupe to downtown and will include new signal timing for the corridor.

Travel Options Marketing

The Downtown Transportation Management Association (TMA) has initiated a demand management marketing campaign to reduce single occupancy vehicles. It will also assist with trip planning and travel coaching.

Next Steps

- There are severe limitations to expanding the footprint of North Lamar due to urban development and the presence of parkland. Given its proximity, Loop 1/MoPac is a logical alternate route to North Lamar. Current plans to **improve Loop 1 by expanding the footprint to add two express lanes** could draw longer trips from North Lamar onto Loop 1.
- The planned bus rapid transit and the City of Austin's signal timing effort will support congestion relief. However, there is no comprehensive effort to examine **traffic and demand reduction strategies** in the corridor. Possible strategies to consider include the following:
  - Access management
  - Reversible lanes
  - Traveler information
  - Overnight truck deliveries
  - Grade separation
  - Intersection improvements
  - Super street arterials
  - Bicycle/pedestrian options
- Austin is lagging behind its peers in the application of traditional and innovative demand management strategies. The formation of the **Downtown TMA will support employer outreach** for downtown commuters and should be closely linked and coordinated with the University of Texas program, Commute Solutions (to reach employers outside of the central area that may have employees

who utilize North Lamar for commuting), and State government, which employs over 24,000 people in the urban core.

- The AIM High program has identified the **development of a pre-positioning plan for incident management equipment and preparation of incident diversion plans for North Lamar, Loop 1, and other congested corridors as a high priority.** Additionally, there is a need for integrated system management and operation, to ensure that an institutional framework is in place to operate North Lamar and other congested corridors in a seamless way under both recurring and non-recurring congestion.
- There is an opportunity for **agencies to work together to provide public information and strategic outreach on actions related to the development and potential changes to North Lamar and other congested corridors via web-based strategies.** Providing project updates would allow all of the agencies involved to offer the same level and detail of information at a single source, simplifying the message, and ensuring consistent communication.

LOOP 1 (MoPac)

US 183 to US 290

Current Conditions

From US 183 to US 290, MoPac operates primarily with six lanes, three northbound and three southbound. While there is access to the highway throughout the stretch, the majority of parallel arterials is through residential areas that become congested during peak periods. Due to the residential and commercial development parallel to MoPac, the potential for future road widening is limited. Similar to traffic slowdowns on IH 35, MoPac experiences near equal speed reductions in both directions, with the heaviest during the evening rush.

- Segment Length: 11.9 miles
- Road Type: 6-Lane freeway
- Annual Hours of Delay: 2,177,000
- Texas Congestion Index: 1.50
- Commuter Stress Index: 1.68

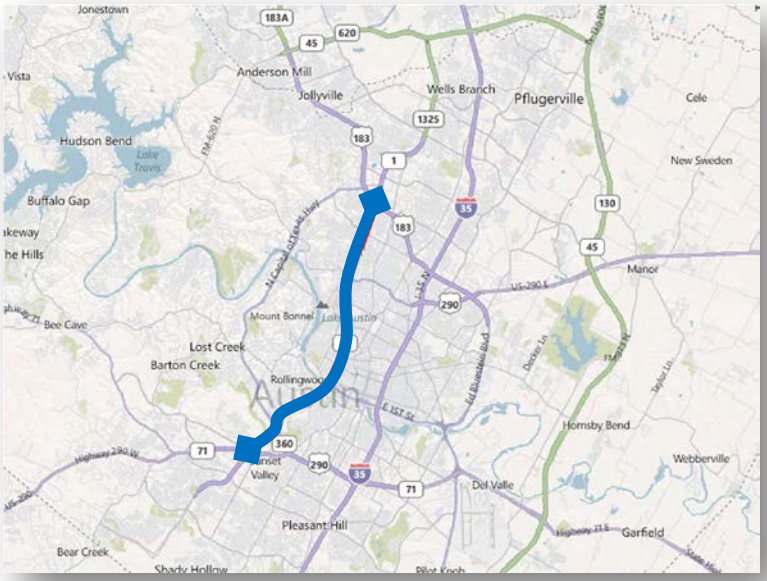
Possible Congestion Causes

The MoPac Expressway (Loop 1) was initially conceived of as part of the 1961 City of Austin Master Plan and Circulation Plan when only 160,000 people lived in Travis County. Since then, the city of Austin has experienced significant growth, and there are now over one million people in Travis County. Nearly 180,000 cars and trucks drive on MoPac every day. Due to the rapid growth and land use limitations, MoPac experiences heavy congestion on the main lanes as well as parallel arterials. Much of the congestion is unpredictable and is worsened by traffic collisions. Further, emergency vehicles have limited access due to congestion and lack of consistent emergency parking shoulders.

Projects in Progress or Completed

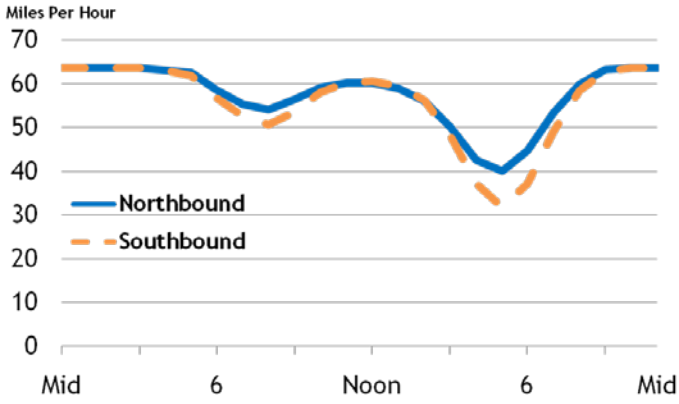
US 290/Loop 1 Interchange

Construction of the US 290 West/Loop 1 interchange to be completed in the spring of 2012 ($13 million).



Rank: 39

Annual Hrs of Delay/Mile:	**183,000**
Congestion Time:	**4 Hours**
Annual Cost of Delay:	**$53 million**
Average Daily Traffic:	**145,000 Vehicles**



Bottleneck Removal

Intersection improvements along Loop 360, which serves as an alternative to Loop 1, will address bottleneck issues at Westlake Dr., Cedar St., and Courtyard and will be completed in 2014 ($5 million).

Planning Efforts to Date

Express Lane Study

The Central Texas Regional Mobility Authority (CTRMA) in partnership with TxDOT is sponsoring an environmental and preliminary engineering study to add northbound and southbound express lanes from FM 734 to the Cesar Chavez interchange, with project letting anticipated in 2014 ($253 million).

Transit Service Options

Capital Metro is planning enhanced bus service in conjunction with the express lanes project, adding express bus service, bus on shoulder options, and additional park-and-ride opportunities.

Travel Options Marketing

The Downtown Transportation Management Association (TMA) has initiated a demand management marketing program to reduce single occupancy vehicles. It will also assist with trip planning and travel coaching.

Public Engagement / Communication in the Austin Region

The Capital Regional Metropolitan Planning Organization (CAMPO) engages in regular public outreach activities when developing and amending the long range plan, the transportation improvement plan, and the unified planning work program. Recently, CAMPO has undertaken a tiered approach to public input that identifies and refines the best methods to solicit public participation in planning efforts. A tiered approach allows minor plan, project, or funding changes to be expedited through the planning process. More concentrated efforts can be focused on projects or plans that have more substantial changes. The intent of this approach is to more effectively utilize limited resources.

The North Loop 1/MoPac improvement project is being jointly developed by TxDOT and CTRMA, with CTRMA taking the lead on public engagement activities. A comprehensive Public Outreach Plan has been drafted. Specific activities highlighted in the plan include:

- One-on-one meetings with neighbor leaders, businesses and organization in the corridor.
- One-on-one meetings with other community stakeholder groups that may be outside of the corridor.
- Engagement of stakeholders previously opposed to MoPac improvements to proactively seek their input as new solutions are identified.
- Regular updates and presentations to boards and staff of other transportation agencies.
- Elected and Community leader briefings.
- Education workshops to introduce unfamiliar concepts to key stakeholders.
- Targeted outreach to corridor users.
- Virtual open house meetings.
- Brown bag lunches for major employers.
- Variety of communication tools, including:
  - Project maps
  - Fact sheets
  - PowerPoint presentation
  - Multi-media demonstration
  - Virtual tour
  - E-newsletters
  - E-mail hotline
- Comprehensive website, including FAQs, maps, videos, history, and social media tools.

The above tools and techniques take advantage of technology to provide a comprehensive picture of the project and its potential solutions. Practices such as identifying and targeting specific users will allow the messages to be tailored to particular audiences.

Next Steps

- An environmental **study to add northbound and southbound express lanes on Loop 1 South from the Cesar Chavez interchange to Slaughter Lane** should be advanced. The current activities to improve North and South Loop 1 by adding express lanes should be expanded to comprehensively examine general purpose lane operations in addition to express lanes, including strategies such as ramp flow signals, acceleration/deceleration lanes, and active traffic management.
- **Aggressive incident clearance will need to be implemented** in the development of the North and South Loop 1 projects. The AIMHigh program is a locally-sponsored effort that has identified tools and strategies for improving incident clearance; however, resources and support for implementation are required to advance the strategies. The AIM High program has identified the development of a pre-positioning plan for incident management equipment and preparation of incident diversion plans for Loop1 and other congested corridors as a high priority. Additionally, there is a need for integrated system management and operation, to ensure that an institutional framework is in place to operate Loop 1 and other congested corridors in a seamless way under both recurring and non-recurring congestion.
- **Long-term plans for addressing congestion in the corridor** have not been formulated. Given the limitations in right-of-way, multiple solutions will need to be considered, including:
  - Freight rail relocation.
  - Alternative modes.
  - Improvements to alternative routes, such as Loop 360 and Lamar.
- Austin is lagging behind its peers in the application of traditional and innovative demand management strategies. The formation of the **Downtown TMA will support employer outreach** for downtown commuters and should be closely linked and coordinated with the University of Texas program, Commute Solutions (to reach employers outside of the central area that may have employees who utilize Loop 1 for commuting), and State government, which employs over 24,000 people in the urban core.

- There is an opportunity for **agencies to work together to provide public information and strategic outreach on actions related to the development and potential changes to Loop 1 and other congested corridors via web-based strategies**. Providing project updates would allow all of the agencies involved to offer the same level and detail of information at a single source, simplifying the message and ensuring consistent communication.

The most congested corridors in Austin were examined to identify the most appropriate actions that will have the greatest impact on relieving traffic congestion. Many of these actions can be funded by Proposition 12 funds and are consistent with the goals of Rider 42, while other actions are being funded or performed by other agencies. Exhibit A-3 summarizes the recommended actions to address traffic congestion in each Austin corridor.

Exhibit A-3: Austin Summary of Congested Corridor Recommendations

Rank	Corridor	Actions Funded by Others	Recommended Early Actions Affecting Congested Corridor
4	**IH 35** *(SH 71 to US 183)*	**City of Austin—**Traffic management and travel options study.	▪ Expand City of Austin study limits; express lane operations and travel options. ▪ Integrated Traffic Management—Engineering study.
24	**N. Lamar** *(West 45th St to West 6th St)*	▪ Loop 1 North express lanes.	▪ Integrated Traffic Management—Engineering study. ▪ IH 35 express lane operations and travel options. ▪ Loop 1 South express lanes.
39	**Loop 1 (MoPac)** *(US 183 to US 290)*	▪ Loop 1 North express lanes.	▪ Engineering, design and environmental for tolled express lanes on Loop 1 South. ▪ Integrated Traffic Management—Engineering study.

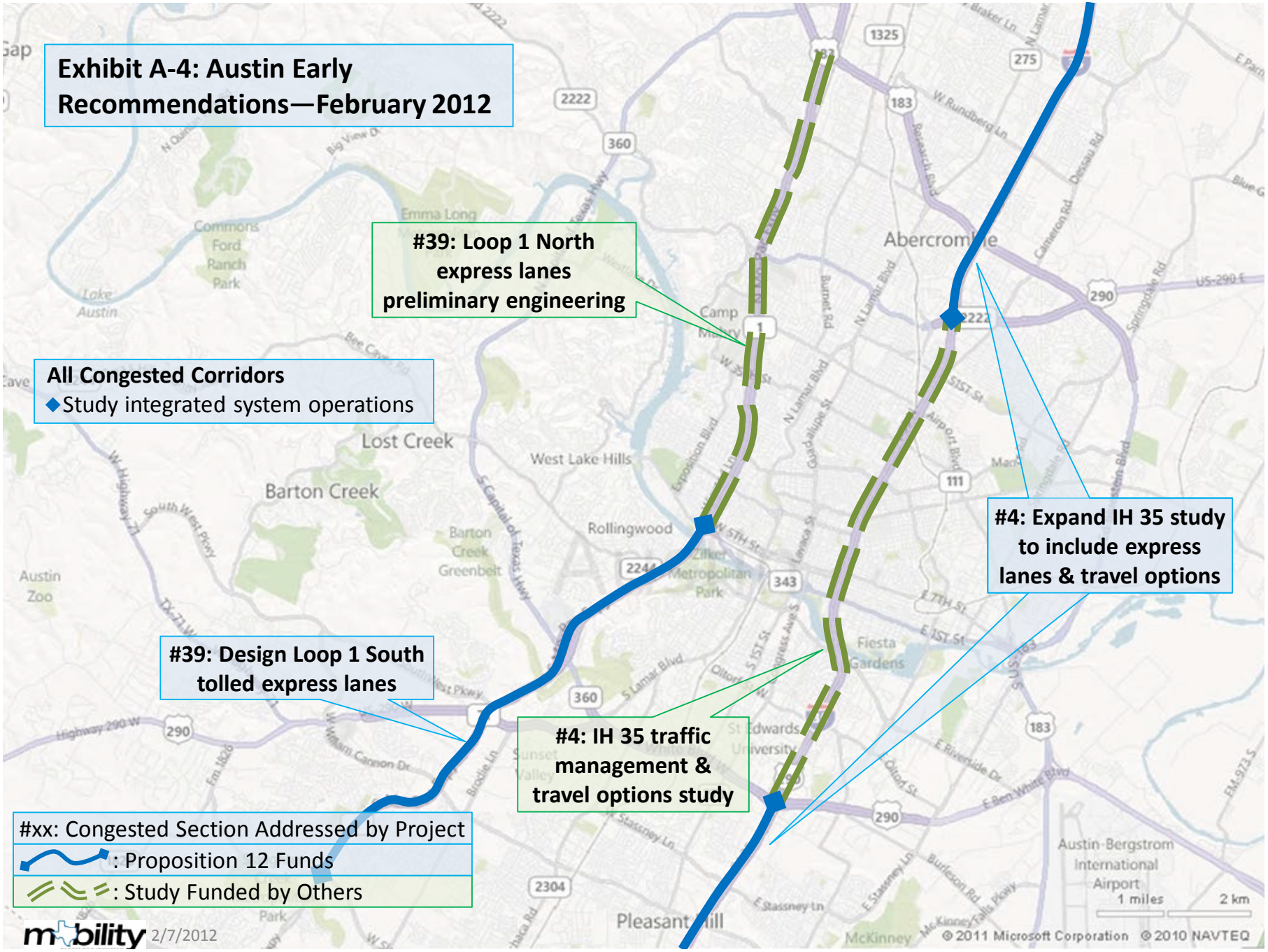


Exhibit A-4: Austin Early Recommendations—February 2012
#39: Loop 1 North express lanes preliminary engineering
All Congested Corridors
◆Study integrated system operations
#4: Expand IH 35 study to include express lanes & travel options
#39: Design Loop 1 South tolled express lanes
#4: IH 35 traffic management & travel options study
#xx: Congested Section Addressed by Project
: Proposition 12 Funds
: Study Funded by Others
Abercrombie
Lost Creek
Barton Creek
West Lake Hills
Rollingwood
Camp Mabry
Austin Zoo
Fiesta Gardens
Austin-Bergstrom International Airport
Pleasant Hill
McKinney
1 miles
2 km
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mobility 2/7/2012

The early recommendations described above represent the first step in the process of reducing congestion on the worst corridors in the state. A larger project involving construction, operation, management, and travel option strategies will follow the early recommended actions. Exhibit A-5 identifies possible projects in the Austin metropolitan area and the amount of funds and timeframe for project implementation. In Austin, the recommended actions coincided with the large projects occurring in the region, primarily on Loop 1 South and IH 35. However, an appropriate long-term solution for IH 35 has not yet been determined and must wait for the results of the extended IH 35 study.

Exhibit A-5: Summary of Possible Large Projects for Austin Congested Corridors

Rank	Corridor	Large Projects	Rider 42 Funding Estimate	Estimated Implementation Funds Needed*	Implementation Timeframe
39	Loop 1 South Managed Lanes	Engineering (preliminary, final and procurement) for tolled managed lanes	$16.5M	$290M	2017
4	IH 35 Study Extension	Expand study limits and scope to address potential managed lane operations and to assess TDM strategies for IH 35 commuters	$1.2M	$7M to $200M	2013 to 2019
All Congested Corridors					
Integrated Traffic Management		Engineering study to develop an integrated system management & operation project that includes comprehensive incident management	$800K	$3M	2013 and 2018
TOTAL			**$18.5M**	**$110M to $303M**	

Remaining Austin Rider 42 allocation: $12.78M.
*Source of implementation funds unknown.

DALLAS – FORT WORTH

Several of the worst congested sections of road in the Metroplex are near the two downtowns (Exhibits DFW-1 and DFW-2), which is similar to Austin and Houston. What is different, however, is that several of the most congested sections already have a large construction project underway or expected to begin soon (Exhibits DFW-3 and DFW-4).

The comprehensive development agreements on LBJ Freeway and IH 35E in Dallas and on IH 820 and IH 35W in Fort Worth will improve conditions on several of the most congested sections (Numbers 3, 8, 14, 19, and 21). The resulting roadways will not be congestion-free, but they will be much improved. The "Horseshoe" project on IH 30 and IH 35E at the southwest corner of downtown Dallas is the final segment of the IH 30 West improvement and the beginning of a congestion relief project on portions of IH 35E and IH 30 around the south end of downtown (Numbers 12, 16, 17, and 29).

There are several congested sections of road that do not have a logical big fix solution.

- Problems on Woodall Rodgers are related to the freeways on each end – Stemmons Freeway and North Central Expressway; expanding Woodall Rodgers will only exacerbate the bottlenecks at each end.
- North Central Expressway (US 75) from downtown to LBJ Freeway was rebuilt and significantly improved in the late-1990s; there does not appear to be much local support for adding lanes to the freeway. An advanced technology project (known as integrated corridor management) that will improve operations on both the freeway and adjacent streets is in the planning phase. The DART rail lines to Plano and Garland provide travel options to the congested sections of North Central Expressway.
- SH 360 in Arlington will likely see a congestion decrease when the parallel President George Bush Turnpike – Western Extension opens. It does not seem prudent to make major investments to SH 360 until the effect of the PGBT-Western Extension is known.

Large projects involving a combination of additional general travel lanes, managed lanes, and interchange improvements appear possible in the Stemmons, South RL Thornton, and East RL Thornton corridors although more study is required. The Trinity Parkway would also provide congestion relief to these corridors using a separate alignment that would draw traffic away from the existing roadways.

A summary and map of the recommended actions that will affect each congested corridor is included in Exhibits DFW-5, DFW-6, DFW-7, DFW-8, and DFW-9 after the individual corridor summaries. Information regarding large projects with significant congestion reduction potential, their estimated implementation cost, and implementation timeframe is included in Exhibit DFW-10.

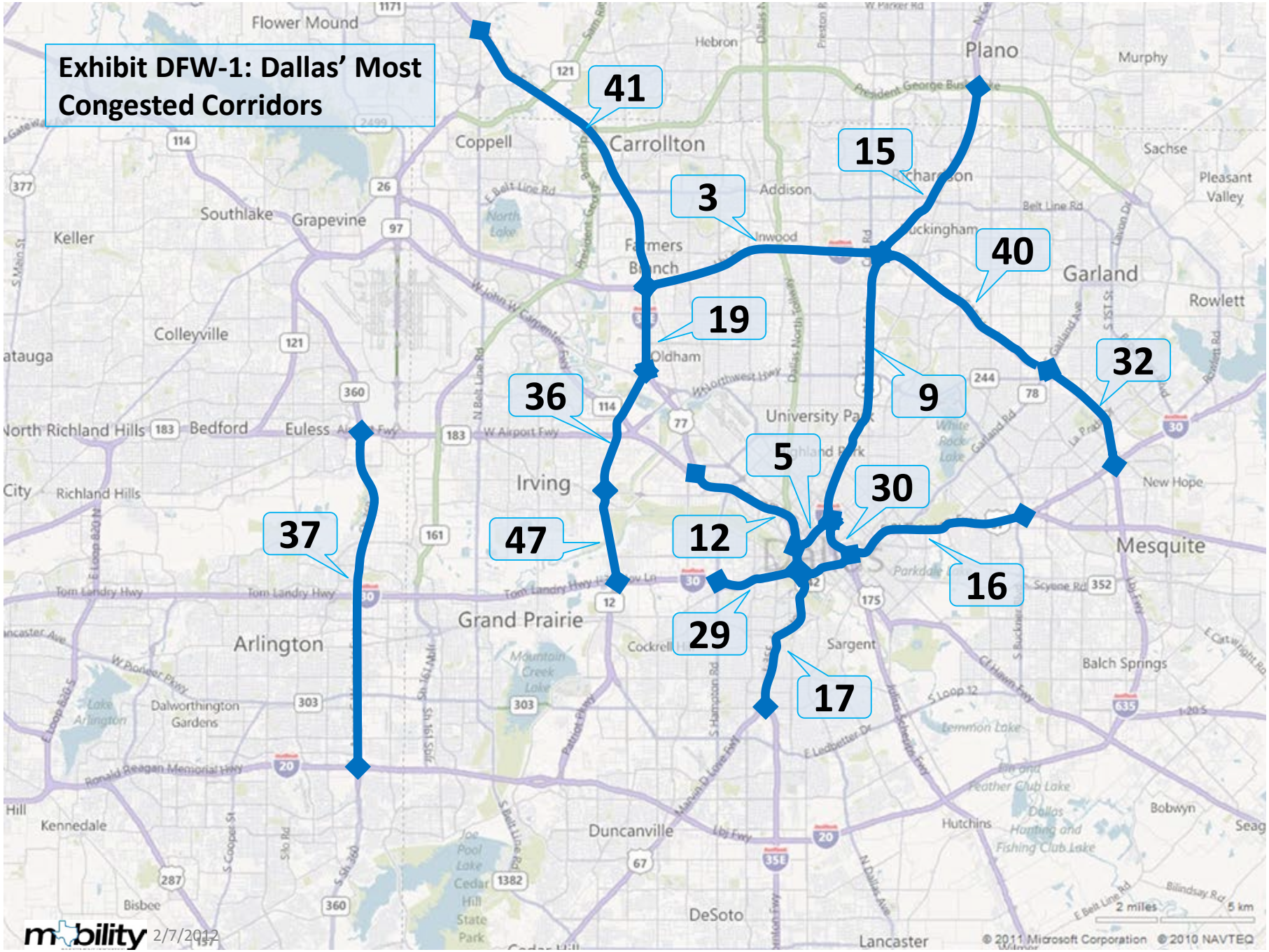
Exhibit DFW-1: Dallas' Most Congested Corridors
41
15
3
40
19
32
36
9
5
30
37
47
12
16
29
17
Flower Mound
Hebron
Plano
Murphy
Coppell
Carrollton
Sachse
Addison
Pleasant Valley
Southlake
Grapevine
Keller
Farmers Branch
Inwood
Buckingham
Garland
Rowlett
Colleyville
Oldham
University Park
Bedford
Euless
North Richland Hills
Irving
New Hope
Richland Hills
Mesquite
Grand Prairie
Arlington
Cockrell Hill
Sargent
Balch Springs
Dalworthington Gardens
Kennedale
Duncanville
Hutchins
Bobwyn
Bisbee
DeSoto
Lancaster
2 miles
5 km
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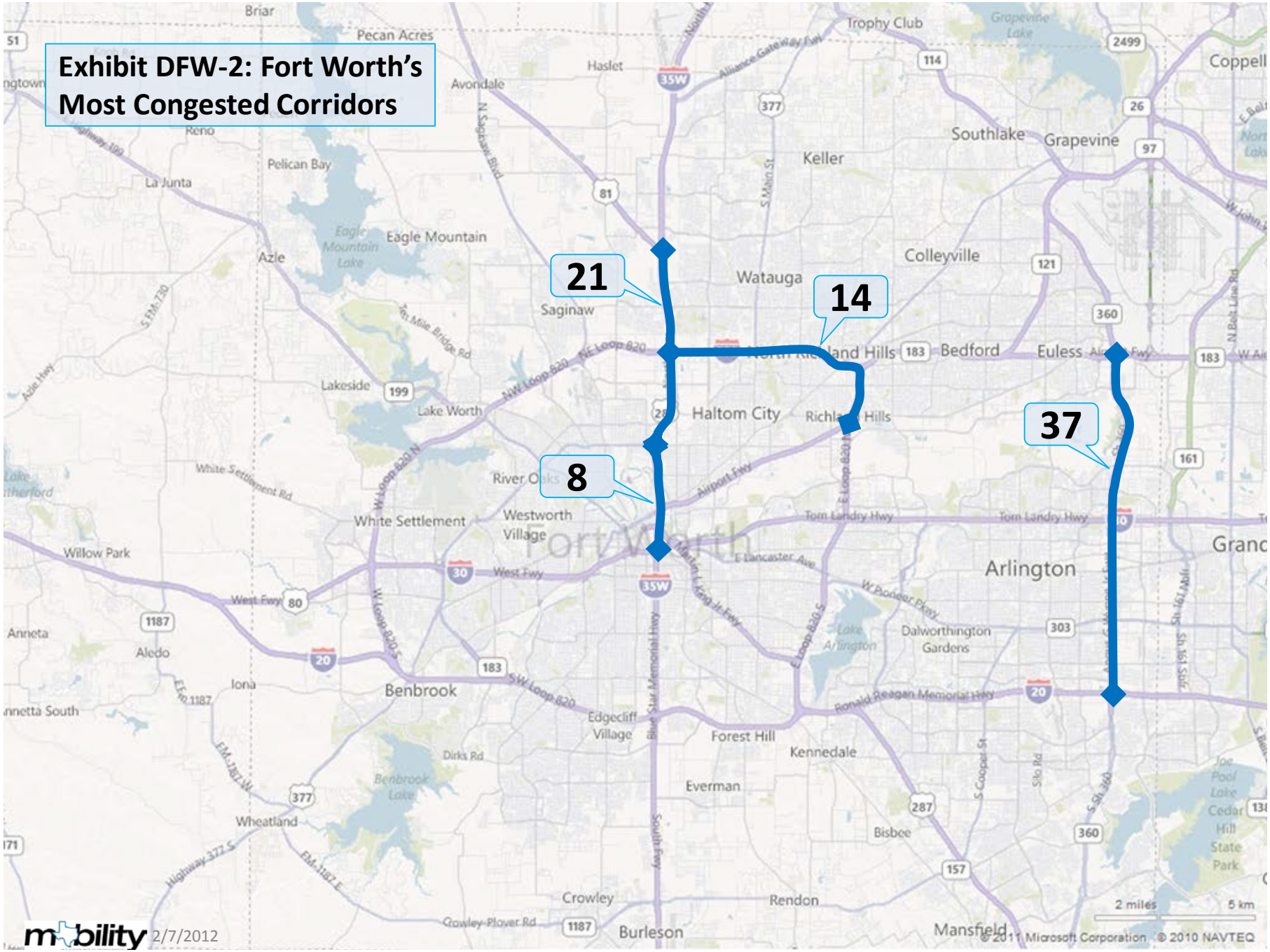
Exhibit DFW-2: Fort Worth's Most Congested Corridors



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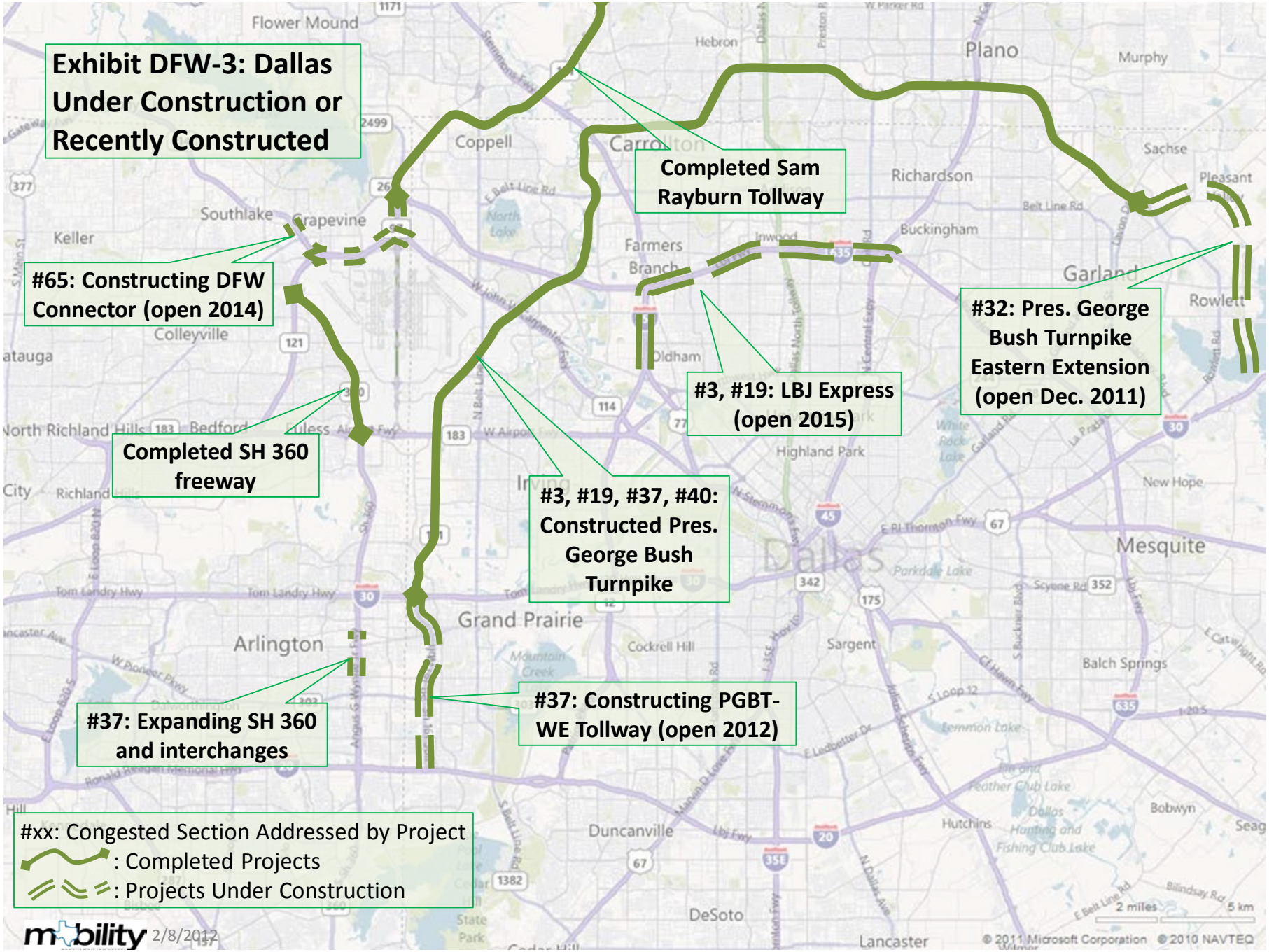
Exhibit DFW-3: Dallas Under Construction or Recently Constructed
Completed Sam Rayburn Tollway
#65: Constructing DFW Connector (open 2014)
Completed SH 360 freeway
#3, #19: LBJ Express (open 2015)
#32: Pres. George Bush Turnpike Eastern Extension (open Dec. 2011)
#3, #19, #37, #40: Constructed Pres. George Bush Turnpike
#37: Expanding SH 360 and interchanges
#37: Constructing PGBT-WE Tollway (open 2012)
#xx: Congested Section Addressed by Project
: Completed Projects
: Projects Under Construction
Flower Mound
Hebron
Plano
Murphy
Coppell
Carrollton
Richardson
Sachse
Pleasant
Southlake
Grapevine
Keller
Farmers Branch
Inwood
Buckingham
Garland
Rowlett
Colleyville
Oldham
Highland Park
North Richland Hills
Bedford
Euless
Richland Hills
New Hope
Irving
Dallas
Mesquite
Grand Prairie
Arlington
Cockrell Hill
Sargent
Balch Springs
Duncanville
Hutchins
Bobwyn
DeSoto
Lancaster
2 miles
5 km
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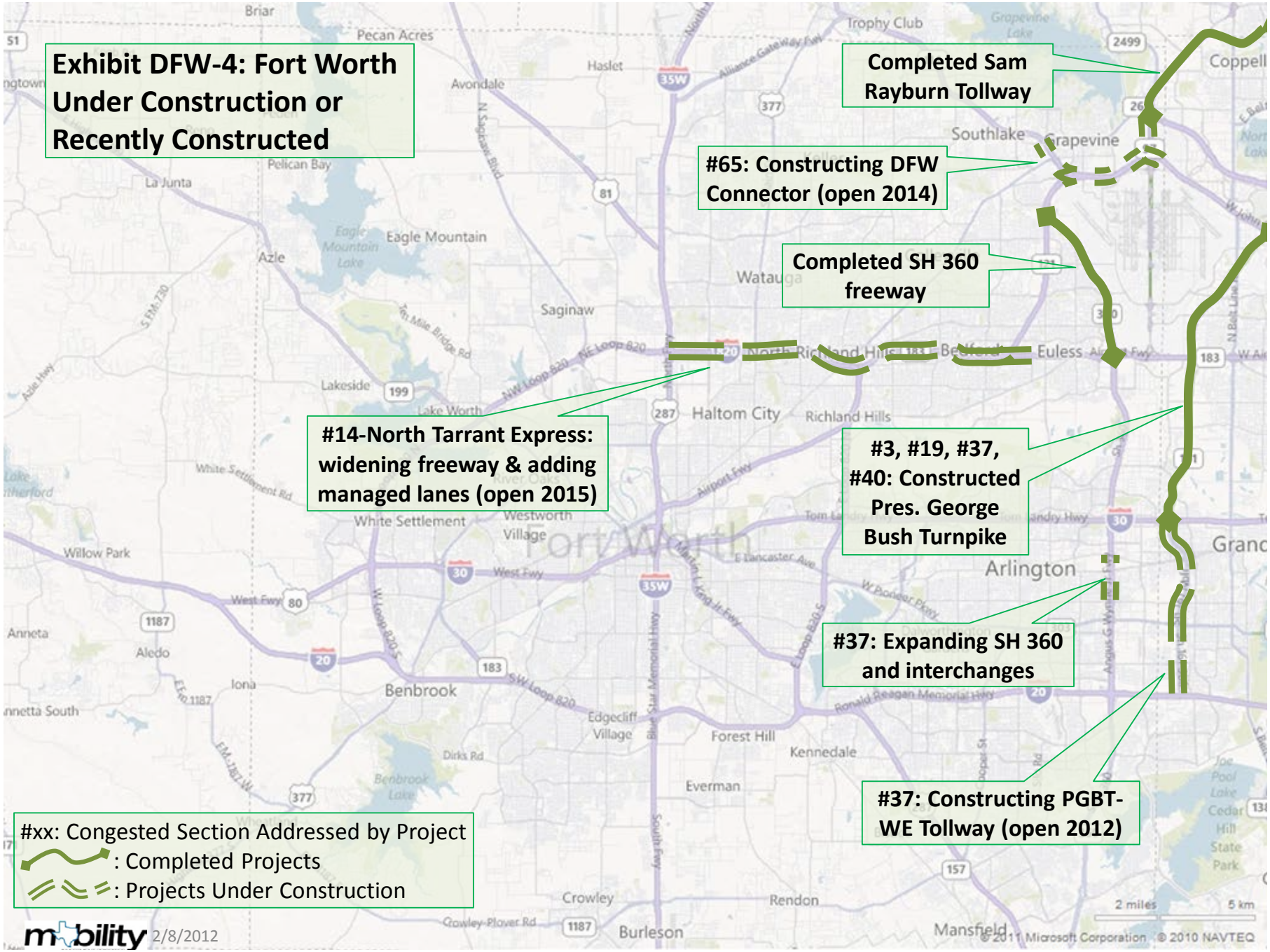

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LBJ FREEWAY (IH 635)

IH 35E (Stemmons Fwy) to US 75 (N. Central Expy)

Current Conditions

The LBJ Freeway between Stemmons Freeway (IH 35E) and North Central Expressway (US 75) is under construction and operates with four mainlanes and an HOV lane in each direction (HOV lanes are closed for construction). It is a major business corridor in the North Dallas area, is a major cross route connection, and connection to the north entrance of Dallas/Fort Worth International Airport. This freeway section remains congested for much of the day, regardless of morning and evening commutes (though congestion is worse during these periods). Eastbound speeds are generally higher in the morning period.

- Segment Length: 10.8 miles.
- Road Type: 8-Lane Freeway.
- Annual Hours of Delay: 5,760,000.
- Texas Congestion Index: 1.59.
- Commuter Stress Index: 1.75.
- HOV lane use: 10,750 vehicles/day.

Possible Congestion Causes

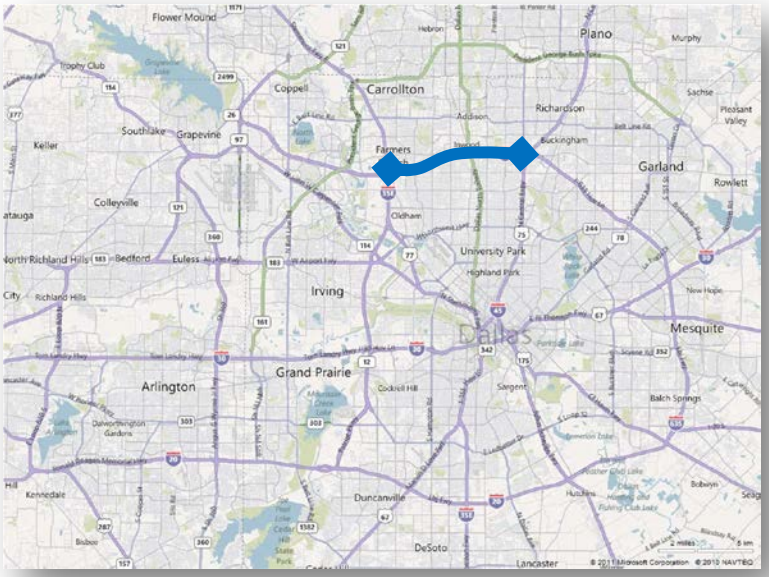
IH 635 was built in 1969 to accommodate 180,000 vehicles per day; current average daily traffic counts exceed 270,000 vehicles. The corridor has not received major reconstruction or capacity expansion in over two decades, until 2011. Coupled with some of the fastest population growth and development in the United States, congestion on the corridor has increased significantly.

Projects in Progress or Completed

LBJ Express

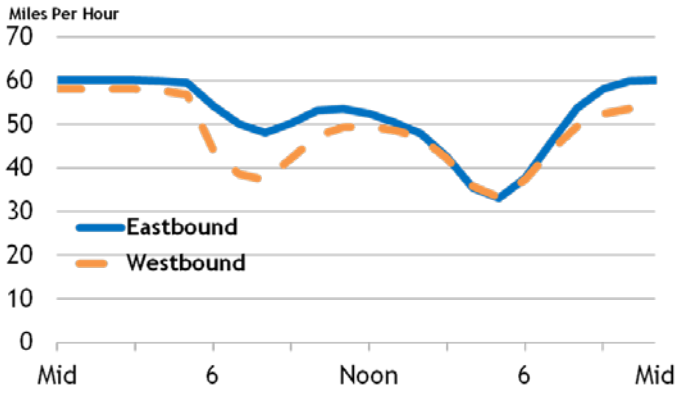
The LBJ Express project will:

- Rebuild the existing mainlanes.
- Build six new HOV/managed toll lanes in the median and below ground with a guaranteed 50 mph trip on the lanes.



Rank: 3

Annual Hrs of Delay/Mile:	**535,000**
Congestion Time:	**9 Hours**
Annual Cost of Delay:	**$141.1 million**
Average Daily Traffic:	**255,000 Vehicles**



- Create continuous frontage roads along IH 635.

Construction zone traffic management program is in place for the LBJ Express. The program will be monitored and enhanced, if necessary, to reduce delays where possible.

Demand Reduction
The Regional Employer Trip Reduction Program is a voluntary program that is designed to reduce employee commute vehicle trips through the education and implementation of travel demand management strategies such as rideshare programs (carpooling and vanpooling), telecommuting and flexible work-hour programs, transit pass subsidies, bicycling, and similar strategies. It is a cooperative program between North Central Texas Council of Governments (NCTCOG), Dallas Area Rapid Transit (DART), Fort Worth Transportation Authority (The T), Denton County Transportation Authority (DCTA), North Texas Clean Air Coalition (NTCAC), and other public and private sector organizations.

Incident Management
Regional Freeway Incident Management Program is in place in the corridor and will be enhanced upon completion of LBJ Express. The police and fire departments in the cities along the corridor have participated in Freeway Incident Management training, as well as photogrammetry training. Photogrammetry allows investigators to map a crash scene in significantly less time than traditional methods and results in up to 50 percent of average time saved per road closing crash scene.

Traffic Signals
Regional traffic signalization improvement program has been implemented on major streets in the corridor.

Intelligent Transportation Systems (ITS)
Regional ITS architecture development continues and will be enhanced by LBJ Express project.

Transit Service
The DART Red Line light rail service crosses LBJ Freeway just east of North Central Expressway (US 75). The Red Line transported 33,200 riders per day in FY2010.

The DART Green Line light rail service crosses LBJ Freeway in Farmers Branch on the west side of the LBJ Freeway corridor. The Green Line transported 4,800 riders per day in FY2010.

DART continues bus service with 17 routes in the corridor, 10 crossing and 7 parallel.

DART operates the LBJ/Central Station park and ride at IH 635 and US 75 with 533 spaces.

Planning Efforts to Date

LBJ Express

The LBJ Express Project represents the culmination of nearly 20 years of planning for improvements in the LBJ Freeway corridor.

Travel Options

Three Transportation Management Associations (TMAs) are planned for the corridor; LBJ and Stemmons (IH 35E) Freeway; LBJ and North Central (US 75); LBJ and the Dallas North Tollway area. These associations are non-profit organizations, generally a private-public partnership, that provide transportation services in a particular boundary area and also serve as the institution to facilitate travel demand management or commute trip options with small and large employers.

Parallel Routes

Widening of the parallel route, the President George Bush Turnpike, is planned to be open by 2020.

Bicycle and Pedestrian

The 2011 Dallas Bike Plan recommends on-street bicycle facilities for several roadways that intersect this corridor including SH 289 (Preston Road), Rosser Road, Webb Chapel Road, Dennis Road, and Denton Drive. Existing trails within this corridor include the Cottonwood Trail and the White Rock Creek Trail.

Commuter Rail

The proposed Cotton Belt commuter rail line parallels this corridor to the north. The Cotton Belt Rail corridor will provide an east-west link across the northern part of the region between Dallas/Fort Worth International Airport east to the cities of Plano and Richardson.

Next Steps

- LBJ Infrastructure Group will **operate and maintain the roadway under a CDA.**
- LBJ Freeway is identified as a **potential corridor for truck lane restrictions** in NCTCOG's *Mobility* 2035 after construction is complete.

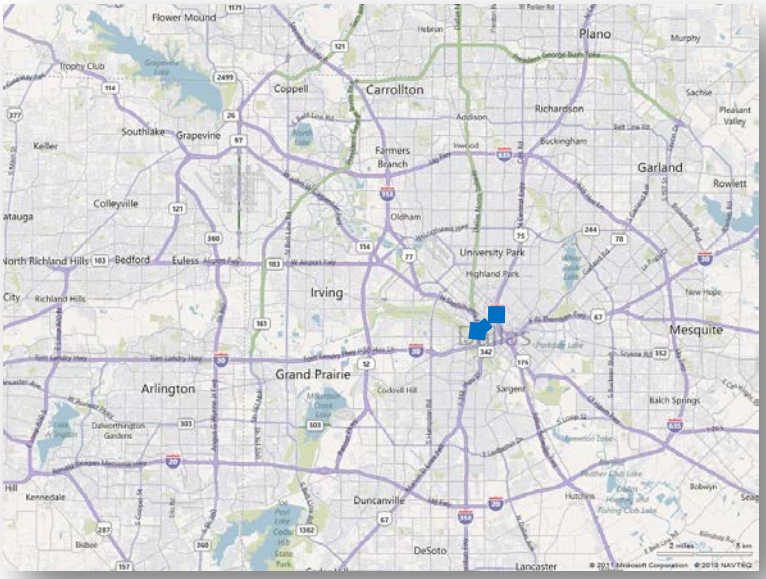
WOODALL RODGERS FWY (SS 366)

IH 35E (Stemmons Fwy) to US 75 (N. Central Expy)

Current Conditions

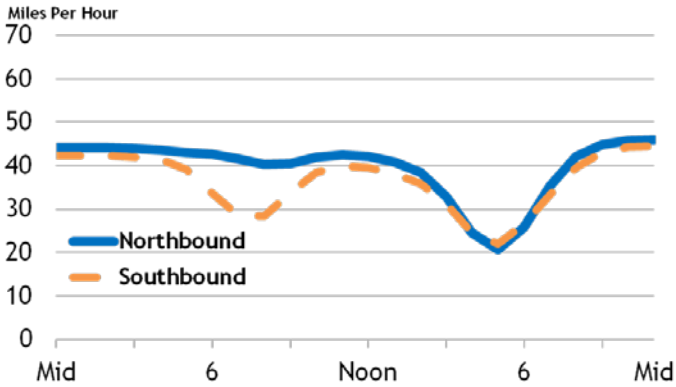
The Woodall Rodgers Freeway connects IH 35E to IH 345 (US 75/IH 45) in central Dallas north of downtown. It operates with four lanes in each direction through a depressed section. The freeway is surrounded by multi-storied commercial and cultural buildings. The freeway forms the northern boundary of the City of Dallas central business district (CBD). The freeway extends from US 75 on the northeast to Riverfront Boulevard on the southwest. Direct connections exist at these same termini, allowing access to and from US 75 and IH 35E (east of Riverfront Boulevard). Congestion dramatically peaks on both northbound and southbound directions in the evening, slowing traffic to near 20 mph. However, the morning peak period slows only the southbound direction.

- Segment Length: 1.6 miles.
- Road Type: 8-lane freeway.
- Annual Hours of Delay: 961,000.
- Texas Congestion Index: 1.84.
- Commuter Stress Index: 2.16.



Rank: 5

Annual Hrs of Delay/Mile:	**597,000**
Congestion Time:	**11 Hours**
Annual Cost of Delay:	**$23.6 million**
Average Daily Traffic:	**159,000 Vehicles**



Possible Congestion Causes

Woodall Rodgers Freeway receives incoming traffic from three major roadways entering the downtown Dallas area: IH 35E Stemmons Freeway, US 75 North Central Expressway, and IH 45 via IH 345. Stemmons Freeway and North Central Expressway are two of the five most congested corridors in the Dallas-Fort Worth area. This freeway is also a construction work zone while an urban park is built on a deck above the main lanes.

Projects in Progress or Completed

Woodall Rodgers Extension

The Woodall Rodgers Extension is being constructed as a 6-lane road from the CBD to west Dallas. The construction is extending the freeway westward from its current terminus at IH 35E across the Trinity River to the Beckley Avenue/Singleton Boulevard Intersection.

Urban Park

An urban deck park is under construction over the freeway between St. Paul Street and Pearl Street. This effort includes several intersection and ramp improvements to reduce bottlenecks.

Demand Reduction
The Regional Employer Trip Reduction Program is a voluntary program that is designed to reduce employee commute vehicle trips through the education and implementation of travel demand management strategies such as rideshare programs (carpooling and vanpooling), telecommuting and flexible work-hour programs, transit pass subsidies, bicycling, and similar strategies. It is a cooperative program between North Central Texas Council of Governments, DART, Fort Worth Transportation Authority (The T), Denton County Transportation Authority (DCTA), North Texas Clean Air Coalition (NTCAC), and other public and private sector organizations.

Downtown Dallas Inc. is a recognized transportation management association that promotes alternative travel modes and demand management among CBD businesses.

Transit Service
The CBD is a primary hub for Dallas Area Rapid Transit (DART). Four light rail lines: the Red, Orange, Blue, and Green Lines converge on Pacific Street that runs through downtown parallel to the corridor.

DART bus service operates 12 routes in the corridor.

Incident Management
The Regional Freeway Incident Management Program operates in the corridor. This corridor has ITS technology deployed for incident detection and management. The police and fire departments in the City of Dallas and the Dallas County Sheriff's Office have participated in Freeway Incident Management training, as well as photogrammetry training. Photogrammetry allows investigators to map a crash scene in significantly less time than traditional methods and results in up to 50 percent of average time saved per road closing crash scene.

Traffic Signals
Regional traffic signalization improvement program has been implemented on major streets in the corridor.

Planning Efforts to Date

Pedestrian Facilities
Woodall Rodgers Cross Street Sidewalk Reconstruction will provide bicycle and pedestrian amenities on cross streets.

Next Steps

- **No future widening of the freeway is possible.** This section of freeway is depressed and surrounded by multi-storied commercial and cultural buildings.
- No specific plans or projects are identified beyond the current efforts.

IH 35W (NORTH FWY)

IH 30 (East Fwy) to SH 183 (NE 28th St)

Current Conditions

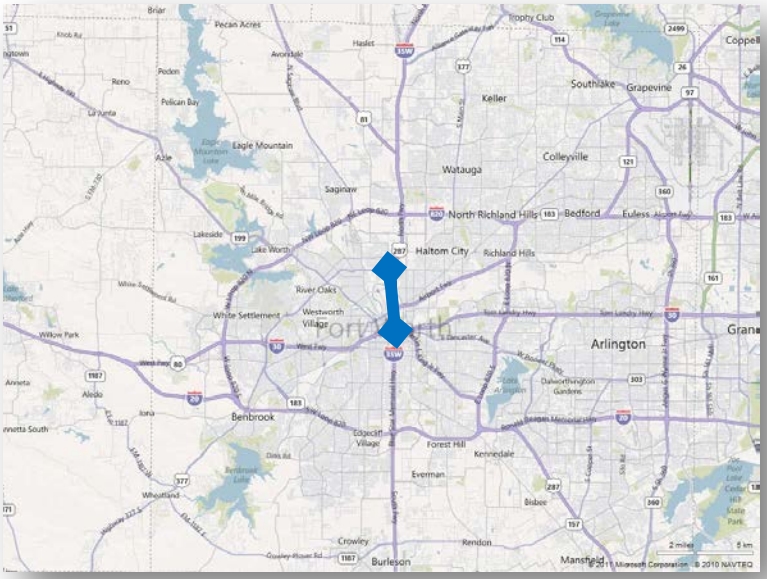
The North Freeway IH 35W is the most congested corridor in Tarrant County. Three major roadways, IH 30, US 287, and Airport Freeway (SH 121), intersect the corridor between the southern and northern ends of downtown Fort Worth. The corridor has eight lanes through downtown and six lanes north of the SH 121 interchange. Congestion plagues this stretch of IH 35W for most of the day in both directions, with the worst slowdowns occurring during the evening rush hour. Northbound traffic experience more dramatic speed changes during the day than the other direction.

- Segment Length: 3.7 miles.
- Road Type: 8-lane highway.
- Annual Hours of Delay: 1,624,000.
- Texas Congestion Index: 1.81.
- Commuter Stress Index: 2.19.

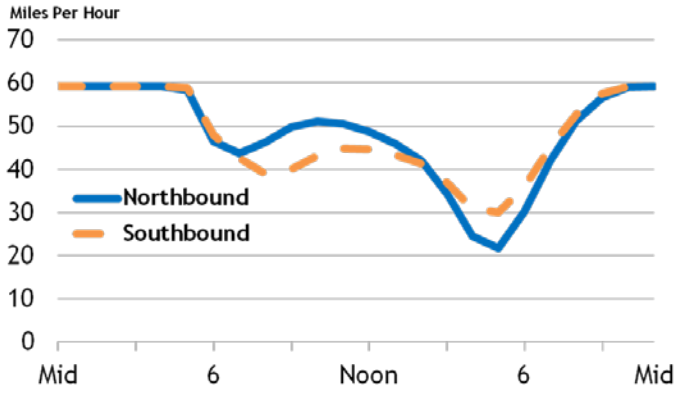
The need for improvements in this corridor has been discussed as far back as 1974 in the region's *Total Transportation Plan for the North Central Texas Region for 1990*. Specific freeway/HOV/managed lane improvements have been recommended in this corridor since 1986 in *Mobility 2000*.

Possible Congestion Causes

The North Freeway contains older roadway designs in sections north of IH 30, forcing drivers to change multiple lanes to continue on the same road or direction. Some improvements to the situation occurred with the redesign of the IH 30/US 287 interchange a decade ago, but problems still persist in the corridor, especially at the Airport Freeway interchange. US 287 merges with North Freeway in downtown Fort Worth adding to the number of vehicles northbound through the corridor. Southbound



Rank: 8	
Annual Hrs of Delay/Mile:	442,000
Congestion Time:	11 Hours
Annual Cost of Delay:	$39.8 million
Average Daily Traffic:	158,000 Vehicles



Airport Freeway terminates at the corridor in downtown creating a chokepoint for drivers entering and passing through downtown.

Projects in Progress or Completed

Traffic Management

Traffic management strategies include a regional mobility assistance patrol that is operated by Tarrant County.

The City of Fort Worth and the TxDOT Fort Worth District Traffic Management Centers are connected via fiber optic cable and exchange transportation data and video.

This corridor has ITS technology deployed for incident detection and management.

Incident Management
The police and fire departments in the City of Fort Worth have participated in Freeway Incident Management training, as well as photogrammetry training. Photogrammetry allows investigators to map a crash scene in significantly less time than traditional methods and results in up to 50 percent of average time saved per road closing crash scene.

Shared Commuting
The region has implemented regional ridesharing software TryParkingIt.

A park-and-ride facility at the T&P station with 376 spots serves commuters traveling to Dallas.

This corridor is part of an area served by the Fort Worth Transportation Authority (The T) vanpool program.

Demand Reduction
Downtown Fort Worth Inc. is a recognized transportation management association that promotes alternative travel modes and demand management among CBD businesses.

Bicycle and Pedestrian
The corridor is included in Bike Fort Worth, several on-street bicycle facilities are provided on Pine Street, Yucca Avenue, and Watauga Road.

The existing West Fork hike and bike trail also intersects this corridor.

Planning Efforts to Date

Expansions
This corridor is part of the North Tarrant Express (NTE) CDA Master Development Agreement that will widen and reconstruct the freeway to include managed lanes and continuous frontage roads. It is not part of the ongoing construction efforts but an agreement to include this facility in the construction efforts is being pursued. The proposed work will create four managed lanes in the corridor and rebuild the existing mainlanes. Improvements to the

IH 35W/SH 121 interchange are acknowledged, but deferred currently. Environmental and schematic clearance is anticipated by mid-2012.

Commuter Rail

The proposed TEX Rail and Speedway commuter rail lines run parallel to the corridor. The Speedway Line runs north-south and connects downtown Fort Worth with the Texas Motor Speedway (TMS). TEX Rail follows the Fort Worth Western Railroad from southwest Fort Worth through downtown Fort Worth on to Dallas/Fort Worth International Airport. This corridor will connect to the Cotton Belt rail corridor. These rail lines are expected to remove some vehicle demand from IH 35W.

Next Steps

- Regional planners will **monitor the corridor's addition to the NTE CDA and initiation of construction**. If added to the CDA, further planned improvements to the corridor will be reviewed accordingly.
- North Freeway is listed in *Mobility 2035* as a **potential corridor for truck lane restrictions**.

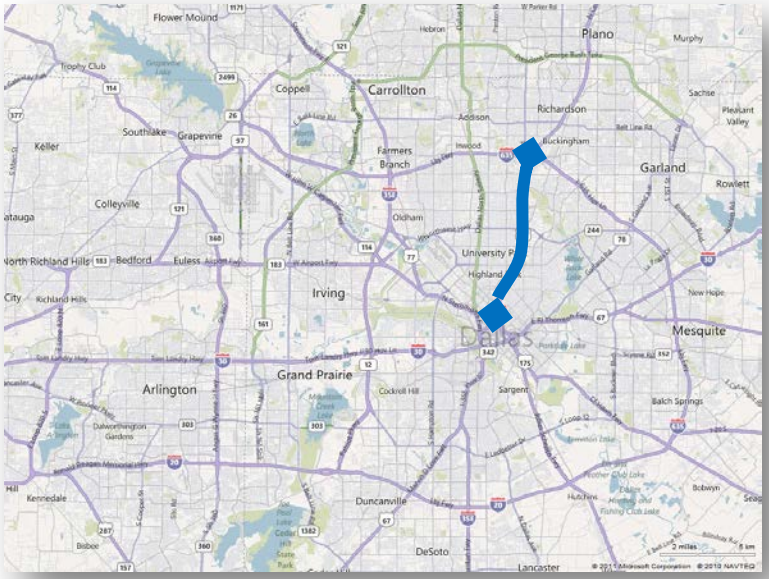
US 75 (N. CENTRAL FWY)

IH 635 (LBJ Fwy) to SS 366 (Woodall Rodgers Fwy)

Current Conditions

US 75 North Central Expressway is a main north-south route from the Dallas central business district (CBD) to the North Dallas area. The southern end of this corridor is depressed. The corridor is surrounded by multi-storied commercial, retail, low to high density residential, and a major university. Congestion slowdowns on US 75 occur equally regardless of direction throughout the day with the evening rush hour experiencing the slowest speeds.

- Segment Length: 9.1 miles.
- Road Type: 8-lane freeway.
- Annual Hours of Delay: 4,547,000.
- Texas Congestion Index: 1.50.
- Commuter Stress Index: 1.70.



Rank: 9

Annual Hrs of Delay/Mile:	**498,000**
Congestion Time:	**7 Hours**
Annual Cost of Delay:	**$111.4 million**
Average Daily Traffic:	**283,000 Vehicles**

Possible Congestion Causes

North Central Expressway is the main non-toll north-south route between the northern suburbs of Dallas and the CBD. The roadway was reconstructed in the late 1990s using the full breadth of right-of-way.

Projects in Progress or Completed

Transit Service

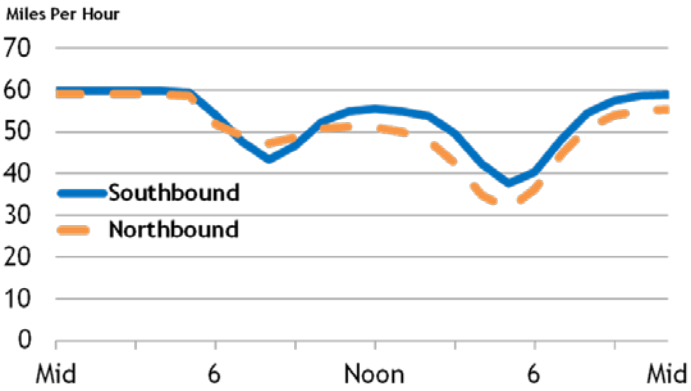
The Dallas Area Rapid Transit (DART) Red and Blue Lines run parallel to the facility with seven stations along the corridor. The Red line carried 33,200 average weekday riders in FY2010. The DART Blue Line runs parallel to the facility to Mockingbird Station and carried 22,200 average weekday riders in FY2010. DART bus service operates over 20 bus routes in the corridor.

LBJ Express

The LBJ Express (IH 635) project is under construction and may provide some congestion relief at the LBJ and US 75 interchange.

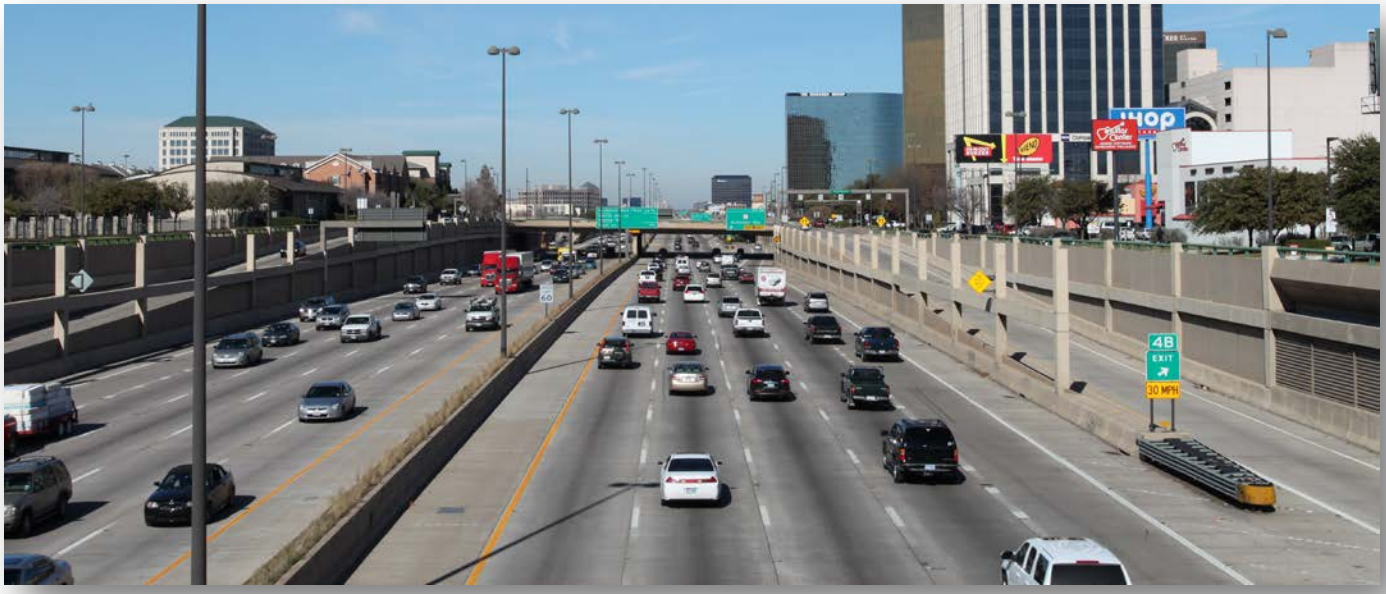
Woodall Rodgers Extension

Similar to improvements with the LBJ Express, the extension may relieve congestion on US 75.



Demand Reduction

The Regional Employer Trip Reduction Program is a voluntary program that is designed to reduce employee commute vehicle trips through the education and implementation of travel demand management strategies such as rideshare programs (carpooling and vanpooling), telecommuting and flexible work-hour programs, transit pass subsidies, bicycling, and



similar strategies. It is a cooperative program between North Central Texas Council of Governments, DART, Fort Worth Transportation Authority (The T), Denton County Transit Authority (DCTA), North Texas Clean Air Coalition (NTCAC), and other public and private sector organizations.

Downtown Dallas Inc. is a recognized transportation management association that promotes alternative travel modes and demand management among CBD businesses.

Incident Management
The Regional Freeway Incident Management Program operates in the corridor. This corridor currently has ITS technology deployed for incident detection and management. The police and fire departments in the City of Dallas and the Dallas County Sheriff's Office have participated in Freeway Incident Management training, as well as photogrammetry training. Photogrammetry allows investigators to map a crash scene in significantly less time than traditional methods and results in up to 50 percent of average time saved per road closing crash scene.

Traffic Signals
Regional traffic signalization improvement program has been implemented on major streets in the corridor.

Traveler Information
The corridor-wide Integrated Corridor Management project, a demonstration for Federal Highway Administration (FHWA), will integrate systems (freeway, transit, and streets) to get the full use out of the available capacity. In addition, a regional 5-1-1 traveler information system will be developed as part of that project.

Planning Efforts to Date

There are no major reconstruction projects planned for North Central Expressway.

Bicycle and Pedestrian
The 2011 Dallas Bike Plan recommends on-street bicycle facilities for several roadways that intersect this corridor. There are three existing trails within this corridor.

Next Steps

- **No future widening of the freeway is possible**. The corridor is depressed and surrounded by multi-storied commercial buildings and a major university.
- As there are no plans for additional capacity, this corridor will continue to **address congestion through additional traffic management and travel demand management** efforts through the FHWA Integrated Corridor Management program.

IH 35E (STEMMONS FWY)

IH 30 (Tom Landry Hwy) to SH 183 (Airport Fwy)

Current Conditions

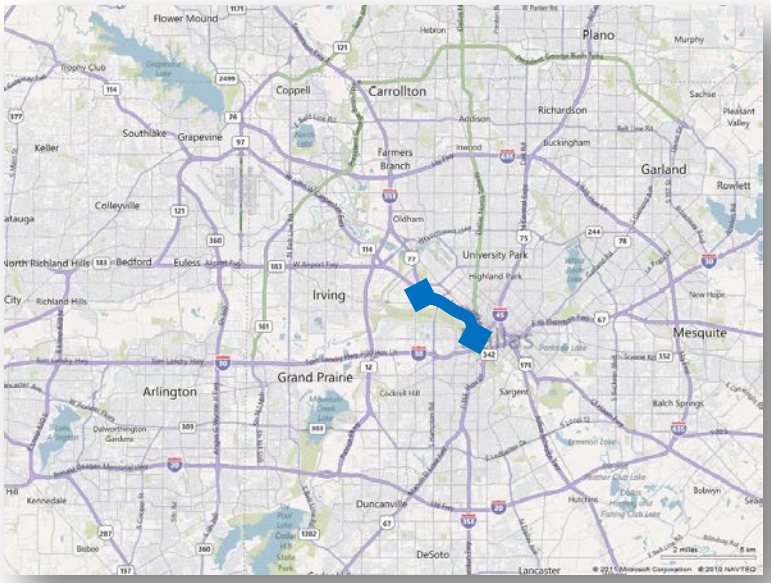
IH 35E Stemmons Freeway was Dallas-Fort Worth's first modern, large-sized freeway when it opened in 1959. Fifty years later it remains DFW's widest freeway for a sustained distance, 10 lanes in some segments. In the early 1990s, the inside shoulder was converted to a travel lane to help relieve congestion. Traffic congestion along IH 35E follows an unusual outbound morning/ inbound evening pattern. However, the evening rush hour travels slower than the morning period.

- Segment Length: 6.6 miles.
- Road Type: 10-lane freeway.
- Annual Hours of Delay: 2,791,000.
- Texas Congestion Index: 1.44.
- Commuter Stress Index: 1.62.

Additional freeway/HOV/managed lane capacity has been recommended in this corridor since 1986 in *Mobility 2000*. A subarea study was undertaken in 1989 that refined the recommended improvement strategy. Since that time, this portion of IH 35E was included in the Trinity Parkway Major Investment Study (conducted 1996–1998) that also confirmed the need for additional freeway and managed lane capacity.

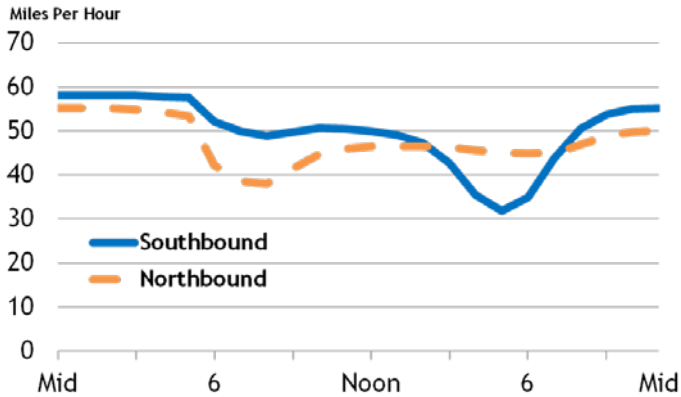
Possible Congestion Causes

Most of the freeway is still in its originally-constructed configuration. The corridor has two major highway segments (IH 35E and SH 183) converging on the northern end, and interchange with the Dallas North Tollway and four major highways (SP 366, IH 30 east and west, and IH 35E south) converging on the southern end in the downtown Dallas area. The corridor serves the Dallas Design district, the region's second major airport Love Field, three major hospital complexes, a sports arena, and the central business district (CBD).



Rank: 12

Annual Hrs of Delay/Mile:	**423,000**
Congestion Time:	**8 Hours**
Annual Cost of Delay:	**$68.4 million**
Average Daily Traffic:	**219,000 Vehicles**



Projects in Progress or Completed

Project Pegasus

The Woodall Rodgers Extension, part of the Trinity Parkway MTIS, is being constructed as a 6-lane road from the CBD to west Dallas. The construction is extending Woodall Rogers westward from its current terminus at IH 35E across the Trinity River to the Beckley Avenue/Singleton Boulevard Intersection.

Transit Service
The DART Green and Orange Lines run parallel to the facility with four stations along the corridor. The Green Line serves 4,800 average weekday riders. The Orange Line provides select service during peak weekday hours. The Trinity Railway Express (TRE) runs parallel to the facility from Medical/Market Center to Union Station and serves 8,680 passenger trips per weekday.

DART bus service operates 20 routes in the corridor, including shuttle service to UT Southwestern.

Incident Management
The Regional Freeway Incident Management Program operates in the corridor. This corridor currently has ITS technology deployed for incident detection and management. The police and fire departments in the City of Dallas and the Dallas County Sheriff's Office have participated in Freeway Incident Management training, as well as photogrammetry training. Photogrammetry allows investigators to map a crash scene in significantly less time than traditional methods and results in up to 50 percent of average time saved per road closing crash scene.

Traffic Signals
Regional traffic signalization improvement program has been implemented on major streets in the corridor.

Demand Reduction
The Regional Employer Trip Reduction Program is a voluntary program that is designed to reduce employee commute vehicle trips through the education and implementation of travel demand management strategies such as rideshare programs (carpooling and vanpooling), telecommuting and flexible work-hour programs, transit pass subsidies, bicycling, and similar strategies. It is a cooperative program between North Central Texas Council of Governments (NCTCOG), DART, Fort Worth Transportation Authority (The T), Denton County Transit Authority (DCTA), North Texas Clean Air Coalition (NTCAC), and other public and private sector organizations.

Downtown Dallas Inc. is a recognized transportation management association that promotes alternative travel modes and demand management among CBD businesses.

Planning Efforts to Date

Horseshoe Expansion

The Horseshoe Project, part of Project Pegasus, near downtown Dallas involves the reconstruction of IH 30 and IH 35E. It includes the replacement of both corridor bridges over the Trinity River and will add general purpose lanes, HOV/managed toll lanes, and collector/distributor lanes to better connect the two interstate highways to the downtown Dallas area.

Project Pegasus

Project Pegasus is a broad planning vision for reconstruction of IH 30 and IH 35E along Lower Stemmons, the Mixmaster and the Downtown Canyon. This includes interchange improvements for IH 35E and Dallas North Tollway, IH 30 and IH 35E, and IH 30 and IH 45.

Trinity Parkway

The Trinity Parkway is a planned new location toll road in Dallas extending from the interchange of SH 183 and IH 35E southeast to IH 45. The tollway will create a reliever route for the Stemmons Freeway corridor and downtown. The project is currently in environmental review with a decision anticipated in 2013.

Bicycle and Pedestrian

The 2011 Dallas Bike Plan recommends on-street bicycle facilities for several roadways that intersect this corridor. There are three existing trails within this corridor.

Next Steps

- The region is **proceeding with development of the Horseshoe Project** to reconstruct the IH 30 and IH 35E bridges over the Trinity River and the connections between these highways at the edge of downtown Dallas. **Recommended use of Proposition 12 funds for engineering and right-of-way.**
- Due to funding shortages and because this facility is parallel to the proposed Trinity Parkway, the **corridor was removed from the financially constrained section of *Mobility 2035***, but remains in the vision component of the plan for consideration if additional funding is realized.
- The corridor is listed in *Mobility 2035* as a **potential corridor for truck lane restrictions**.

IH 820 (NORTHEAST LOOP)

IH 35W (North Fwy) to SH 183 (Airport Fwy)

Current Conditions

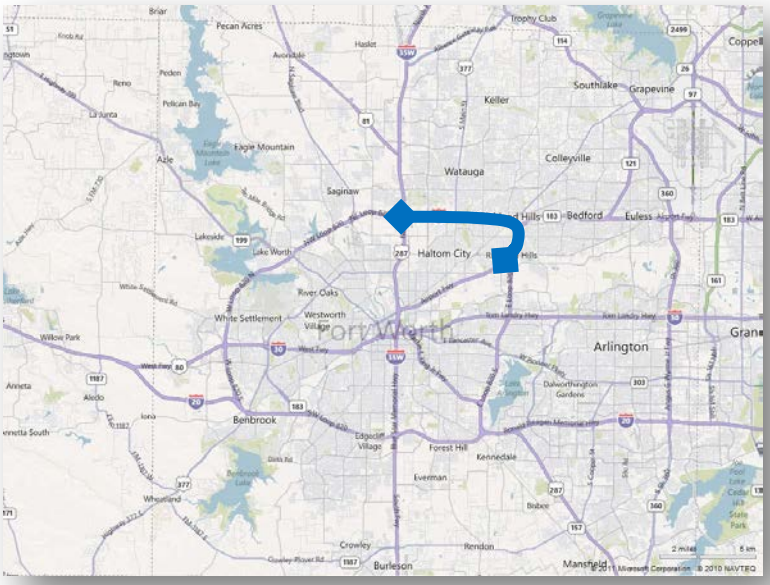
IH 820 Northeast Loop, completed in 1963, is 4-lane freeway in Northeast Tarrant County. It provides an east-west commuter route in north Fort Worth to Dallas County and access toward the south entry of Dallas/Fort Worth International Airport. Congestion loosely follows a traditional pattern; however inbound morning traffic is actually headed toward Dallas rather than Fort Worth. Traffic slows in both directions but less heavily in the off-peak direction. The corridor retains some form of congestion throughout entire day in both directions.

- Segment Length: 6.4 miles.
- Road Type: 4-lane freeway.
- Annual Hours of Delay: 1,873,100.
- Texas Congestion Index: 1.59.
- Commuter Stress Index: 1.75.

The need for improvements in this corridor has been discussed as far back as 1974 in the region's *Total Transportation Plan for the North Central Texas Region for 1990*. Specific freeway/HOV/managed lane improvements have been recommended in this corridor since 1986 in *Mobility 2000*.

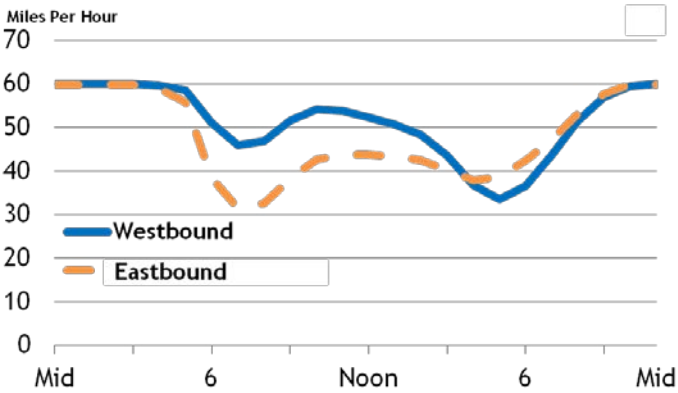
Possible Congestion Causes

Increased population growth and commercial development in the cities immediately north of the corridor have placed much greater demand on a facility that has maintained its original 4-lane configuration. Few improvements have taken place at the western terminus of the corridor at IH 35W. Major reconstruction of the interchange with SH 183/SH 121 has improved congestion at the eastern end for traffic departing the roadway, but the improved interchange still feeds westbound traffic into an outdated facility.



Rank: 14

Annual Hrs of Delay/Mile:	**294,000**
Congestion Time:	**14 Hours**
Annual Cost of Delay:	**$46.8 million**
Average Daily Traffic:	**122,000 Vehicles**



Projects in Progress or Completed

North Tarrant Express (NTE) Expansion

Construction began in October 2010 on the North Tarrant Express. The project (estimated to be completed in 2015) will rebuild and expand 13 miles of IH 820 and SH 121/SH 183 from IH 35W to the SH 121/SH 183 split. The project will rebuild the existing four to six main lanes, add four toll-managed lanes, plus frontage roads

and auxiliary lanes to approximately double the existing capacity. The project also includes provisions for two additional non-tolled main lanes, which will be added no later than 2030 at no additional cost.

There is a construction zone traffic management program in place for the NTE. The program will be monitored and enhanced, if necessary, to reduce delays where possible.

Traffic Management
Traffic management strategies include regional mobility assistance patrol that is operated by Tarrant County outside of the operations area performed by NTE Mobility Partners.

The City of Fort Worth and the TxDOT Fort Worth District Traffic Management Centers are connected via fiber optic cable and exchange transportation data and video between each other.

This corridor has ITS technology deployed for incident detection and management.

Incident Management
The police and fire departments in the City of Fort Worth have participated in Freeway Incident Management training, as well as photogrammetry training. Photogrammetry allows investigators to map a crash scene in significantly less time than traditional methods and results in up to 50 percent of average time saved per road closing crash scene.

Shared Commuting
The region has implemented regional ridesharing software TryParkingIt.

This corridor is part of an area served by the Fort Worth Transportation Authority (The T) vanpool program.

Bicycle and Pedestrian
Included in Bike Fort Worth is the existing Big Fossil Creek Trail that intersects this corridor.

Planning Efforts to Date

Expansion
This corridor is part of the North Tarrant Express CDA Master Development Agreement that will widen and reconstruct the freeway to include managed lanes. No planning efforts for further improvement of the corridor are being conducted.

Rail Transit
The TEXRail/Cotton Belt commuter line is anticipated to relieve some demand on this corridor.

Next Steps

- NTE Mobility Partners will **operate and maintain the roadway under a CDA**. The improvements should significantly mitigate the congestion on the roadway.
- The corridor is listed in *Mobility 2035* as a **potential corridor for truck lane restrictions** after NTE construction is complete.

US 75 (N. CENTRAL EXPY)

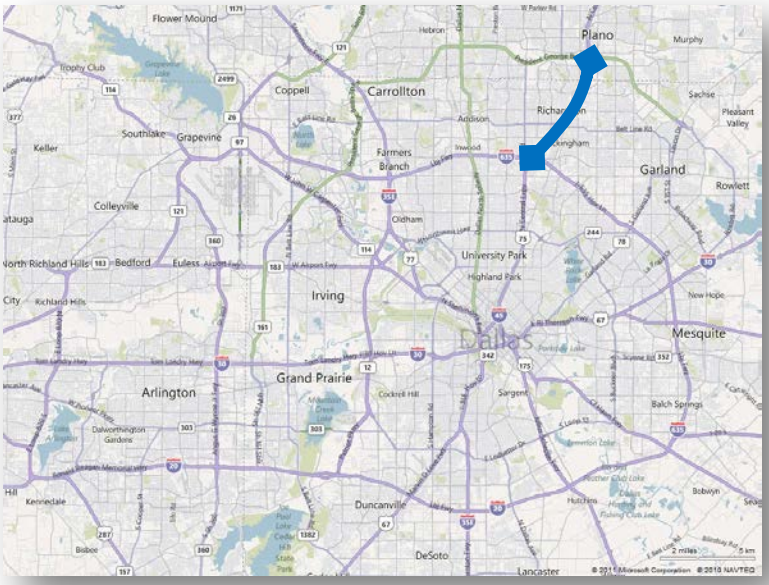
IH 635 (LBJ Fwy) to SH 190 (Pres. George Bush Turnpike)

Current Conditions

This segment of US 75 North Central Expressway is the main non-tolled north-south route between North Dallas and Plano; it was reconstructed in the 1980s. It is a major commuter route to the employment centers in Richardson. It is nicknamed "Telecom Corridor" although the mix of businesses in the corridor has become more varied since the 1990s. Congestion on this freeway section follows the traditional inbound morning/ outbound evening peaking pattern, but northbound speeds are generally lower outside of the morning period.

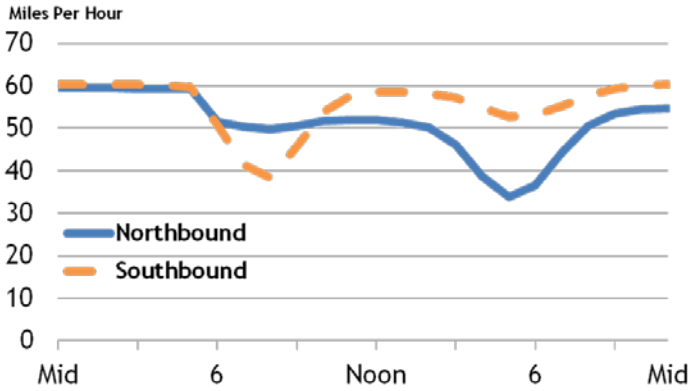
- Segment Length: 7.2 miles.
- Road Type: 8-lane freeway.
- Annual Hours of Delay: 2,452,000.
- Texas Congestion Index: 1.40.
- Commuter Stress Index: 1.58.

The facility has eight general purpose lanes with two 24-hour, concurrent flow HOV lanes.



Rank: 15

Annual Hrs of Delay/Mile:	**339,000**
Congestion Time:	**7 Hours**
Annual Cost of Delay:	**$60.1 million**
Average Daily Traffic:	**236,000 Vehicles**



Possible Congestion Causes

There are no alternate north-south highways between the Dallas North Tollway and IH 30. The major north-south arterials are also congested during peak periods. There is no more right-of-way available for capacity expansion or major reconstruction in the corridor. The corridor is surrounded by commercial and multi-storied office buildings. The southern end of this corridor intersects with two corridors, LBJ Freeway IH 635 and North Central Expressway US 75 that are even more congested.

Projects in Progress or Completed

Incident Management

The Regional Freeway Incident Management Program operates in the corridor. This corridor currently has ITS technology deployed for incident detection and management. The police and fire departments in the City of Dallas and the Dallas County Sheriff's Office have participated in Freeway Incident Management training, as well as Photogrammetry Training. Photogrammetry allows investigators to map a crash scene in significantly less time than traditional methods and results in up to 50 percent of average time saved per road closing crash scene.

Intelligent Transportation Systems (ITS)
Part of a corridor-wide Integrated Corridor Management project using ITS, this project will integrate systems (freeway, transit, and arterials) to get the full use out of the available capacity. In addition, a regional 5-1-1 will be developed as part of this project.

Traffic Signals
Regional traffic signalization improvement program has been implemented on major streets in the corridor.

Demand Reduction
The Regional Employer Trip Reduction Program is a voluntary program that is designed to reduce employee commute vehicle trips through the education and implementation of travel demand management strategies such as rideshare programs (carpooling and vanpooling), telecommuting and flexible work-hour programs, transit pass subsidies, bicycling, and similar strategies. It is a cooperative program between North Central Texas Council of Governments, DART, Fort Worth Transportation Authority (The T), Denton County Transportation Authority (DCTA), North Texas Clean Air Coalition (NTCAC), and other public and private sector organizations.

Transit Services
The DART Red Line run parallel to the facility with seven stations along the corridor. The Red line carried 33,200 average weekday riders in FY 2010.

There is DART bus service in corridor with 11 routes including shuttle service. DART shuttle service is provided to the Texas Instruments campus from LBJ/Central station, the Palisades Shuttle from Galatyn Park station, and the UT Dallas Shuttle from Bush Turnpike station.

There are four Park-and-Ride facilities in the corridor all of them associated with the DART light rail stations at LBJ/Central (553 spots), Spring Valley (393), Arapaho (1100), and George Bush Turnpike (1193).

Bicycle and Pedestrian
On-street bikeways in the City of Richardson that intersect this corridor can be found on Collins Boulevard, Lookout Drive, and Floyd Drive. The Renner Trail, Spring Creek Trail, Cottonwood Trail, and Central Trail are in the corridor.

President George Bush Turnpike Eastern Extension

The Eastern Extension of the President George Bush Turnpike (PGBT) is a toll road from SH 78 to IH 30. This corridor has six general purpose toll lanes with four discontinuous frontage road lanes, as well as a fully-directional interchange at IH 30. This segment opened to traffic in late 2011. This segment provides a more direct and faster route between north Dallas and south Collin counties to eastern areas of Dallas County.

Planning Efforts to Date

HOV Lane Study

An HOV study is identifying potential HOV lane access improvements including wishbone ramps.

Next Steps

- TxDOT will soon begin the process of hiring a consultant to study improvements in this corridor. Congestion in this corridor will continue to be addressed through **additional traffic management, travel demand management, and bottleneck removal** efforts through the FHWA Integrated Corridor Management program.
- TxDOT is also working on the design of **interchange improvements/bottleneck removal on US 75 at SH 190** that will widen direct-connect ramps and construct auxiliary lanes.
- The corridor is listed in *Mobility 2035* as a **potential corridor for truck lane restrictions**.

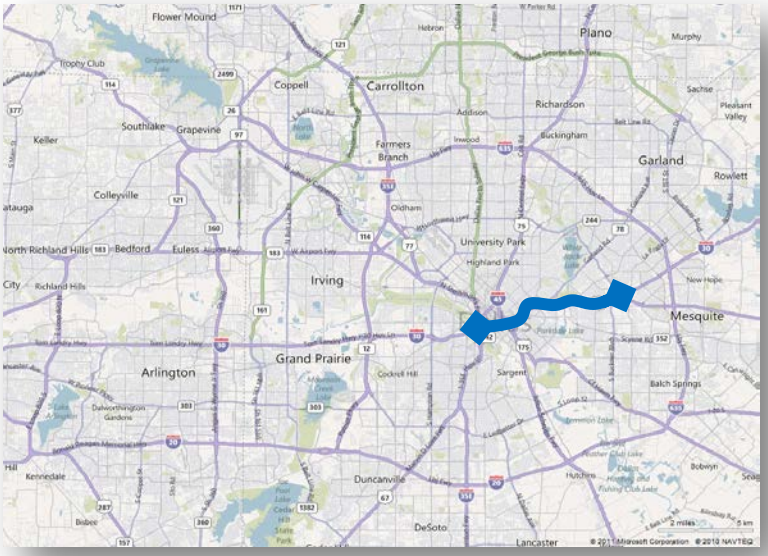
IH 30 (E. RL THORNTON FWY)

Jefferson Viaduct to SH 12 E (Buckner Blvd.)

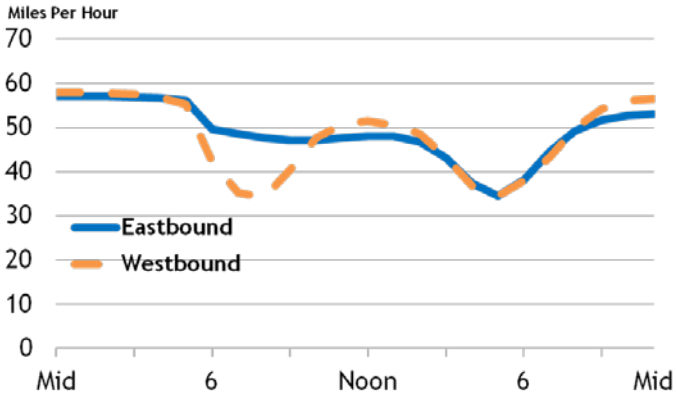
Current Conditions

The East RL Thornton Freeway was completed in 1966. A reversible high-occupancy vehicle lane (also known as the Zipper Lane) was added in 1991. The corridor serves southern downtown Dallas, Fair Park, and the White Rock Lake area. Congestion along this corridor occurs during both daily rush hour periods in the westbound direction. Congestion slowdowns on the eastbound lanes occurs only during the eveing peak period. This corridor has the highest use of the HOV lane in the region.

- Segment Length: 8.2 miles.
- Road Type: 6-lane freeway.
- Annual Hours of Delay: 3,017,000.
- Texas Congestion Index: 1.55.
- Commuter Stress Index: 1.65.



Rank: 16	
Annual Hrs of Delay/Mile:	369,000
Congestion Time:	8 Hours
Annual Cost of Delay:	$73.9 million
Average Daily Traffic:	179,000 Vehicles



Possible Congestion Causes

Aside from the Fair Park bridge reconstruction and widening, the corridor has not received major reconstruction in its lifetime. Five major highways converge on IH 30 in downtown Dallas with the original merging alignments causing congestion among the interchange movements. The Downtown Canyon section of this corridor is severely congested due to high excess demand, merging movements with a collector/distributor network, and highway-highway interchange movements that exceed capacity.

Projects in Progress or Completed

Horseshoe Project

The Horseshoe Project, part of Project Pegasus, near downtown Dallas involves the reconstruction of IH 30 and IH 35E. It includes the replacement of both corridor bridges over the Trinity River and will add general purpose lanes, HOV/managed lanes, and collector/ distributor lanes to better connect the two interstate highways in the downtown Dallas area.

Project Pegasus

Project Pegasus is a broad planning vision for reconstruction of IH 30 and IH 35E along Lower Stemmons, the Mixmaster, and the Downtown Canyon. This includes interchange improvements for IH 35E and Dallas North Tollway, IH 30 and IH 35E, and IH 30 and IH 45.

Reversible HOV Lanes
East RL Thornton Freeway has a reversible HOV lane from downtown to Jim Miller Rd. The HOV lane is created by movable barriers taking excess capacity from the non-peak travel direction. The HOV lane operates from 6 a.m. to 10 a.m. (westbound) and 3:30 p.m. to 7 p.m. (eastbound). The lane was extended to Northwest Highway in December 2007 as a buffer separated concurrent flow HOV lane. As of November 2010, the HOV lane carried 17,735 persons per day.

Transit Service
The central business district is a primary hub for Dallas Area Rapid Transit (DART). Four light rail lines: the Red, Orange, Blue, and Green Lines converge on Bryan Street that runs through downtown parallel to the corridor. The DART Green Line provides direct service to Fair Park from downtown.

There is DART bus service with 18 routes in the corridor.

Incident Management
The Regional Freeway Incident Management Program operates in the corridor. This corridor currently has ITS technology deployed for incident detection and management. The police and fire departments in the City of Dallas and the Dallas County Sheriff's Office have participated in Freeway Incident Management training, as well as photogrammetry training. Photogrammetry allows investigators to map a crash scene in significantly less time than traditional methods and results in up to 50 percent of average time saved per road closing crash scene.

Traffic Signals
Regional traffic signalization improvement program has been implemented on major streets in the corridor.

Demand Reduction
The Regional Employer Trip Reduction Program is a voluntary program that is designed to reduce employee commute vehicle trips through the education and implementation of travel demand management strategies such as rideshare programs (carpooling and vanpooling), telecommuting and flexible work-hour programs, transit pass subsidies, bicycling, and similar strategies. It is a cooperative program between North Central Texas Council of Governments, DART, Fort Worth Transportation Authority (The T), Denton County Transportation Authority

(DCTA), North Texas Clean Air Coalition (NTCAC), and other public and private sector organizations.

Downtown Dallas Inc. is a recognized transportation management association that promotes alternative travel modes and demand management among CBD businesses.

Planning Efforts to Date

Bicycle and Pedestrian

The 2011 Dallas Bike Plan recommends on-street bicycle facilities for several roadways that intersect this corridor. There is one existing trail within this corridor.

Next Steps

- The region is **proceeding with development of the Horseshoe Project** to reconstruct the IH 30 and IH 35E bridges over the Trinity River and the connections between these highways at the edge of downtown Dallas. **Recommended use of Proposition 12 funds for engineering and right-of-way.**
- NCTCOG states that improvements in the corridor are warranted based on 2035 traffic projections. However, because of current financial limitations, this project was not included in *Mobility 2035* recommendations but remains in the vision component of the plan for consideration if additional funding is realized. The corridor is identified in the Roadway Vision Considerations section of *Mobility 2035* indicating a need for improvements but **currently lacking funding based on regional project prioritization**.
- The East Corridor Transportation Study was started in 2004 with preliminary engineering and feasibility. Planned improvements included **reconstruction, lane expansion, and new or enhanced HOV/managed facilities**. The project never completed the formal environmental assessment process.
- The corridor is listed in *Mobility 2035* as a **potential corridor for truck lane restrictions** from IH 45 to US 80.

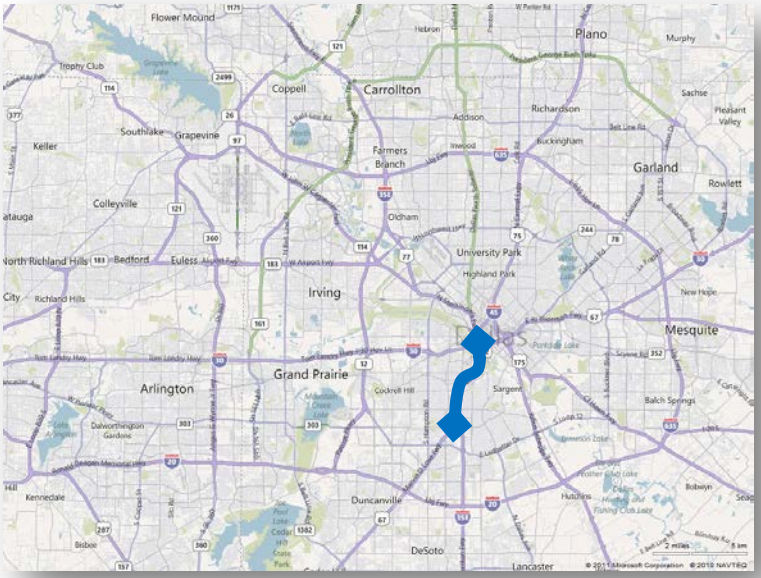
IH 35E (S. RL THORNTON FWY)

US 67 (Martin D. Love Fwy) to Jefferson Viaduct

Current Conditions

South RL Thornton Freeway serves as the southern gateway to the City of Dallas and is a major north-south route from South Dallas to downtown. It has 8 general purpose lanes and 1 reversible HOV lane. This stretch of the freeway follows a traditional inbound morning/outbound evening pattern, with lower inbound speeds in the morning than outbound speeds in the afternoon.

- Segment Length: 5.0 miles.
- Road Type: 8-lane freeway.
- Annual Hours of Delay: 926,300.
- Texas Congestion Index: 1.30.
- Commuter Stress Index: 1.45.

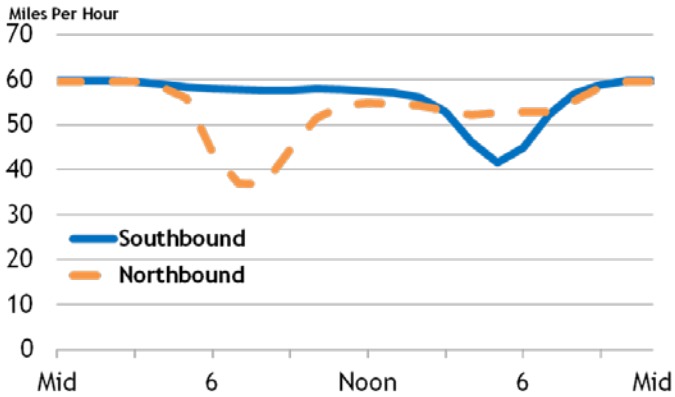


Rank: 17

Annual Hrs of Delay/Mile:	**185,000**
Congestion Time:	**5 Hours**
Annual Cost of Delay:	**$22.7 million**
Average Daily Traffic:	**197,000 Vehicles**

Possible Congestion Causes

The corridor intersects with three corridors of greater congestion at the northern end in downtown Dallas. US 67 merges with South RL Thornton Freeway at the south end of this section. The highly directional traffic demand exceeds the available roadway capacity. The ramp geometrics are of an older design that increases interference in merging operations with the mainlanes.



Projects in Progress or Completed

Reversible Special Purpose Lanes

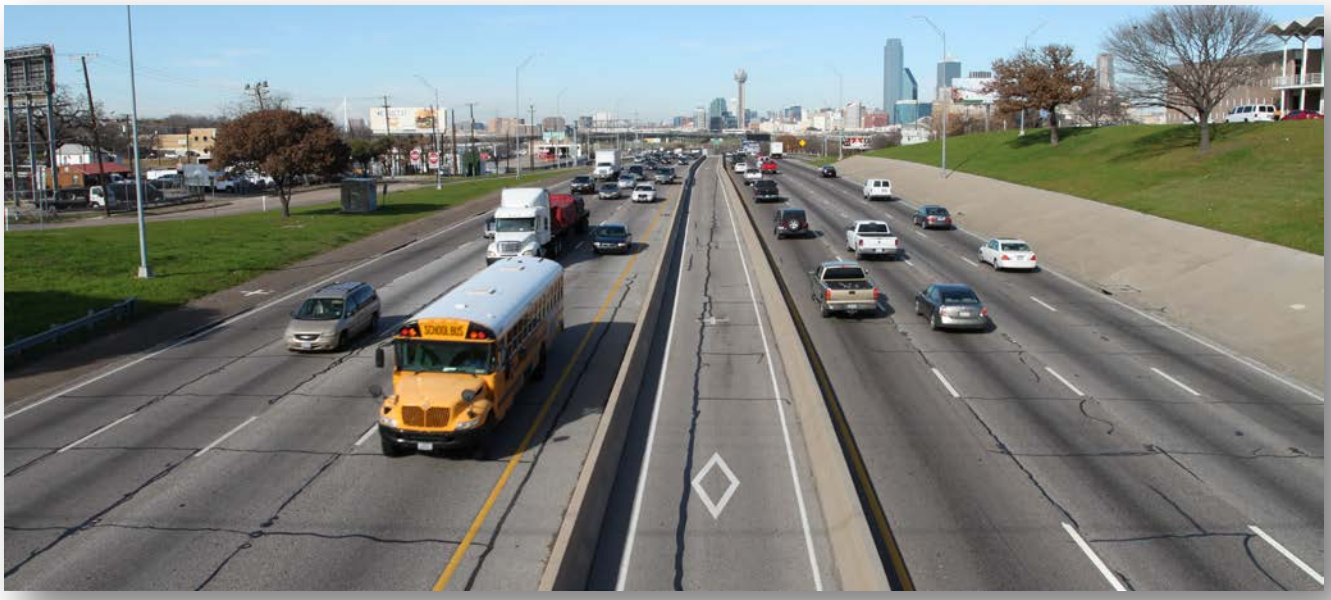
There is a reversible HOV lane operating in the corridor. The Loop 12 to downtown Dallas section is open from 6 a.m. to 12 noon for northbound traffic and from 2 p.m. to 8 p.m. for southbound commuters. Dallas Area Rapid Transit (DART) data from November 2010 indicated 23,070 people used the HOV lane.

Horseshoe Project

The Horseshoe Project, part of Project Pegasus, near downtown Dallas involves the reconstruction of IH 30 and IH 35E. It includes the replacement of both corridor bridges over the Trinity River and will add general purpose lanes, HOV/managed lanes, and collector/distributor lanes to better connect the two interstate highways in the downtown Dallas area.

The Southern Gateway

The Southern Gateway project is an initiative to develop long-term improvements to the IH 35E and US 67 corridors using a multimodal approach.



Incident Management
The Regional Freeway Incident Management Program operates in the corridor. This corridor currently has ITS technology deployed for incident detection and management. The police and fire departments in the City of Dallas and the Dallas County Sheriff's Office have participated in Freeway Incident Management training, as well as photogrammetry training. Photogrammetry allows investigators to map a crash scene in significantly less time than traditional methods and results in up to 50 percent of average time saved per road closing crash scene.

Traffic Signals
Regional traffic signalization improvement program has been implemented on major arterials in the corridor.

Demand Reduction
The Regional Employer Trip Reduction Program is a voluntary program that is designed to reduce employee commute vehicle trips through the education and implementation of travel demand management strategies such as rideshare programs (carpooling and vanpooling), telecommuting and flexible work-hour programs, transit pass subsidies, bicycling, and similar strategies. It is a cooperative program between North Central Texas Council of Governments, DART, Fort Worth Transportation Authority (The T), Denton County Transit Authority (DCTA), North Texas Clean Air Coalition (NTCAC), and other public and private sector organizations.

Downtown Dallas Inc. is a recognized transportation management association that promotes alternative travel modes and demand management among CBD businesses.

Transit Service
The DART Red and Blue Lines serve the corridor. The Red Line carried 33,200 average weekday riders in FY 2010. The Blue Line carried 22,200 average weekday riders in FY2010.

There is ongoing DART bus service with 29 routes in the corridor.

There are five park-and-ride facilities in the corridor all of them associated with the DART light rail stations on the Red and Blue lines. These include Westmoreland (700 spots), Hampton (499), Ledbetter (368), Kiest (20), and Illinois stations (345).

Planning Efforts to Date

Corridor Expansion

The Southern Gateway project will include construction of two additional general purpose freeway lanes and an additional HOV/managed lane in the corridor from 8th Street to US 67 at an estimated cost of $300,000,000. IH 35E from 8th Street to US 67 was environmentally approved in June 2006 through a FONSI, but no action plan or funding source has been developed since then.

Commuter Rail

The proposed Midlothian and Waxahachie commuter rail lines parallel the corridor. The Midlothian corridor utilizes the Burlington Northern Santa Fe Railway line that extends from Midlothian north to DART's Westmoreland light rail station. This corridor would provide access to the cities of Midlothian, Cedar Hill, Duncanville, and Dallas. This corridor would also provide a connection to the Mansfield corridor and Fort Worth. The Waxahachie Rail corridor utilizes the Burlington Northern Santa Fe Railway line that extends between Dallas and Waxahachie. The Waxahachie Conceptual Engineering and Funding Study outlined alternatives for stations and vehicle technology, which are used in *Mobility2035*. This corridor would connect the cities of Waxahachie and Lancaster to jobs in Dallas.

Next Steps

The region is **proceeding with development of the Horseshoe Project** to reconstruct the IH 30 and IH 35E bridges over the Trinity River and the connections between these highways at the edge of downtown Dallas. TxDOT will begin the **procurement for a design-build contractor on the Horseshoe Project in December 2011**. Funding has been identified for the section from Reunion Boulevard to south of Colorado Street (including the IH 35E bridges over the Trinity River). **Recommended use of Proposition 12 funds for engineering and right-of-way.**

IH 35E (STEMMONS FWY)

SL 12 (Walton Walker Fwy) to IH 635 (LBJ Fwy)

Current Conditions

IH 35E Stemmons Freeway was Dallas-Fort Worth's first modern, large-sized freeway when it opened in 1959. More than 50 years later it remains DFW's widest freeway for a sustained distance, 10 lanes in some segments. Congestion is worse in both directions in the afternoon than in the morning. The typical morning inbound peak congestion is somewhat alleviated by the bottleneck at LBJ Freeway, which reduces the traffic load in this section.

- Segment Length: 3.3 miles.
- Road Type: 8-lane Freeway.
- Annual Hours of Delay: 702,300.
- Texas Congestion Index: 1.35.
- Commuter Stress Index: 1.50.

The need for improvements in this corridor has been discussed as far back as 1974 in the region's *Total Transportation Plan for the North Central Texas Region for 1990*. Specific freeway/HOV/managed lane improvements have been recommended in this corridor since 1986 in *Mobility 2000*.

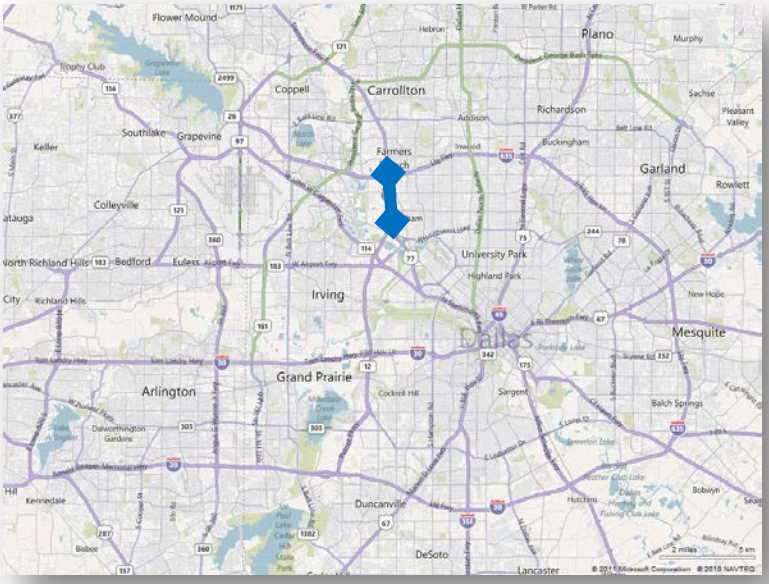
Possible Congestion Causes

Most of the freeway is still in its originally-constructed configuration. The northern end of the corridor intersects the LBJ Freeway (IH 635), the most congested corridor in the DFW Metroplex.

Projects in Progress or Completed

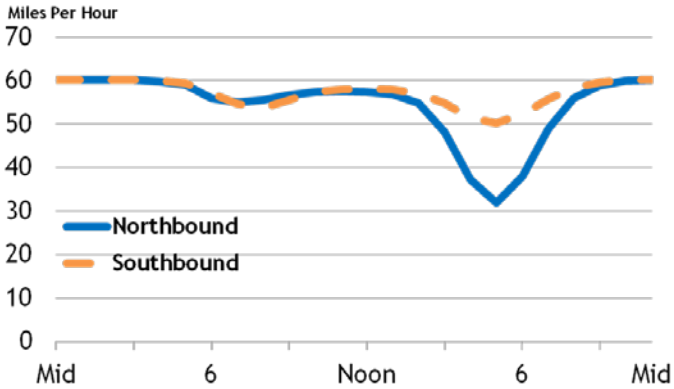
LBJ Express

This corridor is part of the LBJ Express project and is included in the ongoing construction efforts. The LBJ Express project will improve mobility through the addition of three managed lanes in each direction between Loop 12 and LBJ Freeway and improvements to the IH 635/IH 35E interchange at the northern end of the corridor by adding direct connections to/from managed lanes on LBJ Freeway (IH 635). The LBJ Express project will not make improvements to the interchange movements for general purpose traffic. Construction will be complete in 2015.



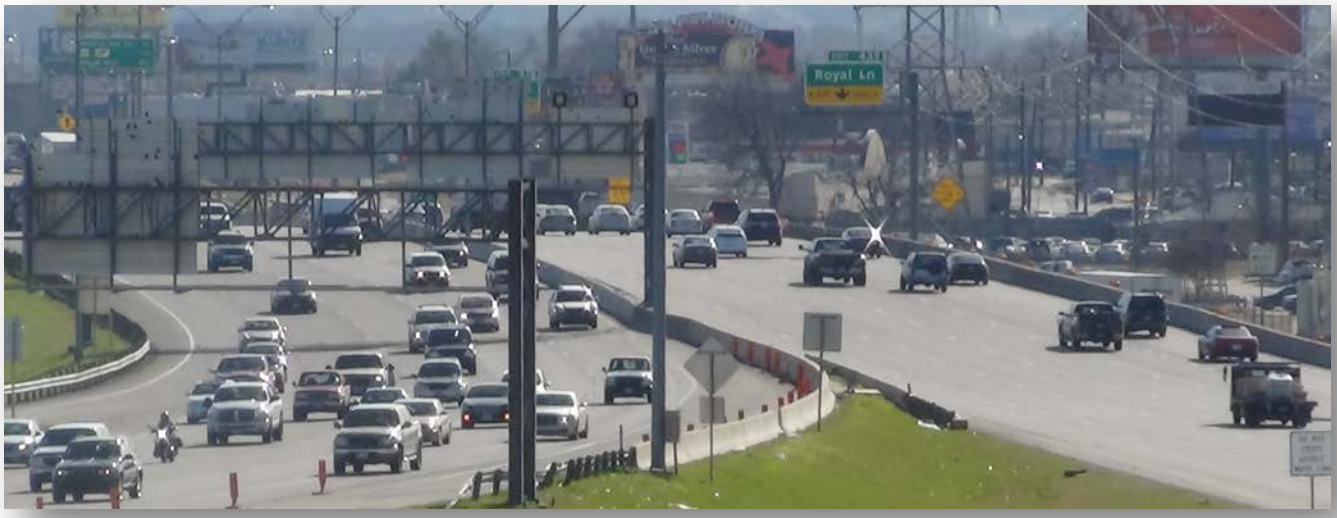
Rank: 19

Annual Hrs of Delay/Mile:	**212,000**
Congestion Time:	**4 Hours**
Annual Cost of Delay:	**$17.2 million**
Average Daily Traffic:	**194,000 Vehicles**



Incident Management

The Regional Freeway Incident Management Program operates in the corridor. This corridor has ITS technology deployed for incident detection and management. The police and fire departments in the City of Dallas and the Dallas



County Sheriff's Office have participated in Freeway Incident Management training, as well as photogrammetry training. Photogrammetry allows investigators to map a crash scene in significantly less time than traditional methods and results in up to 50 percent of average time saved per road closing crash scene.

Traffic Signals
Regional traffic signalization improvement program has been implemented on major streets in the corridor.

Demand Reduction
The Regional Employer Trip Reduction Program is a voluntary program that is designed to reduce employee commute vehicle trips through education and the implementation of travel demand management strategies such as rideshare programs (carpooling and vanpooling), telecommuting and flexible work-hour programs, transit pass subsidies, bicycling, and similar strategies. It is a cooperative program between North Central Texas Council of Governments, DART, Fort Worth Transportation Authority (The T), Denton County Transit Authority (DCTA), North Texas Clean Air Coalition (NTCAC), and other public and private sector organizations.

Transit Service
The Dallas Area Rapid Transit (DART) Green Line runs parallel to the facility with three stations along the corridor. The Green Line serves 4,800 average weekday riders.

There is ongoing DART bus service with seven routes in the corridor.

Planning Efforts to Date

Planned improvements to the IH 35E corridor directly to the north of this corridor include a major reconstruction project from IH 635 to the IH 35W/IH 35E interchange in Denton. General purpose freeway lanes will be rebuilt, continuous frontage roads will be added, and HOV/managed lanes will be constructed to add additional capacity to the corridor.

Bicycle Improvements
The 2011 Dallas Bike Plan recommends on-street bicycle facilities for several roadways that intersect this corridor including Manana Drive and Crown Road.

Next Steps

- **Reconstruction of this section began in 2011** as part of the LBJ Express project.
- NCTCOG, TxDOT, and municipalities will continue to **monitor congestion and identify and analyze possible improvements to the corridor** during construction and completion of the LBJ Express Project.
- The corridor is listed in Mobility 2035 as a **potential corridor for truck lane restrictions**.

IH 35W (NORTH FWY)

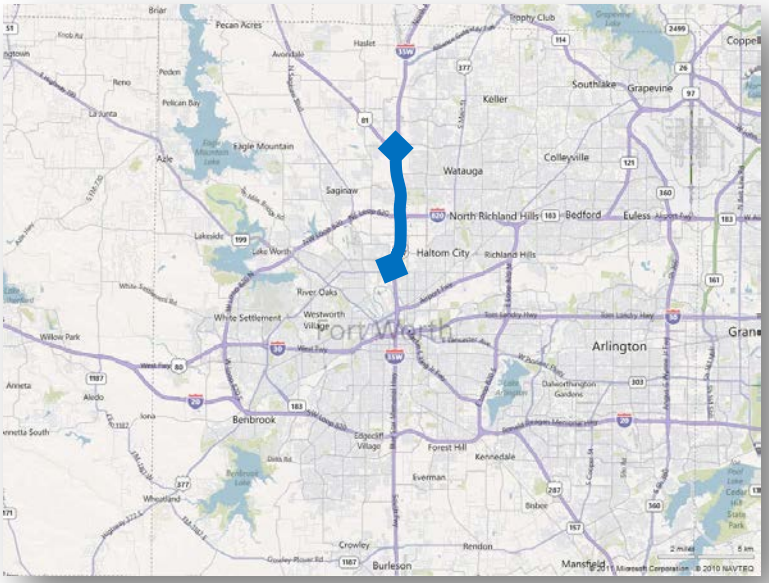
N. 28th Street (SH 183) to US 287 (US 81)

Current Conditions

IH 35W North Freeway from N. 28th Street (SH 183) to US 287 is a 4-lane freeway in a well-developed corridor. This includes industrial, commercial, and residential areas. The southern end of the corridor is the northern end of the downtown North Freeway corridor, the most congested in Tarrant County. Congestion and slowdowns along the North Freeway loosely follow a typical inbound/morning and outbound/evening pattern, with the slowest speeds at the peak of each rush hour. However, note that speeds in the opposite directions also dramatically decrease.

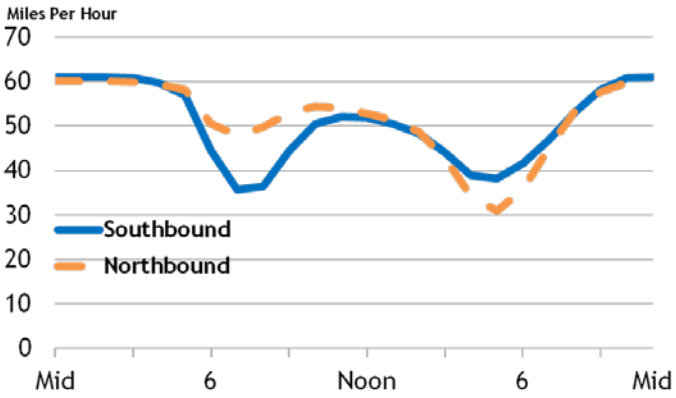
- Segment Length: 6.4 miles.
- Road Type: 4-Lane Freeway.
- Annual Hours of Delay: 1,425,300.
- Texas Congestion Index: 1.59.
- Commuter Stress Index: 1.74.

The need for improvements in this corridor has been identified since 1986 in *Mobility 2000*. HOV/managed lane improvements were first recommended in this corridor in 2000 in *Mobility 2025*.



Rank: 21

Annual Hrs of Delay/Mile:	**224,000**
Congestion Time:	**8 Hours**
Annual Cost of Delay:	**$34.9 million**
Average Daily Traffic:	**122,000 Vehicles**



Possible Congestion Causes

This segment of North Freeway is an older facility that has seen few major improvements in the last two decades. The facility has four mainlanes; these have been insufficient to meet the increased demand from population growth and commercial development in the corridor, especially at its northern end.

Projects in Progress or Completed

Expansion

This corridor is part of the North Tarrant Express (NTE) CDA and improvements are under construction. This includes major reconstruction and widening of the IH 35W and IH 820 interchange. The project will improve the corridor to a 12-lane facility from US 81 to Basswood Blvd. with four general purpose lanes in each direction (plus auxiliary lanes) along with two managed lanes in each direction. From Basswood Blvd. to IH 820 a 14-lane facility will be constructed with four general purpose lanes, auxiliary lanes, and three managed lanes in each

direction. This project should have schematic and environmental clearance by mid-2012.

Construction Management
There is a construction zone traffic management program is in place for the NTE. The program will be monitored and enhanced, if necessary, to reduce delays where possible.

Traffic Management
Traffic management strategies include regional mobility assistance patrol that is operated by Tarrant County. The mobility assistance patrol responsibility will be assumed by NTE Mobility Partners when this corridor is approved for development.

The City of Fort Worth and the TxDOT Fort Worth District Traffic Management Centers are connected via fiber optic cable and exchange transportation data and video with each other.

This corridor currently has ITS technology deployed for incident detection and management.

Incident Management
The police and fire departments in the City of Fort Worth have participated in Freeway Incident Management training, as well as photogrammetry training. Photogrammetry allows investigators to map a crash scene in significantly less time than traditional methods and results in up to 50 percent of average time saved per road closing crash scene.

Shared Commuting
The region has implemented regional ridesharing software TryParkingIt.

This corridor is part of an area served by the Fort Worth Transportation Authority (The T) vanpool program.

Bicycle and Pedestrian
The corridor is included in Bike Fort Worth, several on-street bicycle facilities. An existing hike and bike trail intersects this corridor.

Planning Efforts to Date

The project is included in the NTE CDA Master Development Agreement.

IH 35W from IH 820 to US 287/US 81 is to be traditionally let and constructed. This project's estimated letting is $135 million of Proposition 14 bonds at end of 2012. Work is expected to start in early 2013 with construction duration of 39 months.

Commuter Rail

The proposed Speedway commuter rail line runs parallel to the corridor. The Speedway Line runs north-south and connects downtown Fort Worth with the Texas Motor Speedway (TMS). TMS is located in the northernmost portion of the City of Fort Worth in Denton County. This rail line will provide additional capacity to the parallel IH 35W, drawing some vehicle demand from this corridor.

Next Steps

- **Continue advancing the planned traditional construction** of the section between IH 820 and US 287.
- Continue efforts with NTE Mobility Partners to **develop mobility options in this corridor**.
- The corridor is listed in *Mobility 2035* as a **potential corridor for truck lane restrictions**.

The most congested corridors in Dallas and Fort Worth were examined to identify the most appropriate actions that will have the greatest impact on relieving traffic congestion. Many of these actions can be funded by Proposition 12 funds and are consistent with the goals of Rider 42, while other actions are being funded or performed by other agencies. Exhibits DFW-5 and DFW-6 summarize the recommended actions to address traffic congestion in each Dallas and Fort Worth corridor.

Exhibit DFW-5: Dallas Summary of Congested Corridor Recommendations

Rank	Congested Corridor	Actions Funded by Others	Recommended Early Actions Affecting Congested Corridor
3	**IH 635 (LBJ Freeway)** *(IH 35E to US 75)*	▪ Managed lanes being implemented with LBJ Express comprehensive development agreement (CDA)	▪ Consider actions that can be recommended to CDA holder.
5	**Woodall Rodgers Freeway** *(IH 35E to US 75)*	▪ Extension to street system west of the Trinity River.	
9	**US 75 (Central Expressway)** *(IH 635 to Woodall Rodgers Freeway)*	▪ Feasibility and design study of operations improvements. ▪ FHWA Integrated Corridor Management program including light-rail transit.	▪ Monitor findings of Integrated Corridor Management program and identify possible actions.
12	**IH 35E (Stemmons Freeway)** *(IH 30 to SH 183)*	▪ Construct Horseshoe Project	▪ Purchase right-of-way (ROW), conduct engineering and adjust utilities to construct the Horseshoe Project (the first stage of Project Pegasus) ▪ Purchase ROW, conduct engineering and adjust utilities to construct Phase 1 of the Trinity Parkway Project.
15	**US 75 (Central Expressway)** *(SH 190 to IH 635)*	▪ Study high-occupancy vehicle (HOV) lane operations and access improvements; remove bottlenecks.	
16	**IH 30 (East RL Thornton Freeway)** *(Jefferson Viaduct to SL 12 East)*	▪ Consider environmental study.	▪ Purchase ROW and adjust utilities to construct Phase 1 of the Trinity Parkway Project.
17	**IH 35E (South RL Thornton Freeway)** *(US 67 to Jefferson Viaduct)*	▪ Construct Horseshoe Project	▪ Begin engineering and purchase ROW and adjust utilities to construct the Horseshoe Project (the first stage of Project Pegasus) ▪ Purchase ROW and adjust utilities to construct Phase 1 of the Trinity Parkway Project.

19	**IH 35E (Stemmons Freeway)** *(SL 12 to IH 635)*	▪ Managed lanes being implemented with LBJ Express comprehensive development agreement (CDA)	▪ Consider actions that can be recommended to CDA holder.

Exhibit DFW-6: Fort Worth Summary of Congested Corridor Recommendations

Rank	Congested Corridor	Actions Funded by Others	Recommended Early Actions
8	**IH 35W (North Freeway)** *(IH 30 to SH 183)*	▪ Operating under the North Tarrant Express Master Development Plan agreement	▪ Look for actions that can be recommended to CDA holder.
14	**IH 820 (Northeast Loop)** *(IH 35W to SH 183)*	▪ Operating under the North Tarrant Express CDA	▪ Look for actions that can be recommended to CDA holder.
21	**IH 35W (North Freeway)** *(SH 183 to US 287)*	▪ Operating under the North Tarrant Express Master Development Plan agreement (SH 183 to IH 820) ▪ Traditional TxDOT construction after environmental approvals are received (IH 820 to US 287)	▪ Look for actions that can be recommended to CDA holder.

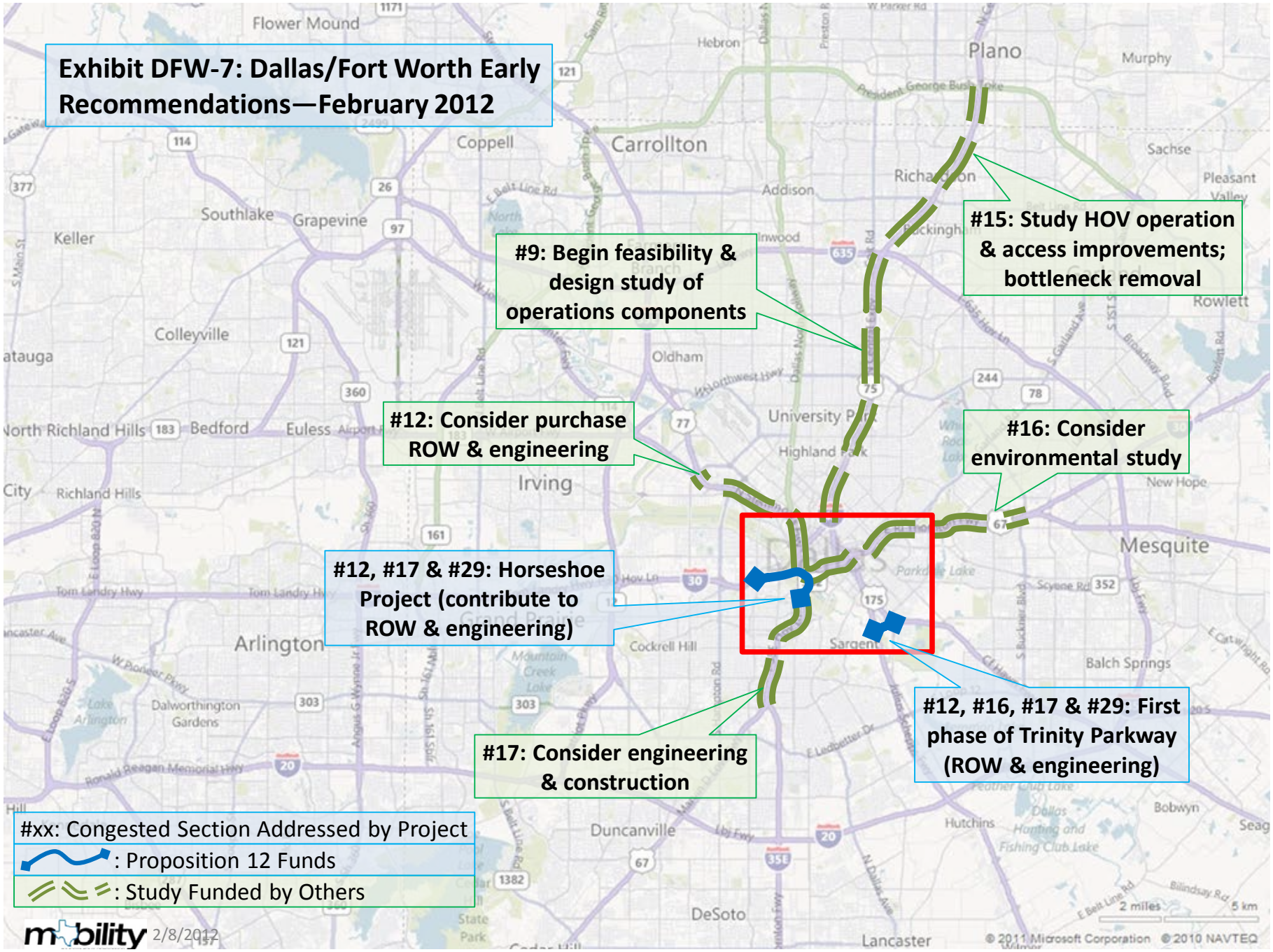


Exhibit DFW-7: Dallas/Fort Worth Early Recommendations—February 2012
#15: Study HOV operation & access improvements; bottleneck removal
#9: Begin feasibility & design study of operations components
#12: Consider purchase ROW & engineering
#16: Consider environmental study
#12, #17 & #29: Horseshoe Project (contribute to ROW & engineering)
#12, #16, #17 & #29: First phase of Trinity Parkway (ROW & engineering)
#17: Consider engineering & construction
#xx: Congested Section Addressed by Project
: Proposition 12 Funds
: Study Funded by Others
mobility 2/8/2012
Flower Mound
Plano
Murphy
Hebron
Coppell
Carrollton
Sachse
Addison
Southlake
Grapevine
Keller
Pleasant Valley
Rowlett
Colleyville
Oldham
University Park
Highland Park
Bedford
Euless
North Richland Hills
Irving
Richland Hills
New Hope
Mesquite
Arlington
Cockrell Hill
Balch Springs
Dalworthington Gardens
Duncanville
Hutchins
Bobwyn
DeSoto
Lancaster
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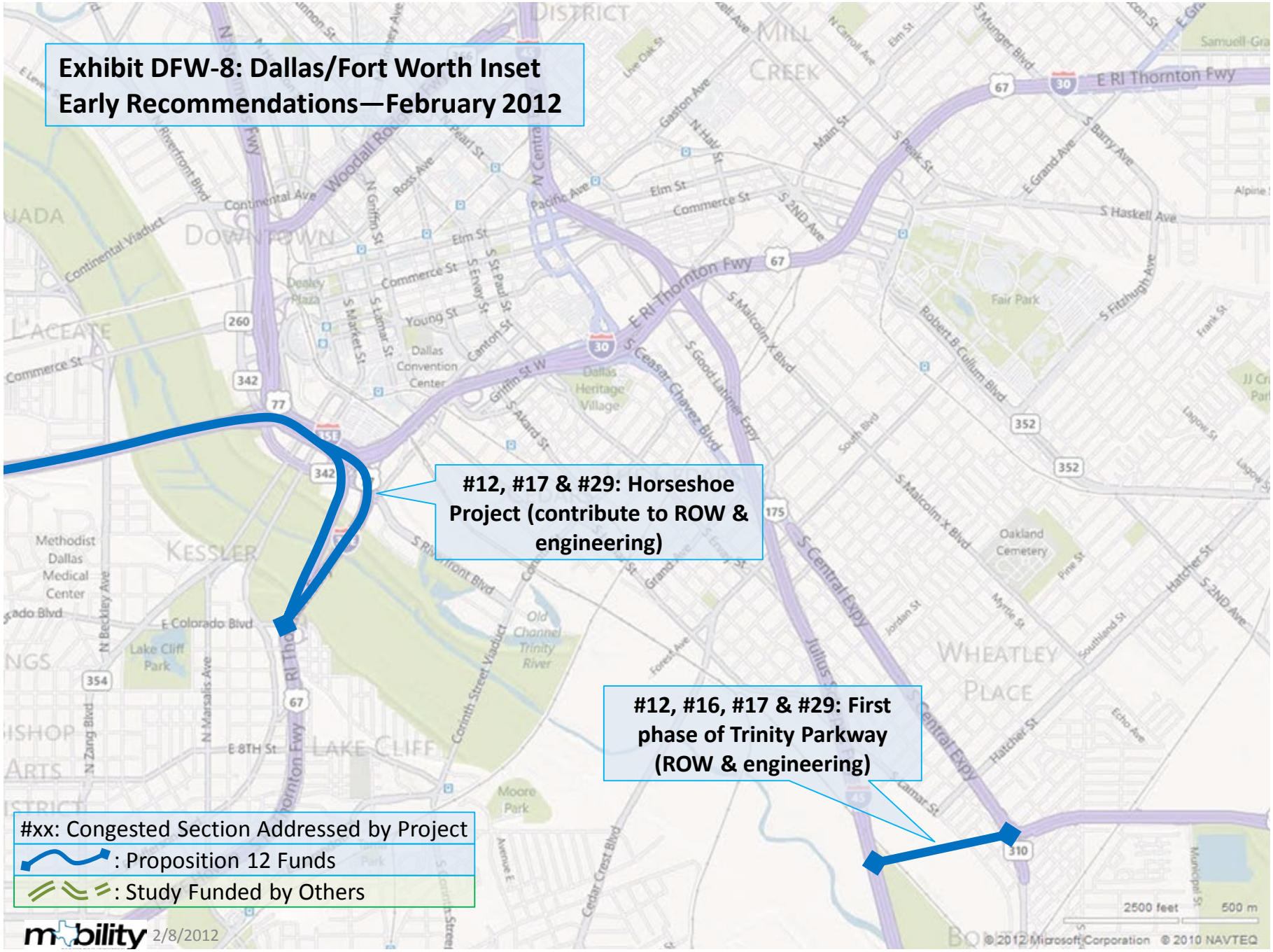
Exhibit DFW-8: Dallas/Fort Worth Inset
Early Recommendations—February 2012
#12, #17 & #29: Horseshoe Project (contribute to ROW & engineering)
#12, #16, #17 & #29: First phase of Trinity Parkway (ROW & engineering)
#xx: Congested Section Addressed by Project
: Proposition 12 Funds
: Study Funded by Others
mobility 2/8/2012
2500 feet
500 m
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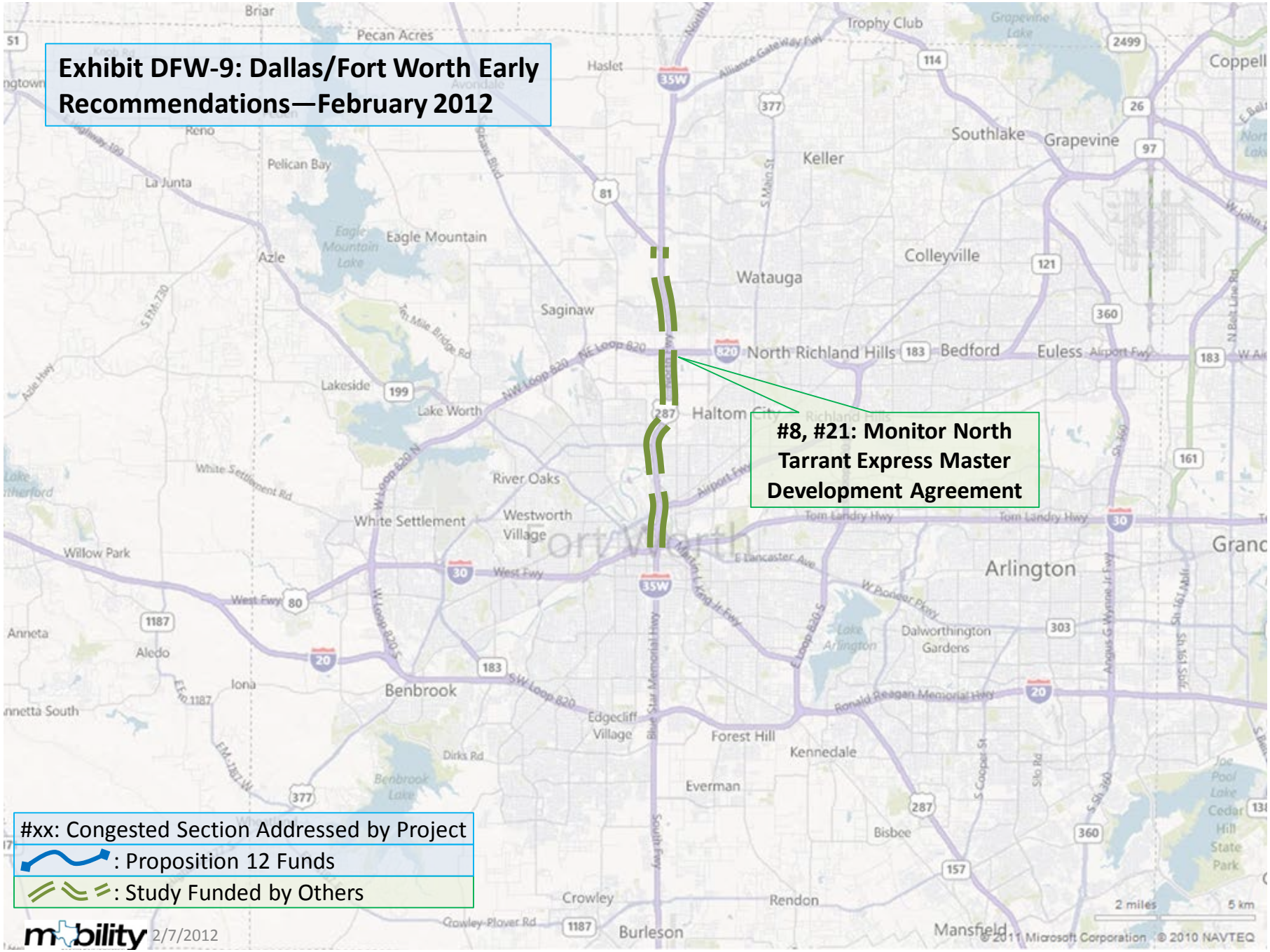
Exhibit DFW-9: Dallas/Fort Worth Early Recommendations—February 2012



The early recommendations described above represent the first step in the process of reducing congestion on the worst corridors in the state. A larger project involving construction, operation, management, and travel option strategies will follow the early recommended actions. The following table identifies possible projects in the Dallas/Fort Worth Metroplex and the amount of funds and timeframe for project implementation. In both Dallas and Fort Worth, many large projects are being completed through a comprehensive development agreement and therefore should not require additional public funds.

Exhibit DFW-10: Summary of Possible Large Projects for Dallas/Fort Worth Congested Corridors

Rank	Corridor	Large Projects	Rider 42 Funding Estimate	Estimated Implementation Funds Needed*	Implementation Timeframe
12, 17, 29	IH 30 & IH 35E	Horseshoe Project	$100.75M	$818M (Prop 12, Prop 14 & MTP)	2011 to 2016
12, 16, 17, 29	Trinity Parkway	Trinity Parkway construction	$18M	$1.9B	2013 to 2030
12, 16, 17, 29	IH 30, IH 35E	Project Pegasus	$0.0	$1.7B	2015 to 2025
9, 15	US 75 North	HOV lane improvements and bottleneck removal	$0.0	TBD	TBD
16	IH 30 East	Lane expansion and managed lanes	$0.0	$750M	2015-
17	IH 35E South	Southern Gateway expansion of 2 additional mainlanes and managed lanes	$0.0	$1.3B (MTP)	2015 to 2035
TOTAL			**$118.75M**	**$6.47B**	

Remaining Dallas/Fort Worth Rider 42 allocation: $0.0.
*Source of implementation funds noted if known.

HOUSTON

As in Dallas, Fort Worth, and Austin, many of Houston's most congested sections are on freeways around downtown (Exhibit H-1). Several congested sections have been improved recently and are unlikely to see major capacity additions over the next decade or so. These include IH 10 West (Katy Freeway), US 59 (Eastex Freeway), and US 59 (Southwest Freeway) (Exhibit H-2). Although these sections remain in the 50 most congested sections, there are other freeways that require improvements for congestion, safety, roadway quality and other reasons.

An Environmental Impact Study being conducted on IH 45 is analyzing alternative improvements that will affect all of the five most congested roadways. In addition to the IH 45 roadway sections, the study also includes the section of SH 288 and US 59 southwest of downtown.

One big project that is close to beginning is the extension of the Hardy Toll Road from its terminus at IH 610 into downtown, which will address congestion on IH 45 and possibly on US 59 on the east side of downtown. This project has been cleared for construction and is being considered by the Harris County Toll Road Authority. Another large construction project that has accomplished all of the necessary environmental reviews would involve widening US 290 northwest of IH 610.

In addition to those corridor projects, there are also several project ideas that are termed "bottleneck removal" ideas. Several of the freeway-to-freeway interchanges have ramps that are too narrow for the traffic demand. In essence some of the traffic congestion on the mainlanes is caused by traffic waiting to use the connector ramps. In these situations, notably the IH 610/IH 45 South, IH 610/IH 10 West and IH 610/US 59 South interchanges, congestion on four or five mainlanes would be reduced for the relatively low cost of adding a lane to some connector ramps.

A summary and map of the recommended actions that will affect each congested corridor is included in Exhibits H-3 and H-4 after the individual corridor summaries. Information regarding large projects with significant congestion reduction potential, their estimated implementation cost, and implementation timeframe is included in Exhibit H-5.

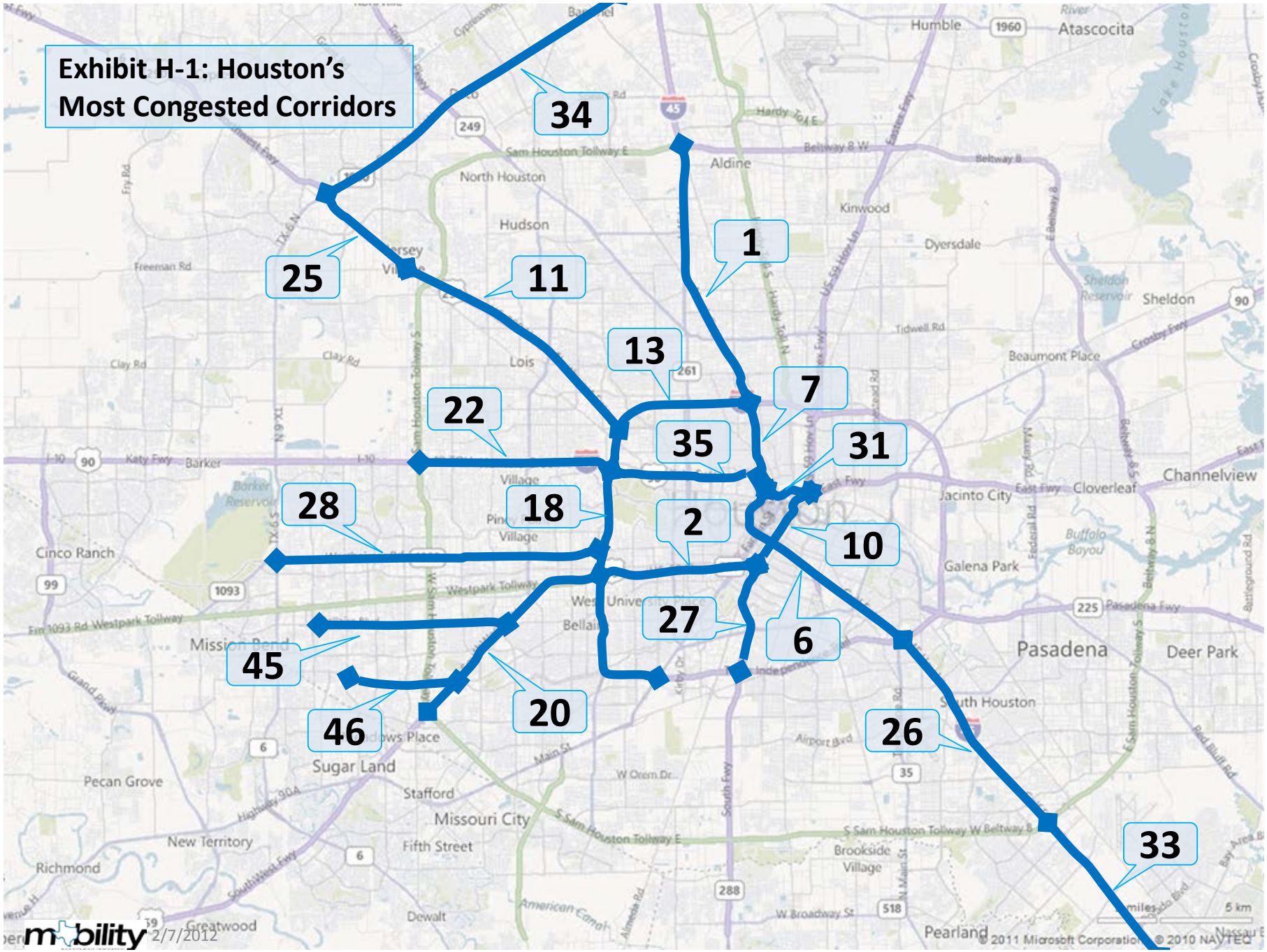


Exhibit H-1: Houston's Most Congested Corridors
34
1
25
11
13
7
22
35
31
28
18
2
10
27
6
45
20
46
26
33
Humble
Atascocita
Aldine
North Houston
Hudson
Kinwood
Dyersdale
Sheldon
Beaumont Place
Lois
Channelview
Cloverleaf
Jacinto City
Galena Park
Cinco Ranch
Pasadena
Deer Park
South Houston
Sugar Land
Pecan Grove
Stafford
Missouri City
New Territory
Richmond
Fifth Street
Brookside Village
Pearland
Greatwood
Dewalt
Katy Fwy
Westpark Tollway
Sam Houston Tollway E
Sam Houston Tollway W
Beltway 8
Pasadena Fwy
Airport Blvd
Main St
W Orem Dr
W Broadway St
Tidwell Rd
Clay Rd
Freeman Rd
Barker
Village
Buffalo Bayou
American Canal
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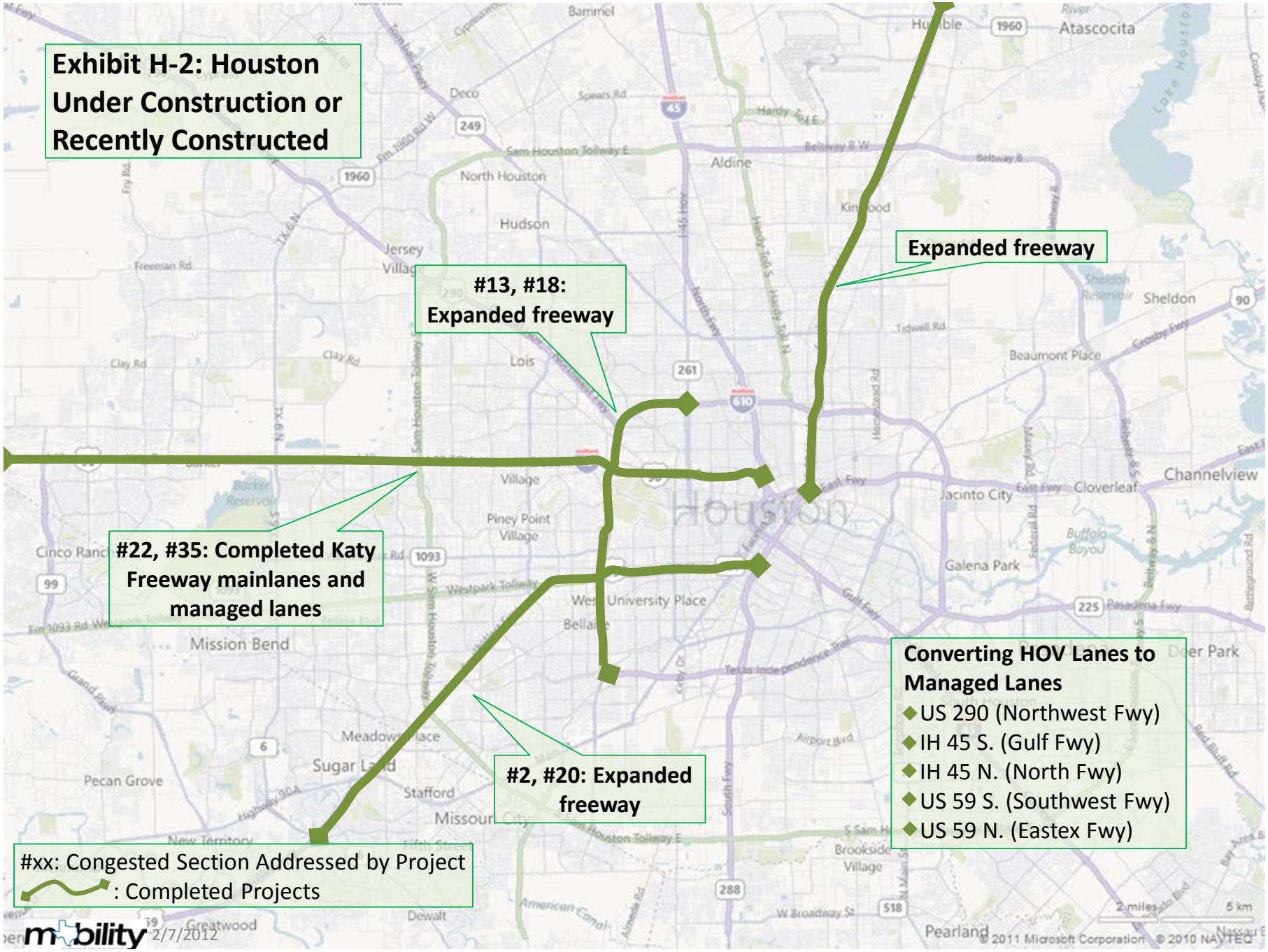
Exhibit H-2: Houston Under Construction or Recently Constructed
Expanded freeway
#13, #18: Expanded freeway
#22, #35: Completed Katy Freeway mainlanes and managed lanes
#2, #20: Expanded freeway
Converting HOV Lanes to Managed Lanes
US 290 (Northwest Fwy)
IH 45 S. (Gulf Fwy)
IH 45 N. (North Fwy)
US 59 S. (Southwest Fwy)
US 59 N. (Eastex Fwy)
#xx: Congested Section Addressed by Project
: Completed Projects
Houston
Atascocita
Humble
Bammel
Deco
North Houston
Aldine
Hudson
Jersey Village
Lois
Sheldon
Beaumont Place
Channelview
Cloverleaf
Jacinto City
Galena Park
Piney Point Village
West University Place
Mission Bend
Meadowlake
Sugar Land
Stafford
Missouri City
Pecan Grove
Brookside Village
Pearland
Deer Park
Greatwood
Dewalt
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IH 45 (NORTH FWY)

Beltway 8 (Sam Houston Tollway) to IH 610 (North Loop)

Current Conditions

From IH 610 North to Beltway 8 (Sam Houston Tollway), IH 45 is a 9-lane section with four general purpose lanes in each direction and a one-lane reversible High Occupancy Vehicle (HOV) lane in the middle. Traffic on IH 45 loosely follows a traditional inbound/morning and outbound/evening congestion pattern, though both directions experience significant slowdowns during the evening peak period.

- Segment Length: 10 miles.
- Road Type: 9-lane divided freeway.
- Annual Hours of Delay: 3,600,000.
- Texas Congestion Index: 1.33.
- Commuter Stress Index: 1.44.

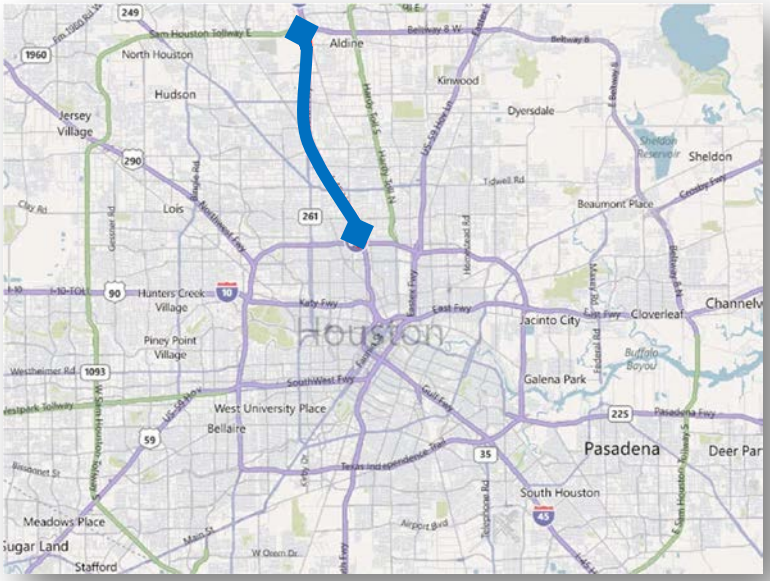
Intelligent Transportation Systems (ITS) improve freeway operations and increase motorist awareness; ITS infrastructure along this corridor includes:

- Travel time monitoring system covering the entire segment.
- 17 CCTV cameras to aid incident management.
- Two radar-based vehicle volume and speed detection locations.
- Four dynamic message signs.
- 17 flow signals.

Possible Congestion Causes

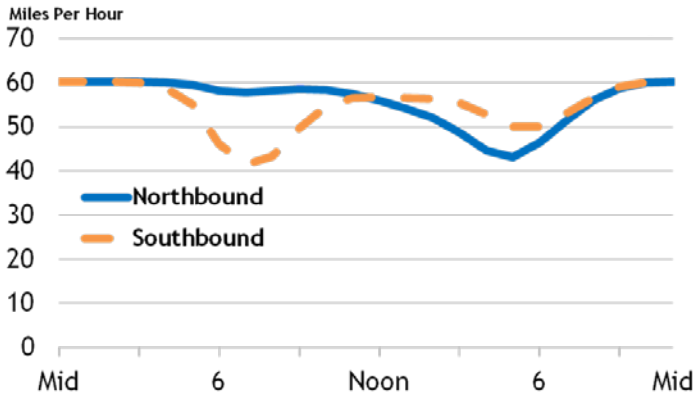
The IH 45 corridor was originally built in 1963. The first HOV lane was a temporary experiment opened in 1979; the success of that lane led to a barrier-separated HOV lane in 1982. This segment of IH 45N serves as a through route for major activity centers including downtown Houston, the Texas Medical Center, University of Houston, Texas Southern University, and the Port of Houston to the south, and, the George Bush Intercontinental Airport, the Woodlands, and the Greenspoint area to the north of the corridor. This freeway segment also serves pass-through traffic for motorists traveling north to/from South Houston and Galveston to/from Dallas. Some causes for congestion in this segment include:

- High travel demand (traffic volumes), which extends beyond typical peak hours.
- Narrow lanes and no inside shoulder reduce the road capacity.



Rank: 1

Annual Hrs of Delay/Mile:	**360,000**
Congestion Time:	**6 Hours**
Annual Cost of Delay:	**$88.4 million**
Average Daily Traffic:	**306,000 Vehicles**



- Older ramp design and absence of frontage roads at and near the interchange of IH 610 North and IH 45.
- Short (¼ to ½ mile) ramp spacing.
- Major interchanges at both ends of the segment.
- Northbound left-hand entry of Shepherd on-ramp and HOV exit ramp to mainlanes combined with right hand exit to Gulf Bank Drive in a short distance causes weaving across all lanes and traffic slowdowns.

Projects in Progress or Completed

Incident Clearance

SAFEClear, the City of Houston's rapid clearance program, provides quick response and towing of crashed and disabled vehicles reducing secondary crashes and congestion. More than 60 private contractor tow trucks rapidly respond to all incidents (approximately two-thirds of incidents were detected by the roving tow trucks and 90 percent were detected and cleared within 20 minutes by SAFEClear). However, effectiveness of this program was reduced in summer 2010 when City budget cuts caused a $50 fee to be instituted for the previously free tows.

TxDOT, METRO, and Harris County operate fewer than a dozen Motorist Assistance Program (MAP) pick-up trucks as a free assistance program to provide minor aid to stranded motorists. It also reduces traffic congestion and improves highway safety.

A heavy tow truck contract allows quick removal of large trucks. There is a policy that does not hold TxDOT liable for damage to products that are removed from the roadway in such an event.

Houston TranStar traffic and emergency management center is the coordination hub for all incidents. Traffic incidents are detected, verified, and the public is notified through its ITS system. Dispatch and response is sent via coordination of the various agencies.

Travel Options

The Houston-Galveston Area Council's (H-GAC) Commute Solutions program funds, promotes, and provides administrative support to various commute alternative projects. The program provides public education to commuters and employers about available commuting options in the region and on the benefits of using alternative transportation modes. The Commute Solutions program also provides literature and public outreach on carpooling, vanpools, transit, guaranteed ride home, teleworking, alternate work schedules, and parking management.

Shared Commuting

NuRide is an online rideshare marketing program that provides ride matches and rewards users for recording their alternative commute trips (i.e., ridesharing, bus, rail, telecommute, walk, bike, and compressed work week). The H-GAC NuRide program is the nation's largest Ridematching rewards program, with over 17,100 registered riders. Since its inception in June 2005, the program has resulted in 3.32 million fewer car trips, 79.42 million fewer miles driven, and the saving of 3.86 million gallons of gas.

Biking and walking trips account for 4.2 percent of alternative commute trips recorded on NuRide during 2011.

METRO operates the STAR Vanpool program serving more than 700 routes and is ranked as the second largest vanpool program nationally by passenger trips and the third largest vanpool program nationally by passenger miles in the 2011 APTA Fact Book.

Flextime

Many employers offer flexible work schedules, with around 350 employers participating annually in the Flex in the City Program.

Incentive Driven TDM Programs
Many large companies in the Texas Medical Center, the Energy Corridor, and the Central Business District subsidize all or part of their employees vanpool or transit commuting costs. Twenty-five companies are voluntarily participating in the Commute Champion Program enabling H-GAC to document emission reductions related to their Commuter Benefits. Additionally 38 companies and 17 local governments are participating in the Clean Air Champion Program in which they voluntarily provide information enabling H-GAC to document their proactive efforts to decrease emissions.

Teleworking
Approximately 2.9 percent of the trips recorded by the NuRide program are telecommutes.

Guaranteed Ride Home Programs
The GRH program provides emergency rides home to transit and rideshare users to address one of the main concerns of those who leave their car at home. All registered users of METRO bus and STAR vanpool riders, registered TREK Express users, and Fort Bend County Transit users have access to three free rides home per calendar year.

Houston Area Transit Service
METRO provides local and express bus service via 97 routes, serving approximately 208,200 average daily boardings (weekday – FY 2012). METRO also operates 32 park & rides routes serving approximately 29,200 average daily boardings (weekday – FY2012). METRO also has light rail transit along a 7.5-mile section serving Downtown, Texas Medical Center, and Reliant Center with 38,100 average daily boardings (weekday – FY2012).

There are also six transit services that have received funding through the Commuter and Transit Services Pilot Program, with a seventh service set to begin in February 2012.

Corridor Transit Service
Along the IH 45 North Corridor, METRO has 12 routes to downtown and one route to Greenway Plaza/Uptown. Combined these routes carry approximately 25,583 average daily boarding (weekday – FY2012). Woodlands Express operates four park and ride lots, serving passengers from 5:30 a.m. to 9:00 p.m.

The North Red Line light rail project is under construction and scheduled to open in 2014. The project will extend 5.1 miles parallel to North Freeway from downtown to Northline Transit Center north of Crosstimbers. The rail line is ultimately planned to extend to Bush Intercontinental Airport.

HOV/HOT Lanes

The North Freeway HOV lane is being converted to a High Occupancy Toll (HOT) lane by METRO; opening is planned for summer 2012. In addition to carpools and vanpools, 11 bus routes use this portion of the HOV lane and carry approximately 22,817 average daily boardings.

Planning Efforts to Date

Bottleneck Removal

Preliminary engineering is being conducted for transportation management improvements in various locations along IH 45. This includes restriping shoulders to add auxiliary lanes and two direct connectors at North Shepherd Drive, bottleneck removal and traffic flow improvement projects between West Road and North Shepherd Drive, and exit ramp relocation at northbound Gulf Bank.

IH 45 Expansion

TxDOT is holding public scoping meetings to conduct the IH 45 North Environmental Impact Statement (EIS) Study for the North Houston Highway Improvement Project (http://www.ih45northandmore.com/news.aspx) that involves evaluation of:

- IH 45 North from the US 59/SH 288 interchange to Beltway 8 North.
- Hardy Toll Road from IH 610 North to Beltway 8 North.
- Portions of the IH 10, US 59, and SH 288 Freeways around downtown.

This project is a result of a comprehensive planning study conducted for the North Hardy Corridor that evaluated various transit strategies prior to evaluating the highway component.

Transit options that were identified for this corridor include:

- Light rail transit service from Downtown to Crosstimbers (phase I – under construction).
- Light rail transit service from Crosstimbers to George Bush Intercontinental Airport (planned).
- Two-way express bus service along IH 45 in the reconstructed two-way managed lanes (being studied).

The highway component of the IH 45 North improvement project is proposing the reconstruction and capacity increases to the IH 45/IH 610 North Loop interchange. The project also includes the construction of four managed lanes from downtown to north of Belway 8.

The Hardy Toll Road is being considered for extension southward by the Harris County Toll Road Authority (HCTRA) from its current terminus at IH 610 to downtown. This project will also construct direct connectors to US 59.

Smart Street Improvements are planned, but unfunded, along North Shepherd Drive from Veterans Memorial to IH 610.

Next Steps

Downtown Redesign Planning Study

In addition to several short and long term planned projects described above, three separate multimodal transportation corridor feasibility studies that have the potential to impact operations on IH 45 are planned to be conducted in 2019. These study limits are:

- IH 45 North from US 59 to Beltway 8 North.
- SH 288 from US 59 to CR 60 in Angleton.
- US 59 South from Spur 527 to IH 45 including the interchange of SH 288.

It is recommended that these three studies be combined into one comprehensive study. The scope of the study should include all freeway routes within Loop IH 610. This comprehensive study should be started as soon as possible.

Support for Aggressive Incident Management
The Motorist Assistance Program has operated a few vehicles to assist with minor repairs and stalled vehicles for 20 years. SAFEClear, the City of Houston's rapid clearance program that implemented performance driven tow services (tow trucks have to reach incident site in 6 minutes), has been very successful since 2005 in reducing incident clearance times and improving safety. Crash reductions of between 10 percent and 15 percent were reported for the first four years of the program. Recent funding cuts have mandated that motorists have to pay for the tow, and the tows have been made optional. The number of tows has, therefore, been reduced by 60 percent to 70 percent. Dedicated funding resources or a different operating strategy should be found for programs such as SAFEClear to advance incident management strategies.

Extension of the Hardy Toll Road
The Hardy Toll Road extension will reduce congestion on IH 45; the Harris County Toll Road Authority decision and implementation schedule should be monitored. If HCTRA decides to not extend the Hardy Toll Road, there may be a need for additional actions.

Feasibility Study for Implementation of Active Traffic Management Strategies
Improving the operation of the existing freeway allows the greatest return on the roadway investment. A study should be conducted to identify freeway locations that can benefit from operational treatments such as dynamic rerouting, dynamic traveler information, and variable speed limits.

Evaluation of Travel Option Strategies
A feasibility study to examine potential benefits and implementation strategies for travel options in the corridor should be conducted. These strategies include, but are not limited to flex-time, carpooling, and employer sponsored vanpooling, transit, and parking incentives.

Mobility Improvements to Significant Parallel Streets
This early action feasibility study would identify mobility improvements along major streets in the IH 45 corridor in order to create viable alternate routes. These mobility improvements would include capacity increases (where possible) and operational treatments including active traffic management strategies such as signal re-timing, dynamic rerouting using improved surface streets, and traveler information.

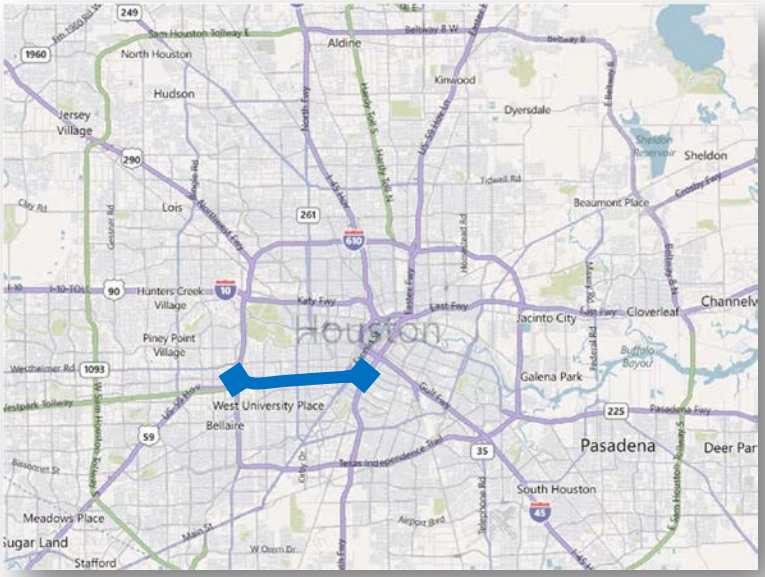
US 59 (SOUTHWEST FWY)

IH 610 (West Loop) to SH 288 (South Fwy)

Current Conditions

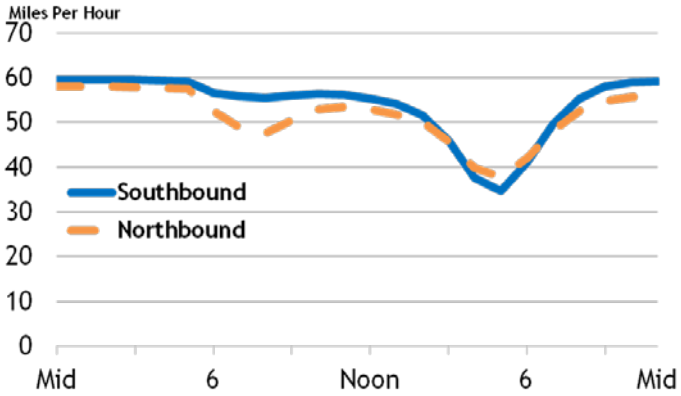
From IH 610 West to SH 288, US 59 operates with four or five lanes in each direction and a reversible high-occupancy vehicle (HOV) lane in the middle. The Southwest Freeway experiences slowdowns during both the morning and evening rush hour periods in the northbound direction. Southbound traffic experiences the heaviest congestion and slowdowns during the evening peak period.

- Segment Length: 7.2 miles.
- Road Type: 8- to 10-lane freeway.
- Annual Hours of Delay: 2,105,000.
- Texas Congestion Index: 1.41.
- Commuter Stress Index: 1.59.



Rank: 2

Annual Hrs of Delay/Mile:	**291,000**
Congestion Time:	**4 Hours**
Annual Cost of Delay:	**$51.6 million**
Average Daily Traffic:	**203,000 Vehicles**



Possible Congestion Causes

The Southwest Freeway between IH 610 West and SH 288 is an 8- to 11-lane facility with four or five lanes in each direction and a reversible HOV lane in the middle from Spur 527 to IH 610. This segment of US 59 serves major travel destinations including Downtown, Uptown/Galleria, Texas Medical Center, Museum District, Greenway Plaza, and Rice University. The segment also serves as a connecting link to traffic headed to/from University of Houston via IH 45. Some reasons for congestion in this segment include:

- High travel demand.
- High traffic volumes merging and diverging near the interchange of IH 610 West and US 59.
- Limited capacity on IH 610 West to accept traffic.
- Vertical and horizontal curves with limited sight distances and design speeds of less than 60 mph.
- Congestion at the interchange of US 59 with IH 45 to the north of this segment causes backup.
- Limited acceleration length on the elevated road from the Main Street entrance ramp; traffic cannot merge smoothly with the freeway.
- Left hand exit to Spur 527.
- Start/terminus of Westpark Tollway just west of this segment results in Westpark traffic using this segment of US 59 as a link to all downtown destinations, thereby increasing travel demand on this segment.

- Bottleneck north of direct connector from US 59 to West IH 610 northbound.

Projects in Progress or Completed

Incident Clearance

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Houston Area Transit Service
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There are also six transit services that have received funding through the Commuter and Transit Services Pilot Program, with a seventh service set to begin in February 2012.

Corridor Transit Service
Eight bus routes serve the Downtown and one route to Texas Medical Center. These routes carry 12,200 average daily weekday boardings (FY 2012). Fort Bend County Transit serves the Greenway Plaza/Uptown area along this segment.

HOV/HOT Lanes
The Southwest Freeway HOV lane is being converted to a High Occupancy Toll (HOT) lane by METRO; opening is planned for spring 2012.

Street Improvements
Signalization, intersection, and transit access improvements are being installed to reduce intersection delay at intersections in the Upper

Kirby Management District along with associated pedestrian accessibility projects. Minor improvements will be made to 16 other area intersections by Upper Kirby Management District. Various traffic flow improvements, pedestrian and bicycle improvement projects are also being funded by Uptown Houston District.

Planning Efforts to Date

Preliminary Engineering and Other Studies

Preliminary engineering is being conducted for:

- Reconstruction of US 59 NB to IH 610 SB direct connector.
- Construction of direct connector from IH 610 NB to US 59 SB.
- Construction of direct connector from IH 610 SB to US 59 NB.
- Reconstruction of frontage roads and intersections from Lancashire St to Shepherd Dr.

Other studies affecting the corridor include:

- Texas Medical Center multimodal transportation study.
- METRO Solutions – University Corridor Light Rail Transit from Hillcroft Transit Center to Eastwood Transit Center (10.6 miles) and ultimately extended to Fort Bend County.
- METRO Solutions – Uptown Corridor Light Rail Transit from Hillcroft Transit Center to Northwest Transit Center (6.3 miles).

IH 45 Expansion

TxDOT is holding public scoping meetings to conduct the IH 45 North Environmental Impact Statement (EIS) Study for the North Houston Highway Improvement Project (http://www.ih45northandmore.com/news.aspx) that involves evaluation of:

- IH 45 North from the US 59/SH 288 interchange to Beltway 8 North.
- Hardy Toll Road from IH 610 North to Beltway 8 North.
- Portions of the IH 10, US 59, and SH 288 Freeways around downtown.

Other Planned Projects

- Improvements to interchange at SH 288 to accommodate managed lanes at SH 288 planned for 2015 (unfunded).
- Reconstruct to six mainlanes with auxiliary lanes and four managed lanes from SH 288 to Spur 527 (unfunded).
- Study to develop a Transit System to meet the needs of the Texas Medical Center area.
- Signature Bus Express Service Routes for uptown area by METRO.

Next Steps

Downtown Redesign Planning Study

In addition to several short and long term planned projects described above, three separate multimodal transportation corridor feasibility studies that have the potential to impact operations on IH 45 are planned to be conducted in 2019. The study limits are:

- IH 45 North from US 59 to Beltway 8 North.
- SH 288 from US 59 to CR 60 in Angleton.
- US 59 South from Spur 527 to IH 45 including the interchange of SH 288.

It is recommended that these three studies be combined into one comprehensive study and accelerated. The scope of the study should include all freeway routes within Loop IH 610. This comprehensive study should be started as soon as possible.

Support for Aggressive Incident Management

The Motorist Assistance Program has operated a few vehicles to assist with minor repairs and stalled vehicles for 20 years. SAFEClear, the City of Houston's rapid clearance program that implemented performance driven tow services (tow trucks have to reach incident site in 6 minutes), has been very successful since 2005 in reducing incident clearance times and improving safety. Crash reductions of between 10 percent and 15 percent were reported for the first four years of the program. Recent funding cuts have mandated that motorists have to pay for the tow, and the tows have been made optional. The

number of tows has, therefore, been reduced by 60 percent to 70 percent. Dedicated funding resources or a different operating strategy should be found for programs such as SAFEClear to advance incident management strategies.

Extension of the Hardy Toll Road

The Hardy Toll Road extension will reduce congestion on US 59; the Harris County Toll Road Authority decision and implementation schedule should be monitored. If HCTRA decides to not extend the Hardy Toll Road, there may be a need for additional actions.

Feasibility Study for Implementation of Active Traffic Management Strategies

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This early action feasibility study would identify mobility improvements along major streets parallel to US 59 in order to create viable alternate routes. These mobility improvements would include capacity increases (where possible) and operational treatments including active traffic management strategies such as signal re-timing, dynamic rerouting using improved surface streets, and traveler information.

IH 45 (GULF FWY)

IH 10 (Katy Fwy) to IH 610 S (South Loop)

Current Conditions

From IH 10 to IH 610 south, IH 45 is a 6- to 9-lane facility with three or four general purpose lanes in each direction and a reversible High Occupancy Vehicle (HOV) lane in the median south of US 59. The Gulf Freeway has a traditional commute pattern with heavier traffic and more slowdowns inbound during the morning rush and outbound during the evening rush hours, although both directions experience some congestion in the evening.

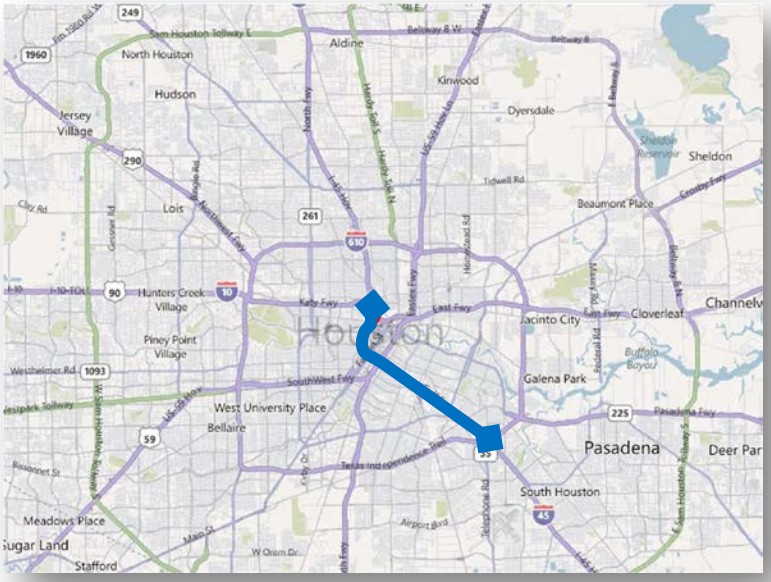
- Segment Length: 9.3 miles.
- Road Type: 6- to 9-lane freeway.
- Annual Hours of Delay: 3,515,400.
- Texas Congestion Index: 1.42.
- Commuter Stress Index: 1.58.

Intelligent Transportation Systems (ITS) improve freeway operations and increase motorist awareness; ITS infrastructure along this corridor includes:

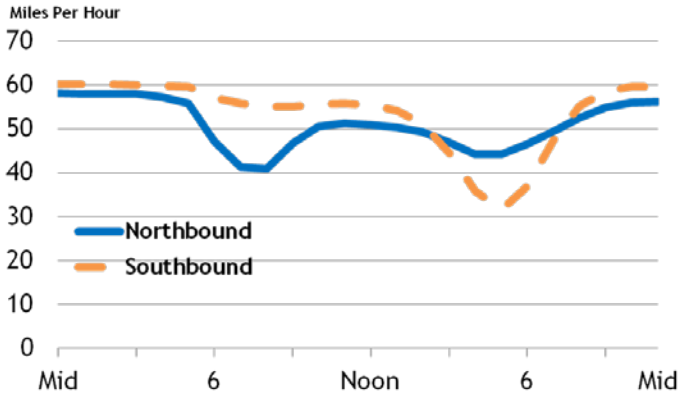
- Travel time monitoring system covering the entire segment.
- 15 CCTV cameras to aid incident management.
- 1 radar based vehicle volume and speed detection location.
- 3 dynamic message signs.
- 12 flow signals.

Possible Congestion Causes

This segment of the Gulf Freeway connects to downtown destinations and University of Houston and serves as a through route for major activity centers including the Texas Medical Center, Port of Houston, and Texas Southern University to the south, and the Dallas-Fort Worth area, the Woodlands and the Greenspoint area to the north of the corridor. The interchange of IH 45, US 59, and SH 288 is a major choke point for several downtown freeway segments, causing slowdowns and stop-and-go traffic.



Rank: 6	
Annual Hrs of Delay/Mile:	378,000
Congestion Time:	6 Hours
Annual Cost of Delay:	$86.1 million
Average Daily Traffic:	254,000 Vehicles



Some other causes for congestion on this segment include:

- Older ramp design and lack of auxiliary lanes cause weaving near on- and off-ramp locations.
- Vertical and horizontal curves with design speeds less than 60 mph.

- Absence of frontage roads between IH 10 and US 59 results in many short trips using the freeway mainlanes.
- Left entry of southbound Allen Parkway ramp combined with southbound Houston Avenue on-ramp (right hand entry) in the same general area causes major weaving problems and violation of driver expectations.
- High travel demand due to the presence of major activity centers and other trip generators within and at either end of this corridor.

Projects in Progress or Completed

Incident Clearance

SAFEClear, the City of Houston's rapid clearance program, provides quick response and towing of crashed and disabled vehicles reducing secondary crashes and congestion. More than 60 private contractor tow trucks rapidly respond to all incidents (approximately two-thirds of incidents were detected by the roving tow trucks and 90 percent were detected and cleared within 20 minutes by SAFEClear). However, effectiveness of this program was reduced in summer 2010 when City budget cuts caused a $50 fee to be instituted for the previously free tows.

TxDOT, METRO, and Harris County operate fewer than a dozen Motorist Assistance Program (MAP) pick-up trucks as a free assistance program to provide minor aid to stranded motorists. It also reduces traffic congestion and improves highway safety.

A heavy tow truck contract allows quick removal of large trucks. There is a policy that does not hold TxDOT liable for damage to products that are removed from the roadway in such an event.

Houston TranStar traffic and emergency management center is the coordination hub for all incidents. Traffic incidents are detected, verified, and the public is notified through its ITS system. Dispatch and response is sent via coordination of the various agencies.

Travel Options

The Houston-Galveston Area Council's (H-GAC) Commute Solutions program funds, promotes, and provides administrative support to various commute alternative projects. The program provides public education to commuters and employers about available commuting options in the region and on the benefits of using alternative transportation modes. The Commute Solutions program also provides literature and public outreach on carpooling, vanpools, transit, guaranteed ride home, teleworking, alternate work schedules, and parking management.

Shared Commuting

NuRide is an online rideshare marketing program that provides ride matches and rewards users for recording their alternative commute trips (i.e., ridesharing, bus, rail, telecommute, walk, bike, and compressed work week). The H-GAC NuRide program is the nation's largest Ridematching rewards program, with over 17,100 registered riders. Since its inception in June 2005, the program has resulted in 3.32 million fewer car trips, 79.42 million fewer miles driven, and the saving of 3.86 million gallons of gas.

Biking and walking trips account for 4.2 percent of alternative commute trips recorded on NuRide during 2011.

METRO operates the STAR Vanpool program serving more than 700 routes and is ranked as the second largest vanpool program nationally by passenger trips and the third largest vanpool program nationally by passenger miles in the 2011 APTA Fact Book.

Flextime

Many employers offer flexible work schedules, with around 350 employers participating annually in the Flex in the City Program.

Incentive Driven TDM Programs

Many large companies in the Texas Medical Center, the Energy Corridor, and the Central Business District subsidize all or part of their employees vanpool or transit commuting costs.

Twenty-five companies are voluntarily participating in the Commute Champion Program enabling H-GAC to document emission reductions related to their Commuter Benefits. Additionally 38 companies and 17 local governments are participating in the Clean Air Champion Program in which they voluntarily provide information enabling H-GAC to document their proactive efforts to decrease emissions.

Teleworking
Approximately 2.9 percent of the trips recorded by the NuRide program are telecommutes.

Guaranteed Ride Home Programs
The GRH program provides emergency rides home to transit and rideshare users to address one of the main concerns of those who leave their car at home. All registered users of METRO bus and STAR vanpool riders, registered TREK Express users, and Fort Bend County Transit users have access to three free rides home per calendar year.

Houston Area Transit Service
METRO provides local and express bus service via 97 routes, serving approximately 208,200 average daily boardings (weekday – FY 2012). METRO also operates 32 park & rides routes serving approximately 29,200 average daily boardings (weekday – FY2012). METRO also has light rail transit along a 7.5-mile section serving Downtown, Texas Medical Center, and Reliant Center with 38,100 average daily boardings (weekday – FY2012).

There are also six transit services that have received funding through the Commuter and Transit Services Pilot Program, with a seventh service set to begin in February 2012.

Corridor Transit Service
Along this segment of IH 45, METRO operates 9 routes serving downtown and one route serving the Texas Medical Center. These 10 routes serve approximately 18,700 average daily weekday boardings (FY2012).

METRO operates 2 transit centers in this corridor (Eastwood and Gulfgate), serving 11 local and park and ride routes.

METRO's Southeast Light Rail Transit (LRT) line is scheduled to open in 2014.

HOV/HOT Lanes
The Gulf Freeway HOV lane is being converted to a High Occupancy Toll (HOT) lane by METRO; opening is planned for winter 2012.

Planning Efforts to Date

IH 45 Expansion

TxDOT is holding public scoping meetings to conduct the IH 45 North Environmental Impact Statement (EIS) Study for the North Houston Highway Improvement Project (http://www.ih45northandmore.com/news.aspx) that involves evaluation of:

- IH 45 North from the US 59/SH 288 interchange to Beltway 8 North.
- Hardy Toll Road from IH 610 North to Beltway 8 North.
- Portions of the IH 10, US 59, and SH 288 Freeways around downtown.

Many projects are in the preliminary engineering stage including:

- Construction of direct connector IH 610 EB to IH 45 NB.
- Construction of direct connector IH 45 SB to IH 610 WB.
- Restriping northbound Pierce elevated to four lanes from IH 10 to US 59; remove southbound left hand Allen Pkwy entrance.
- Use of elevated facility for US 59 connector (Transportation Management System improvements) from Spur 5 to US 59.

The Galveston-Houston Mobility Corridor Alternatives Analysis is reviewing commuter rail and bus rapid transit options from Galveston Island to downtown Houston (www.galvestonrailstudy.com).

Next Steps

Downtown Redesign Planning Study

In addition to several short and long term planned projects described above, three separate multimodal transportation corridor feasibility studies that have the potential to impact operations on IH 45 are planned to be conducted in 2019. The limits for these studies are:

- IH 45 North from US 59 to Beltway 8 North.
- SH 288 from US 59 to CR 60 in Angleton.
- US 59 South from Spur 527 to IH 45 including the interchange of SH 288.

It is recommended that these three studies be combined into one comprehensive study. The scope of the study should include all freeway routes within Loop IH 610. This comprehensive study should be started as soon as possible.

Support for Aggressive Incident Management

The Motorist Assistance Program has operated a few vehicles to assist with minor repairs and stalled vehicles for 20 years. SAFEClear, the City of Houston's rapid clearance program that implemented performance driven tow services (tow trucks have to reach incident site in 6 minutes), has been very successful since 2005 in reducing incident clearance times and improving safety. Crash reductions of between 10 percent and 15 percent were reported for the first four years of the program. Recent funding cuts have mandated that motorists have to pay for the tow, and the tows have been made optional. The number of tows has, therefore, been reduced by 60 percent to 70 percent. Dedicated funding resources or a different operating strategy should be found for programs such as SAFEClear to advance incident management strategies.

Feasibility Study for Implementation of Active Traffic Management Strategies

Improving the operation of the existing freeway allows the greatest return on the roadway investment. A study should be conducted to identify freeway locations that can benefit from operational treatments such as dynamic rerouting, dynamic traveler information, and variable speed limits.

Evaluation of Travel Option Strategies

A feasibility study to examine potential benefits and implementation strategies for travel options in the corridor should be conducted. These strategies include, but are not limited to flex-time, carpooling, and employer sponsored vanpooling, transit, and parking incentives.

Mobility Improvements to Significant Parallel Streets

This early action feasibility study would identify mobility improvements along major streets in the IH 45 corridor in order to create viable alternate routes. These mobility improvements would include capacity increases (where possible) and operational treatments including active traffic management strategies such as signal re-timing, dynamic rerouting using improved surface streets, and traveler information.

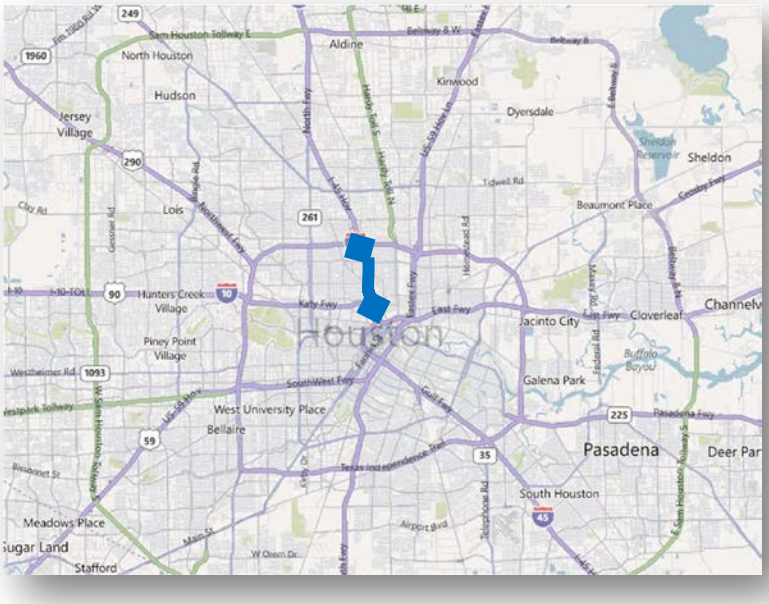
IH 45 (NORTH FWY)

IH 610 N (North Loop) to IH 10 (Katy Fwy)

Current Conditions

From IH 610 North to IH 10, IH 45 operates as a 9-lane facility with four general purpose lanes in each direction and a reversible High Occupancy Vehicle (HOV) lane in the middle. Like other congested corridors in the region, this portion of IH 45 experiences a traditional commute and congestion pattern: slowdowns inbound in the morning and outbound in the evening.

- Segment Length: 3.31 miles
- Road Type: 9-lane freeway
- Annual Hours of Delay: 1,096,000
- Texas Congestion Index: 1.31
- Commuter Stress Index: 1.48



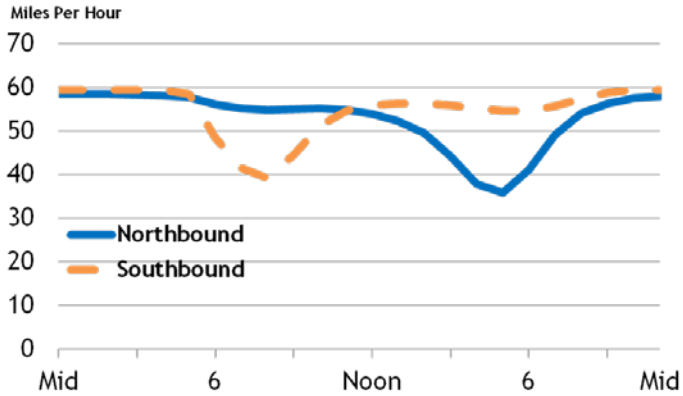
Possible Congestion Causes

This segment of IH 45 North serves as a link for traffic from north of the segment as well as for traffic from Loop IH 610 headed to IH 10, downtown, and University of Houston. In addition, the segment serves as a through route for major activity centers including the Texas Medical Center, Port of Houston, and Texas Southern University to the south, and the Woodlands and the Greenspoint area to the north of the corridor. Some causes for congestion on this segment include:

- High travel demand due to major activity centers on each end of the corridor.
- Narrow lanes and no inside shoulder reduce capacity; a reversible HOV lane was retrofitted into the center of IH 45 North from IH 10 to FM 1960 in 1982.
- Absence of frontage roads at both ends of the segment forces short distance trips to use the freeway, causing additional traffic and weaving.
- Older ramp design and limited right-of-way.
- Bottlenecks caused by major interchanges at both ends of this short segment.

Rank: 7

Annual Hrs of Delay/Mile:	**331,000**
Congestion Time:	**6 Hours**
Annual Cost of Delay:	**$26.9 million**
Average Daily Traffic:	**305,000 Vehicles**



- Both a northbound left hand entry from IH 10 eastbound to IH 45 northbound and a left hand exit from IH 45 southbound to IH 10 eastbound violate driver expectations, causing last minute lane changes and slowdowns.
- Horizontal and vertical curves with design speed of less than 60 mph.

Projects in Progress or Completed

Incident Clearance

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Biking and walking trips account for 4.2 percent of alternative commute trips recorded on NuRide during 2011.

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*Incentive Driven TDM **P**rograms*

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There are also six transit services that have received funding through the Commuter and Transit Services Pilot Program, with a seventh service set to begin in February 2012.

Corridor Transit Service
Along this segment of IH 45, METRO has three routes serving the downtown area and one route to Greenway Plaza/Uptown District.

The North Red Line light rail project is under construction and scheduled to open in 2014. The project will extend 5.1 miles parallel to North Freeway from downtown to Northline Transit Center north of Crosstimbers. The rail line is ultimately planned to extend to Bush Intercontinental Airport.

HOV/HOT Lanes
The North Freeway HOV lane is being converted to a High Occupancy Toll (HOT) lane by METRO; opening is planned for summer 2012.

Planning Efforts to Date

Realignment
Engineering and right-of-way acquisition is being pursued for a new alignment and the redesign of connections to major downtown streets (from the IH 10 interchange to the Pierce/Brazos intersection).

IH 45 Expansion

TxDOT is holding public scoping meetings to conduct the IH 45 North Environmental Impact Statement (EIS) Study for the North Houston Highway Improvement Project (http://www.ih45northandmore.com/news.aspx) that involves evaluation of:

- IH 45 North from the US 59/SH 288 interchange to Beltway 8 North.
- Hardy Toll Road from IH 610 North to Beltway 8 North.
- Portions of the IH 10, US 59, and SH 288 Freeways around downtown.

This project is a result of a comprehensive planning study conducted for the North Hardy Corridor that evaluated various transit strategies prior to evaluating the highway component.

Transit options that were identified for this corridor include:

- Light rail transit service from Downtown to Crosstimbers (phase I – under construction).
- Light rail transit service from Crosstimbers to George Bush Intercontinental Airport (planned).
- Two-way express bus service along IH 45 in the reconstructed two-way managed lanes (being studied).

The highway component of the IH 45 North improvement project is proposing the reconstruction and capacity increases to the IH 45/IH 610 North Loop interchange. The project also includes the construction of four managed lanes from downtown to north of Beltway 8.

The Hardy Toll Road is being considered for extension southward by the Harris County Toll Road Authority (HCTRA) from its current terminus at IH 610 to downtown. This project will also construct direct connectors to US 59.

Next Steps

Downtown Redesign Planning Study

In addition to several short and long term planned projects described above, three separate multimodal transportation corridor feasibility studies that have the potential to impact operations on IH 45 are planned to be conducted in 2019. The limits for these studies are:

- IH 45 North from US 59 to BW 8 North.
- SH 288 from US 59 to CR 60 in Angleton.
- US 59 South from Spur 527 to IH 45 including the interchange of SH 288.

It is recommended that these three studies be combined into one comprehensive study. The scope of the study should include all freeway routes within Loop IH 610. This comprehensive study should be started as soon as possible.

Support for Aggressive Incident Management

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Extension of the Hardy Toll Road

The Hardy Toll Road extension will reduce congestion on IH 45; the Harris County Toll Road Authority decision and implementation schedule should be monitored. If HCTRA decides to not extend the Hardy Toll Road, there may be a need for additional actions.

Feasibility Study for Implementation of Active Traffic Management Strategies

Improving the operation of the existing freeway allows the greatest return on the roadway investment. A study should be conducted to identify freeway locations that can benefit from operational treatments such as dynamic rerouting, dynamic traveler information, and variable speed limits.

Evaluation of Travel Option Strategies

A feasibility study to examine potential benefits and implementation strategies for travel options in the corridor should be conducted. These strategies include but are not limited to flex-time, carpooling, and employer sponsored vanpooling, transit, and parking incentives.

Mobility Improvements to Significant Parallel Streets

This early action feasibility study would identify mobility improvements along major streets in the IH 45 corridor in order to create viable alternate routes. These mobility improvements would include capacity increases (where possible) and operational treatments including active traffic management strategies such as signal re-timing, dynamic rerouting using improved surface streets, and traveler information.

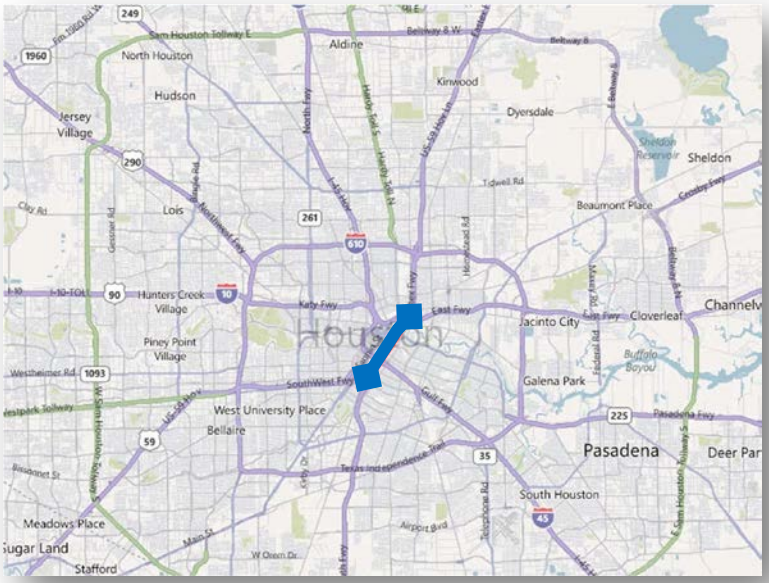
US 59 (EASTEX FWY)

IH 10 (East Fwy) to SH 288 (South Fwy)

Current Conditions

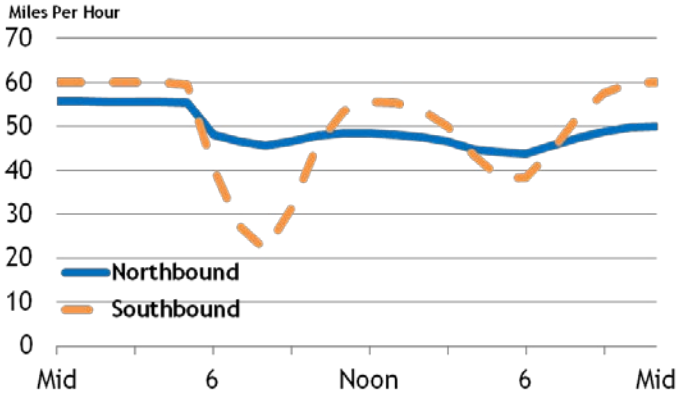
From IH 10 to SH 288, US 59 operates as a 6- to 8-lane section with three or four lanes in each direction. The section south of IH 45 is also parallel to SH 288. Southbound traffic on this segment of US 59 experiences severe slowdowns and congestion in the morning period, with speeds dropping to near 20 mph during the peak period. Evening congestion is less severe owing to the effect of bottlenecks elsewhere on the freeway system. Northbound traffic experiences moderate but consistent slowdowns throughout the entire day and into the evening.

- Segment Length: 6.3 miles.
- Road Type: 6- to 8-lane freeway.
- Annual Hours of Delay: 2,734,000.
- Texas Congestion Index: 1.62.
- Commuter Stress Index: 1.76.



Rank: 10

Annual Hrs of Delay / Mile:	**434,000**
Congestion Time:	**8 Hours**
Annual Cost of Delay:	**$67.0 million**
Average Daily Traffic:	**194,000 Vehicles**



Possible Congestion Causes

US 59 between IH 45 and SH 288 is a mix of two freeways, with mainlanes of both US 59 and SH 288. These freeways serve major travel destinations including downtown, Texas Medical Center, Museum District, Greenway Plaza, and Rice University. The segment also provides connections to George Bush Intercontinental Airport. Some reasons for congestion in this segment include:

- Interchange of US 59 and SH 288 at the south end of this segment causes a major choke point in the area.
- In the middle of the section there is the interchange with the IH 45 Gulf Freeway.
- Conjoined US 59 and SH 288 generates several weaving movements.
- Several horizontal and vertical designs add to driver uncertainty at the south end of the segment.

Projects in Progress or Completed

Incident Clearance

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There are also six transit services that have received funding through the Commuter and Transit Services Pilot Program, with a seventh service set to begin in February 2012.

Corridor Transit Service
METRO operates eight routes that serve downtown, two routes that serve the Texas Medical Center, and two routes that serve Uptown/Greenway areas. Combined, these routes carry approximately 19,800 average daily weekday boardings (FY 2012). METRO operates one transit center (Wheeler Station) in the corridor. The 7.5-mile Red Line light rail transit line serves Downtown, Texas Medical Center, and Reliant Center with 38,100 average daily boardings (weekday – FY2012).

Planning Efforts to Date

IH 45 Expansion
TxDOT is holding public scoping meetings to conduct the IH 45 North Environmental Impact Statement (EIS) Study for the North Houston Highway Improvement Project (http://www.ih45northandmore.com/news.aspx) that involves evaluation of:

- IH 45 North from the US 59/SH 288 interchange to Beltway 8 North.
- Hardy Toll Road from IH 610 North to Beltway 8 North.
- Portions of the IH 10, US 59, and SH 288 Freeways around downtown.

This project has the potential to address bottleneck issues near the interchange of IH 45 and US 59/SH 288.

Rail Transit
METRO is constructing the Southeast Light Rail Transit from IH 45 at Capitol to Palm Center and planning the University Light Rail Transit from Hillcroft Transit Center to Eastwood Transit Center.

Other Planned Projects

- Improvements to interchange at SH 288 with managed lanes on SH 288 planned for 2015 (unfunded).
- Widen from 10 to 12 lanes from IH 45 South to IH 10 East, planned for 2017.
- Widen to eight and 10 mainlanes with managed lanes and improvements to the US 59/IH 45 interchange from IH 45 to SH 288 (unfunded).
- Reconstruct to six mainlanes with auxiliary lanes and four managed lanes from SH 288 to Spur 527(unfunded).

Next Steps

Downtown Redesign Planning Study

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The Hardy Toll Road extension will reduce congestion on US 59; the Harris County Toll Road Authority decision and implementation schedule should be monitored. If HCTRA decides to not extend the Hardy Toll Road, there may be a need for additional actions.

Feasibility Study for Implementation of Active Traffic Management Strategies

Improving the operation of the existing freeway allows the greatest return on the roadway investment. A study should be conducted to identify freeway locations that can benefit from operational treatments such as dynamic rerouting, dynamic traveler information, and variable speed limits.

Evaluation of Travel Option Strategies

A feasibility study to examine potential benefits and implementation strategies for travel options in the corridor should be conducted. These strategies include, but are not limited to flex-time, carpooling, and employer sponsored vanpooling, transit, and parking incentives.

Mobility Improvements to Significant Parallel Streets

This early action feasibility study would identify mobility improvements along major streets parallel to US 59 in order to create viable alternate routes. These mobility improvements would include capacity increases (where possible) and operational treatments including active traffic management strategies such as signal re-timing, dynamic rerouting using improved surface streets, and traveler information.

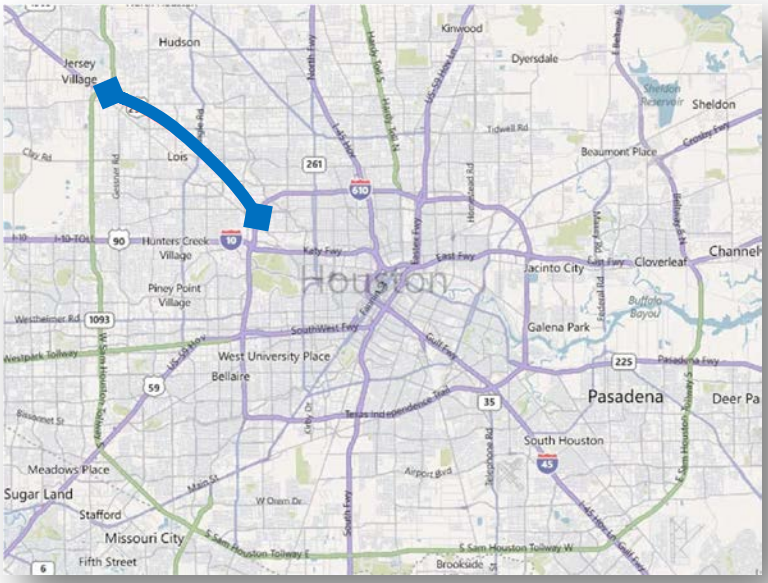
US 290 (NORTHWEST FWY)

FM 529 (Spencer Rd.) to IH 610 (North Loop)

Current Conditions

From FM 529 to IH 610, US 290 has three or four general purpose lanes in each direction and a one-way reversible High Occupancy Vehicle (HOV) lane in the middle. US 290 experiences heavy slowdowns inbound during the morning hours and outbound during the evening hours—following a traditional commute pattern.

- Segment Length: 9.1 miles.
- Road Type: 6- to 8-Lane Freeway.
- Annual Hours of Delay: 2,284,000.
- Texas Congestion Index: 1.37.
- Commuter Stress Index: 1.58.



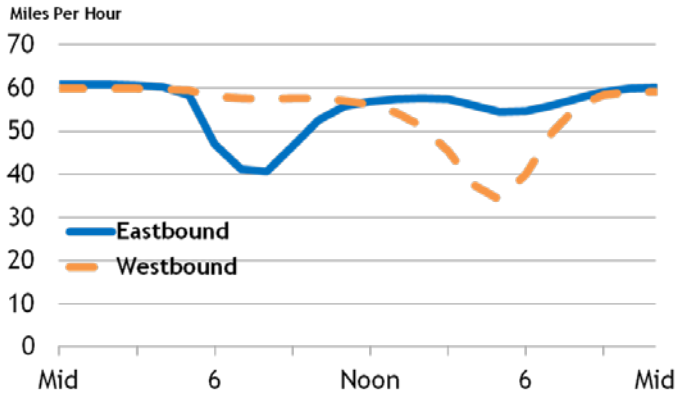
Possible Congestion Causes

IH 610 is the eastern terminus of US 290; thus all traffic to/from Northwest Houston headed for destinations south/east of this terminus point travel along this segment of US 290. Major residential and commercial development is causing this 6-lane facility to be over capacity for the peak periods. Possible causes of congestion in this segment include:

- High traffic volumes exceeding capacity.
- Major bottleneck at the interchange of Beltway 8 with US 290 due to limited number of lanes available to accommodate the weaving traffic.
- Large business centers and commercial activity, heavy truck centers/yards between Pinemont Drive and Fairbanks North Houston Road result in high traffic volumes entering and exiting the freeway causing additional weaving and slowdowns.
- Interchange of US 290 with IH 610 South/IH 10 causes backups and slowdowns due to traffic from IH 610 North Loop weaving left to go south on IH 610 West Loop and traffic from US 290 weaving right to get to IH 10 East and IH 10 West.
- Until recently there were limited auxiliary lanes and narrow or no inside shoulders causing slowdowns near on/off ramps since the HOV lane was retrofitted.
- No inside or outside shoulder in certain sections of the segment.

Rank: 11

Annual Hrs of Delay/Mile:	**250,000**
Hrs of Congestion/Day:	**7 Hours**
Annual Cost of Delay:	**$56.0 million**
Average Daily Traffic:	**207,000 Vehicles**



Projects in Progress or Completed

Interchanges

Reconstruction of the inbound portion of the US 290/IH 610 interchange is underway using Proposition 12 funds.

Traffic Management

Traffic management improvements that added auxiliary lanes extended deceleration and acceleration lanes for Beltway 8 interchange traffic have been completed.

Frontage road improvements at various intersections have also been completed.

Incident Clearance

SAFEClear, the City of Houston's rapid clearance program, provides quick response and towing of crashed and disabled vehicles reducing secondary crashes and congestion. More than 60 private contractor tow trucks rapidly respond to all incidents (approximately two-thirds of incidents were detected by the roving tow trucks and 90 percent were detected and cleared within 20 minutes by SAFEClear). However, effectiveness of this program was reduced in summer 2010 when City budget cuts caused a $50 fee to be instituted for the previously free tows.

TxDOT, METRO, and Harris County operate fewer than a dozen Motorist Assistance Program (MAP) pick-up trucks as a free assistance program to provide minor aid to stranded motorists. It also reduces traffic congestion and improves highway safety.

A heavy tow truck contract allows quick removal of large trucks. There is a policy that does not hold TxDOT liable for damage to products that are removed from the roadway in such an event.

Houston TranStar traffic and emergency management center is the coordination hub for all incidents. Traffic incidents are detected, verified, and the public is notified through its ITS system. Dispatch and response is sent via coordination of the various agencies.

Travel Options

The Houston-Galveston Area Council's (H-GAC) Commute Solutions program funds, promotes, and provides administrative support to various commute alternative projects. The program provides public education to commuters and employers about available commuting options in the region and on the benefits of using alternative transportation modes. The Commute Solutions program also provides literature and public outreach on carpooling, vanpools, transit, guaranteed ride home, teleworking, alternate work schedules, and parking management.

Shared Commuting

NuRide is an online rideshare marketing program that provides ride matches and rewards users for recording their alternative commute trips (i.e., ridesharing, bus, rail, telecommute, walk, bike, and compressed work week). The H-GAC NuRide program is the nation's largest Ridematching rewards program, with over 17,100 registered riders. Since its inception in June 2005, the program has resulted in 3.32 million fewer car trips, 79.42 million fewer miles driven, and the saving of 3.86 million gallons of gas.

Biking and walking trips account for 4.2 percent of alternative commute trips recorded on NuRide during 2011.

METRO operates the STAR Vanpool program serving more than 700 routes and is ranked as the second largest vanpool program nationally by passenger trips and the third largest vanpool program nationally by passenger miles in the 2011 APTA Fact Book.

Flextime

Many employers offer flexible work schedules, with around 350 employers participating annually in the Flex in the City Program.

Incentive Driven TDM Programs
Many large companies in the Texas Medical Center, the Energy Corridor, and the Central Business District subsidize all or part of their employees vanpool or transit commuting costs.

Twenty-five companies are voluntarily participating in the Commute Champion Program enabling H-GAC to document emission reductions related to their Commuter Benefits. Additionally 38 companies and 17 local governments are participating in the Clean Air Champion Program in which they voluntarily provide information enabling H-GAC to document their proactive efforts to decrease emissions.

Teleworking
Approximately 2.9 percent of the trips recorded by the NuRide program are telecommutes.

Guaranteed Ride Home Programs
The GRH program provides emergency rides home to transit and rideshare users to address one of the main concerns of those who leave their car at home. All registered users of METRO bus and STAR vanpool riders, registered TREK Express users, and Fort Bend County Transit users have access to three free rides home per calendar year.

Houston Area Transit Service
METRO provides local and express bus service via 97 routes, serving approximately 208,200 average daily boardings (weekday – FY 2012). METRO also operates 32 park & rides routes serving approximately 29,200 average daily boardings (weekday – FY2012).

There are also six transit services that have received funding through the Commuter and Transit Services Pilot Program, with a seventh service set to begin in February 2012.

Corridor Transit Service
METRO operates two Park & Ride Lots (Pinemont & West Little York) along this section of US 290. METRO also operates five park and ride routes and two local bus routes along this section of US 290. Combined, they carry approximately 10,000 average daily boardings.

HOV/HOT Lanes
The Northwest Freeway HOV lane is being converted to a High Occupancy Toll (HOT) lane by METRO; opening is planned for fall 2012.

Planning Efforts to Date

US 290 Program

The US 290 Program is an improvement project for the US 290 corridor that includes the reconstruction of US 290 and construction of Hempstead Tollway. The vision of the program includes:

- Freeway capacity reconstruction and widening from IH 610 to FM 2920 to create five/six general-purpose lanes in each direction from IH 610 to just west of SH 6, plus auxiliary lanes where appropriate and two- or three-lane frontage roads in each direction throughout the corridor.
- Hempstead Tollway - Two managed toll lanes each way from IH 610 to the proposed SH 99/Grand Parkway.
- Two non-tolled frontage road lanes in each direction to be reconstructed along Hempstead Tollway from IH 610 to Beltway 8.
- US 290 METRO HOV operations moved to the Hempstead Tollway managed toll lanes.
- Proposed high-capacity transit corridor located along Hempstead Tollway.
- H-GAC Commuter Rail study and Gulf Coast Rail District Hempstead Corridor commuter rail feasibility analysis.
- Bicycle and pedestrian improvements.

However, funding issues have forced a phased implementation of the program. To date, construction funding has been secured for the following projects:

- Partial reconstruction of the IH 610/US 290 interchange including the US 290/IH 610 North Loop direct connector to IH 10 and the direct connector from IH 10 to outbound US 290 and the IH 610 North Loop eastbound.
- Construct 10 main lanes with auxiliary lanes, two 2-lane frontage roads, and grade separations near Beltway 8.
- Construct two three-lane frontage roads along Beltway 8 over Union Pacific Railroad and Hempstead Road.
- Construct auxiliary lane inbound with grade separation near Beltway 8.

Other phases along US 290 will progress as funding becomes available. Some of the phases that have been identified for tentative funding sources beyond 2016 are:

- Reconstruct and widen to 12 mainlanes, two 2-lane frontage roads & grade separation (Segment 4) from west of Pinemont Dr. to west of 34th Street.
- Reconstruct and widen to 10 mainlanes with auxiliary lanes, two 2-lane frontage roads and grade separation and bridge replacement (Segment 5) from east of West Little York to west of Fairbanks North Houston.
- Reconstruct 2-lane westbound frontage road and Pinemont bridge (Segment 4) from west of Pinemont Dr. to east of West 43rd Street.
- Construct commuter rail along Hempstead ROW (high capacity transit - six stations) from SH 99 to IH 610.
- Northwest Corridor Hempstead Intermodal Terminal at North Post Oak Road.

HCTRA is assessing its long-term regional mobility goals and financial projections to determine applicable construction phasing for the Hempstead Tollway.

Next Steps

Purchase Right-of-Way near the US 290/Beltway 8 Interchange

Providing $78 million in funds for right-of-way purchase as an early action would allow the planned construction to move forward at a faster pace. Construction funding from Proposition 12 bonds for this segment has been authorized by the Texas Transportation Commission and H-GAC. This funding will allow construction of mainlanes with auxiliary lanes, two 2-lane frontage roads and grade separations from west of FM 529 to east of West Little York and construction of two three-lane frontage roads along Beltway 8 over Union Pacific Railroad and Hempstead Road. This project will alleviate congestion due to this bottleneck but is only one component of the corridor plan.

Support for Aggressive Incident Management

The Motorist Assistance Program has operated a few vehicles to assist with minor repairs and stalled vehicles for 20 years. SAFEClear, the City of Houston's rapid clearance program that implemented performance driven tow services (tow trucks have to reach incident site in 6 minutes), has been very successful since 2005 in reducing incident clearance times and improving safety. Crash reductions of between 10 percent and 15 percent were reported for the first four years of the program. Recent funding cuts have mandated that motorists have to pay for the tow, and the tows have been made optional. The number of tows has, therefore, been reduced by 60 percent to 70 percent. Dedicated funding resources or a different operating strategy should be found for programs such as SAFEClear to advance incident management strategies.

Feasibility Study for Implementation of Active Traffic Management Strategies

Improving the operation of the existing freeway allows the greatest return on the roadway investment. A study should be conducted to identify freeway locations that can benefit from operational treatments such as dynamic rerouting, dynamic traveler information, and variable speed limits.

Evaluation of Travel Option Strategies

A feasibility study to examine potential benefits and implementation strategies for travel options in the corridor should be conducted. These strategies include, but are not limited to flex-time, carpooling, and employer sponsored vanpooling, transit, and parking incentives.

Mobility Improvements to Significant Parallel Streets

This early action feasibility study would identify mobility improvements along major streets in the US 290 corridor in order to create viable alternate routes. These mobility improvements would include capacity increases (where possible) and operational treatments including active traffic management strategies such as signal re-timing, dynamic rerouting using improved surface streets, and traveler information.

The most congested corridors in Houston were examined to identify the most appropriate actions that will have the greatest impact on relieving traffic congestion. Many of these actions can be funded by Proposition 12 funds and are consistent with the goals of Rider 42, while other actions are being funded or performed by other agencies. Exhibit H-3 summarizes the recommended actions to address traffic congestion in each Houston corridor.

Exhibit H-3: Houston Summary of Congested Corridor Recommendations

Rank	Congested Corridor	Actions Funded by Others	Recommended Early Actions Affecting Congested Corridor
1	**IH 45 (North Freeway)** *(IH 610 North to Beltway 8)*	▪ Monitor METRO's high occupancy vehicle (HOV) to high occupancy toll (HOT) conversion. ▪ **Hardy Toll Road—** Monitor, support, and take action if needed.	▪ Feasibility and downtown freeway redesign study (inside Loop 610); origin-destination evaluation. ▪ Supplement IH 45 environmental study with operations and parallel route study. ▪ Active Traffic Management—Study strategies and funding options ▪ Travel Options—Feasibility study
2	**US 59 (Southwest Freeway)** *(IH 610 West to SH 288)*	▪ Study alternative routes. ▪ Monitor METRO's HOV to HOT conversion	▪ Feasibility and downtown freeway redesign study (inside Loop 610); origin-destination evaluation. ▪ Active Traffic Management—Study strategies and funding options. ▪ Travel Options—Feasibility study.
6	**IH 45 (Gulf Freeway)** *(IH 10 to IH 610 South)*	▪ Study alternative routes. ▪ Monitor METRO's HOV to HOT conversion.	▪ Feasibility and downtown freeway redesign study (inside Loop 610); origin-destination evaluation. ▪ Active Traffic Management—Study strategies and funding options. ▪ Travel Options—Feasibility study.
7	**IH 45 (North Freeway)** *(IH 610 North to IH 10)*	▪ **Hardy Toll Road—** Monitor, support, and take action if needed. ▪ Monitor METRO's HOV to HOT conversion.	▪ Feasibility and downtown freeway redesign study (inside Loop 610); origin-destination evaluation. ▪ Supplement IH 45 environmental study with operations and parallel route study. ▪ Active Traffic Management—Study strategies and funding options. ▪ Travel Options—Feasibility study.
10	**US 59 (Eastex Freeway)** *(IH 10 to SH 288)*	▪ Monitor METRO's HOV to HOT conversion.	▪ Feasibility and downtown freeway redesign study (inside Loop 610); origin-destination evaluation. ▪ Active Traffic Management—Study strategies and funding options. ▪ Travel Options—Feasibility study.

11	**US 290 (Northwest Freeway)** *(IH 610 North to FM 529)*	▪ Monitor METRO's HOV to HOT conversion.	▪ Purchase right-of-way and adjust utilities to reconstruct the mainlanes between W. Little York and FM 529 and the interchange of US 290 with Sam Houston Tollway. ▪ Active Traffic Management—Study strategies and funding options. ▪ Travel Options—Feasibility study.

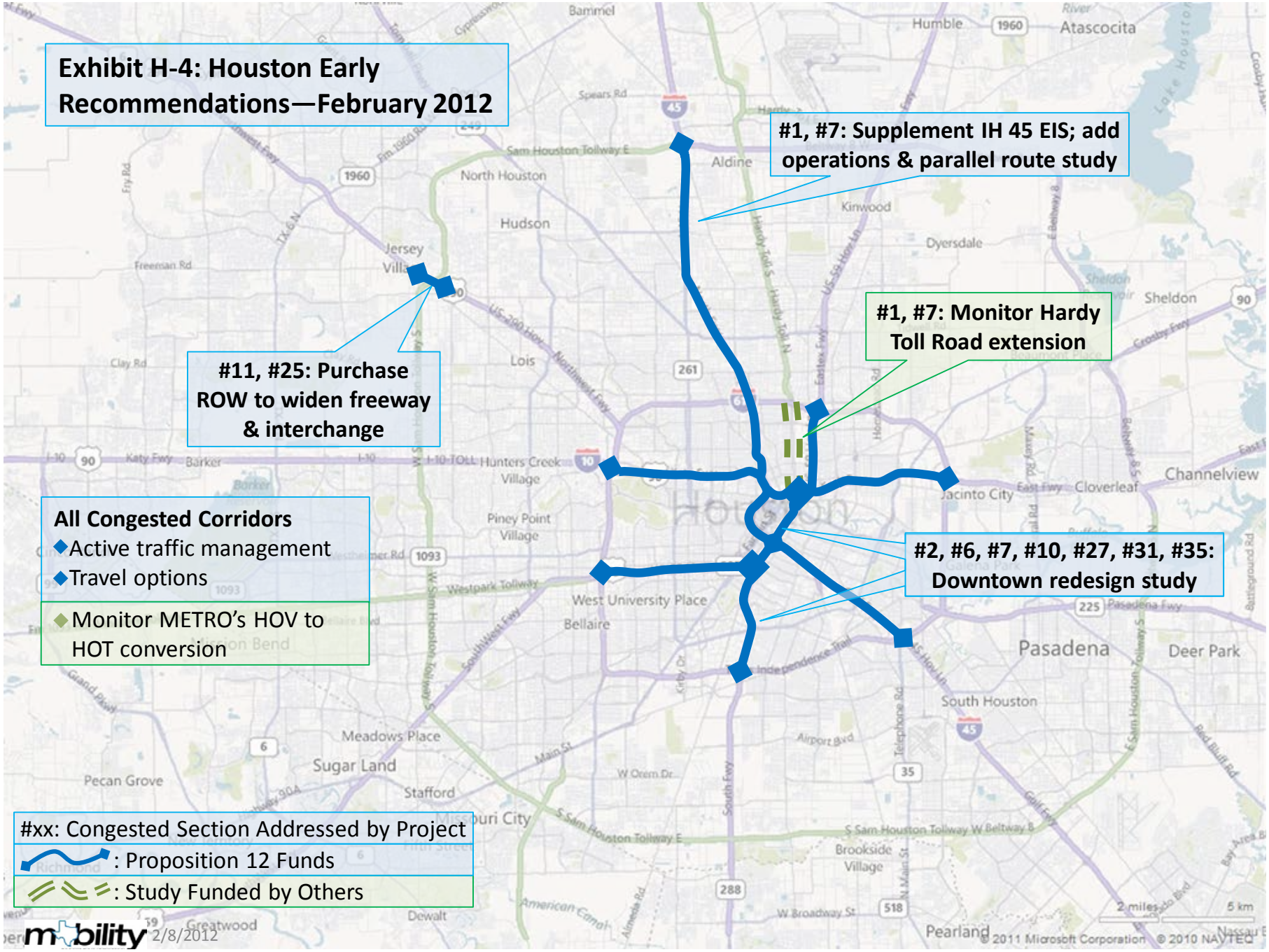


Exhibit H-4: Houston Early Recommendations—February 2012
#1, #7: Supplement IH 45 EIS; add operations & parallel route study
#1, #7: Monitor Hardy Toll Road extension
#11, #25: Purchase ROW to widen freeway & interchange
#2, #6, #7, #10, #27, #31, #35: Downtown redesign study
All Congested Corridors
Active traffic management
Travel options
Monitor METRO's HOV to HOT conversion
#xx: Congested Section Addressed by Project
: Proposition 12 Funds
: Study Funded by Others
Bammel
Humble
Atascocita
Aldine
North Houston
Hudson
Kinwood
Dyersdale
Sheldon
Jersey Village
Lois
Hunters Creek Village
Piney Point Village
Cloverleaf
Channelview
Jacinto City
West University Place
Bellaire
Pasadena
Deer Park
South Houston
Meadows Place
Sugar Land
Pecan Grove
Stafford
Missouri City
Brookside Village
Pearland
Greatwood
Dewalt
2 miles
5 km
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The early recommendations described above represent the first step in the process of reducing congestion on the worst corridors in the state. A larger project involving construction, operation, management, and travel option strategies will follow the early recommended actions. The following table identifies possible projects in the Houston metropolitan area and the amount of funds and timeframe for project implementation. Large construction projects have recently been completed on many congested Houston corridors; those will likely not see any major projects until other corridors are addressed.

Exhibit H-5: Summary of Possible Large Projects for Houston Congested Corridors

Rank	Corridor	Large Projects	Rider 42 Funding Estimate	Estimated Implementation Funds Needed*	Implementation Timeframe
11, 25	US 290	Construction and Design of US 290 at the BW8 Interchange	$78M for ROW at BW8 Interchange	$140M (Prop 12)	2012 to 2013 (Environmental clearance has been obtained)
		Reconstruct US 290 and add mainlanes and managed lanes	—	Total Cost: $2.7B (Available funding from Prop 12, Prop 14 & MPO: $1.24B) Needed Funding: $1.46B	2014 to 2019
1, 7	IH 45 North	Reconstruct mainlanes and add managed lanes	—	$2.0B	In environmental impact study phase
		Feasibility study for mobility improvements along parallel surface routes	$2.0M	TBD**	2014 to 2015
1, 7	Hardy Toll Road	Extend into downtown	—	$400M (HCTRA)	In design phase
2, 10	US 59	Reconstruct to 6 mainlanes and 4 managed lanes from SH 288 to Spur 527	—	$233M (HGAC RTP/TIP)	TBD (as a result of IH 45 North EIS and Downtown Redesign study)
		Widen to 8 and 10 lanes with managed lanes from IH 45 to SH 288	—	$622M (HGAC RTP/TIP)	
		Widen to 12 lanes from IH 45 South to IH 10 East	—	$190M (HGAC RTP/TIP)	—
		Direct connectors from IH 610 West (both NB and SB) to US 59 SB	—	$81.5M (TxDOT Houston District)	—
2, 6, 7, 10, 27, 31, 35	Downtown Corridors Inside Loop 610	Downtown redesign study that will identify strategies to reduce congestion on sections of IH 45, US 59, SH 288, and IH 10.	$5.0M	TBD**	—

All Congested Corridors				
Operational Improvements	Engineering study to identify operational treatments and incident management strategies	$0.85M	TBD**	2014 to 2015
Travel Options	Engineering study to examine regional travel options along the corridors.	$0.5M	TBD**	2013 to 2014
TOTAL		**$86.35M**	**~6.367B**	

Remaining Houston Rider 42 allocation: $29.874M.
*Source of implementation funds noted if known.
**To be determined by additional study or design.

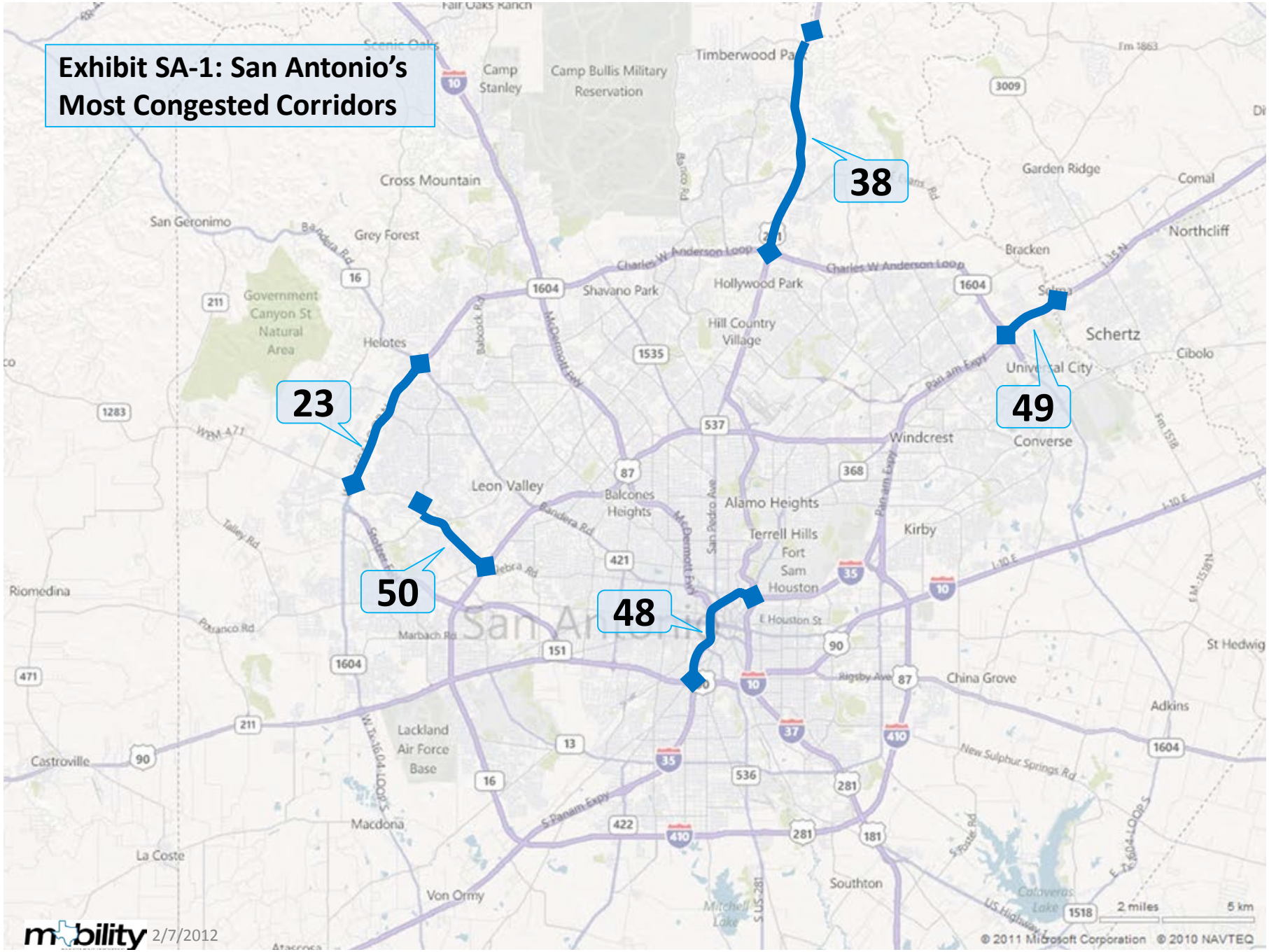
SAN ANTONIO

Five of the state's 50 most congested corridors are in San Antonio (Exhibit SA-1). Recent implementations of congestion reducing designs and improved operations on US 281, Loop 1604, and Culebra Road have improved travel times in those corridors (Exhibit SA-2).

Improvements for the two most congested corridors in the San Antonio area, SL 1604 and US 281, are being examined in environmental impact studies conducted by the Alamo Regional Mobility Authority. These environmental studies will be monitored over the coming months. If the Alamo RMA decides to not pursue a project in these corridors, there may be a need to re-examine the potential for a project implemented by another agency.

The IH 35 corridor is being examined jointly by TxDOT and Alamo RMA using a process termed a Planning and Environmental Linkages (PEL) study. The PEL process uses previous study findings and builds upon those findings through additional planning analysis and public discussion about improvement strategies that address the corridor problems. Numerous capacity alternatives, including additional mainlanes and managed lane projects, as well as other modes of transportation, are studied to meet the long-range transportation demand. The PEL study will also identify short-range transportation improvements to improve efficiency of the corridor. Detailed environmental studies should begin immediately following the PEL studies. Other major corridors should be studied to provide information about alternate routes for the IH 35 corridor, particularly for long-distance trucks traveling through San Antonio.

A summary and map of the recommended actions that will affect each congested corridor is included in Exhibits SA-3 and SA-4 after the individual corridor summaries. Information regarding large projects with significant congestion reduction potential, their estimated implementation cost, and implementation timeframe is included in Exhibit SA-5.



mobility 2/7/2012

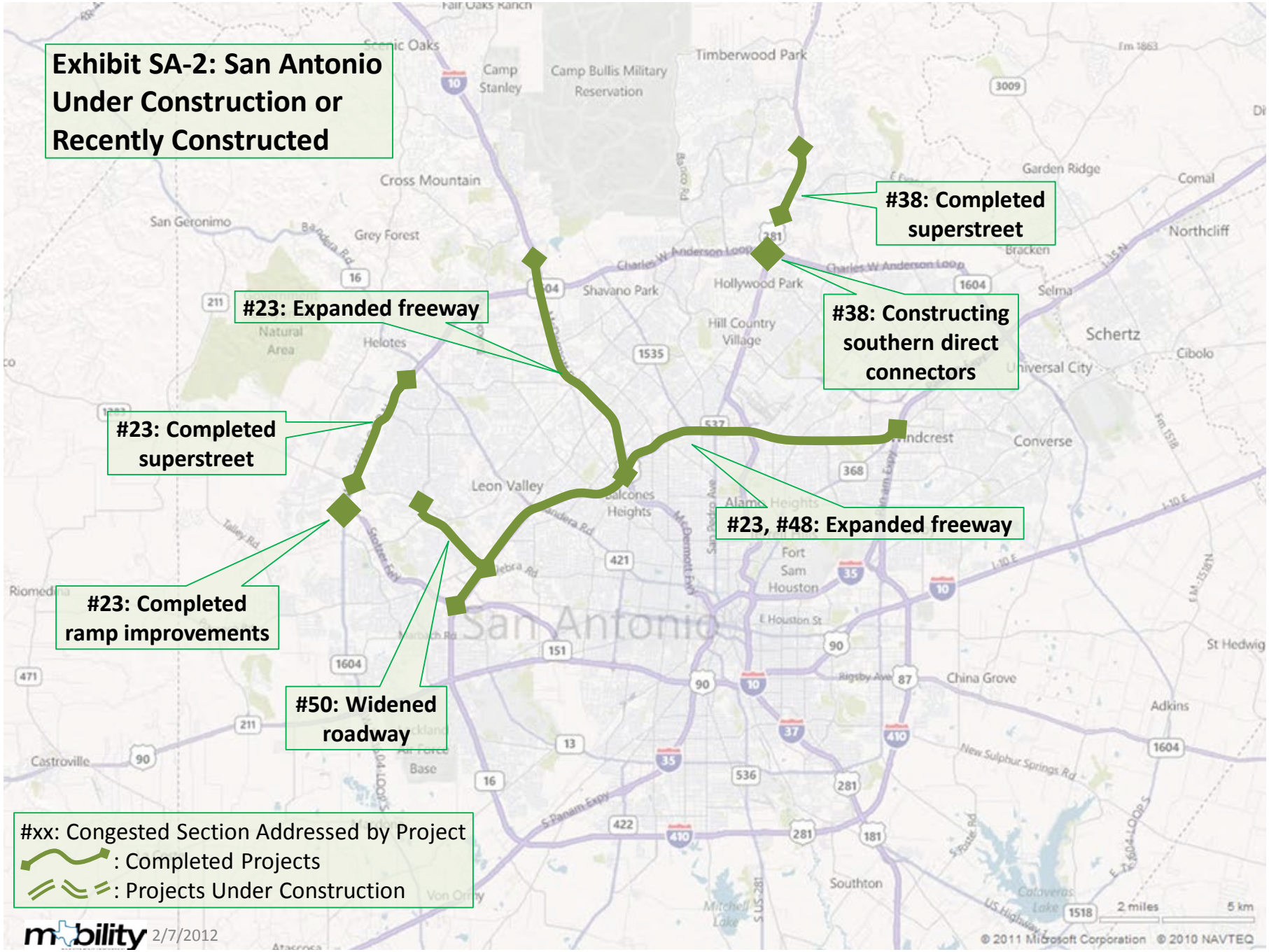


Exhibit SA-2: San Antonio Under Construction or Recently Constructed
#38: Completed superstreet
#38: Constructing southern direct connectors
#23: Expanded freeway
#23: Completed superstreet
#23, #48: Expanded freeway
#23: Completed ramp improvements
#50: Widened roadway
#xx: Congested Section Addressed by Project
: Completed Projects
: Projects Under Construction
mobility 2/7/2012
Camp Stanley
Camp Bullis Military Reservation
Timberwood Park
Cross Mountain
San Geronimo
Grey Forest
Shavano Park
Hollywood Park
Hill Country Village
Garden Ridge
Comal
Northcliff
Selma
Schertz
Cibolo
Universal City
Converse
Helotes
Natural Area
Leon Valley
Balcones Heights
Alamo Heights
Fort Sam Houston
San Antonio
E Houston St
China Grove
Adkins
St Hedwig
Castroville
Riomedina
Southton
Cataveras Lake
2 miles
5 km
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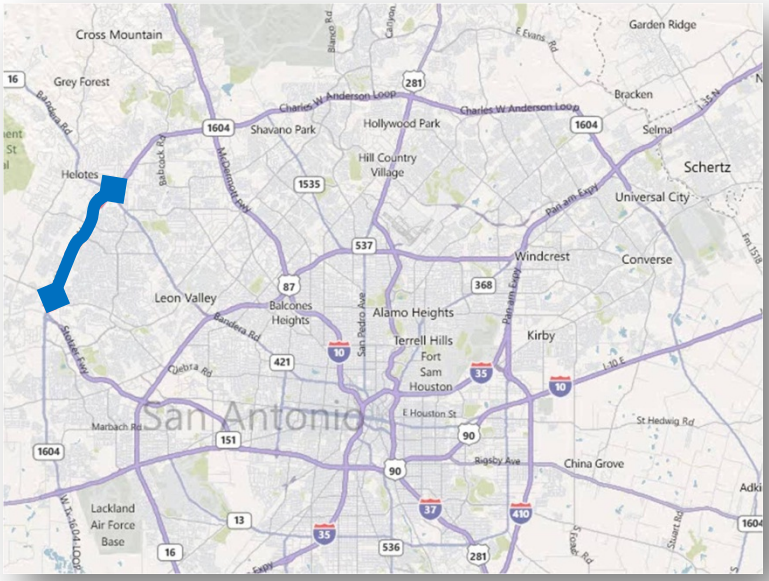
STATE LOOP 1604

SH 16 (Bandera Road) to FM 471 (Culebra Road)

Current Conditions

South of Bandera Road and towards Braun Road, Loop 1604 transitions from a freeway section to a 4-lane divided highway with signalized intersections. Traffic lights and turnarounds improve traffic flow, but there is significant congestion. Current congestion slowdowns occur near equally both in the morning and evening rush hours. However, eastbound traffic does not slow down as much during both rush hour periods as does westbound traffic.

- Segment Length: 5.5 miles
- Road Type: 4-Lane divided highway
- Annual Hours of Delay: 552,000
- Texas Congestion Index: 1.33
- Commuter Stress Index: 1.36

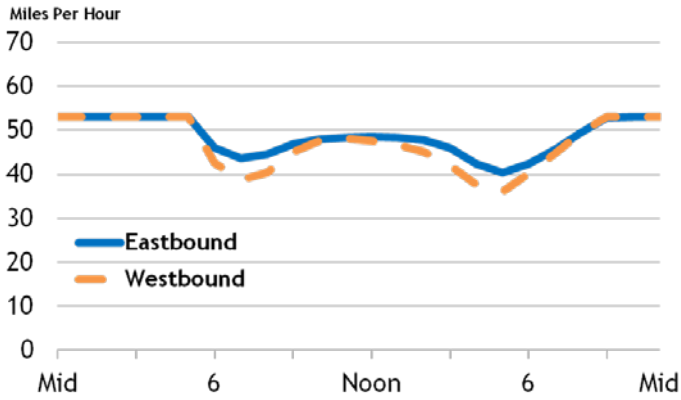


Rank: 23

Annual Hrs of Delay/Mile:	**101,000**
Congestion Time:	**4 Hours**
Annual Cost of Delay:	**$13.5 million**
Average Daily Traffic:	**63,000 Vehicles**

Possible Congestion Causes

Residential and commercial land development has grown extensively in recent years. Traffic volume surpassed the capacity of the current facility and causes recurring congestion.



Projects in Progress or Completed

Superstreet Improvements

The Loop 1604 superstreet improvement was completed in September 2011. Two other projects to reduce congestion and improve safety included intersection improvements at Braun Road and ramp and a frontage road reconfiguration south of Culebra Road. Signal timing operations for the superstreet will be maintained by the City of San Antonio.

- Improvements at Braun Road were environmentally cleared and constructed by the Texas Department of Transportation (TxDOT).
- Alamo Regional Mobility Authority (Alamo RMA) environmentally cleared the operational improvement and reconfiguration of intersections to the superstreet design at New Guilbeau Road and Shaenfield Road in September 2010; construction began in March 2011. The San Antonio District of TxDOT oversaw construction for this phase, with $6.3 million in funding from one-time federal sources.

SH 151 Underpass
The underpass of SH 151 at Loop 1604 is under environmental review; if constructed it will relieve a congestion bottleneck.

Corridor Improvements
Alamo RMA is currently working on the Environmental Impact Statement (EIS) for SL 1604 corridor improvements across the west, north, and east sides of the city, including this congested corridor. Several public meetings have been held, and Alamo RMA maintains an active web site, Twitter account, and Facebook page for the future project.

Expansion
In October 2011, Bexar County completed widening from two to four lanes on Shaenfield Road just north of Culebra Road.

Park and Ride
VIA Transit has an interim park and ride facility two miles south of Culebra Road at SL 1604 and Military Drive/Sea World Drive.

Planning Efforts to Date

Expansion of SL 1604
Options studied in the Alamo RMA corridor EIS include:

- Widening the existing facility (both divided highway and freeway sections),
- Providing tolled managed lanes,
- Managed lane HOV/HOT lane options

Other aspects of the corridor situation and future plans include:

- Local opposition to tolling in the corridor has been strong for years.
- When construction moves forward, Alamo RMA will require the construction contractor to provide incident clearance during construction.
- Any future tolling improvements will be done with electronic tolling.
- Dynamic message signs and cameras will be used for traffic management in the corridor, in cooperation with TxDOT.

Planned Improvements
The San Antonio-Bexar County Metropolitan Planning Organization's (MPO) Metropolitan Transportation Plan (MTP)/Transportation Improvement Program (TIP) includes the following projects related to this portion of SL 1604:

- Expand to a 6-lane toll expressway from W. Military Dr. to Braun Road with non-tolled frontage roads, including two tolled direct connectors at SH 151. Total project cost for this improvement is $226 million.
- Expand from a 4-lane to an 8-lane expressway (with tolling on the four new mainlanes) from Braun Road to SH 16 with non-tolled frontage roads. Total cost of this project is $62.6 million.
- Expand from a 4-lane to an 8-lane expressway (with tolling on the four new mainlanes) from SH 16 to NW Military Highway with non-tolled frontage roads, including two tolled direct connectors at IH 10. Total project cost for this portion of the Loop 1604 improvements is $308.8 million.
- The MPO MTP/TIP currently includes plans by TxDOT to construct a grade separation at Marbach Road with $19 million funded by state sources.

Next Steps

- There is local agency agreement and support for more aggressive incident management methods to improve mobility and congestion in the San Antonio area. **Improved incident management and related agency coordination** in quickly clearing crashes and disabled vehicles will reduce incident-related delay and congestion.
- **Broad deployment of advanced traveler information systems** (including dynamic message signs and camera monitoring) in cooperation with TxDOT has been identified as a city-wide congestion management measure. The TransGuide traffic management center does not cover the Loop 1604 west corridor. TransGuide can be improved with electronic signs, which provide updated traffic information and other traffic management solutions to travelers. Funding for the expansion and maintenance of additional traffic management devices and services has not been identified.
- **Superstreet operation should be monitored and signal timing adjusted** in the corridor to ensure the best possible operation of the existing road.
- There is local agency agreement and support for **increased travel demand management activity and strategy deployment** in San Antonio. Likely champions of these activities in the San Antonio region are the Alamo Area Council of Governments and VIA Metropolitan Transit. Studies can determine the most effective travel demand management strategies for the region and the potential to form Transportation Management Associations (TMAs) in cooperation with major employers in the region.
- **Monitor the progress of the Alamo RMA EIS for this corridor** (to be completed mid to late 2012) as it is reviewed by TxDOT and the FHWA, and released to the public. Provide technical and public information support, as needed, during this process and in support of any future project identified by the EIS. Assuming the outcome of the EIS includes tolled mainlanes along Loop 1604 West, construction of the project could begin by May 2013, and take four years to complete. Overall construction for Loop 1604 from US 90 on the west side to IH 35 in northeastern San Antonio is expected to cost between $770 million and $1.47 billion, depending on which alternative is preferred in the EIS.

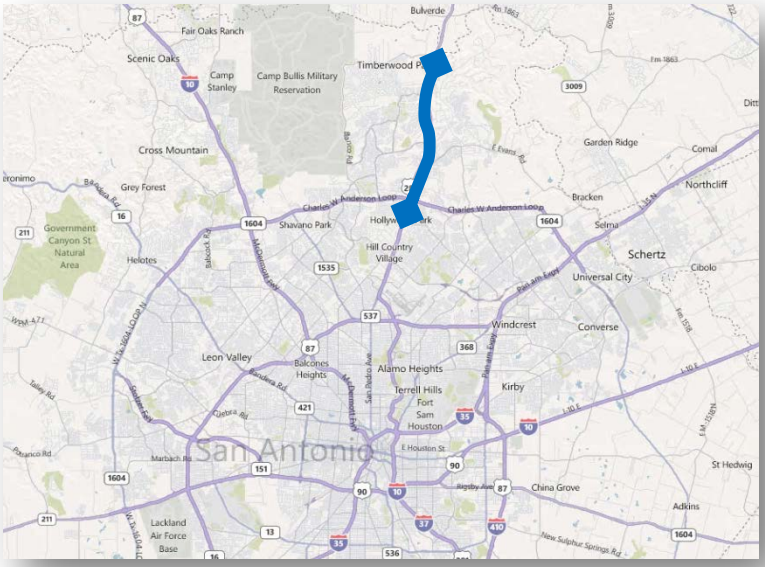
US 281

Comal County Line to SL 1604 (Anderson Loop)

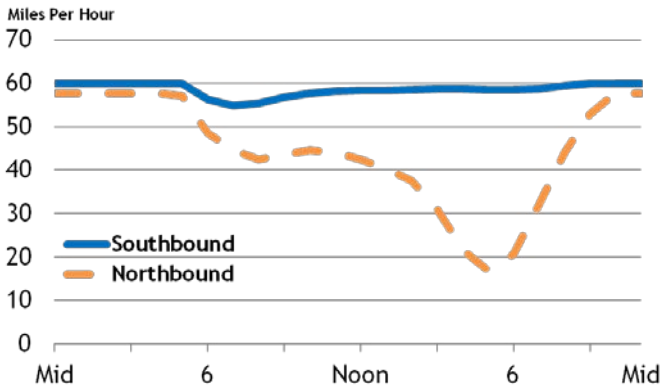
Current Conditions

U.S. Highway 281 North is a multi-lane divided highway in a developing suburban corridor. U.S. 281 south of Loop 1604 is a typical Texas freeway with mainlanes and frontage roads; however, the expressway ends just north of Loop 1604. A superstreet design along some of the corridor has reduced delays, fuel consumption, driver frustration, and vehicle emissions, but congestion remains a significant problem. US 281 experiences the worst congestion and slowdowns in the northbound direction, specifically during the evening rush hour period. Southbound traffic experiences minimal slowdowns only during the morning.

- Segment Length: 7.5 miles
- Road Type: 4- to 6-Lane divided highway
- Annual Hours of Delay: 1,035,000
- Texas Congestion Index: 1.62
- Commuter Stress Index: 2.00



Rank:	**38**
Annual Hrs. of Delay/Mile:	**137,000**
Congestion Time:	**10 Hours**
Annual Cost of Delay:	**$25.9 million**
Average Daily Traffic:	**54,000 Vehicles**



Possible Congestion Causes

Most of the congestion along the US 281 corridor is directional: delays occur inbound in the morning and outbound in the afternoon. Traffic volume has significantly increased because of rapid residential development in the surrounding area in recent years. The growth in homes has dramatically outpaced expansion of the roads causing significant congestion, particularly in the evening rush hours.

Completed Projects

Superstreet Configurations North of Loop 1604

A superstreet high-capacity street configuration was completed in October 2010 on four intersections north of Loop 1604: Marshall Road, Stone Oak Parkway, Evans Road and Encino Rio. The project used $5 million of one-time federal stimulus funding. The project increased the amount of green time at signals on the US 281 corridor by reducing the number of turns.

Bus and Park and Ride Services

VIA Metropolitan Transit has a temporary express bus park and ride facility at the south end of the corridor, as well as a local route servicing the Loop 1604/US 281 interchange area.

Expansion of Blanco Road/FM 2696
This stretch, which parallels US 281 to the west, was expanded from two lanes to four lanes with median treatments beginning in 2008. The project opened in November 2010 and was funded by pass-through financing supported by TxDOT (70 percent of the $30 million cost). San Antonio Advanced Transportation District (ATD) tax proceeds covered the remaining cost. This was the first project completed under a pass-through financing agreement between Bexar County and TxDOT.

Expansion of Bulverde Road
Bulverde Road, which parallels US 281 to the east, was recently expanded by Bexar County from two lanes to four lanes with medians from Evans Road to Marshall Road.

Projects in Progress

Direct Connector Ramps
American Recovery and Reinvestment Act/federal stimulus funding is being used to add four direct connect ramps to the US 281/Loop 1604 interchange. The total construction cost of the four south-side direct connectors and associated improvements is $145.2 million.

Corridor Improvements
The Alamo Regional Mobility Authority (ARMA) is working on an Environmental Impact Statement (EIS) for corridor improvements between Loop 1604 and the Bexar/Comal County Line. ARMA is aggressively pursuing public input (twice the required number of public meetings have been held, and the RMA has an active web site, Twitter account, and Facebook page for the project).

Traffic Signals
TxDOT is completing the installation of traffic signals at the Sonterra interchange, just north of Loop 1604. The cost of this project was $68,000, and it is expected to resolve localized congestion at this interchange.

Expansions
The City of San Antonio is using bond funding to expand Bulverde Road from Loop 1604 to Evans Road from two lanes to seven lanes with medians, sidewalks and bicycle lanes. Improvements to the Bulverde Road/Evans intersection are scheduled for completion in March 2012, while the roadway expansion to the south will continue well into 2012.

Additional expansion projects affecting this corridor are summarized in the table below.

Planning Efforts to Date

Expansions of US 281
Options for US 281 improvements studied in the Alamo RMA corridor EIS include:

- Widening the existing divided highway
- Non-tolled freeway with frontage roads
- Tolled freeway with non-tolled frontage roads
- Overpass construction at major crossings
- Managed lane HOV/HOT lane options

Road Expansions	Location	Stage
Bulverde Phase IV	Marshall Road to 1.2 miles north of Marshall	being designed for an expansion from two lanes to four lanes with shoulders and curbs
Bulverde Phase V	Bulverde Phase IV to Smithson Valley	preliminary design phase to widen the existing 2-lane roadway to a 4-lane road with shoulders
Borgfeld Phase I	Timberline to US 281	final design stage for a reconstruction from a 2-lane street to a 4-lane road with shoulders
Borgfeld Phase II	Blanco to Timberline	awaiting right-of-way clearance for an expansion from two lanes to a 4-lane road with shoulders

In an October 2011 newsletter, the RMA informed the public that the expansion of US 281 with overpasses at cross streets and frontage roads between intersections was eliminated from future consideration by the EIS team. Other aspects of the corridor situation and future plans include:

- Local opposition to tolling in the corridor has been strong for years.
- When construction moves forward, Alamo RMA will require the construction contractor to provide incident clearance during construction.
- Any future tolling improvements will be done with electronic tolling.
- Dynamic message signs and monitoring cameras will be used for traffic management in the corridor, in cooperation with TxDOT.
- Ensure adequate right-of-way is preserved for future high-capacity transit options and maintained on US 281 as part of any added capacity projects.

Toll Expressway

The San Antonio-Bexar County Metropolitan Planning Organization's (MPO) Metropolitan Transportation Plan (MTP)/Transportation Improvement Program (TIP) includes a project to expand this corridor to a 6-lane toll expressway with non-tolled outer 2- and 3-lane frontage roads and non-tolled north-side direct connector ramps at Loop 1604. Total project cost for the tolled expressway expansion is $462.5 million, while the non-tolled northern direct connectors at the Loop 1604 interchange have a total cost of $59 million.

Future Transit Center

VIA Metropolitan Transit has a plan for a future transit center near the middle of the corridor at US 281 and Stone Oak Parkway. The center will serve a local route, as well as express bus service to downtown San Antonio.

Next Steps

- The Alamo Regional Mobility Authority is currently constructing four of the eight direct connector ramps at the US 281/Loop 1604 interchange at the southern end of this congested corridor. The ramps are to be completed by May 2013, with other improvements completed by February 2014. Funding exists for the four northern direct connectors that will complete the interchange, but design work for those connectors has not yet been funded and performed. Utilize Rider 42 funding to **perform the design work necessary for the four northern direct connector ramps at the US 281/Loop 1604 interchange**. The record of decision on the US 281 EIS must first be approved before these connectors are built. Assuming this occurs by December 2013, construction could begin by mid-2014 and completed by late 2018 (The connectors and US 281 improvements would be built simultaneously).
- There is local agency agreement and support for **more aggressive incident management methods** to improve mobility and congestion in the San Antonio area. Improved incident management and related agency coordination in quickly clearing crashes and disabled vehicles will reduce incident-related delay and congestion.
- **Broad deployment of advanced traveler information systems** (including dynamic message signs and camera monitoring), in cooperation with TxDOT, has been identified as a city-wide congestion management measure. The TransGuide traffic management center does not cover the US 281 north corridor. TransGuide can be improved with electronic signs, which provide updated traffic information and other traffic management solutions to travelers. Funding for the expansion and maintenance of additional traffic management devices and services has not been identified.
- There is local agency agreement and support for **increased travel demand management activity and strategy deployment** in San Antonio. Likely champions of these activities in the San Antonio region are the Alamo Area Council of Governments and VIA Metropolitan Transit. Studies can determine the most effective travel demand management strategies for the region and determine the potential to form Transportation Management Associations (TMA) in cooperation with major employers in the region.
- **Superstreet operation should be monitored and signal timing adjusted** in the corridor to ensure the best possible operation of the existing road.
- **Monitor the progress of the Alamo RMA EIS for this corridor** (to be completed mid to late 2013) as it is reviewed by TxDOT and the FHWA and released to the public. Provide technical and public information support, as needed, during this process and in support of any future project identified by the EIS. Depending upon which alternative is ultimately identified in the EIS, construction cost for US 281 is expected to be between $403 million and $703 million. Assuming the EIS is finalized and a record of decision is made by the end of 2013, construction could begin in mid-2014 and be completed by late 2018.

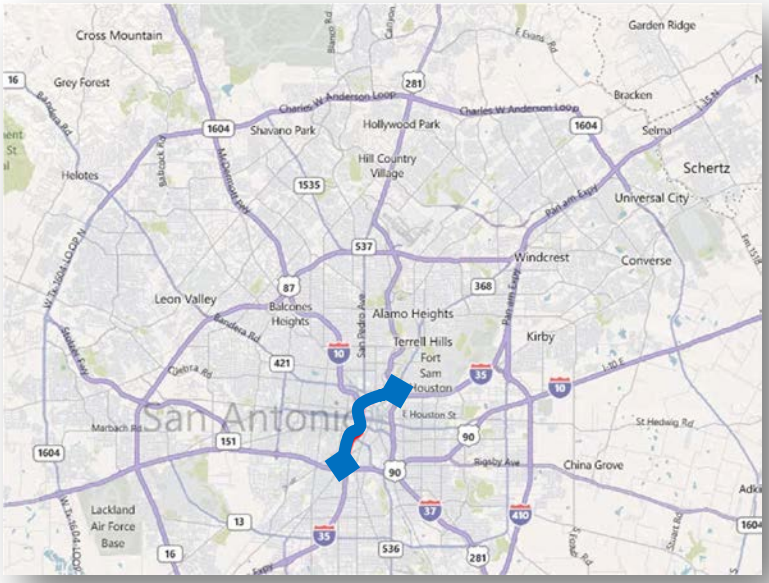
IH 35 (N. PAN AM EXPY)

Loop 353 (Nogalitos St.) to US 281

Current Conditions

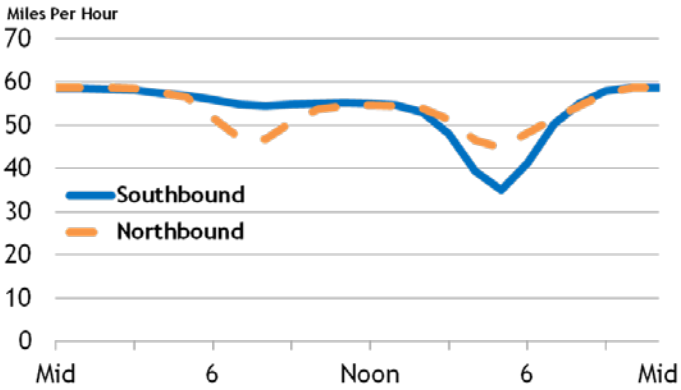
IH 35, a major interstate freeway and international trade corridor, passes through the city of San Antonio from northeast to southwest. IH 10 West joins with IH 35 along the western side of downtown. IH 35 splits into upper and lower levels (two lanes each) across the north side of downtown. This section of IH 35 follows a typical morning inbound/evening outbound congestion pattern; however, the evening rush hour period experiences significantly slower speeds than the morning period.

- Segment Length: 4.2 miles
- Road Type: Multi-lane expressway
- Annual Hours of Delay: 733,500
- Texas Congestion Index: 1.30
- Commuter Stress Index: 1.42



Rank: 48

Annual Hrs. of Delay/Mile:	**175,000**
Congestion Time:	**3 Hours**
Annual Cost of Delay:	**$18 million**
Average Daily Traffic:	**179,000 Vehicles**



Possible Congestion Causes

The corridor has complex configurations near downtown, with upper and lower decks on IH 35 and major interchange ramps connecting facilities (IH 37/US 281, IH 10, US 90). IH 35 is a major NAFTA trade route in the south central US, and commercial traffic from Laredo (IH 35) and Corpus Christi and the Lower Rio Grande Valley (IH 37) combine with daily commuter and visitor traffic in this corridor. On the west side of downtown, the IH 35 and IH 10 routes overlap, and northeast of downtown IH 35 serves Fort Sam Houston and the San Antonio Military Medical Center.

Projects in Progress or Completed

TranGuide Monitoring

The corridor is monitored by the TransGuide (TxDOT San Antonio) traffic management center, using video cameras and dynamic messages signs throughout the corridor.

Interchange Improvements

The Loop 410 South Interchange (i.e., IH 35/ Loop 410 South) near Fort Sam Houston and the San Antonio Military Medical Center (formerly Brooke Army Medical Center) will have $25 million of additional improvements in 2013 from a Department of Defense Office of Economic Adjustment Grant to the City of San Antonio.

Operations Improvements
Operational improvements funded by Proposition 12 will begin in 2013 along IH 35 north of this congested segment. TxDOT issued a Notice of Interest to consultants in October 2011 to bid on the analysis and development of plans for $18.5 million of congestion reduction improvements to the IH 35 corridor between IH 10/US 90 and the IH 35/Loop 410 North Interchange. There is, however, no funding to make physical improvements to IH 35 between IH 10/US 90 and IH 37/US 281.

Bus and Park and Ride Services
VIA has added express bus service and multiple transit routes to the University of Texas at San Antonio's (UTSA) downtown campus, which is adjacent to the corridor west of downtown.

Future Transit Center
VIA purchased property west of downtown and IH 35 for a future west side transit center.

Bus Rapid Transit
VIA adopted a long-range plan known as SmartWaySA in July 2011 that outlines phases of transit improvements for the greater San Antonio area and includes a near-term (2015) implementation of bus rapid transit (BRT) in the corridor northwest of downtown.

VIA's first BRT line, initiating VIA Primo service, will extend from its future west side transit center along Fredericksburg Road through the South Texas Medical Center to the UTSA main campus on Loop 1604. This route will provide a viable connection between the UTSA campuses, the South Texas Medical Center, and downtown, removing some IH 10 traffic using IH 35 near the downtown area. Additionally in Fall 2011, the Federal Transit Administration's Bus Livability Program funded an extension of the VIA Primo service to serve the suburban community of Leon Valley.

SmartWaySA includes an east-west and north-south urban streetcar rail service component in the downtown area. The east-west line connects an existing transit center east of downtown with VIA's future west side multimodal transit center; the north-south line parallels IH 35 and IH 37 in the downtown area. In line with the SmartwaySA, VIA adopted a five year capital improvements plan to include funding the north-south and east-west downtown streetcar system, improvements to the east transit center (Robert Thompson), Phase 2 Improvements to the west-side multimodal facility, the US 281 Park and Ride, and the Brooks Transit Center totaling $240 million. In late 2011, the City of San Antonio, Bexar County and VIA made an agreement to jointly fund these projects with the consideration of ATD bonding capacity and other funding mechanisms.

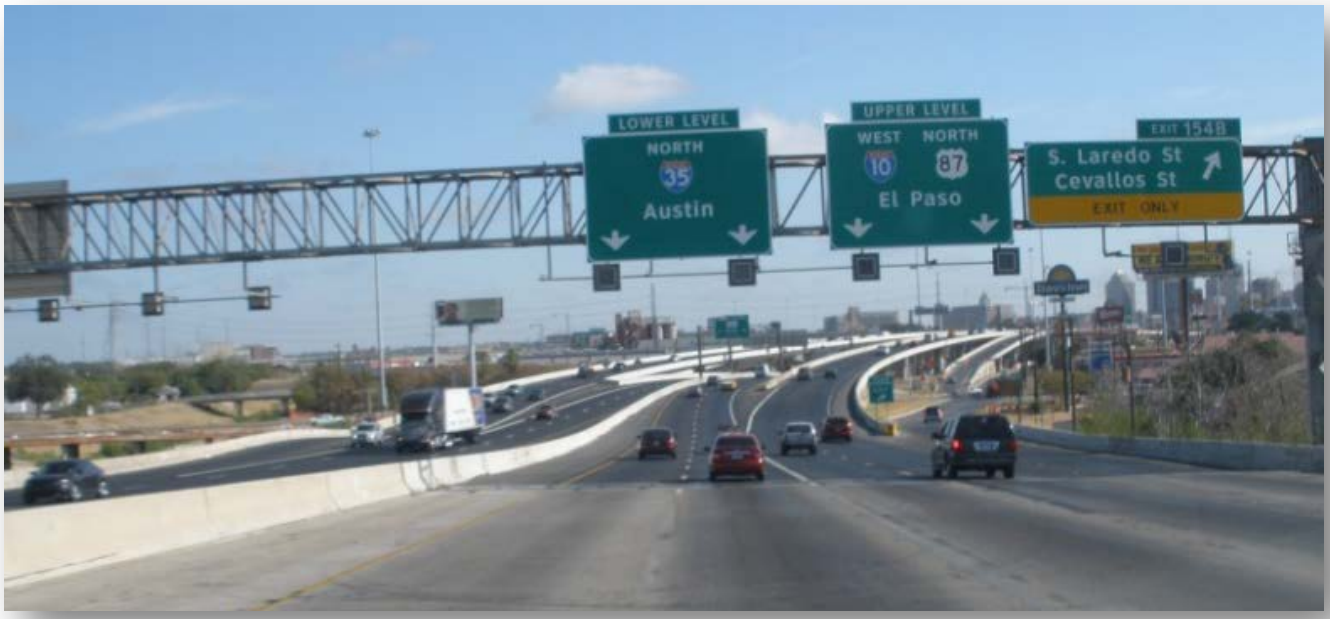
Planning Efforts to Date

Needs Assessment
The Alamo RMA and TxDOT are partnering on a Planning and Environmental Linkages (PEL) Study to determine the long-term needs and viable improvement alternatives for the IH 35 corridor from US 281/IH 37 to FM 1103. This study is scheduled to be complete by the summer of 2012.

Expansion of IH 35
The MPO TIP currently includes the following project related to this portion of IH 35: expand from a 6-lane to 10-lane expressway (tolling the four new mainlanes)

- From US 281/IH 37 to near the Loop 410 South interchange.
- Total project cost of $335.5 million is estimated for this improvement.

My35
The recent award-winning public involvement process and long-term planning initiative, MY 35, conducted by TxDOT on the IH 35 corridor through Texas recommended a number of short-term operational improvements and long-term freeway expansion needs along this portion of the IH 35 corridor.



My35—Short Term Adjustments
Immediately implementable short-term recommendations that could affect this portion of IH 35 included:

- Improve incident management and related agency coordination so collisions and disabled vehicles can be cleared quicker and delays can be minimized.
- Use improved technology such as electronic signs to provide updated traffic information, alternative routes, and other traffic management solutions to travelers.

My 35—Long-Term Improvements
Long-term, capital-intensive recommendations for this portion of IH 35 included:

- IH 35 improvements from the Williamson/Bell County Line to IH 10; estimated cost $2.7 billion to $3.85 billion for a minimum of four lanes in each direction (8-lane facility).
- IH 35 HOV/toll lane from SH 45SE in Austin to IH 10 (estimated cost $6.2 billion to $8.85 billion, excluding right-of-way).
- IH 35 improvements from US 90 to the Atascosa County Line to provide four travel lanes each direction (estimated cost $150 million, not including right-of-way).
- Passenger rail alternatives from Laredo to Dallas/Fort Worth (estimated cost $30 billion to $50 million).
- Freight rail relocation to allow commuter rail to use existing tracks paralleling IH 35 between San Antonio and Taylor (estimated to exceed $2.4 billion based on studies performed by TxDOT in 2008).
- Improvements to alternative routes within San Antonio to link with SH 130 in Seguin, including IH 10 from SH 130 to IH 35, Loop 410 from IH 10 to IH 35, and Loop 1604 on the south side of San Antonio from IH 10 to US 90. Collectively, these projects are expected to cost between $3.2 billion and $4.65 billion, not including right-of-way.

Commuter Rail
LoneStar Rail District Commuter Rail Project from Austin to San Antonio is currently in the preliminary phase of the development process. The project costs are estimated at $2 billion, but the project is not funded.

Expansion of SH 130
Completion of SH 130 from Georgetown to IH 10 (in Seguin) is expected to provide some traffic relief through downtown San Antonio.

Next Steps

- There is local agency agreement and support for more aggressive incident management methods to improve mobility and congestion in the San Antonio area. **Improved incident management and related agency coordination** in quickly clearing crashes and disabled vehicles will reduce incident-related delay and congestion.
- **Broad deployment of advanced traveler information systems** (including dynamic message signs and camera monitoring) in cooperation with TxDOT has been identified as a city-wide congestion management measure. TransGuide can be improved with electronic signs, which provide updated traffic information and other traffic management solutions to travelers. Funding for the expansion and maintenance of additional traffic management devices and services has not been identified.
- There is local agency agreement and support for **increased travel demand management activity and strategy deployment** in San Antonio. Likely champions of these activities in the San Antonio region are the Alamo Area Council of Governments and VIA Metropolitan Transit. Studies can determine the most effective travel demand management strategies for the region and determine the potential to form Transportation Management Associations (TMAs) in cooperation with major employers in the region.
- **Provide support and feedback to TxDOT** and their consultants on the IH 35 operational improvements study that will be initiated in the winter of 2011 (from IH 10/US 90 to Loop 410 North).
- **Conduct Planning and Environmental Linkages (PEL) studies** on IH 35 in the downtown area and along alternative routes to IH 35 in San Antonio. PEL studies and their proactive public involvement efforts will define the type and scope of long-term improvements to the IH 35 corridor and its alternate routes (i.e., Loop 410 southwest, Loop 410 south and east, IH 10 east, and Loop 1604 east), including consideration of past corridor planning efforts and strategies to reduce congestion. Each PEL study will identify both near-term and longer-term, large-scale improvements and the scope and cost associated with recommended projects.
- **Conduct a parking management study** for downtown San Antonio and major employers. Local transportation agencies have identified parking management as one potential strategy for alleviating congestion along major travel routes (such as IH 35) into the urban core. The proposed study will examine available parking resources and examine parking pricing and policy options for their potential to influence traveler behavior and mode choice into the downtown area.
- Work with local agencies (most likely VIA) to **identify a champion for a study of temporary shoulder use (bus on shoulder)**. Though bus use of shoulders is currently precluded by state law, the IH 35 corridor in downtown San Antonio is limited in opportunities for capacity expansion. Buses using the shoulder has been identified as one method of supporting VIA Metropolitan Transit's future downtown transportation center initiatives.

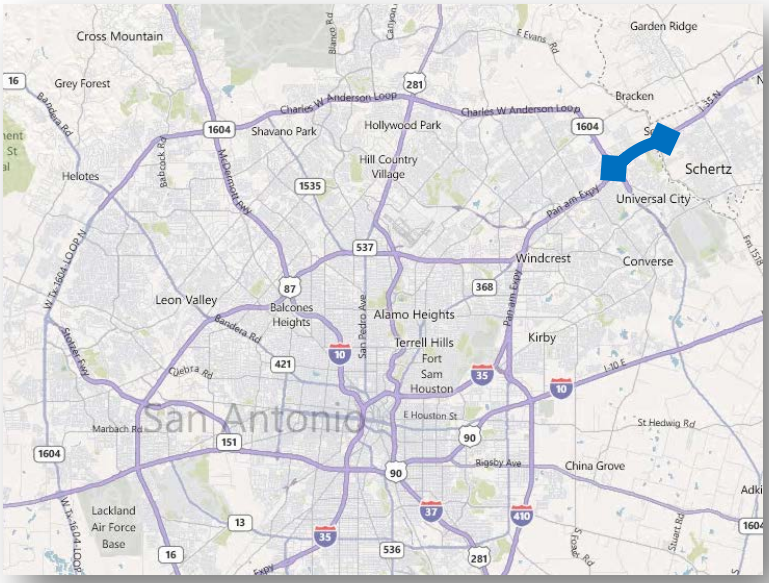
IH 35

FM 1518 (Evans Road) to Loop 1604

Current Conditions

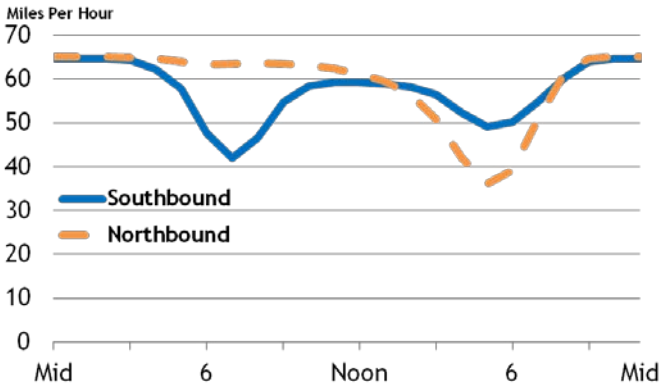
IH 35, a major interstate freeway and international trade corridor, serves a mixture of commuting and freight traffic during a typical weekday. Immediately north of Loop 1604, IH 35 is a 6-lane freeway with continuous frontage roads. This more suburban section of IH 35 follows the traditional daily commute congestion pattern: inbound morning/outbound evening traffic. Southbound traffic still experiences slowdowns in the evening in addition to northbound traffic.

- Segment Length: 2.1 miles
- Road Type: 6-Lane expressway
- Annual Hours of Delay: 326,000
- Texas Congestion Index: 1.40
- Commuter Stress Index: 1.58



Rank: 49

Annual Hrs. of Delay/Mile:	**152,000**
Congestion Time:	**6 Hours**
Annual Cost of Delay:	**$20.4 million**
Average Daily Traffic:	**103,000 Vehicles**



Possible Congestion Causes

Rush hours feature high levels of inbound morning and outbound evening traffic. Daily commuter traffic mixes with international commercial traffic in this major central US NAFTA corridor, which connects to the high-volume inland port of Laredo and sea ports in Corpus Christi and Brownsville. Local communities around this portion of IH 35 (i.e., Live Oak, Universal City, Selma) are not partners with VIA Transit and have limited modal options.

Projects in Progress or Completed

TransGuide Monitoring

This portion of the IH 35 corridor is monitored by TransGuide (TxDOT San Antonio) and the Combined Transportation, Emergency, and Communications Center (TxDOT Austin) staff, with monitoring cameras and dynamic messages signs throughout the corridor.

Truck Restrictions

There are left-lane truck restrictions along IH 35 north of Loop 1604.

Expansion

$21 million in Proposition 12 funding is being applied to the corridor between Judson Road (inside Loop 1604) and FM 3009. A lane addition will be provided to improve operations from FM 3009 to Loop 1604, and ramp improvements will facilitate flow through the Forum Parkway and Loop 1604 interchanges with IH 35.

Operations Improvements
Operations improvements funded by Proposition 12 will begin in 2013 along IH 35 south of this congested segment. TxDOT issued a Notice of Interest to consultants in October 2011 to bid on the analysis and development of plans for $18.5 million of congestion reduction improvements to the IH 35 corridor between IH 10/US 90 and the IH 35/Loop 410 North Interchange. There is, however, no funding to make physical improvements to IH 35 between IH 10/US 90 and IH 37/US 281.

Interchange Improvements
The Loop 410 South Interchange (i.e., IH 35/Loop 410 South) near Fort Sam Houston and the San Antonio Military Medical Center (formerly Brooke Army Medical Center) will have $25 million of additional improvements in 2013 from a Department of Defense Office of Economic Adjustment Grant to the City of San Antonio.

Planning Efforts to Date

Needs Assessment
The Alamo RMA and TxDOT are partnering on an IH 35 Planning and Environmental Linkages (PEL) study. The outcome of the PEL study will frame the environmental study necessary for future facility improvements. This study is scheduled to be complete in the summer of 2012.

Expansion of IH 35
The MPO TIP currently includes the following projects related to this portion of IH 35:

- Expansion from a 6- or 8-lane facility to a 12- or 14-lane expressway (toll six new mainlanes) from the Loop 410 South interchange to Schertz Parkway, including a new tolled direct connector interchange at Loop 1604 and tolled direct connectors at Loop 410 South and Loop 410 North. Total project cost is estimated to be $1.7 billion.

My35
The recent award-winning public involvement process and long-term planning initiative, MY 35, conducted by TxDOT on the IH 35 corridor through Texas recommended a number of short-term operational improvements and long-term freeway expansion needs along this portion of the IH 35 corridor.

My35—Short Term Adjustments
Immediately-implementable short-term recommendations that could affect this portion of IH 35 included:

- Improve incident management and related agency coordination so that accidents and disabled vehicles can be cleared more quickly and delays can be minimized.
- Use and improve upon technology, such as electronic signs, to provide updated traffic information, alternative routes, and other traffic management solutions to travelers on IH 35.

My35—Long-Term Improvement
Long-term, capital-intensive recommendations for this portion of IH 35 included:

- IH 35/Loop 1604 and IH 35/IH 410 interchange improvements (estimated cost $600-$900 million, not including right-of-way).
- Loop 1604 improvements from IH 35 to IH 10 (estimated cost $300-$400 million for freeway construction, not including right-of-way).
- IH 35 improvements from the Williamson/Bell County Line to IH 10; estimated cost $2.7 billion to $3.85 billion for a minimum of four lanes in each direction (8-lane facility).
- IH 35 HOV/toll lane from SH 45SE in Austin to IH 10 (estimated cost $6.2 billion to $8.85 billion, not including right-of-way).

- IH 35 alternative route improvements to IH 10 from Seguin to IH 35 in San Antonio (estimated cost $950 million to $1.4 billion, not including right-of-way).
- Passenger rail alternatives from Laredo to Dallas/Fort Worth (estimated cost $30 billion to $50 million per mile).
- Freight rail relocation to allow commuter rail to use existing tracks paralleling IH 35 between San Antonio and Taylor (estimated to exceed $2.4 billion based on studies performed by TxDOT in 2008).

Managed Lanes

A Major Investment Study (MIS) of the IH 35 corridor conducted in 1996 for the San Antonio-Bexar County Metropolitan Planning Organization (MPO) suggested the addition of barrier-separated express, truck, and/or HOV lanes to this freeway. In addition, a "Basic Improvements Package" was also recommended including signal improvements, better signage, ramp modifications, expansion of the TransGuide (TxDOT) system, addition of pedestrian facilities and bicycle routes, improved bus service, and operational improvements to both Loop 410 interchanges (north and south) and the Loop 1604 interchange. The signal, signage, and TransGuide improvements have already been completed, and some operational improvements have been made for southbound traffic at the Loop 410 South Cutoff interchange[1].

Commuter Rail

Lone Star Rail District commuter rail project from Austin to San Antonio is currently in the preliminary phase of the development process. There is no funding for the $2 billion project.

Expansion of SH 130

Completion of SH 130 from Georgetown to IH 10 (in Seguin) is expected to provide some level of traffic relief for IH 35 throughout San Antonio.

[1] Text for this section adapted from http://texashighwayman.com/ web site. Ste created and managed by Brian Purcell. Site accessed 11/11/2011.

Next Steps

- **Provide support and feedback to TxDOT** and their consultants on the IH 35 operational improvements study from Judson Road to FM 3009.
- **Monitor the TxDOT/Alamo RMA joint IH 35 Planning and Environmental Linkages (PEL) Study** (to be completed in August, 2012). TTI will also p**rovide support and serve as a technical resource** to Alamo RMA as the Planning and Environmental Linkages Study evolves into future corridor plans.
- Utilize the findings of TxDOT/Alamo RMA PEL study to identify the type of environmental study required for IH 35 and **conduct an Environmental Assessment (EA) or Environmental Impact Study (EIS)** for the corridor between downtown and FM 1103 starting as early as January 2013 and ending by late 2015 (if an EA) or late 2017 (if an EIS). The environmental study performed will outline a plan for IH 35 improvements to meet long-range needs as well as provide fundamental travel demand data for all corridor users. The EA or EIS will refine concepts, project scope and costs for future, large-scale IH expansion.
- There is local agency agreement and support for more aggressive incident management methods to improve mobility and congestion in the San Antonio area. **Improved incident management and related agency coordination** in quickly clearing crashes and disabled vehicles will reduce incident-related delay and congestion.
- **Broad deployment of advanced traveler information systems** (including dynamic message signs and camera monitoring) in cooperation with TxDOT has been identified as a city-wide congestion management measure. TransGuide can be improved with electronic signs, which provide updated traffic information and other traffic management solutions to travelers. Funding for the expansion and maintenance of additional traffic management devices and services has not been identified.
- There is local agency agreement and support for **increased travel demand management activity and strategy deployment** in San Antonio. Likely champions of these activities in the San Antonio region are the Alamo Area Council of Governments and VIA Metropolitan Transit. Studies can determine the most effective travel demand management strategies for the region and determine the potential to form Transportation Management Associations (TMAs) in cooperation with major employers in the region.
- In order to fully analyze the potential for IH 35 alternate routes to accommodate traffic strategically diverted from the interstate, **utilize Planning and Environmental Linkages (PEL) studies planned along alternate routes to IH 35**. Roadway corridors that provide viable alternative routes to IH 35 in northeastern San Antonio include Loop 410 South, Interstate 10 East (toward SH 130 in Seguin), and Loop 1604 on the east side of the city.

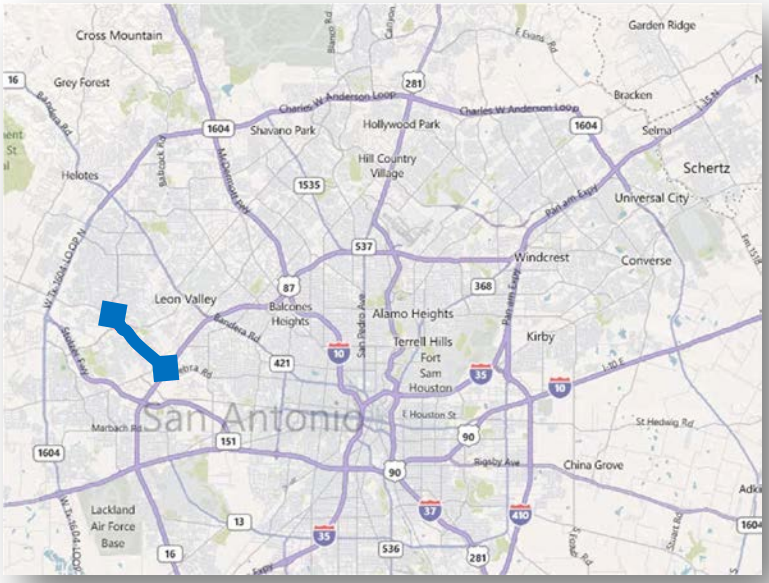
CULEBRA ROAD (FM 3487)

SH 471 (Grissom Road) to IH 410

Current Conditions

Culebra Road (FM 3487), formerly a 4-lane arterial with a center-turn lane, was improved to a 6-lane road with a turn lane in 2010 and 2011. The corridor improvements also included raised medians at signalized intersections, bike lanes, and sidewalks for the length of the project. Bexar County managed the improvement project as a pass-through financing project supported by TxDOT. Culebra Road experiences congestion opposite to a traditional pattern. Morning slowdowns occur in the outbound direction while evening slowdowns occur in the inbound direction. These slowdowns are light compared to other congested corridors in the region.

- Segment Length: 3.3 miles
- Road Type: 6-lane divided arterial
- Annual Hours of Delay: 325,000
- Texas Congestion Index: 1.35
- Commuter Stress Index: 1.42

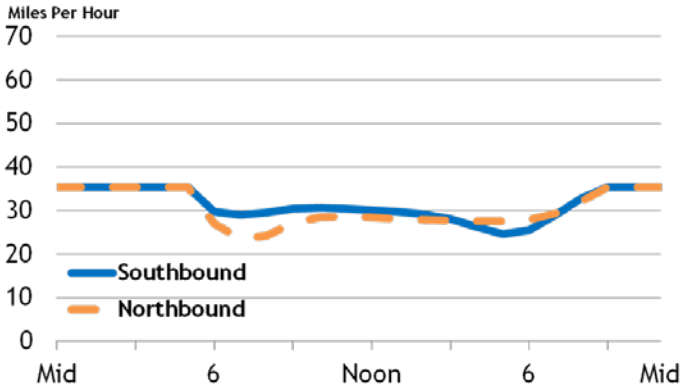


Rank: 50

Annual Hrs. of Delay / Mile:	**99,000**
Congestion Time:	**5 Hours**
Annual Cost of Delay:	**$8.0 million**
Average Daily Traffic:	**39,000 Vehicles**

Possible Congestion Causes

A road construction project caused some of the congestion measured in 2009. With the widening and the end of construction activities, congestion has dramatically decreased.



Projects in Progress or Completed

Roadway Expansion

Bexar County's pass-through financing (supported by TxDOT) of $22.9 million provided improvements to 3.2 miles of Culebra Road including widening the road from five lanes to seven lanes, raised median treatments at major signalized intersections, and several upgrades at cross drainage features, including relocating a city street segment outside of a flood-prone area.

Transit Facilities

VIA operates a nearby transit center on Ingram Road near Ingram Park Mall.

Traffic Signals
New signal equipment will be installed and the signals retimed upon construction completion.

Signals Timing
The City's signal management center will provide remote monitoring and control of Culebra's signalized intersections.

Monitoring for Success
Speed and volume data will be collected in December 2011 to document project impacts.

Planning Efforts to Date

Operations improvements may result in increased bus service by VIA.

Next Steps

- **Monitor the before/after comparison study by the City of San Antonio**, and decide on next steps depending on the remaining congestion.
- There is local agency agreement and support for more aggressive incident management methods to improve mobility and congestion in the San Antonio area. **Improved incident management and related agency coordination** in quickly clearing crashes and disabled vehicles will reduce incident-related delay and congestion.
- **Broad deployment of advanced traveler information systems** (including dynamic message signs and camera monitoring) in cooperation with TxDOT has been identified as a city-wide congestion management measure. TransGuide can be improved with electronic signs, which provide updated traffic information and other traffic management solutions to travelers. Funding for the expansion and maintenance of additional traffic management devices and services has not been identified.
- There is local agency agreement and support for **increased travel demand management activity and strategy deployment** in San Antonio. Likely champions of these activities in the San Antonio region are the Alamo Area Council of Governments and VIA Metropolitan Transit. Studies can determine the most effective travel demand management strategies for the region and determine the potential to form Transportation Management Associations (TMAs) in cooperation with major employers in the region.

The most congested corridors in San Antonio were examined to identify the most appropriate actions that will have the greatest impact on relieving traffic congestion. Many of these actions can be funded by Proposition 12 funds and are consistent with the goals of Rider 42, while other actions are being funded or performed by other agencies. Exhibit SA-3 summarizes the recommended actions to address traffic congestion for each San Antonio corridor.

Exhibit SA-3: San Antonio Summary of Congested Corridor Recommendations

Rank	Congested Corridor	Actions Funded by Others	Recommended Early Actions Affecting Congested Corridor
23	**SL 1604 (Anderson Loop)** *(SH 16 to FM 471)*	▪ Monitor signal timing. ▪ Evaluate need for additional improvements. ▪ Widen to freeway/tollway with managed lanes, based on environmental study.	▪ Traffic Management & Traveler Information—Project planning and feasibility study. ▪ Travel Options—Project planning and feasibility study to assess needs and assist outreach efforts. ▪ Parking Management—Project planning and feasibility study.
38	**US 281** *(SL 1604 to Comal County Line)*	▪ Monitor signal timing on recently implemented superstreet. ▪ Evaluate need for additional improvements. ▪ Widen to freeway/tollway with managed lanes, based on environmental study.	▪ Design four northern direct connector ramps at SL 1604 interchange. ▪ Traffic Management & Traveler Information—Project planning and feasibility study. ▪ Travel Options—Project planning and feasibility study to assess needs and assist outreach efforts. ▪ Parking Management—Project planning and feasibility study.
48	**IH 35 Central** *(US 281/IH 37 to US 90)*		▪ Conduct PEL study on IH 35 Central to examine expanding capacity and operations. ▪ Conduct PEL study for southern IH 35 bypass corridor along Loop 410 South and East, IH 10 East, and Loop 1604 East. ▪ Conduct PEL study on IH 410 Southwest for improvements as an alternative corridor. ▪ Traffic Management & Traveler Information—Project planning and feasibility study. ▪ Travel Options—Project planning and feasibility study to assess needs and assist outreach efforts. ▪ Parking Management—Project planning and feasibility study.

49	**IH 35 Northeast** *(US 281/IH 37 to FM 1103)*		▪ Conduct Environmental study as determined by PEL study. ▪ Conduct PEL study for southern IH 35 bypass corridor along Loop 410 South and East, IH 10 East, and Loop 1604 East. ▪ Conduct PEL study on IH 410 Southwest for improvements as an alternative corridor. ▪ Traffic Management & Traveler Information—Project planning and feasibility study. ▪ Travel Options—Project planning and feasibility study to assess needs and assist outreach efforts. ▪ Parking Management—Project planning and feasibility study.
50	**Culebra Road (FM 3487)** *(SH 741 to IH 410)*	▪ Monitor before/after study. ▪ Evaluate need for additional improvements.	▪ Traffic Management & Traveler Information—Project planning and feasibility study. ▪ Travel Options—Project planning and feasibility study to assess needs and assist outreach efforts. ▪ Parking Management—Project planning and feasibility study.

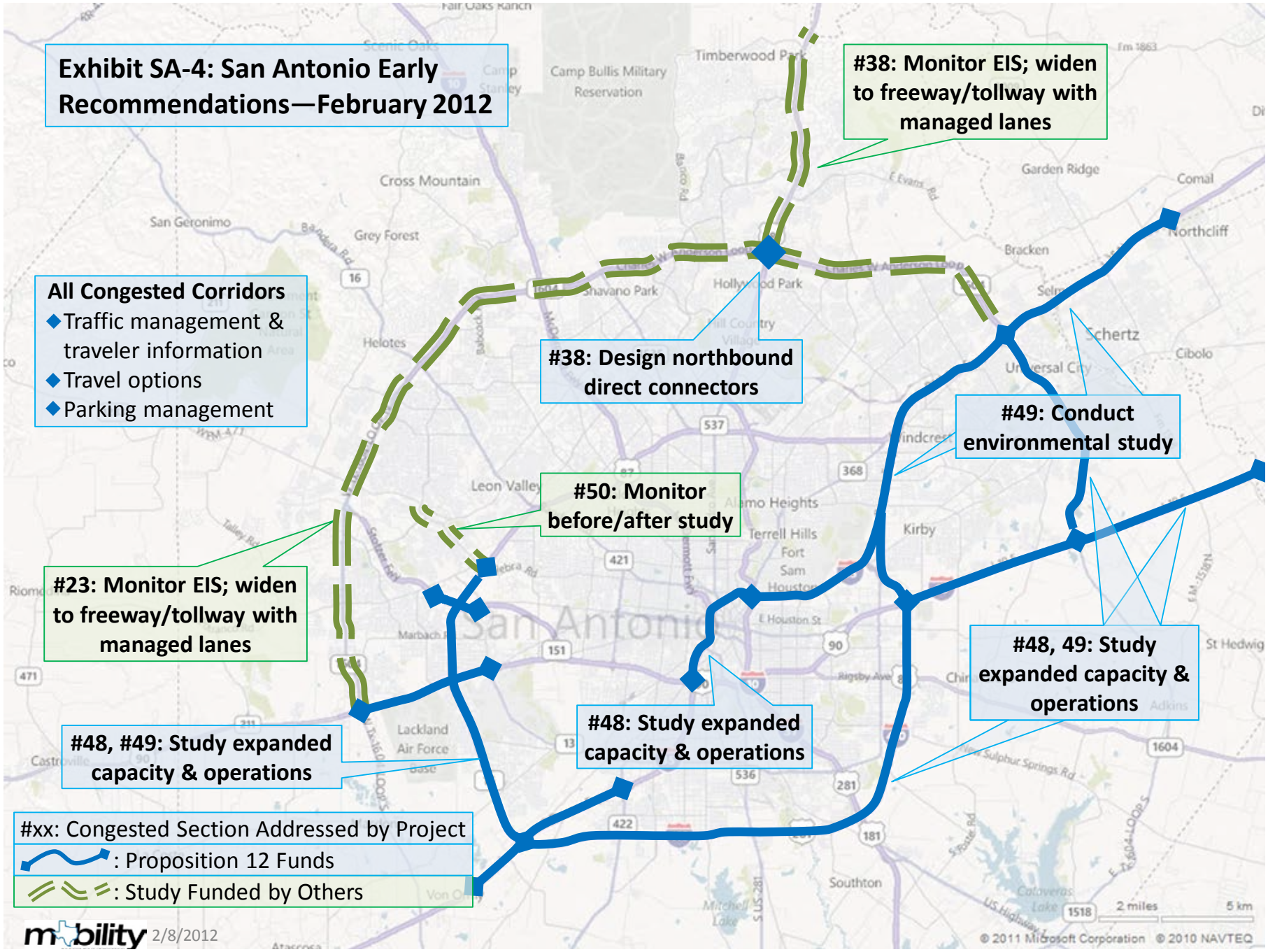


Exhibit SA-4: San Antonio Early Recommendations—February 2012
#38: Monitor EIS; widen to freeway/tollway with managed lanes
All Congested Corridors
Traffic management & traveler information
Travel options
Parking management
#38: Design northbound direct connectors
#49: Conduct environmental study
#50: Monitor before/after study
#23: Monitor EIS; widen to freeway/tollway with managed lanes
#48, 49: Study expanded capacity & operations
#48, #49: Study expanded capacity & operations
#48: Study expanded capacity & operations
#xx: Congested Section Addressed by Project
: Proposition 12 Funds
: Study Funded by Others
mobility 2/8/2012
Camp Bullis Military Reservation
Timberwood Park
Cross Mountain
San Geronimo
Grey Forest
Garden Ridge
Comal
Northcliff
Bracken
Hollywood Park
Helotes
Schertz
Cibolo
Leon Valley
Alamo Heights
Terrell Hills
Fort Sam Houston
Kirby
San Antonio
Lackland Air Force Base
Southton
St Hedwig
2 miles
5 km
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The early recommendations described above represent the first step in the process of reducing congestion on the worst corridors in the state. A larger project involving construction, operation, management, and travel option strategies will follow the early recommended actions. The following table identifies possible projects in the Houston metropolitan area and the amount of funds and timeframe for project implementation. In San Antonio, many large projects are awaiting the results of recommended planning or environmental studies before a specific project option, cost, and implementation timeframe can be determined.

Exhibit SA-5: Summary of Possible Large Projects for San Antonio Congested Corridors

Rank	Corridor	Large Projects	Rider 42 Funding Estimate	Estimated Implementation Funds Needed*	Implementation Timeframe
23	SL 1604	Widen expressway to 6 or 8 tolled lanes from US 90 to IH 35 East	$0.0	$770M to $1.47B (Alamo RMA)	2013 to 2017
38	US 281/SL 1604	Northern direct connectors	$6M	$59M (MPO MTP)	2014 to 2018
38	US 281	Widen existing freeway	$0.0	$403M to $703M (Alamo RMA)	2014 to 2018
48	IH 35 Central	Widen to 10 lanes from US 281/IH 37 to IH 410 South	$0.0	$335.5M (MPO MTP)	TBD*
48	IH 35 Central	PEL study	$1.0M	TBD**	TBD*
49	IH 35 Northeast	EIS or EA Study***	$13M	TBD**	TBD*
49	IH 35 Northeast	Widen to 12 or 14 lanes	$0.0	$1.7B (MPO MTP)	TBD*
49	IH 35 Northeast	IH 35/SL 1604 and IH 35/IH 410 interchange improvements	$0.0	$600M to $900M+ROW	TBD*
48, 49	SL 1604	Widen freeway from IH 35 to IH 10	$0.0	$300M to $400M+ROW	TBD*
48, 49	South IH 35 Bypass	PEL study for IH 410 Southeast, IH 10 East, and SL 1604 Northeast	$2.5M	TBD**	TBD*
48, 49	IH 410 Southwest	PEL study for IH 35 bypass	$0.5M	TBD**	TBD*
48, 49	IH 35 Alternate Routes	Link to SH 130 in Seguin: IH 10 from SH 130 to IH 35, IH 410 from IH 10 to IH 35, and SL 1604 South from IH 10 to US 90	$0.0	$3.2B to $4.65B+ROW	TBD*

All Congested Corridors				
Transportation Management	Planning and feasibility study to implement traffic management and incident clearance	$1.0M	n/a	n/a
Parking Management	Planning and feasibility study to facilitate parking management	$0.3M	n/a	n/a
Travel Options	Engineering study to examine regional travel options along the corridors.	$0.3M	n/a	n/a
TOTAL		**$24.6M**	**$7.4B to $10.2B+ROW**	

Remaining San Antonio Rider 42 allocation: $9.14M.
*Source of implementation funds noted if known.
**Project funding and scope to be determined from current or future PEL, EIS or EA study.
***Alamo RMA's expected time frame for the IH 35 Northeast EA or EIS is 2013-2017.

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