Executive Summary
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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.

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.

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 Massy-Tompkins Road. The Peripheral intersections studied are comprised of 19 major intersections located within and around the 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.

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

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

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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.
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.

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
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.

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<thead>
<tr>
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<th>Short Term</th>
<th>Long Term</th>
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<tbody>
<tr>
<td>Total</td>
<td>$15-20 Million</td>
<td>$725-825 Million</td>
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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 combined 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
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.

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