EXECUTIVE SUMMARY

This Environmental Assessment (EA) discusses the actual and potential social, economic, and environmental impacts of the improvements to United States Highway (US) 281 proposed by the Texas Department of Transportation (TxDOT) and Federal Highway Administration (FHWA) on US 281. The limits of the proposed improvements extend from Loop 1604 to Borgfeld Road in northern Bexar County, Texas. This EA has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA), the Council on Environmental Quality (CEQ) Regulations for Implementing NEPA (40 CFR 1500), FHWA regulations implementing NEPA (23 Code of Federal Regulations, Part 771), and TxDOT's environmental and public involvement rules (43 Texas Administrative Code – Part 1, Chapter 2).

Although per 23 CFR 771.115, a new controlled access expressway would "normally" require the preparation of an environmental impact statement (EIS), FHWA decided that the environmental process could commence with the preparation of an EA on the proposed US 281 project for the following reasons: the project is anticipated to follow existing alignment; the project maximizes the use of existing facilities; all previous transportation studies have not revealed any potentially significant impacts; the review and concurrence of the project by local, state, and federal resource agencies; and the project has been approved through the federally-required local planning process. Therefore, this EA has been prepared to determine the environmental impacts of this project and determine whether the FHWA's regulations require the preparation of an EIS.

Consistent with the requirements of NEPA and the rules and regulations cited above, this EA documents the proposed project's need and purpose and explores a range of possible alternatives. Through the evaluation process, the ability of each preliminary alternative to satisfy the project purpose and need is assessed. Based on this assessment, the field of preliminary alternatives is then narrowed to a subset of reasonable alternatives from which a recommended preferred alternative is identified. In addition, this EA documents existing social, economic and environmental conditions in the project area while evaluating the direct, indirect and cumulative impacts that would result from implementation of the proposed improvements.

This proposed project is included in the San Antonio-Bexar County Metropolitan Planning Organization (MPO), *Metropolitan Transportation Plan (MTP) Update – Mobility 2030*. An MPO is an agency created by federal law to provide local input for urban transportation planning. The MPO's mission is to provide comprehensive, coordinated and continuous ("3C") transportation planning for the safe and efficient

movement of people and goods consistent with the region's overall economic, social and environmental goals.

The MPO, along with its Technical and Citizens Working Groups, have developed a comprehensive plan for meeting the area's transportation needs for the 25-year planning horizon (2030). Adopted in December 2004, the MTP integrates federal transportation legislation with San Antonio and Bexar County transportation needs and requirements. The MTP analyzes what could happen over a 25-year horizon if current trends continue, and subsequently proposes actions to be implemented in order to relieve congestion, maintain air quality, and improve quality of life.

The MPO continually implements and monitors activities and events that are intended to reduce congestion. Using a process defined in the region's Congestion Management System (CMS), the MPO strives to address congestion issues in a systematic fashion. The CMS is established, developed and implemented as a core part of the metropolitan transportation planning process for all Transportation Management Areas (TMA) in Texas and provides information about transportation system performance, alternative strategies for alleviating congestion, and enhancing the mobility of persons and goods to levels that meet state and local needs. The proposed action was developed in accordance with the MPO's CMS and meets all of the requirements 23 CFR 500.109 Federal Highway Administration, Managing and Monitoring Systems.

NEED AND PURPOSE

Environmental documents prepared under NEPA begin with a discussion of the "need and purpose" of a proposed action, which provides context and criteria for the development and screening of alternatives to the proposed action. This need and purpose statement is essentially the foundation of the NEPA decision-making process.

The need (problems) and purpose (solutions) section presents a statement explaining why the proposed action is being considered and influences the rest of the project development process, including the range of alternatives studied and, ultimately, the selected alternative. The need and purpose serves as an important screening criterion for determining whether alternatives are reasonable. All reasonable alternatives examined in detail must meet the defined project need and purpose.

Proposed Project Need

The US 281 needs to be addressed are compromised safety, decreased mobility and operational efficiency, and there is a need for expedited delivery and early implementation.

In recent years, vehicular traffic utilizing US 281 has increased dramatically. As is typical in such situations, US 281 experienced a rapid increase in congestion and a related decrease in safety and mobility. Within the project limits, there were 600 crashes on US 281 from 1998 to 2001. Total crashes for this time period increased 275 percent and crashes that resulted in injuries increased 270 percent. In addition, crash rates from Loop 1604 north to Stone Oak Parkway are between 1.5 and 2 times higher than the state average from 1999 to 2001 and rates between Stone Oak Parkway and the northern project limit are below the statewide averages, but are exhibiting a steady increase for this time period.

Traffic volumes on US 281, from Loop 1604 north to Stone Oak Parkway, have increased considerably from 8,600 vehicles per day (VPD) in 1980 to 91,000 VPD in 2004 an increase of 958 percent. Traffic volumes from Stone Oak Parkway to Bulverde Road for this time period increased from 7,381 to 68,828 VPD and volumes from Bulverde Road to Borgfeld Road increased from 6,062 to 44,851 VPD during the same period, an increase of 833 percent and 640 percent respectively. The projected 2035 average daily traffic (ADT) volumes for US 281 from Loop 1604 to the Comal County line show an expected increase of 149 percent (from Loop 1604 to Stone Oak Parkway), 80 percent (from Stone Oak Parkway to Bulverde Road), 96 percent (from Bulverde Road to Borgfeld Road), and 110 percent (from Borgfeld Road to the Comal County line). The existing roadway is functionally obsolete since it was not designed to accommodate the high volumes of traffic nor the variety of functions currently being experienced.

The quality of a roadway's operational performance can be conveyed using various measures of effectiveness (MOEs). One can assess the ability of a roadway to perform its intended function through a variety of objective and quantitative MOEs, including speed, delay and vehicle miles of travel. Level of Service (LOS) is also considered to be an MOE, though it is a qualitative indication of the operational characteristics of a traffic stream and the perception of these conditions by motorists and passengers. LOS is an indication of the more intangible attributes of corridor travel, such as freedom to maneuver in the travel stream, traffic interruptions, comfort and convenience. Much like a student's report card, LOS is represented by the letters "A" through "F", with "A" generally representing the most favorable driving conditions and "F" representing the least favorable or most congested. According to the Highway Capacity Manual (HCM) (Transportation Research Board 2000), operations at LOS F are volatile because there are virtually no usable gaps in the traffic stream. Any alteration of the traffic stream such as a vehicle changing lanes, can establish a disruption wave that ripples throughout the upstream traffic flow.

Several locations along the US 281 corridor already operate at LOS F during the peak periods (periods of time during a day when traffic volumes are highest), including Marshall Road, Stone Oak Parkway, Evans Road, and Encino Rio. Projected traffic volumes suggest that unless improvements are implemented, the LOS will continue to worsen and all existing signalized/nonsignalized intersections will operate at a LOS F. Signal timing optimization will not alleviate the congestion and operational inefficiencies along US 281 that are a result of excessive traffic volumes as compared to the limited capacity available.

While the proposed improvements to US 281 are listed in the *Metropolitan Transportation Plan (MTP) Update, Mobility 2030*, implementation of those improvements using funds from traditional sources is not a realistic expectation given the insufficient levels of funds. Demographic projections from the San Antonio-Bexar County Metropolitan Planning Organization (MPO) show that to just maintain the current congestion levels in the region, $8.4 billion more are needed in capacity improvements than can be funded through tax dollars.

Currently, there is very limited tax dollars allocated to the US 281 project through the MPO, well short of the current total cost estimate for the proposed project. The transportation plan adopted by the San Antonio-Bexar County MPO includes improvements to US 281 between Loop 1604 and the Bexar/Comal County Line. The plan is fiscally constrained and identifies the US 281 improvements as a toll project. According to the MPO plan, by leveraging available tax dollars with toll revenues, it is estimated that delivery of the project would be expedited by more than 20 years when compared to delivery through traditional non-tolled means.

Proposed Project Purpose

The purpose of the proposed project is to (1) improve safety within the US 281 corridor, (2) enhance mobility and operational efficiency, and to (3) deliver and implement these benefits in an expeditious manner.

To alleviate the deficiencies or "needs" outline above, several project improvements are proposed to help address each element of the identified Need and Purpose. Cumulatively, the intent is to accommodate the US 281 corridor current and future traffic needs. Safety improvements could include replacement and construction of shoulders to current prescribed Highway Design standards; implementation of grade separations to separate cross-traffic from through traffic; separation of conflict of access points between local traffic and through traffic through a controlled-access facility which would eliminate direct driveway access to the US 281 main lanes; and the reduction of speed differential rate by separating local trips from through trips.

Mobility and operational efficiency improvements could include improved roadway capacity; implementation of an expressway system that would utilize parallel non-toll lanes to improve access for local traffic and reduce conflict points; and implementation of other operational improvements on US 281.

Finally, by including tolls as an element of the overall financing approach for the US 281 proposed project, critically needed improvements could be constructed in an expeditious manner in order to better serve the needs of the surrounding communities, the traveling public, and the citizens of Texas. While the project is listed in the *Metropolitan Transportation Plan Update, Mobility 2030*, funding from traditional sources (motor fuel taxes) is not sufficient to construct the proposed project. Improvements to US 281 are needed with safety and capacity as the critical issues.

DESIGN FEATURES

Description of the Existing Facility

Within the project limits, US 281 is as a four-lane divided and partial access-controlled roadway. There is a center median designed to separate traffic moving in opposite directions. Signalized intersections are located at Encino Rio Road, Evans Road, Stone Oak Parkway, Bulverde Road and Borgfeld Road. Connecting streets and driveways from abutting properties have direct access to the US 281 travel lanes. Access is generally managed (partially controlled) by way of driveway permits, controlled intersections and median openings. The existing right-of-way (ROW) varies from 400 feet, between Loop 1604 and Stone Oak Parkway, to 200 feet north of Stone Oak Parkway.

Description of Proposed Facility

The improvements ultimately contemplated in this EA would consist of upgrading US 281 to an expressway facility within the project limits (Loop 1604 to Borgfeld Road) – a total distance of 7.5 miles. The three through travel lanes (express lanes) in each direction would be full access-controlled (no streets or driveways would access the through lanes directly) and tolled. "Grade separations" would be constructed at Redland Road, Evans Road, Stone Oak Parkway, Marshall Road, Wilderness Oaks, Bulverde Road, and Borgfeld Road to allow the express lanes to pass uninterrupted either over or under cross streets; thus, the tolled express lanes would not intersect directly with these local streets. The tolled express lanes would be situated between partial access-controlled outer lanes. The outer lanes would not be tolled and would cross local streets "at grade" via signalized intersections. The non-tolled outer lanes would be continuous for the length of the proposed project and serve local traffic by providing direct access to businesses,

neighborhoods and connecting streets. The proposed ROW would typically be 400 feet (widening to 500 feet at interchanges). The estimated cost of the proposed project is $340,000,000. This cost includes preliminary engineering, ROW and utility adjustments, and construction.

ALTERNATIVES

Several roadway design concept alternatives were suggested through public and stakeholder meetings which were conducted in conjunction with the project development process. Initially, ten preliminary alternatives were considered. These roadway design concept alternatives represent a range of options for the expansion of the facility from its current configuration. In addition to the preliminary design concept alternatives, a transportation system management alternative, a transportation demand management alternative and modal alternatives were identified as preliminary alternatives and evaluated as to ability to satisfy the project's need and purpose.

Two of the preliminary alternatives, the No Build Alternative and the Construct Full Access-Controlled Expressway Alternative, were determined to be reasonable and carried forward for further study. Two options were then developed and considered for the possible implementation of the Full Access-Controlled Expressway Alternative; thus, a total of three reasonable alternatives were considered (No Build and two Build Alternatives). The three reasonable alternatives are described below.

The **No Build Alternative** involves the construction of other projects currently planned and programmed in the San Antonio-Bexar County *Metropolitan Transportation Plan Update - Mobility 2030*. The No Build Alternative would offer no additional capacity or mobility improvements to US 281.

Build Alternative 1 would involve the construction of an expressway facility with tolled and access-controlled through travel lanes (three tolled express lanes in each direction). Grade separations would be constructed at Redland Road, Evans Road, Stone Oak Parkway, Marshall Road, Wilderness Oaks, Bulverde Road, and Borgfeld Road to allow the express lanes to pass uninterrupted either over or under cross streets. The tolled express lanes would be situated between partial access-controlled outer lanes. The outer lanes would not be tolled and would cross local streets at grade via signalized intersections. Build Alternative 1 would acquire the required additional ROW primarily on the west side of the existing US 281 ROW.

Build Alternative 2 would involve implementing the tolled controlled access expressway improvements, as described for Build Alternative 1, while acquiring the required additional ROW primarily from the east side of the existing US 281 ROW.

Preferred Alternative

Build Alternative 1 was selected as the preferred alternative based on the analysis of direct, indirect and cumulative effects of the proposed action and after considering public and agency comments on the proposed project and project alternatives. In addition to environmental and public involvement considerations, engineering and constructability factors were considered during the selection process.

Although the No Build Alternative does not satisfy the need and purpose for the proposed improvements and it is not consistent with the regional transportation plan, FHWA, TxDOT and Commission on Environmental Quality (CEQ) guidelines for the preparation of environmental documents require that the No Build Alternative be carried forward as the basis of comparison for all reasonable alternatives.

The No Build Alternative involves the construction of other projects currently planned and programmed in the San Antonio-Bexar County *Metropolitan Transportation Plan Update, Mobility 2030*. The No Build Alternative would offer no additional capacity or mobility improvements to US 281. Continuing traffic demands on the existing roadway have resulted in tremendous congestion in portions of the project area and unacceptable levels of service have degraded accessibility for the local residents and traveling public. Additionally, the No Build Alternative does not support the needs and desires of the local municipalities, regional transportation planning authorities, and regional governmental officials in addressing the area's congestion concerns.

Build Alternative 1 exhibits fewer impacts over Build Alternative 2. Build Alternative 2 would require additional ROW over Build Alternative 1 (100 acres versus 82 acres). Construction and business relocations would total 19 for Build Alternative 1 while Build Alternative 2 would require 24 displacements. In addition, Build Alternative 2 would directly impact the creek running along US 281 at the Borgfeld Road interchange for approximately three-quarters of a mile. Build Alternative 1 would have less than significant impacts to the resource areas as studied and analyzed. The Build Alternatives would make use of existing regulatory pollution prevention requirements and best management practices (BMPs) and would likely enhance the current highway facility's future ability to handle storm water runoff or possible accidental spills.

ENVIRONMENTAL EFFECTS

There are three types of effects that may be caused by a roadway project: direct, indirect, and cumulative.

Direct Effects

Direct effects are defined by the CEQ regulations that state "direct effects are caused by the action and occur at the same time and place". An example of a direct effect would be the action of acquisition of ROW that would result in displacement of local businesses (direct effect).

The proposed US 281 project limits are located in northern Bexar County and extend from Loop 1604 to Borgfeld Road. Analysis of the following resources indicated no substantial direct effect(s) for the proposed project from socioeconomics, noise, air quality, prime agricultural land, cultural resources, hazardous materials, visual aesthetics or construction. Land use, surface water(s), groundwater and vegetation had minor direct impacts that were not considered substantial, but were associated with resources that were important to the study area. Direct effects for the reasonable alternatives are categorized below:

- Land use: The No Build Alternative would have no direct effects. Build Alternative 1 would require 82 acres of additional ROW and Build Alternative 2 would require 100 acres of additional ROW.
- Socioeconomic: No immediate changes in socioeconomic issues and concerns would result as a result of the No Build Alternative. Under the Build Alternatives, the first round of economic analysis and the subsequent economic multiplier effect would include all those jobs that are created either directly by the firms actually constructing the project or by the firms that provide direct inputs to the construction project. Based on the estimated construction cost, first round employment would be approximately 5,620 person-years, resulting in approximately $162.6 million of first round employment income. Access would be maintained. Community cohesion would be maintained. There would be no disproportionate high or adverse effects to minority or low-income populations. There would be relocations or displacements affecting 19 businesses and one residence.
- Noise: Under the No Build Alternative, noise levels would be expected to increase with an associated increase in traffic volumes. Under the Build Alternatives, there would be noise related impacts both during the construction phase and after project completion. Build Alternative 1 would directly impact four receivers. Build Alternative 2 would impact two receivers. Noise abatement measures would be used where appropriate.
- Air quality: Under the No Build Alternative, air quality could diminish as a result of unchecked congestion levels. Under the Build Alternatives, local concentrations of carbon monoxide (CO) are not expected to exceed the (National Ambient Air Quality Standards (NAAQS) at any time. The projected CO

concentrations would not exceed the NAAQS maximum concentration of 35 parts per million (ppm) for 1-hour concentrations and 9 ppm for 8-hour concentrations. Emissions of total mobile source air toxics (MSATs) are predicted to decrease under both the Build and No Build Alternatives.

- Prime agricultural land: No prime agricultural land exists in the proposed project area. No direct effects would occur under the Build and No Build Alternatives.
- Groundwater: Under the No Build Alternative, there are no immediate changes in the potential for current conditions to effect groundwater resources. The Build Alternatives would have minor direct effects on the quantity or quality of groundwater. Adherence to Texas Commission on Environmental Quality (TCEQ's) Edwards Aquifer Rules, Water Pollution Abatement Plan (WPAP) and storm water guidelines will minimize and mitigate adverse impacts.
- Surface Waters: No direct effects would occur under the No Build Alternative. There would be minimal impacts to jurisdictional surface waters (streams) and wetlands under the Build Alternatives. These resources are not prevalent in the proposed project area. All crossings appear to qualify for a U.S. Army Corps of Engineers (USACE) Nationwide permit. Nationwide permits have been reviewed and determined to be of minimal individual and cumulative effect. Impacts are minimized by adherence to TCEQ storm water guidelines.
- Vegetation: No direct effects would occur under the No Build Alternative. There would be approximately 50 acres of vegetation impacted as a result of construction under the Build Alternatives.
- Threatened and endangered species: There would be no direct effect to endangered species under the Build and No Build Alternatives. For the golden-cheeked warbler, no suitable habitat occurs within, or immediately adjacent to, the ROW. In addition, no golden-cheeked warblers were detected in or within 300 feet of the proposed ROW during all of the presence/absence surveys performed along US 281. All of the features that were identified as having potential to contain karst invertebrate habitat have been evaluated and were ruled out as potential habitat.
- Cultural resources: There are no known direct effects affecting archeological sites or historic structures under the Build and No Build Alternatives. No parklands would be affected by the proposed project under the No Build and Build Alternative 1; however, one parkland would be affected by Build Alternative 2.
- Hazardous Materials: No direct effects would occur under the No Build Alternative. There are two previously contaminated hazardous material sites within or adjacent to the proposed project area and may contain residual soil contamination (one in each Build Alternative). Further assessment of these sites would be required prior to the construction phase of the project.

- Visual and aesthetic: No direct effects would occur under the No Build Alternative. There would be impacts to the visual setting within the project area under the Build Alternatives. Highway design would embellish architectural themes and lighting to mitigate visual impacts.
- Construction phase impacts: No direct effects would occur under the No Build Alternative. Potential direct effects from construction would be identical for both Build Alternatives and they would include detours, re-routing, and road-intersection closures; storm runoff and water quality issues; fugitive dust and increased noise levels; vegetation and soil impacts; migratory nesting species and potential threatened and endangered species; and pedestrian and vehicular safety issues.

Indirect Effects

Indirect effects are defined as effects that are "caused by an action and occur later in time or farther removed in distance, but are still reasonably foreseeable" according to the CEQ (40 CFR 1508.8) and 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 ecosystem". Indirect effects can be linked to direct effects in a causal chain. The chain can be extended as indirect effects produce further consequences.

For indirect effects analysis, the southern, eastern, and western geographic boundary was defined by the "corridor influence area" as delineated in the "Draft US 281 Tolling Traffic Analysis Plan". The "corridor influence area" hereafter referred to as the "Area of Effect" for the purposes of this analysis, was based upon Traffic Analysis Zones (TAZs) within a two to five mile radius of the project corridor consistent with the estimate provided by the National Cooperative Highway Research Program (NCHRP). This reference states that "development effects are most often found up to one mile around a freeway interchange, up to two to five miles along major feeder roadways to the interchange. The northern geographic boundary takes into account FM 1863 as a traffic generator within the Area of Effect. The Area of Effect is comprised of 61,844.92 acres or 96.63 square miles within Bexar County, Comal County, the Cities of San Antonio, Hill Country Village, and Hollywood Park.

The project team gathered reasonable and potential scenarios of future land use and associated demographics. The No Build Scenario is defined as existing and planned development within the project Area of Effect (without improvements to US 281) and the Build Scenario is defined as existing and planned development within the project Area of Effect inclusive of improvements to US 281. Indirect effects are summarized below:

- Land use: 62.70 percent of the total land in the Area of Effect is developed, and 17.63 percent of the land has a subdivision proposed. Therefore, 80.33 percent of the Area of Effect is already developed or planned for development, leaving only 19.67 percent or 12,168.18 acres available for development.
- Socioeconomic: Community cohesion would not be affected under the Build or No Build Scenarios. Economic conditions would benefit from continued development, likely increasing the demand for consumer services under the Build Scenario. However, traffic and local community populations could increase within the Area of Effect to a point where access and safety would further deteriorate under the No Build Scenario; thus, negatively impacting economic conditions. No indirect effects to environmental justice areas under either the Build or No Build Scenarios as there are no identified environmental justice areas present within the Area of Effect and travel is nominal between identified low-income/minority population areas and the project Area of Effect.
- Noise: Under the No Build Scenario, local noise levels would likely increase as the area is developed and congestion goes unchecked. Because 80.33 percent of land is already developed or planned for development regardless of the US 281 proposed project within the Area of Effect, additional noise levels resulting from potential development in the remaining 19.67 percent of land under the Build Scenario is not expected to be substantial.
- Air quality: No change in attainment status is anticipated from the No Build or Build Scenarios.
- Prime Agricultural Land: No indirect effects would occur as a result of the Build or No Build Scenarios.
- Karst: There are no anticipated indirect effects to these features in the Area of Effect under either the Build or No Build Scenarios.
- Groundwater: The Build and No Build Scenario would have minor direct effects on the quantity or quality of groundwater. Adherence to TCEQ's Edwards Aquifer Rules, WPAP and storm water guidelines will minimize and mitigate adverse impacts.
- Surface Waters: There would be minimal impacts to jurisdictional surface waters (streams) and wetlands under both the Build and No Build Scenarios. These resources are not prevalent in the proposed project area. All crossings appear to qualify for a USACE Nationwide permit. Impacts are minimized by adherence to TCEQ stormwater guidelines.
- Vegetation and Wildlife: The No Build Scenario would impact an additional 10,906.94 acres of land totaling 49, 676.74 acres of land that is developed and planned for development. The Build Scenario would impact an additional 12,168.18 acres of land.

- Threatened and Endangered Species: No indirect effects to threatened or endangered species are anticipated under the Build Scenarios. Although, the golden-cheeked warbler has been observed within the US 281 Area of Effect, the closest current observation of the golden-cheeked warbler was approximately 2 miles away from the proposed project area. Suitable vegetation/habitat for golden-cheeked warblers is not considered to be present, in or adjacent to, the proposed project area as determined by recent habitat assessments conducted by TxDOT and independent contactors. Additionally, no golden-cheeked warblers have been detected during presence/absence surveys in the proposed project area. Due to the lack of connected habitat or discernable presence, no indirect effects to the golden-cheeked warbler are anticipated. Under the Build Scenario, 49,676.74 acres of land is developed and planned for development. Critical Habitat Units (CHUs) for karst invertebrate species located within these areas could be negatively impacted where federal funds would not trigger compliance under the Endangered Species Act (such as with private residential and commercial development).
- Cultural resources: Adverse effects to archeological sites could result under both the Build and No Build Scenarios; however, it cannot be determined whether this development would result in substantial effects to these sites because the quantity, location, and integrity of individual resources are unknown. No known National Register of Historic Places (NRHP) sites are located within the project Area of Effect. No indirect effects to parklands are anticipated.
- Hazardous Materials: Site assessments for newly discovered contaminated areas are a standard business practice in commercial and residential development. Discovered sites would be handled according to the TCEQ and Environmental Protection Agency (EPA) regulations. No indirect effects are known for hazardous material sites in either the Build or No Build Scenarios.
- Visual and aesthetic: A properly designed lighting system would minimize negative light pollution aspects and increase the social and economic benefits to the public under the Build Scenario. The No Build Scenario would offer no congestion relief and the associated increase in population growth and development may negatively impact the visual and aesthetic qualities within the Area of Effect.
- Construction phase effects: There would be no construction phase indirect effects under the No Build Scenario. There are no indirect effects anticipated from the construction of the proposed project under the Build Scenario. Construction impacts are generally temporary in nature and are regulated to insure environmentally sound construction practices.

Cumulative Effects

Cumulative impacts are the incremental impacts that the project's direct or indirect effects have on a resource in the context of the myriad of other past, present, and future effects on that resource from unrelated activities (CEQ 40 CFR § 1508.7). This analysis of cumulative impacts relies heavily on both existing land use impacts and the anticipated land use changes anticipated to occur in the project area and the effects these changes would have on the resources considered in this analysis. In order to have a cumulative impact on the resource, the proposed action must have either a direct or indirect impact on that resource. All of the resource categories considered in this EA were candidates for analysis with regard to cumulative impacts. For this project, the following resources were determined to be substantially impacted by the project. It should be noted that the project itself has relatively minor direct impact on the following resources.

- Land use: The proposed action, combined with reasonably foreseeable actions within the land use resource study area (RSA) would result in the conversion of approximately 142.0 square miles of land to developed uses. The proposed action would be responsible for 0.1 percent of this total.
- Surface water: All crossings of jurisdictional waters would likely qualify for a USACE Nationwide permit and have categorically been determined to be of minimal cumulative impacts. Adherence to TCEQ Edwards Aquifer Rules and stormwater controls would minimize and mitigate these effects. Non-compliance by unrelated activities would likely occur, but it is impossible to quantify. The fact that these regulations are implemented in some form or another on a Federal, State and local basis increases the likelihood of compliance.
- Ground Water: The proposed project's contribution would be minimal. The project would contribute minimally to cumulative impacts. (70 acres of impervious cover in a 400,000 acre aquifer recharge area giving 0.000175 percent of impervious cover). Water demand may exceed the capacity of the aquifers. The proposed project would not add cumulatively to the increased water use from the aquifer. Alternative sources of water or increased regulatory constraints may be necessary and shortages are predicted, but these impacts are growth-related and would likely occur with or without the project.
- Vegetation: The combination of the proposed action and anticipated development could result in the conversion of approximately 90,858 acres within the land use RSA; however, the proposed action would be responsible for only 0.06 percent of this total.

Impacts of Special Concern

Based upon the information gathered through environmental study, the location of the project within the recharge and contributing zones of the Edwards and Trinity Aquifers,

and community concerns expressed through the public involvement process, the following potential effects were identified as warranting special attention and focus in this EA:

- Potential impact of the project on Edwards and Trinity Aquifer groundwater quantity and quality
- Preservation of air quality
- Potential impacts on threatened and endangered species
- Indirect and cumulative project effects on land use due to current and forecasted pace of development in the area.

Edwards and Trinity Aquifer Groundwater Quantity and Quality

As discussed in detail in this EA, the Build Alternatives for this proposed project would have the potential for only minor effects on the quality and quantity of the Edwards and Trinity Aquifer groundwater due to numerous factors. One of the reasons is that none of the karst features that have been evaluated and characterized to date, facilitate any substantial amounts of recharge under existing conditions and therefore would not change overall aquifer conditions. In addition, overall volumes of recharge potential are spread over an area that extends far beyond the project corridor, implying that quantity of recharge is not an issue of major concern regarding the proposed roadway. In other words, only a minor volume (and percentage) of potential recharging water would potentially be "lost" due to changes in ground-surface cover.

Finally, the proposed project would not include the point-source types of land use activities such as chemical storage facilities and landfills, that pose a much higher risk to water quality. These minor effects would be mitigated by protective measures that would be implemented during the construction phase of the project and for the life of the project after construction, as required by the regulatory agencies and programs created specifically for protection of the Edwards Aquifer and other regulatory programs for control of discharge of pollutants described in this EA.

Air Quality

CO concentrations for the Build Alternatives of the proposed project were modeled using the worst case scenario and the receptor at the ROW line in accordance with the TxDOT Air Quality Guidelines. The projected year 2015 and 2035 AM and PM peak hour traffic on the northbound and southbound parallel arterials as well as the northbound and southbound through lanes were used at locations representing typical conditions within each segment of the proposed project. Local concentrations of CO are not expected to exceed the NAAQS at any time. The projected CO concentrations would not exceed the NAAQS maximum concentration of 35 ppm for 1-hour concentrations and 9 ppm for 8-

hour concentrations. Further, the proposed project is actually expected to reduce the likelihood of traffic congestion. In addition, continued reduction in air emissions from vehicles on the part of vehicle manufacturers should result in reductions of CO emissions.

Potential for Increased Emission of Mobil Source Air Toxics (MSATs)

Emission impacts for the six priority MSATs from the Build Alternatives were analyzed based on future volumes of traffic projected using a traffic model that includes all roadway links in the project area. The analysis used MOBILE6.2 inputs appropriate to the San Antonio Metropolitan Area, Bexar County specifically. These inputs are consistent with those used for other modeling purposes (e.g., State Implementation Plan, emissions inventories, conformity analysis). Modeling parameters and more detailed information can be found in the US 281 Air Toxics Analysis Technical Report. This analysis indicates that a substantial decrease in MSAT emissions can be expected, even if the proposed project is implemented. The reasons for this predicted decrease is two-fold; a change in vehicle fuels, both gasoline and diesel; and a change in emission standards for light-duty and heavy-duty on-highway motor vehicles.

National emission reduction initiatives, such as the introduction of re-formulated gasoline and improvements to diesel fuels (e.g., reductions in sulfur levels) have actually led to an anticipated reduction of MSATs, especially diesel particulate matter and benzene. EPA predicts substantial air emission reductions as new light-duty and heavy-duty on-highway fuel and vehicle standards come into effect. Thus, projected air emission reductions would be realized in the project area even with an increase in Vehicle Miles Traveled (VMT) that may be associated with roadway improvements and expansions, such as the proposed project.

Potential Impacts on Threatened and Endangered Species

All potential karst features, including depressions, holes, and animal burrows, were carefully examined. Surveys included visual inspections of adjacent property and hand excavations of 21 karst features to more accurately determine their origin. To date, no listed karst invertebrates have been found in the project area. No direct or indirect impacts on threatened or endangered species are anticipated. If additional karst features or any listed karst invertebrates are encountered during project implementation, work would cease in that location and TxDOT environmental personnel would be contacted.

Numerous studies were also conducted to evaluate habitat for the golden-cheeked warbler. Field surveys indicate that most of the wooded areas adjacent to the project corridor have been cleared by land owners. In addition, no GCWs were found within 300 feet of the proposed ROW during all the presence/absence surveys performed along US 281. Informal consultations with the USFWS were conducted on 9 March 2006 and 25

August 2006 and will continue to occur throughout the project development process. The proposed US 281 project would not effect listed threatened or endangered species.

Informal consultations intend to keep all interested parties involved and informed in the evaluation and data gathering process associated with a particular species of concern related to the proposed project. Informal consultations would continue as new information and data analysis reporting becomes available for the project area. TxDOT proactively ensures that all appropriate agencies are informed of any project related information or events that would have bearing on a concerned species and its associated habitat. If at any point TxDOT and/or the FHWA determines that an action may have an adverse affect on the species, formal consultation would be initiated through the submittal of a biologic assessment to the U.S. Fish and Wildlife Service (USFWS).

Indirect and Cumulative Effects on Land Use

Improvements to US 281 are not anticipated to result in significant indirect or cumulative impacts on land use within the project study area, as the amount of undeveloped land is rapidly diminishing. Assuming that reasonably foreseeable development projects are constructed, approximately 69 percent of the land use RSA would be developed. The proposed improvements to US 281, as well as planned improvements to other links in the transportation network, will complement the land use and transportation changes in the area, but cannot be considered the primary reason for the changes to occur. The area has been rapidly developing without improvements to these roadways and is anticipated to continue regardless of the proposed construction activities.

Impacts associated with land use changes can be mitigated through development controls implemented at the local level by area cities and counties. The area municipalities have the authority to implement zoning regulations within their city limits. Through zoning, municipalities are able to control development types and densities to ensure compatibility with surrounding uses and the environment. To a lesser extent, counties also have control over development through subdivision regulations. Conservation easements are another tool that could be used in the study area to control the subdivision of property and the increase in the density of development.

AGENCY COORDINATION AND PUBLIC INVOLVEMENT

Agency coordination for current efforts on the US 281 project began with the distribution of an initial project letter on February 1, 2006 that identified the project location, potential constraints, and preliminary project schedule. The letter further solicited agency comments and served as an invitation to a project scoping meeting. The agency scoping meeting was held on February 13, 2006 for the purpose of informing attendees about the project and to gather comment and input regarding the US 281 proposed project

and potential issues that should be considered during the development of the environmental assessment.

Public involvement has been an important, integral part of the project development process and is essential to help guide proposed projects toward improvement strategies that best meet the area's needs. More than 600 people participated in two public meetings held on March 29 and 30, 2006. Further, 45 stakeholder meetings were conducted in the spring 2006 to gather comment from identified businesses, elected and community officials, community organizations, and neighborhood associations.

The purpose of the public meetings was to inform the public about current activities on the proposed US 281 project, to provide information on the environmental documentation process, to allow interested citizens the opportunity to present information or comment on the proposed project, and to develop a record of public views and participation.

A public hearing will be held prior to final action on the environmental document.

CONCLUSION

An EA is prepared when the significance of the environmental impact of a proposed project is not clearly established. To determine significance, the severity of the impact was examined in terms of type, quality and sensitivity of the resource involved; the location of the proposed project; the duration of the effect (short-long-term) and other considerations of context. If a significant impact is determined for the proposed project, the preparation of an Environmental Impact Statement (EIS) would be recommended.

This EA analyzed and evaluated the proposed project's social, economic and environmental direct, indirect, and cumulative impacts and identified potential impacts of special concern: a) the Edwards and Trinity Aquifers groundwater quantity and quality, b) preservation of air quality, c) protection of endangered species, and d) indirect and cumulative project effects on land use due to the current and forecasted pace of development in the area.

The EA indicated that the proposed project would have no significant impacts on the quality of the human or natural environment. Further, the project is anticipated to follow existing alignment; the project maximizes the use of existing facilities; all previous and current transportation studies have not revealed any potentially significant impacts; the review and concurrence of the project by local, state, and federal resource agencies; and the project has been approved through the federally-required local planning process.

As the assessment of social, economic, and environmental effects conducted herein indicates that the proposed project would have not significant impacts on the quality of the human or natural environment, TxDOT recommends a Finding of No Significant Impact (FONSI) for this project.

The TxDOT recommendation of a FONSI is based on consideration of all alternatives described and evaluated in this EA.

Based on the analysis of potential impacts, as documented in this EA, Build Alternative 1 is identified as the preferred alternative. Under this alternative, additional ROW would generally be acquired to the west of the existing ROW. It would best fulfill the need and purpose for the proposed project and meet the goals identified for the proposed US 281 project corridor. Final selection of the preferred alternative will be made when comments on impacts and the environmental document and from the public hearing have been fully evaluated.