

# Draft Executive Summary

prepared for



**Texas Department of Transportation** 

prepared by



in professional association with HNTB Corporation Quadrant Consultants
The Lentz Group
Aerial Data Services



#### STUDY PURPOSE AND NEED

The purpose of the SH 288 Corridor Feasibility Study is to select a Most Feasible Alternative (MFA) consisting of recommended transportation improvements that address mobility and safety needs along the corridor while minimizing environmental and land use impacts. This study evaluates the impacts and feasibility of various transportation modes and alternative improvements using a detailed evaluation process and consideration of major stakeholder and public input.

Mobility in the SH 288 corridor has become increasingly less efficient as a result of significant development and traffic growth that has occurred in recent decades. With extensive development projected to continue in the area over the next twenty years, traffic conditions will continue to deteriorate without major transportation improvements.

#### STUDY GOALS AND OBJECTIVES

Goals and objectives were developed through the major stakeholder and public involvement process to guide the development and evaluation of alternatives, including ultimate selection of the Most Feasible Alternative. The goals established for this study are as follows:

- Improve and maintain existing and future mobility and access in the study corridor.
- Improve existing and future safety conditions within study area.
- Minimize impacts on the socioeconomic and environmental conditions of the SH 288 corridor.
- Provide for a feasible and cost effective transportation system.
- Allow for efficient transportation system expansion or modification in the future.
- recommendations Consider comments and received from major stakeholders and the public.

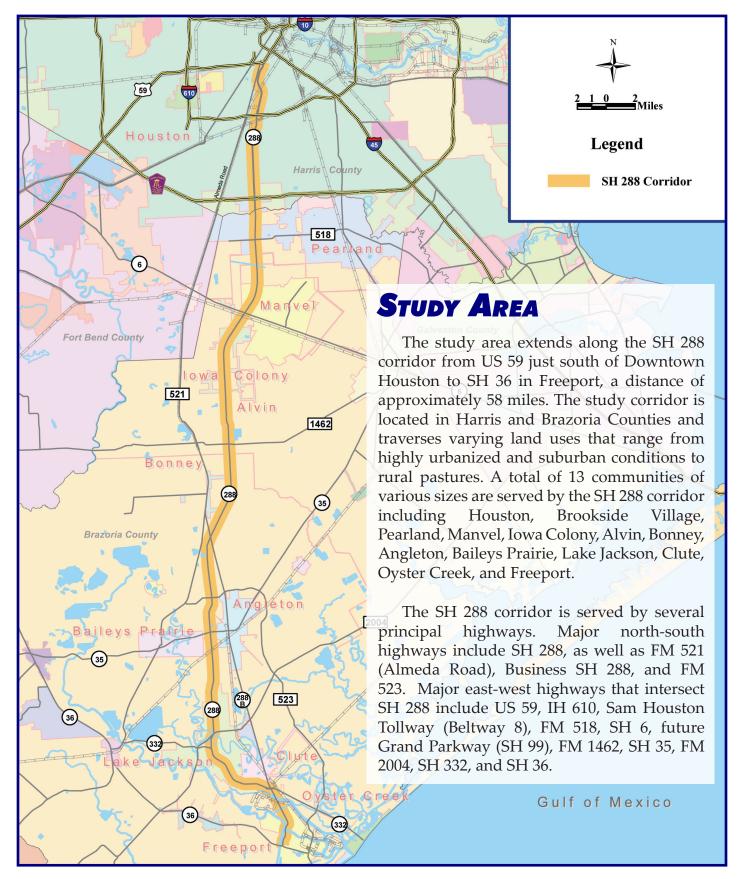


Population along the SH 288 corridor increased significantly between Years 1990 and 2002. The current population is projected to increase by approximately 60 percent by Year 2025. Traffic volumes along many sections of SH 288 have nearly doubled over the past ten years, with volumes in many locations projected to once again increase considerably by Year 2025.

Travel speeds and Level-of-Service (LOS) along SH 288 have already reached unacceptable conditions during peak periods, particularly between US 59 and FM 518. As travel demand increases, mobility conditions are projected to become increasingly unacceptable with congestion extending south to SH 6 and eventually to the future Grand Parkway (SH 99).

Safety along the corridor is also an issue. Over the past few years, SH 288 has experienced a relatively high number of accidents in comparison to other major highways in the region. Additionally, SH 288 is the only northsouth freeway and designated evacuation route serving the rapidly growing Brazoria County.

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#### STUDY DEVELOPMENT AND COORDINATION

The SH 288 Corridor Feasibility Study was a joint undertaking of Texas Department of Transportation (TxDOT), Houston-Galveston Area Council (H-GAC), a Steering Committee consisting of area agencies and major stakeholders, a Consultant Team, and the public. Professional services for this study were provided by Wilbur Smith Associates in association with HNTB Corporation, Quadrant Consultants, The Lentz Group, and Aerial Data Services.

This study included a comprehensive public outreach program that provided numerous opportunities for area agencies, adjacent communities and citizens to voice their suggestions and concerns regarding potential transportation improvements along the SH 288 corridor. Major public involvement activities included:

- An initial **Agency Coordination Meeting** held at the beginning of this project with various federal, state and local governmental agencies to introduce the study and solicit input regarding corridor issues and needs.
- Three Steering Committee Meetings held at major project milestones to provide representatives of area agencies organizations with continuous opportunities to review and comment on study findings and • recommendations.
- Separate Stakeholder Meetings were held with 15 area communities and organizations to obtain information, and solicit suggestions development and concerns regarding and transportation improvements in their respective areas of the corridor.



- Three series of **Public Meetings** were conducted along the corridor following completion of major study activities to provide all interested citizens and the general public with opportunities to review and comment on interim study findings and recommendations. Over 700 citizens attended the public meetings and approximately 360 written comments were provided to the Consultant Team.
- A total of three **Newsletters** indicating public involvement opportunities and summarizing study findings and recommendations were prepared and distributed to nearly 2,000 persons and organizations included in the project mailing list.
- Information regarding the study progress and results was provided and periodically updated on TxDOT's Website.



#### **EXISTING CONDITIONS**

Existing highway, transportation, land use, and environmental conditions along the SH 288 corridor are summarized in the following paragraphs.

#### **Major Highway Characteristics**

- ♦ SH 288 currently provides four to eight main travel lanes with a grassy median of approximately 108 feet along much of its length.
- Between US 59 south of Downtown Houston and FM 518 in Pearland, SH 288 is a freeway facility with full control of access (i.e. overpasses or underpasses at cross streets). SH 288 functions as a limited access highway or arterial south of FM 518 with many at-grade intersections that are primarily controlled by stop signs on cross streets in rural areas, as well as traffic signals at major intersections in urban areas such as Angleton and Lake Jackson.



- ◆ Existing Right-of-Way (ROW) widths generally range from 120 feet to 150 feet along the southern section of the facility between SH 332 and SH 36 and up to 600 feet at some locations along the northern section between US 59 and IH 610. A majority of SH 288 has a ROW of approximately 420 feet, which is adequate for significant highway capacity improvements.
- ◆ There are a total of six grade separated railroad crossings along SH 288, including five with Union Pacific (UP) rail lines and one with a Burlington Northern Santa Fe (BNSF) rail line.



#### **Major Transportation Conditions**

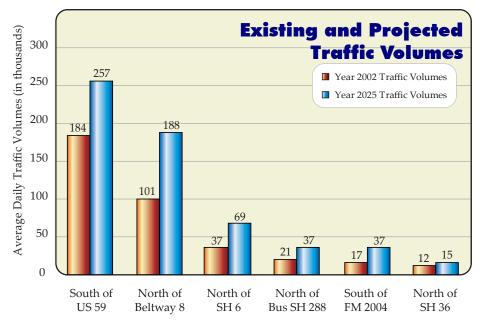
- Existing daily traffic volumes on SH 288 range from a high of 184,000 vehicles per day (vpd) just south of Downtown Houston near US 59, to a low of 12,000 vpd at the southern end of the facility near SH 36 in Freeport.
- Truck traffic ranges from three percent of total traffic between US 59 and IH 610 to 20 percent at the southern end of the facility.
- The northern section of SH 288 between US 59 and FM 518 in Pearland experiences congestion (unacceptable LOS E/F) during peak periods.
- The most serious collision hot spots (in terms of total number of accidents) are primarily located between US 59 and the Texas Medical Center area. In terms of serious crash rates (the number of serious crashes per 100 million vehicles miles traveled), the southern section of the corridor in the Lake Jackson and Freeport areas was shown to have the highest crash risk.
- Examples of major traffic generators served by the SH 288 corridor include Downtown Houston, the Texas Medical Center, Silverlake



and Shadow Creek Subdivisions in Pearland, Houston Community College, and Dow Chemical and other petrochemical plants in the Freeport area.

- SH 288 provides access to several intermodal facilities including the Port of Freeport (second largest container port on the Texas Gulf Coast), Brazoria County Airport, and Houston Hobby Airport located just east of the study corridor.
- Transit facilities in the SH 288 corridor

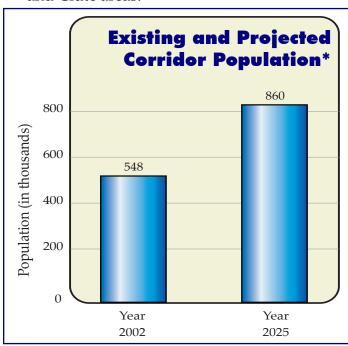
include six TxDOT Park and Pool lots with each providing approximately 25 to 50 parking spaces; a limited number of METRO bus routes between US 59 and IH 610 (the Sam Houston Tollway (Beltway 8) is the southern limit of METRO's service area); the Fannin Street METRORail station; and rural public transportation services provided by Gulf Coast Center - Connect Transit.





#### **Major Land Use Conditions**

- Land uses along SH 288 generally become less intensely developed moving from north to south along the corridor, with the exceptions of the Cities of Lake Jackson, Clute and Freeport.
- There are several existing and ongoing residential subdivisions and large-tract master planned communities located primarily between Sam Houston Tollway (Beltway 8) and SH 6.
- Commercial land uses are primarily concentrated around the major intersections of FM 2234 (McHard Road), FM 518, SH 6, SH Major Environmental 35 and Business SH 288.
- Industrial development is concentrated in the northern and southern sections of SH 288. Warehouse and oil field industries are located between the Sam Houston Tollway (Beltway 8) and Brays Bayou, with extensive petrochemical facilities located in the Freeport and Clute areas.



\* The SH 288 Corridor is generally defined as a 10 mile band along each side of SH 288 for the length of the study area.



# **Conditions**

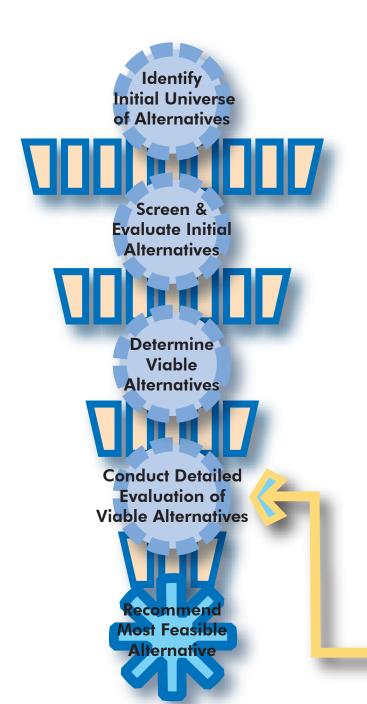
- The SH 288 corridor crosses Sims Bayou, Brays Bayou, Clear Creek, Mustang Bayou, Oyster Creek, Austin Bayou, West Fork Chocolate Bayou, Hayes Creek and Bastrop Bayou. These streams have various areas of associated floodplains as well as fringing wetlands that are likely to be jurisdictional.
- The SH 288 corridor includes three major watersheds including the San Jacinto River Basin, San Jacinto-Brazos Coastal Basin, and Brazos River Basin.
- Although there is a significant amount of farmlands located along the SH 288 corridor, a very small amount is considered prime farmland.
- Most of the known or potential hazardous contamination sites located in the SH 288 corridor are petroleum storage tanks at service stations.
- Within a half-mile of SH 288, there is only one site listed on the National Register of Historic Places. There are several other registered historical sites located within 1.5 miles of SH 288.



#### Evaluation of Alternatives

The study began with the identification of nine initial "Universe of Alternatives" that included a No-Build Alternative, a Transportation System Demand Management/Travel Management/ Intelligent Transportation System (TSM/TDM/ ITS) Alternative, and seven build alternatives that consisted of major capacity improvements requiring significant capital investment. The initial build alternatives included several transportation modes and improvements including the addition of travel lanes with various restrictions (general purpose, high occupancy vehicle managed, express toll, and exclusive truck lanes) on SH 288, as well as construction of light rail and commuter rail lines along the corridor.

Based on the results of the initial screening evaluation and public input, the original nine alternatives were narrowed down to six "viable" alternatives that were considered the most reasonable and merited detailed evaluation. All of the viable alternatives assumed the construction transportation improvements programmed for implementation in the H-GAC 2025 Regional Transportation Plan (RTP) and other area transportation programs; implementation of relatively minor and cost effective TSM/TDM/ ITS measures; and the conversion of SH 288 to a freeway facility along its entire length, which requires the elimination of at-grade intersections and construction of grade separation (overpasses/ underpasses) between FM 518 in Pearland and Main Street in Clute.





#### VIABLE ALTERNATIVES

The viable build alternatives included four highway improvement options that assumed construction of additional travel lanes along SH 288 and two transit improvement options that assumed construction of passenger rail facilities along the FM 521 (Almeda Road)/ UP Railroad corridor.

Alternative A: Single Occupancy Vehicle (SOV) and High Occupancy Vehicle (HOV) Lanes along SH 288

Alternative B: Highway Occupancy Vehicle (HOV)
Lanes along SH 288

**Alternative C:** Managed Lanes along SH 288

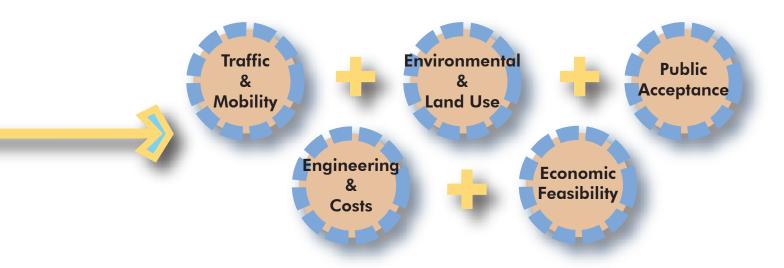
**Alternative D: Express Toll Lanes along SH 288** 

Alternative E: Light Rail Transit along FM 521 (Almeda Road)/UP Railroad corridor

Alternative F: Commuter Rail Transit along FM F21 (Almeda Road)/UP Railroad corridor

This study confirmed that the rail alternatives along the FM 521 (Almeda Road)/UP alignment would not significantly reduce congestion or improve safety in the study corridor on their own and could not reasonably compete with the viable highway alternatives on SH 288. Therefore, the rail alternatives were considered complimentary options that could provide an important mobility benefit by introducing an alternative mode of transportation to assist in accommodating travel demands in the SH 288 corridor.

The major categories of the evaluation criteria used for the detailed study of the viable alternatives included impacts related to traffic/ mobility, engineering/costs, environmental/land use, economic feasibility, and public acceptance. Special consideration was given to the study goals and major issues identified early in the project including existing and future traffic congestion, safety, proposed corridor development, consistency with area transportation programs and planned improvement projects, and provision and encouragement of alternative modes of transportation.



## RECOMMENDED MOST FEASIBLE ALTERNATIVE (MFA)

The MFA was selected based on the detailed • evaluation of viable alternatives and consideration of stakeholder and public input. The primary characteristics of the MFA include highway improvements, transitimprovements that promote alternative modes and reduce travel demand, and a variety of measures that further improve the cost effective, efficient, and multimodal character of the SH 288 corridor.

#### **Major Highway Improvements**

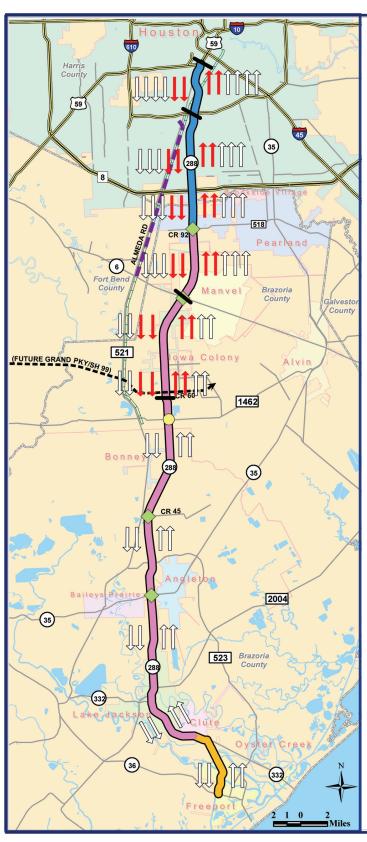
- Construction of two managed lanes in each direction within the median of SH 288 from US 59 to the proposed Grand Parkway (SH 99), a distance of approximately 25 miles. The managed lanes could be used by selected HOV and transit vehicles without paying a user fee, but could also be used by single occupancy drivers who pay a toll that could vary according to the level of congestion and time of day along SH 288. Restrictions regarding the use of managed lanes could be adjusted to better accommodate future traffic characteristics and patterns in the corridor, as well as provide consistency and support regional policy and goals.
- Upgrade SH 288 to a freeway facility with full control of access from FM 518 to Main Street in Clute, a distance of approximately 40 miles. The upgrade consists of removing at-grade intersections and providing grade separations (overpasses and underpasses) to improve mobility and safety along the corridor.

Construction of fully directional interchange at Beltway 8 and SH 288, which would include a total of eight direct connectors to accommodate projected Year 2025 traffic volumes at this major intersection. Two of the proposed direct connectors are already programmed by TxDOT.

#### Transit Improvements

- Future development of the FM 521 (Almeda Road)/UP Railroad right-of-way as a high capacity transit corridor. Final determination of the most appropriate and feasible form of high capacity transit should be determined as part of future regional transportation planning activities and passenger rail improvements that could ultimately be constructed throughout the Houston-Galveston metropolitan area.
- Construction and expansion of Park and Ride **lots** is recommended to encourage carpooling and vanpooling and use of the recommended managed lanes along SH 288. Locations of existing Park and Ride lots recommended to be expanded include FM 518, SH 6, CR 45, and SH A new Park and Ride lot is recommended at FM 1462. T-ramps are recommended at the Park and Ride lots at Airport, FM 518, and SH 6, which will provide commuter bus service and carpoolers with direct access to the recommended managed lanes along SH 288.
- Commuter bus service is recommended along the SH 288 corridor to serve major origin-destinations such as between Pearland and the Texas Medical Center and Downtown Houston.

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#### SH 288 Major Highway Improvements

- Add two additional managed lanes in each direction between US 59 and proposed Grand Parkway (SH 99)
- Construct fully directional interchange at Beltway 8
- Upgrade to a freeway facility (overpasses/underpasses) from FM 518 to Clute

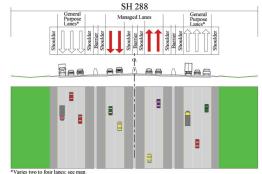
#### Transit Improvements

- Preserve FM 521 (Almeda Road) corridor from METRORail Fannin South Station to SH 6 for future high capacity transit
- Expand existing and construct new park and ride lots
- Provide commuter bus service along the SH 288 corridor

#### Other Improvements

- Implement TSM/TDM and access management measures along SH 288, FM 521 (Almeda Road), and cross streets (intersection improvements, signal synchronization, transit, bikeway/pedestrian improvements)
- Implement Intelligent Transportation System (ITS) improvements (dynamic message signs, closed circuit television cameras, and motorist assistance patrol)
- Implement regional improvements by H-GAC and other local entities

#### **Proposed Typical Section**



#### Map Legend

Existing Lane

Proposed Managed Lane

**Existing Freeway Facility** 

Upgrade to Freeway Facility (Overpasses/Underpasses)

Existing Limited Access Facility

Expand Existing Park & Ride Lot/Transit Center

O Potential New Park & Ride Lot/Transit Center

Future High Capacity Transit and Bikeway Corridor

#### Other Improvements

#### **Transportation System Management** (TSM) Measures

effective TSM improvements cost are measures that can improve traffic flow by making better use of the existing transportation system. Examples of these measures recommended along SH 288, FM 521 (Almeda Road) and other area highways include optimizing traffic signal timing, constructing intersection geometric/ operational improvements, implementing access management measures, re-striping faded pavement markings, improving or building shoulders, and implementing auxiliary lanes and ramp modifications on SH 288.

#### Intelligent Transportation Systems (ITS) Measures

ITS uses information technology to enhance travel and transportation system efficiency. Recommended ITS improvements along SH 288 include providing additional closed circuit television cameras and dynamic message signs, installing ramp meters at warranted locations, and expanding highway advisory radio and motorist assistant patrols.

#### **Biking/Pedestrian Facilities**

Biking and walking provide alternative forms of transportation for persons making relatively short trips for commuting or recreational purposes. Several bicycle and pedestrian amenities are already in place or planned along the SH 288 corridor. As part of the MFA, it is recommended that the proposed bikeway facility on FM 521 (Almeda Road) be extended between FM 2234 (McHard Road) to SH 6 as an off street bikeway facility along the railroad/future high capacity transit right-of-way or an on-street bike route using shoulders along FM 521 (Almeda Road). The proposed improvements would provide a continuous bikeway/pedestrian facility from the Texas Medical Center area to SH 6.

#### **Planned Area Transportation Improvements**

The MFA recommends and supports other planned improvements in the SH 288 corridor. The following transportation improvements included in the H-GAC 2025 RTP are particularly important for improved mobility in the SH 288 corridor.

- Widening of FM 521 (Almeda Road) to four lanes between Anderson and Beltway 8 and to six lanes between Beltway 8 and Sienna Parkway while converting to a "Smart Street" from Holcombe to SH 6. This improvement along with the recommended TSM/TDM/ ITS measures should encourage the use of FM 521 (Almeda Road) as an alternate route and reduce the congestion projected along SH 288, especially for commuters destined for the Texas Medical Center and Downtown Houston.
- Widening of CR 92 (Broadway) to four lanes between SH 288 and Almeda School Road, extending from Almeda School Road to FM 521 (Almeda Road), as well as converting it to a "Smart Street" from the Ft. Bend county line to SH 288. This project would provide another important connection to SH 288 and encourage the use of FM 521 (Almeda Road) as an alternative north-south route in the study corridor.
- Widening of FM 523 to four lanes between FM 1495 to FM 2004, and converting to a "Smart Street" from SH 35 to SH 332. This would provide an improved alternative route for truck traffic generated by the Port of Freeport and serve as a relief route that could accommodate and encourage the diversion of regular traffic as well as heavy vehicles that carry potentially hazardous material cargo around Oyster Creek, Clute, Lake Jackson, and Angleton.



### Light Rail Transit Alternative



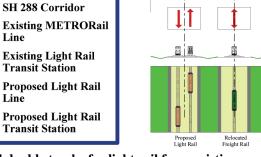
#### Commuter Rail Alternative



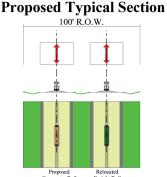


#### Map Legend SH 288 Corridor **Existing METRORail** Line **Existing Light Rail Transit Station**

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Map Legend SH 288 Corridor **Existing METRORail** Line **Existing Light Rail Transit Station Proposed Commuter** Rail Line **Proposed Commuter** Rail Transit Station



- Extend double tracks for light rail from existing **METRORail Fannin South Station to SH 6**
- Utilize existing rail right-of-way to accommodate light rail between FM 521 and freight track
- Grade-separate light rail at
  - Holmes Road / UP main line
  - ■W. Fuqua / Almeda Genoa
  - Freight Rail Track / FM 521
- Reed Road

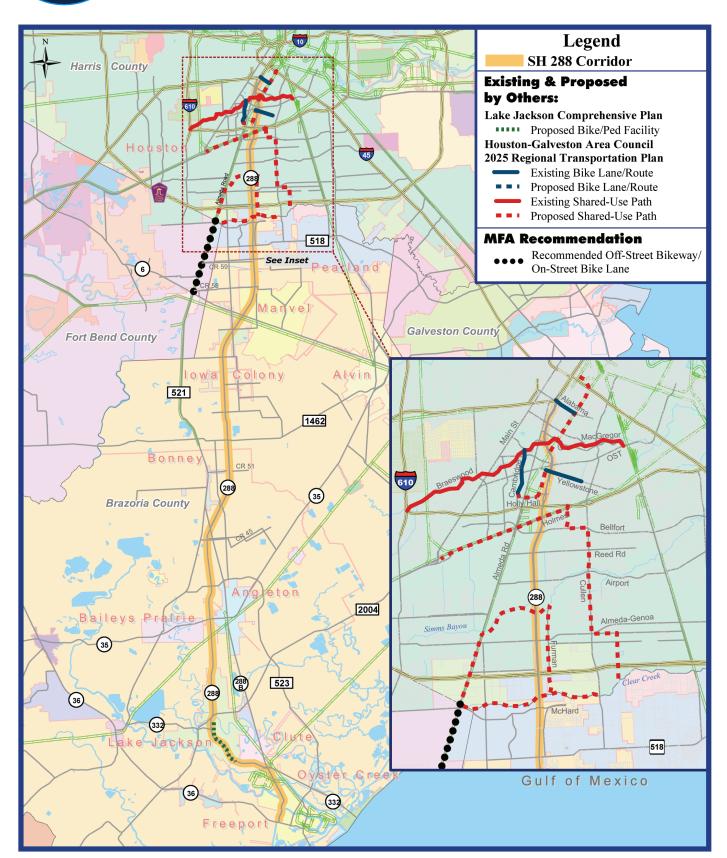
**Proposed Typical Section** 

100' R.O.W

- Airport Blvd.
- McHard / FM 2234

- Extend light rail from existing METRORail Fannin South Station to Reed Road at FM 521 • Construct a Transfer Station at Reed Road to switch
- between light rail and commuter rail • Install single track for commuter rail from the proposed
- **Transfer Station to SH 6**
- Utilize existing rail right-of-way to accommodate light rail between FM 521 and freight track
- Grade-separate light rail at Holmes Road / UP main line

**Potential High Capacity Transit Alternatives** 



**Existing & Proposed Bicycle Facilities** 



### BENEFITS & IMPACTS OF MFA

The recommended MFA meets the study goals and objectives established in the beginning stages of the process. It significantly improves corridor mobility and safety, minimizes environmental and land use impacts, is very cost effective (benefits far outweigh its costs), provides flexibility for future expansion, and reflects public input. Its ultimate development would also result in a "multimodal" transportation system that provides a number of alternative transportation solutions and choices for users of the SH 288 corridor.

The MFA also supports current TxDOT policies (particularly House Bill 3588) and transportation plans programs. and toll revenues generated by For example, managed lanes would provide an additional funding source for faster implementation of much needed transportation improvements the SH 288 corridor. Additionally, recommendations included in the MFA confirm • the need for and complement various planned area transportation improvements included in the H-GAC 2025 RTP, Texas Metropolitan Mobility Plan, METRO Regional Plan, Brazoria County Mobility Plan, City of Pearland Bond Program, and several other regional planning efforts.



The recommended MFA meets the study goals A summary of the estimated benefits and and objectives established in the beginning stages impacts of the recommended MFA by major study of the process. It significantly improves corridor element follows:

#### **Traffic/Mobility**

- Recommended managed lanes on SH 288 significantly improve travel speeds and result in acceptable traffic operations during peak periods.
- ◆ Implementation of the MFA provides a multimodal system that encourages the use of alternative transportation modes.
- Recommended and planned transportation improvements in the area provide important connections to SH 288 and encourage the use of FM 521 (Almeda Road), Business SH 288 and FM 523 as alternative routes for more efficient north-south mobility in the corridor.
- Recommended highway, TSM and ITS alternative improvements significantly improve emergency evacuation.
- Future high capacity transit along the FM 521 (Almeda Road)/UP corridor is projected to serve up to 9,000 daily passengers depending on the form of transit, operation characteristics, station locations, and terminus locations.

#### **Engineering/Costs**

- ◆ Safety is significantly improved by eliminating geometric deficiencies and at-grade crossings and by constructing managed lanes as recommended along SH 288 to increase separation of local versus through traffic.
- Total net implementation cost of the recommended MFA is estimated to be \$782 million (in Year 2004 dollars), including construction, limited right-of-way acquisition, and annual operations and maintenance costs, minus estimated toll revenues.

- Estimated capital costs (in Year 2004 dollars) for light rail transit or commuter rail along the FM 521 (Almeda Road)/UP corridor are approximately \$293 million and \$173 million, respectively.
- The MFA requires a minimal amount of **Economics** right-of-way acquisition, primarily for the recommended Park and Ride lot expansions and potential future rail stations.

#### **Environmental/Land Use**

- The recommended SH 288 managed lanes and corridor TSM/TDM measures do not require residential or business displacements while future high capacity transit along FM 521 (Almeda)/UP corridor could potentially require a limited number of relocations.
- Implementation of the MFA results in minimal to no impacts to the natural environment, including threatened and endangered species, vegetation and wildlife habitat, floodplains, wetlands, and water quality.
- A minimal amount of prime farmlands could potentially be impacted by the recommended Park and Ride lot expansions.

- Section 4(f) lands such as parks, recreation facilities and historic sites are not impacted.
- Air and noise impacts are estimated to be minimal and within acceptable ranges.

- The recommended SH 288 managed lanes are economically feasible and extremely cost effective with an estimated benefit/cost (b/c) ratio of over 5.0. That is, the transportation improvements will produce over \$5.00 in transportation user benefits for every dollar spent on construction.
- The estimated cost per new rider on future highway capacity transit (assuming either light or commuter rail) is projected to be approximately \$20/rider - sufficiently low to be considered a likely candidate for federal funding.
- Toll revenues that are generated by the SH 288 managed lanes are estimated to provide a significant funding source for faster implementation of needed transportation improvements along the SH 288 corridor.
- The MFA promotes economic development throughout the corridor.

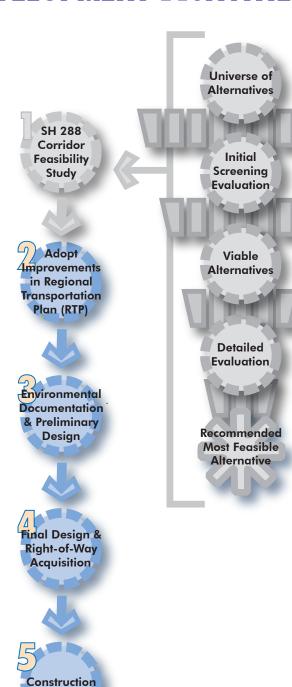




#### REMAINING PROJECT DEVELOPMENT ACTIVITIES

This SH 288 Corridor Feasibility Study is the first of several project development phases that will be required prior to the implementation and construction of the recommended transportation improvements included in the selected MFA. Following its adoption and incorporation into the Houston-Galveston Regional Transportation Plan (RTP) and Transportation Improvement Program (TIP), the various improvements included in the MFA will need to be accepted for implementation responsibility by one or more sponsoring agencies; undergo preparation of required environmental documentation, preliminary and final design, and right-of-way acquisition; and finally, construction.

The time frame for the ultimate completion of the MFA could be several years in the future depending on the actual scheduling of required agency coordination and remaining project development activities, and more importantly the successful securing of needed funding sources.







# For More Information About the SH 288 Corridor Feasibility Study Contact:

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