Purpose and Need
Draft Technical Report

I-35 Capital Express Central Project
I-35 from US 290 East to US 290 West/SH 71

Texas Department of Transportation, Austin District

CSJ Number(s): 0015-13-388

October 2020

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 12-9-2019, and executed by FHWA and TxDOT.

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1. Introduction

The Texas Department of Transportation (TxDOT) proposes to construct improvements to Interstate Highway 35 (I-35) from US Highway 290 (US 290) East to US 290 West/State Highway (SH) 71, and add direct connectors at I-35/US 290 East, in Austin, Travis County, Texas (referred to as the I-35 Capital Express Central project). The proposed project measures approximately 8 miles.

The existing I-35 roadway from US 290 East to US 290 West/SH 71 is located in an urban area with adjacent commercial, residential, institutional, governmental, and parks/open space properties. Within the proposed project limits, I-35 is an access-controlled interstate highway. Beginning at the southern limit, US 290 West/SH 71, the roadway typically has three to four, 12-foot-wide mainlanes (concrete barrier-separated) with 4- to 12-foot-wide inside shoulders, 10- or 12-foot-wide outside shoulders, and two to three, 11- or 12-foot-wide frontage road lanes with curb and gutter in each direction. From Lady Bird Lake to 15th Street, I-35 generally includes three 12-foot-wide mainlanes in each direction with auxiliary lanes between some of the ramps. North of 15th Street, the roadway has four mainlanes in each direction and includes the upper/lower deck split just north of MLK Jr. Boulevard with a continuation of the upper decks to north of Airport Boulevard. From Airport Boulevard to US 290 East, I-35 includes four barrier-separated mainlanes in each direction. The roadway here typically has 2- to 6-foot-wide inside shoulders, 10-foot-wide outside shoulders, and two to four, 11- or 12-foot-wide frontage road lanes with curb and gutter in each direction. Sidewalks exist in most, but not all, locations throughout the project area and shared-use paths are located within the project area in "downtown" Austin, defined as between MLK Jr. Boulevard and Holly Street. Drainage along the roadway (mainlanes and frontage roads) is provided by storm sewer networks and some open ditches. The existing right of way (ROW) width is typically 200 to 350 feet but is wider at the interchanges. Existing permanent drainage easements are located at creek crossings. The posted speed limit along I-35 in the proposed project area is 60 mph on the mainlanes and 35 to 50 mph on the frontage roads.

I-35 has been the north-south transportation backbone of personal, business and freight transportation in Texas since 1962. It connects Central Texas to the rest of the United States, Mexico and Canada, serving as a major thoroughfare for inter- and intrastate traffic. I-35 is critical to local, state and national security, economic vitality and overall mobility. Many Texans are familiar with I-35 as a local route for their work commute and other personal travel.

2. Need for the Proposed Project

The proposed project is needed to improve I-35 between US 290 East and US 290 West/SH 71 to meet current design standards and current and future travel demand. The existing roadway does not meet current federal and state design standards, which has resulted in operational deficiencies and longer travel times for all users, including emergency response vehicles and transit, particularly during peak hours. The proposed project is also needed to improve bicycle and pedestrian paths within the project limits.

2.1 Design Standards

I-35 within the project limits does not meet current roadway design standards based on TxDOT's *Roadway Design Manual* (TxDOT 2020a), their *Hydraulic Design Manual* (TxDOT 2019), American Association of

State Highway and Transportation Officials' *A Policy on Geometric Design of Highways and Streets* (AASHTO 2018), and the *Texas Manual of Uniform Traffic Control Devices* (TxDOT 2011). There is a need to improve design deficiencies along I-35 within the project limits, including narrow lane widths, nonexistent or narrow shoulders, low vertical clearances, substandard horizontal and vertical geometry, and outdated drainage systems.

Multiple bridges within the project limits are under the current standard height of 16.5 feet: the mainlane underpasses through the upper deck area, between Airport Boulevard and MLK Jr. Boulevard, have vertical clearances that vary from 13.25 to 15.25 feet; the underpasses through the downtown area have vertical clearances of less than 15 feet; the southbound mainlane underpass beneath Cesar Chavez Street has a vertical clearance of 14 feet, and the bridge has evidence of vehicle strikes. There is a need to increase vertical clearance for underpasses to current design standards to improve overall safety and operations for this heavily traveled area.

Ingress and egress to I-35 is hindered by closely-spaced ramps, narrow lane widths, and narrow or nonexistent shoulders, which could contribute to slow traffic and collisions. For example, the existing lower lanes on I-35 between Airport Boulevard and Manor Road do not have inside shoulders. When collisions occur on ramps and narrow lanes, travelers may be delayed without the opportunity to bypass the collision, resulting in reduced traffic flow. There is a need to add auxiliary lanes and revise ramp geometry and spacing according to current design standards to improve traffic operations along the corridor.

Substandard horizontal and vertical geometry along the project limits does not meet optimum design speeds and can result in compromised driver's sight distance and reduced traffic flow. Additionally, there is a need to upgrade the storm drainage system and evaluate the existing systems with respect to new rainfall data contained in the *National Oceanic and Atmospheric Administration Atlas 14* (Perica et al. 2018), which could reduce areas of flooding and improve overall driver safety.

2.2 Travel Demand

2.2.1 Traffic Congestion and Operational Deficiencies

I-35 within Travis County is located within a heavily urbanized area that consistently ranks within the Top 3 Most Congested Roadways in Texas, currently #2, as measured by Texas Transportation Institute (TTI) in 2019, and roadways with the highest Annual Congestion Costs at more than $200M (TTI 2019). Due to existing north-south travel demand and the limited number of alternative parallel controlled-access routes through Austin, I-35 is presently subject to severe traffic congestion for substantial periods of time each day. As population and employment growth continue, current congestion levels along I-35 are anticipated to worsen. The annual average daily traffic (AADT) for the portion of I-35 between US 290 East and US 290 West/SH 71 is estimated at 207,215 vehicles per day (vpd) in 2019 (TxDOT 2019a). By 2045, traffic is expected to reach 303,700 vpd, an increase of approximately 47% over 2019 (TxDOT 2020).

Population increases have occurred over the last several decades within the city of Austin, Austin-Round Rock Metropolitan Statistical Area (Austin-Round Rock MSA), and Travis County, with all three areas more than doubling in population between 1980 and 2010 (Table 1). Subsequently, 10-year growth rates for Austin and Travis County were significantly higher than 10-year growth rates at the state level, except for the city of Austin's 2000-2010 growth rate, which was slightly less than the state average. Population

forecasts for the regions surrounding the study area (Table 2) predict continued growth for the City of Austin and Travis County through 2045 (TDC 2020).

Table 1: Historical Population Data

Jurisdiction	1980	1990	2000	2010
State of Texas	14,229,191	16,986,510	20,851,820	25,145,561
Austin-Round Rock MSA	536,688	781,572	1,249,763	1,716,289
Travis County	419,573	576,407	812,280	1,024,266
City of Austin	345,890	465,622	656,562	790,390

Sources: Texas State Data Center; USCB, Census 2000 and 2010 (Table SF1, DP1)

Table 2: Population Forecasts

Jurisdiction	2018*	Projected 2045	Projected Percent Change
State of Texas	27,885,195	43,866,965	74.5%
Travis County	1,203,166	1,884,155	84.0%
City of Austin	935,755	1,367,879	73.1%

Sources: Texas Demographic Center 2020, City of Austin 2017
*USCB 2020. 2018 5-Year Population Estimates.

Table 3: CAMPO Employment Forecast

Region/Year	2015	2045	Projected Percent Change
Travis County	600,322	1,199,239	99.7%
CAMPO Region	988,712	2,367,070	139.4%

Source: CAMPO 2020

Note: The CAMPO Region includes Bastrop, Burnet, Caldwell, Hays, Travis and Williamson Counties.

Table 3 illustrates the forecast for employment in the CAMPO counties from 2015 to 2045. The Austin metropolitan area added 22,700 net new jobs, or 2.1%, in the 12 months ending in March 2019, according to releases of preliminary payroll jobs numbers by the Texas Workforce Commission (TWC) and the U.S. Bureau of Labor Statistics (BLS) (Kerr 2019). Austin's 2.1% growth makes it the 16th highest growth rate among the 50 largest metro areas during the March 2018 to March 2019 year. According to the Capital Area Metropolitan Planning Organization (CAMPO) Baseline 2045 Demographic Forecast (CAMPO 2020), the CAMPO region anticipates an additional 2.7 million in population and over one million new jobs by 2045 (over the baseline year of 2015). Employment in the Austin-Round Rock MSA increased

nearly 31% between 2007 and 2017. The region's most highly concentrated industries primarily include technology and administration (Texas Comptroller 2018). All population and employment resources analyzed identified the continued growth of the Austin metropolitan area now and in the future.

There is a need to improve the project corridor and increase capacity based on the projected population growth, employment, and travel demand increases. In addition, the projected population increases in the region will further the need for improvements to the bicycle and pedestrian accommodations throughout the corridor.

2.2.2 Travel Time

I-35 is the only interstate highway connecting Mexico, the United States, and Canada through the central part of the United States and is one of two north-south interstate highways traversing Texas. According to the American Transportation Research Institute (ATRI) American Highway Users Alliance 2015 study "Unclogging America's Arteries Prescriptions for Healthier Highways" (ATRI 2015), the portion of I-35 in downtown Austin ranks number 10 on the list of top bottleneck highways in the country. The study estimates that the "annual total delays from this bottleneck amount to 3 million hours at a lost value of time of about $73 million a year."

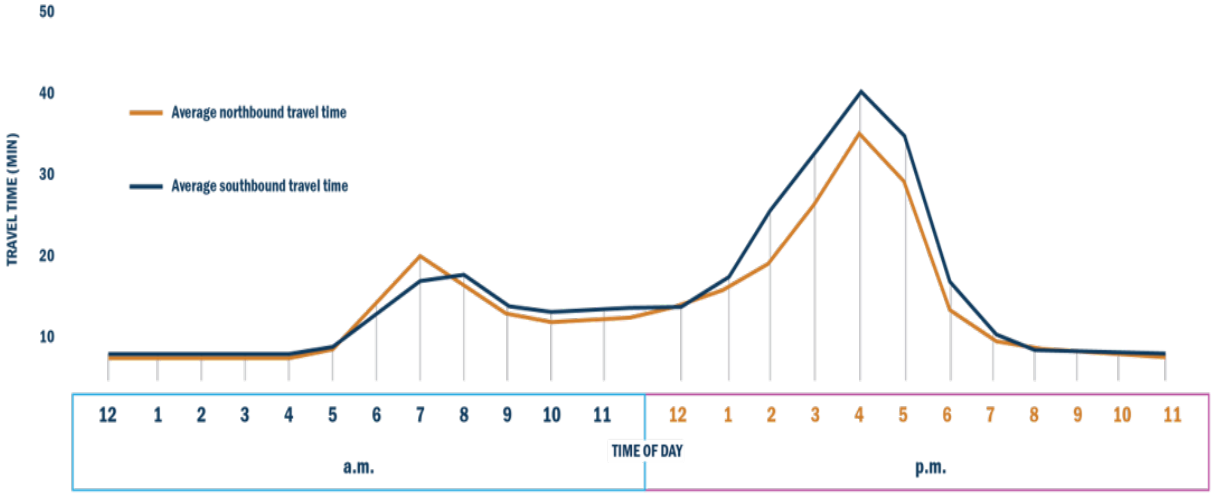
Travel times were collected for the project limits for the year 2019 and projected for the years 2025 and 2045 based on traffic microsimulation models for the corridor. Table 4 shows the existing (2019) AM and PM peak hour travel times, and 2025 and 2045 forecasts along I-35, between US 290 East and US 290 West/SH 71. Peak hours are defined as 7:30 AM to 8:30 AM, and 4:30 PM to 5:30 PM. As Table 4 shows, based on the current projections (2025 and 2045), mobility within the project limits in the near future will become unmanageable without substantive improvements. Figure 1 provides a comparison of corridor travel time at the posted speed limit with actual (2019) travel times throughout a typical weekday.

Table 4: Current and Projected Travel Times on I-35 from US 290 East to US 290 West/SH 71

	2019		2025		2045	
Direction	AM Peak Hour (7:30 AM to 8:30 AM) (mins)	PM Peak Hour (4:30 PM to 5:30 PM) (mins)	AM Peak Hour (7:30 AM to 8:30 AM) (mins)	PM Peak Hour (4:30 PM to 5:30 PM) (mins)	AM Peak Hour (7:30 AM to 8:30 AM) (mins)	PM Peak Hour (4:30 PM to 5:30 PM) (mins)
I-35 NB	19.2	32.2	19.8	131.6	33.6	223.2
I-35 SB	16.6	36.6	16.4	78.3	19.5	208.6

Source: INRIX 2019
2025 and 2045 – I-35 Capital Express Central Project Team Projections

Figure 1: Existing (2019) Travel Times on I-35 During a Typical Weekday



Source: INRIX 2019

According to Figure 1, a one-way trip traversing the project area should take approximately 8 minutes, northbound or southbound. Currently, travel within the project limits on a typical weekday takes between approximately 20 minutes in the morning peak period (approximately 6 AM to 9 AM) traveling northbound, and about 17 minutes traveling southbound. In the evening peak period (approximately 1 PM to 6 PM), the average trip rises to 32 minutes traveling northbound and over 36 minutes traveling southbound. Based on these current estimates, the average commuter's daily round-trip within the project limits can take nearly an hour of time in traffic, more with crashes. The measured current travel times show that I-35 from US 290 East to US 290 West/SH 71 has reduced mobility during a majority of the day---not just during the peak hours of 7:30 AM to 8:30 AM and 4:30 PM to 5:30 PM---demonstrating the need to increase capacity.

2.3 Bicycle and Pedestrian Safety

According to the City of Austin's 2014 Bicycle Plan, updated in 2019 with the Austin Strategic Mobility Plan, approximately three-quarters of the streets that cross this corridor have been identified as being in the Bicycle Priority Network. Per the Bicycle Plan, the City of Austin will use guidance from the National Association of City Transportation Officials, *Urban Bikeway Design Guide* for the selection of bicycle accommodations that meet an all ages and abilities level of comfort (City of Austin 2020). The existing bicycle paths for most cross streets is either a shared lane or a wide curb lane. There is a need to provide safer and more continuous accommodations for bicyclists and pedestrians.

3. Purpose of the Proposed Project

The purpose of the proposed project is to improve this critical regional, national, and international thoroughfare by enhancing safety, managing congestion, improving operational efficiency, and creating a more dependable and consistent route for the traveling public, including bicyclists and pedestrians, emergency responders, and transit.

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