Indirect and Cumulative Effects Technical Report

10/69 Interchanges Project

CSJs: 0028-13-135 and 0739-02-140

Jefferson County, Texas

December 2019

The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried-out by TxDOT pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated December 16, 2014, and executed by FHWA and TxDOT.

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1.0 Introduction

This technical report was developed using the Texas Department of Transportation's (TxDOT) January 2019 Indirect Impacts Analysis Guidance and Cumulative Impacts Analysis Guidelines (TxDOT, 2019). These documents incorporate guidance from the 2002 National Cooperative Highway Research Program (NCHRP) Report 466 Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects (NCHRP, 2002), and the American Association of State Highway and Transportation Officials' (AASHTO) Practitioner's Handbook 12: Assessing Indirect Effects and Cumulative Impacts Under NEPA (AASHTO, 2011).

The National Environmental Policy Act (NEPA) of 1969 established the requirements for indirect and cumulative impact analysis and is administered by the Council on Environmental Quality (CEQ). NEPA defines indirect effects as those that are ". . . caused by an action and occur 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).

NEPA defines a cumulative effect as "…the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR §1508.7).

2.0 Project Description

The proposed I-10 Interchanges Project (the project) includes reconstructing and expanding I-10 and US 69 where they converge in the city of Beaumont, Jefferson County, Texas. The project would widen the existing I-10 from Walden Road (County Road 131) to 7th Street and existing US 69 from Fannett Road (State Highway 124) to 11th Street. Between the Cardinal Drive and Eastex Freeway interchanges, the roadway would be widened in each direction from four lanes to five lanes. The roadway approaches to the Cardinal Drive and Eastex Freeway interchanges on I-10 and US 69 would be widened in each direction from two lanes to three lanes. The project also includes new frontage roads for continuity throughout the limits, relocating I-10 ramps, and constructing two-lane direct connectors in each direction where I-10 and US 69 converge within the project limits. In addition, the project includes changes to the Maury Meyers Bridge (Liberty/Laurel Overpass) to address a height constraint for freight movements and includes upgrading drainage infrastructure to current design standards.

Existing right of way (ROW) at the Eastex interchange varies from approximately 250 feet to 350 feet. Approximately 11 acres of additional ROW is anticipated as part of the proposed project, including potential easements or ROW for drainage. Existing ROW at the Cardinal Drive interchange varies from approximately 290 feet to 450 feet. This project is addressing an existing roadway facility, no new location or new alignment is anticipated.

3.0 Indirect/Induced Growth Effects

In accordance with TxDOT guidance, the indirect effects analysis is focused on project-induced development effects, which are also called induced growth effects (NCHRP, 2002). Induced growth effects are most often related to changes in mobility or accessibility to an area, which in turn affects the area's attractiveness for development. Current TxDOT guidance established the following 6-step process to determine the potential for induced growth and its potential impacts:

Table 1. Six-Step Approach to Conduct an Indirect Impact Analysis

Step	Guidelines
1	Define the methodology.
2	Define the area of influence (AOI) and study timeframe
3	Identify areas subject to induced growth in the AOI
4	Determine if growth is likely to occur in the induced growth areas.
5	Identify resources subject to induced growth impacts.
6	Identify mitigation if applicable.

Source: TxDOT, 2019.

TxDOT's Induced Growth Indirect Impacts Decision Tree (TxDOT 2014) was utilized to determine if the proposed project required an indirect impacts analysis. Because the project would increase mobility in an area encompassed by a Municipal Planning Organization (MPO; South East Texas Regional Planning Commission, or SETRPC), which is experiencing population growth (see Section 3.3), it was determined that the proposed project would require an indirect impacts analysis.

3.1 Methodology

A planning judgment approach was the primary form of analysis used to identify development trends and the potential impact of the proposed project on regional land use patterns. Geographic information system (GIS)-based cartographic techniques were also utilized to quantify the amounts of developed land, developable land, and undevelopable land. This cartographic technique exercise utilized GIS software to analyze data (i.e., parcel information and aerial mapping) combined with constraints layers (i.e. FEMA floodplain mapping) and the proposed alignment ROW, to determine the amount of currently developed land versus land available for development within the AOI.

3.2 Project's Area of Influence (AOI) and Study Time Frame

Indirect effects associated with a project can occur at a distance in time or space from the project itself (NCHRP, 2002). The area studied for indirect effects will be referred to as the Area of Influence (AOI) to distinguish it from the study areas used to assess the direct effects of the proposed project. The AOI encompasses approximately 28 square miles (17,947 acres) in Jefferson County and is largely within the city limits of Beaumont (Figure 1). The AOI includes the census tracts located adjacent to the proposed project area, which was determined to encompass all those areas where the proposed project could influence local traffic patterns or land development. It is generally bounded by where US 69 (Eastex Freeway) crosses W. Lucas Drive to the north and by where I-10 crosses S. Major Drive to the south. Eastern and western boundaries vary.

The temporal boundary for induced growth effects analysis ends in 2045. The year 2045 corresponds with the design year and the horizon dates for long-range planning documents and demographic forecasts available for this study. Performance of the proposed project beyond 2045 cannot yet be reasonably evaluated.

3.3 Population and Housing Growth

This section includes information about trends that characterize the AOI over time. The city of Beaumont is the county seat of Jefferson County, Texas and is the largest city along the I-10 corridor between the Houston metropolitan area and Lafayette, Louisiana. The I-10 crossing of the Neches River at Beaumont provides the most direct route for interstate and regional traffic travelling east and west, as well as for local commuters in the greater Beaumont area. The seaport at Beaumont is the fifth largest in the country by tonnage, and Beaumont's extra-territorial jurisdiction (ETJ) contains large petrochemical facilities. Port Arthur, about 20 miles south of Beaumont, is also an important seaport and is home to the largest oil refinery in the U.S. Since Beaumont's population provides a work force for the petrochemical industry and those that support it, it tends to be responsive to economic fluctuations.

Data from 1990 to present has been included in the following tables to provide some context. **Table 2** shows current and historic population numbers for both the city of Beaumont and Jefferson County. Aside from negative growth in the city of Beaumont between 1990 and 2000, growth has been positive through 2010.

Table 2. Current and Historic Population Growth in the Project Vicinity, 1990-2010

	Total Population by Year			
Geography	1990	2000	2010	% change from 1990-2010
City of Beaumont	114,323	113,866	118,296	3.5%
Jefferson County	239,397	252,051	252,273	5.4%

Source: U.S. Census Bureau

Table 3 shows the estimated number of residential dwellings built since 1990 in the city of Beaumont and Jefferson county. The number of homes as a percent of the total built during this period is about the same in the city and county and comprises about 30% of existing stock. For comparison, about 50% of existing structures were built between 1950 and 1980 in both geographies, reflecting the petrochemical boom after World War II.

Table 3. Year Structure Built/Percent Built by Decade within Jurisdictions in the AOI, 1990-2014

Geography	Total Homes	Year Structure Built/% Built Within Decade					
		1990-1999		2000-2009		2010 or later	
		#	%	#	%	#	%
City of Beaumont	53,111	5,204	10%	6,953	13%	3,451	6%
Jefferson County	107,716	11,197	10%	12,769	12%	6,109	6%

Source: American Community Survey (Table B25034), "Year Structure Built", 2013-2017 5-year estimates.

The city of Beaumont and Jefferson County overall are expected to sustain their population growth into 2040 (**Table 4**)

Table 4. Projected Population Growth in the Project Vicinity, 2010-2040

	Total Population by Year (Projected 2020-2040)				
City or County	2010	2020	2030	2040	% change from 2010-2040
City of Beaumont	118,296	130,024	138,409	147,221	24.5%
Jefferson County	252,273	267,379	284,620	302,744	20.0%

Source: Texas Water Development Board 2021 Regional Water Plan population projections.

NOTE: 2021 population projections are based on water utility service areas, not political boundaries (e.g., city limits)

3.4 Potential Induced Growth Effects

Induced growth effects can result from changes in traffic, access, and mobility. Transportation projects may provide new or improved access to adjacent land or may induce development on surrounding land by effecting a reduction in the time-cost of travel (NCHRP, 2002). Transportation projects may also affect the rate at which planned development is implemented.

Land within the AOI was classified as developed or undeveloped based on existing land use using current aerial photos, and publicly available County tax records. 'Developed' land generally had dwellings or other more permanent structures and/or improvements. 'Undeveloped' land was generally vacant or had one or two small outbuildings or other less permanent type structures.

A portion of the undeveloped land was considered 'undevelopable' if it was included in one of the following categories: 1) FEMA regulated floodways and/or lands owned by the Jefferson County Drainage District or the Lower Neches Valley Authority; 2) other linear waterbodies not included under category 1; 3) publicly owned parks and open space; and 4) utility rights of way; and 5) undeveloped parcels that did not have access to existing or proposed public road rights of way or were not connected by ownership to those with access. For this analysis, the last category was considered undevelopable because these parcels would require additional permissions to make them readily developable. Any land not already categorized as developed or determined to be undevelopable was considered developable land or planned development.

Additionally, a portion of the undeveloped land was considered 'planned for development'. Land that is not yet developed but is already planned for development was not included in the total amount of developable land as it is assumed that this land will be developed, regardless of whether the project is constructed. It was assumed that the land would be developed regardless of the project's construction because of the continued growth of the city of Beaumont and Jefferson county (see Section 3.3), which leads to increased housing demand. However, the development of vacant, available land is considered possible but not necessarily probable. Land was assumed to be planned for development if Jefferson County parcel data showed that: 1) a vacant parcel was part of an existing industrial or office park or was indicated as a future commercial or industrial development (e.g. Willow Creek Industrial Park); or 2) it was owned by residential or commercial development company. The purpose of this indirect effects analysis is to determine if future development could be causally linked to the proposed roadway project.

Table 5 shows the current breakdown of developed and undeveloped land in the AOI. Once the amount of planned development and undevelopable land is subtracted from the undeveloped land total, 3,491 acres (19.5%) of the AOI is considered developable (Figure 2).

Table 5. Acres of Land Available for Project-Influenced Development within the AOI

Existing Land Uses		Acres	% of Total AOI (17,947 acres)
Total Developed Land*		11,371	63.4%
Total Undeveloped Land		6,576	36.6%
Undeveloped Land Analysis	Planned Development	157	0.9%
	Undevelopable Land	2,928	16.3%
	Developable Land	**3,491**	**19.5%**

*The proposed project area is included in the developed land total.

The subject project adds capacity and provides interchange updates to US 69 and I-10 where they converge and diverge within the largely built-out city of Beaumont. The project will likely aid in easing congestion along I-10 as it travels through Beaumont and may make development south of US 69 and Walden Road in the AOI more attractive. Much of the developable land in the AOI is located south and west of the Cardinal Drive interchange and tends to be in larger tracts. However, there is another TxDOT project proposed on I-10 between Walden Road and FM 365 (CSJ 0739-02-162) that will widen I-10 from 4 to 6 lanes, with an estimated completion date of June 2023. The proposed project between Walden Road and FM 365 is more likely to influence development south of US 69 and Walden Road both within the city of Beaumont and farther south in the ETJ than the subject project, which is limited in extent and scope.

There is developable land north of Walden Road and west of I-10; however, the project would likely not induce new development in this area. The project aims to improve mobility along I-10 mostly through interchange improvements, while also adding additional capacity to accommodate current and projected traffic increases and keep pace with adjoining transportation projects. Its construction should not encourage large-scale residential development and/or change its current or future pace in these areas that rely on I-10 or US 69 to access points north and east. In addition, any new frontage roads would be in areas where access to parcels already exists and their construction alone would likely not increase the probability that adjacent parcels would be developed.

The proposed project was designed to accommodate the projected increase in traffic along I-10 caused by increasing population in the area; however, it was not designed to accommodate additional traffic beyond that projected in the design year. Rather than inducing development, the proposed project is needed to keep pace with traffic demand resulting from already established growth and development trends.

3.5 Resources Subject to Induced Growth Impacts & Mitigation Measures

No induced growth is anticipated from the proposed project; therefore, no resources are anticipated to be impacted and no mitigation for indirect impacts is proposed.

4.0 Cumulative Effects

TxDOT prescribes a five-step process to consider the cumulative effects of a proposed project, which is based on both the opinion of the Fifth Circuit in Fritiofson v. Alexander (5th Cir. 1985) and the AASHTO's Practitioners Handbook (**Table 6**).

Table 6. Five-Step Approach to Conduct a Cumulative Effects Analysis

Step	Topic
1	Resource Study Area, Conditions, and Trends
2	Direct and Indirect Effects on each Resource from the Proposed Project
3	Other Actions—Past, Present, and Reasonably Foreseeable—and their Effect on each Resource
4	The Overall Effects of the Proposed Project Combined with Other Actions
5	Mitigation of Cumulative Effects

Source: TxDOT, 2019.

TxDOT's Cumulative Impacts Decision Tree (TxDOT, 2014) was utilized to determine if the proposed project required a cumulative impacts analysis. The project is expected to only have a small to moderate direct effect on natural resources; however, there are water resources downstream of the project area that are in poor or declining health as documented in the Final 2018 Texas Commission on Environmental Quality (TCEQ) 303(d) list. Therefore, a cumulative effects analysis for water resources is required. Water resources for the purposes of this analysis are defined as wetlands and waters of the U.S., including water quality concerns.

4.1 Resource Study Area, Conditions, and Trends

The Resource Study Area (RSA; Figure 3) for water resources is defined as the two 12-digit U.S. Geological Survey (USGS) Hydrologic Unit Codes (HUC) sub-watersheds straddled by the project area (120402010201 & 120402010202) and is approximately 56 sq. miles (36,021 acres). The RSA represents the headwaters of Hillebrandt Bayou as well as that portion directly downstream of the project area, as resources within both these HUCs will be directly affected by the project.

The northern and eastern portions of the RSA are largely urban and contain a large part of the city of Beaumont. The extreme western and southern portions of the RSA are dominated by suburban residential development, agricultural and range lands, forested tracts, and facilities associated with oil and gas development. As such, many of the waterbodies in the RSA are affected by municipal discharges as well as organics and other pollutants from stormwater runoff. There are currently two waterbody segment assessment units within 5 miles of the subject project or within the RSA listed as impaired on the TCEQ Final 2018 303(d) list (**Table 7**; Figure 3). The impairments listed in **Table 7** are generally caused by increased water temperatures, as well as higher levels of organic material and other pollutants from urban stormwater runoff and inputs from storm sewers. While the waterbody segment assessment units on the 303(d) list are not found within the project area, one is less than a half-mile downstream. The Commission adopted the second submission of the Draft 2018 Texas 303(d) List on September 27, 2019. The 2018 List was referenced for this report.

Table 7. 303(d) Listed Waterbodies in the RSA or Within 5 Miles of Project

Watershed	Segment name	Segment number	Assessment unit number
Sabine Lake	Hillebrandt Bayou	0704	0704_01
Sabine Lake	Hillebrandt Bayou	0704	0704_02*
Source: Draft 2018 Texas Integrated Report – Texas 303(d) List *Directly downstream of the project area			

The National Wetlands Inventory (NWI) shows 4,454 acres of wetlands (not including riverine or lacustrine habitats) present in the RSA (Figure 3). The most common wetland type is Palustrine farmed (3,409 acres; 77% of total), distantly followed by Freshwater Forested/Shrub (847 acres), Freshwater Ponds (126 acres), and Freshwater Emergent (72 acres). The NWI is not an official delineation but provides an indication of what wetland types might be present and a rough estimate of their extent in the RSA. The RSA lies within the Environmental Protection Agency's (EPA) Level IV Northern Humid Gulf Coastal Prairies ecoregion, which suggests that Forested/Shrub wetlands are not typical of undisturbed areas in this region. Many of the Freshwater Emergent wetlands expected in this ecoregion were likely converted to the Palustrine farmed wetland type. This designation is for those areas where the soil surface has been mechanically or physically altered for the production of crops, but hydrophytes (e.g. wetland plants) will become re-established if farming is discontinued (Dahl, et al. 2009).

Other than conversion to farmland, the general trend in the RSA is towards urbanization, as a large portion of the RSA lies within the city limits of Beaumont, which has been steadily growing in population since 2000 (see Section 3.3).

4.2 Direct and Indirect Effects on each Resource from the Proposed Project

0.72 acre of wetlands and 3,408.66 linear feet of streams were identified within the project area. It is anticipated that 0.01 acre of wetlands and 3,408.66 linear feet of stream, including already culverted stream lengths, would be considered potentially jurisdictional. The project could potentially cause direct impacts to wetland and stream resources based on current design, resulting in a loss of wetland and aquatic habitat. Indirect effects of the project on water resources are primarily those on water quality. The project will add further impervious surface to the RSA, which will increase the potential for stormwater runoff, both during and after construction. Stormwater runoff in urban areas can include suspended solids, nitrogen, phosphorus, bacteria (fecal coliforms), petroleum hydrocarbons, copper, lead, zinc, pesticides, herbicides, and solid wastes (trash, plastic floatables). In addition, during construction there is potential for the inclusion of sediment and construction chemicals (e.g., concrete sealant), though erosion and sediment control measures should minimize these inputs.

4.3 Other Actions—Past, Present, and Reasonably Foreseeable—and their Effect on each Resource

Past actions are largely encapsulated by land conversion for agricultural uses, as well as industrial, commercial, and residential development throughout the RSA that started or accelerated in the 20th century, along with the major transportation infrastructure associated with it (i.e., I-10, US 90, and railways that serve

the port). Reasonably foreseeable actions are those that are likely to occur, or are probable, rather than those that are merely possible. These can include major development or transportation projects, and specific land use plan objectives for a particular area, among others. While the city of Beaumont enforces zoning, neither the city nor Jefferson County have a comprehensive plan to guide development. For this exercise, those parcels identified as planned development in the indirect effects analysis are considered 'probable' enough to include. However, aside from these parcels, no other large-scale development was identified in the RSA that was reasonably foreseeable.

Reasonably foreseeable actions in the vicinity of the proposed project also include linear transportation projects. Estimated wetland and stream impacts from these transportation projects in the RSA, along with those associated with planned development, are summarized in **Table 8**.

Table 8: Reasonably Foreseeable Development Actions in the RSA

Action	Type of Action	Estimated Direct Effect*
US 69 from LNVA Canal to I-10	Widen I-10 from 4 to 6 lanes	Wetlands: none Streams: 150 ft.
I-10 from Walden Road to FM 365 (extends outside RSA; impacts estimated in RSA only)	Widen I-10 from 4 to 6 lanes	Wetlands: 1 acre Streams: 200 ft. (drains directly to Hillebrandt Bayou)
Indirect effects analysis	Planned development	Wetlands: 100 acres Streams: 1,900 ft.

*Based on NWI and aerial interpretation

4.4 The Overall Effects of the Proposed Project Combined with Other Actions

The direct and indirect effects of the proposed project on water resources were addressed in Section 4.2. Actual direct impacts to water resources from the actions listed in **Table 8** are unknown, though it is anticipated that only one will indirectly affect the 303(d) listed section of Hillebrandt Bayou. For the transportation projects, both follow existing transportation corridors, which will likely reduce or even eliminate impacts to jurisdictional water resources. The planned development is on vacant land, so it may result in more significant impacts, though field verification of the NWI wetlands is required. However, to receive a Clean Water Act (CWA) Section 404 permit to impact jurisdictional water resources, an applicant is required to first avoid and minimize impacts to the extent possible and provide compensatory mitigation at a watershed level for unavoidable impacts. Mitigation is generally required to be in the same watershed and the same or adjacent ecoregion as impacts, and as geographically close as possible. Therefore, wetland and stream functions lost through development will generally be replaced elsewhere in the same watershed and ecoregion.

Regarding potential impacts to water quality, the Beaumont city government and the Jefferson County Stormwater Quality Coalition (cooperative effort of the cities of Port Arthur, Nederland, Groves, and Port Neches, as well as the Jefferson County drainage district) either regulate stormwater runoff themselves (e.g. Beaumont's watershed protection ordinance) or aid in compliance with TCEQ's stormwater quality regulations. These efforts help to offset potential increases in stormwater runoff due to development projects in the RSA.

Given the proposed project's relatively small stream and wetland impacts, the limited amount of reasonably foreseeable development, and regulatory guardrails for water quality, the cumulative impact of this action along with others in the RSA is anticipated to be negligible.

4.5 Mitigation of Cumulative Effects

Over the past several decades federal, state, and local lawmaking bodies have enacted statutes, regulations, and ordinances designed to preserve and enhance the abundance and quality of natural resources by requiring project applicants to avoid, minimize, and mitigate the environmental impacts of their projects or actions. Therefore, the cumulative impacts analysis focuses on the expected impacts to each resource that would remain after full compliance with the regulatory requirements at all levels and reflect long-term impacts in light of mitigation that would likely be applied.

The magnitude and significance of adverse cumulative impacts are expected to be limited and controllable. Efforts will be made to avoid and minimize project effects to all resources during the detailed design phase of the project. Mitigation measures will be implemented where practicable. When project alternatives are developed, several environmental issues are considered that influence the location of the proposed alignment, including the potential for involvement with Section 4(f) and 6(f) resources, avoiding and minimizing the filling of wetlands and floodplains, and sensitive biological communities. Other factors are also evaluated, including compatibility with local land use plans/policies, housing and business displacements, socioeconomic issues, and community interests. The alternatives evaluation process is based on the sequential practice of avoidance, minimization, and mitigation. All project-specific commitments and conditions of approval, including resource agency permitting, compliance, and monitoring requirements, will be further documented in the project's Environmental Assessment.

Construction activities associated with the proposed project would directly affect wetlands and aquatic systems to varying degrees. Land clearing during construction activities would remove vegetative cover. These activities may increase stormwater runoff and could lead to erosion. If runoff were allowed to flow into streams without erosion and sediment control measures, increased turbidity and sedimentation may contribute to elevated levels of sediments, nutrients, and pollutants, which would also diminish suitable habitat for aquatic animal and plant species. To aid in minimizing such effects, placement and monitoring of erosion control measures at the start of, during, and after construction would be incorporated into project plans according to TxDOT Stormwater Management Program guidelines. In addition, Beaumont is registered with the TCEQ as a Municipal Separate Storm Sewer System (MS4) Operator. The proposed project would disturb more than five acres; therefore, a notice of intent (NOI) shall be filed with TCEQ stating that a Storm Water Pollution Prevention Plan (SWP3) would be in place during construction of the proposed project. A copy of the NOI would be submitted to the City of Beaumont MS4 operator. Re-vegetation along the existing and proposed ROW would adhere to TxDOT re-vegetation guidelines. Temporary impacts to jurisdictional waters of the U.S., including wetlands, would be returned to pre-construction elevations.

Effects to wetlands, whether direct, indirect, or cumulative, are regulated through the Section 404 permit process as administered by the U.S. Army Corps of Engineers (USACE). Natural resource agencies (including USACE, EPA, TCEQ, Texas Parks and Wildlife Department, and the U.S. Fish and Wildlife Service) would be involved in decisions regarding appropriate wetland mitigation ratios and the location, size, and character of the mitigation. A compensatory mitigation plan would be submitted to the USACE as part of the Section 404 permit review process.

5.0 Conclusion

The indirect effects AOI for the proposed project encompasses approximately 17,947 acres (28 sq. miles), 3,491 acres (19.5% of AOI) of which is currently considered developable. The AOI is contained within the city of Beaumont and its ETJ, which has experienced moderate population growth and is projected to do so into the future. Based on the project's focus on increasing mobility through interchange improvements, surrounding capacity projects that will likely be greater drivers of growth, and recent and projected population growth trends, the proposed project is not anticipated to induce growth on its own.

The cumulative analysis RSA for the proposed project encompasses 36,021 acres (56 sq. miles) and largely overlaps the AOI used for the indirect effects analysis. Proposed actions in the RSA, of which the project is part, will affect water resources, including those in declining health, both directly and indirectly. However, existing governmental regulations, in conjunction with the goals and coordination of community planning efforts, address the many and varied issues that influence local and ecosystem-level conditions. The regulatory powers of state and federal programs, such as the CWA, serve to safeguard resources and prevent or minimize negative impacts that would threaten the general health and sustainability of the region. The proposed project is consistent with the historical growth rates, patterns, and land use changes found in the RSA. The analysis provided concludes that there are no substantial adverse cumulative impacts to resources in the RSA, when taken into consideration with other past, present, and reasonably foreseeable actions.

6.0 References

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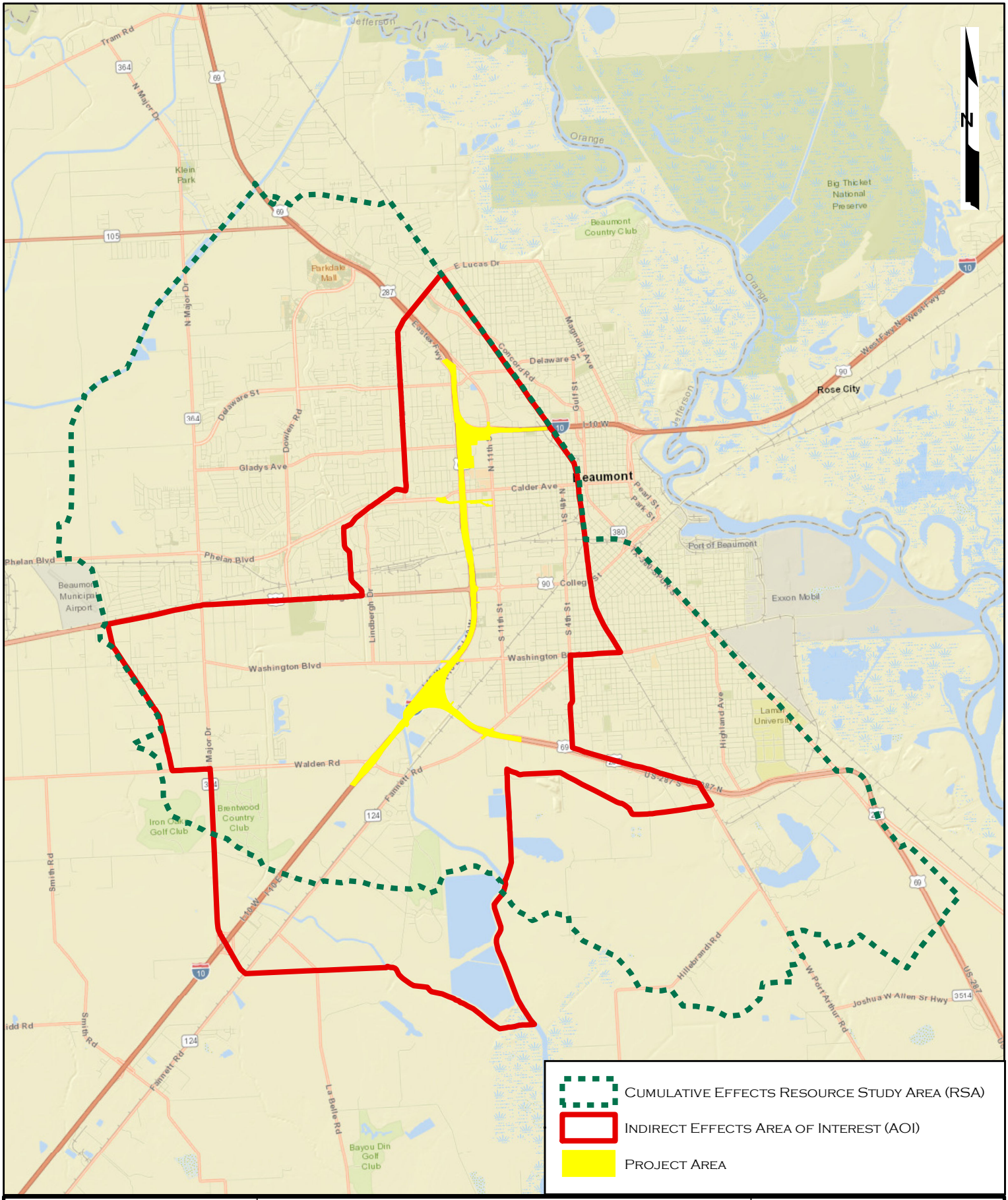
FIGURES



10/69 Interchanges Project

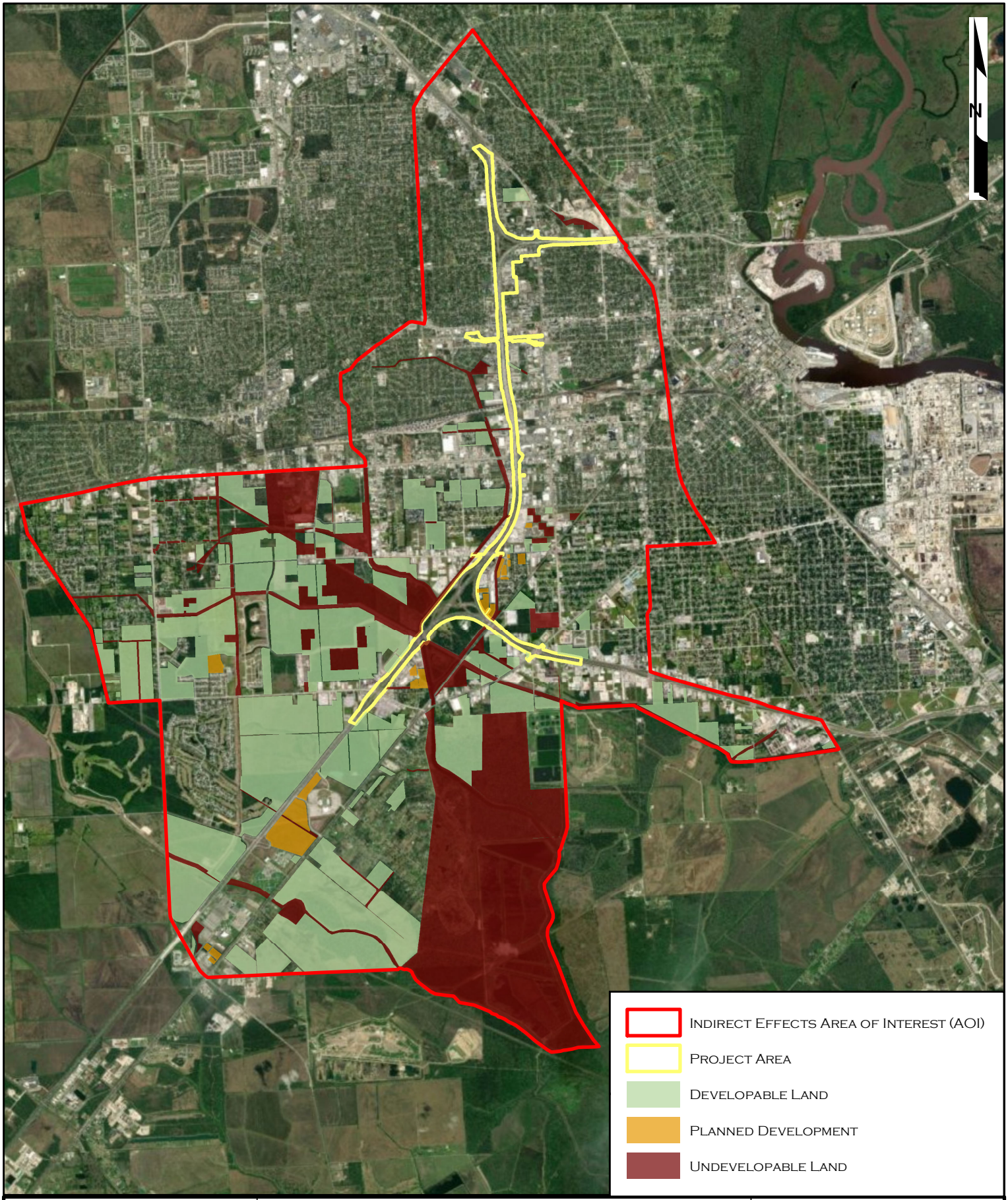
Area of Interest and Resource Study Area Map

Texas Department of Transportation

Figure 1

Jefferson County, Texas

Date:
December 2019



0 0.75 1.5 Miles

10/69 Interchanges Project

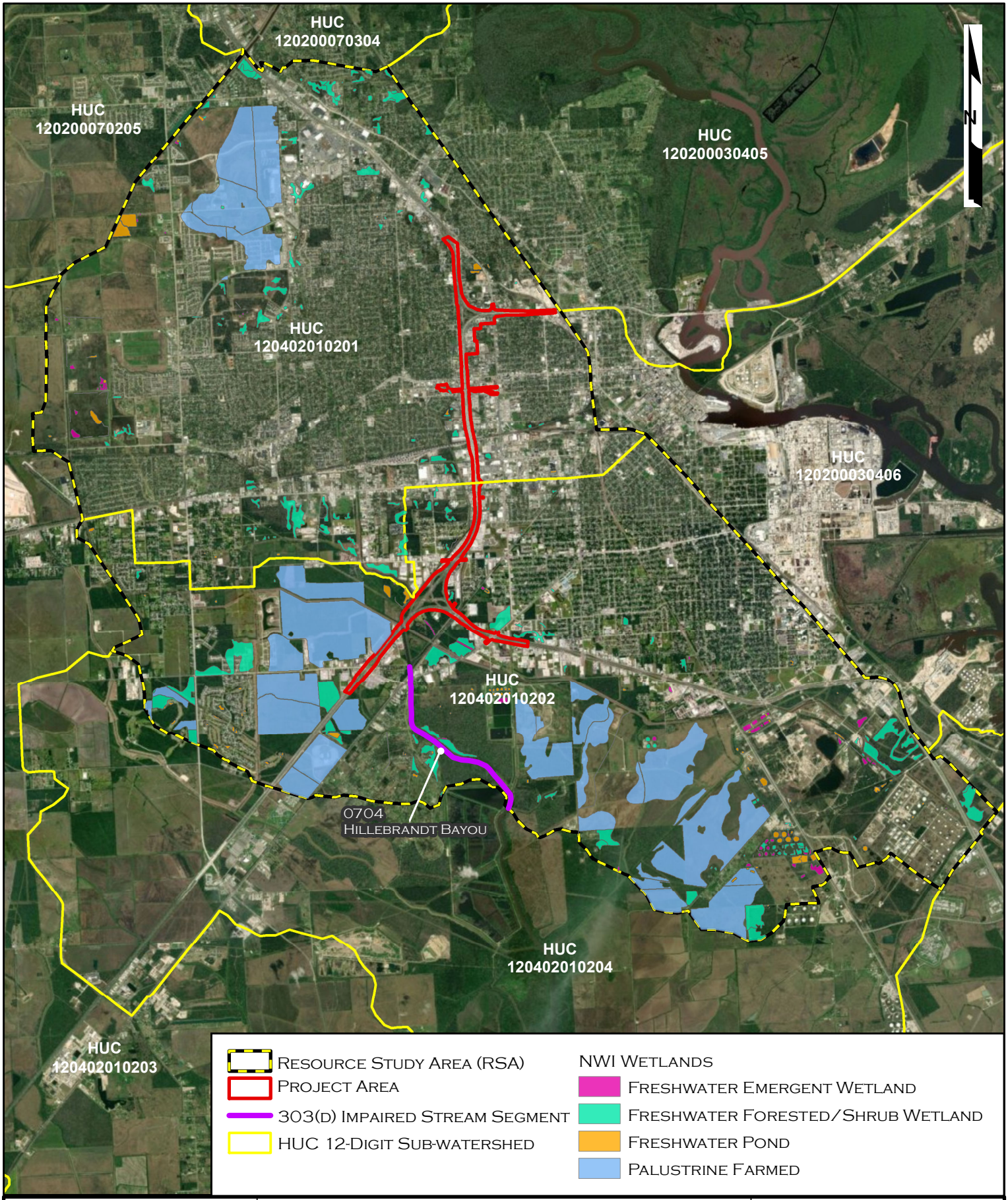
Developable Land Analysis Map

Texas Department of Transportation

Figure 2

Jefferson County, Texas

Date:
December 2019



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10/69 Interchanges Project

Water Resources Cumulative Impacts Analysis Map

Texas Department of Transportation

Figure 3

Jefferson County, Texas

Date:
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