

## 8.0 Transportation Planning and the Environment

The SLRTP includes discussion of potential environmental mitigation activities and potential areas to carry out these activities, but content focuses on policies, programs, and strategies by mode (23 CFR 450.214(j)), rather than the more extensive mitigation activities carried out and documented at the project level. Information regarding project level mitigation for highways can be obtained on TxDOT's website or by contacting the Environmental Affairs (ENV) Division.

Engaging in the necessary environmental planning and public involvement processes according to the National Environmental Policy Act of 1969 (NEPA), allows TxDOT to meet the increasing environmental requirements and concerns, plan for sustainability, and develop projects that avoid and minimize environmental impacts to the greatest extent practicable and as needed implement cost effective mitigation.

While NEPA requires the evaluation of natural, human and cultural resources, there are several areas that were considered in the development of the SLRTP and which will potentially impact planning and decision making for future transportation plans and projects. These include air quality, consideration of low income and minority populations and longer term potential climate changes.

### 8.1 Air Quality

The Clean Air Act Amendments (CAAA) created nonattainment areas for criteria pollutants and established mechanisms for these areas to achieve compliance with the National Ambient Air Quality Standards (NAAQS). State and local air pollution agencies are responsible for carrying out the CAAA. They are able to develop solutions for pollution problems that require special understanding of local industries, geography, housing, and travel patterns, as well as other factors.

Nonattainment areas are areas that have failed to meet federal standards for ambient air quality. The nonattainment areas in Texas are described in Table 8-1, and a map of the nonattainment and near nonattainment areas in Texas is provided on Figure 8-1. Near nonattainment areas currently meet federal standards but are at risk of violating standards.

Texas meets federal air quality standards with the following exceptions:

- ★ Particulate matter in El Paso; and



- ★ 8-hour ground-level ozone (O<sub>3</sub>) in Houston-Galveston-Brazoria and Dallas-Fort Worth.

Maintenance areas are areas that were once designated as nonattainment, but which have since been redesignated in attainment of those standards. Areas operating under maintenance SIP remain subject to transportation conformity.

**Table 8-1: Nonattainment and Maintenance Areas in Texas**

Nonattainment Area	Counties	Classification	Attainment Date Required by EPA
<b>1997 8-Hour Ozone Nonattainment and Maintenance Areas</b>			
Houston-Galveston-Brazoria (HGB)	Brazoria Chambers Fort Bend Galveston Harris Liberty Montgomery Waller	Severe	June 15, 2019
Dallas-Fort Worth (DFW)	Collin Dallas Denton Tarrant Ellis Johnson Kaufman Parker Rockwall	Moderate ★	June 15, 2010
Beaumont-Port Arthur (BPA)	Hardin Jefferson Orange	Maintenance	N/A
<b>Ozone Early Action Compact (EAC) Areas</b>			
Austin-San Marcos (AUS)	Travis Williamson Bastrop Hays Caldwell	Attainment	December 31, 2007
San Antonio (SA)	Bexar Comal Guadalupe Wilson	Attainment	December 31, 2007
Northeast Texas (NET)	Rusk Smith Upshur	Attainment	December 31, 2007



**Table 8-1: Nonattainment and Maintenance Areas in Texas**

Nonattainment Area	Counties	Classification	Attainment Date Required by EPA
	Gregg Harrison		
<b>CO Nonattainment and Maintenance Areas</b>			
El Paso (ELP)	El Paso	Maintenance	N/A
<b>PM<sub>10</sub> Nonattainment Areas</b>			
El Paso (ELP)	El Paso	Moderate	December 31, 1994

Source: TCEQ

★On 8/15/2010 EPA proposed to reclassify DFW to “serious” for failing to attain the standard by 6/15/2010. This proposal is anticipated to be finalized in December 2010. The pending attainment date is 6/15/2013.

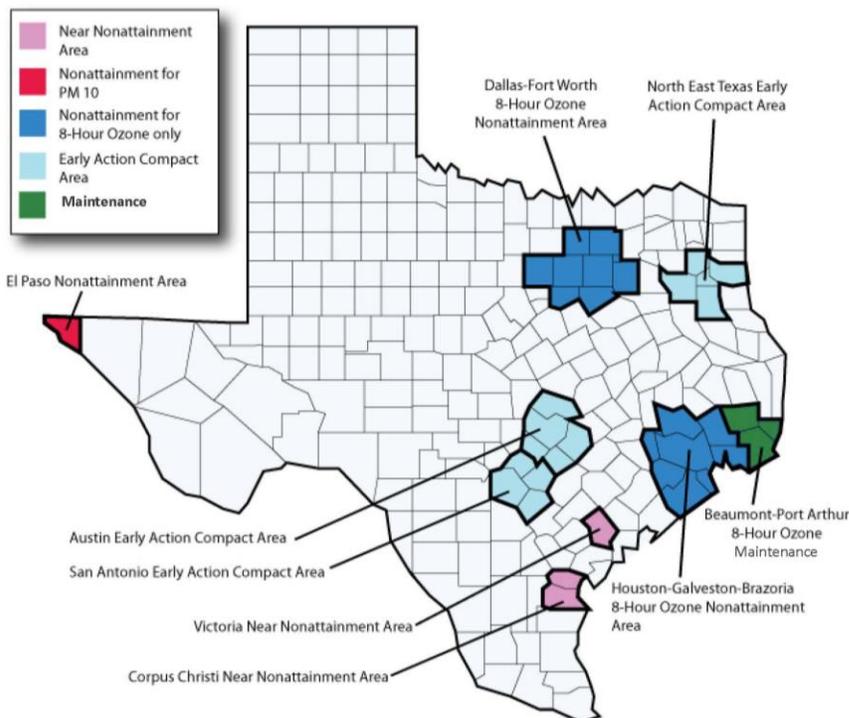
Texas also has three Early Action Compact (EAC) Areas: Austin, San Antonio, and Northeast Texas. These are areas that have submitted ozone EAC plans, which were used to develop SIP strategies to reduce emissions and adopted into the SIP on November 17, 2004.<sup>193</sup>

On October 13, 2010 Governor Perry recommended a small portion of Collin County to be designated nonattainment for the 2008 Lead NAAQS. Transportation conformity does not apply to the Lead NAAQS.

<sup>193</sup>TCEQ, <http://www.tceq.state.tx.us/implementation/air/sip/texas-sip>



**Figure 8-1: Map of Texas’ Nonattainment and Near-nonattainment Counties**



### 8.1.1 New Federal Standard for Ozone

In January of 2010, the EPA proposed lowering the primary ozone standard and creating a separate secondary standard based on cumulative seasonal average ozone concentrations. The proposed 8-hour ozone standard, which decreases from >75 parts per billion (ppb) to <70 ppb (approximately 60 to 70 ppb), may be finalized by EPA in late 2010. Metropolitan and urban areas that are already officially nonattainment for this pollutant include Dallas-Fort Worth and Houston-Galveston. Based on information from TCEQ shown in



Table 8-2, additional urban areas that may exceed the standard, based on monitoring, include Austin, Corpus Christi, Victoria-Goliad, and Waco-Temple.

An area is in nonattainment of the 8-hour ozone standard if the design value (3-year average of the annual fourth highest 8-hour ozone monitor reading at any single monitor) is at or above the level of the standard.



**Table 8-2: 2010 Exceedance of Potential 70 ppb 8-hour Average Ozone Standard**

Region	March	April	May	June	July
Dallas-Fort Worth			X	X	
Tyler-Longview			X	X	
El Paso				X	
Waco		X	X		
Beaumont-Port Arthur	X		X		X
Austin				X	
Houston-Galveston-Brazoria	X	X	X	X	X
San Antonio				X	
Corpus Christi-Victoria				X	
Lower Rio Grande Valley					
Laredo					

Source: TCEQ; based on 2008-2010 design value using monitored data through July 8, 2010

### 8.1.2 State Implementation Plan (SIPs)

States must develop SIPs that outline how it will control air pollution under the CAAA. A SIP consists of regulations, programs, and policies that a state will implement and enforce to clean up polluted areas.<sup>194</sup>

The state agency responsible for the development of the SIP in Texas is the Texas Commission on Environmental Quality (TCEQ). The SIP is developed as a cooperative effort between state and local transportation agencies, and must be vetted by TCEQ through a public involvement process that provides industries and the public with an opportunity to provide input and have that input considered during the planning process. The Texas SIP outlines the control strategies and measures to be implemented to reduce emissions from stationary, area, and mobile sources, and demonstrate

<sup>194</sup>EPA. A Plain English Guide to the Clean Air Act. April 2007.



attainment and maintenance of air quality standards statewide, but particularly in the nonattainment areas.

Nonattainment area boundaries are set by the State and the EPA, and define the geographic area subject to SIP controls and conformity. Commuting and travel patterns are important elements in setting the boundaries, and transportation agencies, such as TxDOT and MPOs, are the best sources for this information.

TxDOT and nonattainment MPOs are involved with decisions made in the air quality planning process and during SIP development because this process directly affects state and local transportation plans and projects. TCEQ, in coordination with TxDOT and the MPOs, develops a motor vehicle emissions budget, which is that portion of allowable emissions defined in a SIP allocated to on-road (highway and transit) vehicle emissions.

Since travel and transportation factors are key elements of on-road mobile source emissions inventory development, TxDOT and MPOs ensure that current and accurate transportation data (e.g., traffic volumes, VMT, emissions, etc.) are developed, used and interpreted correctly, and that travel data or projections are representative of the local area. The accuracy of this data is important because it is used initially to define the baseline conditions and thereafter to measure the progress of reductions in pollutants from motor vehicles in order to comply with transportation conformity and SIP requirements.

TxDOT and the MPOs may also work cooperatively with the TCEQ to determine what transportation control measures (TCMs), or emission reducing projects, are practical, implementable, and best serve the needs of an area. These decisions are crucial since both transportation agencies will be required by federal law to implement these TCMs if they have committed to and have included them in the Texas SIP.

Transportation conformity ensures that federal funding and approval are given to those transportation projects and activities that are consistent with air quality goals. If transportation conformity cannot be determined or the SIP measures are not implemented on schedule, there are significant impacts on the transportation planning process with plans, programs, and projects being delayed.<sup>195</sup>

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<sup>195</sup>FHWA, Air Quality Planning for Transportation Officials: An Introduction.  
<http://www.fhwa.dot.gov/environment/agplan/aqintro.htm>



## 8.2 Environmental Justice

Environmental justice refers to groups in our population that have been traditionally underserved by limited access to decision making for transportation solutions. These populations include low income, the elderly, and minority groups. Within the low income and minority groups are also those segments of the population with limited-English-proficiency and low-literacy. Considering these groups are important to future transportation decisions as their needs for transportation services may be different from the population as a whole.

As a federal-aid recipient, TxDOT works to ensure nondiscrimination in their programs and activities under Title VI of the Civil Rights Act of 1964 and many other related laws, regulations and policies. Presidential Executive Order 12898 directed every federal agency, and its sub-recipients, to address the effects of all programs, policies, and activities on minority and low-income populations. In 1997, the USDOT issued its DOT Order to Address Environmental Justice in Minority Populations and Low-Income Populations to summarize and expand upon the requirements of Executive Order 12898 to:

- ★ Avoid, minimize or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations;
- ★ Ensure the full and fair participation by all potentially affected communities in the transportation decision-making process; and
- ★ Prevent the denial of, reduction in or significant delay in the receipt of benefits by minority and low-income populations.

If issues are addressed early in the planning process, environmental justice principles and procedures—properly implemented—improve all levels of transportation decision making, the results of which are the avoidance of disproportionately high and adverse impacts on minority and low-income populations, and projects that meet the needs of the entire community.<sup>196</sup>

The department successfully integrates Title VI and environmental justice into its programs and activities by:

- ★ Developing and enhancing its technical capabilities to assess the benefits and adverse effects of transportation activities among different population groups and

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<sup>196</sup>TxDOT. An Overview of Environmental Justice. June 2009.  
[http://www.txdot.gov/txdot\\_library/consultants\\_contractors/publications/environmental\\_resources.htm](http://www.txdot.gov/txdot_library/consultants_contractors/publications/environmental_resources.htm)



using those capabilities to develop appropriate procedures, goals and performance measures in all aspects of its mission.

- ★ Ensuring that STIP findings of statewide planning compliance and NEPA activities satisfy the letter and intent of Title VI requirements and environmental justice principles.
- ★ Enhancing its public involvement activities to ensure the meaningful participation of minority and low-income populations.
- ★ Working with federal, state, local, and transit planning partners to create and enhance intermodal systems, and support projects that can improve the natural and human environments for low-income and minority communities.

To engage these populations during the development of SLRTP, TxDOT district public information officers crafted and distributed media advisories targeted to the population makeup of each district. To ensure broad distribution of the information, issuance of media advisories were not limited to just major print and television outlets. They included non-English language publications and publications with smaller circulations, or more specific target audiences than mainstream media.

## **8.3 Climate Change**

Discussion of climate change is becoming more common in transportation planning documents. Many states recognize the role that transportation policies and investments play in contributing to climate change and conversely, the potential impact of climate change on transportation systems. Long-range transportation plans in particular are beginning to highlight climate change among a new generation of environmental and sustainability issues that shape transportation planning.

At present, there is no federal regulatory requirement to consider climate change in transportation plans. The federal government has just recently recognized greenhouse gases (GHGs) such as methane and water vapor as pollutants and has begun the process to inventory and regulate them.

### **8.3.1 Federal Focus on Climate Change Policy**

The anticipated federal transportation reauthorization and accompanying planning regulations are expected to address climate change as a focus area of long-range planning. There remains uncertainty about both the potential legislation and the effects of climate change on Texas. Current planning regulations already include a number of requirements that generally align with climate change mitigation and adaptation.



TxDOT already responds in some way to these issues as part of its normal course of business. For example, planning factors that relate to efficient management and operation of the transportation system, coordination with land use plans, and congestion mitigation can all be related to reducing green house gas (GHG) emissions. Adaptive responses, including infrastructure preservation and maintenance, as well as corridor preservation and connectivity of the system, can provide direct avenues for mitigation of the effects of climate change. In addition, addressing the environment and energy conservation are already among the eight federally required statewide planning factors.

### **8.3.2 Vulnerabilities in Texas as a Result of Climate Change**

A recent report by the U.S. Climate Change Science Program<sup>197</sup> examined in detail the potential effects of climate change on the Texas Gulf Coast, perhaps the most vulnerable region in the state. The analysis included the effects on the transportation system (Figure 8-2) as follows:

- ★ Inundation from Relative Sea Level Rise – Anticipating a rise in sea level, a large portion of the Galveston to Mobile, Alabama, region’s road, rail, and port network is at risk of permanent flooding. The crucial connectivity of the intermodal system in the area means that the services of the network can be threatened even if small segments are inundated.
- ★ Flooding from Storm Activity – The Gulf Coast and its transportation infrastructure is already vulnerable to hurricanes. Models indicate potentially increasing major storm frequency and intensity. Intensified wind speed, flying and water borne debris, and storm surges put a great deal of the coastal area’s infrastructure at risk of temporary flooding.
- ★ Temperature Increase – Maintenance costs will increase for some types of infrastructure because they deteriorate more quickly at temperatures above 32 °C (90 °F). Increase in daily high temperatures could increase the potential for rail buckling in certain types of track. Construction costs could increase because of work crew deployment restrictions on days above 32 °C (90 °F). Concrete strength is affected by the temperature at which it sets. Increases in daily high temperatures affect aircraft performance and runway length.
- ★ Average Precipitation – Transportation infrastructure and services may be impacted by changes in average precipitation; however, current models are unclear as to whether a wetter or a drier climate in the area is more probable.

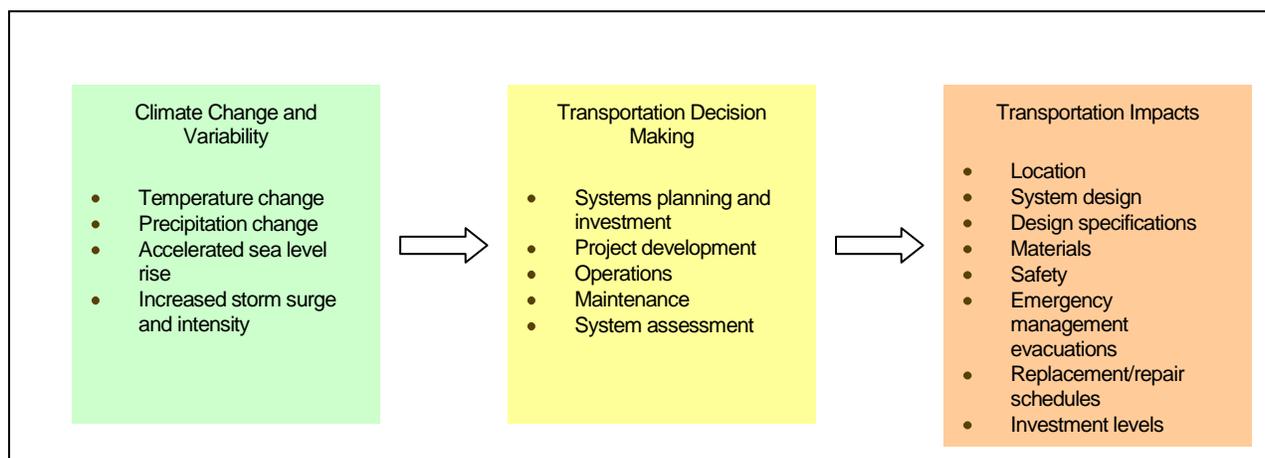
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<sup>197</sup>U.S. Climate Change Science Program. Impacts of Climate Change and Variability on Transportation Systems and Infrastructure: Gulf Coast Study, Phase I. Synthesis and Assessment Product 4.7. March 2008.



- ★ Extreme Precipitation Events – Of more concern is the potential for short-term flooding due to heavier downpours. Even if average precipitation declines, intense storms can lead to temporary flooding as culverts and other drainage systems are overloaded. Prolonged flooding may also damage pavement substructure.

**Figure 8-2: How Climate Change Affects Transportation Decisions**



## 8.4 Overview of the NEPA Process

NEPA (42 U.S. Code §4321) established a national environmental policy intentionally focused on federal activities and the desire for a sustainable environment balanced with other essential needs of present and future generations of Americans. NEPA established a supplemental mandate for federal agencies and federal-aid recipients—such as TxDOT—to consider the potential environmental consequences of proposed projects, document the analysis, and make this information available to the public for comment prior to the construction or implementation of a project.

NEPA forms the basic framework for federal decision-making for transportation projects. The NEPA process is managed by federal agencies as an “umbrella,” under which all-applicable environmental laws, executive orders (EOs), and regulations are considered and addressed prior to the final project decision and document approval. During the process, a wide range of partners and stakeholders including the public, businesses, interest groups, and representatives of Tribal, state, and local government agencies, provides input into project and environmental decisions.

The NEPA process allows transportation officials to make informed decisions that balance engineering and transportation needs with social, economic, and natural environmental factors, and to compensate for the impacts of constructing and maintaining the transportation system.



Documentation is an essential component of the NEPA process, which supports and complements public involvement and interagency coordination. It provides for complete disclosure to the stakeholders and public by allowing them an opportunity to provide input and comment on proposals, alternatives, and environmental impacts. Finally, it provides the appropriate information for the decision-maker to make a reasoned choice among alternatives.

Requirements for the preparation of environmental documents vary, depending on the complexity of the project and the anticipated impacts. There are three primary levels of environmental review, which are referred to as “classes of action”: Categorical Exclusions (CEs), Environmental Assessments (EAs), and Environmental Impact Statements (EISs).<sup>198</sup>

While each transportation organization is responsible for complying with NEPA, the specific processes vary by lead federal or state agency. Outlined below is a brief discussion of the environmental processes by mode of transportation and the agency involved in decision making.

#### **8.4.1 Roadways and Highways**

Federally funded roadway and highway projects are coordinated through the FHWA as described under 23 CFR Part 771. FHWA provides oversight and approval of environmental responsibilities with TxDOT, including possible reevaluations of the decision documents and implementation of mitigation plans. Additionally, FHWA also serves as the lead agency on rail projects such as highway/rail intersection grade separations, and as directed by the FHWA Administrator. Projects that are funded with even \$1 of federal funds must be coordinated through FHWA.

State-funded (i.e., no federal funding) roadway and highway projects are coordinated by TxDOT in accordance with 43 TAC Chapter 2, Subchapter C to provide comprehensive regulations for environmental analyses in project development, regardless of mode or funding source. These sections mirror FHWA’s regulations found in 23 CFR Part 771.

#### **8.4.2 Bicycle and Pedestrian**

Bicycle and pedestrian projects are coordinated through similar processes as federally and state-funded roadways and highways because most projects are adjacent to or on roadways. Federally funded projects that are located within state parks are coordinated with FHWA through the TPWD.

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<sup>198</sup>National Environmental Policy Act (NEPA). The NEPA Process. EA and EIS Components.  
<http://www.epa.gov/oecaerth/basics/nepa.html>



### 8.4.3 Rail (Freight and Transit)

Federally funded rail projects are coordinated through several agencies depending upon the type of project and location of facility, including the Surface Transportation Board (STB), FRA, and FTA. The type of planned rail activity or project determines which federal agency or agencies are consulted during the project development/environmental process.

#### 8.4.3.1 Surface Transportation Board

The STB regulates rail mergers, line sales, line construction, and line abandonment, and is the lead agency for new freight rail construction projects and rail abandonment projects. The STB must consider the environmental impacts of its actions, but it completes a slightly different environmental process than FHWA and other agencies responsible for actions involving rail. The STB's *Procedures for Implementation of Environmental Laws* are included in 49 CFR 1105. Environmental documentation may be in the form of an EA or EIS. The STB maintains ultimate responsibility for the environmental process for projects requiring its approval.

#### 8.4.3.2 Federal Railroad Administration

The FRA enforces rail safety regulations, administers railroad assistance programs, conducts research and development in support of improved railroads, and plays an active role in the development of the country's inter-city rail passenger system. The FRA also serves as the lead agency on all high-speed rail development proposals and freight rail operations, and must consider the environmental impacts of its actions, similar to the environmental process that the FHWA uses. The FRA's environmental process is completed under different environmental rules, but is procedurally similar to that of the FHWA.

The FRA's agency specific environmental procedures<sup>199</sup> outline specific policies, application tools, the level of environmental review required, and are pursuant to the Council on Environmental Quality's (CEQ) Regulations for implementing NEPA. The FRA's *Railroad Corridor Transportation Plans – A Guidance Manual*, provides additional guidance regarding the environmental process.

#### 8.4.3.3 Federal Transit Administration

The FTA regulates mass transit, which includes buses, subways, light rail, commuter rail, monorail, passenger ferryboats, trolleys, inclined railways, and people movers. tThe

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<sup>199</sup>Federal Register, Vol. 64, Number 101, Page 28545. May 26, 1999.



FTA must consider the environmental impacts of its actions, similar to the environmental process used by the FHWA. The FTA and FHWA operate under the same NEPA implementing regulation (23 CFR 771). This regulation is supported by 49 USC, Subtitle III, Chapter 53, Transportation, *General and Intermodal Programs – Mass Transportation*, which specifically pertains to mass transit projects and programs implemented under the FTA.

The FTA maintains agency-specific requirements for the analysis and assessment of noise and vibration that differ from roadway projects. FTA projects frequently require an in-depth analysis of socioeconomic and Environmental Justice (EJ) issues because mass transit projects are often located in urban areas.

#### **8.4.3.4 State-funded Rail Projects**

State-funded rail projects are coordinated through the TxDOT Rail Division, which oversees railroad planning, inspection, at-grade rail crossings, rail public transit safety, and manages the 382-mile South Orient Railroad line in West Texas. Environmental analysis is outlined in 43 TAC Chapter 2, Subchapter C, which mirror FTAs regulations found in 23 CFR Part 771 (with additional sections for mass transit rail projects).

TxDOTs 2008 *Guidance on Environmental Documentation for Texas Rail Projects* outlines the specific policies, application tools, and level of environmental review required for rail projects in Texas. TxDOT's programmatic agreements with the THC and FHWA do not apply to FTA-regulated rail projects.

#### **8.4.4 Airports**

Federally funded commercial service airport projects are coordinated through the FAA. The FAA must consider the environmental impacts of its actions under different environmental rules and agency-specific procedures,<sup>200</sup> but the process is procedurally similar to that of the FHWA.

State-funded, noncommercial service airport projects (i.e., general aviation airports) are coordinated through the TxDOT Aviation Division, which assists cities and counties applying for, receiving and disbursing federal and state funds for reliever and general aviation airports. The Aviation Division completes environmental reviews of aviation

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<sup>200</sup>FAA Order 1050.1E Environmental Impacts: Policies and Procedures and FAA Order 5050.4B National Environmental Policy Act Implementing Instructions for Airport Actions.



projects in accordance with FAA Orders<sup>201</sup> and CEQ's Regulations for implementing NEPA.

## 8.4.5 Waterways and Ports

Federally funded waterway and port projects are coordinated through several agencies depending upon the type of project and location of facility, including the USACE and the USCG. The type of activity or project determines which federal agency or agencies will conduct and oversee the environmental process.

### 8.4.5.1 USACE

The USACE is responsible for waterway navigation projects and implements environmental processes under agency-specific environmental procedures—Environmental Operating Principles and Implementation Guidance—but is procedurally similar to FHWA.

### 8.4.5.2 USCG

The USCG has five missions: maritime safety, security, mobility, national defense, and the protection of natural resources. USCG must consider the environmental impacts of its actions, similar to the environmental process that FHWA uses. USCG's environmental process operates under different agency-specific environmental procedures,<sup>202</sup> but is procedurally similar to FHWA.

State-funded waterway and port projects, including those associated with the Gulf Intracoastal Waterway, are coordinated through TxDOT's Transportation Planning and Programming (TPP) Division. TxDOT fulfills the non-federal sponsorship requirements for the waterways in Texas described in Chapter 51 of the Transportation Code. TPP provides environmental reviews of waterway and port projects in accordance with the USACE and USCG policies and CEQ's Regulations for implementing NEPA.

## 8.4.6 Pipelines

Pipeline projects are coordinated through several federal oversight agencies depending upon the type of project and location of facility, including the FERC, USDOT–PHMSA, and the U.S. Bureau of Land Management (BLM). The type of planned pipeline activity

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<sup>201</sup> FAA Order 1050.1E Environmental Impacts: Policies and Procedures and FAA Order 5050.4B National Environmental Policy Act Implementing Instructions for Airport Actions.

<sup>202</sup> Commandant's Manual Instruction M16475.1 for National Environmental Policy Act Procedures and Commandant's Manual Instruction M16590.5A Bridge Administrative Manual.



or project determines which federal agency or agencies are consulted during the project development/environmental process.

#### **8.4.6.1 FERC**

FERC is an independent agency that regulates the interstate transmission of electricity and natural gas, and also reviews proposals to build liquefied natural gas terminals and interstate natural gas pipelines as well as licensing hydropower projects. FERC must consider the environmental impacts of its actions, but it uses a slightly different environmental process than FHWA, which is contained within its Guidance Manual for Report Preparation. The resource reports differ from a typical EA or EIS, but contain similar information.

#### **8.4.6.2 PHMSA**

The USDOT – PHMSA has jurisdiction over intra-state hazardous liquid pipelines under 49 CFR Part 100-1085 and Part 195. PHMSA’s mission is to protect people and the environment from the risks inherent in transportation of hazardous materials—by pipeline and other modes of transportation. PHMSA must consider the environmental impacts of its actions, similar to the environmental process that FHWA uses. PHMSA’s environmental process operates under agency-specific environmental procedures (*National Operations Manual*), but is procedurally similar to FHWA pursuant to CEQ’s Regulations for implementing NEPA.

#### **8.4.6.3 U.S. BLM**

The U.S. BLM reviews and approves permits and licenses from applicants to explore, develop, and produce both renewable and nonrenewable energy on federal lands. The BLM ensures that proposed projects meet all applicable environmental laws and regulations – 43 CFR 2880, Section 2881.11 and 43 CFR 2880, Section 2881.7(b)(2). If BLM lands (or two or more federal lands) are crossed by an interstate pipeline project, then the project applicant must have a BLM grant under 30 USC 185. The BLM must consider the environmental impacts of its actions under agency-specific environmental procedures (*BLM National Environmental Policy Act Handbook H-1790-1*), but is procedurally similar to FHWA.

#### **8.4.6.4 Texas Railroad Commission Oversight**

State oversight of pipeline projects is coordinated through the RRC (under Texas Natural Resources Code Section 111.013 [Vernon, 1978]<sup>203</sup>), which provides environmental reviews of pipeline projects in accordance with the FERC, PHMSA, and

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<sup>203</sup>Original version at 1917 Texas General Laws, Ch. 30, Texas Rev. Civ. Stat. art. 6019 (Vernon 1962).



BLM policies, pursuant to CEQ's Regulations for implementing NEPA. Additionally, pipeline projects are coordinated through the TCEQ for permits related to air quality and water quality, the TPWD for permits related to threatened and endangered species, and the THC for permits related to cultural resources.

## 8.5 Environmental Mitigation

Planned improvements may result in impacts to humans, and various natural, cultural or historical resources. These impacts may require mitigation measures to ensure projects are implemented in an environmentally sound manner, and when required, are planned and implemented as part of the NEPA process.

Mitigation measures are defined in the CEQ Regulations (40 CFR Part 1508.20 – *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act*) in five ways: avoid, minimize, rectify, reduce or eliminate, and compensate. Typically, the implementation of mitigation measures follows a process based on these five mitigation methods or steps to determine what level of mitigation may be appropriate for a project. Whether in planning or project delivery, the process begins by identifying opportunities to “avoid” or “minimize” environmental impacts. Examples of actions that illustrate each of the five steps are:

- ★ **Avoid:** Avoid the impact altogether by not taking certain actions or parts of action (example: find ways to avoid disturbance to existing vegetation, wildlife, wetlands, creeks, water bodies and nest sites).
- ★ **Minimize:** Minimize impacts by limiting the degree or magnitude of the action and its implementation (example: build retaining walls or limit surface grading, topsoil stripping, and excavation).
- ★ **Rectify:** Rectify the impact by repairing, rehabilitating, or restoring the affected environment (example: immediately clean up spills using proper remediation procedures).
- ★ **Reduce or Eliminate:** Reduce or eliminate the impact over time by preservation and maintenance during the life of the action (example: no-idling policy for vehicles where appropriate).
- ★ **Compensate:** Compensate for the impact by replacing or providing substitute resources or environments (example: revegetation or on-site wetland creation will be undertaken on disturbed sites).

As each project—regardless of mode—advances through project development, designs must recognize the unique needs and culture of the community, utilize community



cohesion and preservation techniques, and feature community mitigation and enhancement measures as necessary. As each project is different, in terms of design, scope, and the surrounding area affected, mitigation will be considered on a case-by-case basis. It should be noted that following the above hierarchy of mitigation steps may provide significant savings in project delivery time due to a reduction in coordination time with resource agencies as well as cost savings.

## **8.6 Potential Mitigation Sites and Programs**

The utilization of Geographic Information System (GIS) databases is one of the best methods for advanced planning for mitigation. This early planning approach provides the ability to predict mitigation needs and establish availability and location where the use of credit-based compensation is appropriate. Available GIS data consists of a combination of where important resources are located as well as where potential mitigation sites are located. Current available databases are available from the TPWD, THC, USACE, U.S. Fish and Wildlife Service (USFWS), and EPA. Many counties and cities also have GIS data that can be useful when searching for potential mitigation sites and partners.

This information permits planners to practice the most effective mitigation measure of all, avoidance, by determining that certain sites are prohibitively impacted, and planning to move construction projects away from those sensitive and unique locations. Ultimately, this effort will help leverage funds and form agreements with other agencies to create better plans and acquire land or easements that would mitigate the combined impacts of multiple projects in a given area or affecting any given resource.

For the SLRTP, an assessment was conducted to identify existing mitigation banks, habitat conservation plans (HCPs), federal and state parks, and wildlife refuges that might be available for mitigation purposes. Privately held land owned or controlled by such entities as The Nature Conservancy and The Trust for Public Lands are generally considered as constraints, but may provide an opportunity for mitigation on a case-by-case basis. In addition to these sources, counties and cities may offer partnering opportunities where improvements to their properties could be used to serve as mitigation for a project within the same geographical area.

Some of the environmental data is not suitable for mapping on a statewide basis. There are 300,000 identified cultural resources throughout the state, as catalogued by the THC in the Texas Historic Atlas.<sup>204</sup> Mapping of those resources is typically done at the project level and is difficult to display effectively at a statewide scale. While details may

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<sup>204</sup>THC, Texas Historic Sites Atlas, <http://atlas.thc.state.tx.us/>



be lost when providing maps at this scale, biological constraints and hydrologic regions are provided on Figures 8-3 and 8-4. The Texas Highway Trunk System, with the segments identified for future improvements, are included on the figures to show proximity of the various environmental features.

The Priority 1 Texas Highway Trunk System corridors and the various potential sites and programs that might be considered to mitigate project impacts are provided in Table 8-4 by region.

<b>Table 8-3: Potential Mitigation Areas by Region</b>			
<b>Region</b>	<b>Priority 1 Corridors Improvement</b>	<b>Potential Mitigation Banks for Hydrologic Resource Mitigation</b>	<b>Potential Sites/Programs for Biological Resource Mitigation</b>
East Texas	SH 7 SH 31 US 69 US 175	<ul style="list-style-type: none"> <li>• West Mineola</li> <li>• Anderson Tract</li> <li>• Hawkins</li> <li>• KLAMM</li> <li>• Sabal Wetland Preserve</li> <li>• Byrd Tract</li> <li>• Martin Creek</li> <li>• Pineywoods</li> </ul>	<ul style="list-style-type: none"> <li>• Caddo Lake Preserve</li> <li>• Sheff's Woods Preserve</li> <li>• Lennox Woods Preserve</li> <li>• Tridens Prairie Preserve</li> <li>• Knight Prairie Preserve</li> <li>• Cowleech Prairie Preserve</li> <li>• Clyner Meadow Preserve</li> <li>• County Line Prairie Preserve</li> <li>• Big Woods on the Trinity</li> </ul>
North Central Texas	US 83 US 277	<ul style="list-style-type: none"> <li>• Trinity River</li> <li>• Bunker Sands</li> <li>• South Forks Trinity River</li> </ul>	-
West Texas	US 82 US 83 US 87	-	<ul style="list-style-type: none"> <li>• HCP in development for Real and Edwards Counties.</li> <li>• Independence Creek Preserve</li> <li>• Diamond Y Spring Preserve</li> <li>• Davis Mountain Preserve</li> <li>• Sandia Springs Preserve</li> </ul>
Panhandle	US 87	-	<ul style="list-style-type: none"> <li>• Yoakum Dunes Preserve</li> </ul>
Central Texas	SH 6 SH 21 US 190	-	<ul style="list-style-type: none"> <li>• Williamson County HCP</li> <li>• HCP in development for Caldwell, Hays and Blanco Counties</li> <li>• Leonhardt Prairie Preserve</li> <li>• Ruth P. Lehman Preserve</li> <li>• Barton Creek Habitat Preserve</li> <li>• Eckert James River Bat Cave Preserve</li> </ul>



**Table 8-3: Potential Mitigation Areas by Region**

Region	Priority 1 Corridors Improvement	Potential Mitigation Banks for Hydrologic Resource Mitigation	Potential Sites/Programs for Biological Resource Mitigation
			<ul style="list-style-type: none"> <li>• Big Woods on the Trinity</li> <li>• Steele Creek</li> </ul>
South Texas	, SH 44 US 59 US 83	-	<ul style="list-style-type: none"> <li>• HCP in development for Guadalupe, Comal, Kendall, Bexar, Atascosa, Medina, Uvalde, Bandera, Kinney, and Kerr Counties.</li> <li>• Mesquite Brushland Preserve</li> <li>• Love Creek Preserve</li> <li>• Dolan Falls Preserve</li> </ul>
Coastal	FM 1774 SH 44 SH 105 US 59 US 69 US 83	<ul style="list-style-type: none"> <li>• Mill Creek</li> <li>• Katy-Cypress</li> <li>• Greens Bayou</li> <li>• Neches River</li> <li>• Blue Elbow Swamp</li> <li>• Coastal Bottomlands</li> <li>• Palacios</li> </ul>	<ul style="list-style-type: none"> <li>• HCP in development for Refugio, Calhoun, Victoria and Gonzales Counties.</li> <li>• Las Estellas Preserve</li> <li>• Chihuahua Woods Preserve</li> <li>• Lenos Foundation Preserve</li> <li>• Mesquite Brushland Preserve</li> <li>• Francine Cohn Preserve</li> <li>• Shamrock Island Preserve</li> <li>• Mad Island Marsh Preserve</li> <li>• Pierce Marsh Preserve</li> <li>• Texas City Prairie Preserve</li> <li>• Wilson Preserve</li> <li>• Wier Woods preserve</li> <li>• Roy E. Larson Sandyland Sanctuary</li> <li>• Big Thicket Bogs and Pinelands Preserve</li> <li>• Little Rocky Preserve</li> </ul>



Figure 8-3: Biological Constraints

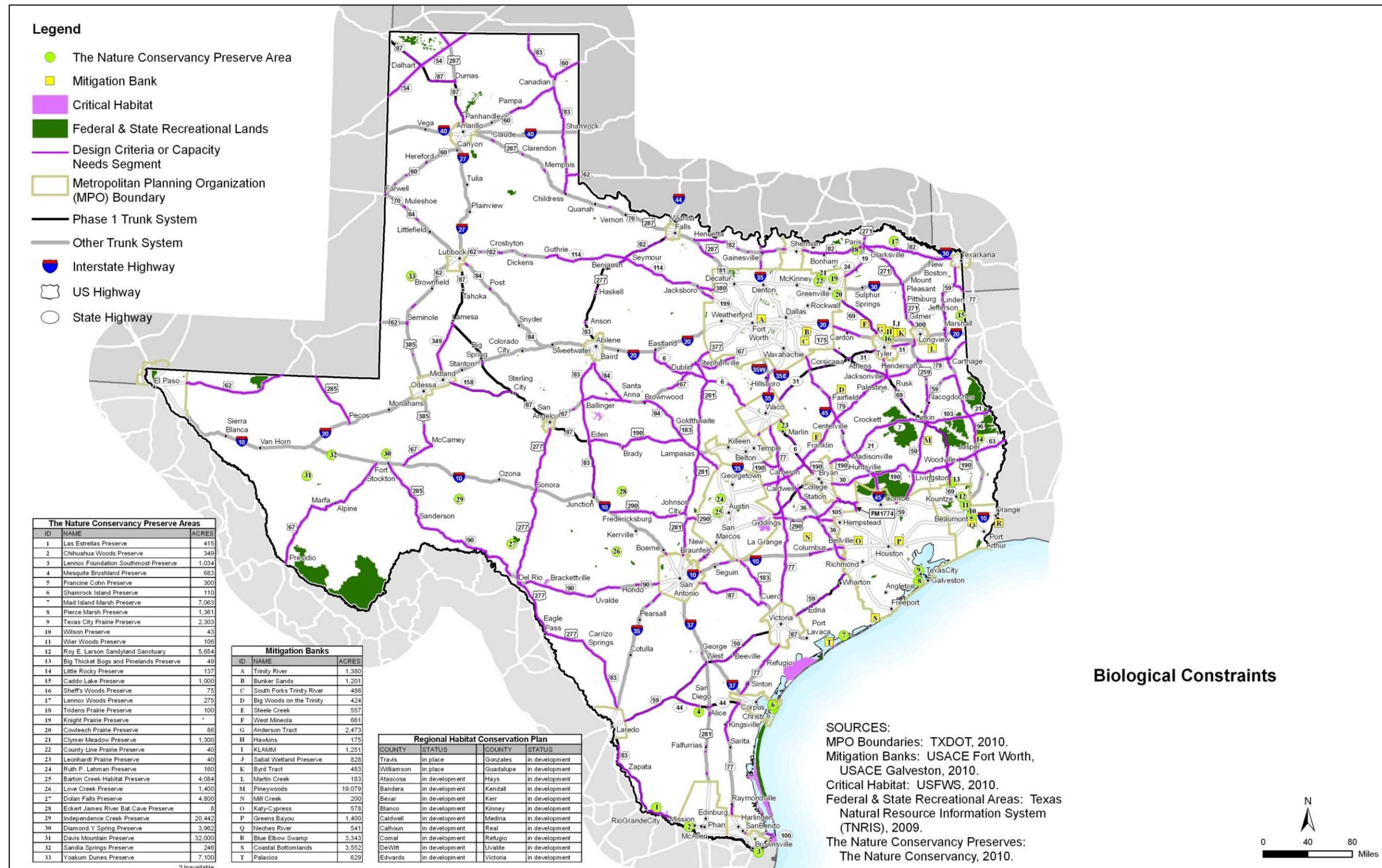




Figure 8-4: Hydrological Constraints

