

## 9 Summary of Findings

As mentioned previously, this study does not recommend a preferred alternative, but provides sufficient technical information and comparisons of the impacts and feasibility of various improvements that could be considered to address existing and future transportation needs along the study corridor. The study results will be used by TxDOT and other involved agencies to assist in prioritizing potential projects along the US 190/I-10 corridor. These projects would need to be examined in further detail as part of subsequent project development phases.

This report concludes with an overall summary of the evaluation results of the Conceptual Alternatives and potential localized transportation improvements which would be less costly than an entire end-to-end alternative.

### 9.1 Conceptual Alternatives Evaluation Results

Overall, the Total Four-Lane Highway alternatives received the best ratings considering the five major evaluation categories:

- Traffic/Mobility
- Engineering/Cost
- Environmental/Land Use
- Economics
- Public Input

The following sections represent a summary of the Conceptual Alternatives and their respective evaluation results by each major criteria.

**Traffic/Mobility** - Based on 2040 traffic needs, no additional lanes are warranted along I-10 except in the El Paso area. The section of US 190 from its junction with I-10 west of Iraan to US 281 in Lampasas (West US 190) is also not projected to need any additional lanes. The existing two-lane facility will accommodate the 2040 projected travel demand within these limits. Additional lanes are warranted by year 2040 from Killeen east along US 190 to US 59 in Livingston. East of US 59 the existing two-lane facility is adequate to accommodate the projected travel demand at acceptable operating conditions through 2040. However, if the 14th Amendment Highway/Gulf Coast Strategic Highway is constructed, additional lanes are projected to be needed along US 190 from the Killeen area to Jasper and along SH 63 from Jasper to the Louisiana state line. Chapter 6 discusses the various impacts on US 190 with the implementation of the 14th Amendment Highway.



Based solely on the traffic/mobility evaluation, the Four-Lane Highway Options 1, 2, and 3 scored the best of the Conceptual Alternatives. These alternatives did not attract as much travel demand as the freeway alternatives and therefore resulted in better travel times and speeds within the Central and East US 190 Sections.

In the West US 190 Section, the Freeway Options 1 and 2 and the Fort to Port Options 1 and 2 alternatives scored the best (these were closely followed by the Mobility/Safety Options 1 and 2). This is primarily due to upgrading US 190 to a freeway in this section which resulted in better mobility (travel time and speed) compared to other alternatives that included upgrading to a four-lane highway. However, this section currently carries nominal traffic and therefore the projected volumes, even when upgraded to a freeway, carried the lowest projected travel demand in 2040 compared to other sections.

In the Central US 190 Section, the Total Four-Lane Options 2 and 3 scored the best overall. This is primarily because both of these alternatives utilize options FM 93 and SH 30 and divert traffic from the congested areas of I-35 in the Killeen/Temple area and US 190/I-45 near Madisonville. This section carries the most traffic along the corridor and upgrading to a four-lane highway attracted manageable traffic volumes whereas a freeway type facility only exacerbates existing congestion issues because it would attract substantially more traffic.

For the East US 190 Section, all the four-lane highway options and the Fort to Port Option 1 scored most favorably. As discussed earlier, upgrading to a highway did not attract as much travel demand in this section as it did when upgraded to a freeway. As a result, the lower traffic volumes with the four-lane highway configuration provided better mobility along this section.

Finally, it should be noted that this study focused on examining the need for improving this corridor to four-lane divided highway or a four-lane divided freeway. The existing freeways in the Central Section, US 190 in the Killeen area, and the portions of I-35 and I-45 concurrent with US 190, are currently freeway sections with a minimum of four lanes. As such, no improvements were considered in these locations. These roadways are currently congested and are projected to further deteriorate in the future. Improvements to these roadway sections need to be addressed. US 190 in the Killeen area and I-35 are recommended to be an eight-lane freeway, and I-45 is projected to need six-lanes of freeway to accommodate the future travel demand at acceptable operating levels.

**Engineering/Costs** – Overall, the Four-Lane Highway Options 1, 2, and 3 scored the best from an engineering and cost evaluation. A four-lane highway is considerably less expensive to construct than a freeway. For the West US 190 Section, Total Four-



Lane Option 3 scored the best since it was the shortest improvement corridor (utilizes US 83) with a four-lane highway typical section. In the Central US 190 Section, the Total Four-Lane Option 1 scored the best in all engineering/cost categories. This alternative remained on US 190 and no improvements were considered on existing freeway sections which reduced the costs considerably. For the East US 190 Section, all four-lane highway options and the Fort to Port Option 1 received the highest ratings.

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**Environmental** – Overall, Four-Lane Highway Option 1 scored the best as it had the lowest number of potential impacts to both the natural and land use environment. Generally, the smaller the footprint of the alternative (i.e., the four-lane highway typical section) and the greater distance the alternative follows the existing US 190 provided fewer impacts to the environment. For the West US 190 Section, Four-Lane Highway Option 3 scored the best as there were fewer impacts following US 83 than US 277. In the Central Section, Four-Lane Highway Option 1 received the best rating. In the East US 190 Section, all four-lane highway options received the most favorable rating.

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**Economics** – In evaluating the economic feasibility of the Conceptual Alternatives, via a comparison of the societal benefits to the development costs, all alternatives were determined to be economically infeasible from an entire corridor-wide perspective. Of the alternatives, the Four-Lane Highway Options 1, 2, and 3 yielded the best relative travel efficiency results compared to the other alternatives. None of the alternatives analyzed in the West US 190 Section was found feasible. The freeway alternatives in the Central US 190 Section were marginally feasible and the four-lane alternatives were very feasible, but any improvements will need to carefully address persistent congestion issues on unimproved segments (i.e. freeway section in Killeen, I-35, and I-45). Certain segments in the East US 190 Section are economically feasible depending on the alternative. The section from I-45 to Livingston is feasible as a four-lane divided highway. However, most segments are economically infeasible without the 14th Amendment Highway. With the 14th Amendment Highway, and the associated additional traffic volumes, the US 190 and SH 63 corridor become economically feasible for a four-lane divided section. It must be noted, however, the economic impacts (as measured by employment, economic activity, income, etc. and distinct from the economic feasibility perspective), associated with the alternatives were found to be modest, at best, once the capital expenditures were subtracted from the analysis.



**Public Involvement** – The public indicated support in varying degrees for all the Conceptual Alternatives. The alternatives that were most “strongly supported “ or “supported” were the Total Four-Lane Highway Options 1, 2, and 3, followed by the Mobility/Safety Option 2 alternative.

Overall, the Total Four-Lane Options 1, 2, and 3 received the best ranking compared to the other Conceptual Alternatives. These four-lane options generally had lesser costs compared with the freeway and combination alternatives that included both freeway and four-lane divided highway typical sections. They also better accommodated the projected traffic volumes compared to the other alternatives. Environmentally speaking, there were fewer potential impacts when utilizing US 190. Comparing the costs to the derived benefits the four-lane highway alternatives ranked best economically. Finally, from a public involvement perspective, the four-lane highway options received the most support.

## 9.2 Transportation Improvement Strategies

As discussed in this report, the widening of US 190 in the West Section is not needed for existing or future traffic demand. The US 190 Central Section shows a need for widening in its entirety and the East US 190 Section shows widening is needed between I-45 and US 59. However, due to the high costs of implementing these improvements section wide, transportation improvements at a smaller, local level were developed and evaluated. The following sections discuss the results of these improvements by time-frame and costs.

Potential transportation improvements were considered based on their ability to address the localized needs without the construction of any of the statewide corridor alternatives. The evaluation for these potential improvements considered included:

1. **Providing for additional travel lanes where needed** – Locations along the corridor where LOS degraded below LOS D in the years 2020, 2030, and 2040 were identified.
2. **Providing for relief routes around cities/towns** – Towns and cities along the corridor were evaluated based on: average ADT, timeframe in which 20% or more of the existing US 190 route within the city reached LOS E-F, travel delay, accidents, and impedances.
3. **Adding passing lanes consistent with a “Super 2” roadway design standard** – Existing two-lane roadway sections were evaluated based on: long-term need for a four-lane roadway (based on capacity), percent of roadway above the statewide accident rate, and 2040 traffic volumes.
4. **Roadway design enhancements such as interchange improvements, adding shoulders where needed, and/or elimination of at-grade railroad**



**crossings** – Potential interchange improvements, railroad grade separations, and areas not meeting current roadway design criteria were identified through field investigations and public involvement efforts.

5. **Implementation of ITS along the corridor** – Potential ITS services were identified on a corridor-wide as regional basis.

Based on these evaluations, the potential improvements included in **Tables 9-1** and **9-2** were identified. This project listing is not financially constrained, and local decision makers will need to weigh the needs, benefits, and costs of these improvements against other local needs. Near to mid-term improvements are those that are recommended to begin the project development process prior to 2030, while long-term improvements are those that are recommended to begin the project development process prior to 2040. Individual ITS projects are not included in the listing of potential projects, but ITS should be considered in the planning and design of any improvement as a design concept and alternative analysis within each of the potential projects.

**Table 9-1** Recommended Near to Mid-Term Potential Improvements

Section	Improvement Type
West US 190	Passing Lanes
Central US 190	Added Capacity, Relief Routes, Passing Lanes, Roadway Design
East US 190	Passing Lanes

**Table 9-2** Recommended Long-Term Potential Improvements

Section	Improvement Type
West US 190	Relief Routes, Passing Lanes
Central US 190	Added Capacity, Passing Lanes, Roadway Design
East US 190	Added Capacity, Relief Routes, Passing Lanes, Roadway Design

### 9.3 Overall Study Objectives and Findings

The previous sections of this chapter discussed both the alternative-wide corridor results as well as potential local improvements. The following is a summary of the general objectives of the study and the findings associated with each of them.



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**Determine existing and future mobility and safety needs:** Overall, the US 190/I-10 study corridor adequately serves existing and future mobility and safety needs with a few exceptions. Additional travel lanes are, or will be, needed along US 190 between I-35 and US 59 in Livingston by 2040. Also, there are several towns/cities experiencing, or projected to experience, unacceptable congestion along the corridor including El Paso, Brady, San Saba, Lampasas, Copperas Cove, and Killeen. The US 190/I-10 corridor has experienced crash rates above the statewide average in the vicinities of Fort Stockton, Eldorado, Temple, Madisonville, and from Onalaska to Livingston.

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**Evaluate impacts and feasibility of alternative transportation improvements:** From a cost effective perspective (benefits versus costs), a freeway/interstate type facility is marginally feasible along US 190 from US 281 in Lampasas to I-45, and from Jasper to the Louisiana state line. A four-lane divided highway is very feasible along US 190 between I-35 and US 59 in Livingston, and from Jasper to the Louisiana state line.

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**Assess advantages of improved connections to military installations and deployment ports:** The existing roadway and rail network is generally adequate to meet the mobility needs between the military installations along the US 190/I-10 corridor and Gulf Coast deployment ports through 2040, based on this high level feasibility study. The major impediment to deployment was rail capacity in the Houston area and at the Ports of Beaumont and Corpus Christi; however, recent expansion projects at the ports have increased rail capacity to address this issue. Additionally, the existing highway routes connecting the military installations to the deployment ports traverse congested urban areas including Houston and San Antonio.

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**Identify alternative funding sources:** The estimated costs for the conceptual alternatives ranged from \$2.4 to \$4.8 billion. Due to limited funding, Texas is challenged in maintaining its existing highway infrastructure. The currently available funding is less than half of the total estimated highway needs for Texas through 2035.

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**Develop a prioritized implementation plan:** It was determined that widening the entire US 190/I-10 corridor was not needed. However, potential local improvements were identified and prioritized into near- to mid-term and long-range projects. These potential improvements should be considered along with other transportation needs to maximize limited available transportation funding.



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**Obtain public/stakeholder input:** Two series of public and Local Outreach Group meetings and numerous stakeholder meetings were conducted during the study. Public/stakeholder comments were collected during these meetings as well as via comment forms, the project website, toll free telephone line, and postal mail.



