

146



**Executive
Summary**

EXECUTIVE SUMMARY

OVERVIEW

The State Highway 146 Subregional Study was commissioned by the Houston-Galveston Area Council (H-GAC), and funded by the Texas Department of Transportation (TxDOT) and the cities of Baytown and Mont Belvieu. SH 146 is an important regional corridor that serves as a major north-south thoroughfare, freight route, and hurricane evacuation route. Areas surrounding SH 146 are a rapidly growing part of the greater Houston-Galveston region in terms of population, employment, freight movement and traffic.

*The **vision** of the SH 146 Subregional Plan is to improve mobility and safety of the roadway network for all users.*

To realize this vision, a set of project goals were developed to further define the expectations of the participating agencies and to provide guidelines for the recommendations.

GOALS

- Enhance safety by addressing the needs of all users
- Mitigate congestion
- Mitigate mobility barriers
- Address commercial vehicle issues
- Increase connectivity for all modes of transportation
- Enhance streetscapes
- Engage the public in decision making process

STUDY AREA

The study area includes the City of Mont Belvieu and the eastern portion of the City of Baytown. This area is experiencing a growing amount of commuter, residential, and industrial traffic as the petrochemical and manufacturing plants continue to expand. These expansions have added thousands of short-term workers to the area as well as hundreds of new permanent employees. In addition to shift change traffic, major industrial and manufacturing companies located within the area contribute to growing traffic and safety issues. The study area is shown in **Figure 1**.

Recommended physical improvements focus primarily on two distinct zones: along the SH 146 Corridor and the Peripheral Intersections. The SH 146 Corridor extends roughly eight miles along SH 146 from the Liberty-Chambers County line to Cedar Bayou, approximately 1,000 feet north of Massey-Tompkins Road. The Peripheral intersections studied are comprised of 19 major intersections located within and around the study area.

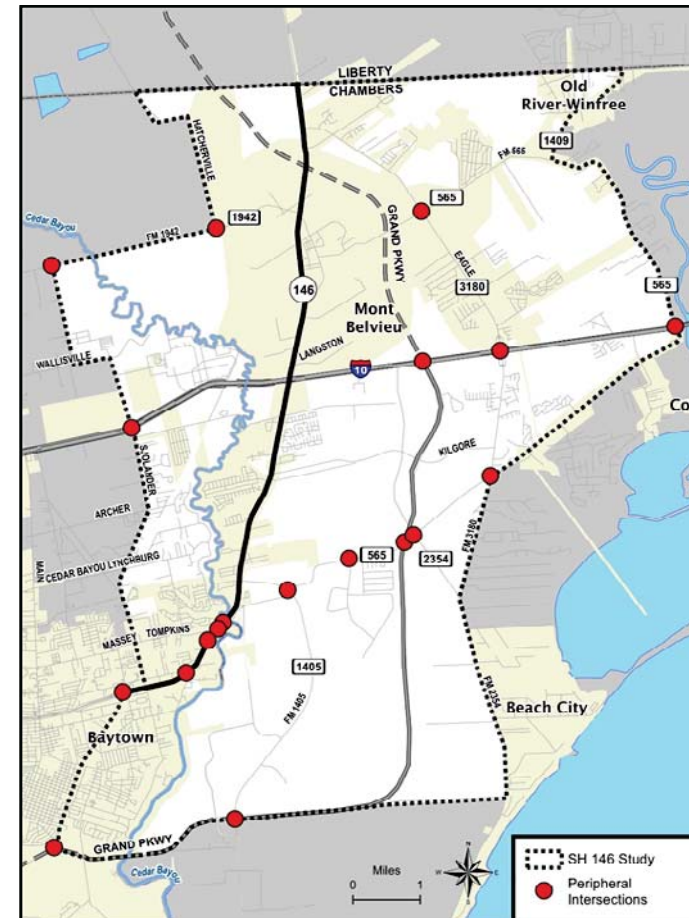


Figure 1 – Study Area

PUBLIC INVOLVEMENT

An important aspect of this study was to actively engage the public early in the process and to continue to gather feedback throughout the life of the project. Feedback was received from three different groups: a steering committee, area stakeholder groups, and the public. **Table 1** summarizes the major issues that were identified by each group. The “Data” column indicates if field investigations, previous studies, or traffic analyses have identified the issue as a concern.

A steering committee was created to gather input from local agencies within the study area, provide guidance and technical expertise throughout the study. Stakeholder groups were comprised of local business owners, industry representatives, elected officials, emergency responders, and leaders from the surrounding schools and faith communities. Two public meetings were held for the project, both of which were well attended by a diverse mix of people from the surrounding area.

Major Issues	Steering	Stakeholders	Public	Data
SH 146 Congestion	X	X	X	X
Signal Timings	X	X	X	X
Driveway Consolidation	X			X
School Zones (Safety)	X	X	X	X
Underutilization of SH 99	X	X	X	X
Heavy Haul Traffic	X	X	X	X
Additional Road Connections	X	X	X	X
Railroad Crossings	X	X	X	X
Bike / Pedestrian Facilities		X	X	
Aesthetics	X	X	X	X
Hurricane Evacuation Route	X	X	X	X
Cedar Bayou Crossing	X	X	X	X
Hazardous Material Hauling			X	
FM 565 & FM 3180 Congestion	X	X	X	X

Table 1 – Common Issues

TRAFFIC OPERATIONS

The existing roadway network and traffic volumes for the year 2017 were modeled to determine the delay at each study intersection. 2017 Average Daily Traffic (ADT) counts and corresponding roadway capacity are shown in **Figure 2**, and PM peak hour Level of Service (LOS) for signalized intersections is shown in **Figure 3**.

CRASH ANALYSIS

Crash data for the study area was obtained from H-GAC and TxDOT's Crash Records Information System (CRIS) for the five-year period from 2011 through 2015. During the five-year period, about 688 crashes occurred on the study corridor. In **Figure 4**, the heat map shows the crash locations along the corridor. Locations with the highest crash numbers (shown in red) include the intersections of:

- SH 146 at FM 1942
- SH 146 at Loop 207
- SH 146 at IH 10
- SH 146 at Redwood Drive
- SH 146 at El Chaco Drive
- SH 146 at FM 1405
- SH 146 at FM 565

The crash records indicate that areas with high driveway density, such as SH 146 near IH 10, experience a much higher crash frequency than other sections of the corridor.

PREVIOUS PLANS

Several transportation-related projects are planned within the study area. Planned projects at study intersections were considered short-term projects (unless otherwise denoted). These projects were incorporated into the short-term improvement exhibits and improved-scenario Synchro™ models. A map of funded projects is shown in **Figure 5**.

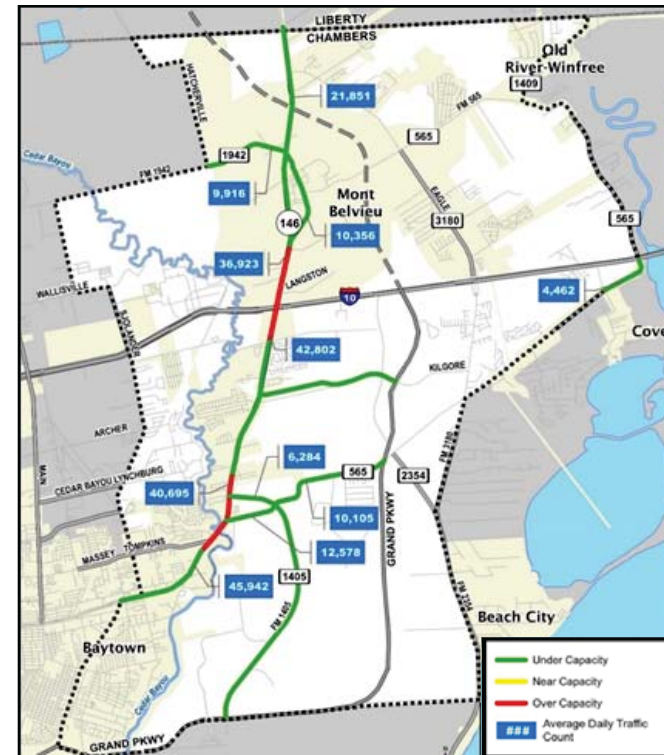


Figure 2 – 2017 Average Daily Traffic and Roadway Capacity

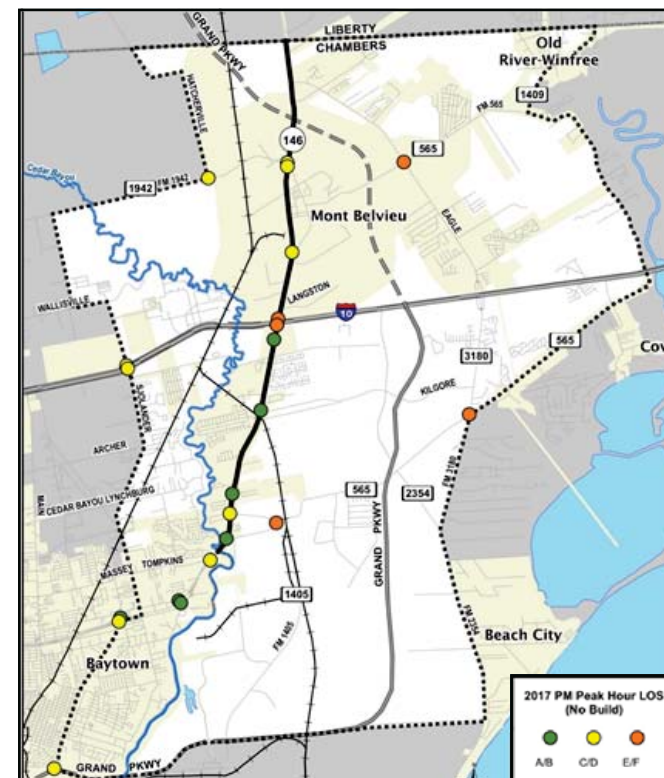


Figure 3 – 2017 PM Peak Hour Intersection LOS



Figure 4 – SH 146 Study Corridor Crash Data Heat Map (2011-2015)

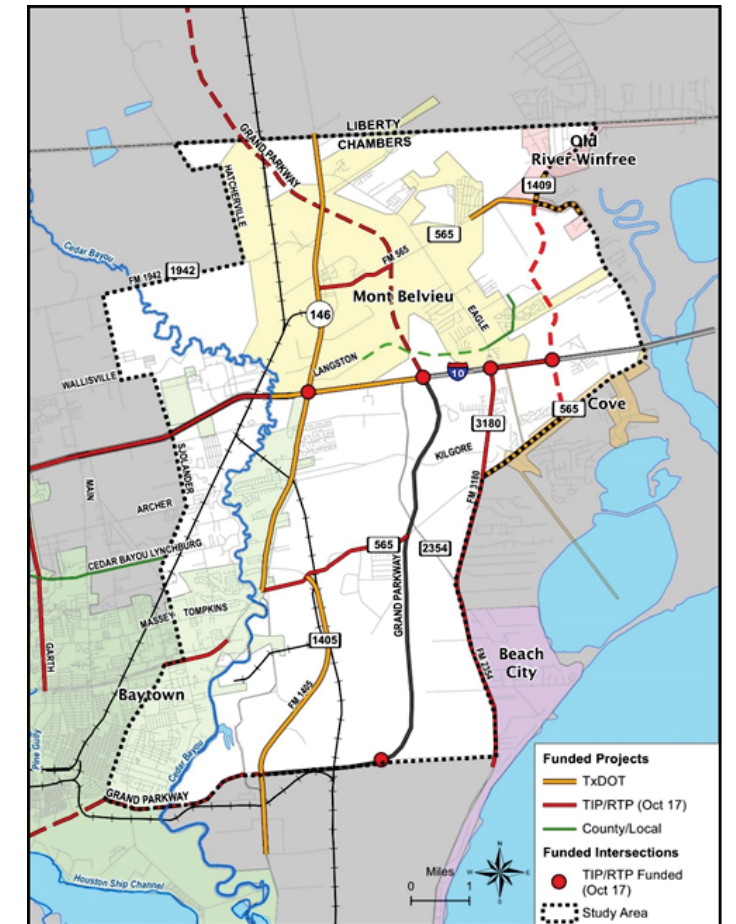


Figure 5 – Planned Projects

BARRIERS

Barriers to mobility within the study area include natural and man-made barriers. Natural barriers (such as bayous and their floodways) and manmade barriers (such as railroads and pipelines) can limit the feasibility of mobility improvements by their high construction cost. Barriers to mobility within the study area are shown in **Figure 6a and 6b**.

Cedar Bayou is the most prominent natural barrier to mobility and has hindered the construction of an east-west roadway between IH 10 and Massey-Tompkins Road. A major but less-apparent man-made barrier, especially along SH 146 in Mont Belvieu, are pipelines located above and below grade. Pipelines play a major role in the ability to improve mobility in the study area. The increased cost associated with accommodating pipelines sometimes prohibit roadway widening. Crossing or relocating pipelines must be considered before constructing any major improvements within the study area.

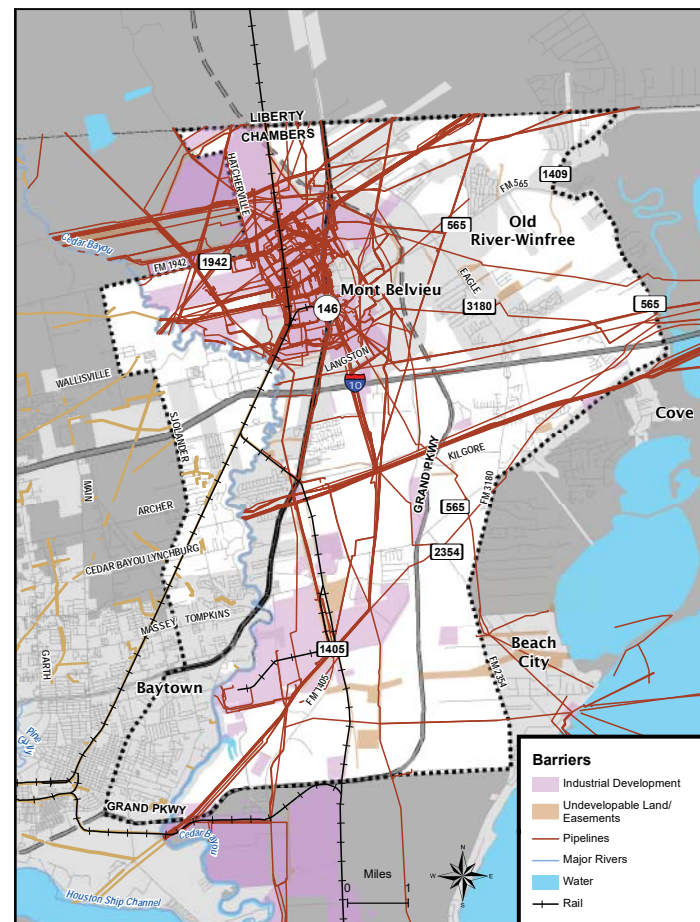


Figure 6a – Barriers to Mobility - Manmade

SUMMARY OF ALL RECOMMENDATIONS

The following recommendations are proposed to be implemented over the next 20 years (**Figure 7**), are intended to improve safety and mobility in the study area.

Roadways

- 8.2 miles of access management modifications along SH 146.
- 34 miles of new road connections
- 63 miles of roadway widenings
- 5 Potential Cedar Bayou crossings

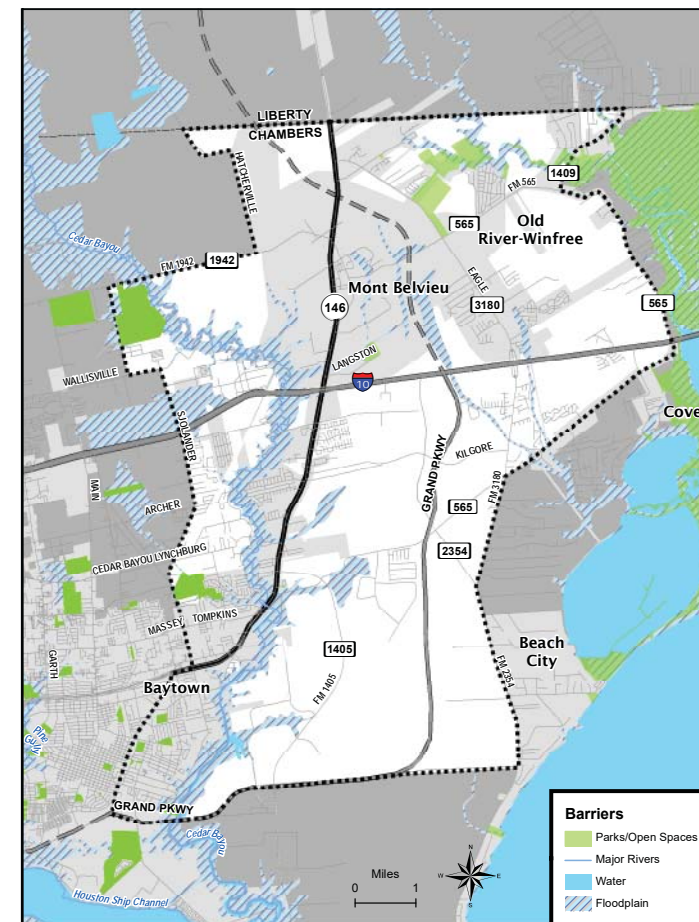


Figure 6b – Barriers to Mobility-Natural

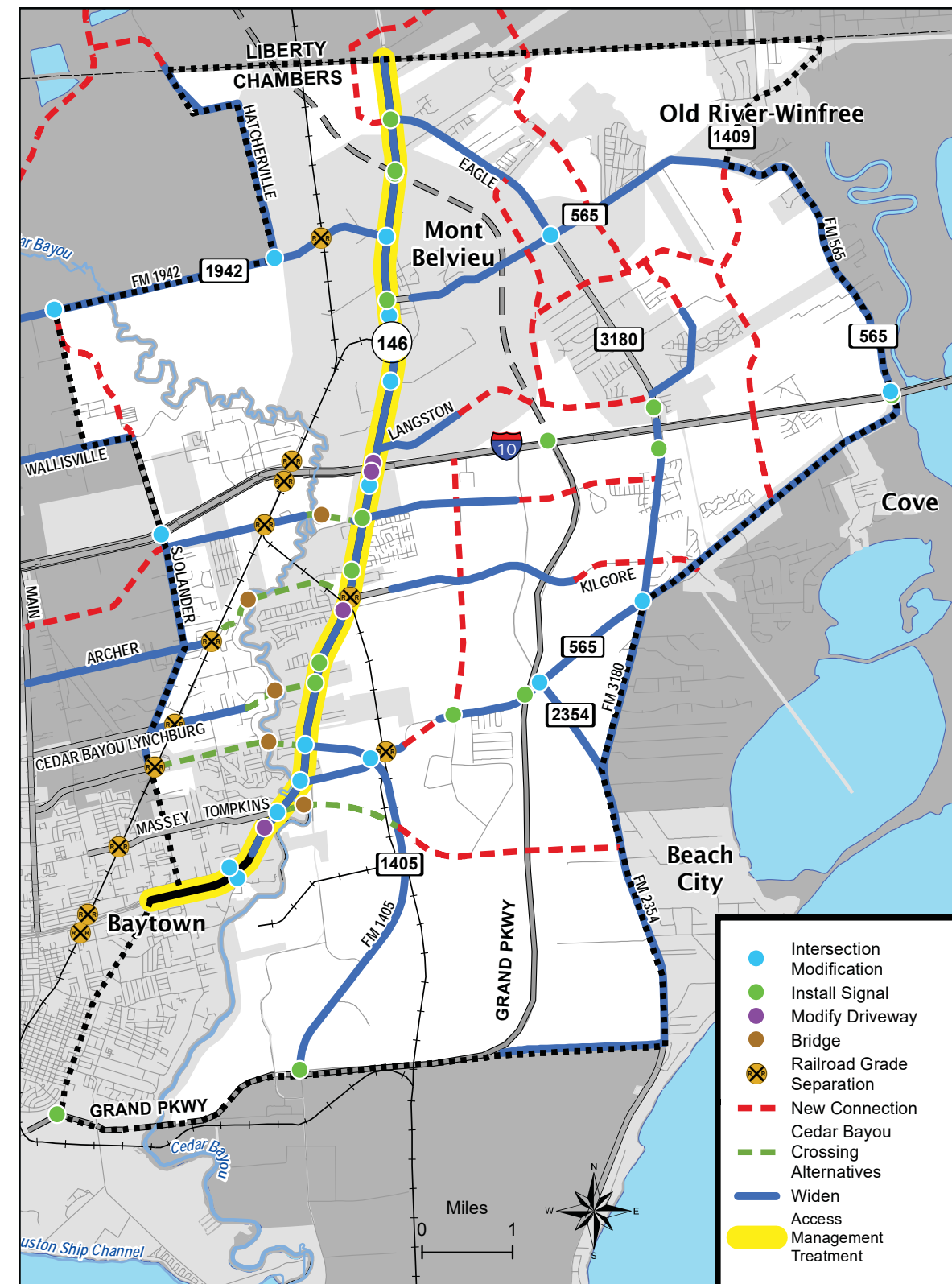


Figure 7 – Recommended Physical Improvements

Intersections

- Adjust signal timing and restripe intersections at all signalized intersections.
- Add turn lanes and other capacity improvements to alleviate delay.
- Install 20 signals throughout the study area.
- Construct 12 grade-separated railroad crossings.

Transit

- Implement general paratransit
 - (Demand Response – Dial a Ride)
- Explore/Analyze flexible routing in Baytown and Mont Belvieu
- Develop an Action Plan to determine the strategy for implementing service in Chambers County
- Work with large employers for additional transit opportunities

Bike and Pedestrian

- Develop 25 Miles, bike/trail corridors
- Develop 10 Miles, pedestrian corridors

POLICY

- Address truck / heavy vehicle concerns
- Establish new land use policies and ordinances
- Chambers and Harris County policies should complement each other
- Chambers and Harris County Economic Development policies should complement each other
- Adopt the Goals of the Texas Freight Mobility Plan
- Establish 380/381 area
- Address Hurricane Harvey concerns
- Review SH 99 toll policy
- Harness innovative technology

OTHER

- Develop a Chambers County Thoroughfare Plan

SHORT-TERM RECOMMENDATIONS

Detailed drawings identifying specific recommendations along the SH 146 corridor and at peripheral intersections are presented in pages 33-85.

LONG-TERM RECOMMENDATIONS

Concept-level exhibits that show long-term recommendations at key intersections are presented in pages 91-97.

COST ESTIMATES

Estimated plan costs were divided between short-term and long-term recommendations. Short-term recommendations can be implemented within five years, and long-term recommendations within six years or greater.

Short Term	\$15-20 Million
Long Term	\$725-825 Million
Total	\$740-845 Million

ANTICIPATED PLAN BENEFITS

Benefits of short-term recommendations include improvements to mobility, safety, and air quality. Based on a comparison of year 2025 traffic operations along SH 146 with and without short-term recommendations, the following benefits are anticipated:

- **Reduction in number of crashes:**
 - Annual crash cost savings of \$4.2 M
- **Enhancement to traffic operations:**
 - Reduce Travel Time during peak periods by 22%
 - Improve speed during peak periods by 32%
 - Annual travel time savings of \$5.5 M during peak periods
- **Improvements to Air Quality**
 - Reduction of 16% of Volatile Organic Compounds (VOC), carbon monoxide (CO), and nitrogen oxides (NOx) levels.

Similar to short-term benefits, long-term recommendations improve mobility, safety, and air quality. However, these improvements are more difficult to quantify due to the uncertainty of traffic projects, the timeline of improvement construction, and changes in technology. Benefits of long-term improvements, described in a general sense, are as follows:

- Enhancements to safety and streetscapes by improved bike and pedestrian facilities
- Congestion mitigation, increased connectivity, and reduced mobility barriers by roadway and intersection improvements

- Address commercial vehicle issues by constructing railroad overpasses and implementing new policy
- Implement transit services for elderly and disabled

FUNDING

Texas provides three ways for cities and counties to implement physical improvements or changes for their jurisdictions:

- Regulatory
- Financing
- Economic development

These strategies should be incorporated into comprehensive plans and used for transportation, flood mitigation, parks, housing etc. Each strategy is unique and most effective if combine with other economic strategies.

Pro-active approaches could help to move projects forward in H-GAC's Transportation Improvement Program. Examples include:

- County and/or local jurisdictions acquiring right-of-way in advance
- Encourage landowners and developers to donate right-of-way
- County and/or local governments can fund feasibility and traffic studies, environmental studies and preliminary engineering and design
- County and/or local governments could pay the full cost of relocating utilities and pipelines and constructing drainage improvements

POLICY AND ORDINANCE NEXT STEPS

1. Consider creating region-wide 380/381 districts
2. Meet with developers early in development process to discuss concerns and facilitate a shared vision. Make sure the plat and permit information is shared among the common members of the study area to allow power in collaboration for the necessary improvements.
3. Ordinance amendments for local regulations should be shared with the counties and cities to insure complementary standards.
4. Hold at least two meetings per year with public partners and the private industry to discuss private sector plans.

IMPLEMENTATION NEXT STEPS

The steps below outline the key actions to be undertaken and the agencies responsible to implement the recommended improvements in the SH 146 Subregional Study. TxDOT, Chambers and Harris Counties and the Cities of Baytown and Mont Belvieu should form a working group to coordinate improvements and policies in the coming years.

Implementation Step	Responsible Agency
Accept SH 146 Subregional Plan	Baytown & Mount Belvieu
Transportation Policy Council acceptance of SH 146 Subregional Plan	H-GAC
Implement system-wide signal retiming	TxDOT
Secure funding for short-term improvements	H-GAC and TxDOT
Coordinate with TxDOT for median & intersection aesthetics	Baytown & Mount Belvieu Chamber of Commerce
Perform design for short-term improvements	TxDOT
Implement short-term improvements	TxDOT
Secure funding for long-term improvements	Baytown & Mount Belvieu Chamber of Commerce & TXDOT
Perform environmental documentation and schematic design	TxDOT
Perform detailed design of long term-improvements	TxDOT
Implement long-term improvements	TxDOT
Program long range thoroughfare improvements and update thoroughfare plans	Cities and Counties
Conduct route alignment and preliminary engineering studies for Cedar Bayou crossing	Baytown
Conduct environmental & hydrologic/hydraulic studies for Cedar Bayou crossing	Baytown
Coordinate with United States Army Corps of Engineers on Cedar Bayou crossing	Baytown
Perform detailed design of Cedar Bayou crossing	Baytown
Implement Cedar Bayou Crossing	Baytown