6.0 INDIRECT EFFECTS

This section was developed using the Texas Department of Transportation's (TxDOT) September 2010 *Revised Guidance on Preparing Indirect and Cumulative Impact Analyses*, which is based on the 2002 National Cooperative Highway Research Program (NCHRP) Report entitled *NCHRP Report 466: Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects* (NCHRP 2002). Other sources of guidance include the NCHRP Project 25-25, Task 22 report entitled *Forecasting Indirect Land Use Effects of Transportation Projects* (NCHRP 2007).

The Council on Environmental Quality (CEQ) rules define indirect effects as those "…which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems" (40 CFR 1508.8[b]).

NCHRP Report 466 identifies three broad categories of indirect effects (NCHRP 2002):

1. Encroachment-alteration effects. These effects may result from changes in ecosystems, natural processes, or socioeconomic conditions that are caused by the proposed action but occur later in time or farther removed in distance. These types of effects could include gradual effects on a neighborhood's cohesion as a result of roadway encroachment, displacements, or changes in access.
2. Project-influenced development effects. Sometimes called induced growth or the "land use effect." For transportation projects, induced growth effects are most often related to changes in accessibility to an area, which in turn affects the area's attractiveness for development.
3. Effects related to project-influenced development. These are impacts to the natural or human environment that may result from project-influenced changes in land use.

As noted in the NCHRP guidance, "[i]ndirect effects can be linked to direct effects in a causal chain" (NCHRP 2002). This analysis operates under the assumption that a proximate cause-effect relationship with the proposed project must be present in order for an indirect effect to occur. In cases where the proposed project would potentially contribute—but not be causally linked—to a potential effect, the contribution of the proposed project to this potential effect when added to other past, present, and future actions by others is considered further in **Section 7.0 Cumulative Effects**.

Probability helps distinguish indirect effects from direct effects: direct effects are often inevitable, while indirect effects are simply probable. Reasonably foreseeable effects must be probable, not just possible, and should be considered "sufficiently likely to occur that a person of ordinary prudence would take them into account in making a decision" (NCHRP 2002). As stated in NCHRP Report 466, "[e]ffects that can be classified as possible but not probable may be excluded from consideration."

NCHRP Report 466 further describes an eight-step framework for identifying and analyzing the potential indirect effects for significance (NCHRP 2002), which TxDOT has reduced to seven steps:

1. **Scoping**: The basic approach, effort required, and geographical boundaries of the study are determined.
2. **Identify the Study Area's Goals and Trends**: Information regarding the study area is compiled with the goal of defining the context for assessment.
3. **Inventory the Study Area's Notable Features**: Additional data on environmental features are gathered and synthesized with a goal of specifically identifying important environmental issues through which to assess the proposed project.
4. **Identify Impact-Causing Activities of Proposed Action and Alternatives**: Fully describe the component activities of each proposed project alternative.
5. **Identify Potentially Substantial Indirect Effects for Analysis**: Indirect effects associated with proposed project activities and alternatives are cataloged, and evaluated, in the context of goals and trends, notable features, and impact-causing activities, to determine which potentially substantial effects merit further analysis in Step 6.
6. **Analyze Indirect Effects and Evaluate Results**: Qualitative and quantitative techniques are employed to estimate the magnitude of the potentially substantial effects identified in Step 5. The analysis will assess the extent of the causal relationships between the proposed action and the potential effects and describe future conditions with and without the proposed transportation improvement. The uncertainty of the results of the indirect effects analysis is evaluated for its ramifications on the overall assessment.
7. **Assess Consequences and Consider/Develop Mitigation**: The consequences of indirect effects are evaluated, and strategies to avoid or lessen any effects found to be unacceptable are developed. Effects are reevaluated in the context of those mitigation strategies. (TxDOT 2010d)

6.1 SCOPING

The main objectives of the scoping process are: 1) to determine the level of effort and general approach required to complete the study, and 2) to determine the location and extent of the study area. The products of this step are a work plan outlining the methodology and assumptions to be used in the analysis and a map showing the aerial extent of the Area of Influence (AOI).

6.1.1 Determining the Appropriate Methods and Level of Effort

The purpose of the proposed project is to maximize the long-term highway operability of the US 181 crossing over the ship channel and to improve safety for the traveling public, including during hurricane evacuations. As part of the purpose of the proposed project, TxDOT and the Federal Highway Administration (FHWA) also aim to provide the transportation infrastructure to support economic opportunities in the area and consider the connectivity of US 181 to the local roadway system and its effect on adjacent neighborhoods. The project is consistent with local plans and policies, including the Corpus Christi Metropolitan Planning Organization's (MPO's) current Metropolitan Transportation Plan (MTP), *MTP 2010-2035*; the 2013-2016 Statewide Transportation Improvement Program

(STIP)/Transportation Improvement Program (TIP) (August 2013 Quarterly Revision); and TxDOT's 2010 Unified Transportation Program.

The potential of the proposed project to influence local and regional land use decisions is a central focus of this indirect effects analysis. In order to assess these types of potential indirect effects, this analysis utilizes an approach that relies on both planning judgment and collaborative judgment techniques. The planning judgment element of the approach uses the population and employment forecasts from the Corpus Christi MPO in combination with assessment of local land use plans and trends, aerial photography, state and local regulations, and Geographic Information Systems (GIS) databases to determine the potential encroachment-alteration and induced growth effects of the proposed project. The collaborative judgment portion of this approach is supported by the Harbor Bridge Collaborative Judgment Land Use Panel (Land Use Panel), a group of local experts with an intimate knowledge of the proposed project and study area. The contributions of the Land Use Panel and results of the collaborative judgment process are described further in **Section 6.1.4**.

6.1.2 Study Area Boundaries

The AOI represents the geographical area within which potential indirect effects related to the proposed project, including project-influenced development, would be most likely to occur (see **Figure 6.1-1** in **Appendix A**). The AOI boundaries were determined using political, geographic, and community-based boundaries in order to facilitate data collection and evaluation of applicable trends and, ultimately, to encompass the full range of potential indirect effects related to the proposed project. The majority of the AOI follows the Traffic Analysis Zone (TAZ) boundaries as delineated by the Corpus Christi MPO as part of the Travel Demand Model (TDM) update currently underway for the *2040 MTP*. In coordination with local and state agencies, the MPO produced five-year demographic sets from the base-year 2012 to 2040 at the TAZ level using 2010 Census demographic and land use data (Corpus Christi MPO 2012, 23). In addition to TAZ boundaries, the AOI for this indirect effects analysis also follows portions of city limits, natural boundaries, and the community boundaries defined in **Section 3.5.3** for the proposed project (depicted on **Figure 3.5-4** in **Appendix A**).

North of the Nueces Bay Causeway, the AOI boundary follows the western boundary of the city limits of Portland, many residents of which utilize the Harbor Bridge to commute to work. The limit of the AOI on the north, east and south sides of Portland follows TAZ boundaries, which extend slightly north and east of the Portland city limits to include the La Quinta Trade Gateway Terminal Site and Cheniere Liquefied Natural Gas (LNG) facility. South of the Nueces Bay Causeway, the AOI follows TAZ boundaries and the shoreline to include all of North Beach. From here, the AOI incorporates community boundaries, including the South Central community (comprised of the Central Business District (CBD), the Evans Elementary neighborhood, and the Crosstown East neighborhood). The Westside neighborhood boundaries serve as the AOI boundary on the west side of the I-37/Crosstown Expressway intersection. The AOI then follows I-37, a major highway corridor, west along the south side of the Inner Harbor to Carbon Plant Road just west of the Inner Harbor. This area encompasses the majority of the Joe Fulton Corridor, a critical component of the transportation system within this area. Carbon Plant Road also

serves as a TAZ boundary that then intersects the nearby Corpus Christi city limit as well as the Nueces County line. The AOI then follows all of these boundaries to Nueces Bay and continues east along the shoreline back to the Nueces Bay Causeway.

6.1.3 Timeframe for Indirect Effects Analysis

The temporal boundary for the indirect effects analysis extends from the start of construction to 2035, the planning horizon year for the Corpus Christi MPO's *MTP 2010-2035*.

6.1.4 Planning/Collaborative Judgment Process

The indirect effects analysis for the proposed project utilizes a planning/collaborative judgment approach in which the assumptions made and analyses conducted by the US 181 Harbor Bridge EIS Team were supplemented, verified, and adjusted when appropriate, based on input from a panel of local experts in land use planning and development. Comprised of 16 members, the Land Use Panel included a broad range of individuals with a demonstrated knowledge of current land use and development trends within the AOI (see **Table 6.1-1**). The following local and regional groups were represented by the Land Use Panel: the City of Corpus Christi, the Corpus Christi Regional Transportation Authority (RTA), Nueces County, the Port of Corpus Christi Authority, the Coastal Bend Bays Foundation, Texas A&M University-Corpus Christi, the Coastal Bend Bays and Estuaries Program, the Hispanic Chamber of Commerce, the Corpus Christi MPO, local real estate developers, and city planners and engineers. The Land Use Panel provided the bulk of the collaborative judgment component of the analysis by helping to refine the preliminary AOI developed by the US 181 Harbor Bridge EIS Team; assisting in identifying trends within the AOI; aiding in forecasting the potential for indirect land use effects to occur as a result of the proposed project; and identifying reasonably foreseeable future actions expected to occur within the area. The vital contribution of the Land Use Panel was the result of a three-round process, described further below. The ultimate conclusions of the collaborative judgment process with regard to potential indirect and cumulative effects of the proposed project are briefly summarized below and are incorporated in the subsequent analyses.

Table 6.1-1 Collaborative Judgment Land Use Panel Participants

Name	Title	Organization
Tom Niskala	Transportation Planning Director	Corpus Christi Metropolitan Planning Organization
Jim Lee, Ph.D.	Regents Professor of Economics	Texas A&M University–Corpus Christi
Mark Van Vleck, P.E.	Director of Development Services	City of Corpus Christi
Jeffrey Pollack	Project Manager	HDR, Inc.
John Wright, AIA	Owner/Architect	John Wright Architect, LLC
Andrew Dimas	Planner	City of Corpus Christi
Ray Allen	Executive Director	Coastal Bend Bays & Estuaries Program
Judge Samuel "Loyd" Neal	County Judge	Nueces County
Jim Boller	Founder & President	Jim Boller & Associates, Inc., Commercial Real Estate Services
Ismael "Smiley" Nava	Executive Director	Coastal Bend Bays Foundation

Table 6.1-1 Collaborative Judgment Land Use Panel Participants		
Name	**Title**	**Organization**
Carl Weckenmann	Managing Director of Strategic Planning	Corpus Christi Regional Transportation Authority
Teresa Rodriguez	President/CEO	Corpus Christi Hispanic Chamber of Commerce
David Krams, P.E.	Director of Engineering Services	Port of Corpus Christi Authority
Frank Brogan	Managing Director	Port of Corpus Christi Authority
Bob Paulison	Executive Director	Port Industries of Corpus Christi
Joe Adame	Owner/Broker	Joe Adame Commercial Real Estate (former Mayor of the City of Corpus Christi)

Source: US 181 Harbor Bridge EIS Team 2013

Land Use Panel members were identified by the US 181 Harbor Bridge EIS Team based on the following criteria: expertise in related fields, demonstration of knowledge of the study area, representation of study area interests, and willingness to participate in the process. Upon acceptance of the invitation to participate in the Land Use Panel process, each individual received a package of information intended to help them prepare for the subsequent rounds of the process. This information included a description of the general goals and purpose of the Land Use Panel, an overview of the proposed US 181 Harbor Bridge project, a list of the current panel participants, and maps of the alternative alignments and of the preliminary AOI as developed by the Harbor Bridge EIS Team. This stage of the process was referred to as Round 1; during this time, panel participants were asked to review and familiarize themselves with this information to ensure the preparedness of each individual.

Round 2 of the Land Use Panel aimed to solicit participants' individual opinions regarding indirect and cumulative effects associated with the proposed project, particularly focusing on the potential of the project to induce growth within the AOI. The US 181 Harbor Bridge EIS Team distributed a questionnaire through Qualtrics.com, an online survey host, and asked participants to answer the questions based on their knowledge of the AOI, the proposed project, and their individual area of expertise. A total of 12 participants (out of 15 total participants) completed the questionnaire (see **Appendix J** for individual land use panel responses to the questionnaire). Questions focused on the following topics: the preliminary AOI, major factors influencing development, reasonably foreseeable future actions, location of potential new development, and potential indirect and cumulative effects of the build and No Build Alternatives. A brief summary of the Land Use Panel responses follows in **Section 6.1.4.1**, below.

6.1.4.1 Individual Land Use Panel Responses

The questionnaire asked the Land Use Panel participants to determine if the boundaries of the preliminary AOI encompassed the areas likely to be indirectly affected as a result of the proposed project. According to some participants, the preliminary AOI accurately reflected these areas, while others suggested expansion of the AOI boundaries. Selected responses regarding expansion of the preliminary AOI include: a quarter-mile buffer surrounding the entire preliminary AOI; industrial areas in San Patricio County; more planned development near the La Quinta Trade Gateway Terminal; and

neighborhoods near the southwest boundary of the preliminary AOI by redrawing the boundaries to connect SH 44 and Loop 407. Following careful consideration and follow-up discussions with Land Use Panel members regarding these proposed adjustments, it was determined that the finalized boundaries of the AOI would be adjusted to incorporate areas of planned development near the La Quinta Trade Gateway Terminal in San Patricio County.

In terms of factors that influence development, participants identified the Port of Corpus Christi and Port Industries as the most common catalysts for development within the AOI, in addition to increasing oil and natural gas production in the Eagle Ford Shale region, a growing tourism industry, and the presence of military and educational institutions. Panel members also indentified potential limitations on development, including potential shortages of fresh water, an insufficient skilled workforce, and inadequate transportation infrastructure. In addition to these factors, participants also identified the navigational air draft clearance of the existing Harbor Bridge as one factor that influences Port-related development.

The questionnaire also asked the Land Use Panel to consider reasonably foreseeable future development within the area and if they considered that development to be dependent on the proposed project. Future development identified by the participants included plans for revitalization of and infill development in downtown, redevelopment of existing land uses to mixed-use community centers, increased pedestrian access throughout the area, and repurposing of City parks. Other specific planned developments mentioned included a steel processing plant at the La Quinta Terminal, a plastics plant on the north side of the ship channel, and further development at the former Naval Station Ingleside. Participants also identified expansion of the rail industry by the Port of Corpus Christi Authority and potential development of a cruise ship industry as reasonably foreseeable actions that could occur within the region. While indicating the potential for the proposed project to play a part in the future development of the area, the panel members acknowledged that the current and future actions identified would not be dependent on the implementation of the proposed project and either are or would be taking place independently.

The Land Use Panel identified several areas likely to be developed independently of the proposed project: areas along the north side of the Inner Harbor (in the form of industrial [Port-related] development); in greenfield areas in San Patricio County; the Sports, Entertainment, and Arts (SEA) District (within the CBD); the downtown area in general (in the form of higher-density infill development); and along the access roads of realigned thoroughfares (highway-oriented development). Panel participants indicated that these areas are currently being developed and would likely continue to be developed even if the proposed project were not implemented. Participants recognized, however, that increased accessibility and an improved view of the downtown area and the SEA District resulting from the Red and Orange Alternatives could enhance opportunities for development in these locations. Panel participants held differing opinions as to whether growth was likely to occur in the North Beach area: one panel member stated that the potential for flooding would continue to inhibit development, while another felt that transportation improvements in the area would potentially allow for, though not cause, increased tourism-related development.

Finally, the questionnaire asked Land Use Panel participants to consider the potential indirect and cumulative effects of the build alternatives and the No Build Alternative. When considering the No Build Alternative, participants felt that the SEA District would remain divided by US 181. Common responses also included an anticipated negative economic impact of the existing navigational air draft clearance of the bridge, either on the area as a whole or on Port-related industries only. Some participants felt that the height of the existing bridge prevents the Port of Corpus Christi from effectively competing with other port cities. Other concerns about the No Build Alternative included safety of the current facility, worsening traffic conditions, and perpetuation of the adverse community impacts of the existing highway network (I-37/US 181), particularly in the Northside neighborhoods of Washington-Coles and Hillcrest.

Overall, participants indicated that anticipated impacts of the build alternatives would include beneficial effects to most communities and the economy. These impacts varied from increased economic opportunity for the Port; greater access to the SEA District and North Beach; decreased traffic congestion; an increased tax base due to potential business growth; and higher-density infill development within the Downtown area. Potential adverse impacts of the build alternatives were also addressed. Participants mentioned potential noise impacts; increased impervious cover as it relates to the environment; and adverse impacts to the Hillcrest and Washington-Coles neighborhoods.

6.1.4.2 Collaboration of Land Use Panel Viewpoints

Following the response of the Land Use Panel to the online questionnaire, the US 181 Harbor Bridge EIS Team held a Collaborative Judgment Land Use Panel Workshop (Round 3) at the TxDOT office in Corpus Christi on May 7, 2013. The framework of the workshop consisted of a group discussion focused on the responses to the online questionnaire; small-group sessions in which the participants were divided into groups of five or six and were asked more pointed questions regarding indirect and cumulative impacts of the proposed project; and another large-group discussion about the responses to the small-group questions and any remaining issues regarding the potential indirect and cumulative impacts of the proposed project. A total of 14 of the 15 Land Use Panel participants attended the workshop, all of whom lent a unique perspective to the topics discussed. The collaborative input of the panel is incorporated throughout the indirect and cumulative effects analyses; however, certain themes regarding potential indirect and cumulative effects were identified to be of particular importance to the Land Use Panel members. These include the following: transportation changes, economic development, visual impacts/changes to the urban environment, community impacts, and effects on natural resources. These themes, briefly discussed below, helped determine the key issues to be addressed in the indirect and cumulative effects analysis for the proposed project.

Transportation changes such as altered access and mobility were discussed at length during the Collaborative Judgment Land Use Panel Workshop. Of particular importance to the panel members were changes in curvatures along I-37 at the US 181 interchange near downtown, where northbound travelers are required to make a nearly 90-degree turn on a facility with a posted speed limit of 50 miles

per hour. Mobility was also of common interest for Land Use Panel members, both in terms of a decrease in access for northbound travelers within the North Beach area and potential improvements within downtown (particularly with regard to the SEA District).

According to multiple participants, the viability of the SEA District is limited by the location of the existing facility, which serves as a divider between tourism- and entertainment-related amenities and the rest of downtown. Improved mobility within downtown was also cited as an opportunity for increased mixed-use development. Although, it was noted that such opportunities would be dependent upon "many [other] factors" in order for any changes in development to actually be realized, factors such as real estate market conditions, availability of private investment capital, and local planning decisions.

With regard to visual impacts, panel participants stated that the SEA District is currently hidden from view by the existing facility and that moving the facility further away from the area would make the district more prominent visually, a presumed positive influence on business activity. General concerns for the potential changes to viewsheds from the bridge were also noted during the workshop.

Community impacts were of considerable importance during both the small group and large group discussions (particularly with regard to the Northside community) and are explored at length in the subsequent analysis. Finally, effects on natural resources, particularly wetlands, were discussed as potential adverse effects of the build alternatives. The Land Use Panel recognized that effects to wetlands and coastal environments would be most likely to occur in the (Nueces Bay) Rincon Channel area under the West Alternative.

6.2 IDENTIFICATION OF STUDY AREA GOALS AND TRENDS

6.2.1 Study Area Plans and Goals

This section focuses on study area plans and components of plans that contain short- and long-term goals which would potentially be affected or supported by the proposed project. A full inventory of land use plans and policies is included in **Section 3.1.3** and an evaluation of the consistency and compatibility of each of the alternatives with these plans is included in **Section 4.1.2**. As stated in NCHRP Report 466, these "social, economic, and environmental goals reflect a current vision of the future" that should be compared with changes that could be induced by the proposed project. Sources for the study area plans discussed here include the Cities of Corpus Christi and Portland, the Corpus Christi MPO, and the Port of Corpus Christi Authority.

6.2.1.1 Corpus Christi MPO's Metropolitan Transportation Plan 2010-2035

The Corpus Christi *Metropolitan Transportation Plan (MTP) 2010-2035* evaluates and plans for the transportation needs of the Nueces and San Patricio County areas and recommends implementation based on input from local governments and authorities (Corpus Christi MPO 2009). In order to estimate future demand for travel, the MPO uses demographics such as population, household income and size,

and employment in order to develop a TDM. The most current TDM was developed in support of the 2030 MTP but will soon be replaced to coincide with the most recent MTP. The current version of the TDM assumes completion of the Joe Fulton Corridor with an enhanced connection at I-37 as well as replacement of the Harbor Bridge on a new alignment with an interchange at the Crosstown Expressway (Corpus Christi MPO 2009, 17). See **Section 6.2.2** for further discussion of how the Corpus Christi MPO develops the TDM and how it is used in this analysis.

The MTP also identifies goals related to the Port, which include promotion of diversification of future infrastructure development through channel improvements, completion of the Joe Fulton Corridor (completed in 2012), and establishment of intermodal facilities at the La Quinta Trade Gateway Terminal site. The MTP also cites railway improvements as a critical factor in Port development and economic growth. The following are identified as long-term goals for the highway system: reduce congestion, improve safety and air quality, expand economic opportunities, and increase the value of transportation assets. Regional connectivity, particularly as it relates to Port operations, is also identified as a main goal in the MTP.

6.2.1.2 City of Corpus Christi's Integrated Community Sustainability Plan

The City of Corpus Christi's *Integrated Community Sustainability Plan* (based on the *Integrated Community Sustainability Plan* published in 2011 by HDR, Inc.) will eventually serve as the City's *Comprehensive Plan*. The plan was developed by a project team of technical specialists who worked in cooperation with the City and community stakeholders in order to identify "context-sensitive, multimodal transportation choices that support economic growth and social equity while protecting natural resources and promoting public health and safety" (HDR, Inc. 2011, 1). The plan identifies destination nodes determined to be well-suited for development or redevelopment as livable community centers (HDR, Inc. 2011, 10). One node, the Downtown/Uptown Node, incorporates a large portion of the eastern extent of the AOI. The plan identifies much of this area as a "mixed-use opportunity" area, assuming that the Harbor Bridge is relocated west of its current location, and includes conceptual plans for a new 'Green Downtown Gateway' along the existing I-37 east of US 181. Two other nodes identified by the plan as conducive to mixed-use opportunities are mapped just outside of the AOI: the Morgan/Avenue Baldwin Boulevard Node, located just west of the Westside/Ben Garza community; and the Six Points Node, located just south of the Morgan Avenue boundary of the South Central/Crosstown East community.

6.2.1.3 City of Corpus Christi's Urban Transportation Plan

The Corpus Christi's *Urban Transportation Plan* aims to create an efficient transportation network for pedestrian and vehicular traffic within the Corpus Christi corporate limits and the Extraterritorial Jurisdiction (ETJ). The proposed project is not mentioned in the plan and is not included on the *Urban Transportation Plan Map*, which depicts US 181 as remaining in its existing location. According to the plan, matching street types with existing and future land uses of roadway-adjacent properties can result in an efficient, fully integrated, multimodal transportation system, which ultimately serves to enhance community quality of life. Main focuses of the *Urban Transportation Plan* include: quality of life, access

and mobility, air quality, economic vitality, equity ("through a system that addresses all people in all parts of the region"), health and safety (through encouragement of walking and biking and ensuring emergency access and routes are sufficient), and environmental sustainability (City of Corpus Christi 2010a). The plan also aims for integration of the long-term design of RTA facilities, services, and routes into the City's design requirements and the MPO's Corpus Christi Bicycle and Pedestrian Plan.

6.2.1.4 City of Corpus Christi's Future Land Use Plan

The Corpus Christi's *Future Land Use Plan* serves as a component of the City's *Comprehensive Plan* and includes all areas within the Corpus Christi city limits as well as within the ETJ. Policy statements for Corpus Christi included in the plan focus on: rezoning consistent with other future plans; efficient development; control of expansion of commercial or industrial use into residential areas; natural assets (such as development effects on water resources); adjacency of commercial and residential uses; and infill development (City of Corpus Christi 2010b). The plan also emphasizes rezoning that enables the City to require dedication of land for improvements aimed at serving communities, such as land for improvements to parks, drainage, and water and wastewater services (City of Corpus Christi 2010b).

The plan cites an estimated population projection of 374,693 for the city of Corpus Christi by 2040, a roughly 25,000-person increase each decade between 2010 and 2040. This is slightly lower than the Texas Water Development Board (TWDB) projection from the 2017 Draft State Water Plan, which estimates a population of 384,420 for the city of Corpus Christi by 2040 (TWDB 2013). The *Future Land Use Plan* illustrates proposed densities of future land use, allowing for the future planning of water, sewer, stormwater, and transportation improvements. These improvements are implemented through the Capital Improvement Program, which identifies improvement projects for the area within a five-year planning term. The Future Land Use Map identifies North Beach as zoned for tourism-oriented land use; the downtown and SEA District area zoned for commercial and public uses; the Northside and the Evans Elementary area as medium-density residential; the south side of I-37 as commercial; and the majority of the Westside and Refinery Row communities as industrial and low-density residential (see **Figure 6.2-1**). The *Future Land Use Plan* assumes the existing location of US 181 and the Harbor Bridge.

6.2.1.5 City of Corpus Christi's Strategic Parks and Recreation Master Plan

According to the *Strategic Parks and Recreation Master Plan*, Corpus Christi is divided into seven park planning areas, with Park Planning Areas 1, 2, and 4 located within the AOI (City of Corpus Christi 2012a). Park Planning Area 1 includes the western portion of the Refinery Row community; Park Planning Area 2 encompasses the majority of the AOI within the Northside, Westside, and South Central communities; and Park Planning Area 4 includes the areas along the shoreline in the South Central community and the entire North Beach area. A total of approximately 180 acres, 380 acres, and 200 acres of existing parkland are located within Park Planning Areas 1, 2, and 4, respectively. The plan points out that while the city has a relatively high ratio of park sites to residents, the parks are small and dispersed and need to be developed into larger but more manageable areas. Due to recent budget cuts, the Parks and Recreation Department is attempting to streamline park development and maintenance by developing new park classifications, which range from the smallest (less than three-acre) niche parks

to the largest (over 100-acre) city parks. Four parks within the AOI are identified by the plan as in need of repurposing; these include Breakwater Park in North Beach, Cabra and T.C. Ayers Park in Northside, and Tom Graham Park in Westside.

6.2.1.6 City of Portland's Comprehensive Plan

The City of Portland's *Comprehensive Plan* states that "[g]rowth and development occurring within Portland in the future will require the conversion of vacant and agricultural land to more intensified urban uses," which will impact not only the economy but also the "character, attractiveness and livability of the community for many years to come" (City of Portland 2006, 27). Excluding water surface area, single-family homes are the most common land use in Portland, and the plan aims to maintain the "small town" character of the city by encouraging quality retail/commercial and industrial development. The plan also cites community livability and character (achieved through improvements such as pedestrian and bicycle linkages) as a main goal for Portland (City of Portland 2006, 48–57).

6.2.1.7 Port of Corpus Christi's Rail Master Plan

The Port of Corpus Christi's *Rail Master Plan* outlines the railroad improvements needed to accommodate growing rail traffic at cargo terminals and port industries. Existing rail facilities in the area include three Class 1 railroads (Union Pacific, Kansas City Southern, and Burlington Northern Santa Fe) and the Corpus Christi Terminal. The plan describes the improvements planned and currently underway by the Port in preparation for an anticipated rise in rail activity in the future, in part due to potential economic opportunities such as expected increases in shipments of crude oil, liquid fertilizer, grain, and wind turbine components. In addition, development of the La Quinta property and construction of a steel pipe plant in Gregory (the TPCO plant) would be expected to contribute to increased rail activity (Port of Corpus Christi 2012c). Some of the more noteworthy future plans located within or partially within the AOI include: the Nueces River rail yard and Suntide unit train sidings and rail yard adjacent to the Joe Fulton Corridor; the bulk terminal reconfiguration loop; ADM grain elevator track improvements; and Northside Permian Rail extension and yard on the north side of the Inner Harbor; and the La Quinta Rail Line conceptual route and terminal loop track and the Gregory rail relief route located within and north of Portland.

6.2.2 Study Area Trends

The following discussion of study area trends is largely based on components of the MPO's TDM, which was last revised in 2004 in support of the *2030 MTP* (and is currently under revision to include horizon year 2040). The TDM uses population and employment forecasts to develop three products: trip generation, trip distribution, and traffic assignment modules, all of which are assessed within TAZs. Demographic data required for development of the TAZs used in the model are based on population and employment estimates and projections from the Texas State Data Center (TSDC) for the years 2006–2035. TSDC population data was allocated by the MPO to TAZs "based on a review of the character of each TAZ and on its available developable land area. Allocation within each census place was further guided by population and employment 'trend areas' identified through a consensus of regional

stakeholders in a workshop hosted by the MPO. Allocated data was then reviewed and smoothed as necessary for reasonableness of growth, growth rates, and compatibility with historic data, and cross-checked against reasonable ratios" (Corpus Christi MPO 2009, 19). The results of this process are used in this analysis for discussion of past and future trends within the AOI.

6.2.2.1 Population Trends

Regional population trends and projections discussed in **Section 3.5.1.1** indicate that, historically, San Patricio County is growing more slowly than Nueces County, and both have grown more slowly than the state as a whole. Data on future conditions, though, indicate a shift in this trend. By 2040, San Patricio County is expected to see a more rapid increase in population (approximately 89 to 93 percent based on location) than Nueces County (approximately 34 to 42 percent) and statewide (between 42 and 50 percent). Further data on population trends and projections are included in **Tables 3.5-1** and **3.5-2**.

Future population trends within the AOI are reflected in the MPO's analysis of population change within the Corpus Christi area TAZs, which served as a major factor in determining the AOI boundaries. According to the MPO, the portion of the AOI that encompasses the Inner Harbor and Refinery Row is anticipated to undergo a population change of -11 percent to 1.63 percent between 2006 and 2020, based on location. Between 2020 and 2040, this portion of the AOI is anticipated to continue to undergo a population loss or relatively minor increase (up to 22.3 percent) as compared to other TAZs within the Corpus Christi area. The Inner Harbor and Refinery Row encompass a majority of the acreage within the AOI; however, these areas do not include the most concentrated pockets of commercial or residential development.

Areas such as North Beach and portions of the CBD and Westside neighborhoods are projected to undergo increases in population from 2006 to 2020 (approximately 17 to 55 percent) and from 2020 to 2040 (approximately 22 to 86 percent). TAZs anticipated to see the largest increase in population during both timeframes (2006–2020 and 2020–2040) are located within Portland, parts of which are expected to undergo population gains of over 100 percent.

6.2.2.2 Employment Trends

The MPO indicates that between 2006 and 2020, employment is anticipated to increase the most in Portland and the South Central community (as would be expected due to the inclusion of the CBD within South Central) relative to other project area communities during this period. Isolated employment increases are projected in the Northside community and within a small portion of the Refinery Row community. These areas could undergo an increase in employment between approximately 17 and 27 percent by 2020. From 2020 to 2040, the MPO expects a more balanced increase in employment throughout the TAZs within the AOI, with Portland, South Central, and surrounding areas expected to see continued growth in employment through 2040.

Large-scale projects related to Port activity, such as the La Quinta Trade Gateway Terminal, are anticipated to contribute to higher rates of employment within the area beyond those projected by the

Texas State Data Center. Projections of employment for the full build-out of the La Quinta facility estimate up to 14,000 jobs by the year 2035; however, "there is some question of whether the full amount of estimated employment will be reached" (Corpus Christi MPO 2009, 20). Therefore, the MPO developed a model-based tool for defining a set of 2035 demographics which include employment and population at any given level of estimated employment for the La Quinta facility. The projections utilized in this indirect effects analysis assume an MPO-estimated employment at the La Quinta facility of 5,000 persons. This analysis also considers the Hurricane Alley Waterpark (opened Spring 2012) and the Schlitterbahn Beach Resort and Indoor Waterpark (scheduled to open in 2014).

Greater focus on alternative energy sources such as wind farms "has also generated a boost of shipping activity at the Port of Corpus Christi, which is the hub for wind turbine equipment coming from overseas" (Texas A&M University-Corpus Christi 2011, 8). As energy continues to play a major role in the economic viability of the Corpus Christi area, creation of additional employment opportunities has recently occurred and is expected to continue. A recent boom in oil and gas production in the Eagle Ford Shale region is anticipated to create approximately 68,000 jobs throughout the Coastal Bend Region (the 12-county region of South Texas that includes Nueces and San Patricio Counties) by 2020, according to an economic study by Texas A&M University-Corpus Christi (2011).

The healthcare industry and education sector also provide a substantial proportion of jobs in the area. As the third-largest employer in the Corpus Christi MSA, the Spohn Health System employs over 5,000 individuals, closely followed by the Corpus Christi Independent School District (ISD) (see **Table 3.4-9**). Del Mar College and Texas A&M University-Corpus Christi are also significant employers in the area, the latter of which recently experienced a 10 percent increase in annual enrollment (Texas A&M University-Corpus Christi 2011, 9). Government jobs also provide work for many Nueces and San Patricio residents, with the majority of individuals working on military bases. The Corpus Christi Army Depot is the largest employer within the Corpus Christi MSA. However, the 2010 closure of the Navel Station Ingleside was estimated to cause direct loss of nearly 2,000 military jobs and approximately 260 civilian jobs (Texas A&M University Corpus Christi 2011, 8). Finally, tourism is also an important economic factor within Corpus Christi. According to a 2009 study by Dr. Jim Lee of Texas A&M University-Corpus Christi, nearly 13,000 local jobs within the Corpus Christi area are directly related to tourism, which makes it the second largest private employer sector in the area (Lee 2009a, iii). Given the focus of recent City and MPO plans, tourism-related employment within the AOI is expected to continue to rise. Further discussion of employment within the area is also included in **Section 3.4.2.**

6.2.2.3 Development Trends

Residential development within Corpus Christi and Portland in the latter half of the twentieth century was shaped in large part by major transportation changes. The existing Harbor Bridge and US 181 improvements were constructed in 1959 in support of infrastructure expansion, post-war population growth, and increasing recreational activity. Subsequent construction of I-37 in 1961 and the Crosstown Expressway in 1963 routed these roadways through existing residential neighborhoods, resulting in

severed neighborhoods bound by the interstate, oil refineries, and the Port. See **Section 3.1.1** for further background on the history and development trends of land use within the area.

Today, land use within the AOI is characterized by a mix of commercial, residential, industrial, recreational, and public facilities with small portions of undeveloped land (see **Land Use Plates** in **Appendix E**). According to the MPO, Nueces and San Patricio Counties had an estimated population density of approximately 256 residents per square mile in 2009 (Corpus Christi MPO 2009, 9). The City of Corpus Christi's *Future Land Use Plan* (summarized in **Section 6.2.1.4**) indicates that high-density residential development "should be encouraged, especially in the central area of the city," since high land prices in this part of Corpus Christi call for more efficient use of services and provide a population base to support "commercial revitalization of the central core" (City of Corpus Christi 2010b). The plan also encourages infill development on vacant tracts already served by municipal infrastructure and services, and suggests the economic viability of infill development should be improved through incentives to attract private investments (City of Corpus Christi 2010b). According to the MPO's TDM, though, the majority of population increases are projected to occur south and west of the AOI as well as to the north outside of Portland. The City of Corpus Christi's *Future Land Use Plan* (see **Figure 6.2-1** in **Appendix A**) depicts a projected spread of residential development south and west of the AOI.

Commercial development within Corpus Christi has, in recent years, been driven by a desire to increase tourism throughout the region, as evident with development of the SEA District, discussions of the viability of Corpus Christi as a cruise ship destination, and other actions by both government agencies and private developers. Tourism is a mainstay of the Corpus Christi economy; the city is the sixth-most visited tourist destination in Texas (Lee 2009a, 2). As stated in **Section 6.2.1.1**, the MPO lists a number of transportation-oriented goals in support of improved recreational travel and overall support of the tourism industry. Improved access to area attractions, such as the USS *Lexington* Museum and the Texas State Aquarium, as well as creation of an attractive tourism environment through cooperation of regional, state, and local interest groups to integrate land use and transportation are main goals of the region.

The Port of Corpus Christi continues to be the most critical player in industrial development throughout the region. Ongoing and future rail improvements, as outlined in the Port of Corpus Christi's 2012 *Rail Master Plan* (summarized **Section 6.2.1.7**), are planned in support of anticipated increases in rail activity in the future. According to the MPO, the Port's plans for the La Quinta facility between Portland and Ingleside (as shown on **Figure 6.1-1**) are anticipated to have "an enormous impact on the region's employment (and consequently on its population)" (Corpus Christi MPO 2009, 20). Projects such as the Nueces River rail yard are intended to increase Inner Harbor rail capacity in preparation for expansion of grain and Eagle Ford Shale activity (Port of Corpus Christi Authority communication 2013). Port-related development is currently focused on the global market demand shift from coal to natural gas associated with Eagle Ford Shale activity in the surrounding region.

6.3 INVENTORY OF NOTABLE FEATURES

Notable features are defined as "specific valued, vulnerable, or unique elements of the environment" (NCHRP 2002, 45) and can include sensitive species and habitats, valued environmental components, landscape features with relative uniqueness, and vulnerable elements of the population (TxDOT 2010d). The following notable features have been identified within the AOI in accordance with TxDOT 2010 guidance, accepted practice, and project-specific consultation with FHWA and TxDOT:

- **Communities**, including:
  - Refinery Row (including the Academy Heights and Dona Park neighborhoods);
  - Westside (including the Oak Park, Leopard Street, Ben Garza, and Crosstown West neighborhoods);
  - Northside (including the Hillcrest and Washington-Coles neighborhoods);
  - North Beach;
  - South Central (including the CBD and SEA District, Evans Elementary, and Crosstown East neighborhoods); and
  - Portland.
- **Port of Corpus Christi and Port Industries**
- **Coastal Resources**, as they relate to the:
  - economy, particularly with respect to Port operations and the tourism industry;
  - community, in terms of recreational amenities and employment (especially within the above-mentioned industries); and
  - environment, with regard to vegetation, wildlife, and water resources.

These notable features are discussed in more detail throughout the indirect effects analysis in relation to whether they may be impacted as a result of encroachment-alteration effects, induced growth effects, or effects related to induced growth.

In addition to the notable features listed above, this analysis also considers potential effects to vulnerable elements of the population in accordance with FHWA impact assessment guidance (FHWA 1987). While potential adverse effects on minority and low-income populations are fully addressed in **Section 4.7**, vulnerable elements of the population, including children, the elderly, and non-drivers, are also considered throughout the indirect and cumulative effects analysis.

6.4 IDENTIFICATION OF IMPACT-CAUSING ACTIVITIES

Impact-causing activities include all of the steps involved in the proposed project, including construction, operation, and maintenance of the facility (TxDOT 2010d). Based on guidance provided by NCHRP Report 466 (2002) and TxDOT (2010d) as well as past experience with similar projects and accepted practice, the following have been identified as impact-causing activities associated with the proposed project.

6.4.1 Modification of Regime–Including Land Use, Vegetation, and Hydrology

Increased impervious cover would result from construction of the proposed project, which would involve changes in storm water runoff generation and in the way runoff is routed to receiving waters via constructed drainage systems. Additionally, modifications to vegetation would occur during construction of any of the build alternatives.

The extent of changes to storm water runoff and existing vegetation regimes as a result of the proposed project would be dependent on the level of modification each alternative would require to the existing environment. In all cases, pre-existing regimes would be preserved to the extent practicable, and temporary and permanent best management practices (BMPs) would be employed in accordance with Clean Water Act regulations and TxDOT construction specifications.

6.4.2 Land Transformation and Construction

The proposed project would result in conversion of existing commercial, residential, and mixed land uses to transportation use. The extent of potential changes to land uses would vary based on the proposed alternative selected and would be greater for those alternatives that would be constructed as new-location facilities (the Red, Orange, and West Alternatives). Existing vegetation and other cover types, including asphalt and concrete, would be removed from the proposed right of way, and existing overhead and underground utilities would require relocation. Property improvements (buildings and fencing), roadway features (existing pavement and culverts), and the existing Harbor Bridge would be demolished or removed and disposed of off-site. Construction activity may generate a temporary increase in Mobile Source Air Toxics (MSAT) emissions as a result of equipment operation and truck hauling.

6.4.3 Resource Extraction, Processing, and Storage

Construction of the proposed project would require mobilization of equipment and resources for the duration of the construction phase. Additional activities that would occur during construction of the proposed project include: excavation of off-site borrow material and truck hauling to the project site; stockpiling of materials (including road-base fill, concrete, signage, and fuel); solid waste disposal; processing of concrete and asphalt at on- or off-site batch or mixing plants; and manufacture and transport of bridge components such as pre-formed concrete and/or steel beams and girders. Air quality effects associated with materials transport and processing include diesel engine air emissions from trucking of materials to the project site and batch plant air emissions.

6.4.4 Land Alteration, Erosion Control, and Fill

Impact-causing activities in the land alteration, erosion control, and fill category include:

- Bridge replacement and reconstruction;
- Drilling for bridge foundations;
- Bridge demolition;

- Earthmoving activities;
- Excavation and embankment construction;
- Roadway placement;
- Stabilization of exposed soils by seeding and revegetation;
- Grading and temporary fill within water features; and
- Installation and maintenance of temporary and permanent erosion and sediment control measures.

6.4.5 Resource Renewal

Impact-causing activities would include post-construction landscaping and revegetation. These activities would use native materials and species and avoid introduction of non-native plant species.

6.4.6 Changes in Traffic Patterns, Access Alteration and Travel Times

Changes in traffic patterns, access alteration, and impacted travel times would be anticipated to occur as a result of the following impact-causing activities associated with the proposed project. These changes would include:

- Long-term changes in accessibility and travel patterns associated with design modifications of access roads and intersections;
- Long-term changes in mobility due to more efficient traffic movement throughout the area; and
- Short-term impacts to accessibility and mobility as a result of construction-phase traffic control or detours.

6.5 IDENTIFICATION OF POTENTIALLY SUBSTANTIAL EFFECTS FOR ANALYSIS

This step in the indirect effects analysis (Step 5) serves as a screening tool for identifying potentially substantial indirect effects that warrant further analysis in Step 6. This determination is based on the comparison of the impact-causing activities (identified in Step 4) with the lists of goals (Step 2) and notable features within the AOI (Step 3) in order to explore potential cause-effect relationships in the context of environmental issues of concern to the community. Indirect effects can be divided into three types: encroachment-alteration effects, including socioeconomic and ecological effects; induced growth effects, including complementary development and redevelopment of existing land uses; and effects related to induced growth.

Following identification of the potential indirect effects of the proposed build alternatives, a determination is made regarding whether each indirect effect would be considered *potentially substantial*. Only those effects considered potentially substantial are further discussed in Step 6 (see **Section 6.6**). Some of the potential indirect effects identified in this analysis will vary depending on the build alternative. In these cases, the differences among the indirect effects associated with each proposed build alternative are assessed separately, as appropriate.

The No Build Alternative would not result in any of the potential indirect effects discussed below; however, this alternative would not satisfy the need, purpose, and associated objectives of the proposed project described in **Section 1.0**.

6.5.1 Encroachment-Alteration Effects

Encroachment-alteration effects are defined as effects that alter the behavior and functioning of the affected environment by project encroachment (NCHRP 2002, 55). These effects can be separated into two broad categories: socioeconomic and ecological effects. In this analysis, these categories are further divided in order to distinguish the root cause and extent of potential effects as they relate to the surrounding environment, including the notable features identified within the AOI (listed in **Section 6.3**).

6.5.1.1 Socioeconomic Effects

Socioeconomic effects in the encroachment-alteration category would include changes to the condition of the local and regional economies; to employment as a result of business displacements; and to community resources, measured in changes to community cohesion and health. While related, these types of effects originate from distinct causes and are therefore considered independently in this section.

The proposed project has the potential to adversely affect different social groups in different ways. Potential adverse effects on minority populations and low-income populations are addressed in the Environmental Justice analysis in **Section 4.7**, which concludes that after considering mitigation, the Orange Alternative would cause displacement and community cohesion effects and the West Alternative would cause accessibility effects which would be disproportionately high and adverse with respect to minority populations and low-income populations, and these effects would not reasonably be offset with mitigation. Mitigation measures for the effects of the Red Alternative (Preferred) combined with the beneficial economic, safety, and connectivity effects overall would substantially offset adverse effects to minority and low-income populations to the extent that the effects would not be disproportionately high and adverse. Effects of the Green Alternative on minority and low-income populations would also not be disproportionately high and adverse. Other vulnerable elements of the population that may be indirectly affected by specific aspects of the proposed project include elderly persons, children, low-wage employees, and persons who might be dependent on transit. Potential indirect effects to these vulnerable elements of the population are considered throughout the indirect effects analysis.

<u>Economic Resources</u>

The primary impact-causing activities of the proposed project that would result in encroachment-alteration effects on economic resources include right of way acquisition, during which business displacements would occur in some locations; changes in access and traffic patterns associated with facility design alterations; and activities associated with the construction phase of the proposed project. These impact-causing activities would occur under all of the proposed build alternatives to varying

degrees; indirect effects as a result of these activities would occur later in time and be further removed in distance from the proposed project when compared to direct effects.

Encroachment-alteration effects on the local and regional economy would stem from displacement of businesses during right of way acquisition, which in turn could result in decreased tax revenues and potential job losses based on whether the employer chooses to relocate. Due to the uncertain nature of the effects of business displacements on jobs, this issue is explored further under the *Employment* heading in this section. Encroachment-alteration effects on economic conditions within the AOI as a result of business displacements would vary slightly among the alternatives. As described in **Section 4.4.2.1**, construction of the Green Alternative would result in a total of 57 business displacements located primarily in the central business district. These businesses serve a variety of functions within these communities and include highway-oriented businesses (such as gas stations and restaurants); small, local businesses (such as auto service stations); a business park; a charter and shuttle service; the Hurricane Alley Waterpark; and Port facilities. Under the Red Alternative (Preferred), a total of three businesses would be displaced within each of the North Beach, Northside, and South Central communities: two highway-oriented businesses and a small, local business. The Orange Alternative would displace 10 businesses in the North Beach, Northside, and South Central communities, most of which include highway-oriented businesses as well as a funeral home, Hurricane Alley Waterpark, and a storage facility. Finally, construction of the West Alternative would result in displacement of two businesses within the North Beach and Northside communities: one gas station and the CITGO Refinery office buildings.

The business displacements discussed above, identified as direct effects and discussed in **Section 4.4.2.1,** could potentially result in decreased tax revenues for the local economy, though the magnitude and duration of these effects would depend on whether the businesses choose to relocate. Under all of the build alternatives, highway-oriented business would be anticipated to relocate based on the location of major highways (such as US 181) and associated frontage roads. While the analysis conducted in **Section 4.4.2.1** suggests that most displaced businesses would be able to find replacement properties nearby, a minor loss of tax base for the local economy would result from businesses choosing to relocate outside the area. Also, minor impacts to the economy would potentially occur due to temporary cessation of business operations during the relocation process. As stated in **Section 4.4.2.1**, all displaced business owners would receive fair market value compensation for their land and improvements as well as reasonable relocation assistance under federal and state law; for this reason, it is assumed that business operations would eventually resume. In most circumstances, decreased tax revenues within the AOI as a result of business displacements during right of way acquisition would be anticipated to be temporary; therefore, indirect impacts to the local and regional economy as a result of business displacements during right of way acquisition are considered insubstantial and are not carried forward for further analysis in Step 6.

Permanent changes in travel patterns and access would also contribute to an encroachment-alteration effect on the local economy, since modifications to the connections between existing businesses and communities (as well as along interconnecting roadways) would occur under all of the proposed

alternatives to varying degrees. For roadway-dependent businesses not displaced during the right of way acquisition process, changes in the design and alignment of frontage roads, intersections, and driveway locations would potentially affect convenience of access for customers. Due to the extent of travel pattern and access changes that would occur under all of the build alternatives, potential impacts to the local and regional economy resulting from these changes are considered to be potentially substantial and are discussed further in **Section 6.6.1.1**.

Short-term impacts during the construction phase of the proposed project would also occur under all of the build alternatives, partially as a result of increased economic activity within the area during the period of project construction. In addition to the direct economic effects shown in **Table 4.5-8** and discussed in **Section 4.5.6.1**, the indirect and induced economic effects of the proposed project were calculated using the U.S. Department of Commerce Bureau of Economic Analysis RIMS II Multipliers. These values (shown in **Table 6.5-1**) represent output and earnings beyond those associated with the final-demand industry (in this case, construction). Indirect economic effects are based on how goods and services are supplied within a region (such as by construction supply companies). Induced economic effects are based on purchases made by all employees whose earnings are related to the expenditure of funds on the project (final-demand change). The indirect and induced effects to total output (sales) and household earnings are shown in **Table 6.5-1**. The indirect and earnings multipliers are presented as the indirect economic effects of the proposed project as they most nearly represent the regional, rather than statewide, benefits to the Corpus Christi area.

Table 6.5-1 Indirect and Induced Economic Effects of the Proposed Build Alternatives

	Green	Red	Orange	West
Construction ($)	557,530,443	636,527,734	629,819,315	679,131,890
Indirect Economic Effects				
Output ($)	200,989,725	229,468,284	227,049,863	244,827,046
Earnings ($)	57,878,085	66,078,915	65,382,504	70,501,717
Induced Economic Effects				
Output ($)	261,426,024	298,467,855	295,322,277	318,444,943
Earnings ($)	74,207,302	84,721,841	83,828,951	90,392,455
Total Indirect + Induced Effects				
Output ($)	**462,415,749**	**523,936,139**	**522,372,140**	**563,271,989**
Earnings ($)	**132,085,387**	**150,800,756**	**149,211,455**	**160,894,172**

Source: U.S. Bureau of Economic Analysis, RIMS II Multiplier System, Table 2.5, 2010 Total Multipliers for Output, Earnings, and Employment, by Industry Aggregation for Nueces and San Patricio County, Texas (Types I and II).

The applications of these earnings multipliers indicate that construction of any of the build alternatives would have positive indirect and induced effects on the local and regional economy; however, these effects would not be anticipated to result in substantial changes within the local or regional economy after the construction phase is complete and are not carried forward for further analysis in Step 6.

Employment

As stated above, the businesses displacements that would occur under each build alternative would potentially result in temporary or permanent job losses for employees. If the displaced business is relocated, the length of time before services resume would potentially result in temporary impacts to area employment. With respect to long-term encroachment-alteration effects to employment, employers who choose not to relocate or who relocate outside of Corpus Christi would represent a loss in employment and subsequent decreased tax revenues.

In view of the types of businesses to be replaced, these effects would also apply to low-wage jobs, which could contribute to a decline in quality of life for vulnerable elements of the population if operations of displaced businesses do not resume after a reasonable length of time. However, these impacts would likely be offset by the creation of new jobs within the AOI, as discussed below, as well as by the benefits of potential partnership between TxDOT and such organizations as the non-profit Workforce Solutions of the Coastal Bend, which would serve to complement TxDOT's overall relocation assistance program (discussed further in **Section 6.7.1**). Given the creation of new jobs and these measures, employment impacts to vulnerable elements of the population would not be considered to be substantial and are not carried forward for further analysis in Step 6.

In addition to the employment impacts discussed in **Section 4.5.2.1**, the proposed project would also result in indirect and induced employment (shown in **Table 6.5-2**). The Green Alternative would result in the least amount of indirect and induced employment (3,371 total jobs), while the West Alternative would result in the highest amount of indirect and induced employment (4,107 jobs).

Table 6.5-2 Indirect and Induced Employment Effects of the Proposed Build Alternatives

	Green	Red	Orange	West
Construction ($)	557,530,443	636,527,734	629,819,315	679,131,890
Indirect Employment Effects				
Employment (jobs)	1,206	1,377	1,363	1,469
Induced Employment Effects				
Employment (jobs)	2,165	2,472	2,446	2,638
Total Indirect + Induced Employment Effects				
Employment (jobs)	3,371	3,849	3,809	4,107

Source: U.S. Bureau of Economic Analysis, RIMS II Multiplier System, Table 2.5, 2010 Total Multipliers for Output, Earnings, and Employment, by Industry Aggregation for Nueces and San Patricio County, Texas (Types I and II).

The permanence of these jobs is uncertain; while the majority of these employment effects would be temporary and last only as long as the construction phase, some jobs supported by the proposed project may represent opportunities for continued employment depending on current job market conditions at the time construction is completed. Considered along with the employment benefits of additional jobs indirectly supported by the proposed project, potentially adverse impacts to employment that could result from business displacements under any of the build alternatives are considered insubstantial and are not carried forward for further analysis in Step 6.

Community Resources

Encroachment-alteration effects to community resources would occur as a result of impact-causing activities such as changes in access and travel patterns; bridge replacement; and roadway placement and associated landscape modifications. These effects would also include the potential changes to communities discussed in **Section 4.6.**

Potential changes to community cohesion are explored here as an encroachment-alteration effect to the communities within the AOI, all of which possess unique traits that could potentially be affected by the long-term implications of changes related to the proposed project. Due to the potentially substantial nature of some changes to communities identified in **Section 4.6**, particularly in areas with concentrations of vulnerable elements of the population, the long-term continuation of these effects are considered to also be potentially substantial and are therefore discussed further in **Section 6.6.1.2**.

Potential effects to communities can also include changes in air quality as it relates to health. However, this project would not result in any meaningful changes in traffic volumes, vehicle mix, location of existing roadways, or any other factor that would cause a substantial increase in emissions impacts relative to the No Build Alternative. As such, TxDOT has determined that the proposed project would generate minimal indirect impacts on air quality. In light of community concerns that have been expressed regarding air quality and related health effects, this issue is further considered in the analysis of potential cumulative effects in **Section 7.0**.

6.5.1.2 Ecological Resources

Potential encroachment-alteration effects to ecological resources are discussed with regard to impacts to water resources, including groundwater and surface water; and wildlife habitat and vegetation, including habitat for threatened and endangered species. The primary impact-causing activities that would potentially result in encroachment-alteration effects to ecological resources include: removal of existing vegetation; grading, earthmoving, excavation, and embankment; and roadway and bridge placement. The potential effects of these impact-causing activities are discussed by resource below.

Water Resources

Encroachment-alteration effects on water resources would potentially occur under all of the build alternatives as a result of increased impervious cover throughout the project area, which can lead to increased non-point source (vehicle-related) pollution from runoff during rain and flooding events. During rainfall events, highway runoff would discharge into Corpus Christi and Nueces Bays and the Inner Harbor. The extent of these potential impacts is discussed further in **Section 4.11.2**. In addition, increased localized erosion, which can lead to increased sediment loads within the watershed, would be anticipated to occur under all of the build alternatives as a result of vegetation removal and roadway placement.

The Texas Water Code and the Clean Water Act (33 U.S.C. 26, Sections 401, 402, and 404), when implemented, would serve to mitigate potential adverse effects to water resources. Specifically, Section 402 describes the National Pollutant Discharge Elimination System, as delegated to the Texas Commission on Environmental Quality (TCEQ) under the Texas Pollution Discharge Elimination System (TPDES), which requires implementation of a storm water pollution prevention plan during the construction phase of the proposed project and the implementation of erosion and sedimentation controls to protect surface waters from storm water runoff. Mitigation strategies for potential impacts to water quality as a result of construction and operation of the proposed project are discussed further in **Section 4.11.3**.

Direct impacts to ground water from project alternative construction activities are not expected to be substantial (**Section 4.11.4**). Encroachment-alteration impacts related to highway runoff constituents reaching the water table are similarly not considered to present substantial risks to the ground water resource, which is generally unsuitable for human use throughout most of the Corpus Christi area. Although fresh water supplies are expected to continue to decline in the Corpus Christi Bay area, the brackish shallow water table resource has not been considered as a water supply alternative, currently or in the future. Water development strategies presented in the Coastal Bend Regional Water Planning Group 2010 plan involve greater use of potable supplies from the Gulf Coast and Carrizo Wilcox aquifers rather than brackish local ground water.

Given the regulatory protections in place on both the state and federal level, the extent of indirect impacts to surface water resources would not be substantial and are not carried forward for further analysis in Step 6. Potential indirect impacts to ground water resources in the AOI are similarly not substantial and are not carried forward for further analysis.

Vegetation & Wildlife Habitat

Vegetation removal during construction would be required under all of the build alternatives (see **Section 4.15.1**). The majority of existing vegetation within the project area is characterized as maintained landscape. Other vegetation types that would require removal during construction would include sparsely vegetated lands and relatively small areas of mixed grasslands, brush, and marshes. Indirect impacts to Texas windmill-grass habitat would potentially occur under all of the build alternatives during right of way clearing and roadway placement, as potential suitable habitat for this species occurs along project area roadsides. In addition, as discussed in **Section 4.13.1.1**, construction of the West Alternative would result in direct impacts to mangrove vegetation, which provides shoreline stabilization, water quality improvement, and habitat for fish and wildlife. Mangroves are described in the Nationwide Permit (NWP) regional conditions for Texas as rare or ecologically sensitive wetlands (resulting in Tier II Certification under Section 401 of the Clean Water Act), and temporary and/or permanent discharges into these areas would require authorization under a Section 404 Individual Permit (IP).

The use of BMPs, vegetation clearing techniques, and replanting, as well the avoidance techniques discussed in **Section 4.15.1**, would be utilized during construction, and disturbed areas would be restored and reseeded according to TxDOT specifications as well as in accordance with FHWA's Executive Memorandum on Environmentally Economically and Beneficial Landscaping Practices and the Executive Order on Invasive Species. Given the implementation of these measures, the potential encroachment-alteration effects on vegetation, including Texas windmill-grass, would not be considered to be substantial and are not further considered in Step 6. The West Alternative's effects on mangrove vegetation would require a Section 404 Individual Permit, and onsite mitigation would be required for permanent impacts to mangrove vegetation. A Section 404 Individual Permit would address both direct and indirect impacts to this vegetation community; therefore, given the regulatory measures in place, potential indirect impacts of the West Alternative to mangroves would not be anticipated to be substantial and are not carried forward for further analysis in Step 6.

All of these vegetation types discussed above can serve as habitat for wildlife (see **Section 4.16.1.1**). However, given the generally urbanized/industrialized nature of the project area, potential encroachment-alteration effects on wildlife habitat in the form of habitat degradation would be minor. Moreover, the use of BMPs, vegetation clearing techniques, and replanting would minimize indirect encroachment-alteration impacts to wildlife habitat within the AOI. Compliance with the Migratory Bird Treaty Act (MBTA), which includes monitoring before and during construction activities, would serve to protect wildlife species, including nesting birds, from direct harm. Adjacent wildlife habitat would be protected from storm water runoff through implementation of BMPs, which would control erosion, post-construction effects, and limit sedimentation effects. Native vegetation would be re-established where practicable to replace important forage and cover for wildlife. Given the insubstantial nature of potential impacts on wildlife habitat as a result of habitat degradation, along with the efforts described above that would minimize potential impacts, encroachment-alteration effects on wildlife habitat would not be considered substantial and are not carried forward for further analysis in Step 6.

Critical habitat for one federally listed species, the Piping Plover, has been mapped by USFWS within the AOI at Indian Point, across the Nueces Bay Causeway from Corpus Christi and south of Portland (see **Figure 6.5-1** in **Appendix A**). As discussed in **Section 4.16.1.2**, this federally listed threatened species could utilize the tidal flats associated with Nueces Bay for foraging and roosting. Construction of the proposed project would not take place within the area designated as critical habitat for the Piping Plover; therefore, encroachment-alteration effects to critical habitat for this species would not occur and are not further considered in Step 6.

6.5.2 Induced Growth Effects

Induced growth effects of a transportation project can result from new or improved access to adjacent land or reduced travel times, both of which can increase the attractiveness of the surrounding land for development (TxDOT 2010d, 34). Induced growth effects of the proposed project were determined using a combined planning/collaborative judgment approach. The collaborative efforts of the Land Use Panel (described in **Section 6.1.4**) were supplemented by planning judgment informed by MPO

projections as well as current land use trends, patterns, and plans. The discussion below describes the combined planning and collaborative judgment efforts and subsequent conclusions regarding the potential induced growth effects of the proposed project. These potential induced growth effects are discussed based on the following types of development: residential and commercial development, including complementary development and redevelopment of existing land uses; and industrial and Port-related development.

6.5.2.1 Residential and Commercial Development

Access and mobility within the project area would be altered under all of the build alternatives. Ingress and egress points along major roadways would be reconfigured, and changes in traffic patterns would occur to varying degrees based on alternative. While mobility changes would also extend throughout the AOI, new access to previously inaccessible land would not be created as a result of the proposed project, and additional capacity would not be created. As shown in **Table 4.5-5**, estimated travel time for the year 2040 would not vary appreciably among the proposed build alternatives or when compared to the existing condition and No Build Alternative.

The proposed project would result in improved access in some areas and, in certain cases, reduced travel times. The project would not, however, be anticipated to spur new growth (residential or commercial) when considered independently. As defined by the CEQ, indirect impacts "are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable." In the absence of other actions within the AOI by outside parties, this transportation improvement project represents a single factor to be considered when estimating potential growth within the AOI. As stated in NCHRP Report 466, transportation projects and resultant increases in accessibility are "just one factor in the development decision-making process" (NCHRP 2002, 58). Other factors in land use development include the following:

- Location attractiveness (e.g., physical features, land price and development cost, adjacency to markets, customers, and demand generators);
- Consumer preferences (e.g., for local features, existing/anticipated development);
- The existence/availability of other infrastructure (e.g., water, sewer);
- Local political and economic conditions (e.g., availability of labor, regulatory environment); and
- The rate and path of urbanization in the region.

Critical factors in location attractiveness were identified during the collaborative judgment process. The presence of the Port of Corpus Christi and Port Industries and the developing tourism industry in the area were cited as major factors that influence development within the AOI. Historically, the presence of the Port and tourism industry has played a pivotal role in attracting developers and customers to the area, a trend that is expected to continue in the future. Military and educational institutions, such as the Corpus Christi Army Depot and Texas A&M-Corpus Christi, were also cited by the Land Use Panel as playing important roles in development within the AOI. As shown in **Table 3.4-9**, the Corpus Christi Army Depot is the largest employer within the Corpus Christi MSA, while two of the top ten employers

in the MSA are education-related. In terms of consumer preferences and local political and economic conditions, it is expected that the factors described above will continue to guide development in the future whether or not the proposed improvements are constructed. While it is recognized that, by altering the existing facility, the proposed project may represent a change in the environment within which development decisions are made, the project would not serve as a primary catalyst for a shift in consumer preferences or local political or economic conditions.

Since the majority of the AOI is relatively urbanized, a lack of infrastructure would not likely serve as a major impediment to development; however, the availability of necessary resources can potentially slow or even inhibit growth within an area. Land Use Panel members were asked to identify major factors that influence development within the AOI. The most common issue cited by participants as an anticipated inhibitor of future growth was the availability of fresh water in the Corpus Christi area. The proposed project would not be expected to contribute to drought conditions in the future, as stated in **Section 4.11.1**. Nonetheless, "the variability of weather patterns in South Texas and a continually growing population" indicate that "it is critical that the City plans for future drought conditions" (City of Corpus Christi 2013c, 1). The City of Corpus Christi's Drought Contingency Plan points out that "[e]ven with three reservoirs, the City still faces drought conditions" approximately 16 percent of the time, hence the need of the City to "dramatically cut water consumption in order to conserve water supplies" (City of Corpus Christi 2013c, 2). These long-term trends in regional water availability are also addressed as cumulative effects in **Section 7.0**.

Complementary Development

According to NCHRP Report 466, complementary land development (typically in the form of highway-oriented businesses such as gas stations, motels, and restaurants), "is more likely near interchanges in rural areas where property values were initially low" (NCHRP 2002, 59). A large portion of the proposed build alternatives would not be at-grade; at these locations, increased access to adjacent land would not occur. While the proposed improvements would reconfigure the major interchanges under each of the build alternatives as well as replace local street connections demolished during the construction phase, the current condition of US 181, I-37, and the Crosstown Expressway as controlled-access highways would not be changed. Because the proposed modifications to interchanges and local connecting streets would not increase accessibility to adjacent land relative to the existing conditions, complementary development as a result of the proposed project would not be anticipated at the redesigned interchanges of US 181 with I-37 and the Crosstown Expressway with I-37 and is not further considered in Step 6.

Redevelopment of Existing Land Uses

With respect to interchanges in suburban or urban areas, such as Corpus Christi, where property values are higher than in rural areas and where urbanization has already begun, a greater proportion of higher density uses as well as a greater mix of uses are more likely to be supported (NCHRP 2002, 59). In these urbanized areas, the "general tendency is toward relatively high-density commercial or multifamily residential development near the facility nodes" (NCHRP 2002, 62).

The removal of the existing US 181 bridge and ramp structures between the Inner Harbor and I-37 under the Red, Orange, and West Alternatives would eliminate a physical barrier to traffic mobility within the CBD. The proposed design of the build alternatives (with the exception of the Green Alternative) also calls for the existing US 181 facility to be converted to an at-grade boulevard section by removing the embankment on the north and south approaches of the bridge and improving N. Broadway Street north of I-37 (see **Plates R-2, O-2,** and **W-7** in **Appendix E**). Removal of the embankment barrier at this location as well as improved access within portions of the CBD would potentially contribute to an increase in attractiveness of the CBD for redevelopment to higher density uses, particularly within the currently expanding SEA District. The degree to which the Red, Orange, and West Alternatives would potentially support redevelopment within the CBD is explored further below. The boulevard section is not proposed as a component of the Green Alternative due to its location adjacent to the existing facility; therefore, the potential for increased attractiveness for redevelopment would not be anticipated as a result of this alternative.

The northern portion of the proposed boulevard section is in close proximity to major SEA District attractions, such as Whataburger Field and Bayfront Science Park, while the southern portion is adjacent to a fire station and the vacant old county courthouse (see **Plates R-2, O-2,** and **W-7** in **Appendix E**). The middle portion of this corridor includes a sign company and large parking lots on the west and an oil company and park maintenance and recreation warehouse on the east. Access along US 181 in the CBD is currently provided only via N. Broadway Street, which extends northbound from Belden Street (just north of the old county courthouse) and terminates at the traffic circle just south of the Inner Harbor. This one-way, one- to two-lane street currently intersects Belden, Power, Palo Alto, Fitzgerald, Resaca, Hughes, Brewster, and Hirsch Streets; access to these streets would be retained with the proposed boulevard section. Construction of the Red, Orange, or West Alternative would remove (or, in the case of the Orange Alternative, partially remove) the embankment of the approaches to the bridge and improve N. Broadway Street (as well as a proposed new I-37 frontage road) to create an at-grade facility that would provide travel lanes in each direction. The proposed boulevard would terminate at Hirsch Street, which would connect to Harbor Street just south of the Inner Harbor. The southbound lanes of the proposed boulevard would continue south to connect to I-37. These improvements would serve to provide greater connectivity and ease of access within this area.

As stated by participants of the Land Use Panel, construction of the at-grade boulevard section with the Red, Orange and West Alternatives would also allow for improved views of the SEA District, which would, in turn, help to increase the attractiveness of this area to potential developers. One panel member stated that with the location of the existing facility, the majority of the SEA District is not visible to traffic passing over the bridge; some attractions are too close to the facility to be easily viewed by travelers. By removing the existing US 181 and replacing it with an at-grade facility, visibility of existing and future businesses would improve. In addition to business opportunities associated with increased visibility, the construction of a wider, at-grade boulevard would allow for greater potential for landscaping and other aesthetic improvements. These types of improvements would create a more visually appealing area for development than the current condition, which is flanked by the concrete

bridge approaches to the west and sparse vegetation or concrete driveways to the east. Creation of a more aesthetically pleasing environment in the CBD would be consistent with the City's encouragement of higher density, mixed uses within the CBD.

The 2011 *Integrated Community Sustainability Plan* for Corpus Christi identifies the area along the existing US 181 and I-37 east of Crosstown Expressway as a "node" in which mixed-use development opportunities would be available if the current Harbor Bridge were relocated further west. The 2004 *South Central Area Development Plan* (an element of the City of Corpus Christi's *Future Land Use Plan*) identifies this area as Planning Area A, which the City describes as an area in which "much higher density and intensity of uses than currently exists" should be encouraged (City of Corpus Christi 2004b, 20). The plan also emphasizes the importance of aesthetics and reduction of costly surface parking lots on high-value downtown property as well as suggests expansion of Heritage Park, which would add to the mixed-use development aesthetic encouraged by the City. These and other future plans and goals would be supported by the construction of the at-grade boulevard under the Red, Orange, and West Alternatives.

While the Red, Orange, and West Alternatives would potentially make the CBD more attractive for future conversion to higher density, mixed uses, implementation of one of these alternatives would not be enough on its own to induce redevelopment. While potential redevelopment in the CBD would not be as likely to occur without the removal of the existing US 181 barrier, this redevelopment would also not occur in the absence of other critical land development factors (such as land price, market demand, and a broad range of other economic and political conditions). The dependence of potential redevelopment in the CBD on other land development factors beyond removal of the existing barrier illustrates the lack of any cause-effect relationship between the proposed project and potential future growth within the CBD. A fundamental requirement for realizing the City's goals for downtown enhancement is the longer-term prospect for growth of the City's economy, which will determine the availability of investment capital and the rate at which desired urban improvements are likely to occur. Therefore, potential redevelopment within the CBD would not be an indirect effect of the proposed project. Redevelopment in the CBD in the context of a reasonably foreseeable future action, independent of the proposed project, is considered in **Section 7.5.6**.

6.5.2.2 Industrial and Port-Related Development

During phone and in-person interviews with project planners, the Port of Corpus Christi indicated that where they are considering dock expansion or land development on leased parcels, the proposed project is a minor factor only. Other, more near-term factors, most notably global market demand, intermodal freight infrastructure improvements, and oil and gas exploration in the region are the primary influences on current and future Port-related development. The reasonably foreseeable future developments among the Port's plans are considered more fully in **Section 7.5**. Moreover, most shipping contracts, according to the Port, are executed on the basis of a two- to three-year commitment, making the proposed project virtually a non-factor in decisions by current or prospective tenants to pursue dealings with the Port.

While predictions of induced growth as a result of transportation improvements are inherently uncertain, an even greater level of uncertainty exists when considering whether an opportunity potentially created by the proposed project would be realized in the absence of other factors. This uncertainty is further increased by the complex nature of Port operations and their critical role within the local, regional, and state economies. Nonetheless, the opportunity that the proposed project represents for the Port—specifically with respect to an increase in the air draft limitation—cannot be disregarded, despite the absence of a clear cause-effect relationship between the proposed improvements and potential increases in Port-related activity. Therefore, the relationship between the proposed project and potential future growth of the Port of Corpus Christi and the Port-related industries warrants further discussion.

All of the proposed build alternatives would meet the objective of the project to provide the transportation infrastructure to support economic development in the area. As the primary economic driver within the AOI and throughout the Coastal Bend Region, the Port would stand to benefit from this infrastructure improvement, primarily from the raising of the current 138-foot air draft clearance to 205 feet. During a November 13, 2012, participating agency coordination meeting with TxDOT staff, the Director of Port Operations stated the Port's expectation that a higher air draft clearance would not necessarily cause increased traffic; instead, economic efficiency would be increased for some Port customers, allowing them to ship cargoes in and out of the Port on fewer vessels with greater capacities, thereby lowering unit transport costs. Lower transport costs would be expected to increase the attractiveness of the Port to current and potential new maritime businesses and better position the Port to take advantage of current and future economic opportunities. Increased efficiency as well as other navigation improvements, such as the full implementation of the Corpus Christi Channel Improvement Project (discussed further in **Section 7.5.1**), would, for example, position the Port to take advantage of the expansion of the Panama Canal. Upon completion in 2015, the Panama Canal will see an increase in annual capacity by more than 75 percent (Cambridge Systematics, Inc. 2011). Navigational clearance is not the only factor that would influence the Port's ability to expand and capture the benefits of the Panama Canal expansion, however, which indicates that future development associated with the Port would not be linked to the proposed project in a causal way.

Moreover, the Port's primary commodities are petroleum and petroleum products, which represents over 70 percent of annual cargo tonnage since 2004 (Port of Corpus Christi 2013). Crude oil is exported by barge. Because the existing bridge clearance currently allows passage of these vessels, a higher bridge would not be expected to affect petroleum and petroleum product shipments at the Port, which represent the largest share of its business. According to the 2010 *Harbor Bridge Clearance Study*, other factors cited by Port customers as limitations for larger vessels include dock size, loading and intermodal infrastructure, and maneuvering of the sharp turn inside the jetties at Port Aransas, which leads to Corpus Christi Bay and the Port facilities (Harrington & Cortelyou, Inc. 2010, 5).

Based on this information, a clear cause-effect relationship between the proposed project and increased shipping at the Port cannot be demonstrated. However, future development associated with the Port is

considered reasonably foreseeable and is therefore assessed further in **Section 7.0** in the context of the potential cumulative effects of the proposed project.

Tourism

Another economic opportunity that would potentially be presented by raising the height of the existing bridge can be found in the cruise ship industry, as indicated in the 2003 *U.S. 181 (Harbor Bridge) Feasibility Study* (URS 2003) as well as in discussions with the Land Use Panel. According to the 2010 *Harbor Bridge Clearance Study*, new, larger cruise ships carrying 5,400 passengers can have an air draft of approximately 236 feet; however, older, smaller cruise ships with room for 2,600 passengers can have an air draft of 203 feet (Harrington & Cortelyou, Inc. 2010, 9–10). If the proposed project were to be implemented, the Port would be better suited to receive these smaller cruise ships, which could represent an economic opportunity for the Port as well as for the tourism industry in the area. However, as discussed above, the air draft limitation at the Inner Harbor is not the only factor limiting expansion of the cruise ship industry into Corpus Christi. Capitalization on the economic promises of the cruise ship industry relies heavily on the perception of a port city as either a tourism destination or as a location with convenient access to popular destinations. As stated by the *U.S. 181 (Harbor Bridge) Feasibility Study*, "while the Port of Corpus Christi hopes to grow its business in many areas, it may be difficult for the Port to attract the largest cruise ships from their Florida homeports in Miami, Fort Lauderdale, and Cape Canaveral" (URS 2003, 4-23).

Military Sector

As stated in **Section 3.4.4.3**, the Port of Corpus Christi is identified by the U.S. Department of Defense as a strategic installation for use in moving surge military cargoes in times of crisis and also serves a critical role in military mobilization and demobilization. While some cargo vessels and sealift ships are currently able to utilize the Port (Harrington & Cortelyou, Inc. 2010, 10), a higher bridge would potentially allow for an increase in military cargo. Currently, the Port of Beaumont is the number one port in the country for the shipment of military cargo (Texas Transportation Institute 2012, 13).

The *U.S. 181 (Harbor Bridge) Feasibility Study* states that as a designated strategic military port, the Port of Corpus Christi "must be able to accommodate military vessels" (URS 2003, 1-2). However, the study points out that military vessels with high air drafts (215 feet) do not call the Port, and that those "military vessels anticipated to call do not have high air draft requirements" (URS 2003, 4-18). According to the feasibility study, U.S Naval strategy, which determines the long-term future of Navy vessels and the Port's ability to attract those vessels, "does not depend on particularly large Navy vessels in homeports on the Gulf of Mexico" (URS 2003, 4-18). Therefore, it is not anticipated that the height of the bridge would provide substantial support of economic opportunities as they relate to military vessels.

6.5.3 Effects Related to Induced Growth

The analysis in the preceding sections indicates that the proposed project would not induce growth and that other critical land development factors would need to be in place for growth to occur. Therefore, effects related to induced growth are not explored further in this section or carried forward for further analysis in Step 6.

6.5.4 Screening for Further Analysis

Indirect effects anticipated to occur within the AOI under one or more of the build alternatives are addressed in the sections above and are summarized in **Table 6.5-3**. Those effects determined to be potentially substantial, encroachment-alteration effects to socio-economic resources, are carried forward for further analysis in Step 6.

6.6 ANALYSIS OF INDIRECT EFFECTS AND EVALUATION OF RESULTS

This portion of the analysis (Step 6) further explores the indirect effects identified as potentially substantial in **Section 6.5** and in **Table 6.5-3**. The analysis in Step 5 concluded that the following potentially substantial indirect effects require further consideration in Step 6: the economic effects of changes in access on local businesses, and the potential long-term effects on community cohesion. The probability of occurrence, magnitude, timing, duration, and degree to which these encroachment-alteration effects could be controlled or mitigated are discussed here.

Table 6.5-3 Potentially Substantial Indirect Effects		
Types of Effects	**Potential Indirect Effects**	**Potentially Substantial Indirect Effects Carried Forward to Step 6**
Encroachment-Alteration Effects		
Socioeconomic Effects		
Economic Resources	• Effects on tax revenues caused by business displacements • Travel pattern and access changes resulting in impacts to business operations, including increased circuity in some locations • Temporary increase in economic activity during the construction phase	• Travel pattern and access changes resulting in impacts to business operations, including increased circuity in some locations
Employment	• Temporary or permanent job loss as a potential effect of business displacements • Employment benefits of jobs indirectly supported and induced by project to last the duration of the construction phase	None
Community Resources (including health)	• Long-term implications of effects to community cohesion • Minimal indirect effects on air quality	• Long-term implications of effects to community cohesion
Ecological Effects		
Water Resources (including surface water and ground water)	• Surface water o Non-point source pollution as a result of increased impervious cover o Increased localized erosion • Ground water o Highway runoff reaches water table via infiltration of overland flow o Potential water quality impairment precludes future development of water table in the face of fresh water shortages	None
Vegetation & Wildlife Resources	• Potential encroachment-alteration effects on vegetation • Potential habitat degradation as a result of vegetation removal	None
Induced Growth and Related Effects		
Induced Growth (Including residential, commercial, and industrial development)	• Potential increase in attractiveness of CBD for redevelopment to higher density uses • Potential contribution to opportunity for increased activity at the Port of Corpus Christi	None
Effects Related to Induced Growth	None	None

1 Source: US 181 Harbor Bridge EIS Team 2013

6.6.1 Encroachment-Alteration Effects

Encroachment-alteration effects of the build alternatives considered to be potentially substantial include the following:

- Potential economic effects on businesses resulting from changes in travel pattern and access; and
- Potential long-term effects to community cohesion

The No Build Alternative would not result in any of the indirect effects described in this section; however, this alternative does not meet the need and purpose or associated objectives of the proposed project as described in **Section 1.0**.

6.6.1.1 Economic Effects of Changes in Travel Patterns and Access

Potential encroachment-alteration effects on local businesses could result from changes in travel patterns and access due to the build alternatives, including increased circuity of travel in some locations. Changes to traffic patterns and access on a larger scale—throughout the entire AOI—could also affect the local and regional economy, particularly with respect to the amount of travel within the downtown area and the CBD, the major commercial centers within the AOI. It should be noted that the proposed project would, under all build alternatives, improve safety and travel time reliability within the project area. Overall, the proposed project would provide the transportation infrastructure to support economic opportunities in the area. The following discussion focuses on the unique ways in which changes in travel patterns and access associated with each proposed build alternative could contribute to an indirect effect to the local and regional economy.

The proposed build alternatives would each have differing impacts to travel patterns and access changes in areas throughout the AOI with the exception of North Beach, another major economic center within the AOI. The following potential indirect impacts in the North Beach area would likely be the same under all of the build alternatives. In this location, the build alternatives would each reduce the number of existing northbound exit ramps from two to one (Beach Avenue) through the removal of the exit ramp to Burleson Street. Both existing exits for southbound traffic would remain, while the northbound US 181 entrance ramp and the southbound US 181 entrance ramp at Burleson Street would be closed. Impacts to travel times to and from North Beach would not affect the economic activities in this area. As an area that includes major tourist attractions, such as the Texas State Aquarium and the USS *Lexington* Museum, and a point of access to the north side of the Inner Harbor and Portland, a reduction in the number of travelers crossing the Harbor Bridge to reach North Beach would not be expected as result of these changes in traffic patterns. In addition, highway signage pointing to the area's major public attractions would be incorporated into the proposed design. According to some Land Use Panel participants, all of the proposed build alternatives would potentially serve to encourage business activity to become more distributed within the North Beach area, because the consolidation of exiting traffic at Beach Avenue would require travelers to pass through the majority of the North Beach area to reach attractions in the southern portion of North Beach. This increase in circuity (less than one-half a mile)

represents a potential benefit for North Beach businesses (and subsequently for the region as a whole) by increasing their exposure to traffic along north–south roadways like Timon Boulevard or the southbound frontage road of US 181. In terms of truck traffic travelling to the north side of the Inner Harbor, access via the intersection of US 181 and Burleson Street would no longer be available. Travelers would be required to continue travelling north in order to turn around at Beach Avenue, after which access to the north side of the Inner Harbor via Causeway Boulevard would be available. While these changes would also result in a slight increase in circuity, the amount of additional travel time would be minimal and offset by improvements to roadway safety. Those travelling from Portland would not likely be affected by the proposed access changes within North Beach, because the southbound US 181 frontage road would still maintain access at Burleson Street underneath the facility.

Green Alternative

Changes in travel patterns and access throughout the AOI under the Green Alternative would primarily affect the South Central community, particularly within the CBD area. Southbound travelers exiting off of the Harbor Bridge would travel to the dedicated turnaround at N. Staples Street to access downtown, creating a slightly longer route than currently exists; however, this would not substantially affect economic activity downtown. Also, access across I-37 via southbound Tancahua and northbound Carancahua Streets would no longer be available. This would result in changes in access from the Northside community (particularly Washington-Coles neighborhood) to downtown, although the changes are relatively minor and access would still be available via N. Staples Street or any one of the underpasses to be constructed along the US 181 approaches to the Harbor Bridge south of the Inner Harbor.

The Green Alternative is the only build alternative that does not include construction of a proposed at-grade boulevard, since the facility would be located within virtually the same location as the existing US 181 and Harbor Bridge. As a result, the Green Alternative potentially represents a loss of opportunity for businesses within the Downtown area, a viewpoint shared by many members of the Land Use Panel. Downtown businesses and attractions would benefit from greater visibility if the bridge were moved farther west from its current location and were accessible via an at-grade facility with a higher capacity than N. Broadway Street. However, the design of the Green Alternative does not represent major changes in travel patterns or access as compared to the existing facility.

The Green Alternative would not result in substantial encroachment-alteration effects on the local or regional economy associated with changes in access or travel patterns throughout the AOI.

Red Alternative (Preferred)

Under the Red Alternative (Preferred), the existing US 181 facility would be moved west of its current location to cross the Inner Harbor at a point about one-quarter mile west of the existing Harbor Bridge. Access into downtown from I-37 would not change, and while the I-37 intersection with the Crosstown Expressway would be reconstructed, changes in travel patterns or access would not have substantial indirect impacts to the local or regional economy. For other reasons, however, the Land Use Panel

expressed the opinion that the Red Alternative represents the greatest potential benefit to the economy out of the four build alternatives. Rather than focusing on specific changes in vehicular access, the Panel described a broader conceptual benefit of removing the physical barrier downtown and allowing for greater mobility within and between the downtown area and the SEA District in particular. The Red Alternative would be routed between the Northside neighborhoods of Hillcrest and Washington-Coles, the community-related effects of which are discussed in **Section 4.6.3** and **4.7.3.3**. While the path of the Red Alternative would likely result in changes within these residential communities, it would not be anticipated to cause substantial impacts to the regional or local economy resulting from changes in travel patterns or access in this area.

The Red Alternative, along with the Orange and West Alternatives, would result in conversion of the existing US 181 facility into an at-grade boulevard section through downtown. Increased access and greater mobility through this portion of downtown represent a potential benefit of the proposed project, and the Land Use Panel shared the view that removing the barrier between the SEA District and the rest of downtown presents an opportunity for the City to realize and implement its long-term downtown redevelopment plans (reflected in the *Integrated Community Sustainability Plan*) which if fully implemented would represent a diversification and expansion of the local and regional economy.

Orange Alternative

The Orange Alternative would cause similar changes to travel patterns and access as the Red Alternative (Preferred), resulting in similar changes to the local and regional economy. This build alternative involves construction of a new bridge immediately adjacent to and west of the existing bridge, following the existing US 181 right of way southward to near Port Avenue. It then veers west through a portion of the Washington-Coles neighborhood and toward the I-37/Crosstown Expressway interchange. The elevated sections of the bridge and approaches would remain as visual and physical barriers between the museum district along the bayfront and portions of the SEA District to the west. The at-grade boulevard section would proceed southward along the existing US 181 right of way, while the new location of US 181 would occupy developed and developable portions of the SEA District itself (including resulting in removal of the Hurricane Alley Waterpark).

By providing an at-grade boulevard through the downtown area, the Orange Alternative would provide potential benefits similar to those described for the Red Alternative. Overall, this alternative would aid in the City's implementation of their *Sustainability Plan* objectives, potentially leading to diversification of the local and regional economy as a result of increased mobility and access to amenities in the downtown area. This potential would likely be realized to a lesser extent than if the alternative were moved out of the SEA District entirely.

West Alternative

The West Alternative would result in the highest degree of changes to travel patterns and access as compared to the existing facility (see **Section 4.6** and **4.7.3.3** for a detailed description of these changes). The West Alternative would require motorists seeking to travel between the downtown/CBD

area and North Beach and Portland to travel west in order to access the Harbor Bridge, which would no longer be located within a more centralized location within Corpus Christi. This would direct traffic away from downtown, which could in turn result in decreased exposure for businesses. (The limited impact of the "bypass effect" is discussed in **Section 4.5.1.1**.) The length of the West Alternative between its north and south termini, at a length of 8.2 miles, is longer than the existing facility and other proposed build alternatives and represents a slightly longer average travel time. This additional length and travel time could potentially discourage some travelers within the network from accessing businesses, although the effects of this would be insubstantial.

The design of the West Alternative includes construction of an at-grade boulevard through the downtown area. While vehicular traffic would no longer be routed through downtown in order to access the Harbor Bridge, visitors to the downtown area, including bicyclists and pedestrians, would benefit from the increased accessibility between downtown and the SEA District. Though the West Alternative would be aligned adjacent to refineries within the AOI, access to these industries would not be substantially impacted. Overall, the West Alternative would not be anticipated to result in a substantially negative or positive encroachment-alteration effect on the local or regional economy.

6.6.1.2 Effects to Community Cohesion

Effects to communities identified in **Section 4.6** and discussed in **Section 6.5.1.1** are further explored here in terms of how continuation of these effects could be experienced later in time and further removed in distance from the proposed project. These changes are described as they relate to community cohesion.

<u>North Beach Community</u>

As shown in **Table 4.6-1**, North Beach would not undergo substantial physical or psychological effects as a result of the Green or Orange Alternatives. Under the Red Alternative (Preferred), realignment of the facility west of its existing location would potentially allow for connection of the areas south of Burleson Street, though no substantial impacts to community cohesion would be anticipated to occur. The most notable changes in North Beach would occur under the West Alternative, which could potentially result in an increased sense of isolation for North Beach residents as a result of increased circuity along the route between Downtown and North Beach. In the North Beach area, the West Alternative would provide one exit (to Beach Avenue) compared to the two exits that exist today (Burleson Avenue and Beach Avenue), and this could potentially affect the way residents of the North Beach community access their homes.

Defining characteristics of North Beach, including identification as a "beach community" (particularly by residents) and a tourism destination, would not be expected to decline over time as an indirect result of any of the build alternatives, nor would the attractiveness of the North Beach area as a whole be anticipated to decline. Therefore, indirect encroachment-alteration effects to the North Beach community would not be considered substantial.

South Central Community

Cohesion in the South Central community would not be substantially impacted by any of the build alternatives, as shown in **Table 4.6-2**. The existing facility is viewed as a barrier to connectivity between the SEA District and the downtown area, and the removal of this barrier under the Red, Orange, and West Alternatives could, over time, allow for greater opportunities for accessibility.

Land Use Panel participants indicated that the current perception of the South Central area is one of a divided district which would benefit from relocation of the existing facility. The Green Alternative would result in somewhat increased connectivity, specifically between the Northside community and downtown; however, the physical barrier created by the existing US 181 facility between the SEA District and the rest of downtown would remain in place. Over time, this is likely to perpetuate the perception that the SEA District is not a fully integrated element of downtown. The Red, Orange, and West Alternatives, by removing the existing facility, are expected to lead to greater integration of these areas over time. The Orange Alternative, which would not fully remove the existing barrier from the SEA District, would likely result in a lesser degree of integration. The opportunities for downtown redevelopment that could potentially follow the transportation infrastructure, though, would be dependent on other, unrelated influences, such as market demand, land cost and availability, zoning changes, and political and community support. Therefore, the potential for these opportunities to occur is discussed further in the context of cumulative effects in **Section 7.0**, as there would not be the proximate-cause linkage to characterize these as indirect effects of the project.

The Evans Elementary neighborhood, located southeast of the I-37/Crosstown Expressway intersection, is considered to be a relatively cohesive community, with 100 percent of the residences in this area identified as single-family homes. The neighborhood is currently bounded by the Crosstown Expressway and I-37 to the west and north, with industrial and commercial uses within a former rail yard site separating this neighborhood from the Crosstown East neighborhood to the south. As stated in **Section 3.5.3.2**, the South Central Area Development Plan identifies the future of this area (Area B) as a "premiere location for mid- to high-rise office development," which would change the aesthetic from the older, single-family homes currently representative of this area. This change, if it were to occur, would not be dependent upon or caused by the relocation of US 181. Therefore, none of the proposed build alternatives would indirectly affect community cohesion within the Evans Elementary neighborhood.

The Crosstown East neighborhood, as discussed in **Section 3.5.3.2**, is identified by the South Central Area Development Plan as Area C, an area which the City envisions as conducive to low- to mid-rise professional office and residential uses, with limited expansion of industrial uses. Similar to the Evans Elementary neighborhood, if the City decided to encourage more business development within the neighborhood, the change could potentially affect community cohesion. This type of change would not be dependent upon or caused by the relocation of US 181, and therefore the proposed build alternatives would not indirectly affect community cohesion with the Crosstown East neighborhood.

Northside Community

Potential changes to community cohesion over time would be most substantial in the Northside community (see **Table 4.6-3**). The Green Alternative represents a relatively minor change for the Northside community, whereas the Red, Orange, and West Alternatives would all result in potential adverse encroachment-alteration effects to varying degrees throughout the Northside community over time.

The Green Alternative would reconstruct the Harbor Bridge slightly west of the existing facility, maintaining the existing barrier created by US 181 between the Northside neighborhoods and downtown. However, as stated in **Section 4.6.3**, the addition of four underpasses at the reconstructed US 181 facility proposed as a part of the Green Alternative would allow for somewhat improved connectivity to and from the downtown area.

While both the Red and Orange Alternatives would remove the existing US 181 barrier between the Washington-Coles neighborhood and downtown, the new facility would be placed between the Hillcrest and Washington-Coles neighborhoods. The Hillcrest neighborhood exhibits a relatively high degree of community cohesion, while Washington-Coles is considered to have a lower degree of cohesion (though the majority of public facilities used by both neighborhoods are located within Washington-Coles). Construction of the proposed facility west of its original location would result in a minor increase in connectivity between the Northside neighborhoods and downtown under the Red, Orange, and West Alternatives, and the existing downtown streets extending across the proposed boulevard could be improved further west by the City to provide improved access between downtown and the Washington-Coles neighborhood. However, connectivity between the Hillcrest and Washington-Coles neighborhoods would also be affected as a result of placing the proposed facility between the two neighborhoods as planned under the Red and Orange Alternatives. Winnebago Street, a primary connecting thoroughfare between the two neighborhoods, would be closed. While connectivity would be restored via an extension of Lake Street, the construction the proposed Red and Orange Alternatives would contribute to separation of these neighborhoods already challenged to maintain community cohesion and interconnectivity with the rest of the city, stemming primarily from the barrier presented by I-37. The indirect effects (occurring later in time) to the Northside community under the Red and Orange Alternatives would include separation and decreased connectivity overall. Similarly, the longer-term effects of the physical separation between the Hillcrest and Washington-Coles neighborhoods under the Red and Orange Alternatives would be expected to adversely affect the cohesion of the Northside community.

The West Alternative would remove the existing barrier between the Northside neighborhoods and downtown and create a new barrier between the Hillcrest neighborhood and nearby refineries. While this would potentially be perceived as a positive separation between these two areas, it would also introduce a new physical encroachment into the Hillcrest neighborhood, which is already bound on two sides (by the Inner Harbor and refineries to the north and I-37 to the south). Neighborhood opinion is mixed regarding whether introduction of the West Alternative at the western edge of the Hillcrest

neighborhood would represent an intrusion into the community or would serve as a beneficial barrier (see **Section 4.6.3.3**). However, this potential intrusion into the Hillcrest neighborhood would not be anticipated to result in long-term changes to community cohesion for the neighborhood over time. As with the Red and Orange Alternatives, an increase in connectivity would result from removing the existing barrier from downtown and replacing it to the west of the Northside community. Adverse impacts to access under the West Alternative, particularly for vulnerable elements of the population, are discussed in **Section 4.7.3.3.** These impacts include removal of the three existing entrance ramps to westbound I-37 and a lack of access to US 181 from the Northside community. This decrease in accessibility into and out of the community would limit immediate access to the two primary hurricane evacuation routes for the area and would be inconsistent with the community values expressed by residents through their responses to the community survey (see **Section 3.5.3.3**).

Westside Community

Indirect impacts within the Westside community under all of the build alternatives would be mostly associated with access changes and would not result in changes to community cohesion (see **Table 4.6-4**). The existing barriers created by the Crosstown Expressway and I-37, each constructed in the 1960s, would remain, and would not represent a substantial change relative to the existing conditions in the community.

The Ben Garza neighborhood includes both commercial and residential land uses, with Ben Garza Park located in between. Under the Green Alternative, one home would be displaced in this neighborhood, while the Red, Orange and West Alternatives would displace two homes. Community cohesion within the Ben Garza neighborhood would not be indirectly affected as a result of any of the build alternatives, and changes in access would be relatively minor.

Changes in the cohesion of the Crosstown West neighborhood would not be anticipated under any of the build alternatives. Residents would not be substantially impacted by access changes, and access to important resources such as CHRISTUS Spohn Memorial Hospital would remain.

Refinery Row Community

The Refinery Row community, including the Academy Heights and Dona Park neighborhoods, are located approximately two and a half miles west of the closest proposed build alternative (the West Alternative), and encroachment-alteration effects are therefore not applicable.

Portland Community

Portland is across Nueces Bay from the proposed improvements, and encroachment-alteration effects are therefore not applicable.

6.6.2 Evaluation of Analysis Results

The conclusions of this indirect effects analysis regarding potential encroachment-alteration effects of the proposed build alternatives are summarized in **Table 6.6-1**.

Table 6.6-1 Summary of Indirect Effects Analysis by Proposed Build Alternative

Types of Effects	Green	Red	Orange	West
Encroachment-Alteration Effects				
Economic Resources	No substantial encroachment-alteration effects			
Employment	No substantial encroachment-alteration effects			
Community Resources (including health)	No substantial encroachment-alteration effects	Substantial barrier and separation effects to Hillcrest and Washington-Coles		Substantial accessibility effects to Hillcrest; placement of transportation facility closer to homes in Hillcrest
Water Resources (including surface water and ground water)	No substantial encroachment-alteration effects			
Vegetation and Wildlife Resources	No substantial encroachment-alteration effects			
Induced Growth and Related Effects				
Induced Growth (including residential, commercial, and industrial development)	No residential, commercial, or industrial development anticipated to be induced by the proposed project			
Effects Related to Induced Growth	No effects related to induced growth			

Source: US 181 Harbor Bridge EIS Team 2013

With the exception of substantial barrier and separation effects and access changes which would affect community cohesion in the Hillcrest and Washington-Coles neighborhoods, the indirect effects of the proposed project are generally consistent with the strategic goals of the City of Corpus Christi, the Corpus Christi MPO, and other planning organizations as discussed in **Section 6.2.1**.

A secondary purpose of Step 6 in the indirect effects analysis is to examine the potential for uncertainty in the assumptions made thus far and whether that uncertainty could lead to substantial changes in the magnitude and extent of the potential indirect effects. Conclusions in the indirect effects analysis depend on the following assumptions:

- Encroachment-alteration effects on the economy rely on assumptions that the majority of businesses displaced by the proposed build alternatives would relocate and eventually resume operations, resulting in temporary impacts to the local economy as well as temporary lapses in employment for workers.

- Local, state, and federal environmental protection regulations would be followed during the construction and maintenance phases, which would serve to mitigate potential encroachment-alteration effects on water, vegetation, and wildlife.
- Shipping activity at the Port of Corpus Christi relies more heavily on current market conditions and supply and demand than on the height of the Harbor Bridge, and that raising the air draft clearance of the bridge would not eliminate other infrastructural limitations on increased Port activity and related future development.
- The at-grade boulevard section proposed downtown under the Red, Orange, and West Alternatives would increase visibility and provide convenient at-grade access to businesses and other attractions; however, the at-grade boulevard section would not provide new access to previously inaccessible parcels of land. Also, in order for necessary capital investments to be made in support of redevelopment, it is assumed that sufficient and sustainable growth in the area economy would first need to occur.

While uncertainty is inherent with regard to the specificity of any of the predictions of the Collaborative Judgment Land Use Panel, the information provided represents their best professional judgment and is based on intimate knowledge of the planning area.

6.7 ASSESSMENT OF CONSEQUENCES AND CONSIDERATION OF MITIGATION

The majority of encroachment-alteration effects that would potentially occur as a result of the proposed build alternatives are considered probable but are found to be insubstantial. Mitigation measures for the potential effects to employment and community cohesion as discussed in **Sections 6.5.1.1** and **6.6.1.2**, respectively, are discussed below.

6.7.1 Mitigation of Effects to Employment

To minimize the potential effects of business displacements on employees, TxDOT would establish a partnership with the non-profit Workforce Solutions of the Coastal Bend, which would provide a range of services for both employers and employees affected by the displacement of businesses as a result of the proposed project. Workforce Solutions of the Coastal Bend would distribute information to potentially affected employees and employers at the Public Hearing for the proposed project and would potentially provide services to these individuals during the right of way acquisition phase of project development. These assistance efforts would be pursued by TxDOT with particular attention to the lower-wage employees likely to be affected. This effort would minimize the potential adverse effects of temporary interruption of jobs and associated household income to vulnerable elements of the population.

Workforce Solutions of the Coastal Bend receives funding from the Texas Workforce Commission, which is the state-government agency charged with overseeing and providing workforce development services to employers and job seekers for the state of Texas. For employers, the Texas Workforce Commission offers recruiting, retention, training and retraining, and outplacement services as well as valuable information on labor law and labor market statistics. For job seekers, the Texas Workforce Commission

offers career development information, job search resources, training programs, and as appropriate, unemployment benefits. See **Section 4.7.5.2** for further information regarding mitigation measures for these potential effects.

6.7.2 Mitigation of Effects to Communities

Potentially substantial encroachment-alteration effects to communities would occur in the Hillcrest and Washington-Coles neighborhoods. Under the Orange Alternative, effects resulting from placement of the facility within the Washington-Coles neighborhood would be expected to substantially change the community cohesion of the neighborhood over time. While the placement of the Red Alternative (Preferred) between the Hillcrest and Washington-Coles neighborhoods would alter the relationship between these neighborhoods and therefore alter the cohesion of the Northside community as a whole, these effects could be substantially offset by the proposed mitigation efforts (including livability enhancements, expansion of travel mode options, and aesthetic improvements) and beneficial economic, safety, and connectivity proposals discussed in **Section 4.7.5**. The adverse impacts to these communities under the Orange Alternative would be more difficult to offset even with the mitigation efforts proposed. The West Alternative also results in substantial adverse impacts to the Northside community due to removal of access to the highway, and these effects, as discussed in **Section 4.7.5**, are similarly difficult to offset through the mitigation efforts proposed. TxDOT would continue to work with the community throughout the development of the proposed project, including further consideration and refinement of the mitigation proposals herein.