



IH 635 LBJ East Project

Attachment 1 - Project Narrative

FY 2018 BUILD Grant Application



**North Central Texas
Council of Governments**



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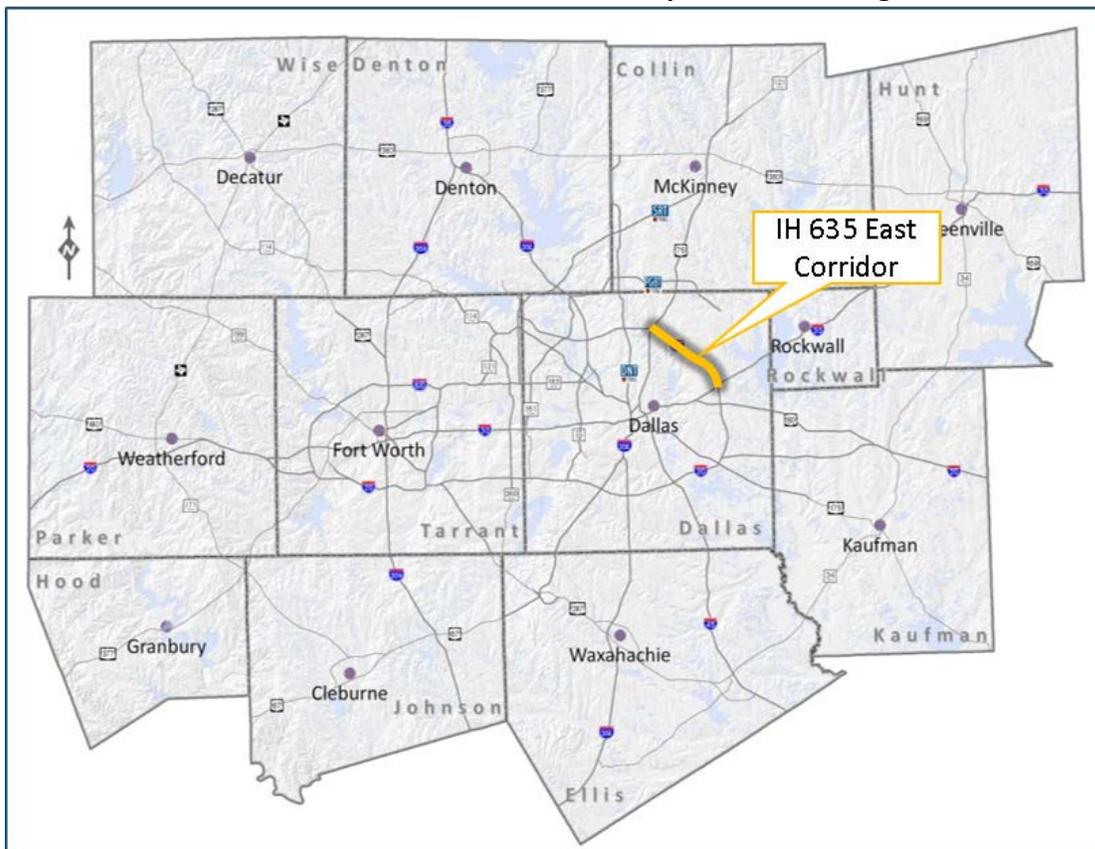
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1.0 Project Description

The North Central Texas Council of Governments (NCTCOG), in cooperation with the Texas Department of Transportation (TxDOT), is seeking funding assistance of **\$25 million** through the Fiscal Year (FY) 2018 Better Utilizing Investments to Leverage Development (BUILD) Discretionary Grant Program application for an 11-mile section of the Interstate Highway (IH) 635 corridor, also locally designated as the Lyndon Baines Johnson (LBJ) Freeway. The project is locally known as the IH 635 LBJ East Project and it extends from United States (US) 75 to IH 30. The IH 635 corridor serves as a major east/west and north/south transportation facility in northern and eastern Dallas County, Texas. It links IH 20, IH 30, IH 35E, US 75, US 80, and the Dallas North Tollway and is a primary link to Dallas Fort Worth International Airport (DFW). Exhibit 1 highlights the project area location with respect to the Dallas-Fort Worth region.

Exhibit 1 – Dallas-Fort Worth Metropolitan Planning Area



Currently, IH 635 has four general purpose lanes and one interim express/high-occupancy vehicle (HOV) managed lane in each direction with discontinuous frontage roads (see Exhibit 2). The proposed improvements from east of US 75 to north of IH 30 will reconstruct and widen the roadway to five general-purpose lanes, one dynamically-tolled managed lane, and two to three continuous frontage road lanes in each direction as shown in Exhibit 3. The proposed project will also reconstruct ramps, frontage roads, cross street bridges, and cross streets. Continuous sidewalks and shared-use lanes for bicycles will be provided along the proposed



frontage roads and cross streets. The proposed project will also include the reconstruction of the IH 635/IH 30 interchange, including all direct connector ramps and some improvements to IH 30. A visualization of the future IH 635 East corridor can be viewed at <https://youtu.be/xrfjYc-Ubr0>.

Exhibit 2 – Existing IH 635 Typical Section

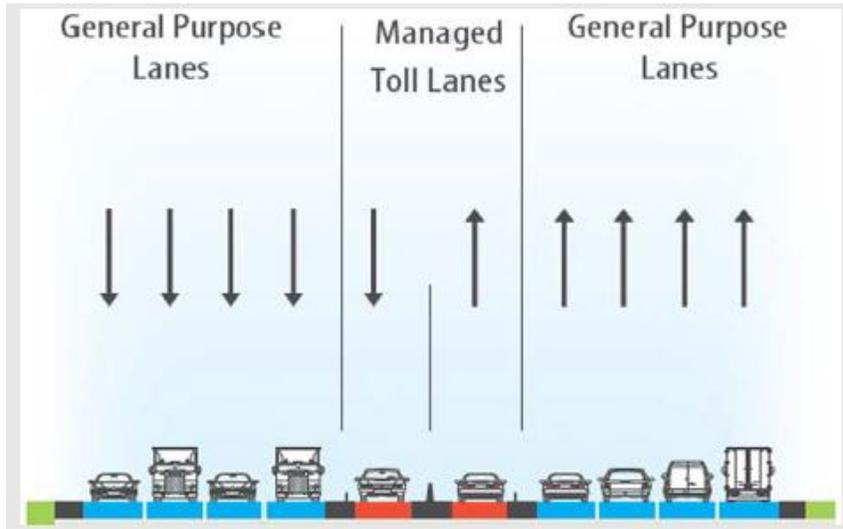
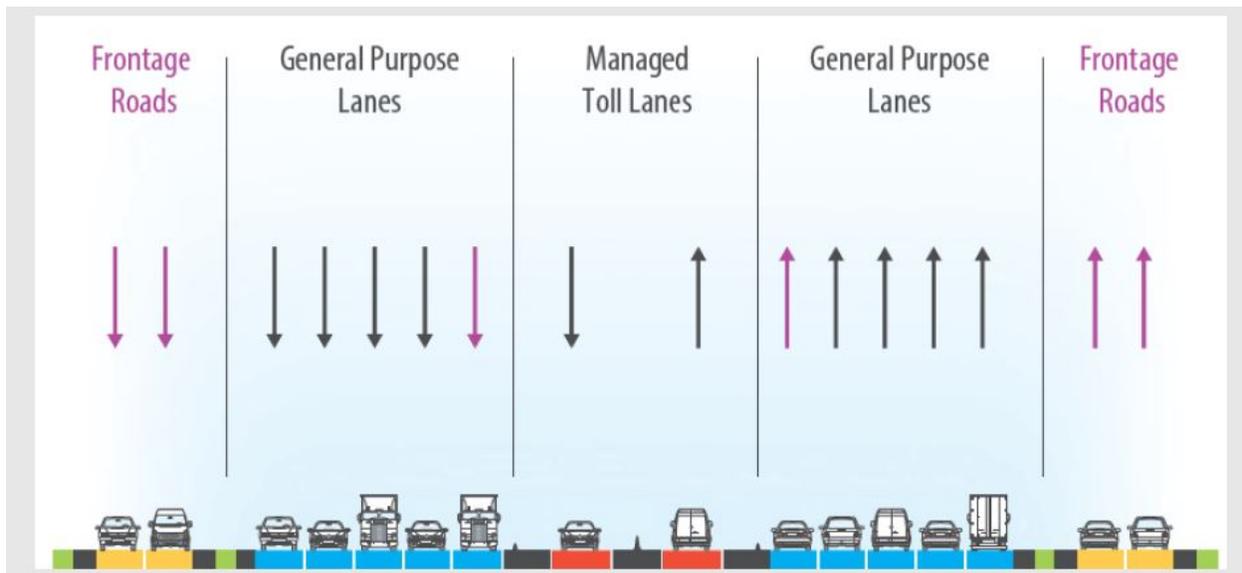


Exhibit 3 – Proposed IH 635 Typical Section





The need and purpose for the proposed improvements to IH 635:

- Provide traffic congestion relief in the IH 635 corridor and surrounding arterial street system
- Provide a continuous frontage road system to maintain local access and provide an alternate route during incidents
- Improve safety
- Provide balanced and improved access by modifying ramps to meet future conditions
- Provide improved cross street/frontage road intersections
- Incorporate dynamic pricing (value pricing) into the corridor to improve traffic management
- Improve operations to the major interchanges at US 75 and IH 30
- Replace the existing facility which is more than 45 years old and has exceeded its design life

1.1 Project History

IH 635 was constructed in the late 1960s and early 1970s to serve as an outer loop freeway and provide mobility for the rapidly growing North Dallas, Garland, and Mesquite areas. At the time of initial construction of the IH 635 facility, residential and commercial developments were just approaching the IH 635 corridor from the south. The original facility was constructed with eight freeway lanes in anticipation of the continuing growth. However, what was considered aggressive planning at the time proved to be insufficient to handle the substantial travel demands placed on the facility. The growth in the corridor led to fully developed surrounding land uses by the mid-1980s.

Formal planning for the IH 635 LBJ East Project was initiated in 2001, and environmental and design approvals were received in 2003. TxDOT began purchasing right-of-way but because of funding constraints, construction was unable to proceed. In 2014, with reconstruction/widening of IH 635 to the west (the LBJ Express Project from IH 35E to US 75) nearing completion and more available funding, the previous approvals for IH 635 LBJ East were reevaluated to account for updated regional demographics and traffic projections, and to consider various locally-requested design changes, including changes to the configuration of various cross streets and operation of the managed lanes.

As an interim measure, to help reduce congestion and improve air quality, TxDOT restriped the corridor to add an HOV lane in each direction in 2008. In 2016, the operation of these HOV lanes was converted to express/HOV lanes to allow single-occupant vehicles to pay a toll to use the lane.

1.2 Costs

The cost to complete the IH 635 LBJ East Project is estimated to be \$1.56 billion (2018 dollars) as shown in Exhibit 4. The original total project cost was \$1.76 billion. This was a conservative estimate as the project is expected to gain significant savings through the design-build process. This innovative process will produce as much as \$200,000,000 in cost reduction. To date, TxDOT has spent approximately \$14.3 million on engineering, \$67.4 million on right-of-way, and



\$24.0 million for noise wall construction (mitigation) for a total of \$105.7 million. Please see Section 4.6.3 for more information on this innovative approach.

Exhibit 4 – IH 635 LBJ East Cost to Complete Estimate

Cost Category	Total Cost	Funding Source	
		Federal (Percent)	Non-Federal (Percent)
Design/Engineering	\$133,000,000	0%	100%
Utility Relocation	\$41,500,000	90%	10%
Right-of-Way	\$219,161,523	39%	61%
Construction	\$1,369,210,694	73%	27%
Potential Design-Build Savings	\$(200,000,000)	N/A	N/A
TOTAL PROJECT COST	\$1,562,872,217		

1.3 Targeted Transportation Challenges

The IH 635 LBJ East Project creates a unique opportunity for the Dallas-Fort Worth region to implement an innovative and efficient process for addressing urban transportation needs while balancing costs and impacts to the community and to the environment. The project is anticipated to significantly help relieve congestion and enhance mobility, connectivity, and reliability along the IH 635 corridor.

1.3.1 Relieving Congestion

According to the 2017 edition of the Texas “100 Most Congested Road Sections,” IH 635 from US 75 to State Highway (SH) 78 ranked as the 20th most congested roadway for all vehicles and 32nd worst for truck congestion. Reference source (<https://mobility.tamu.edu/texas-most-congested-roads/>). The section from SH 78 to US 80 ranks as the 11th worst for all vehicles and 22nd for trucks. Exhibit 5 lists the annual hours of delay and cost of congestion for all vehicles and trucks.

Exhibit 5 – Congestion Rankings

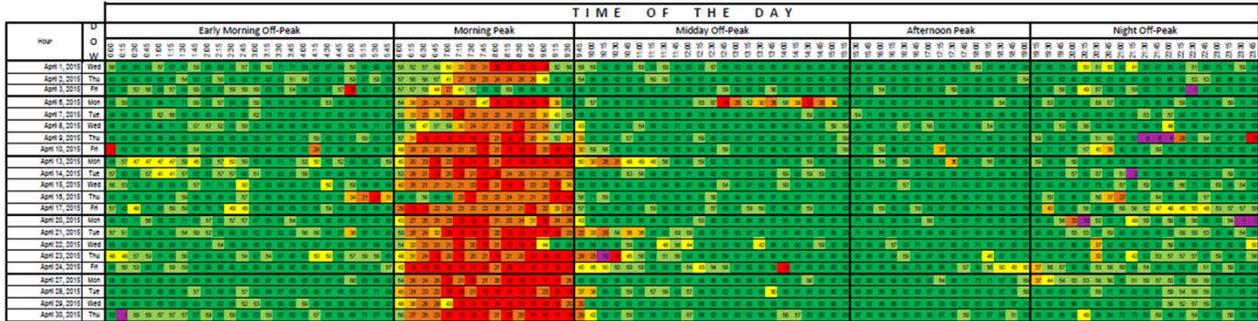
Measure	US 75 to SH 78	SH 78 to US 80
2017 Overall Rank	20	32
2017 Truck Delay Rank	11	22
Annual Hours of Overall Delay (person-hours)	3,086,278	2,249,644
Annual Hours of Truck Delay (person-hours)	222,210	161,521
Annual Overall Congestion Cost (\$)	\$63.2 million	\$11.1 million
Annual Truck Congestion Cost (\$)	\$46.0 million	\$8.1 million

Source: Texas Transportation Institute, 2017

Additionally, NCTCOG utilized speed data from the Federal Highway Administration (FHWA) to create speed thermal maps to evaluate current speeds, duration of peak periods, and delay on area roadways by time of day. Exhibit 6 denotes the speeds for the northbound IH 635 general purpose lanes at Skillman Avenue in April 2015. The morning peak period is 6:15 am to 9:30 am on most weekdays.



Exhibit 6 – Speed Thermal for Northbound IH 635 at Skillman Avenue (April 2015 Data)



Legend: Purple (1-10 mph), Red (11-20 mph), Orange (21-30 mph), Gold (31-40 mph), Yellow (41-50 mph), Light Green (51-60 mph), Dark Green (61-70 mph)

In terms of vehicular volume, IH 635 is one of the most traveled roads in Texas and is forecast to experience significant traffic growth by 2040. According to demographic forecasts, the populations of the cities adjacent to IH 635 (Dallas, Garland, and Mesquite) are anticipated to experience 25 percent cumulative growth between 2010 and 2040. The existing corridor is experiencing significant congestion today and does not have the capacity to handle the anticipated growth. The additional general purpose lanes, managed lanes, and ramp improvements will help relieve current and future congestion by adding capacity and improving operations.

1.3.2 Enhancing Mobility, Connectivity, and Reliability

Mobility 2045: The Metropolitan Transportation Plan for North Central Texas (Mobility 2045), www.nctcog.org/trans/mtp/2045/ is the defining vision for the multimodal transportation system in the Dallas-Fort Worth Metropolitan Planning Area (MPA). The focus of *Mobility 2045* is providing transportation choices. North Central Texas is a dynamic, diverse, and rapidly growing region whose residents increasingly require a range of transportation options to serve their varied travel needs. As the region grows to an estimated 11.2 million by 2045, it will require a maturing transportation system of roads, public transportation, and bicycle and pedestrian facilities, complemented by local policies and programs to enhance infrastructure investment. These efforts will provide transportation choices to the traveling public and improve the quality of life driving the growth in the region.

The IH 635 LBJ East Project is a major roadway element in *Mobility 2045*. As stated in Section 1.3.1, the project will add travel lanes to help relieve congestion, which will improve mobility for motorists and freight. Multimodal design elements integrated within the project will support increased use of transit, bicycle, and pedestrian modes in the corridor (please see Section 4.4).



As previously mentioned, IH 635 LBJ East links three interstate highways (IH 20, IH 30, IH 35E), US 75, US 80, and the Dallas North Tollway, and the corridor overall provides a primary link to Dallas-Fort Worth International Airport. The IH 635 LBJ East improvements will enhance the connectivity to these other major freeways/tollways, transit, and bicycle/pedestrian facilities. The addition of continuous frontage roads will provide a parallel corridor to improve connectivity between cross streets, help facilitate local trips and improved accessibility to/from adjacent properties, and provide an alternate route during incidents and accidents along the general purpose lanes.

Managed lanes are a vital component of *Mobility 2045*. This type of lane provides a more efficient use of roadways and is a more appropriate response to growing environmental and fiscal constraints in addressing transportation needs. Managed lanes improve traffic operations and

maximize the efficiency of a roadway through active management of the lanes, which 1) make higher speed reliable travel available to all corridor users; 2) creates opportunities to examine operation and pricing strategies for the region; and 3) generates revenue to pay for ongoing corridor operation and maintenance. The six managed lanes on LBJ Express (IH 635 from IH 35E to US 75) opened to traffic in December 2015. The proposed managed lanes on IH 635 LBJ East will connect to and extend the system. Exhibit 7 shows the managed lanes currently operating in the Dallas-Fort Worth region.

Exhibit 7 – Dallas-Fort Worth Managed Lane (TEXpress) System



As a comparison, the LBJ Express Project (IH 635 from IH 35E to US 75) is one of the most critical projects completed in north Texas in recent decades and opened to traffic in 2015. LBJ Express is one of the most travelled corridors in the state accommodating nearly 500,000 trips daily and providing access and connectivity between other major transportation corridors. Currently, this section of IH 635 LBJ carries approximately 25 percent more vehicles than it did prior to its recent construction with peak period speeds more than 50 percent higher than before implementation, resulting in 60 percent less congestion. The managed lanes operate at a speed near 70 mph even during the peak periods, with a third of its users being new to the lanes each month. The managed lanes provide a reliable travel option in an extremely high demand corridor at a reasonable cost for users. Almost all commuters

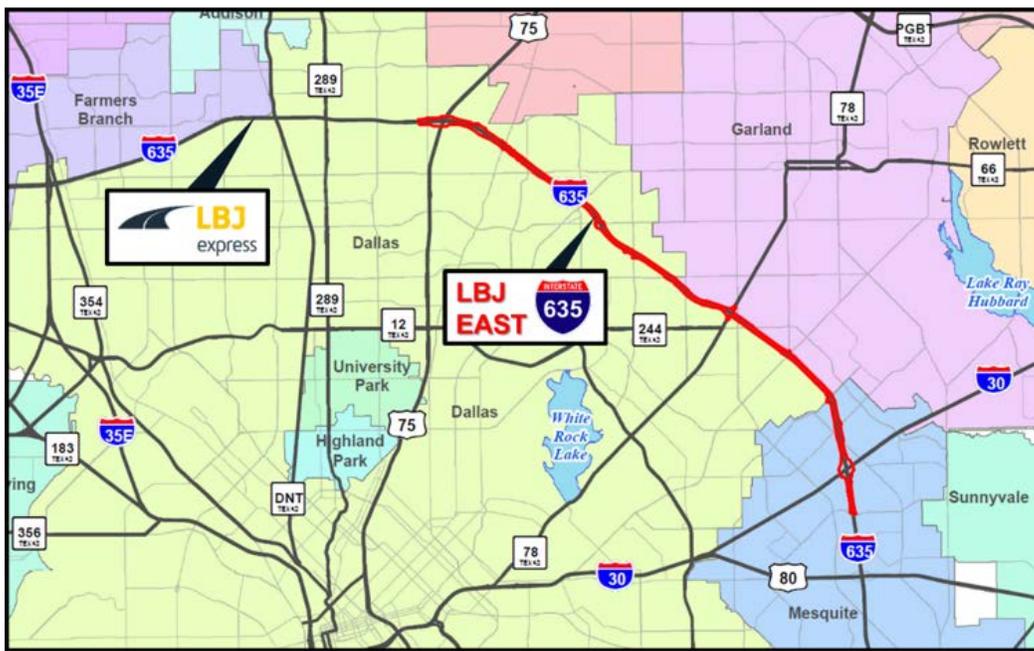


(98 percent) only use the lanes when time savings and reliability are important for that trip, with an average toll bill of approximately \$10 monthly.

2.0 Project Location

The IH 635 LBJ East Project is located in the northeast portion of Dallas County and is within the cities of Dallas, Garland and Mesquite, which is within the US Census-designated Dallas-Fort Worth-Arlington Urbanized Area. The project also includes IH 30 from west of Gus Thomasson Road to east of Galloway Avenue. Exhibit 8 shows the limits of the project. This project will tie into the recently reconstructed LBJ Express Project (from IH 35E to US 75) that was opened to traffic in 2015.

Exhibit 8 - Project Location Map



The Dallas-Fort Worth MPA is one of the fastest growing areas in the country. The population of the North Central Texas region has increased from 2.4 million in 1970 to over 7.2 million in 2017, an increase of 200 percent. A significant part of this growth has occurred in the project area of northern and eastern Dallas County. Exhibit 9 highlights both the past trends and future forecasts for population growth within the adjoining cities along IH 635, Dallas County, and the 12-county MPA. While forecasted city populations are expected to slow as they approach build out within their jurisdictions, growth elsewhere in the region (particularly in Dallas County) and the strong economic draw of the area will continue to attract significant traffic surges over time.



Exhibit 9 – Population Trends and Forecasts for Project-Related Locations

Location	1980 Census	1990 Census	2000 Census	2010 Census	2040 Forecast	Growth 2010-2040
Dallas	904,078	1,006,877	1,188,580	1,198,816	1,531,680	27%
Garland	138,857	180,650	215,768	226,876	243,522	7%
Mesquite	67,053	101,484	124,523	139,824	186,335	33%
Dallas County	1,556,390	1,852,810	2,218,899	2,368,139	3,107,541	31%
NCTCOG 12-County MPA	3,116,152	4,111,750	5,309,277	6,539,950	10,676,844	63%

The 2017 population within one-mile of the corridor is almost 150,800. This is predicted to increase to over 180,000 people by 2040, a growth of over 19 percent. The employment within one mile of the corridor is forecasted to grow from almost 149,800 jobs in 2017 to 241,100 in 2040, or over 60 percent. Exhibit 10 shows existing average daily traffic counts and future traffic projections for the freeway segments within the project area. The projected high traffic growth for IH 635 LBJ East is attributed to forecasted population increases for both adjacent cities and the North Central Texas region at-large. The additional roadway capacity included as part of the IH 635 LBJ East Project is needed to facilitate traffic generated by rapid population and employment growth in the cities of Dallas, Garland, and Mesquite.

Exhibit 10 – Current and Future Daily Traffic Volumes

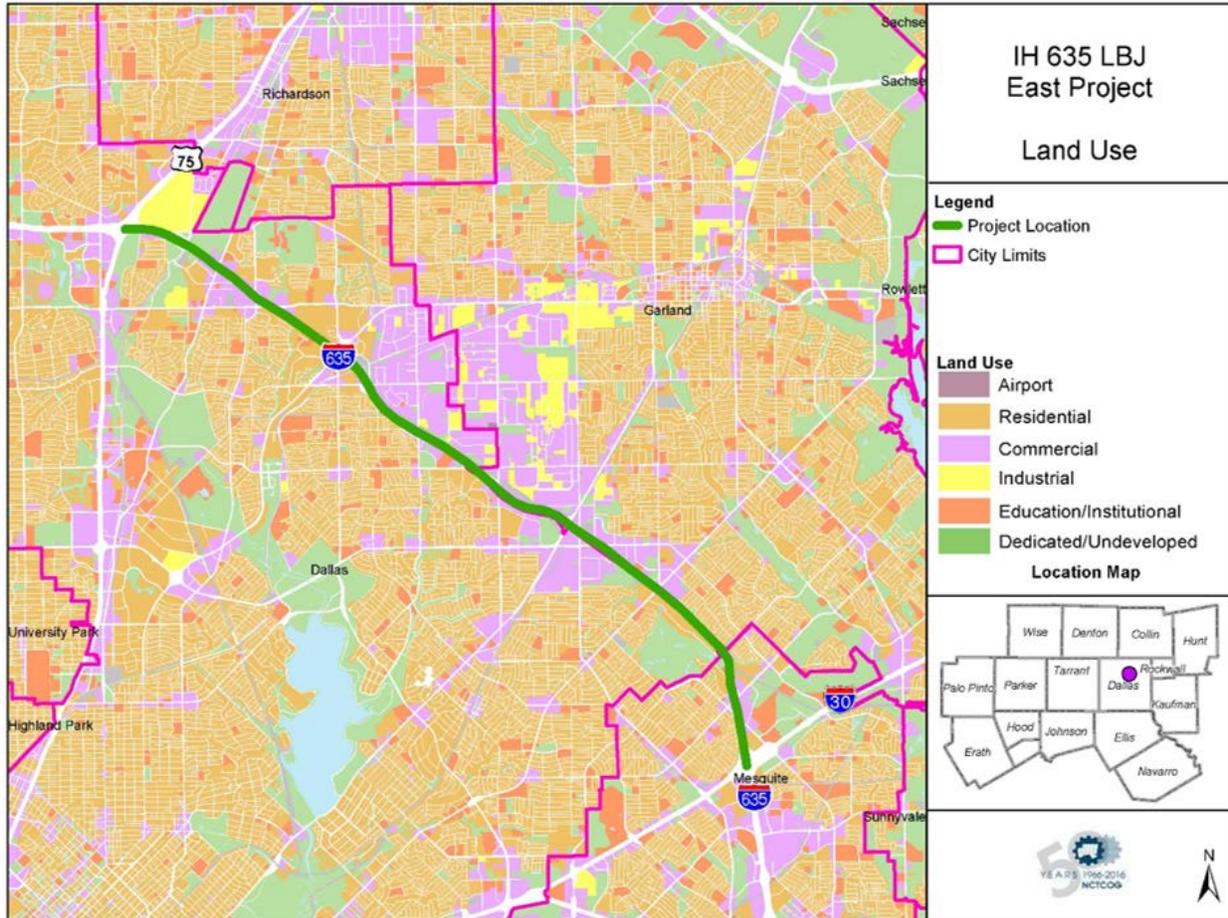
Location	2017 Traffic Volumes	2040 Traffic Volumes	Change	Percent Change
IH 635 (US 75 to Royal Lane/Miller Road)	225,700	267,000	41,300	18%
IH 635 (Royal Lane/Miller Road to SH 78)	218,400	239,600	21,200	10%
IH 635 (SH 78 to IH 30)	230,300	252,000	21,700	9%

Source: NCTCOG travel demand model

The type, intensity, distribution, and availability of specific land uses is an important determinant for identifying travel demand characteristics and prioritizing transportation needs. Exhibit 11 shows the land use in the project area.



Exhibit 11 – Existing Project Area Land Use



The overall intensity and distribution of residential and commercial development is further reflected in Exhibit 12, which highlights population density. While population density is a key indicator of transportation needs in most other cases, movements around IH 635 are governed more because it is one of the most concentrated industrial and commercial employment centers in the Dallas-Fort Worth region.



Exhibit 12 – Existing Project Area Population Density

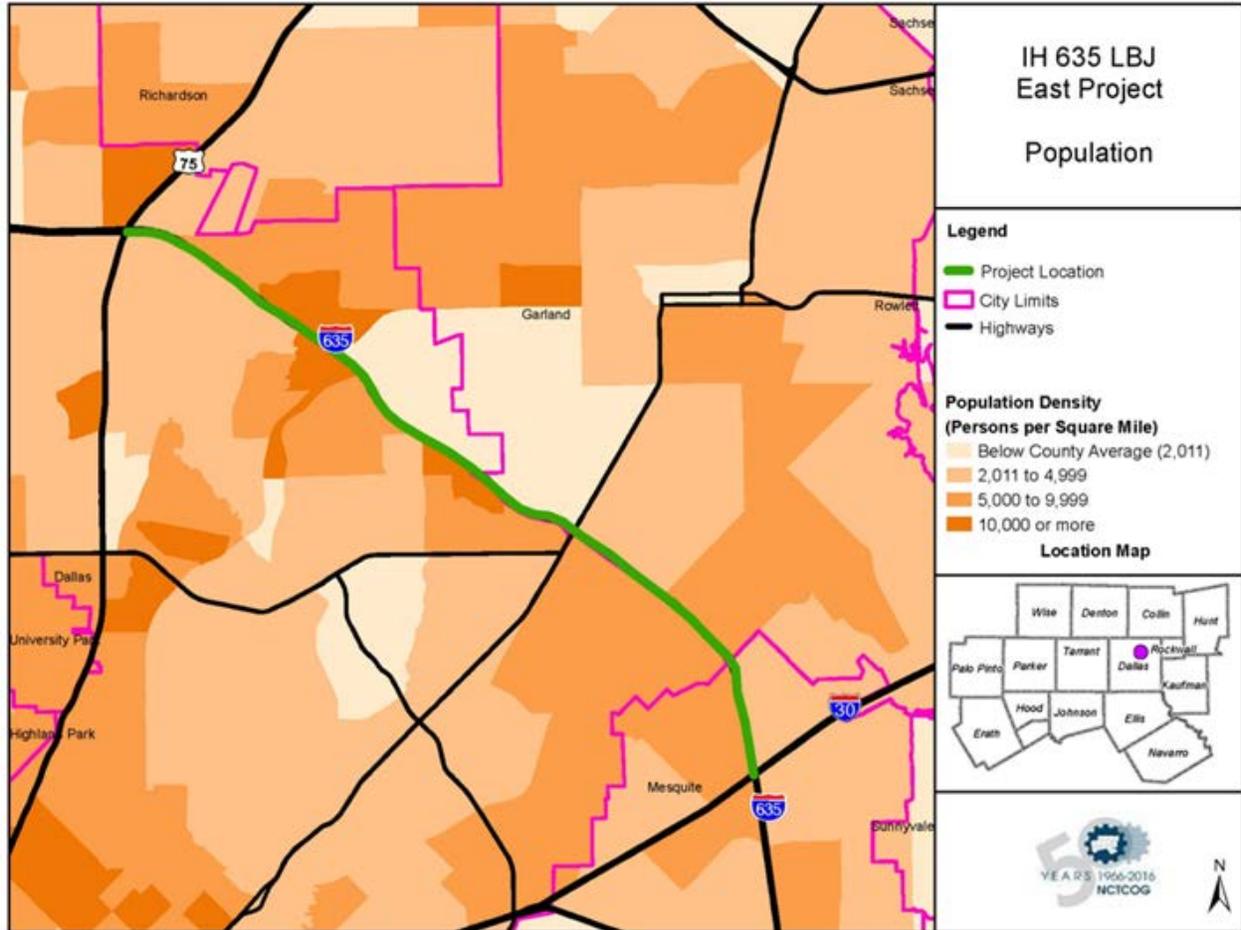
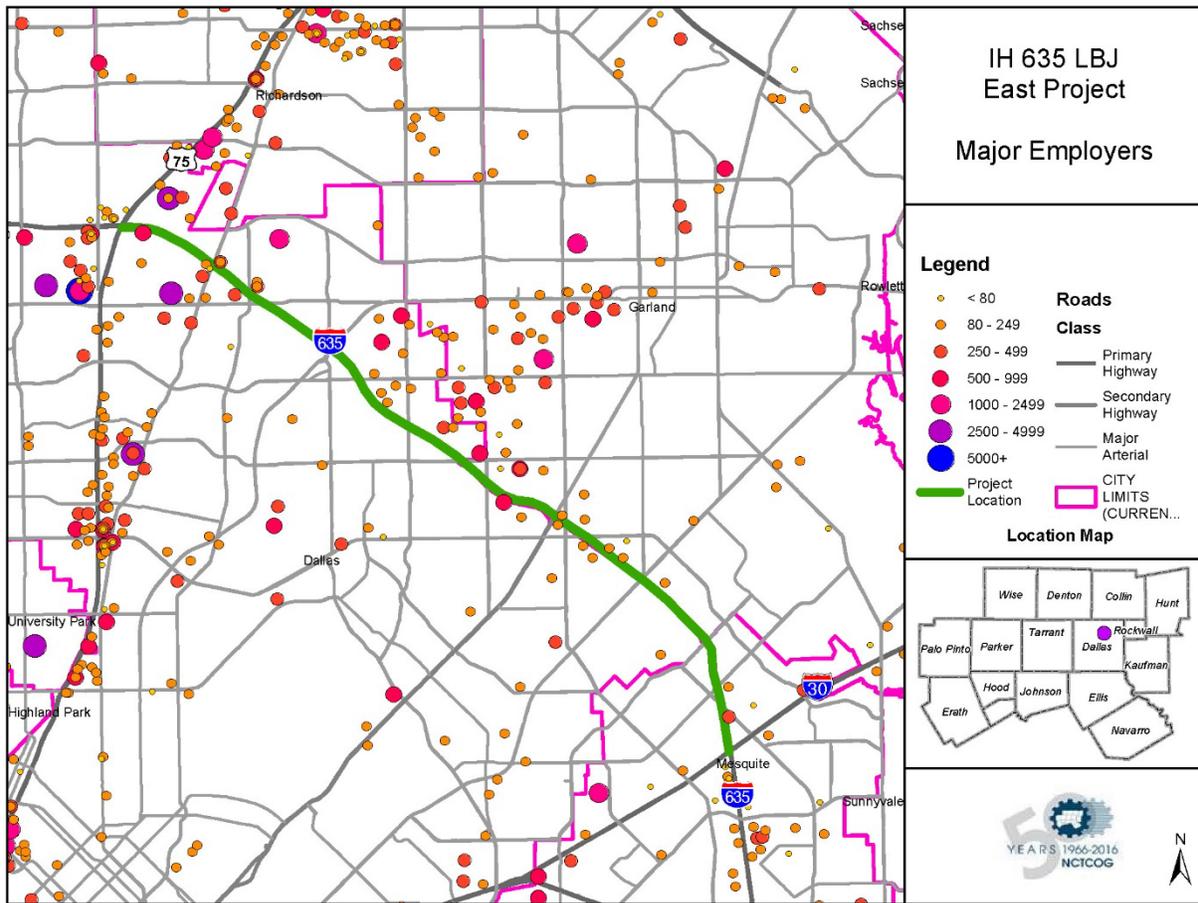


Exhibit 13 displays the size and location of major employers in the vicinity of IH 635. The map shows the largest clusters of employers closest to the project location occur near the IH 635/US 75 interchange and north of the project near its intersection with Royal Lane/Miller Road.



Exhibit 13 – Project Area Major Employers



3.0 Grant Funds, Sources, and Uses of Project Funds

While Exhibit 4 above details the estimated project costs by category to complete the project IH 635 LBJ East Project (in 2018 dollars), Exhibit 14 describes the project funding sources. The amount of this FY2018 BUILD Grant request is **\$25 million**, designated for construction. To date, TxDOT has spent approximately \$14.3 million on engineering, \$67.4 million on right-of-way, and \$24.0 million for noise wall construction (mitigation) for a total of \$105.7 million. The IH 635 LBJ East Project is proposed to be built with **64 percent federal funds and 36 percent state, local, and private funds**. The \$1,762,872,217 total for funding is a conservative total, as potential efficiencies and other advancements through the design-build process are expected to help lower total cost. This innovative process could produce as much as \$200,000,000 in savings. Please see Section 4.6.3 for more information on this innovative approach.



Exhibit 14 – IH 635 LBJ East Project Funding Summary

Funding Source	Type	Funding Amount	Percent
State	TxDOT Engineering Funding	\$133,000,000	7.54%
State	TxDOT Right-of-Way Funding	\$122,957,325	6.90%
State	TxDOT Funding (Category 11, Category 4, Category 12)	\$124,826,133	7.08%
State/MPO	State Match to CMAQ	\$5,000,000	0.28%
State/MPO	State Match to STBG	25,000,000	1.42%
State/MPO	State Match to Category 2	96,600,000	5.48%
Private Sector	Private Funding Paid Up-front, Repaid with Toll Revenue	\$125,000,000	7.09%
Local	Local Funds	\$3,579,931	0.20%
Total of Non-Federal Funding Sources		\$635,963,389	36.00%
Federal	TxDOT Funding (Category 11, Category 4, Category 12)	\$499,304,530	28.32%
Federal/MPO	CMAQ Federal Share	\$20,000,000	1.13%
Federal/MPO	STBG Federal Share	\$100,000,000	5.67%
Federal/MPO	Federal Share of Category 2	386,400,000	21.92%
Federal	TxDOT Right-of-Way Funding	\$96,204,298	5.46%
Federal	BUILD Grant	25,000,000	1.42%
Total of Federal Funding Sources		\$1,126,908,828	64.00%
Potential Design-Build Savings		\$(200,000,000)	N/A
TOTAL PROJECT FUNDING		\$1,562,872,217	100.00%

4.0 Merit Criteria

4.1 Criterion #1: Safety

Within the project area, a total of 6,107 crashes were recorded along IH 635 between 2010 and 2015, as well as 398 crashes on IH 30 (see Exhibit 15). Of the total recorded crashes on both roadways, there were 63 fatality crashes and 2,874 injury crashes. The most common types of crashes on IH 635 were rear-end vehicle (37.2 percent) and angle/sideswipe (33.1 percent). The average annual crash rate for IH 635 is 60 percent higher than the statewide average annual crash rate for similar urban interstates in Texas in the same period. The average annual crash rate for the portion of IH 30 within the IH 635 LBJ East study area was 60 percent lower than the statewide average. However, IH 30 had a higher percentage of fatality and incapacitating injury crashes compared to IH 635. Much of the original IH 635 facility remains unimproved and predates various current-day design standards for numerous freeway attributes. Throughout the majority of the corridor, the inside shoulder widths are substandard and some bridges do not have adequate vertical clearance.



To help reduce future crashes, the proposed IH 635 improvements will reconstruct IH 635 to current design standards (e.g., lane widths, shoulder widths, horizontal and vertical alignments, acceleration and deceleration lengths, sight distances), lessen weaving conflicts, and provide on-street bike accommodations and pedestrian accommodations (sidewalks) on frontage roads and cross streets.

Exhibit 15 – Crash Data (2010 to 2015) Analysis

	IH 635	IH 30
Total Crashes	6,107	398
Severity		
Fatality	50 (0.8%)	13 (3.3%)
Injury	2,637 (43.2%)	237 (59.5%)
Non-Injury	3,331 (54.5%)	114 (36.2%)
No Information	89 (1.5%)	4 (1.0%)
Crash Type		
Single Vehicle	1,494 (24.5%)	177 (44.5%)
Rear End	2,273 (37.2%)	152 (38.2%)
Angle/Sideswipe	2,024 (33.1%)	61 (15.3%)
Head On	316 (5.2%)	8 (2.0%)
Crash Rate (per 100 million Vehicle Miles Traveled)	174.72	106.90

4.2 Criterion #2: State of Good Repair

As mentioned previously, the IH 635 LBJ East corridor between US 75 and IH 30 was originally built during the late 1960’s and early 1970’s. As a result, the existing infrastructure assets have exceeded their design life and current operations are greatly influenced by design elements that are insufficient compared to current standards. Though recent evaluations have indicated that corridor pavement and bridge sections remain either in good or fair condition, the age of the facility, numerous and previously approved design exceptions, and lengthening periods of congestion are degrading functionality beyond what further maintenance may overcome. In terms of operations, an eight-lane urban freeway (with 10 percent trucks) at level-of-service E carries approximately 158,200 vehicles per day. As shown in Exhibit 10, this section of IH 635 LBJ East currently exceeds this volume by 40 percent. This greatly affects the reliability of the facility and contributes to the high crash rate (see Section 4.1).

TxDOT will be utilizing a design-build project delivery approach for the IH 635 LBJ East Project. This method has been applied more frequently for large projects in Texas compared to most other states, and all such past, present, and planned applications statewide have incorporated extensive provisions for ongoing capital maintenance, routine maintenance, and operations. The project will include a five-year comprehensive maintenance agreement and a warranty that covers an extended period of time beyond final project delivery with renewals to follow.

The quality assurance provisions that have been included with TxDOT design-build projects generally exceed those of more traditional project delivery methods, in addition to contractor obligations for maintenance that can extend well beyond the substantial completion of a project. Though TxDOT design-build projects have not been in operations for a long period of time, it is expected that design-build projects will ultimately result in higher quality, increased life-cycle functionality, and reduced public agency risks over time. Additional details regarding TxDOT design-build agreement general conditions, standard specifications, the Quality



Assurance Program, and other resources may be reviewed through the TxDOT Strategic Contracts Management web page: www.txdot.gov/inside-txdot/division/debt/strategic-projects.html.

The IH 635 LBJ East Project represents the final phase of ultimate improvements from west of IH 35E in Farmers Branch to US 80 in Mesquite. With the Mesquite section (IH 30 to US 80) completed in 2002, the IH 635/US 75 “High-Five” Interchange completed in 2005, and the LBJ Express Project completed in 2015, this project will bring more than 20 consecutive miles of IH 635 into modern and consistent standards for traffic design, operations, construction materials, drainage conveyance, mitigation elements, and utility easements that benefit a continued state of good repair.

Additionally, the inclusion of tolled managed lanes provides a long-term sustainable revenue source to support reliable routine maintenance throughout the project area over time once design-build contractor obligations have concluded. This practice is consistent with other North Central Texas freeway corridors containing tolled managed lanes, ensuring that targeted maintenance needs and other lifecycle improvements may not have to compete with other similar projects statewide for general maintenance funding. It is estimated that the IH 635 LBJ East tolled managed lanes could provide as much as \$200 million in revenue over the design life of the project to fund various maintenance and operational improvements throughout the corridor. These funds could also be used to ensure that the purpose and functionality of the managed lanes could evolve over time so that alternate forms of congestion mitigation, trip purposes, and/or vehicle automation may be accommodated as needs arise (please see Section 4.6.1 for more information).

4.3 Criterion #3: Economic Competitiveness

As the fourth largest metropolitan area in the U.S., the Dallas-Fort Worth region is responsible for one-third of the Gross Domestic Product of the State of Texas. The North Central Texas region is centrally located within the lower 48 states, allowing it to serve as a primary distribution center, or inland port, for the southwestern U.S. and the nation. Trucks leaving the region can reach the majority of the country within 72 hours. The region is also at a crossroads of the east-west transcontinental rail from the ports of Los Angeles/Long Beach to the eastern U.S. and the north-south transcontinental rail lines from Mexico and the Port of Houston to the Upper Midwest.

Transporting freight is a key component of the regional economy. Over 317,000¹ tons of freight move to and from the region in a single year, and of this tonnage over 249,000 tons or 78 percent of the total is moved by trucks. Moving this much freight through the region requires a well-developed highway system. A key component to this system is freight movement on IH 635. One example of this is the just-in-time delivery of parts from manufacturers along IH 635 being delivered to the General Motors Assembly Plant in Arlington, Texas.

¹ All tonnage numbers come from FHWA FAF4.



There are over 16,000 trucks that travel through the IH 635 corridor each day, which is almost 10 percent of all traffic.² This corridor has several freight attributes located along or near it. The IH 635 corridor is part of the Federal National Freight Highway System (NFHS). Several of the Critical Urban Freight Corridors (CUFCs) in the region connect to or are near IH 635. These CUFCs include SH 78, which connects the Kansas City Southern (KCS) Intermodal Facility in Wylie to the NFHS, as well as to Big Town Boulevard and US 80, both of which connect Freight Oriented Developments (FOD) and the Union Pacific Mesquite Intermodal Facility to the NFHS. Exhibit 16 shows the location of these FODs in relation to the project. The freight developments in the area include:

- 1 – Northgate Business Park, one of the largest FODs in the region
The FOD is 3,776 acres, an area larger than downtown Dallas with multiple major distribution operations including Plastipak, Fossil, Sears Logistics Services, PETCO, Prime Distribution Services, and UPS.
- 2 – Casa Linda Industrial District (includes a KCS Rail Facility)
Major freight-oriented businesses include Texas Cartage, KCS, YRC Freight, US Ink, and Eastpoint Business Center featuring Coca-Cola and Americold Logistics.
- 3 – Skyline Industrial is a major freight-oriented development with UPS, FS Alloys, and Hayes Company as prominent distribution operators.

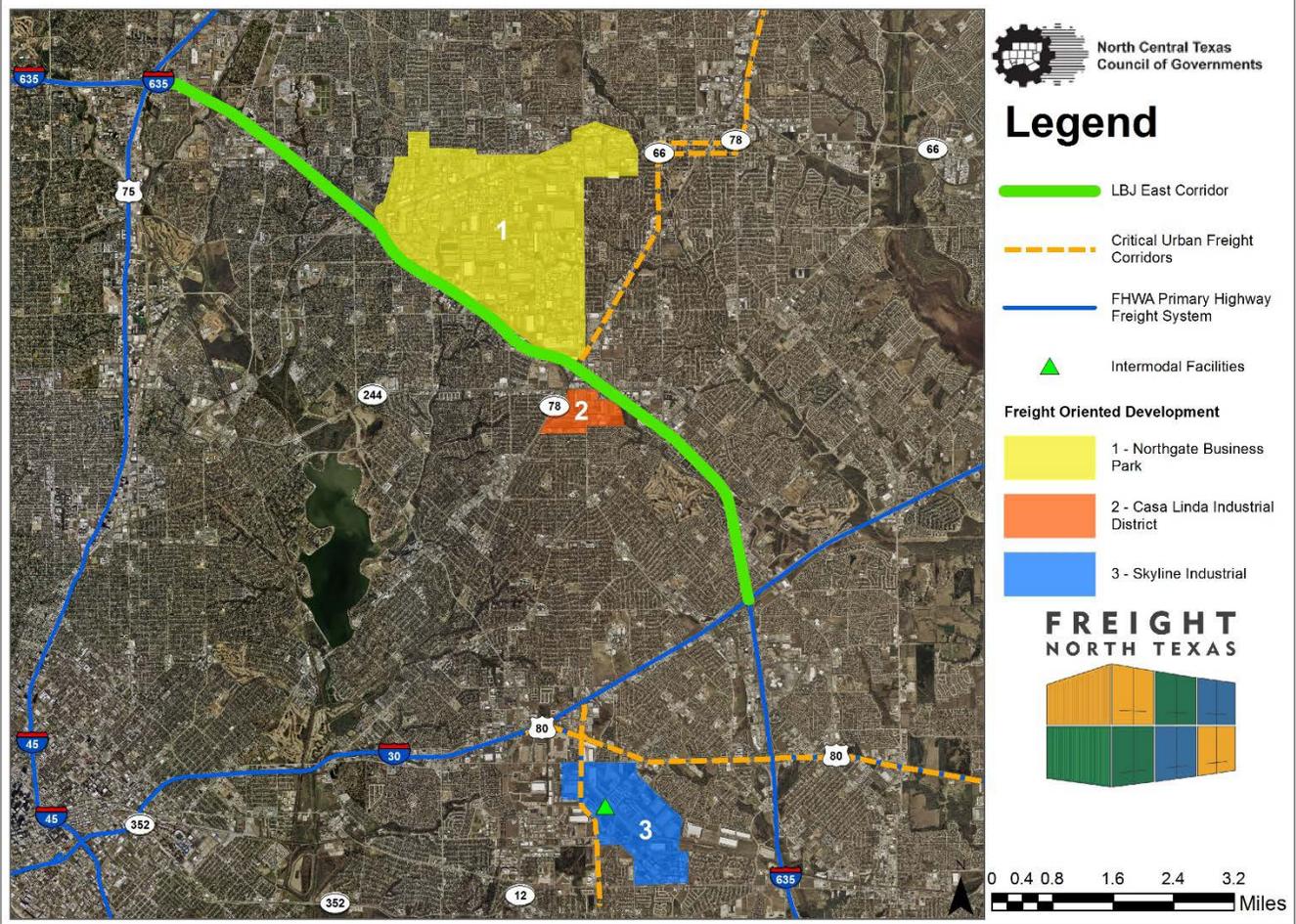
Reliable roads are vital to the efficient movement of freight. This point has been highlighted by the use of Truck Travel Time Reliability as a federal performance measure. In recent years, the freight industry has placed a strong emphasis on “just in time” delivery. This has led to drivers and trucking companies using managed lane and toll facilities in increasing numbers and is a common practice on the LBJ Express Lanes west of the project area. Managed lanes can increase the reliability of freight traffic and enhance the economic competitive edge.

IH 635 is a major connection from DFW Airport. It provides access to numerous radial freeway facilities including IH 35E, US 75, IH 30, US 80, and IH 20. These are all significant regional freight corridors where considerable volumes of freight are transported daily, through the region to destinations across the U.S. The IH 635 LBJ East Project will enhance freight movements in the project area and the region, including along numerous connecting and parallel roadways. Improved traffic movement along freight-heavy corridors such as IH 635 will reduce shipping costs and increase efficiency both for the region and the nation, particularly since the region is a recognized national and international freight hub.

² Traffic information taken from TxDOT Planning Map:
www.txdot.gov/apps/statewide_mapping/StatewidePlanningMap.html



Exhibit 16 – IH 635 LBJ East Freight Features



4.4 Criterion #4: Quality of Life

The IH 635 LBJ East Project will improve access to two existing Dallas Area Rapid Transit (DART) light rail stations and one park-and-ride facility along the corridor. The LBJ Central Station is located near US 75/TI Boulevard and serves both the Red Line and Orange Line as well as five bus routes. The LBJ Skillman Station serves the Blue Line plus five bus routes and is located on the northeast side of IH 635 between Skillman Street and Miller Road. The South Garland Transit Center is located on the westbound frontage road between Shiloh Road and Leon Road and serves 11 bus routes. These three facilities provide access to numerous employment, education, medical, park, shopping, and entertainment venues within the region. The overall DART transit system includes 93 miles of light rail, 34 miles of commuter rail, and 14,000 bus stops across a 700-square-mile service area.

The IH 635 LBJ East Project will enhance cycling within the corridor by including wide outside lanes along the frontage roads and cross streets that can be shared by vehicles and bicyclists. Six-foot wide sidewalks would also be constructed along the frontage roads. At all cross streets, the design includes the wide curb lane for cyclists and sidewalks ranging from 6 to 14



feet. The sidewalks, crosswalks, and signals will comply with the Americans with Disability Act. The project design maintains the existing pedestrian bridge north of the DART Blue Line and accommodates two future grade-separated trail crossings near the KCS railroad crossing and Long Branch Creek, that will help extend the regional trail system.

Such provisions for multimodal travel, both through and across the IH 635 corridor, encourage more diverse travel choices and improved markets for both transportation and land development. Efforts to support noise reduction are also important livability considerations. The IH 635 LBJ East Project includes the construction of 11 noise barriers to reduce impacts to neighborhoods adjacent to the corridor. Eight of these walls are currently under construction, ahead of the freeway reconstruction, to help minimize impacts during construction.

4.5 Criterion #5: Environmental Protection

The IH 635 LBJ East corridor is within an urbanized setting but does cross at numerous creeks and tributaries. To the greatest extent possible, impacts to the natural environment have been avoided.

While no federally-listed threatened or endangered species will be impacted, there is a possibility that the state-listed threatened timber rattlesnake and two species of greatest conservation need (plains spotted skunk and Texas garter snake) may be present in the forested riparian habitat along various perennial streams that cross IH 635. Best management practices for these species, along with freshwater mussel best management practices, will be implemented during construction and no adverse impacts are expected.

Any potential impacts to water quality will be minimized by best management practices per Section 401 of the Clean Water Act. Additionally, TxDOT is developing a comprehensive permanent best management practice plan for reducing storm water total suspended solids (TSS) within the IH 635 LBJ East Project right-of-way. The primary TSS best management practices under consideration include the use of enhanced vegetation swales, below-ground hydrodynamic devices, and detention ponds within the roadway right-of-way to enhance the effectiveness of measures to reduce TSS in local streams.

Along the 11-mile limit, the project will impact less than one acre of water and approximately 0.02 acres of wetlands at 12 crossings. All crossings would be authorized under nationwide permits.

Ten counties in the Dallas-Fort Worth area are classified as nonattainment for ozone. While regional air quality has improved since the Clean Air Act of 1990, the region still does not meet the amended federal standard. Failure to meet federal standards for air quality could result in additional emission control requirements that negatively affect local businesses.

Transportation is a significant source of air pollutants. Planned transportation improvements must not degrade air quality and must pass air quality conformity requirements. Efforts to address air pollution include reducing the number of miles that vehicles travel by expanding



transit, bicycle/pedestrian facilities, and travel reduction programs to reduce emissions-causing congestion and elevate public education campaigns.

4.6 Criterion #6: Innovation

4.6.1 Innovation – Technology

Exhibit 17 – Dynamic Pricing on Tolled Managed Lane



Source: LBJ Infrastructure Group

Innovative Electronic Toll Collection (ETC) will be implemented along the facility allowing for the free flow of traffic without requiring vehicles to stop and pay tolls. The ETC system will be interoperable with other regional and statewide tolling networks currently in place. As mentioned in Section 1.3.2, the managed lanes will use dynamic congestion-management pricing to help manage traffic flow and provide faster, more predictable travel (see Exhibit 17). Roadside equipment will recalculate real-time prices every five minutes, 24 hours a day. As traffic levels and demand

increase, the toll price will change to keep vehicles moving. Once traffic volumes drop, the price will go down. A modern congestion management dynamically-priced facility that is focused on maintaining guaranteed speeds on the managed lanes will be constructed.

Intelligent Transportation System (ITS) devices are planned to be an integral part of the proposed IH 635 LBJ East Project. The type of traffic monitoring technology includes closed-circuit television cameras, vehicle detection devices, and dynamic message signs. Traffic monitoring technologies detect incidents in a timely manner to gain quicker responses from first responders and law enforcement. The speed at which an incident is detected affects the incident clearance time as well as roadway clearance time and the potential time of disruption to the other motorists.

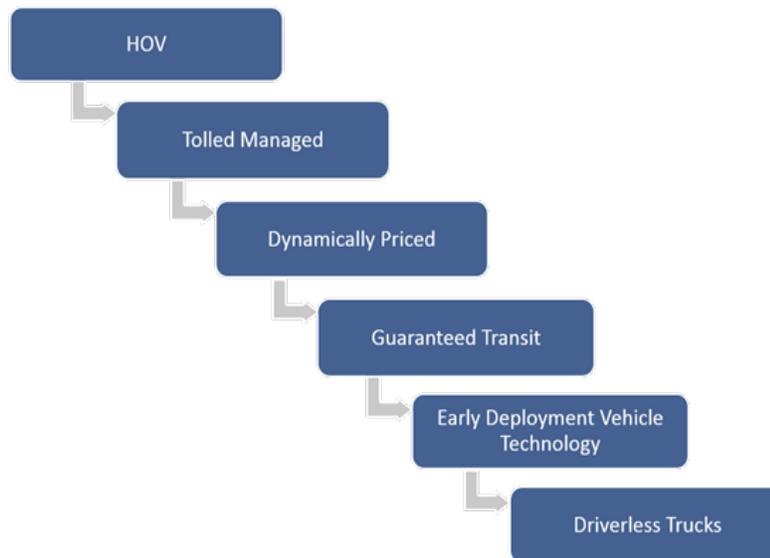
ITS technologies will also provide a truck parking information system that displays real-time truck parking availability along the corridor. In addition to truck parking, the DFW region has the ability to provide route options for through truck traffic. Utilizing the roadway infrastructure and traffic information, specific routes for trucks, based on current traffic demand, will complement the truck parking system. This information system would alert drivers to available truck parking along IH 635 via ITS and dynamic signs. This signage will make it easier for drivers to find parking and help meet the needs of the Hours of Service requirements as defined by the Federal Motor Carrier Safety Administration. Signs will be located prior to exits where truck parking is located. Dynamic messaging signs, as well as



vehicle detection technology at the truck stops, would indicate availability for the next truck parking facility noting the available spaces at the next exit.

Other technological innovations could include adaptable pavement (including shoulders) designed so that it is highly configurable to accommodate different lane types and uses over time. Managed lanes and future roadways may have to accommodate a variety of specific lane uses—e.g., a dedicated lane for trucks in platoon formation or a lane reserved for vehicles above a specified level of vehicle automation. Exhibit 18 highlights the predicted evolution of the managed lane system in the Dallas-Fort Worth region.

Exhibit 18 – Evolution of HOV and Managed Lanes



4.6.2 Innovation – Environmental Review and Permitting

TxDOT and NCTCOG have taken advantage of two innovative federal programs to streamline the environmental review and permitting process to help progress the IH 635 LBJ East Project to construction faster. These programs help expedite the review of projects but do not allow the permitting, approval processes, and/or regulations to be circumvented or bypassed.

- Under the Surface Transportation Project Delivery Program (23 US Code 327), TxDOT applied, and was granted responsibility for review, consultation, and approval of National Environmental Policy Act (NEPA) documents for highway projects. This delegation eliminated a layer of governmental review and allows TxDOT to directly consult with federal resource agencies, resulting in shorter review times. Texas was the second state to assume NEPA responsibility for all levels of environmental documentation.
- Many projects require a Section 404 permit under the Clean Water Act from the US Army Corps of Engineers (USACE). The time needed to receive the permit varies by the permit type, magnitude of project impacts to wetlands and waters of the U.S., and complexity of the project. Section 214 of the Water Resources Development Act of 2000 allows the



USACE to accept funds from non-federal public entities to give priority to the evaluation of the USACE permit applications. Under this act, NCTCOG and USACE has had a Memorandum of Agreement to fund a position at the USACE to expedite permitting for regional priority transportation projects in the Dallas-Fort Worth region since 2008. The opportunity to coordinate in advance has resulted in reductions in permitting time, mitigation costs, and impacts.

4.6.3 Innovation – Funding and Finance

The traditional approach to design and construct a large freeway is to break the project into smaller two to three miles sections with 100 percent of the design complete before bidding the projects. This process requires a longer implementation schedule that can increase the price due to multiple contracts and inflation and increases the time until the roadway is open to traffic. For IH 635 LBJ East, TxDOT using a design-build process to procuring a single contractor to design and construction the project under a one competitively bid contract. This requires an innovative funding approach to assemble almost \$1.8 billion for one project. As outlined in Exhibit 14, numerous funding sources are being used to fund the IH 635 LBJ East Project.

The funding required is based on a traditional approach to completing the project. The Exhibit also highlights potential savings from the design-build process as described above. The result of this effort is expected to be \$200 million in cost savings, and as a result, the design-build process then becomes an innovative funding source. This approach creates a means to capture non-federal revenue.

The project will include dynamic tolling of the managed lanes. This would allow the repayment of the private funds outlined in the funding sources as shown in Exhibit 3. This is the \$125,000,000 of private investment outlined in Exhibit 14. Funds generated from tolling will remain in the public sector as outlined in Exhibit 19; an excerpt from the Regional Transportation Council (RTC) Request to the Texas Transportation Commission to authorize procurement.

Exhibit 19 – RTC Resolution

WHEREAS, in October 2017, the RTC approved Policy P17-01 to support the expediting of IH 635 East from US 75 to and including the IH 30 Interchange; expressing its desire to complete the project in its entirety through tax-supported general purpose lanes and frontage roads with dynamically priced managed lanes for the entire corridor; with toll revenue to remain with the public sector for debt service, operations, maintenance, and congestion management and optional off-peak and weekend tolling (IH 635 East project); and,

The RTC Resolution outlines how the toll revenue will be used for this project. The managed lanes can be used in a wide variety of ways to generate revenue including carpool lanes, truck only lanes, and peak time tolling only (see Section 4.6.1).

This innovative approach on funding makes it possible to move the project forward and also help provide reliable congestion relief for the region. In addition to this, TxDOT will utilize the



design-build method of construction for the project. TxDOT is familiar with and has constructed projects using this method of procurement and project delivery before and will help bridge funding gaps via innovative cost savings in construction.

4.7 Criterion #7: Partnership

The IH 635 LBJ East Project has and will have strong collaboration among its partners and stakeholders. These include NCTCOG, TxDOT, North Texas Tollway Authority (NTTA) and Dallas County as funding and implementing partners (see profiles below). There have been many public meetings throughout the project planning process with strong support from stakeholders and the public alike. There is also strong support from neighboring jurisdictions including neighboring cities, county judges, commissioners, and the local U.S. Congressman, in the form of project Letters of Support.

NCTCOG (Submitting Agency)

NCTCOG is a voluntary association of cities, counties, school districts, and special districts established in January 1966 to assist local governments in planning for common needs, cooperating for mutual benefit, and coordinating for sound regional development. Since 1974, NCTCOG has served as the Metropolitan Planning Organization (MPO) for the 12-county Dallas-Fort Worth MPA. The NCTCOG Transportation Department is responsible for the regional planning process for all transportation modes. The department provides technical support and staff assistance to the RTC and its technical committees, which comprise the MPO policy-making structure. The department also provides technical aid to local governments and transportation providers in planning, coordinating, and implementing transportation decisions.

TxDOT (Roadway Implementation)

The Texas Legislature originally established TxDOT in 1917 as the Texas Highway Department. TxDOT has a workforce of more than 12,000 employees and is made up of engineers, administrators, designers, environmental professionals, accountants, maintenance workers, and many other professionals. Headquartered in Austin, TxDOT has 25 district offices and 21 divisions. This project is located in the Dallas District which plans, designs, builds, operates, and maintains the state transportation system in the following counties: Collin, Dallas, Denton, Ellis, Kaufman, Navarro, and Rockwall.

Dallas County (Funding Partner)

Dallas County is located in the North Central region of the State of Texas, established in 1846, the county has a population over 2 million. The county seat, Dallas, is the 3rd largest city in Texas and 9th largest in the country. The IH 635 LBJ East Project is entirely located in Dallas County traversing the cities of Dallas, Garland, and Mesquite.

NTTA (Toll Implementation)

NTTA was created in 1997 to finance, construct, and oversee turnpike projects in North Texas. NTTA will oversee the tolling element of the IH 635 LBJ East Project. The project will take

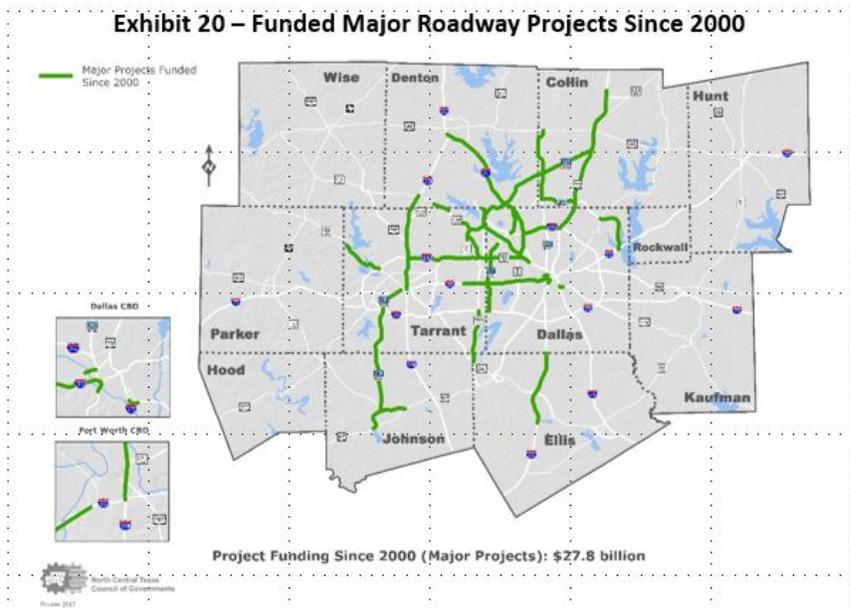


advantage of the existing NCTTA infrastructure to manage the tolling system for the managed lanes.

4.8 Criterion #8: Non-Federal Revenue for Transportation Infrastructure Investment

As shown in Exhibit 14, the IH 635 LBJ East Project is proposed to be built with 64 percent federal funds and 36 percent state funds by leveraging multiple types of funding sources such as Congestion Mitigation Air Quality (CMAQ) funds. CMAQ funds are typically used by MPOs for smaller projects to reduce nitrogen oxide and volatile organic compounds for conformity purposes in achieving near-term air quality milestones. This project helps accomplish that goal as well as leverages CMAQ funds on a major project. Accomplishing short-term air quality benefits with long-term regional and national vitality benefits is an innovative leveraging element. This project uses \$100 million in CMAQ/state funds.

Over the past 17 years, Dallas-Fort Worth has leveraged over \$27.8 billion dollars in federal, state, regional, and private sector funds to build major roadway projects. Exhibit 20 demonstrates the implementation of projects using partnership driven innovative leveraging elements. For example, on the LBJ Express Project (IH 35E to US 75) the private sector provided roughly four-fifths of the total financing for the project or approximately \$2.21 billion of the total \$2.7 billion needed. The innovative public-private partnership enabled taxpayers to leverage \$490 million in public funds to receive more than four times the value in infrastructure enhancements and traffic relief.



NCTCOG and TxDOT evaluated the IH 635 LBJ East Project for private financing. It was estimated that the project could bring up to \$125 million from the private sector. However, authority to enter into such in an agreement was not granted by the Texas Legislature during the past two legislative sessions.

To ensure long-term operations, the public sector (NCTCOG and TxDOT) will retain ownership of the revenue stream from the tolled managed lanes and the funds will be used to operate, maintain, and rehabilitate the corridor. Once this revenue is established, tolls may only then be charged for the sole purpose of maintaining speeds during the congested times of day. This is a



very different financial model than a proposal which transfers the revenue risk to the private sector.

5.0 Project Readiness

5.1 Technical Feasibility

The IH 635 LBJ East Project has been developed over a number of years, taking into account the needs of the corridor and desires of local stakeholders. A schematic (30 percent) design has been developed and approved. The planning effort included the preparation of environmental documents, public involvement, traffic analysis, and interstate access justification report. The project design received approvals from FHWA on July 21, 2017. Additionally, because the project cost estimate is over \$500 million (Major Project), the project has undergone a Cost Estimate Review (CER) by FHWA, value engineering, and a draft Project Management Plan (PMP) has been prepared. Capital cost estimates included in this application were developed by performing a quantity takeoff of the schematic design. Recent TxDOT unit prices for bid items were applied to the quantities to develop the project construction cost. Construction included a 15 percent contingency with a 50 percent contingency for right-of-way acquisition and 25 percent for utility relocation. Additional items such as aesthetics, mobilization, and traffic control were estimated using a percentage of the construction cost based on TxDOT experience.

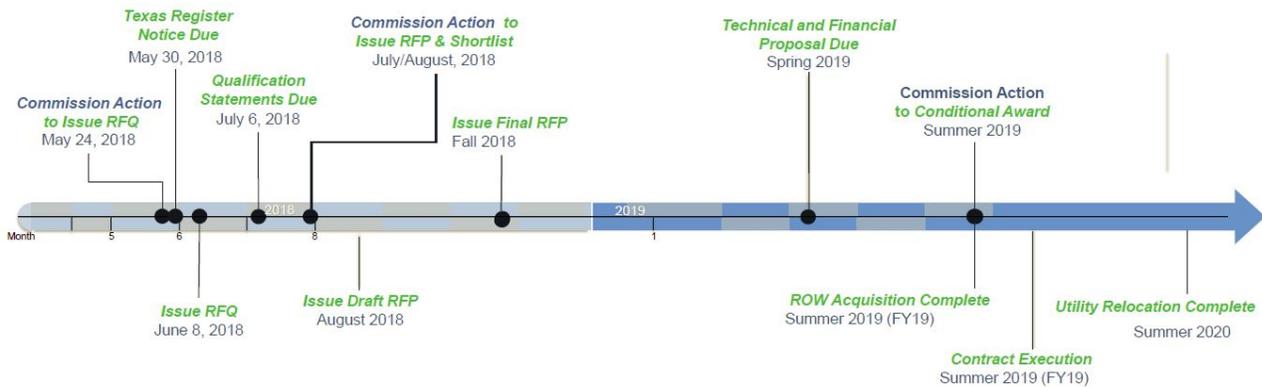
5.2 Project Schedule

The IH 635 LBJ East Project is set for an expedited delivery that will be in a position to move ahead well before the BUILD requirement of September 30, 2020, for obligation of funding and construction commencement within 18 months thereafter. The project schedule shown in Exhibit 21 indicates obligation of funding and construction beginning in summer 2019. Construction is expected to take 4.5 years and the new facility would open to traffic in late 2023.

TxDOT has made the preliminary design documents and performance requirements available to interested contractors and has held an industry workshop. The design and construction will be procured under a single competitively bid contract awarded through a two-step process (see Exhibit 20). The first step involves a qualifications-based screening to develop a shortlist of qualified contractor teams to provide detailed bids. Qualification Statements were due to TxDOT on July 6, 2018. The second step is a best value assessment of bids from the shortlisted teams.



Exhibit 21 – IH 635 LBJ East Project Procurement Schedule



All necessary activities will be complete to allow BUILD funds to be obligated sufficiently in advance of the statutory deadline and any unexpected delays will not put the funds at risk of expiring before they are obligated. The project can begin construction quickly upon obligation of BUILD funds, and the grant funds will be spent expeditiously once construction starts. All real property and right-of-way acquisition has and will be acquired in a timely manner in accordance with 49 Code of Federal Regulations (CFR) part 24, 23 CFR part 710, and other applicable legal requirements.

5.3 Required Approvals

5.3.1 Environmental Status and Approvals

The IH 635 Environmental Assessment (EA) received environmental clearance through a FHWA Finding of No Significant Impact (FONSI) issued on January 30, 2003. TxDOT began purchasing the right-of-way needed for the improvements in 2005. Refinements to the proposed operations and design of the facility mandated a reevaluation of the EA, which was completed and approved on April 24, 2017. The technical reports (in three parts) supporting the reevaluation can be found at www.keepitmovingdallas.com/public-hearings/2017/ih-635-lbj-east-ultimate-project-from-us-75-to-ih-30. This approval allowed TxDOT to continue purchasing right-of-way and begin construction on eight noise abatement walls to help provide noise mitigation during and after construction.

As approved, the project included dynamic tolling of the managed lanes from US 75 to Royal Lane/Miller Road (3.7 miles). During the public hearing held in January 2017, the attendees were in strong support of the project and for tolling the managed lane for the entire distance of the project (from US 75 to IH 30 or 11 miles) if the project could be built faster and included the reconstruction of the IH 635/IH 30 interchange. As a result, the RTC approved a policy to expedite IH 635 from US 75 to and including the IH 30 interchange (Policy P17-01) in October 2017. This policy included tolling the managed lanes from US 75 to IH 30.



To apply tolling to the section of the IH 635 managed lanes from Royal Lane/Miller Road to IH 30, a reevaluation is required. The reevaluation will be in the form of a Documented Reevaluation Checklist (see <http://ftp.dot.state.tx.us/pub/txdot-info/env/toolkit/640-02-gui.pdf>). Because Dallas-Fort Worth is a nonattainment area, the critical path for the reevaluation is approval of the conformity determination of *Mobility 2045*, the long-range metropolitan transportation plan for the Dallas-Fort Worth region. The extension of tolling on the managed lanes for the entire length of the corridor must be reflected in the long-range metropolitan transportation. *Mobility 2045* was approved by the Regional Transportation Council in June 2018 with conformity approval expected by US DOT in November 2018. TxDOT has begun work on the reevaluation so it can be approved shortly after a positive conformity determination is received.

5.3.2 State and Local Approvals

- Because IH 635 LBJ East has a pricing component, the NTTA has primacy for tolling the project and must waive this right. This right was approved during the November 15, 2017, NTTA Board meeting.
- The Texas Transportation Commission authorized TxDOT to issue a Request for Qualifications for the project on May 24, 2018.
- Permits involving waters of the United States will be permitted under nationwide Section 404 permits. No major Section 404 (of the Clean Water Act) issues have been identified.
- A revision to the State Transportation Improvement Program/Transportation Improvement Program will be necessary to add the BUILD Grant funding to the project. The modification will be coordinated between NCTCOG and TxDOT during a quarterly State Transportation Improvement Program/Transportation Improvement Program modification cycle. It is anticipated that the revision would occur in January 2019 (assuming grant award in December 2018).

5.4 Project Risks and Mitigation Strategies

As mentioned in Section 5.1, the project has undergone a CER by FHWA, value engineering, and a draft PMP has been prepared. Prior to the CER, a risk workshop for IH 635 LBJ East was held in February 2017 by TxDOT Dallas District senior management. This workshop resulted in development of a risk register for both cost and schedule, which was used during the CER. During the CER, uncertainties in the project estimate such as base variability, inflation, market conditions, and risk events were modeled by the review team to reflect the opinions of the subject matter experts interviewed. Then a Monte-Carlo simulation was used to incorporate the uncertainties into forecast curves that represent a range of costs and completion dates for the project. Based on the assumptions and risks discussed during the CER, there is a high (70 percent) confidence level for the total project costs. Exhibit 22 lists the identified risks, opportunities, chance of occurrence, impact, and potential mitigation strategies.



Exhibit 22 – Identified Risks and Opportunities

Risk/ Opportunity	Chance or Occurrence	Likely Impact to Costs	Likely Impact to Schedule	Potential Mitigation Strategy
Unplanned Work (changed orders)	100%	\$75 million	Unknown	Design-build should help minimize these changes
Increased Right-of-Way Costs	75%	\$12 million	None	TxDOT has purchased almost 60% of the right-of-way and continues to purchase the remaining parcels
Third Party Impacts (permits, utilities, railroad, etc.)	75%	\$10 million	6 months	Early coordination with all third-parties
Poor Surface Conditions	60%	\$20 million	None	Design-build should help minimize these changes
Longitudinal Drainage	50%	\$10 million	None	Design-build should help minimize these changes
Skillman Bridge Sequencing	100%	\$2 million	None	TxDOT will include this bridge as part of the IH 635 LBJ East Project. Previously, this bridge was to be a separate project.
Reducing Retaining Wall Heights	50%	\$3 million saving	None	None
Reducing TSS Controls	50%	\$2 million saving	None	None
Use of Pre-Cast Bent Caps	60%		6 months saving	None

5.4.1 Potential Procurement Delays

To keep up with the tremendous population growth across the Dallas-Fort Worth region, TxDOT has used innovation project delivery methods (i.e., design-build, comprehensive development agreements) to build projects faster. In the past seven years, TxDOT has built six roadway projects in the Dallas-Fort Worth area using design-build: DFW Connector (\$1.0 billion), IH 635 LBJ Express (\$2.7 billion), North Tarrant Express (\$2.4 billion), 35Express (\$1.4 billion), Midtown Express (\$850 million), and IH 30/IH 35E Horseshoe (\$800 million). As a result of these projects, TxDOT has gained experience and expertise in the planning, design, procurement, and



implementation of mega-projects such as the IH 635 LBJ East Project. TxDOT staff is highly capable of delivering a project of this magnitude.

5.4.2 Environmental Uncertainties

Project risks should be minimal because the proposed work is environmentally cleared, almost 70 percent of the needed right-of-way has already been acquired/purchased, and all stakeholders fully support the project.

6.0 Benefit-Cost Analysis

The benefits described in previous sections were monetized. The project benefits documented in the Benefit-Cost Analysis (BCA) are shown in Exhibit 23. The present value of the IH 635 LBJ East Project cost and its benefits in 2017 dollars is shown in Exhibit 24. Applied to a remaining project cost of \$1.56 billion, a substantial net benefit is achieved for both discounting scenarios. Based on a 20-year analysis period, the overall effect of this transportation investment will result in a positive net benefit of approximately \$1.69 billion at three percent and \$447 million at seven percent, after subtracting out the residual construction, maintenance, and operating costs of the project. The calculations used to determine these totals are discussed in more detail in Attachment 2.

Exhibit 23 – Total Project Benefits

Benefit Category	Benefits
	7% Discount Rate
Time Savings Benefits	\$1,135,250,500
Crash Reduction Benefits	\$337,526,000
Air Quality Emission Benefits	\$1,188,000

Exhibit 24 – Net Project Benefits

Discount Rate	Present Value of Total Project Costs (2017 Dollars)	Present Value of Total Benefits (2017 Dollars)	Cost/Benefit Ratio
7%	\$1,156,412,000	\$1,330,285,759	1.15

The overall net effect of this transportation investment will result in a positive return on investment of **115 percent (\$1.33 billion/\$1.116 billion)**, after discounting by 7 percent to 2017. Though only based on a 20-year period of analysis, the results of this BCA clearly indicate that the IH 635 LBJ East Project will provide a lifetime of regional benefits for travelers.



Photo Source: LBJ Infrastructure Group

IH 635 LBJ East Project

Attachment 2: Benefit-Cost Analysis FY 2018 BUILD Grant Application



**North Central Texas
Council of Governments**

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- Table 2 – Detailed Maintenance and Operations Costs
- Table 3 – Travel Time Benefit
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- Table 5 – Air Quality Emissions Reduction Benefit
- Table 6 – BCA Summary

1.0 Methodology

The following description provides the methodology for various sections within the Benefit-Cost Analysis (BCA), including detailed calculations of benefits and costs of the Interstate Highway (IH) 635 [Lyndon Baines Johnson (LBJ) Freeway] East Project for the years between 2025 and 2045, for each cost and benefit factor. Benefits are assumed to incur after project completion in 2025 for a 20-year life span of the projects to 2045.

Traffic volumes for current conditions (2017) and for build and no-build conditions in 2045 were based on the North Central Texas Council of Governments (NCTCOG) DFX Regional Travel Demand Model. This version of the travel demand model and the no-build transportation networks were used for *Mobility 2045: The Metropolitan Transportation Plan for North Central Texas*. The only modification made in running the two build alternatives was the addition of the IH 635 LBJ East Project to the transportation network.

1.1 Project Cost

Proposed construction costs were obtained from the Texas Department of Transportation (TxDOT) Dallas District office. The costs were estimated using the 30 percent completed engineering schematic drawings for the project and the TxDOT average unit bid prices. All costs are in 2017 dollars. The project costs are shown in Exhibit 4 in Attachment 1: Project Narrative of the IH 635 LBJ East Project Better Utilizing Investments to Leverage Development (BUILD) Discretionary Grant Program application.

The length of the BCA analysis period is 20 years beyond the in-service date of the project. Because the estimated useful life of this type of project is approximately 40 years before major reconstruction would be required, the residual value was calculated by dividing the years in service (20) by the useful life of the facility (40). The resulting value was 50 percent. This was then multiplied by the total cost of the project, including engineering, right-of-way, utility relocation, and construction.

The maintenance and operating costs were provide by TxDOT Dallas District. This included overhead, routine operations and maintenance, and renewal costs for the life of the project. As recommended in the *Benefit-Cost Analysis Guidance for Discretionary Grant Programs* (dated June 2018), those activities that occur outside of the analysis period window have been discounted and accounted for as part of the total residual project cost. See Tables 1 and 2 for project capital costs and maintenance and operating spending by year.

1.2 Travel Time Benefit

Travel time benefits were calculated based on data from the NCTCOG travel demand model. The reduction in hours of delay per day between the no-build and the build scenario for the 12-county Metropolitan Planning Area were utilized in the calculation of travel time benefits to the users of the IH 635 LBJ East facility. These travel time benefits (see Table 3) reflect the reduced traffic congestion experienced by all users of the transportation facilities in the project location, as well as all commercial motor vehicles. The percentage of commercial motor vehicles was

calculated using estimates taken from the TxDOT Statewide Planning Map www.txdot.gov/apps/statewide_mapping/StatewidePlanningMap.html.

The number of days used in the calculation was not reduced for weekends as the facility experiences high usage levels during the weekends due to the proximity of Freight-Oriented Developments in the area, many of which service “just-in-time” supply chains and the ability of the project to provide regional connectivity for all users.

Equation for Annual Travel Time Benefit:

$$\begin{aligned}
 & \text{Annual Travel Time Benefit (AUTO)} \\
 &= \left(\text{Daily Hours of Congestion Delay (Build Network)} \right. \\
 & \quad \left. - \text{Daily Hours of Congestion Delay (No Build Network)} \right) \times 365 \text{ days} \\
 & \quad \times \frac{\$14.80}{\text{hour}}
 \end{aligned}$$

$$\begin{aligned}
 & \text{Annual Travel Time Benefit (TRUCK)} \\
 &= \left(\text{Daily Hours of Congestion Delay (Build Network)} \right. \\
 & \quad \left. - \text{Daily Hours of Congestion Delay (No Build Network)} \right) \times 365 \text{ days} \\
 & \quad \times \frac{\$28.60}{\text{hour}}
 \end{aligned}$$

1.3 Safety Benefits

Much of the original IH 635 facility remains unimproved and predates various current-day design standards. Throughout the majority of the corridor, the inside shoulder widths are substandard and some bridges do not have adequate vertical clearance. To help reduce future crashes, the proposed improvements will reconstruct IH 635 to current design standards (e.g., lane widths, shoulder widths, horizontal and vertical alignments, acceleration and deceleration lengths, sight distances), lessen weaving conflicts, and provide on-street bike accommodations and pedestrian accommodations (sidewalks) on frontage roads and cross streets.

IH 635 and IH 30 crash data was provided by TxDOT for the years 2010 through 2015. This crash data provided the number of crashes for the different crash severity types (fatal, incapacitating, non-incapacitating, etc.). The crash data is shown in Exhibit 8 in Attachment 1: Project Narrative.

Although the IH 635 LBJ East Project will provide many safety benefits, for purposes of this BCA, a conservative approach using only the benefits realized by the addition of lanes was used. The project will add one main lane and one managed lane in each direction. This benefit (see Table 4) is calculated by applying a Crash Modification Factor (CMF) of 0.696 www.cmfclearinghouse.org/detail.cfm?facid=7932. This CMF was applied to the six-year average of the crash rates for all crashes to estimate the build condition crash rate for the KABCO rating system.

The before and after difference was then calculated by subtracting the total observed crashes by total estimated crashes from the CMF calculation.

Equation for Annual Crash Reduction Benefit:

$$\begin{aligned} & \text{Annual Crash Reduction Benefit} \\ &= \text{Total Reduction in Crashes} \times \text{KABCO Crash Reduction Rate} \\ & \times \text{KABCO to AIS Conversion} \times \text{Monetized Value}_{\text{By AIS Type}} \end{aligned}$$

1.4 Air Quality Benefits

To develop the project-specific emission benefits for the addition of lanes, speed-based running emissions were calculated for the no-build¹ and build² speed-based running exhaust emissions. The speed-based running exhaust emissions are calculated by multiplying the speed-based running exhaust emission factors with the length of the roadway and the volume of vehicles. After calculating the build and no-build project emissions for north and southbound during three time periods (morning peak, afternoon peak, and off-peak), the differences between the speed-based running exhaust emissions for the no-build scenario and the speed-based running exhaust emissions for the build scenario were evaluated. The difference in emissions for the no-build and build scenarios are the emission benefits for the addition of lanes. Emission benefits for freeway high-occupancy vehicle/managed lane facilities were developed using the methodology from the Texas A&M Transportation Institute Mobile Source Emission Reduction Strategies guidance.³ Table 5 shows emission reduction benefits.

Equation for Annual Emissions Reduction:

$$\begin{aligned} & \text{Annual Emission Reduction for NOx} \\ &= \text{Daily Emission Reduction (NOx lbs. per day)} \\ & \times 365 \text{ days/2000 (lbs. per ton)} \\ & \times \text{Emission Reduction Monetized Benefit for NOx} \end{aligned}$$

$$\begin{aligned} & \text{Annual Emission Reduction for VOC} \\ &= \text{Daily Emission Reduction (VOC lbs. per day)} \\ & \times 365 \text{ days/2000 (lbs. per ton)} \\ & \times \text{Emission Reduction Monetized Benefit for VOC} \end{aligned}$$

Total Emission Reduction Benefit is the sum of the two

Note: Nitric oxides (NOx) and volatile organic compounds (VOC) monetized values based on *Benefit-Cost Analysis Guidance for Discretionary Grant Programs*, dated June 2018.

¹ No-build speeds based on National Performance Management Data Set (NPMRDS)

² Build speeds are calculated based on the assumption this project will demonstrate the same proportional increase in speeds measured from the SH 161 pilot project in the Dallas-Fort Worth region

³ https://moser.tamu.edu/docs/Texas.Guide.to.Accepted.Mobile.Source.Emission.Reduction.Strategies_August.2007.pdf

2.0 Benefit-Cost Analysis Results

The present value of the IH 635 LBJ East Project cost and its benefits in 2017 dollars is shown in Tables 6 through 8. Applied to a remaining project cost of \$1.56 billion, a substantial net benefit is achieved for both discounting scenarios. Based on a 20-year analysis period, the overall effect of this transportation investment will result in a positive net benefit of approximately \$1.69 billion at three percent and \$447 million at seven percent, after subtracting out the residual construction, maintenance, and operating costs of the project.

Table 7 – Total Project Benefits

Benefit Category	Benefits
	7% Discount Rate
Time Savings Benefits	\$1,135,250,500
Crash Reduction Benefits	\$337,526,000
Air Quality Emission Benefits	\$1,188,000

Table 8 – Net Project Benefits

Discount Rate	Present Value of Total Project Costs (2017 Dollars)	Present Value of Total Benefits (2017 Dollars)	Cost/Benefit Ratio
7%	\$1,156,412,000	\$1,330,285,759	1.15

The overall net effect of this transportation investment will result in a positive return on investment of **115 percent (\$1.33 billion/\$1.116 billion)**, after discounting by 7% to 2017. Though only based on a 20-year period of analysis, the results of this BCA clearly indicate that the IH 635 LBJ East Project will provide a lifetime of regional benefits for travelers.

Tables

The following exhibits are a static version of the Microsoft Excel spreadsheets used to calculate the costs and benefits. A copy of the Microsoft Excel file is also included in the IH 635 LBJ East Project Fiscal Year 2018 BUILD Grant Application submittal.

Table 1 – Project Capital, Maintenance, and Operations Costs

Table 2 – Detailed Maintenance and Operations Costs

Table 3 – Travel Time Benefit

Table 4 – Safety Benefits

Table 5 – Air Quality Emissions Reduction Benefit

Table 6 – BCA Summary



Photo Source: LBJ Infrastructure Group

IH 635 LBJ East Project

Attachment 4: Letters of Support FY 2018 BUILD Grant Application



**North Central Texas
Council of Governments**

United States Senate

WASHINGTON, DC 20510-4305

June 28, 2018

The Honorable Elaine Chao
Secretary of Transportation
United States Department of Transportation
1200 New Jersey Avenue SE
Washington, DC 20590

Dear Secretary Chao:

I am writing to express my support for the National Infrastructure Investments – Better Utilizing Investments to Leverage Development (BUILD) application submitted to the Department of Transportation by the North Central Texas Council of Governments (NCTCOG).

As you and your staff review the proposal, I trust you will give full consideration to the many strengths of this application. The Interstate Highway (IH) 635 corridor from US-75 to IH-30 is struggling to accommodate the increase in traffic that stems from constant population increases in North Dallas. This BUILD funding, if awarded, would enable NCTCOG to widen an eleven mile passage of IH-635 from eight lanes to at least ten lanes and fully reconstruct the existing managed/TEXpress Lanes facility, resulting in a total of at least fourteen new general purpose and TEXpress Lanes. Once completed, this project will improve local mobility, freight mobility, and passenger safety within the IH-635 corridor, resulting in reduced congestion.

I would appreciate your efforts to ensure that I am kept informed of the progress of this application. Please contact Andrea McGee (Andrea_McGee@cornyn.senate.gov), my Grants Coordinator, with any developments regarding this proposal as soon as they are available.

Thank you for your assistance and consideration of this project.

Sincerely,



JOHN CORNYN
United States Senator



DALLAS COUNTY
COMMISSIONERS COURT

July 3, 2018

The Honorable Elaine L. Chao
Secretary of Transportation
United States Department of Transportation
1200 New Jersey Avenue, SE
Washington, DC 20590

Dear Secretary Chao:

Dallas County Commissioners Court is pleased to support the 2018 Better Utilizing Investments to Leverage Development (BUILD) Discretionary Grant application submitted by the North Central Texas Council of Governments (NCTCOG) for the Interstate Highway (IH) 635 LBJ East Project.

The IH 635 LBJ East Project will consist of the full reconstruction and widening of the IH 635 corridor from US 75 to IH 30, approximately 11 miles. The general purpose lanes will be widened from 8 lanes to at least 10 lanes, and combined with reconstruction of the existing managed/TEXpress Lanes facility, the project will result in a total of at least 14 new general purpose and TEXpress Lanes. In addition, continuous frontage roads will be constructed. The approximate total project cost is \$1.74 billion, with a BUILD grant request of \$25 million.

The proposed IH 635 LBJ East Project would improve mobility and safety within the IH 635 corridor, accommodate dedicated managed lanes, improve freight mobility, reduce congestion, and improve the roadway connections between IH 635 and IH 30, as well as between the general purpose lanes and the adjacent frontage roads and cross-streets. The project originally received a Finding of No Significant Impact (FONSI) in January 2003. A public hearing on the environmental re-evaluation was held in January 2017, and environmental clearance for the project was received in April 2017. TxDOT anticipates delivering the project through a design-build procurement which was initiated in June 2018.

411 Elm Street, Administration Building, 2nd Floor, Dallas, Texas 75202
(214) 653-7327

Again, Dallas County Commissioners Court fully supports the 2018 BUILD grant application submitted by NCTCOG for the IH 635 LBJ East Project. Thank you for your time and consideration. If you have any questions, please contact Darryl Martin, Dallas County's Administrator at darryl.martin@dallascounty.org or 214/653-7327.

Sincerely,



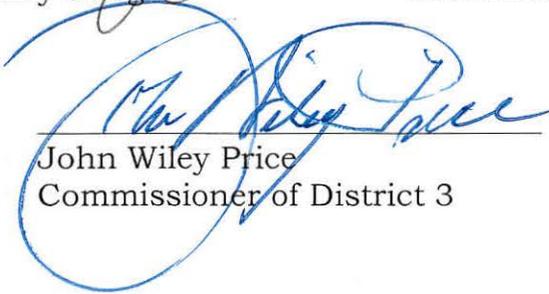
Clay Lewis Jenkins
County Judge



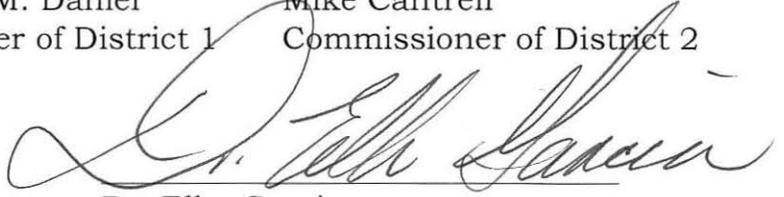
Dr. Theresa M. Daniel
Commissioner of District 1



Mike Cantrell
Commissioner of District 2



John Wiley Price
Commissioner of District 3



Dr. Elba Garcia
Commissioner of District 4



Dallas County

July 3, 2018

The Honorable Elaine Chao
Secretary of Transportation
United States Department of Transportation
1200 New Jersey Avenue, SE
Washington, DC 20590

Dear Secretary Chao:

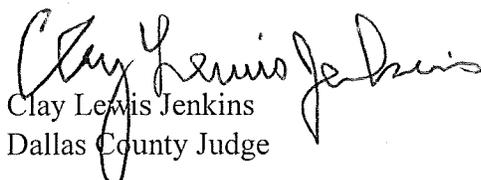
Dallas County is pleased to support the 2018 Better Utilizing Investments to Leverage Development (BUILD) Discretionary Grant application submitted by the North Central Texas Council of Governments (NCTCOG) for the Interstate Highway (IH) 635 LBJ East Project.

The IH 635 LBJ East Project will consist of the full reconstruction and widening of the IH 635 corridor from US 75 to IH 30, approximately 11 miles. The general purpose lanes will be widened from 8 lanes to at least 10 lanes, and combined with reconstruction of the existing managed/TEXpress Lanes facility, the project will result in a total of at least 14 new general purpose and TEXpress Lanes. In addition, continuous frontage roads will be constructed. The approximate total project cost is \$1.74 billion, with a BUILD grant request of \$25 million.

The proposed IH 635 LBJ East Project would improve mobility and safety within the IH 635 corridor, accommodate dedicated managed lanes, improve freight mobility, reduce congestion, and improve the roadway connections between IH 635 and IH 30, as well as between the general purpose lanes and the adjacent frontage roads and cross-streets. The project originally received a Finding of No Significant Impact (FONSI) in January 2003. A public hearing on the environmental re-evaluation was held in January 2017, and environmental clearance for the project was received in April 2017. TxDOT anticipates delivering the project through a design-build procurement which was initiated in June 2018.

Again, Dallas County fully supports the 2018 BUILD grant application submitted by NCTCOG for the IH 635 LBJ East Project. Thank you for your time and consideration. If you have any questions, please contact, Micah Baker at Michah.Baker@dallascounty.org or 214-653-7465.

Sincerely,


Clay Lewis Jenkins
Dallas County Judge

June 25, 2018

Stan Pickett
Mayor

Daniel Aleman, Jr.
Mayor Pro Tem

Tandy Boroughs
Deputy Mayor Pro Tem

Robert Miklos
Councilmember

Jeff Casper
Councilmember

Bruce Archer
Councilmember

Greg Noschese
Councilmember

Cliff Keheley
City Manager

The Honorable Elaine L. Chao
Secretary of Transportation
United States Department of Transportation
1200 New Jersey Avenue, SE
Washington, DC 20590

Dear Secretary Chao:

The City of Mesquite is pleased to give enthusiastic and full support to the 2018 Better Utilizing Investments to Leverage Development (BUILD) Discretionary Grant application submitted by the North Central Texas Council of Governments (NCTCOG) for the Interstate Highway (IH) 635 LBJ East Project.

The IH 635 LBJ East Project will consist of the full reconstruction and widening of the IH 635 corridor from US 75 to IH 30, approximately 11 miles. The general purpose lanes will be widened from 8 lanes to at least 10 lanes, and combined with reconstruction of the existing managed/TEXpress Lanes facility, the project will result in a total of at least 14 new general purpose and TEXpress Lanes. In addition, continuous frontage roads will be constructed. The approximate total project cost is \$1.74 billion, with a BUILD grant request of \$25 million.

The proposed IH 635 LBJ East Project would improve mobility and safety within the IH 635 corridor, accommodate dedicated managed lanes, improve freight mobility, reduce congestion, and improve the roadway connections between IH 635 and IH 30, as well as between the general purpose lanes and the adjacent frontage roads and cross-streets. The project originally received a Finding of No Significant Impact (FONSI) in January 2003. A public hearing on the environmental re-evaluation was held in January 2017, and environmental clearance for the project was received in April 2017. TxDOT anticipates delivering the project through a design-build procurement which was initiated in June 2018.

The City of Mesquite has been a long and avid supporter of this project. Thank you for your time and consideration. If you have any questions, please contact Matthew Holzapfel, P.E., Director of Public Works, at 972.216.6353.

Sincerely,



Stan Pickett
Mayor



Congress of the United States
House of Representatives

□ 2233 RAYBURN HOUSE OFFICE BUILDING
WASHINGTON, DC 20515-4332
TELEPHONE: 202.225.2231
FAX: 202.225.5878

□ LAKESIDE SQUARE
12377 MERIT DRIVE
SUITE 750
DALLAS, TEXAS 75251-2224
TELEPHONE: 972.392.0505
FAX: 972.392.0615
sessions.house.gov

June 25, 2018

The Honorable Elaine L. Chao
Secretary of Transportation
United States Department of Transportation
1200 New Jersey Avenue, SE
Washington, DC 20590-0001

Dear Secretary Chao:

I am writing in support of the 2018 Better Utilizing Investments to Leverage Development (BUILD) Discretionary Grant application submitted by the North Central Texas Council of Governments (NCTCOG) for the Interstate Highway (IH) 635 LBJ East Project.

The IH 635 LBJ East Project will consist of the full reconstruction and widening of the IH 635 corridor from US 75 to IH 30, which is approximately 11 miles. The general-purpose lanes will be widened from 8 lanes to at least 10 lanes, and combined with reconstruction of the existing managed/TEXpress Lanes facility, the project will result in a total of at least 14 new general purpose and TEXpress Lanes. Furthermore, continuous frontage roads will also be constructed. The approximate total project cost is \$1.74 billion, with a BUILD grant request of \$25 million.

The proposed IH 635 LBJ East Project would improve mobility and safety within the IH 635 corridor, accommodate dedicated managed lanes, improve freight mobility, reduce congestion, and improve the roadway connections between IH 635 and IH 30, as well as between the general-purpose lanes and the adjacent frontage roads and cross-streets. The project originally received a Finding of No Significant Impact (FONSI) in January 2003. A public hearing on the environmental re-evaluation was held in January 2017, and environmental clearance for the project was received in April 2017. TxDOT anticipates delivering the project through a design-build procurement which was initiated in June 2018.

I request that you give the 2018 BUILD grant application submitted by NCTCOG for the IH 635 LBJ East Project your full consideration, consistent with your existing guidelines and policies. If I can be of further assistance, please do not hesitate to contact me or my staff by phone at 202.225.2231, or by email at Ryan.Ethington@mail.house.gov.

Sincerely,

Pete Sessions
Member of Congress



The Transportation Policy Body for the North Central Texas Council of Governments
(Metropolitan Planning Organization for the Dallas-Fort Worth Region)

June 22, 2018

The Honorable Elaine L. Chao
Secretary of Transportation
United States Department of Transportation
1200 New Jersey Avenue, SE
Washington, DC 20590

Dear Secretary Chao:

On behalf of the Regional Transportation Council (RTC), which serves as the Metropolitan Planning Organization (MPO) for the Dallas-Fort Worth (DFW) area, I am pleased to support the 2018 Better Utilizing Investments to Leverage Development (BUILD) Discretionary Grant application submitted by the North Central Texas Council of Governments (NCTCOG) for the **Interstate Highway (IH) 635 LBJ East Project**.

The IH 635 LBJ East Project will consist of the full reconstruction and widening of the IH 635 corridor from US 75 to IH 30, approximately 11 miles. The general purpose lanes will be widened from 8 lanes to at least 10 lanes, and combined with reconstruction of the existing managed/TEXpress Lanes facility, the project will result in a total of at least 14 new general purpose and TEXpress lanes. In addition, continuous frontage roads will be constructed. The approximate total project cost is \$1.74 billion, with a BUILD grant request of \$25 million.

The project originally received a Finding of No Significant Impact (FONSI) in January 2003. A public hearing on the environmental re-evaluation was held in January 2017, and environmental clearance for the project was received in April 2017. TxDOT anticipates delivering the project through a design-build procurement which was initiated in June 2018. The proposed IH 635 LBJ East Project would improve mobility and safety within the IH 635 corridor, accommodate dedicated managed lanes, improve freight mobility, reduce congestion, and improve the roadway connections between IH 635 and IH 30, as well as between the general purpose lanes and the adjacent frontage roads and cross-streets.

This project is included in *Mobility 2045: The Metropolitan Transportation Plan for North Central Texas*. All federally funded surface transportation projects must also be included in the Transportation Improvement Program (TIP). If the project is successful in receiving funds, the RTC will support its inclusion and modification, as necessary, in the *2019-2022 Transportation Improvement Program for North Central Texas*.

P.O. Box 5888 • Arlington, Texas 76005-5888 • (817) 695-9240 • FAX (817) 640-3028
<http://www.nctcog.org/trans>

June 22, 2018

Again, the RTC fully supports the 2018 BUILD grant application submitted by NCTCOG for the IH 635 LBJ East Project. Thank you for your time and consideration. If you have any questions, feel free to contact Michael Morris, P.E., Director of Transportation for NCTCOG at (817) 695-9241 or mmorris@nctcog.org.

Sincerely,



Gary Fickes, Chair
Regional Transportation Council
Commissioner, Tarrant County

RH:clh

cc: Michael Morris, P.E., Director of Transportation, NCTCOG

MICHAEL S. RAWLINGS
Mayor of Dallas



July 10, 2018

The Honorable Elaine L. Chao
Secretary of Transportation
United States Department of Transportation
1200 New Jersey Avenue, SE
Washington, DC 20590

Dear Secretary Chao:

The City of Dallas is pleased to support the 2018 Better Utilizing Investments to Leverage Development (BUILD) grant application submitted by the North Central Texas Council of Governments (NCTCOG) for the Interstate Highway (IH) 635 LBJ East Project.

The IH 635 LBJ East Project will consist of the full reconstruction and widening of the IH 635 corridor from US 75 to IH 30, approximately 11 miles. The general purpose lanes will be widened from 8 lanes to at least 10 lanes. Combined with reconstruction of the existing managed/TEXpress Lanes facility, the project will result in a total of at least 14 new general purpose and TEXpress Lanes. In addition, continuous frontage roads will be constructed. The approximate total project cost is \$1.74 billion, with a BUILD grant request of \$25 million.

The proposed IH 635 LBJ East Project would improve mobility and safety within the IH 635 corridor, accommodate dedicated managed lanes, improve freight mobility, reduce congestion, and improve the roadway connections between IH 635 and IH 30, as well as between the general purpose lanes and the adjacent frontage roads and cross-streets. The project originally received a Finding of No Significant Impact (FONSI) in January 2003. A public hearing on the environmental re-evaluation was held in January 2017, and environmental clearance for the project was received in April 2017. TxDOT anticipates delivering the project through a design-build procurement, which was initiated in June 2018.

Again, the City of Dallas fully supports the 2018 BUILD grant application submitted by NCTCOG for the IH 635 LBJ East Project. If you have any questions, please contact Michael Rogers at michael.rogers@dallascityhall.com or 214-671-9596. Thank you for your time and consideration.

Best regards,



Michael S. Rawlings
Mayor, City of Dallas

OFFICE OF THE MAYOR CITY HALL 1500 MARILLA ST., 5EN DALLAS, TEXAS 75201



GARLAND

July 10, 2018

The Honorable Elaine L. Chao
Secretary of Transportation
United States Department of Transportation
1200 New Jersey Avenue, SE
Washington, DC 20590

Dear Secretary Chao:

The City of Garland is pleased to support the 2018 Better Utilizing Investments to Leverage Development (BUILD) Discretionary Grant application submitted by the North Central Texas Council of Governments (NCTCOG) for the Interstate Highway (IH) 635 LBJ East Project.

The IH 635 LBJ East Project will consist of the full reconstruction and widening of the IH 635 corridor from US 75 to IH 30, approximately 11 miles. The general purpose lanes will be widened from 8 lanes to at least 10 lanes, and combined with reconstruction of the existing managed/TEXpress Lanes facility, the project will result in a total of at least 14 new general purpose and TEXpress Lanes. In addition, continuous frontage roads will be constructed. The approximate total project cost is \$1.74 billion, with a BUILD grant request of \$25 million.

The proposed IH 635 LBJ East Project would improve mobility and safety within the IH 635 corridor, accommodate dedicated managed lanes, improve freight mobility, reduce congestion, and improve the roadway connections between IH 635 and IH 30, as well as between the general purpose lanes and the adjacent frontage roads and cross-streets. The project originally received a Finding of No Significant Impact (FONSI) in January 2003. A public hearing on the environmental re-evaluation was held in January 2017, and environmental clearance for the project was received in April 2017. TxDOT anticipates delivering the project through a design-build procurement which was initiated in June 2018.

Again, the City of Garland fully supports the 2018 BUILD grant application submitted by NCTCOG for the IH 635 LBJ East Project. Thank you for your time and consideration. If you have any questions, please contact me at 972-205-2400.

Sincerely,

Lori Barnett Dodson

Mayor