Establishing Mobility Investment Priorities
Under TxDOT Rider 42:
First Year Report

Prepared for
Texas Transportation Commission
And
83rd Texas Legislature

Prepared by:
Texas A&M Transportation Institute
The Texas A&M University System
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Mobility Investment Priorities Project
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Contributions by Metropolitan Area Agencies

**Austin**

- TxDOT–Austin District
- Capital Area Metropolitan Planning Organization
- Capital Metro
- Central Texas Regional Mobility Authority
- City of Austin
- Greater Austin Chamber of Commerce
- Downtown Austin Alliance
- Downtown Transportation Management Association

**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

**Houston**

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

**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
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BACKGROUND
The most congested metropolitan highways in Texas are becoming even more crowded, resulting in lost time and wasted fuel topping $10 billion per year—more than $800 for the average Texas household. Two-thirds of Texas residents live in urban areas that are ranked in the 40 most congested U.S. metropolitan areas, and three 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 areas (including San Antonio) rank in the 15 fastest growing congested urban areas in the U.S. over the last 15 years. These congested corridors also cause problems for the movement of goods and services through the large metropolitan areas to the rest of Texas.

Funding for many of the traditional solutions in Texas’ large metropolitan regions, however, is not expected to increase, and congestion will continue to worsen. There is, however, a generally accepted path toward improvement involving:

- First and foremost, state and local transportation agencies must be perceived as doing a good job with the funding, policies and priorities they have. They must be effective and efficient.
- The agencies must have a coherent and comprehensive 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.

Recognizing the growing urgency of the traffic congestion problem, the 82nd Texas Legislature set aside $300 million to get the state’s highest-priority roadway projects moving, beginning with those segments identified as the 50 most congested roads in the state in 2010. In order to accomplish this task, as a part of the General Appropriations Act (H.B. 1, TxDOT Rider 42), the Legislature directed the Texas A&M Transportation Institute (TTI) 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 will 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. Public participation in the concept development ensures the most inclusive planning process possible.
4. The funding scenarios take advantage of all feasible options so that public funds provide the greatest “bang for the buck.”
5. Recommendations are made to the Department of Transportation at each major decision point for the projects.
FIRST YEAR ACCOMPLISHMENTS

In the first year, TTI delivered the following major products:

- Facilitated and coordinated regional transportation meetings, workshops and analyses with TxDOT, Metropolitan Planning Organizations, Regional Mobility Authorities, major city and county governments, transit agencies and others, resulting in a five-month expedited project prioritization and identification process.

- Early Recommendations Report identifying and recommending funding for $248 million of projects that will improve the most congested roadway sections. These include right-of-way purchases, design contracts, planning studies and project feasibility analyses and studies to redesign roads and improve the operation of some of the most congested roadways in the state. There is more information for the recommendations in each area in following pages.

- Public Engagement Report detailing the state of the practice in developing public involvement in each of the four metropolitan areas and providing a set of best practices for public engagement. The specific practices will improve the chances of having a richer discussion about the congestion reduction strategies and projects the public desires, and the funding mechanisms they will approve.

- Strategy descriptions to illustrate how, when, where, why and for what purpose a range of congestion reduction, public engagement and funding strategies should be deployed. These include 65 traffic management and travel option strategies, 10 public engagement practices and 15 funding options. Products include information for a range of audiences and potential users from technical implementation agencies to policy and leadership groups.

- Summary of the key design and operational elements in the most congested corridors. More details on the congestion problems, key improvement projects and programs that are being developed and other planning efforts assist readers and decision-makers with understanding future options.
  [http://mobility.tamu.edu/mip/congestion.php](http://mobility.tamu.edu/mip/congestion.php)

- Assisted TxDOT and agencies in Dallas-Fort Worth and Houston in developing a congestion mitigation strategy to improve response to crashes, stalled vehicles and other congestion causing events. Deployment will begin in late 2012 and 2013.

- Developed a computer simulation model of the IH 35 corridor in Austin to investigate a number of improvement ideas. The model will be used to study options developed by the Central Texas Working Group.

- Developing a model to estimate the economic benefits of the congestion reduction projects. The model will be used in the second year of the Mobility Investment Priorities project as plans are finalized for the congested corridors.

All of these products are available on the Texas A&M Transportation Institute’s Mobility Investment Priorities website: [mobility.tamu.edu/mip](http://mobility.tamu.edu/mip).
NEXT STEPS, NEXT YEAR

The next year of activity in the Mobility Investment Priorities project will involve follow-up activities related to the Early Recommendations Report as well as working with local and state agencies to reduce congestion using a variety of practices and engage the public in a discussion about the benefits and possible funding mechanisms. Specific work tasks and products include those listed below.

Develop Recommendations for Remainder of the $300 Million in Project Development Funding
Approximately $41 million remains to be allocated to project development activities in the top 50 congested corridors in three metropolitan areas. The working groups in these three areas are developing recommendations for these funds; in some cases, these decisions will be based on planning activities that will be completed soon.

Identify Funding Mechanisms that are Tailored to Fit the Large Congestion-Reducing Projects
Important projects that have been identified in each metropolitan area will be examined for the possible funding approaches that might be applicable. A range of funding opportunities exist—the key is matching the type and scale of the project to the amount of funding that the public is willing to commit to the improvement.

Assist in the Implementation of Travel Option Strategies
Agencies in all four metropolitan areas are engaged in assisting companies in the implementation of travel options. These might be part of a company’s employee support program that allows flexibility in the method and location that job tasks are accomplished, or they may be oriented at reducing company costs for office space, parking and operations. The information developed during the first year of the MIP project can be used at the local level to improve these programs.

Improve Public Engagement Practices in All Four Metropolitan Areas
The TTI staff will assist transportation agencies in each region as they work to actively engage travelers and ensure that transportation improvement projects reflect local needs and wants. In part, this would be achieved by bringing project development staff and public engagement staff together early in the project development process. Project planners will have more flexibility to proactively address issues and concerns that may arise. This will result in fewer project schedule delays and increased cost savings.

TTI staff will use a variety of techniques, including focus groups and public opinion surveys, and will work with agencies and stakeholder groups in support of broader education efforts to engage taxpayers and voters directly in policy decisions that will determine how the state’s most urgent transportation needs will be met, and how they will be paid for. These efforts will seek to communicate the ways in which transportation conditions influence life quality and employment on both a community level and an individual, personal level.

Central to each of these efforts will be the development and/or use of information that helps travelers better understand transportation funding requirements and options in a way that contributes to well-informed viewpoints and choices.
Produce Congestion Reduction Strategies Checklist for Corridors
The existing status of the traffic and demand management strategies in many of the 50 most congested corridors will be identified and posted on the MIP website. This will be used as a baseline to evaluate potential improvements and evaluate progress over the next year.

Use the Computer Simulation Model of IH 35 in Austin
Several congestion reduction strategies and designs have been identified by a consultant team and the Central Texas Working Group. The computer model will be used to identify the effect on IH 35 and surrounding roads as a method to provide the public with more accurate view of the possible future outcomes. These model results will be incorporated into public meetings and web-based public engagement techniques.

Summarize the Experience with Public/Private Partnerships
The public/private partnership (P3) contractors, TxDOT project directors and other officials in local governments will be interviewed to provide better information for the next round of P3 projects. This study will focus on the methods and arrangements used to operationalize the projects. Several other efforts have researched the negotiations and project agreements but very few have, for example, identified the steps needed to arrange for local government first responders to operate in the P3 project work zones. New practices and performance expectations are being developed in corridors where TxDOT is not performing its traditional role in maintaining and operating the network. The costs and institutional relationships as well as best practices will be documented in a guidebook.

Examine Other Corridors in the Top 50
Several other corridors will be studied to identify possible congestion reduction actions. There may be some actions identified in the most congested corridors that will be applicable to these lesser congested corridors.

Estimate Congestion Reduction Investment Benefits
The Mobility Investment Priorities team will estimate two important components of congestion reduction projects—travel delay benefits and economic effects. As the individual projects are identified, travel delay reductions based on the type of project improvements will be developed and the resulting mobility improvements presented for commuters and freight shippers. The economic effects that result from the project construction and the improved travel conditions will be calculated.

Continue Pursuing Innovative/Non-Traditional Designs
Several projects will continue through planning and design phases. The Mobility Investment Priorities team will continue to work with the project teams to suggest design and operational schemes that provide improved mobility.
UPDATING THE EARLY RECOMMENDATIONS REPORT

The Early Recommendations Report (found at mobility.tamu.edu/mip) identifies the initial results of activities by TTI to coordinate studies for project identification and prioritization in the four most congested areas of the state. By legislative direction, funding was allocated by the Texas Transportation Commission to the four metropolitan areas using the formula for Category 2, Metropolitan and Urban Area Corridor Projects. The Rider 42 funds are available to support engineering, feasibility studies and right-of-way acquisition on the state’s 50 most congested corridors. Most of the funding in the early recommendations is allocated to purchase right-of-way and to conduct planning and environmental studies in 10 high priority corridors. These recommendations are appropriate for the current development stage in the metropolitan areas.

Other reports, additional recommendations and other project ideas will be produced during the project timeframe. These initial findings may be modified upon more investigation, but these early recommendations identify projects, studies and purchases that meet the standards identified in Rider 42 to “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.” Additional recommendations will be made for each area over the remaining period of the study.

In 2007, Texas voters approved Proposition 12, allocating $3 billion for highway improvements. Most of the studies or right-of-way purchases identified in the Early Recommendations Report 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. In February, 2012, the Early Recommendation Report was approved by the Texas Transportation Commission.

The affected corridor/project with its top 100 congestion rank, the recommended early action, the August 2012 status of the early action projects and the funding allocation for each action are listed in the following tables; a corresponding map illustrating the congested corridors and the recommended actions can be found in the Early Recommendations Report (mobility.tamu.edu/mip). The status update indicates the progress on each project since the February 2012 report.
The City of Austin has nearly doubled in size every 20 years since World War II. The city’s rapid growth has exacerbated traffic congestion. 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 1 identifies the $18.5 million allocated for priority studies and design efforts that were recommended as the first funding request by the Central Texas Working Group, a steering committee formed to address the Rider 42. The two corridor studies are underway, and the traffic management study will begin when a consultant is identified. The Central Texas group recently approved a request for an additional $10.75 million in Rider 42 funds for a feasibility study on IH 35 that would address conclusions of the on-going City of Austin study. Other studies, design efforts or right-of-way purchases will be recommended for the remaining $2 million in future reports.

Exhibit 1. Austin Early Recommendations

<table>
<thead>
<tr>
<th>Rank</th>
<th>Corridor/Project</th>
<th>Recommended Early Action and Status</th>
<th>Rider 42 Funding Allocation</th>
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</thead>
<tbody>
<tr>
<td>39</td>
<td>Loop 1 South Managed Lanes Tolled express lanes engineering (environmental clearance, final design &amp; preparation for construction). Central Texas Regional Mobility Authority received funding agreement from TxDOT; RFQ to be issued in September 2012.</td>
<td>$16.5 million</td>
<td></td>
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<tr>
<td>4</td>
<td>IH 35 Study Extension Expand the City of Austin study limits &amp; scope: express lanes, operations, and travel options. City of Austin—consultant notice to proceed in August 2012.</td>
<td>$1.2 million</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>IH 35 Implementation Plan Feasibility study (pre-NEPA) to use output of the City of Austin study (see above) to develop an implementation plan for IH 35 from SH 45 North to SH 45 South, including critical components, designs, constructability, project construction costs, environmental process, project phasing plan, public involvement and revenue assessment. Recommended by this report for approval by Texas Transportation Commission.</td>
<td>$10.75 million</td>
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All Congested Corridors

Integrated Traffic Management Comprehensive system operation engineering study including aggressive incident clearance. Waiting for TxDOT to procure engineering services. $0.8 million

Total Request, February and August 2012 $29.25 million

*Remaining Austin area Rider 42 allocation: $2.03 million
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 the Early Recommendations 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 were recommended for Proposition 12 funding in February 2012. The two projects listed in Exhibit 2 combined to use the full Dallas/Fort Worth Proposition 12 project development allocation of $118,750,000. Public meetings were held on both projects in August 2012; procurement of the engineering and right-of-way has begun on the Horseshoe Project and construction plans are being developed for Phase 1 of the Trinity Parkway.

Other studies were suggested in the Early Recommendations Report (mobility.tamu.edu/mip), and additional recommendations will be made over the remaining period of the Mobility Investment Priorities project. 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 2. Dallas/Fort Worth Early Recommendations

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<th>Rank</th>
<th>Corridor/Project</th>
<th>Recommended Early Action and Status</th>
<th>Rider 42 Funding Allocation</th>
</tr>
</thead>
</table>
| 12, 17, 29 | IH 30 & IH 35E Horseshoe  | Engineering, right-of-way (ROW) & adjust utilities  
*Public hearing held in August 2012; Proposals due September 25, 2012; award of design-build contract and environmental document approval expected in October 2012.* | $100.75 million |
| 12, 16, 17, 29 | Trinity Parkway Phase 1  | Engineering, ROW & adjust utilities  
*Public meeting in August 2012; environmental approval expected in first quarter of 2013; TxDOT has begun construction plans.* | $18.0 million |

**Total Request, February 2012**  
$118.75 million

*Remaining Dallas-Fort Worth area Rider 42 allocation: $0.00*
Houston

Most of Houston’s most congested sections are located between downtown and the IH 610 Loop. The Houston metro area has been allocated $116,224,000 in Rider 42 funds. Exhibit 3 summarizes the recommended right-of-way needs, priority studies and design efforts for funding and the August 2012 status. US 290 right-of-way acquisition and the origin-destination study have begun; the other studies are in the initial stages or are awaiting the completion of prior studies.

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 six most congested Houston 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 from the IH 610 to SH 99 Grand Parkway has been funded and will be finished by 2017. The project consists of additional mainlanes, interchange improvements and reversible managed lanes that will provide travel options for corridor travelers. TxDOT reports the project will be completed 20 years ahead of schedule thanks to $1.4 billion in funding by TxDOT and $400 million from the Harris County Tollroad Authority (HCTRA). Some of the funding was already scheduled, but a combination of funding from Proposition 12, HCTRA and other TxDOT sources allowed the acceleration. (see http://www.my290.com/)
### Exhibit 3. Houston Early Recommendations

<table>
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<th>Rank</th>
<th>Corridor/Project</th>
<th>Recommended Early Action and Status</th>
<th>Rider 42 Funding Allocation</th>
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</thead>
</table>
| 11, 25 | US 290 | Purchase right-of-way and adjust utilities in locations along US 290 (primarily at Beltway 8 interchange)  
Right-of-way maps approved and acquisitions are underway. | $78.0 million |
| 2, 6, 7, 10, 27, 31, 35 | IH 45, US 59, IH 10 & SH 288 – Downtown Redesign Study | Feasibility study for long-term solutions to the downtown area and connecting freeways based on origin-destination travel patterns.  
Beginning the origin-destination study before the end of the year; study will take 9 to 12 months to complete. Information will be used to develop congestion reduction solutions. | $5.0 million |
| 1, 7 | IH 45 | Feasibility study and design of mobility improvements along major streets parallel to IH 45 North.  
Will begin once downtown area origin-destination study is completed. | $2.0 million |

### All Congested Corridors

| Operational Improvements | Engineering study to identify locations & funding for operation treatments, including aggressive incident clearance.  
Have not initiated study; TxDOT will do so in the coming months in coordination with TTI and HGAC’s on-going incident management study. | $0.85 million |
| Travel Options | Engineering study for implementing travel option strategies.  
Have not initiated study; TxDOT will do so in the coming months in coordination with TTI and HGAC. | $0.5 million |

**Total Request, February 2012**  
$86.35 million

*Remaining Houston area Rider 42 allocation:*  
$29.87 million
San Antonio

Initial investigation of the five San Antonio corridors in the 50 most congested corridors identified several on-going efforts that should be monitored. Modifications to those studies may position them to address the Rider 42 issues more comprehensively and additional study ideas can accelerate the development of corridor solutions. There are also several actions that have been taken in San Antonio in the past two years that can provide examples of successful approaches to congestion reduction. The initial set of actions for the $33,740,000 allocated to the San Antonio area is shown in Exhibit 4.

The largest project expenditure is awaiting the completion of a planning and environmental linkage (PEL) study on IH 35. That study will identify the scale and scope of the environmental studies to follow. The PEL studies examine previous planning and environmental documents to organize existing knowledge, determine the community views on the corridor needs and options and allow agencies to rapidly move into more detailed planning and decision-making. Such studies are in procurement for several other San Antonio corridors to examine alternative routes to the congested section of IH 35 in downtown San Antonio. Funding for the design of the connector ramps on the northern side of the US 281/Loop 1604 interchange will be used following a decision on the current environmental studies.

Exhibit 4. San Antonio Early Recommendations

<table>
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<tr>
<th>Rank</th>
<th>Corridor/Project</th>
<th>Recommended Early Action</th>
<th>Rider 42 Allocation</th>
</tr>
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<tbody>
<tr>
<td>49</td>
<td>IH 35 Northeast</td>
<td>Conduct environmental study as recommended by planning and environmental linkages (PEL) study. PEL study will be completed in Fall 2012; environmental study will follow.</td>
<td>$13.0 million</td>
</tr>
<tr>
<td>38</td>
<td>US 281/Loop 1604 Interchange</td>
<td>Design four northern direct connector ramps. Will follow record of decision on environmental study; sometime in 2014.</td>
<td>$6.0 million</td>
</tr>
<tr>
<td>48</td>
<td>IH 35 Central</td>
<td>PEL study to define the needs &amp; alternative improvements. Process to procure consultant begun in July 2012.</td>
<td>$1.0 million</td>
</tr>
<tr>
<td>48, 49</td>
<td>South Alternative Routes to IH 35</td>
<td>PEL study to define the needs &amp; alternative improvements. Process to procure consultant begun in July 2012.</td>
<td>$2.5 million</td>
</tr>
<tr>
<td>48, 49</td>
<td>IH 410 Southwest</td>
<td>PEL study to define the needs &amp; evaluate alternatives to IH 35. Process to procure consultant begun in July 2012.</td>
<td>$0.5 million</td>
</tr>
</tbody>
</table>

**All Congested Corridors**

| ITS/Transportation Management | Project planning & feasibility study to facilitate traffic & incident clearance (infrastructure, policies & practices). Process to procure consultant begun in July 2012. | $1.0 million        |
| Parking Strategies           | Parking management project planning & feasibility study. Procurement of consultant will begin in October 2012. | $0.3 million        |
| Travel Option Strategies     | Project planning & feasibility study to identify possible travel option strategies and champions. Procurement of consultant will begin in October 2012. | $0.3 million        |

**Total Request, February 2012** $24.6 million

*Remaining San Antonio area Rider 42 allocation:* $9.14 million
CONGESTION REDUCTION STRATEGIES

The intent of Rider 42 is to ensure that the best congestion reduction practices are incorporated by Texas’ large metro regions to effectively and efficiently utilize the state’s roadways. Congestion mitigation strategies come in all shapes, sizes and operating styles.

- Some use changes during the day to take maximum advantage of available road space.
- Others use incentives to encourage commuters to choose different travel paths, modes or times of day.
- Some use different roadway designs to reduce congestion or improve operations.

The descriptions in the next section offer a quick summary of the important congestion relief strategies. The strategy groups include projects/programs that should be done, methods to engage the public and fund the improvements:

- Traffic Management
- Travel Options
- Additional Capacity
- Construction Improvements
- Funding
- Public Engagement

Rider 42 recognized the key role that traffic operations and travel option strategies will play in Texas’ future.

- Many of these strategies are relatively low-cost projects and programs.
- They generally 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.
- Examples: Rapidly removing vehicle crashes, timing traffic signals so more drivers experience green lights, improving road and intersection designs and/or adding a short section of roadway are relatively simple actions with big payoffs.

More than 80 strategies are summarized below; more details are available on the Mobility Investment Priorities project website (http://mobility.tamu.edu/mip/strategies.php).
CONGESTION REDUCTION STRATEGY DESCRIPTIONS

TxDOT and the metropolitan planning organizations in Austin and San Antonio are beginning studies that will develop a plan for expanding the use of these strategies. In a separate program, TxDOT and MPO staff in Houston and Dallas-Fort Worth investigated the possibilities of implementing a program that would reduce congestion with a combination of traffic management and travel option strategies. The program funds would be partially provided by TxDOT and the specific program elements are still being designed, but the projects and programs could begin to deliver congestion reduction soon at relatively low cost. Decisions on which programs to pursue will be made in Fall 2012.

The mobility investment priorities website (http://mobility.tamu.edu/mip/strategies.php) has more information, but the descriptions below offer a quick summary of the important congestion relief strategies.

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 actions such as rapidly clearing collisions and stalled vehicles or improving signal coordination so drivers experience green lights as they move in the peak travel direction. While many of these are primarily agency actions, several of them will benefit from collaboration with businesses, commuters and neighborhoods.

Access Management: These techniques control several elements of the street, such as spacing, design, and operation of driveways, turns, medians, and intersections to control where vehicles enter and exit a road. When used properly, access management increases safety and reduces congestion by reducing the conflicts between through traffic and turning vehicles. The techniques also preserve public investment and improve aesthetics along a corridor.


Active Traffic Management: This strategy refers to several congestion mitigation strategies used together to dynamically manage traffic based on current or predicted conditions. The strategies maximize the efficiency of the road and delay the onset and size of the congestion problem.


Aggressive Incident Clearance: Reducing the duration and effect that stalled vehicles or crashes have on traffic can dramatically decrease congestion and increase safety for everyone. Quickly detecting, responding, and clearing incidents from a road can also reduce secondary collisions caused by stop-and-go traffic.

**Bottleneck Removal:** Small projects often result in big benefits. Correctly identifying and removing the causes of slowdowns from interchanges can dramatically reduce congestion on an entire road. Common bottleneck solutions include adding lanes for a short section by reducing lane widths or using shoulders, adding lanes to accommodate entering and exiting traffic, or modifying ramps.


**Dynamic Merge Control:** This active traffic management strategy regulates upstream traffic or closes a specific lane on a freeway to accommodate high demand from entrance ramps further downstream. Useful at known bottlenecks or during special events, this strategy can delay the onset of congestion and effectively utilize existing road space.


**Dynamic Rerouting:** Dynamic rerouting helps drivers find alternate less-congested routes in real-time using roadside message signs or broadcast media. The process examines prevailing traffic conditions to determine the best alternate route, shortening commuters’ travel times, and keeping the congested road from becoming more so.


**Dynamic Truck Restrictions:** Similar to truck restrictions, these exclude trucks from certain lanes, ramps, or routes based upon prevailing traffic conditions or the time of day in order to keep passenger traffic flowing smoothly. This strategy offers significant flexibility, efficiency, and reliability over static restrictions.


**Electronic Toll Collection Systems:** These cost-effective systems eliminate the need for toll booths, allowing traffic to pay tolls while maintaining freeway speeds. Tolling equipment can detect transponders or read license plates and automatically deduct tolls from an account or send a bill to the owner. New smartphone apps allow drivers to designate the number of people in a vehicle and (in some cases) pay a lower toll on managed lanes.


**Express Bus Service:** A fixed route service that typically provides commuter service to park-and-ride lots in suburban areas. They have limited stops, travel non-stop on highways, utilize HOV lanes, and usually only operate during peak traffic periods. These services reduce the number of single-occupant vehicles by providing an alternative to the personal car. The service can also be helpful with time management by allowing people to work on the bus.

**Freight Rail Improvements:** New freight rail construction and relocation can consolidate freight movement and remove long-distance truck traffic from congested corridors. These projects can improve safety and speeds for both street vehicles and trains by eliminating many ground level road-rail crossings.


**Multimodal Transportation:** This concept encourages designers and engineers to look beyond a single concept and incorporate multiple strategies into corridors to provide an array of options for passenger and freight movement. Transportation facilities then have the flexibility to adapt as traffic and commute patterns change over time, reducing the cost of expanding existing facilities.


**Park-and-Ride Lots:** Strategically placed in suburban and urban areas, these parking lots provide staging areas for carpooling, real-time ridesharing, express bus routes, bus rapid transit, and rail. The purpose of these lots (which vary in size from 200 spaces to more than 1,000) is to allow transit riders to come from low density suburbs and group at one site, thus making transit services more efficient.


**Queue Warning:** Commuters can be warned about downstream stop-and-go conditions with signs and flashing lights. Managers can also use a dynamic message sign with a symbol or word when congested conditions occur. These warnings can reduce the number of crashes and delay the onset of congestion.


**Ramp Configurations:** Agencies can relocate ramps to change traffic patterns and alter the way that entering traffic merges on to main lanes. These adjustments help reduce congestion and improve safety.


**Ramp Flow Control:** Special traffic signals on the freeway entrance ramps turn green in short intervals (one or two seconds) to release vehicles onto the freeway in a smooth, orderly manner. The flow control signals keep vehicles from crowding entrance ramps and allow them an easier merge onto the freeway main lanes.


**Reversible Traffic Lanes:** Roads can have a lane that reverses the direction of flow, adding capacity to the direction with more traffic demand. Roads can either be transformed into one-way streets or have a middle lane that reverses to operate in the peak direction.

Signal Operations and Management: Updating equipment and improving the signal timing can help to decrease congestion, because more green time can be given to roads with more vehicles. These changes can be done at a relatively low cost.

Special Event Traffic Management: Planning and handling the large amount of traffic caused by attendees can greatly reduce the congestion in the area of special events. Providing additional buses and trains or preparing the surrounding roadways are easy and relatively inexpensive methods to handle large volumes of added traffic.

Temporary Shoulder Use: Also known as “hard shoulder running”, this technique adapts roadway capacity to higher traffic flow on a temporary basis by allowing either all vehicles or only buses on the shoulder. A traffic management center decides when to open the shoulder based on traffic volume and speed. This not only delays the onset of congestion and increases volume, but can also provide reliable travel times for transit vehicles.

Traffic Management Centers (TMC): These centralized hubs serve as the “mission control” for an urban area’s roadway network. A TMC monitors traffic conditions, deploys various traffic management strategies to reduce congestion, provides real-time information to the public, and assists local authorities during special events, emergencies, or daily stop-and-go traffic. A robust TMC reaches across city boundaries within an urban area to identify weak areas and proactively suggest solutions.

Traveler Information Systems: Providing real-time information to drivers is crucial to maximizing efficiency, increasing safety, and reducing the impacts of congestion. Traveler information systems use sensors and cameras that transmit information to the region’s traffic management center. The center relays roadway information including incidents, weather information, travel times, emergency alerts, and alternate routes via dynamic message signs (DMS) throughout the network. This information can also be distributed through text messages or social media.

Truck Lane Restrictions: These restrictions typically prohibit trucks from using the far left lane of traffic (unless passing a vehicle), certain ramps, or routes. The restrictions can be used all day or just during specified peak hours to separate slower, less maneuverable trucks from passenger vehicles. This reduced interaction improves both safety and traffic flow.
Truck Incentives & Use Restrictions: Freight operators can shift the times their trucks are on the road to overnight or off-peak periods through financial incentives or regulatory limits on the time, location, or manner in which trucks can access certain areas or corridors for deliveries. Shifting freight traffic to these periods improves traffic flow during peak times, improves safety, and uses the road network more efficiently.


Variable Speed Limits: This active traffic management strategy uses sensors along the roadway to detect when congestion or weather conditions exceed a set threshold and adjust the speed limit to slow traffic and delay the onset of congestion. Dynamic message signs give drivers real-time information or explanations of the speed change. Adjusted speeds can be advisory or regulatory.


Travel Options

Reducing single occupant vehicle trips by encouraging practices such as ridesharing or vanpooling can reduce roadway congestion. 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 deadlines, while also reducing roadway congestion during peak travel periods.

Carpooling: Commuters with similar schedules who live and work near each other can benefit from sharing their commute in one vehicle. Transportation agencies can assist this by matching potential carpool partners and creating lanes where carpools gain a time advantage. Private business can also support carpooling by designating premium parking spots and allowing work hour flexibility.


Compressed Work Weeks: Employees can eliminate an entire day from their workweek by working extra hours on other days (e.g., working four ten-hour days or 80 hours over nine days). Employers are able to reduce operating costs, and their employees commute during lighter traffic periods and have a longer weekend.


Flexible Work Hours: Similar to compressed work weeks, employees can work within a time range other than from 8:00 to 5:00, avoiding the peak period commutes. These plans work well for most business types, especially for office work, manufacturing, and other shift-based operations. Implementing this plan typically increases productivity and decreases overtime and sick leave.

Land Use Planning: Incorporating thought and foresight into the development patterns and how transportation functions within that space can mitigate the growth of congestion. Focused planning can increase the number of home options, improve the overall quality of life for residents, reduce the number of single-occupancy vehicles and increase transit use.


Parking Management: Cities can monitor parking availability in real-time and control the number of public parking spaces using dynamic pricing, ensuring the appropriate number of spaces are available when needed. Availability and price can then be passed along to drivers via website, dynamic message signs, or smartphone apps, all reducing the amount of time it takes to find a parking space.


Pay-As-You-Drive Auto Insurance: Also known as usage based insurance (UBI), drivers are charged according to their driving habits, how long, and how far they drive rather than paying a flat monthly rate. Drivers are encouraged to drive less because of the lower rates.


Real-Time Ridesharing: Companies match carpool partners at the time a trip is needed (requiring no preplanning) using a smartphone app or website. Prescreened drivers are paid through the app by the rider and per mile driven. Riders may also wait at a transit stop or near an HOV entrance to be picked up (also known as “slugging”).


State Employee Trip Reduction: State governments employ a large number of people usually in concentrated locations, such as downtown or major activity center. By implementing trip reduction programs (such as alternative work schedules, telecommuting, carpool incentives, or parking management), state agencies demonstrate leadership in addressing congestion and positively impacting the environment while reducing their own expenses.


Telecommuting: Telework programs provide employees the flexibility to work on tasks remotely, either from home or a satellite office for all or part of the day. This relatively low-cost program eliminates trips or changes the time of day trips are made, reducing congestion and increasing productivity while decreasing overhead costs for businesses.

**Transportation Management Associations (TMA):** Usually a public-private partnership, TMAs provide transportation services and education to a particular area or activity center within a city. They provide information and support for local agencies and businesses interested in travel options that would make the transportation system more efficient. TMAs can also encourage land use planning that slows the need for new capacity and increasing transit usage in the coverage area.


**Trip Reduction Ordinances:** Cities may enact relatively low-cost ordinances encompassing different regulations or measures requiring some form of congestion mitigation. Cities try to encourage alternative travel choices through developer requirements or incentives, employer trip reduction programs, or transportation management associations.


**Vanpooling:** This service provides registered users with organized transit service in a van to a worksite or to a transit stop. Five to 15 riders that live or work near one another pay a fee that is less than the cost of driving alone in a private vehicle. Vanpools can use HOV lanes, reducing their trip times and reducing congestion.


**Variable Pricing:** Used on high-occupancy toll (HOT) lanes or other congested toll roads, these pricing programs adjust the toll (dynamically based on congestion levels or on a set schedule) to better use the road space and keep traffic moving at a minimum speed. When congestion in the priced lane is imminent, the price increases, demand shifts to alternate routes, times, or modes.


**Additional Capacity**

Constructing new roadways reduces congestion; however, limited right-of-way in congested urban corridors makes this a costly approach. Exclusive or managed lanes can mitigate congestion by designating lanes for trucks or buses, or through the use of High Occupancy Vehicle (HOV)/High Occupancy Toll (HOT) lanes.

**Acceleration/Deceleration Lanes:** These extra entrance and exit lanes provide drivers with an opportunity to speed up or slow down when entering or exiting a freeway without interfering with the main traffic flow. The lanes increase safety and speeds, reducing congestion from maneuvering vehicles or incidents.

**Adding Lanes or Roads:** This remains a traditional strategy for mitigating congestion, though it may not always be the best or most cost-effective solution. Occasionally, it may be more advantageous to add a new road, add a connection between two roads or create an entirely new corridor instead of widening an existing one to provide the needed person and freight movement capacity and congestion relief. [http://mobility.tamu.edu/mip/strategies_pdfs/added-capacity/executive-summary/adding-new-lanes-or-roads-1-pg.pdf](http://mobility.tamu.edu/mip/strategies_pdfs/added-capacity/executive-summary/adding-new-lanes-or-roads-1-pg.pdf)

**Adding New Toll Lanes or Toll Roads:** Toll roads offer an alternative financing method to provide new or improved facilities. Users of the facility (rather than the general public) pay for the road and its maintenance as they use it, freeing resources for other projects. This method can accelerate the implementation of critical projects to provide benefits sooner. [http://mobility.tamu.edu/mip/strategies_pdfs/added-capacity/executive-summary/adding-new-toll-roads-1-pg.pdf](http://mobility.tamu.edu/mip/strategies_pdfs/added-capacity/executive-summary/adding-new-toll-roads-1-pg.pdf)

**Commercial Vehicle Accommodations:** In areas with high truck traffic volume, several projects and programs can reduce congestion caused by trucks and increase freight efficiency and safety. The common techniques include improving shoulder width and strength, turning radii, parking, acceleration/deceleration lanes, or even physically separating truck and car traffic. [http://mobility.tamu.edu/mip/strategies_pdfs/added-capacity/executive-summary/commercial-vehicle-accommodations-1-pg.pdf](http://mobility.tamu.edu/mip/strategies_pdfs/added-capacity/executive-summary/commercial-vehicle-accommodations-1-pg.pdf)

**Displaced Left Turns:** Also known as a continuous flow intersection (CFI), this innovative design moves left-turning vehicles across the on-coming traffic before the main intersection. Left-turning vehicles use a separate roadway to complete their turn unimpeded by the time they reach the main intersection. Eliminating the left-turn signal provides more green time for the through movements. [http://mobility.tamu.edu/mip/strategies_pdfs/added-capacity/technical-summary/DLT-Intersection-4-Pg.pdf](http://mobility.tamu.edu/mip/strategies_pdfs/added-capacity/technical-summary/DLT-Intersection-4-Pg.pdf)

**Diverging Diamond Interchanges:** This relatively new interchange design crosses traffic over to the left (“wrong”) side of the road as it passes over or under a freeway, accommodating heavy left-turn movements, and then crosses traffic back onto the right (“correct”) side of the road. These designs are inexpensive and quick to build; they improve safety while increasing smooth traffic flow where turning volumes are high at freeway/cross street intersections. [http://mobility.tamu.edu/mip/strategies_pdfs/added-capacity/executive-summary/diverging-diamonds-1-pg.pdf](http://mobility.tamu.edu/mip/strategies_pdfs/added-capacity/executive-summary/diverging-diamonds-1-pg.pdf)

**Freight Shuttle:** A privately-financed freight movement system developed within the right-of-way of existing highways can improve truck freight operations, reduce congestion and emissions. The Freight Shuttle can improve freight movement at marine ports, border crossings and in major congested roadway corridors. [http://mobility.tamu.edu/mip/strategies_pdfs/added-capacity/executive-summary/freight-shuttle-1-pg.pdf](http://mobility.tamu.edu/mip/strategies_pdfs/added-capacity/executive-summary/freight-shuttle-1-pg.pdf)
Grade Separation: Overpasses can eliminate many of the common conflicting traffic movements at an intersection. Separating the traffic directions not only allows cars to avoid stopping at an intersection, but also dramatically improves safety for cars, pedestrians, and trains.  

Innovative Intersections: Intersections have been reinvented to handle traffic in interesting ways. These new designs tend to imitate the operation and design of freeway interchanges, but operate at ground-level and at a smaller scale. These intersections decrease or eliminate common problems (primarily the conflicts between through traffic and left turns) to reduce congestion and improve safety and efficiency. http://mobility.tamu.edu/mip/strategies_pdfs/added-capacity/executive-summary/innovative-intersections-1-pg.pdf

Intersection Improvements: Handling turning vehicles in an efficient manner is one of the most important purposes of intersections. Improvements include adding right- or left-turn lanes, improving the ability to see on-coming cars at intersections, adding bicycle and pedestrian facilities, and adding features that make drivers aware of an upcoming intersection. These changes improve efficiency at a relatively low cost. http://mobility.tamu.edu/mip/strategies_pdfs/added-capacity/executive-summary/intersection-improvements-1-pg.pdf

Loop Ramps to Reduce Left Turns: Loop ramps eliminate the need for a left turn signal at an intersection and reduce queuing that can spill back onto the main road and create a bottleneck. Loop ramps allow turning vehicles to move past the intersection and exit onto a loop that merges them into the desired direction. http://mobility.tamu.edu/mip/strategies_pdfs/added-capacity/executive-summary/loop-ramps-1-pg.pdf

Managed Lanes: These special lanes for buses and carpools, or for toll-paying vehicles can provide faster commute times with fewer vehicles. These lanes improve travel time reliability, maximize roadway capacity, and encourage transit, carpool, vanpool, and real-time ridesharing usage. Also called express lanes, high-occupancy vehicle (HOV) lanes or high-occupancy toll (HOT) lanes. http://mobility.tamu.edu/mip/strategies_pdfs/added-capacity/executive-summary/managed-hov-hot-1-pg.pdf

Median U-Turns: Also called “ThrUTurns,” this intersection design guides all traffic, except right-turning vehicles, through the main intersection. Left-turning vehicles access a U-turn area further down the road to proceed in the desired direction. Eliminating all left-turn signals simplifies signal timing and provides more green time for the other movements. http://mobility.tamu.edu/mip/strategies_pdfs/added-capacity/technical-summary/Median-U-Turn-Intersections-4-Pg.pdf

Modern Roundabout: Roundabouts reduce intersection delay by using yield signs. Traffic entering the intersection is controlled and slowed, but not stopped unless other traffic is in the roundabout. Although speeds are slower, more traffic can enter the intersection with less delay. http://mobility.tamu.edu/mip/strategies_pdfs/added-capacity/executive-summary/modern-roundabouts-1-pg.pdf
One-Way Street: One-way streets are typically applied to high-volume roadways and can be implemented in many ways to improve the capacity of a road or roads. The traffic may travel in one direction on a road during peak periods, with the direction switching with the time period or traffic could be switched permanently with two one-way roads located relatively closely. [http://mobility.tamu.edu/mip/strategies_pdfs/added-capacity/executive-summary/one-way-streets-1-pg.pdf](http://mobility.tamu.edu/mip/strategies_pdfs/added-capacity/executive-summary/one-way-streets-1-pg.pdf)

Quadrant Intersections: One of many innovative intersections, quadrant intersections guide left-turning vehicles onto connector roads in different quadrants away from the main intersection, eliminating these turns from the main intersection. Traffic is directed to another smaller intersection where it can complete the desired turn. [http://mobility.tamu.edu/mip/strategies_pdfs/added-capacity/technical-summary/Quadrant-Roadway-Intersections-4-Pg.pdf](http://mobility.tamu.edu/mip/strategies_pdfs/added-capacity/technical-summary/Quadrant-Roadway-Intersections-4-Pg.pdf)

Superstreets: When land develops around a four-lane rural highway too quickly, traveling across the major road or making a left turn from a minor street can become difficult. Signalizing the intersection typically adds delay to the major road. A superstreet, however, only allows right turns from minor streets (restricting left and through movements). U-turn lanes are provided between intersections on the major street to provide left turns from the minor street. This allows more green time for through and left-turning vehicles on the superstreet. [http://mobility.tamu.edu/mip/strategies_pdfs/added-capacity/executive-summary/superstreets-1-pg.pdf](http://mobility.tamu.edu/mip/strategies_pdfs/added-capacity/executive-summary/superstreets-1-pg.pdf)

Construction Improvements

There are well accepted methods for reducing the effect of construction projects. These include the use of design techniques that require less new construction, doing the construction in ways that reduce the time or the amount of road closures and accommodating construction techniques that also mean less maintenance over the many years of pavement life.

Construction Contracting Options: Contracting options, that give incentives to control construction costs, reduce annual maintenance costs and shorten schedule length, can mitigate congestion and cost experienced during major road projects. [http://mobility.tamu.edu/mip/strategies_pdfs/traffic_management/executive_summary/construction-contracting-options-1-pg.pdf](http://mobility.tamu.edu/mip/strategies_pdfs/traffic_management/executive_summary/construction-contracting-options-1-pg.pdf)

Reducing Construction & Maintenance Interference: Planning and coordinating the efforts of various stakeholders can limit the disruption caused by major construction on congested roadways. There are three major elements to the planning needs: how traffic will be controlled during construction, a transportation operations plan that organizes road and transit congestion-reduction strategies, and a public information plan. [http://mobility.tamu.edu/mip/strategies_pdfs/traffic_management/executive_summary/reducing-construction-maintenance-interference-1-pg.pdf](http://mobility.tamu.edu/mip/strategies_pdfs/traffic_management/executive_summary/reducing-construction-maintenance-interference-1-pg.pdf)
Pavement Recycling: Re-using the material that is removed when pavement is reconstructed can reduce the time and cost of a project.

Shoulder Pavement Upgrade: Many shoulders are wide enough to handle a full lane of traffic, but the pavement may not be adequate to support the weight of cars, trucks, and buses. Improving the structural capacity of the pavement can help maintain capacity during construction or evacuation and increase the operating options for the roadway.

Sustainable Pavements: Pavement design efforts have shifted towards environmental sustainability and improved safety. Warm mix asphalt (WMA) can be relatively cool when laid, reducing pollution, increasing worker safety, and saving energy. Permeable friction course (PFC) mixtures allow water to drain quickly through the road surface, which reduces traffic noise and improves visibility during wet weather.

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 should be identified in an effort to maximize flexibility in financing improvements.

Comprehensive Development Agreement (CDA): A CDA is a method of public-private partnership that allows a private company to perform any combination of design, finance, construction, maintenance, and operation as negotiated with the state or other transportation entity.

Driver’s License Surcharge: Texas drivers pay $25 to apply for or renew their driver license every six years. This fee is dedicated to the Texas Mobility Fund. Any additional driver license surcharge would be charged at the time of application or renewal and could be dedicated solely to funding transportation.
**Fuel Sales Tax:** Texas has a state sales tax rate of 6.25 percent. Additionally, local entities (e.g., counties, cities) can impose a local sales tax up to 2 percent. Gasoline and diesel fuel are not currently subject to the sales tax. The current state sales tax rate of 6.25 percent could be applied to gasoline and diesel purchases and dedicated to transportation purposes.


**Fuel Tax Local Option:** The state of Texas levies a flat 20 cent per gallon tax on gasoline and diesel fuels. Local regions could be authorized to levy an additional gasoline and diesel tax that would be on fuels sold within their jurisdiction.


**Statewide Fuel Tax:** The state of Texas levies a 20 cent per gallon tax on gasoline and diesel fuels. Of this 20 cents, 15 cents is dedicated by the Texas Constitution to roadways, with the remaining 5 cents dedicated to public education. The tax is included in the price of fuel you buy at the pump. The state motor fuels tax was last increased in 1991. The average Texas driver pays $9.52 a month in state fuel taxes. The net to the highway fund is $7.14 a month per driver. The tax could be increased to help the state fund new transportation capacity and/or keep pace with the increase in roadway construction costs.


**Indexed Fuel Tax:** The state of Texas levies a flat 20 cent per gallon tax on motor fuels. As such, tax revenues are adversely affected as fuel efficiency improves and construction and maintenance costs rise. Indexing the gasoline and diesel tax rate to the Highway Cost Index or the Consumer Price Index allows the tax rate to keep pace with the rate of construction and maintenance cost inflation.


**Pass Through Financing:** A toll way operator (public or private) agrees to build and operate a facility in exchange for “toll payments” from a public agency. These payments are most often made on a ‘per vehicle’ basis but are not collected from the road user. Funding for shadow tolls can come from multiple sources, such as the highway fund, tax increment financing, or other local dedicated taxes or fees.


**Public-Private Partnerships:** A Public Private Partnership (PPP) is an agreement for a private company to fund and/or operate new and existing roadways over which a public agency normally has jurisdiction. PPPs allow a group of private companies to perform different combinations of design, finance, construction, maintenance, and operation. There are several different types of PPPs, including: Build-Transfer Operate, Build-Operate-Transfer, Build-Own-Operate, Buy-Build-Operate, Developer Finance, Lease-Develop-Operate, Sale-Leaseback, Turnkey, and Comprehensive Development Agreement.

State Sales Tax: Texas has a state sales tax rate of 6.25 percent. Additionally, local entities (e.g., counties, cities) can impose a local sales tax up to 2 percent. An increase to the statewide sales tax could be dedicated to the highway fund.


Tax Increment Financing: Tax increment financing designates a special district or region associated with a roadway project. Property tax revenues in this designated area increase due to the roadway project’s positive effect on property values. The additional revenue generated by the higher property tax revenues is used to service the debt on bonds that are issued to finance the roadway project. A Transportation Reinvestment Zone (TRZ) is an example of tax increment financing.


Transportation Impact Fees: A Transportation Impact Fee is charged by the local municipality to new development projects. This fee is used to pay for capital improvements needed as a result of the new development. The fee attempts to repay a portion of the cost local entities encounter providing the facilities needed to service the new development.


Vehicle Registration Fees Local Option: The state of Texas requires all vehicles registered in the state to pay an annual state vehicle registration fee. Local regions could require an additional vehicle registration fee that would be collected and spent locally on transportation programs.


Vehicle Registration Fees Statewide: The state of Texas requires all personal car and light truck owners to pay an annual $50.75 state vehicle registration fee. For commercial vehicles, the registration fee is based on the weight of the vehicle, and these fees range from $54 to more than $840. Each County Tax Assessor-Collector collects this fee, and nearly 100 percent of these funds go directly toward transportation-related purposes.


Vehicle Sales Tax: Texas has a state motor vehicle sales tax rate of 6.25 percent of the sales price (minus any trade-in allowance). Of this tax, 25 percent is dedicated to the Foundation School Fund and the remaining portion is deposited in the General Revenue Fund. The entire motor vehicle sales tax, or an increase to the tax, could be dedicated to the Highway Fund.


Vehicle Mileage Fee: A vehicle mileage fee charges drivers based on the number of miles each vehicle travels. This fee-per-mile charge directly relates to road usage, as opposed to the fuel tax, which is based the gallons of fuel consumed and, as such, is heavily influenced by fuel efficiency.

http://mobility.tamu.edu/mip/strategies_pdfs/financing/executive_summary/VM-Fee-1-Pg.pdf
Public Engagement Strategies

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. Furthermore, public outreach is a necessary component of successful project planning and can ultimately benefit the decision-making process. Public engagement strategies are implemented by the public agency or a private consulting firm hired to conduct project meetings. There are a range of strategy costs and implementation mechanisms that vary according to the budget and project type.

Citizen Advisory Committees: A Citizen Advisory Committee is an assembly of people who represent the various interests and concerns related to a major transportation project. These panels can lend credibility to both the project and the process, and help ensure that citizen input is truly representative of community interests and concerns. The functions of such a committee can be tedious and time-consuming, so this strategy’s effectiveness is dependent upon a sustained commitment on the part of both the agency and the committee members. 

Crowdsourcing: This collaborative problem solving method enables multiple individuals to act as information collectors who relay information to others in “the crowd.” Participants – either in person or online – work on a problem or issue through a “call” for solutions. This can be particularly cost-effective and useful in project planning, as it allows numerous people to provide input on the full range of aspects related to a project. Like all forms of feedback gathering, the productiveness of crowdsourcing depends heavily on the diversity of interests that are represented. 

Electronic Updates: Text messages and e-mail alerts can be used to convey important information – from lane closures to meeting notices – to travelers and other stakeholders in a way that is timely, inexpensive, and finely-targeted. Like all methods of information dissemination, the effectiveness of this strategy depends heavily on the accuracy, credibility and timeliness of the information conveyed. The amount of staff time required for this strategy is relatively small, but it is essential that that staff commitment be sustained over the full timeline of the project. 
Fact Sheets: Electronic communication has become a dominant force in the daily lives of more people than ever before. Still, however, the printed word still has a place for members of some target audiences, particularly those limited access to, or comfort with, online information sources. For these people, traditional fact sheets offer the most effective way to convey project information. Simple graphic illustrations and text prepared in a conversational tone can ensure that travelers have just the right amount of information – information which should be updated as project conditions evolve.


Opinion / Market Research: Meaningful public engagement in a transportation project requires a full and complete understanding of the opinions held by the people who will be affected by that project. The most direct way to understand where people stand on a particular project or issue is to ask them – through opinion polls, focus groups, interviews, or some combination of these methods. To be credible in the eyes of the public (particularly opposition groups), it is important that the research findings be put to some productive use to demonstrate that public opinion is being heard, respected, and considered in the decision-making process.


Project Newsletters: Project newsletters provide an effective way to communicate progress on transportation projects to targeted audiences. As designs, schedules and other elements of a project evolve, agencies can use newsletters – both printed and electronic – to provide updates on a periodic basis. This tool is most effectively used with large, long-term projects. By initiating a newsletter, an agency is creating an expectation in the audience’s mind that it will be published on a regular basis, so it is important to maintain a consistent publication schedule.


Project Websites: Project websites can be used to convey much of the same information that might be used in a project newsletter, without the space constraints associated with a newsletter. This is perhaps the most common engagement tool currently used for major transportation projects. And although it is used primarily to push information out to audiences, a website provides a cost-effective means for gathering traveler questions and comments. The immediacy of the internet creates high audience expectations for the timeliness (as well as the accuracy) of the information, so sustained staffing is essential to ensure effectiveness and maintain agency credibility.

**Public Meetings and Hearings:** Hearings and meetings represent two of the most common strategies for public engagement, both to present information and to collect feedback. These gatherings, however, can also be a negative experience for all involved if certain aspects are not carefully managed. The meeting must be held at times and places that are convenient and accessible to those who are interested; multiple opportunities to attend must be offered; the information conveyed must be understandable; and it must be presented by staff who are skilled in group presentation and facilitation. [http://mobility.tamu.edu/mip/strategies_pdfs/public_engagement/executive-summary/public-hearings-and-meetings-1-pg.pdf](http://mobility.tamu.edu/mip/strategies_pdfs/public_engagement/executive-summary/public-hearings-and-meetings-1-pg.pdf)

**Social Media:** By using social media, agencies can allow individuals to engage on their own time and in their own preferred way. Facebook, Twitter and YouTube offer a means to provide project information updates and collect audience comments and questions in a way that is vivid and immediate. For some audiences, social media represents the only way to reach them. Staffing for the social media function should be sufficient to ensure that updates are relevant, meaningful and timely, and that questions and comments are addressed promptly. [http://mobility.tamu.edu/mip/strategies_pdfs/public_engagement/executive-summary/social-media-1-pg.pdf](http://mobility.tamu.edu/mip/strategies_pdfs/public_engagement/executive-summary/social-media-1-pg.pdf)

**Virtual Public Meetings:** Due to varying work schedules and other obligations, many people affected by a major transportation project are not able to participate in traditional public meetings. For those individuals, virtual public meetings provide a channel through which they can be an active part of the public engagement process at any time they find convenient. These meetings, conducted via the internet, greatly extend the reach of public engagement far beyond that of traditional gatherings, and they represent one of the most effective means currently available to minimize barriers to the planning and public engagement processes. [http://mobility.tamu.edu/mip/strategies_pdfs/public_engagement/executive-summary/virtual-meetings-1-pg.pdf](http://mobility.tamu.edu/mip/strategies_pdfs/public_engagement/executive-summary/virtual-meetings-1-pg.pdf)
PUBLIC ENGAGEMENT RECOMMENDATIONS

The Mobility Investment Priorities project is designed to identify which roadway projects and programs promise the biggest “bang for the buck” in the state’s most congested regions and to lay the groundwork to help make those projects and programs happen. But for them to happen, it is essential that the public support them and support the manner in which they will be paid for.

The Public Engagement Report examines the importance of effective public engagement and its place in transportation planning and development. The report underscores why transportation decision making must reflect the needs and opinions of the citizens that it will affect. The report reviews current metropolitan area engagement efforts, presents best practices and case examples and offers recommendations to help agencies ensure that their public engagement activities are meaningful, credible, productive and successful.

The Public Engagement Report (http://mobility.tamu.edu/mip/pdfs/MIP_PE-Report-5_15-FINAL.pdf) was presented to the Texas Transportation Commission in May 2012.

Voters—and the public in general—are more likely to support increased investment in the transportation system if they clearly recognize and understand the need for—and benefits of—that investment. That understanding is difficult to achieve without a significant investment in communications. Consequently, when transportation agencies are working to address needs in Texas’ most congested corridors, each effort should include a robust public engagement element. This element should be funded at a level sufficient to ensure that the public has ample opportunity to participate meaningfully, to understand the state’s transportation problems and the effect of the solutions and to contribute to the discussion of which strategies to implement and how to pay for them.

This early and significant effort is at the heart of achieving the open and transparent public participation called for in Rider 42. An agency’s ability to achieve its goals depends heavily on the relationships it has with its many publics, and these relationships are built upon public engagement. Effective engagement not only helps an agency build public support for individual programs and projects, but it helps establish and reinforce a foundation of trust and credibility for future interaction. The recommendations outlined in this report provide a list of steps designed to achieve the goals of Rider 42. Those steps include:

1. Initiate a broad public discussion to raise awareness of the state’s mobility crisis and to begin building public consensus toward solutions.
2. Sustain the discussion through means of an assertive public education campaign to help citizens and voters understand the magnitude of the state’s mobility crisis and the consequences of inaction.
3. Communicate with all stakeholder groups; content is based upon polling results and project information produced through the Mobility Investment Priorities project.
4. Continue polling to ensure that changes in public opinion are understood and reflected in ongoing public engagement efforts.
5. Enlist and continually expand community-based networks of movers and doers (both elected and non-elected) to assist in educating various community segments.
6. Ensure that leader/educator networks have ongoing, meaningful interaction with citizens in a manner that accurately reflects the input and opinions of those whose lives are affected daily by worsening traffic congestion.

7. Ensure that public engagement efforts at all levels are sufficiently funded to ensure that communication efforts with all audiences are thorough, and that feedback from those audiences is accurate and meaningful.

8. Expand the use of technology in public engagement.
ECONOMIC IMPACT ANALYSIS

Rider 42 includes a requirement that the congestion reduction projects have the greatest impact on several factors including the economic effects of the potential transportation investments. The first year’s analysis began this process by identifying projects and programs that might be implemented. Some of these are at an advanced development state, and some projects are only awaiting funding. Economic benefits for these projects will be estimated if they have not already been developed during the detailed corridor studies. Other corridors are in the conceptual planning or early feasibility stage and economic benefit estimates are more difficult to achieve.

Recognizing this range of development certainty, the second year of the Mobility Investment Priorities study will conduct economic estimates of the projects that have advanced to the point where a few concepts have been identified and cost estimates are available.

The economic impact analysis for each project will be conducted using both the economic impact component of the TRENDS model developed by TTI as well as EDR Group’s TREDIS model. A brief description of the analysis and the products that will be provided by each model is included below.

Transportation Revenue Estimator and Needs Determination System (TRENDS) Model

The Transportation Revenue Estimator and Needs Determination System (TRENDS) is used by TxDOT and the metropolitan planning organizations (MPOs) to estimate revenue at the state and MPO region level. One element of TRENDS uses the amount of transportation revenue dedicated to a specific metropolitan planning organization region to determine the economic impact of the construction projects in the area. TTI will use the estimated cost of the projects and project time parameters to calculate the economic impacts during both construction and operation after completion.

Construction economic impacts include:
- Construction jobs created.
- Aggregate income associated with those jobs.
- Aggregate economic impact of the construction spending.

Economic impacts associated with the operation of the new or improved facility include:
- Total increased business efficiencies (business savings resulting from reduced travel time and costs)
- Business profit (income)
- Total economic activity (resulting from the construction and business efficiencies)

Transportation Economic Development Impact System (TREDIS)

The Transportation Economic Development Impact System (TREDIS) calculates several economic impacts for a particular project. The model works by comparing a base scenario (no-build) to a project scenario (build). There are three categories of inputs needed for each scenario. Cost inputs (which include startup construction costs and annual operations and maintenance costs), travel demand data and other inputs such as land and building development and market access. TREDIS then produces reports on
travel cost savings, total economic impacts, benefit/cost results and tax impacts. The travel cost savings report breaks down the savings into several categories which include:

- vehicle operating cost savings
- Safety cost savings
- Environmental cost savings
- Reliability cost savings
- Passenger cost savings
- Household out-of-pocket cost savings
- Household value of time benefit
- Societal environmental benefit

The travel cost savings are also shown for industry categories using the North American Industry Classification System (NAICS). The total economic impacts report calculates the business output, value added, jobs, and wage income for each year of construction as well as operation. The business output, value added, jobs, and wage income is also reported for each year for each NAICS industry. In the benefit/cost report, TREDIS calculates the present value of benefit stream, the present value of the cost stream, and the benefit/cost ratio. The tax report determines the tax impacts of the project—estimating the taxes and fees paid by households as well as businesses at the federal, state and local level.

**Travel Delay Reduction Estimates**

New roads, added lanes, express lanes, operating improvements (such as quickly clearing crashes and more green time for major traffic signals) and travel option programs (such as telecommuting and flexible work hours) reduce congestion. The data and calculation methods to estimate these quantities vary depending on the information available, the project elements and the resulting mobility improvements for commuters and freight shippers. Three general methods are being used to assess the project benefits.

**Previous Studies**

Some projects have been studied in great detail, either in the environmental process or a feasibility study, and congestion benefits have already been estimated. The results of these detailed studies will be used when available.

**Congestion Reduction Estimate**

Researchers at the Texas A&M Transportation Institute developed a spreadsheet-based congestion reduction estimate method to calculate the congestion-related benefits that a project or strategy will have on the road segment and any roads that interact with that segment. The analysis technique uses the speed data from the 100 most congested section dataset and traffic volume data from TxDOT’s Roadway-Highway Network (RHINo) dataset. The procedure assesses current roadway conditions and calculates the estimated conditions if an improvement project is completed. An estimated reduction in delay is developed for current and future years, and the congestion cost savings over the life of the improvement is calculated.
The analysis examines congestion benefits on the road section being improved as well as other nearby road sections that might also be affected. The method also includes congestion benefits from operating improvements such as rapid crash clearance programs. The improved road characteristics are used to estimate new peak period speeds and travel times for each road segment. This process uses available data and can be performed for any road section in the 100 most congested sections list.

**Computer Simulation Model of IH 35 in Austin**

Rider 42 provides an opportunity for local stakeholders in the Austin area to explore roadway design scenarios and determine if their benefits are substantial enough to make them a good investment for the public. Several congestion reduction strategies and designs have been identified by a consultant team and the Central Texas Working Group. TTI will provide person and freight moving performance measures for the IH 35 corridor through the Austin metropolitan area using an area that includes IH 35, SH 130, Loop 1 (MoPac), SH 45, US 183 and the major arterial street system. The computer model will be used to identify the congestion reducing effect on IH 35 and surrounding roads as a method to provide the public with a more accurate view of the possible future outcomes. These model results will be incorporated into public meetings and web-based public engagement techniques.

The analysis examines scenarios using an hourly version of the regional Capitol Area Metropolitan Planning Organization planning model as a base and then modifies both the demand and supply components to examine the effects of a variety of possible scenarios. The model is being run for each scenario to generate projected trips for the following modes: single and two occupant vehicles (SOV and HOV2 autos), high-occupant vehicles (HOV3+ autos), trucks, rail and bus transit and non-motorized travel (pedestrians and bicycles). The IH 35 model shifts trips between these modes according to the design of each scenario. Drivers and transit users are influenced by various factors including congestion levels, user cost of roadways (tolls) and roadway traffic information. Performance measures that illustrate the congestion-reducing effect of shifting trips between these modes as a result of each scenario will be provided to inform the public, project planners and decision-makers.
THE POTENTIAL BIG PROJECTS

The early recommendations in February 2012 represented 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 in many corridors. This section provides an update to listings of the larger projects that were mentioned in the February 2012 report. The economic effects and possible funding options for these projects and others like them will be evaluated in the second year of the Mobility Investment Priorities project.

Exhibit 5 identifies possible projects in the Austin metropolitan area, the amount of funds and project implementation timeframe. The large projects are 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. Several medium-sized projects that could be opened in the near-term are also included in the IH 35 cost.

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

<table>
<thead>
<tr>
<th>Rank</th>
<th>Corridor</th>
<th>Large Projects</th>
<th>Rider 42 Funding</th>
<th>Estimated Implementation Funds Needed*</th>
<th>Implementation Timeframe</th>
</tr>
</thead>
<tbody>
<tr>
<td>39</td>
<td>Loop 1 South Managed Lanes</td>
<td>MoPac South Express Lanes</td>
<td>$16.5M</td>
<td>$290M</td>
<td>2017</td>
</tr>
<tr>
<td>4</td>
<td>IH 35 Study Extension</td>
<td>Potential express lane operations, travel option and traffic management strategies for IH 35 commuters.</td>
<td>$1.2M</td>
<td>Combined with next listing</td>
<td>2013 to 2019</td>
</tr>
<tr>
<td>4</td>
<td>IH 35 Implementation Plan</td>
<td>Feasibility study (pre-NEPA) (using output of City of Austin study) to develop an implementation plan for IH 35 from SH 45 North to SH 45 South (includes critical elements, designs, constructability, costs, environmental process, phasing plan, public involvement and revenue assessment).</td>
<td>$10.75M</td>
<td>$800M</td>
<td>2013 to 2019</td>
</tr>
</tbody>
</table>

**All Congested Corridors**

| Integrated Traffic Management | Integrated system management & operation project that includes comprehensive incident management. | $0.8M | $3M | 2013 to 2018 |

**TOTAL**  
$29.25 Million  
$1.1 Billion

Remaining Austin Rider 42 allocation: $2.03 Million

*Source of implementation funds unknown.
Exhibit 6 identifies possible projects in the Dallas/Fort Worth Metroplex and the amount of funds and timeframe for project implementation. The Rider 42 funds were focused on two projects, but there are several others that might be accomplished if additional funding were available. These would combine with the large projects that are being completed through comprehensive development agreements (which should not require additional public funds).

**Exhibit 6: Summary of Possible Large Projects for Dallas/Fort Worth Congested Corridors**

<table>
<thead>
<tr>
<th>Rank</th>
<th>Corridor</th>
<th>Large Projects</th>
<th>Rider 42 Funding</th>
<th>Estimated Implementation Funds Needed*</th>
<th>Implementation Timeframe</th>
</tr>
</thead>
<tbody>
<tr>
<td>12, 17, 29</td>
<td>IH 30 &amp; IH 35E</td>
<td>Horseshoe Project</td>
<td>$100.75M</td>
<td>$818M (Prop 12, Prop 14 &amp; MTP)</td>
<td>2011 to 2016</td>
</tr>
<tr>
<td>12, 16, 17, 29</td>
<td>IH 30 &amp; IH 35E</td>
<td>Trinity Parkway</td>
<td>$18.0M</td>
<td>$1.9B</td>
<td>2013 to 2030</td>
</tr>
<tr>
<td>12, 16, 17, 29</td>
<td>IH 30 &amp; IH 35E</td>
<td>Project Pegasus</td>
<td>$0.0</td>
<td>$1.7B</td>
<td>2015 to 2025</td>
</tr>
<tr>
<td>9, 15</td>
<td>US 75 North</td>
<td>HOV lane improvements and bottleneck removal.</td>
<td>$0.0</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>16</td>
<td>IH 30 East</td>
<td>Lane expansion and managed lanes.</td>
<td>$0.0</td>
<td>$750M</td>
<td>2015-</td>
</tr>
<tr>
<td>17</td>
<td>IH 35E South</td>
<td>Southern Gateway (expand with 2 additional mainlanes and managed lanes).</td>
<td>$0.0</td>
<td>$1.3B (MTP)</td>
<td>2015 to 2035</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td><strong>$118.75 Million</strong></td>
<td><strong>$4.35 Billion +TBD</strong></td>
<td></td>
</tr>
</tbody>
</table>

Remaining Dallas/Fort Worth Rider 42 allocation: $0.0.

*Source of implementation funds noted if known.
Exhibit 7 identifies the possible large construction projects in the Houston metropolitan area and the amount of funds and timeframe for project implementation. A large project in the IH 45 corridor is estimated to cost $2 billion; several other large construction projects—particularly around downtown and the freeways leading into it—are still to be determined.

### Exhibit 7: Summary of Possible Large Projects for Houston Congested Corridors

<table>
<thead>
<tr>
<th>Rank</th>
<th>Corridor</th>
<th>Large Projects</th>
<th>Rider 42 Funding</th>
<th>Estimated Implementation Funds Needed*</th>
<th>Implementation Timeframe</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1, 7</td>
<td>IH 45 North</td>
<td>Reconstruct mainlanes and add managed lanes.</td>
<td>—</td>
<td>$2.0B</td>
<td>Environmental impact study</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Feasibility study for mobility projects on parallel streets.</td>
<td>$2.0M</td>
<td>TBD</td>
<td>2014 to 2015</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1, 7</td>
<td>Hardy Tollroad</td>
<td>Extend Hardy Tollroad into downtown.</td>
<td>—</td>
<td>$400M (HCTRA)</td>
<td>In design phase</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2, 10</td>
<td>US 59</td>
<td>Reconstruct to 6 mainlanes &amp; 4 managed lanes from SH 288 to Spur 527.</td>
<td>—</td>
<td>$233M (HGAC RTP/TIP)</td>
<td>TBD (as a result of IH 45 North EIS and Downtown Redesign study)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Widen to 8 &amp; 10 lanes with managed lanes from IH 45 to SH 288.</td>
<td>—</td>
<td>$622M (HGAC RTP/TIP)</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Widen to 12 lanes from IH 45 South to IH 10 East.</td>
<td>—</td>
<td>$190M (HGAC RTP/TIP)</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Direct connectors between IH 610 West and US 59 South.</td>
<td>—</td>
<td>$81.5M (TxDOT Houston District)</td>
<td>In design phase</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2, 6, 7, 10, 27, 31, 35</td>
<td>Corridors Inside Loop 610</td>
<td>Downtown redesign study to identify strategies on IH 45, US 59, SH 288 and IH 10.</td>
<td>$5.0M</td>
<td>TBD</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All Congested Corridors</td>
<td>Engineering study to identify operational treatments and incident management strategies</td>
<td>$0.85M</td>
<td>TBD</td>
<td>2014 to 2015</td>
<td></td>
</tr>
<tr>
<td>Travel Options</td>
<td>Engineering study to examine regional travel options along the corridors.</td>
<td>$0.5M</td>
<td>TBD</td>
<td>2013 to 2014</td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL** $86.35 Million ~$2 Billion + TBD

Remaining Houston Rider 42 allocation: $29.87M

*Source of implementation funds noted if known.
Exhibit 8 table identifies possible projects in the San Antonio metropolitan area, the amount of funds and timeframe for project implementation. 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. The most significant funding needs will be in the IH 35 corridor, but there are also large unfunded projects in the US 281 and Loop 1604 corridors.

### Exhibit 8: Summary of Possible Large Projects for San Antonio Congested Corridors

<table>
<thead>
<tr>
<th>Rank</th>
<th>Corridor</th>
<th>Large Projects</th>
<th>Rider 42 Funding</th>
<th>Estimated Implementation Funds Needed*</th>
<th>Implementation Timeframe</th>
</tr>
</thead>
</table>
| 23   | Loop 1604      | Widen to (or build) 6 to 8 lane expressway from US 90 to IH 35 East (Total budget: $1.5B).  
  • US 90 to Potranco (to be funded as toll project).  
  • Potranco to Bandera ($198.8M, 4 expressway lanes funded).  
  • Bandera to IH 35 East (to be funded as toll project).  
  • Managed lanes from US 90 to IH 35 East (to be funded as toll project). | $0                | $1.3B                               | 2013 to 2018 (Potranco to Bandera)  
  Toll expansion timeline TBD |
| 38   | US 281/Loop 1604 | Northern direct connectors.                                                   | $6M              | $59M (MPO MTP)                         | 2018                             |
| 38   | US 281         | Construct expressway (Total budget: $500M).  
  • Loop 1604 to Stone Oak ($170M funded, $330M needed).  
  • Expressway from Stone Oak to County Line (to be funded as toll project).  
  • Managed lanes from Loop 1604 to Stone Oak (to be funded as toll project). | $0                | $330M                               | 2018 (Loop 1604 to Stone Oak)  
  Toll expansion timeline TBD |
<p>| 48   | IH 35 Central  | Widen to 10 lanes from US 281/IH 37 to IH 410 South.                        | $0                | $335.5M (MPO MTP)                     | TBD*                              |
| 48   | IH 35 Central  | PEL study                                                                    | $1.0M             | TBD**                                 | TBD*                              |
| 49   | IH 35 Northeast| EIS or EA Study***                                                          | $13.0M            | TBD**                                 | TBD*                              |
| 49   | IH 35 Northeast| Widen to 12 or 14 lanes.                                                    | $0.0              | $1.7B (MPO MTP)                       | TBD*                              |
| 48, 49| IH 35 Alternate Routes Inside IH 410 | PEL study for IH 410 Southeast, IH 410 Southwest, IH 10 East and Loop 1604 Northeast. | $3.0M             | TBD**                                 | TBD*                              |</p>
<table>
<thead>
<tr>
<th>Corridor</th>
<th>Description</th>
<th>Cost</th>
<th>Funding</th>
<th>Timeframe</th>
</tr>
</thead>
<tbody>
<tr>
<td>48, 49</td>
<td>IH 35 Alternate Routes Outside IH 410</td>
<td>$0.0</td>
<td>$3.2B to $4.65B+ROW (My 35)</td>
<td>TBD*</td>
</tr>
</tbody>
</table>

**All Congested Corridors**

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
<th>Funding</th>
<th>Timeframe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enhanced Transportation and Incident Management</td>
<td>$1.0M</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Enhancing Travel and Parking Option Strategies Among Regional Employers</td>
<td>$0.6M</td>
<td>n/a</td>
<td>n/a</td>
</tr>
</tbody>
</table>

**TOTAL**

$24.6M $4.8B to $6.3B+ROW +TBD

**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 to 2017."
CONCLUSION

TTI will deliver other recommendations, reports and analyses to the Legislature and the Texas Transportation Commission over the next 12 months and a final report in August 2013. Throughout the study period, commuters in each region will be actively involved in deciding just how much congestion relief and what kind of solutions they want and how they think those solutions should be paid for. TTI’s purpose is to support local transportation agencies, and in the end, the priorities identified will reflect locally expressed needs. The Institute’s work is a complement to existing planning and development efforts already underway in the regions and will not replace any such local efforts.

In addition, TTI’s Mobility Investment Priorities team will be available to respond to other issues in the 50 most congested corridors that are identified locally or at the state level. The two years of the Mobility Investment Priorities project is a good start on solving the congestion issues in the state, but there may be other studies or education efforts needed to support the next decade of projects and programs necessary to address Texas’ growth challenges.