



Interstate Highway 20 Y-Connection Upgrade

FY 2017 AND 2018 INFRA GRANT APPLICATION

ATTACHMENT 1 - COVER PAGE AND PROJECT NARRATIVE



North Central Texas
Council of Governments
Transportation Department

IH 20 Y-Connection Upgrade: Cover Page

A. Was an INFRA application for this project submitted previously?	NO
B. If yes, what was the name of the project in the previous application?	N/A
C. Previously Incurred Project Cost*	\$ 11,441,000
D. Future Eligible Project Cost**	\$ 1,543,203,000
E. Total Project Cost (This should be the sum of the previous two rows)	\$ 1,554,644,000
F. INFRA Request	\$ 100,000,000
G. Total Federal Funding (including INFRA)***	\$ 1,243,841,000
H. Are matching funds restricted to a specific project component? If so, which one?	NO
I. Is the project or a portion of the project currently located on the National Highway Freight Network?	YES
J. Is the project or a portion of the project location on the National Highway System?	YES
i. Does the project add capacity to the Interstate system?	YES
ii. Is the project in a national scenic area?	NO
K. Do the project components include a railway-highway grade crossing or grade separation project?	YES (598348U, 598349B, 794992X, & 765267E)
L. Do the project components include an intermodal or freight rail project, or freight project within the boundaries of a public or private freight rail, water (including ports), or intermodal facility?	NO
M. If answered yes to either of the two component questions above, how much of the requested INFRA funds will be spent on each of these project components?	N/A
N. State(s) in which project is located?	TEXAS
O. Small or large project?	LARGE
P. Urbanized Area in which project is located, if applicable.	DALLAS - FORT WORTH - ARLINGTON
Q. Population of Urbanized Area.	5,391,487 (2017)
R. Is the project currently programmed in the:	
i. TIP	YES - 2017-2020
ii. STIP	YES - 2017-2020
iii. MPO Long Range Transportation Plan	YES - MTP 2040
iv. State Long Range Transportation Plan	YES - TEXAS TRANSPORTATION PLAN 2040
v. State Freight Plan	NO
S. If selected, would you be interested in participating in a new environmental review and permitting approach?	YES

Note: All dollar amounts are rounded to \$1,000.

* - Includes cost of IH 820 East Loop (\$6,500,000) and Southeast Connector (\$4,941,000) components

** - Includes cost of IH 820 East Loop Ultimate only (\$254,203,000) and Southeast Connector (\$1,289,000,000) components

*** - Includes federal funding for IH 820 East Loop and Southeast Connector plus INFRA request

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LIST OF ABBREVIATIONS:

ADT	Average Daily Traffic
BCA	Benefit-Cost Analysis
BCR	Benefit-Cost Ratio
DFW	Dallas-Fort Worth
EA	Environmental Assessment
FHWA	Federal Highway Administration
FONSI	Finding of No Significant Impact
FY	Fiscal Year
HB	House Bill
IH	Interstate Highway
INFRA	Infrastructure For Rebuilding America
MPA	Metropolitan Planning Area
MPO	Metropolitan Planning Organization
MTP	Metropolitan Transportation Plan
NCTCOG	North Central Texas Council of Governments
NEPA	National Environmental Policy Act
NOFO	Notice of Funding Opportunity
NPV	Net Present Value
NTTA	North Texas Tollway Authority
OMB	Office of Management and Budget
PE	Preliminary Engineering
PGBT	President George Bush Turnpike
PPP	Public-Private Partnership
ROW	Right-of-Way
RTC	Regional Transportation Council
RTR	Regional Toll Revenue
SH	State Highway
SRT	Sam Rayburn Tollway
STIP	State Transportation Improvement Program
TIP	Transportation Improvement Program
TxDOT	Texas Department of Transportation
UTP	Unified Transportation Program

Executive Summary

This Fiscal Year (FY) 2017 and 2018 Infrastructure For Rebuilding America (INFRA) Grant application submitted by the North Central Texas Council of Governments (NCTCOG) is for the Interstate Highway 20 (IH 20) Y-Connection Upgrade, which is multi-corridor interchange, capacity, and access improvement project located at the confluence of IH 20, IH 820, US 287, State Highway (SH) 121, and SH 183 in eastern Tarrant County. This application represents the combining of two partnership projects (the IH 820 East Loop and the IH 20/IH 820/US 287 Southeast Connector) with the Texas Department of Transportation (TxDOT). These two partnership projects are already included in the region's metropolitan transportation plan and have been identified by the Regional Transportation Council (RTC) as high-priority projects for funding in the Transportation Improvement Program (TIP) and in the House Bill 20 (HB 20) 10-Year Plan for the Dallas-Fort Worth Region.

In addition to improving safety, mobility, and operations, the IH 20 Y-Connection Upgrade will not only relieve congestion for regional travelers and local workers in this major urbanized area, but it will also improve the delivery of goods to the various economic centers along these five highway corridors within the cities of Hurst, Richland Hills, Fort Worth, Forest Hill, Arlington, Kennedale, and Mansfield. Proposed improvements will include additional mainlanes (to replace the remaining four-lane bottlenecks), bi-directional or reversible express or managed lanes, new direct connectors and entrance/exit ramp adjustments, auxiliary lane and frontage road improvements, and bicycle and pedestrian accommodations.

The IH 20 Y-Connection Upgrade meets the following key objectives of the INFRA Grant Program:

#1: Supporting Economic Vitality - The project will improve the regional freight network by eliminating major bottlenecks on IH 20 and IH 820. The project will add capacity and ramp improvements to the interstate highway system and other connecting highways to reduce traffic congestion and will improve access to economic and employment centers in seven cities to support commerce and economic growth. It is also expected to reduce fatalities and injury accidents and will interactions between commuter and freight traffic by eliminating traffic weaving problems between five highways corridors.

A Benefit-Cost Analysis (BCA) was prepared for this application to identify the anticipated benefits and the costs for this project. The BCA (Application Attachment 2) summarizes the net present value (NPV) and the benefit-cost ratio (BCR) utilizing a 7 percent discount rate. Net benefits of over **\$489 million** over the 20-year time horizon are attainable with a BCR of **0.31**. **Exhibit 1** outlines a summary of costs and benefits for the IH 20 Y-Connection Upgrade.

Exhibit 1: Benefit-Cost Analysis Summary Results

Benefit-Cost Summary Results			Average Annual	Total Over 20 Years
Life-Cycle Costs	\$(1,556,634,245)	ITEMIZED BENEFITS		
Life-Cycle Benefits	\$2,465,272,326	Travel Time Savings (mil. \$)	\$117.5	\$2,350.1
Net Present Value	\$489,464,294	Safety Cost Savings (mil. \$)	\$53.5	\$1,069.2
BENEFIT-COST RATIO	0.31	Emissions Cost Savings (thou. \$)	\$157	\$3,143.9
		TOTAL BENEFITS (mil. \$)	\$123.2	\$2,465.2
Annual Percentage Yield	2.33%	Person Hours of Delay Saved	7,628,305	152,566,110
Payback Period				

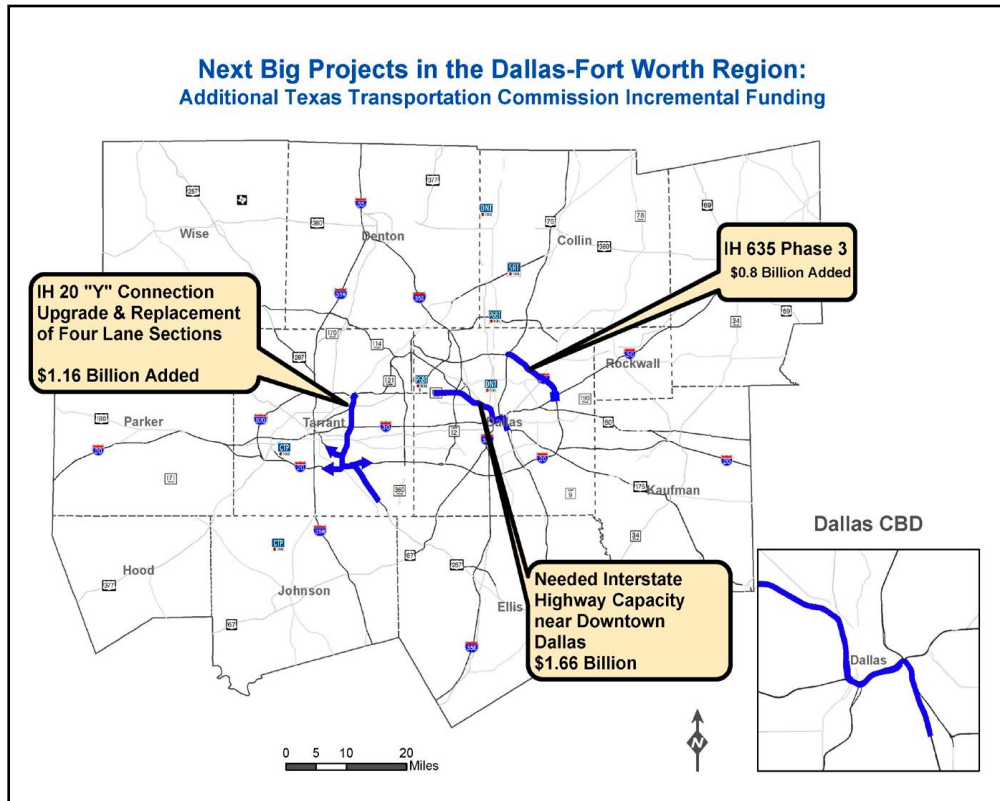
#2: Leveraging of Federal Funding – State legislative actions in 2013 and 2015 allowed for additional transportation revenues as the result of overwhelming approval by voters and revised constitutional amendments without any increase in gas taxes or debt issuances. At the regional level, RTC and TxDOT partnerships with the North Texas Tollway Authority (NTTA) have established Regional Toll Revenue (RTR) funds comprised of upfront payments in exchange for construction, operations, maintenance, and upgrades on several critical toll roads throughout the North Central Texas region. These various initiatives combined with recent successes through public-private partnerships (PPP) and promotion of design-build implementation strategies demonstrate the Dallas-Fort Worth area’s determination and effectiveness in leveraging Federal funds, stretching the value of local/state funds, and strongly encouraging private sector investment. In the 21st century, the North Central Texas region has leveraged nearly \$28 billion from these sources to build numerous major limited-access roadway projects. This same approach will be applied extensively for the IH 20 Y-Connection Upgrade Project.

#3: Innovation – This project will undertake a new streamlined approach to expedite the environmental review and permitting process through the use of worst-case “buffer” analyses and “single checklists”, early coordination with resource agencies to fast-track bridge construction, and the delegation of some FHWA’s NEPA responsibilities to TxDOT. In addition, a PPP would be used to implement the IH 820 East Loop component to take advantage of efficiencies through a design-build contract.

#4: Performance and Accountability - RTC approval to submit this project for INFRA consideration was passed October 12, 2017. In addition, the RTC approved a policy to reaffirm support for future new revenue allocations from the Texas Transportation Commission for this project as one of the “Big Projects” in the Dallas-Fort Worth region (**Exhibit 2**) and requested that TxDOT expedite this project through a pass-through toll or design-build contract. The RTC actions are linked here: www.nctcog.org/trans/committees/rtc/documents/web.agenda.rtc101217.pdf

Letters of support for the IH 20 Y-Connection Upgrade have been received from the RTC, Tarrant County, and the Cities of Arlington, Forest Hill, Fort Worth, Hurst, Kennedale, Mansfield, Richland Hills (Application Attachment 3).

Exhibit 2: IH 20 Y-Connection Upgrade – Regional Inclusion among Next “Big Projects”



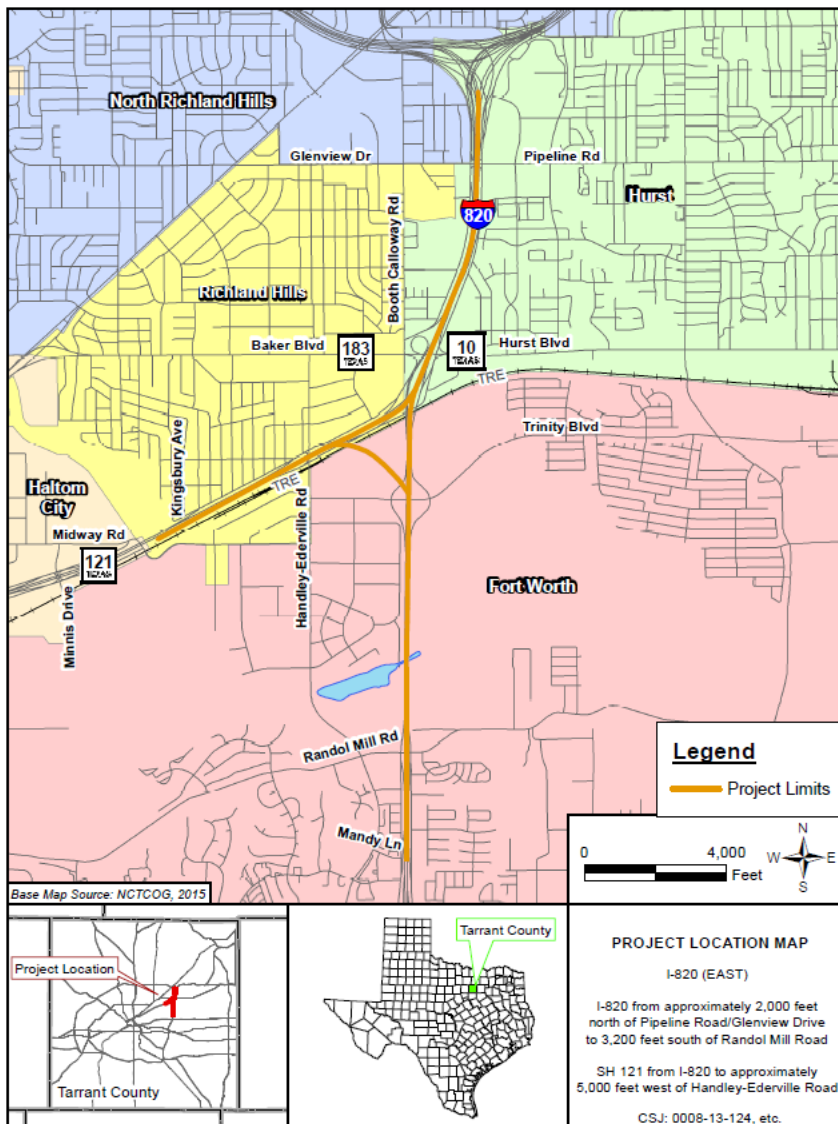
I. Project Description

The project referred to in this INFRA Application as the **Interstate Highway (IH) 20 Y-Connection Upgrade** is actually a compilation of two major improvement projects by TxDOT that focus upon the IH 820 Northeast and Southeast Loop sections around the City of Fort Worth in Tarrant County, Texas. Originally completed in the mid-1960’s, the Northeast and Southeast Loop sections have two general purpose lanes in each direction, and with obsolete design characteristics that contribute to significant congestion, safety concerns, and inefficient accessibility. Additional complications result at the extreme northern and southern sections of the IH 820 loop where multiple freeways merge and diverge in short succession and in varying configurations creating ineffective and bottlenecked funnel-like conditions. The proposed IH 20 Y-Connection Upgrade project will fully reconstruct these two IH 820 loop sections, as well as their various intersecting freeway approaches, to provide substantial extra capacity and improved interchange design to safely and more effectively accommodate rapidly-growing travel demands in this diverse and underserved portion of the Dallas-Fort Worth Metropolitan Area.

The northernmost of the two projects that comprise the IH 20 Y-Connection Upgrade is referred by the TxDOT – Fort Worth District as the **IH 820 East Loop Project**, located within the jurisdictions

of North Richland Hills, Richland Hills, Hurst, and Fort Worth. The project was originally conceived in 1992. A Public Hearing in October 2017. A Finding of No Significant Impact (FONSI) for the IH 820 East Loop Project preferred alternative is expected by December 2017. The proposed project will reconstruct IH 820 from just north of Pipeline Road/Glenview Drive, at the northern IH 820/SH 121/SH 183 interchange, to just south of Randol Mill Road. Additionally, SH 121 will be reconstructed from the southern IH 820/SH 121 interchange to approximately one mile west of Handley-Ederville Road. These improvements would also include the addition of connections providing direct access between SH 121 with IH 820, and SH 121 with Trinity Boulevard. **Exhibit 3** illustrates the extent of the proposed IH 820 East Loop Project improvements.

Exhibit 3: IH 820 East Loop Project Location Map



Source: TxDOT – IH 820 East Public Hearing Web Page (<http://www.txdot.gov/inside-txdot/get-involved/about/hearings-meetings/fort-worth/100517.html>)

The portion of IH 820 to be reconstructed via the IH 820 East Loop Project is described in two segments. The northern segment extends from the northern IH 820/SH 121/SH 183 interchange south to Trinity Boulevard. The existing freeway along this segment includes four northbound and five southbound general purpose lanes with discontinuous frontage roads. The proposed project will reconstruct this segment to include an additional general purpose lane in each direction, in addition to auxiliary lanes. The project will also include one managed toll lane in each direction, continuous frontage roads, and improved ramping. Most importantly, the southern IH 820/SH 121 interchange will be reconstructed in a new configuration such that traffic traveling through the southern and northern IH 820/SH 121/SH 183 interchanges on the same freeway (IH 820 or SH 121) would not be required to change lanes.

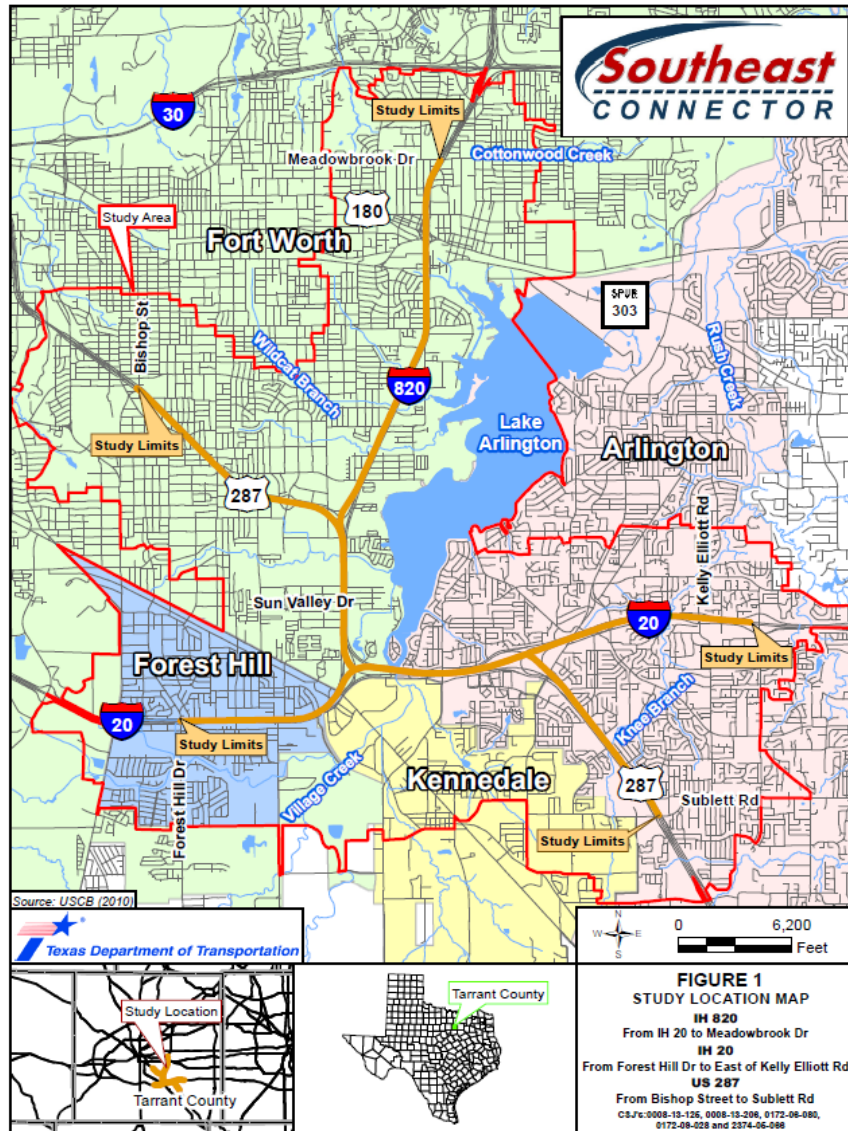
The southern segment of the IH 820 East Loop Project extends between Trinity Boulevard to Randol Mill Road. Currently, this segment includes two general purpose lanes in each direction. The proposed project will reconstruct this segment to include five general purpose lanes each direction. The existing freeway of SH 121, from IH 820 to Handley-Ederville Road, varies from two to three general purpose lanes each direction and includes continuous frontage roads. The proposed project will reconstruct this segment of SH 121 to include three general purpose lanes in each direction, one managed toll lane in each direction and continuous frontage roads with additional capacity. Safety lighting would also be added to improve driver visibility.

The southernmost, larger, and even more complex of the two projects that comprise the IH 20 Y-Connection Upgrade is locally known as the ***IH 20/IH 820/US 287 Southeast Connector Project***. This project is located within the jurisdictions of Fort Worth, Forest Hill, Kennedale, and Arlington, and like its companion project to the north, the IH 20/IH 820/US 287 Southeast Connector has also gone through several design iterations since its original inception back in 2000. **Exhibit 4** shows the project limits of the current Environmental Assessment and Schematic Development effort, which is expected to conclude in early 2020.

Also similar to its companion project to the north, the proposed IH 20/IH 820/US 287 Southeast Connector reconstruction can best be described in two segments. The northern segment consists of the IH 820 corridor from just north of Meadowbrook Drive (near the IH 30 interchange) to the US 287 interchange, a distance of approximately five miles. The existing freeway consists of two general purpose lanes in each direction with discontinuous frontage roads. The proposed project will reconstruct IH 820 to a facility with up to four general purpose lanes in each direction plus auxiliary lanes between ramps, as well as continuous frontage roads.

The southern segment of the proposed IH 20/IH 820/US 287 Southeast Connector project can best be described as the convergence zone and approaches for three separate freeway facilities. The existing freeway segments (totaling ten miles in length) are comprised of the following:

Exhibit 4: IH 20/IH 820/US 287 Southeast Connector Project Location Map



Source: TxDOT – IH 20/IH 820/US 287 Southeast Connector Website (<https://www.txdot.gov/inside-txdot/projects/studies/fort-worth/southeast-connector.html>)

- IH 20 West Approach (Forest Hill Drive to IH 820 Interchange) – Four general purpose lanes in each direction with discontinuous frontage roads, for a distance of approximately two miles.
- IH 20/US 287 “Funnel” (IH 820 Interchange to US 287 Interchange) – Five general purpose lanes in each direction with continuous frontage roads, for a distance of approximately one mile.
- IH 20 East Approach (US 287 Interchange to Park Springs Boulevard) – Four general purpose lanes in each direction with discontinuous frontage roads, for a distance of approximately two miles.

- IH 820/US 287 “Funnel” (US 287 Interchange to IH 20 Interchange) – Four general purpose lanes in each direction with continuous frontage roads, for a distance of approximately two miles.
- US 287 North Approach (Bishop Street/Berry Street to IH 820) – Three general purpose lanes in each direction with discontinuous frontage roads, for a distance of approximately two miles.
- US 287 South Approach (IH 20 to Sublett Road) – Two general purpose lanes in each direction with continuous frontage roads, for a distance of approximately one mile.

Several alternatives have been evaluated using the NCTCOG’s regional travel demand model. These alternatives include the addition of general purpose lanes, implementation of reversible or concurrent express lanes or tolled managed lanes, addition of collector-distributor facilities, or some combination of each of these options. An important design consideration of these alternatives includes reconstruction of the three major “funnel area” interchanges in such a way that traffic on general purpose lanes entering or leaving each interchange using the same freeway facility will not be required to change lanes. Additionally, all local access ramps to/from various cross-streets within each of the converge/diverge areas will be relocated to the outside of any potential general purpose lane weaving areas. These two issues have long been the primary causes of congestion and operational problems within the project area. These issues must be addressed for the IH 20/IH 820/US 287 Southeast Connector Project to be successful and adequately accommodate future traffic growth.

For the purposes of estimating the benefit-cost analysis (BCA) calculations for this INFRA Application, TxDOT and its project partners have agreed on the following technically-preferred alternative for the southern segment:

- IH 20 West Approach – Transition from four to up to seven general purpose lanes in each direction (including auxiliary lanes) with improved local access ramps and frontage road connectivity near the IH 820 interchange.
- IH 20/US 287 “Funnel Area” – Four to six general purpose lanes, as well as two to four additional lanes accommodated on collector-distributor facilities, in each direction.
- IH 20 East Approach – As a result of the proposed IH 20 expansion east of this project through the City of Arlington, this segment will include a transition from five to seven general purpose lanes in each direction (including auxiliary lanes), as well as improved local access ramps and continuous frontage roads.
- IH 820/US 287 “Funnel Area” – Up to seven general purpose lanes in each direction (including auxiliary lanes) with improved local access ramps outside of the potential weave zones between freeway-to-freeway connections. The segment will also contain reconstructed continuous frontage roads.
- US 287 North Approach – Transition of three to four general purpose lanes in each direction (including auxiliary lanes) with improved local access ramps and discontinuous frontage roads.

- US 287 South Approach – As a result of the proposed US 287 expansion south of this project through the cities of Arlington and Mansfield, this segment will include a transition from three to four general purpose lanes in each direction with improved local access ramps and continuous frontage roads.

It should be noted that the two projects that comprise the IH 20 Y-Connection Upgrade join together at an already-improved section of IH 820 between Randol Mill Road and Meadowbrook Drive in east Fort Worth. This section was improved during the late 1980's and early 1990's when the IH 30/IH 820 interchange was reconstructed. The approaches to the IH 30/IH 820 interchange have up to five general purpose lanes in each direction, and there are three to four general purpose lanes in each direction between the IH 30 direct connector ramps. The improvements proposed for each of the IH 20 Y-Connection Upgrade projects do not intend to significantly alter the existing capacity, configuration, and structures of IH 820 through this section.

II. Project Location

Located in the United States Census-designated Fort Worth–Arlington Urbanized Area at the eastern portion of Tarrant County, Texas, this proposed project will advance long-awaited improvements to the eastern loop of IH 820 as well as its various other freeway approaches/connections. Tarrant County is one of the core counties of the North Central Texas region which contains the Dallas-Fort Worth Metropolitan Area, currently the fourth most populated urban region in the nation. The cities within the IH 20 Y-Connection Upgrade project area have experienced significant growth in population since the original IH 20, IH 820, and US 287 corridors were built during 1960's and 1970's, and this growth contributes strongly to the daily congestion experienced on those facilities. **Exhibit 5** displays both past population growth trends and future forecasts within the adjoining IH 20 Y-Connection Upgrade project cities, Tarrant County, and the 12-county Metropolitan Planning Area (MPA). This growth, particularly in the cities near and/or beyond the southern and eastern ends of the overall corridor, highlights the strong need to improve mobility in the project area as quickly as possible.

The rapid growth in population for cities along the IH 20 Y-Connection Upgrade corridor has and will continue to translate into substantial daily traffic volumes. Though the volume in some locations is physically constrained given that the number of general purpose lanes is the same as the corridor's original capacity from up to five decades ago, in some cases significant congestion occurs well beyond the typical peak travel periods. This condition type is taken into account each year as TxDOT identifies the top 100 congested roadways in the state, and the IH 820 segment between State Highway (SH) 183 and IH 30 (located within the IH 820 East Project area) was ranked #83 on the list in 2016. **Exhibit 6** illustrates year 2016 TxDOT average daily traffic (ADT) counts and NCTCOG traffic projections for various freeway segments within the project area.

Exhibit 5: Population Trends and Forecasts in Project Vicinity

Location	1980 Census ¹	1990 Census ¹	2000 Census ¹	2010 Census ¹	2020 Forecast ²	2040 Forecast ³	Growth 2010-2040
Arlington	160,123	261,721	332,969	365,438	387,725	513,177	40%
Forest Hill	11,684	11,482	12,949	12,355	13,000	13,788	12%
Fort Worth	385,141	447,619	534,694	741,206	953,971	1,376,965	86%
Hurst	31,420	33,574	36,273	37,337	40,000	41,000	10%
Kennedale	2,594	4,096	5,850	6,763	8,000	10,824	60%
Mansfield	8,092	15,607	28,031	56,368	72,000	145,160	158%
North Richland Hills	30,592	45,895	55,635	63,343	71,655	77,126	22%
Richland Hills	7,977	7,978	8,132	7,801	8,401	9,601	23%
Tarrant County	860,880	1,170,103	1,446,219	1,809,034	2,006,473	3,094,649	71%
NCTCOG MPA	3,030,053	4,013,418	5,197,317	6,417,724	7,504,200	10,676,844	66%

Sources: 1. U.S. Census 2010 PL94-171, NCTCOG (February 2011).

2. Texas Water Development Board, 2016 Regional Water Plan Population Projections for 2020-2070 for Cities, Utilities, and County-Other by Region by County, Region C (December 2015).

3. NCTCOG 2040 Demographic Forecast (May 2015), <http://rdc.nctcog.org/Index.aspx> (at county level only).

Exhibit 6: Current and Future Traffic Volumes – Project Freeway Segments

Location	2016 Traffic Volumes ¹	2040 Traffic Volumes ²	Numerical Change	% Change
IH 820 (North of SH 10)	158,033	336,000 ³	177,967	113%
IH 820 (South of Trinity Boulevard)	89,153	254,300	165,147	185%
IH 820 (North of Ramey Street)	102,528	194,900	92,372	90%
IH 820/US 287 (South of Martin Street)	140,399	263,400	123,001	88%
IH 20/US 287 (East of Bowman Springs Road)	217,770	320,700	102,930	47%
IH 20 (East of Anglin Drive)	173,348	270,800	97,452	56%
IH 20 (West of Green Oaks Boulevard)	187,659	219,800	32,141	17%
US 287 (North of Carey Street)	66,865	136,600	69,735	104%
US 287 (South of Little Road)	78,083	118,000	39,917	51%

Sources: 1. TxDOT average daily traffic counts in 2016.

2. NCTCOG DFWDFX regional travel demand model.

3. Volume includes TEXpress Lanes.

Because IH 20 and IH 820 are major regional segments of the Interstate Highway System, a substantial portion of the current and future traffic volumes occurring on the facilities involves freight movement. In fact, TxDOT identified that truck volumes in 2016 represented approximately 7% to 8% of the total daily volumes in both of those corridors. Much of that volumes is derived by the North Central Texas MPA being centrally located within the lower 48 states, allowing a substantial logistics advantage in serving as a primary distribution center, or inland port, for the southwestern United States and the nation at-large. As a key component of the regional economy, over 317,000 tons of freight move to and from the region in a single year, and approximately 78% of this total is moved by trucks. Trucks can travel between the region and a majority of the country within 72 hours, and the freeways that comprise and/or intersection the IH 20 Y-Connection Upgrade project area provide critical connections to multiple large commercial and industrial activity centers throughout the western portion of the DFW Metropolitan Area. Within the project area itself, there are three primary Freight-Oriented Developments (FOD). The Riverbend FOD, located near the IH 820/SH 121 interchange, drives several major freight operations including McLane, ABC Supply, ATCO Rubber, and AT&T Fleet Services. The second FOD, near the IH 820 Southeast/Lake Arlington area, supports freight operations from FB McIntire Equipment, United Vision Logistics, and VoidForm Products Mesquite. The southernmost FOD, situated adjacent to the IH 820/US 287 interchange, includes major freight operations from FedEx, Old Dominion, Southeastern Freight Lanes, UPS Freight, and Central Transport.

IH 20, IH 820, US 287 and SH 121 each carry special distinctions and incorporate specific lane restrictions as result of their freight movement capacity and importance. **Exhibit 7** illustrates that each freeway is identified as part of either the TxDOT Primary or Secondary Freight Network or as part of the Federal Highway Administration (FHWA) Primary Highway Freight System. **Exhibit 8** highlights how both IH 20 and IH 820 are components of the North Central Texas region's designated Hazardous Cargo Routes, and IH 20 is classified as the Transuranic Radioactive Waste Route. **Exhibit 9** displays the location of current and future truck lane restrictions for freeway facilities across the DFW Metropolitan Area. It should be noted that IH 820 section of the IH 20 Y-Connection Upgrade project area is the only circumferential freeway that currently does not have restrictions for trucks using the left passing lane. This is a consequence, in addition to others, of the facility still having its 1960's capacity of two general purpose lanes in each direction for a majority of its length. The condition would be alleviated, along with the provision of numerous other safety benefits to be described further in the BCA, once the IH 20 Y-Connection Upgrade project is implemented.

Exhibit 7: North Central Texas Highway Freight Network Designations

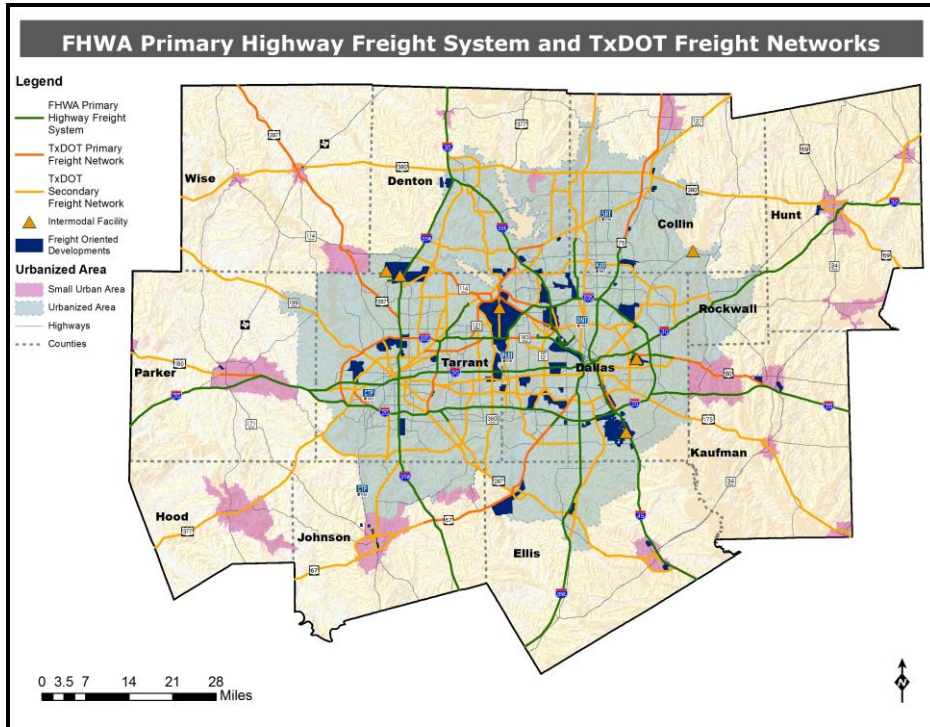


Exhibit 8: North Central Texas Regional Hazardous Materials Routes

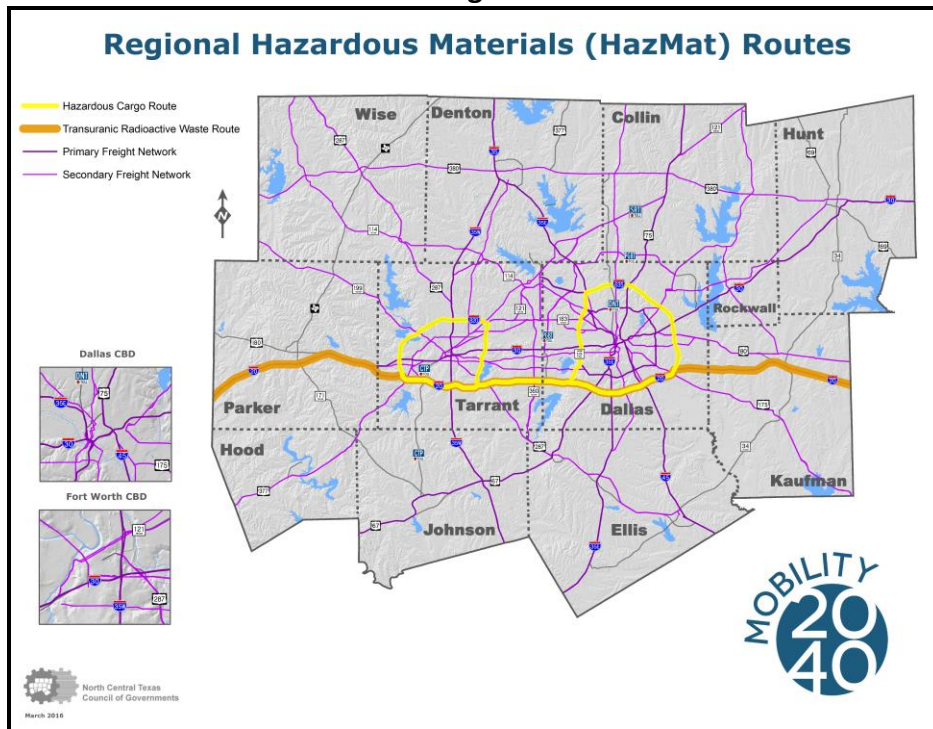
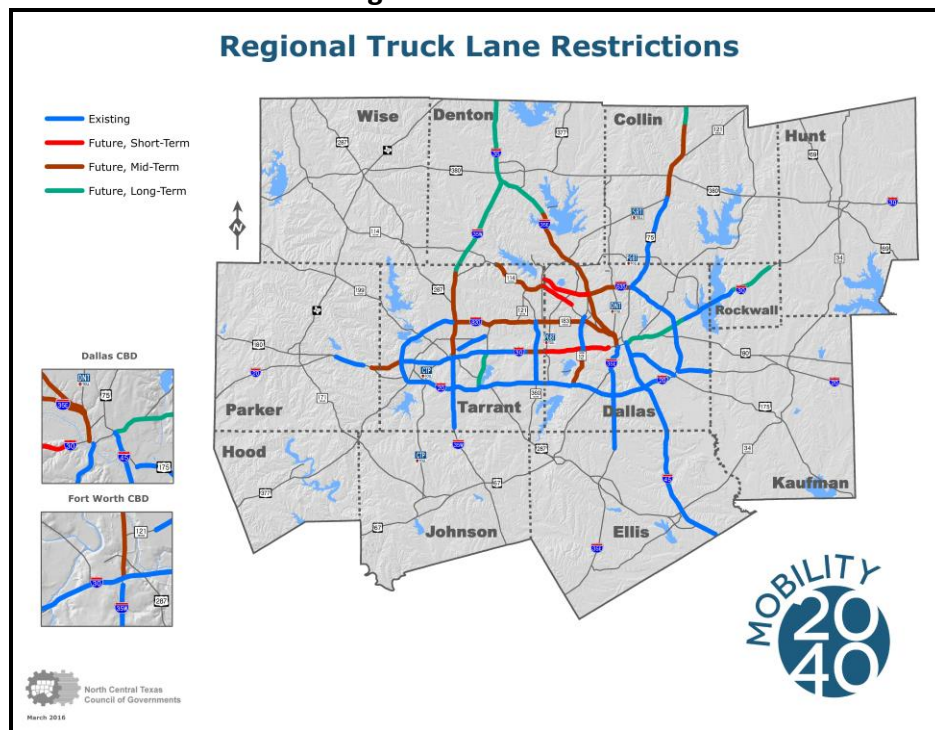


Exhibit 9: Regional Truck Lane Restrictions



Socio-Economic Context

Principal land uses within the IH 20 Y-Connection Upgrade project area is a diverse combination of industrial, commercial, conservation, and residential. As illustrated in **Exhibit 10**, land adjacent to the proposed roadways in both of the companion projects is predominantly developed with the exception of the Trinity River floodplain between Trinity Boulevard and Randol Mill Road, and various locations near/along the western shoreline of Lake Arlington. **Exhibit 11** identifies major employer locations along and near the project area.

Within the IH 820 East Project corridor, specifically, land use is a mixture of commercial and industrial, residential, and undeveloped land north of the IH 820/SH 121 southern interchange. An assortment of industrial, commercial, conservation, and limited park land exist to the south of the interchange. All residential land use is confined to the area north of the interchange, west of the interchange adjacent to Handley-Ederville Road, and to the south of Randol Mill Road. For the IH 20/IH 820/US 287 Southeast Connector Project corridor, land uses are generally more uniform in nature, with residential clearly the predominant condition in areas north of the IH 820/US 287 interchange, and near the IH 20 and US 287 termini at the southeastern corner of the project area. Commercial land uses are primarily clustered at several freeway interchanges, particularly in southwest Arlington at the IH 20/US 287 interchanges with Mansfield Highway and Little Road. Industrial land uses are clustered around the IH 820/US 287 interchange and where IH 820 crosses the Union Pacific Railroad between Lancaster Avenue and Rosedale Avenue.

Exhibit 10: IH 20 Y-Connection Upgrade Project Area – Land Use Map

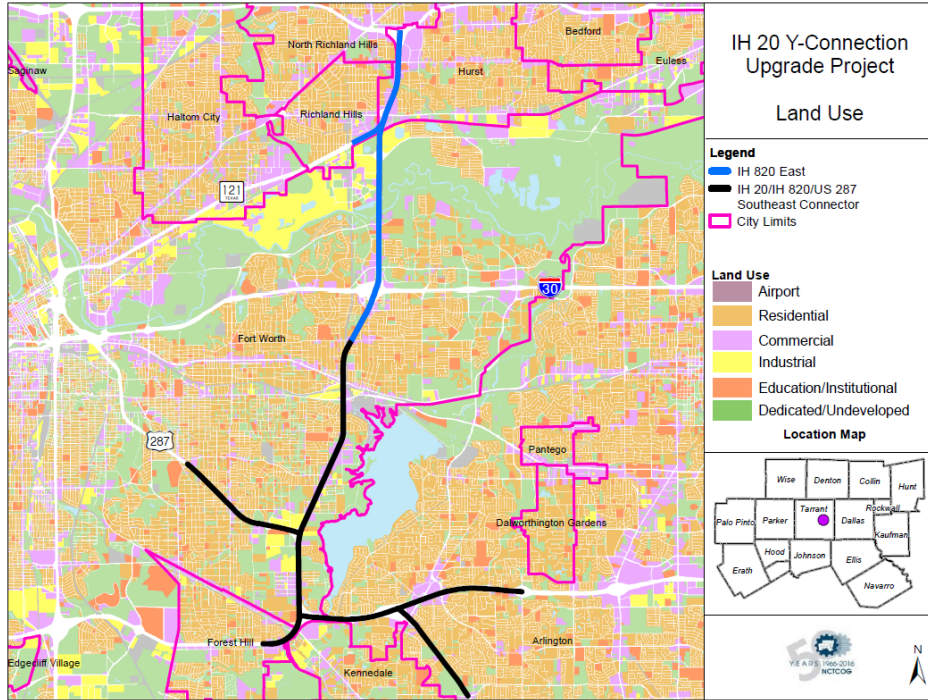
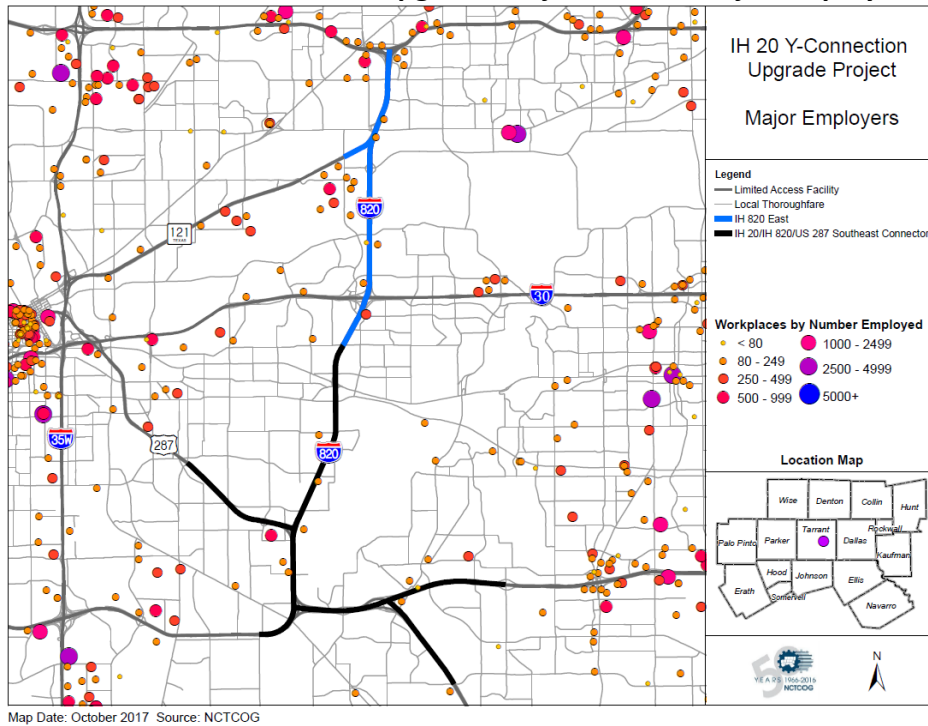
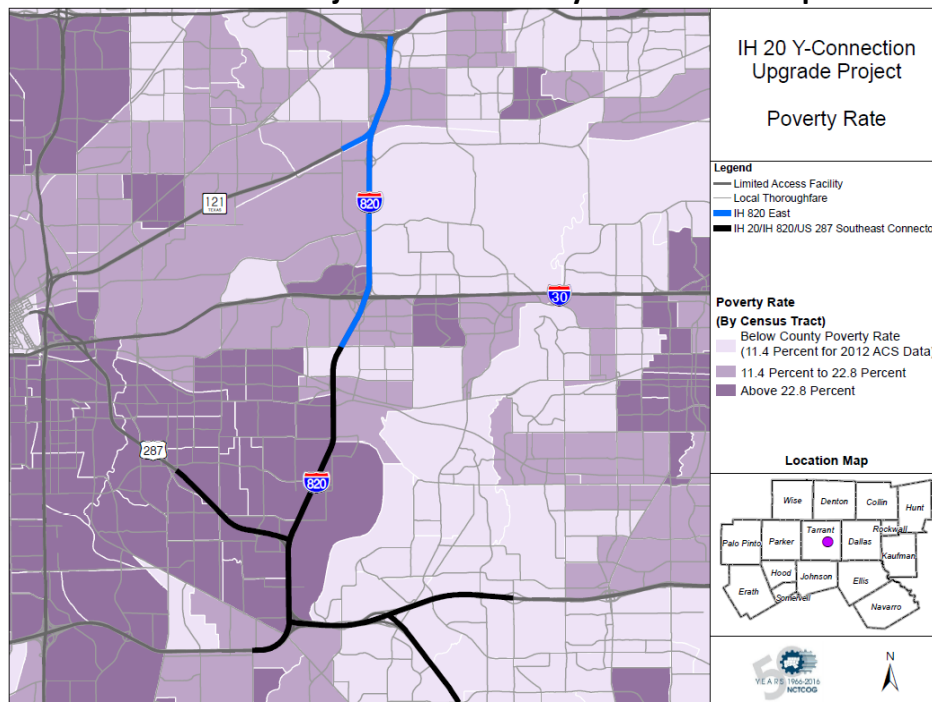


Exhibit 11: IH 20 Y-Connection Upgrade Project Area – Major Employers Map



The IH 20 Y-Connection Upgrade project area is also distinctive in that residents within a vast majority of census tracts along the IH 820 corridor, and particularly in the segment between Meadowbrook Drive and IH 20, live well below the average county poverty level according to American Community Survey (ACS) data. **Exhibit 12** shows the concentration of high-poverty census tracts along the IH 820 corridor, and it indicates how typical and widespread this condition is across much of east and southeast Fort Worth. Additionally, households in this area generally have high percentages of minority and limited-English proficiency populations compared to other sectors of the North Central Texas region. Adverse community impacts for environmental justice populations are not anticipated. As the project continues to develop, improved community connectivity and redevelopment opportunities in this traditionally underserved area will certainly be a primary focus in addition to mobility and efficiency improvements.

Exhibit 12: Project Area – Poverty Distribution Map



III. Project Parties

North Central Texas Council of Governments (Grant Applicant)

The North Central Texas Council of Governments (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. NCTCOG serves a 16-county metropolitan region comprised around the urban centers of Dallas and Fort Worth, and it consists of 234 members, including 16 counties,

169 cities, 22 independent school districts, and 28 special districts. Since 1974, NCTCOG has served as the Metropolitan Planning Organization (MPO) for the Dallas-Fort Worth area. The NCTCOG Transportation Department is responsible for the regional planning process for all transportation modes, and also 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.

Texas Department of Transportation (Grant Recipient/Project Implementation)

The Texas Legislature originally established TxDOT in 1917 as the Texas Highway Department. TxDOT's workforce of more than 12,000 employees is made up of engineers, administrators, designers, architects, sign makers, accountants, purchasers, maintenance workers, travel counselors, and many other professionals. Headquartered in Austin, TxDOT is made up of 25 district offices, 21 divisions, and 6 regional offices. This project is located in the Fort Worth District which plans, designs, builds, operates, and maintains the state transportation system in the following counties: Erath, Hood, Jack, Johnson, Palo Pinto, Parker, Somervell, Tarrant, and Wise.

IV. Grant Funds, Sources, and Uses of Project Funds

Exhibit 13 details the project funding sources and **Exhibit 14** details the estimated project costs to be funded through this INFRA Grant. All costs are in 2016 dollars. The amount of this FY 2017 and 2018 INFRA Grant request is **\$100 million**, designated for use in the project's construction phase.

Exhibit 13: IH 20 Y-Connection Upgrade Funding Sources

Funding Source	Type	Funding Amount	Percent
State	TxDOT PE Funding	\$19,600,000	(1%)
State	TxDOT ROW Funding	\$10,200,000	(1%)
State	TxDOT State Matching to INFRA Grant	\$25,000,000	(2%)
State	State Match to Leveraged STBG Funding	\$253,841,000	(16%)
Total of Non-Federal Funding Sources		\$308,641,000	(20%)
Federal (MPO)	Leveraged STBG (Federal)	\$1,046,626,000	(68%)
Federal	TxDOT PE Funding	\$78,400,000	(5%)
Federal	TxDOT ROW Funding	\$9,536,000	(1%)
Federal	INFRA Request	\$100,000,000	(6%)
Total of Federal Funding Sources		\$1,234,562,000	(80%)

Exhibit 14: IH 20 Y-Connection Upgrade Cost Estimate

Cost Category	Total Cost	Funding Source	
		Federal (Percent)	Non-Federal (Percent)
Design	\$98,000,000	\$78,400,000 (80%)	\$19,600,000 (20%)
Utility Relocation	\$68,920,000	\$55,136,000 (80%)	\$13,784,000 (20%)
Right-of-Way	\$51,000,000	\$40,800,000 (80%)	\$10,200,000 (20%)
Construction	\$1,169,379,000	\$935,503,000 (80%)	\$233,876,000 (20%)
Contingency	\$155,904,000	\$124,723,000 (80%)	\$31,181,000 (20%)
TOTAL PROJECT COST	\$1,543,203,000	\$1,234,562,000 (80%)	\$308,641,000 (20%)

V. Merit Criteria

Criterion #1: Support for National or Regional Economic Vitality

Results of the Benefit-Cost Analysis

A BCA for this project was prepared in accordance with the requirements and outcomes specified in the INFRA Notice of Funding Opportunity (NOFO) and the Benefit-Cost Analysis Guidance for TIGER and INFRA Applications (July 2017). The anticipated benefits and costs for this project were monetized in the BCA Attachment. The project benefits are shown in **Exhibit 15**. The NPV for the IH 20 Y-Connection Upgrade is shown in **Exhibit 16**. Applied to a total project cost of **\$1.54 billion**, a net benefit is achieved assuming a discount rate of 7 percent. Based on a 20-year project life, the overall effect of this transportation investment will result in a positive net value of **\$489 million**, after netting out the cost of the project. Calculations used to determine this total are discussed in more detail in the BCA Attachment.

Exhibit 15: Total Project Benefits

Benefit Category	Benefits
	7% Discount Rate
O & M Costs	\$(4,073,480)
Time Savings	\$594,096,935
Crash Reduction	\$307,397,228
Air Quality Emission Savings	\$803,497

Exhibit 16: Net Project Benefits

Discount Rate	Net Present Value of Total Benefits	Rounded Net Present Value of Total Benefits	Return on Investment
7 Percent	\$489,434,294	\$489 million	31 percent

The overall net value of this transportation investment will result in a positive return on investment of **31 percent (\$489 million/\$1.54 billion)**.

This project will increase the economic competitiveness and freight movement of the United States over the medium- and long-term by increasing accessibility to urban centers and job opportunities along five highway corridors (IH 20, IH 820, US 287, SH 121, and SH 183) in eastern Tarrant County. There will be direct freight and economic competitiveness benefits to project users including reduced air quality emissions, auto and commercial vehicle travel-time savings, and reductions in vehicle crashes. By providing direct frontage road access to/from these centers, the project also benefits all transportation system users through reduced freight shipping costs, new economic development opportunities, increased system reliability, reduced roadway and freight operating costs, and fuel savings.

Calculation of regional benefits from reduced congestion and travel times associated with the increased capacity is included in the BCA. The NPV of travel time savings to transportation system users is \$594 million.

As with all infrastructure improvements, the IH 20 Y-Connection Upgrade will generate an increment of new short-term jobs. Based on the Council of Economic Advisers' September 2011 determination that a job-year is created by every \$76,900 in transportation infrastructure spending, this \$1.54 billion project would generate approximately 20,067 job-years. This number is inclusive of onsite jobs and additional employment in other industries due to the multiplier effect. Benefits from short-term job creation were not included in the BCA because some or all of these benefits would have to be considered transfer benefits.

The annual crash frequency for this project was calculated based on rates identified within the ROW of the project. The NPV of crash reduction benefits is \$307.4 million. Similar to the safety improvements, air quality emissions are reduced as a result of added capacity and elimination of bottlenecks. The NPV of emission reductions is \$803,497.

Criterion #2: Leveraging of Federal Funding

NCTCOG currently manages federal, as well as state-administered, grants that are in various stages of development, implementation, and closeout. In FY 2016, NCTCOG facilitated expenditures of

\$12.6 million from various federal grants including awards from the Department of Commerce, Department of Energy, Environmental Protection Agency, Federal Transit Administration, Federal Emergency Management Agency, Department of Defense, Department of Labor, and the Federal Housing Administration. Also in FY 2016, NCTCOG facilitated expenditures of \$112.3 million from various state-administered grants including awards from the Texas Commission on Environmental Quality, Texas Department of Health, Texas State Energy Conservation Office, and TxDOT. The NCTCOG Transportation Department employs 21 fiscal and grant professionals who provide financial, legal, and compliance support for projects funded from these grants. No adverse audit findings from standards used by states, local governments, and non-profit organizations expending federal awards (Circular A-133) have been determined at this time. NCTCOG has not been required to comply with special “high risk” terms and conditions under agency regulations in the implementation of consistency and uniformity in the management of grants and cooperative agreements with state, local, and federally-recognized Indian tribal governments (OMB Circular A-102).

The current metropolitan transportation plan (MTP), *Mobility 2040: The Metropolitan Transportation Plan for North Central Texas*, represents a \$118.9 billion blueprint for the continued maintenance and development of the regional transportation system over 20-plus years. The MTP complies with all federal requirements regarding identifying and defining a financially-constrained long-range transportation plan. Funds available for implementing projects and programs are estimated using financial forecasting models which track and project revenue based on historical trends and anticipated future growth. Overall, the MTP financial forecast utilizes the following sources:

- Federal and state motor fuels taxes;
- State vehicle registration revenues;
- Other federal and state taxes;
- Revenue from the region’s toll and managed lane system;
- Local funds;
- Sales tax collected by transit authorities; and
- Proposition 1/Proposition 7 funds

State legislative action in the 2013 and 2015 sessions allowed for additional transportation revenue approved by voters as Proposition 1 and Proposition 7. Proposition 1 authorized a constitutional amendment allocating a portion of the Economic Stabilization Fund derived from oil and gas revenues to be deposited in the State Highway Fund for non-tolled projects (<http://www.txdot.gov/government/legislative/state-affairs/ballot-proposition.html>). Proposition 7 enabled an additional constitutional amendment to dedicate portions of revenue from the state’s general sales and use tax, as well as from the motor vehicle sales and rental tax, to the State Highway Fund for non-tolled projects (<http://www.txdot.gov/government/legislative/state-affairs/ballot-proposition-7.html>). TxDOT developed the estimate for the funding available to the region from these propositions, and Texas House Bill 20 (2015) provides the mechanism for

establishing funding categories and developing performance metrics to support project selection through an annually-updated UTP, also known as the Ten-Year Plan. Concerning the IH 20 Y-Connection project area, December 2016 RTC action requested that the Texas Transportation Commission (TTC) authorize \$659,171,200 in various FY 2017 UTP category funds to be allocated for the IH 20/IH 820/US 287 Southeast Connector Project. Additionally, it should be noted that this action also included a directive that \$300 million in FY 2017-2026 resources be reserved in a contingency fund that could be programmed to fill funding gaps for specific projects, if necessary. (<http://www.nctcog.org/trans/committees/rtc/documents/web.agenda.rtc120816.pdf>). Cost savings from construction bids lower than initial cost estimates for other on-system Tarrant County projects could be applied as alternate funding sources to this project.

Another accomplishment by the 2015 Texas Legislative Session was to eliminate several ongoing diversions of state gas taxes to various agencies and initiatives unrelated to transportation. This resulted in a projected revenue increase of as much as \$650 million per year for the state. Combined with the influx in additional revenue through Proposition 1 and 7 funds, Governor Greg Abbott directed the TTC generate a focused congestion relief initiative to identify and address the most congested corridor bottlenecks in the largest urban areas and work with MPO's to expedite additional capacity construction. Coined the Texas Clear Lanes Initiative in September 2016, an initial task force of TxDOT administration/district staff and MPO representatives led to the authorization of priority funding for projects in the state's five largest metropolitan areas, including the Dallas-Fort Worth region (<http://www.texasclearlanes.com>). Regarding the IH 20 Y-Connection project area, this initial effort resulted in a \$200 million allotment to partially reconstruct the IH 820 East Project beginning in 2018. However, shortly after TTC approval of the FY 2017 UTP in February 2017 and the release of new demographic projections showing even more robust population/employment growth in the state's largest metropolitan areas, the Governor authorized a subsequent effort to further redistribute state funds toward additional urban congestion relief projects. As of October 2017, the TTC anticipates committing up to an additional \$2 billion statewide in unallocated Category 12 Strategic Priority (Federal/State) funds to help fill funding gaps for high-priority large urban area projects, including the ultimate build-out of the IH 20 Y-Connection project (<http://ftp.dot.state.tx.us/pub/txdot/commission/2017/1025/2-presentation.pdf>). Following public/agency involvement, final TTC action with this effort is scheduled to occur in December 2017 in combination with the statewide approval of the FY 2018 UTP (<http://ftp.dot.state.tx.us/pub/txdot/commission/2017/1026/3-presentation.pdf>).

At the local/regional level, should funds be needed for the proposed INFRA project as a result of potential cost overruns or shortage of federal/state funds, Regional Toll Revenue (RTR) funds can be utilized by the RTC. RTR funds comprise a unique funding source, created in 2007 after the North Texas Tollway Authority (NTTA) agreed to build the 28-mile-long SH 121 extension, or Sam Rayburn Tollway (SRT), through Collin, Dallas and Denton Counties. In addition to the expedited construction of a major roadway, the NTTA agreement also enabled delivery of a \$3.2 billion upfront payment in exchange for appropriate SRT operations, maintenance, and upgrades for a

minimum of 52 years, and the available revenue could be applied to projects of varying types throughout the North Central Texas region. Since inception, additional payments and toll revenues from the 10-mile-long President George Bush Turnpike (PGBT) Eastern Extension, which opened in 2011, and the 12-mile-long PGBT Western Extension (also known as SH 161) completed in 2012, have increased the total RTR funds over time. These funds have helped leverage additional resources from public/private partners for a comprehensive regional list of projects/programs with total user benefits and economic values that greatly exceed the overall funds received.

Since the turn of this century, the North Central Texas region has leveraged nearly \$28 billion in federal, state, regional, and private sector funds to build major limited-access roadway projects. For example, on the IH 635 LBJ Express Project (IH 35E to US 75) in north Dallas, the private sector provided roughly four-fifths of the project financing, or approximately \$2.21 billion of the total \$2.7 billion needed. The innovative PPP enabled taxpayers to leverage \$490 million in public funds to receive more than four times the value in infrastructure enhancements and traffic relief. Though not all of the IH 20 Y-Connection Upgrade corridor will contain tolled managed lanes, certainly portions of the potential revenue stream, as well as additional PPP innovative financing, design, and delivery options, will result in some extra leveraging from the private sector to further enhance this project.

Criterion #3: Potential for Innovation

TxDOT will utilize a new environmental review approach to expedite the National Environmental Policy Act (NEPA) and permitting process for this project. Through the use of a “buffer” analysis, TxDOT will jump-start the NEPA process by performing an early analysis of worst-case impacts for areas of study that do not require a substantial level of design detail to support an anticipated FONSI. By analyzing a worst-case footprint that results in no substantial effect, then any lesser footprint identified by detailed design in later phases of the project would still be environmentally cleared. The use of a worst-case “buffer” analysis allows us to complete various supporting technical studies earlier in the design/environmental process. Another benefit to this approach is the results of a “buffer” analysis could aid in the project avoiding potentially substantial effects. While some supporting studies (e.g. biological assessments) utilize multiple forms and/or checklists, TxDOT will be utilizing a “single checklist” as a guide to streamline the documentation and technical review of a given area of study. By advancing bridge construction to the IH 820 East Loop interim project, TxDOT has also jump-started permitting with the resource agencies.

TxDOT has assumed NEPA responsibilities from FHWA for environmental review, consultation, and other actions required under federal environmental law that pertain to the review or approval of a specific highway, railroad, public transportation and multimodal projects. The responsibilities were assigned under the Surface Transportation Project Delivery Program (assignment program) codified at 23 USC 327. The assigned responsibilities are subject to the same procedural and substantive requirements as previously applied to FHWA. The

assignment program does not preempt or interfere with any power, jurisdiction, responsibility or authority of an agency, excluding FWHA, under applicable law and regulations. When TxDOT became responsible for the assigned responsibilities, the TxDOT Environmental Program was updated to address the assignment program requirements. The tools in the TxDOT Environmental Compliance Toolkits explain or satisfy the requirements of the TxDOT environmental review process, which includes the assignment program requirements.

Criterion #4: Performance and Accountability

On October 12, 2017, the RTC approved a policy to request that TxDOT expedite this project through a pass-through toll or design-build contract. The IH 820 East Loop project is expected to be added to the scope of the existing PPP design-build contract between TxDOT and NTE Mobility Partners/Cintra for the North Tarrant Express along the IH 35W/IH 820/SH 121/183 corridors in Tarrant County. The contract addition is the most efficient means of advancing construction, because TxDOT can elect to request pricing for additional scope from the current developer. This allows for the best schedule for construction with the ability to release some construction packages early. Some benefits to using the existing developer include:

- Familiarity between key design staff, contractor staff, and TxDOT staff, as well as with the current process for changes and additions to the contract;
- Existing contract change would allow rapid mobilization for scoping and design initiation;
- Early packages would allow for rapid start of construction while design is completed;
- As labor resources in the area are consumed by competing projects, using design-build method sets the price earlier and Developer assumes risk of obtaining crews and material;
- No mobilization period and relatively little cost due to current/proposed work by NTE Mobility Partners/Cintra to deliver other IH 820 and SH 121 projects in Tarrant County.

If awarded INFRA funding, the NCTCOG would work with TxDOT to investigate performance incentive clauses in the change order to the existing design-build contract or other future construction contracts. The NCTCOG would request regular project updates from TxDOT as part of future RTC meetings. Once construction has been initiated, performance and accountability would be monitored in both the TxDOT Project Tracker web page and the existing contractor's website (www.northtarrantexpress.com).

VI. Project Readiness

Project Schedule

As a result of recent efforts to ensure partial funding through the UTP/Ten-Year Plan process and the Texas Clear Lanes Initiative, the two major projects that comprise the IH 20 Y-Connection will be in a position for expedited delivery well before the INFRA obligation and construction commencement requirements. For the IH 820 East Project, the project schedule shown in **Exhibit 17** indicates obligation of funds and construction letting for the Clear Lanes interim project in

summer 2019, and completion of the project anticipated by the end of 2021. Through a design-build delivery mechanism, the procurement, design, and utility relocation activities for the ultimate IH 820 East Project could occur during construction of the interim project allowing for a seamless transition. Therefore, construction of the ultimate IH 820 East Project could begin as

Exhibit 17 – IH 820 East Loop Project Schedule

IH 20 Y- Connection: IH 820 East Interim Project (Green)	2017				2018				2019				2020				2021			
	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4
Pre-Construction																				
Environmental Clearance				█																
MTP Listing				█	█															
TIP/STIP Listing					█	█														
UTP Listing					█	█														
Procurement								█	█	█	█									
Design										█	█	█	█	█						
Utility Relocation										█	█		█	█	█	█	█			
Right-of-Way Acquisition										█	█					█	█	█	█	█
Construction										█	█	█	█	█	█	█	█	█	█	█
Misc./Landscaping																				█
Punchlist/Final Acceptance																				█
IH 20 Y-Connection: IH 820 East Ultimate Project (Red)	2022				2023				2024				2025				2026			
	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4
Construction	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Misc./Landscaping																				█
Punchlist/Final Acceptance																				█

early as spring 2022, and it would conclude by the end of 2026. For the IH 20/IH 820/US 287 Southeast Connector Project, the schedule illustrated in **Exhibit 18** indicates that the full reconstruction project would proceed to construction letting by winter 2021, and substantial completion could be achieved by the end of 2026. As with its companion project, this aggressive schedule is made possible through the efficiencies and innovations of the design-build delivery mechanism, a method promoted extensively by the state as part of the Clear Lanes Initiative. Numerous large transportation projects in the North Central Texas region have successfully delivered through this method over the past decade, including the DFW Connector, LBJ Express, North Tarrant Express, and 35Express, and therefore TxDOT, local governments, and the regional consortium of major contractors have extensive knowledge, experience, and resources to meet the demands of such great coordination efforts.

Exhibit 18: Southeast Connector Project Schedule

IH 20 Y- Connection: IH 20/IH 820/US 287 Southeast Connector	2017				2018				2019				2020				2021			
	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4
Pre-Construction																				
MTP Listing																				
TIP/STIP Listing																				
UTP Listing																				
Environmental Clearance																				
Procurement																				
Design																				
Utility Relocation																				
Right-of-Way Acquisition																				
IH 20 Y-Connection: IH 20/IH 820/US 287 Southeast Connector	2022				2023				2024				2025				2026			
	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4
Construction																				
Misc./Landscaping																				
Punchlist/Final Acceptance																				

NEPA Status

A Finding of No Significant Impact (FONSI) for the IH 820 East Loop project component is expected by December 2017 (October 2017 Public Hearing documentation - <http://www.txdot.gov/inside-txdot/get-involved/about/hearings-meetings/fort-worth/100517.html>). The environmental assessment and schematic development process for the IH 20/IH 820/US 287 Southeast Connector component is underway with approval expected in spring 2020. The overall project is expected to be consistent with recommendations from the upcoming *Mobility 2045: The Metropolitan Transportation Plan for North Central Texas*, anticipated for federal approval by November 2018.

State and Local Approvals

Regarding the IH 820 East Project component, permits involving waters of the United States would be relatively minor in nature for planned culvert crossings, but no major Section 404 or 408 (of the Clean Water Act) issues have been identified for the Trinity River crossing. For the whole IH 20 Y-Connection Upgrade project, revision to the STIP/TIP will be necessary if INFRA Grant funding is applied, however potential expedited delivery resulting from TTC Clear Lanes Initiative funding effort through the state has already initiated this process. Right-of-way (ROW) will need to be

acquired for the entire project, though the extent of acquisition within the IH 20/IH 820/US 287 Southeast Connector component is not yet defined.

Project Risks and Mitigation Strategies

- a. Environmental Uncertainties – Project risks are somewhat elevated since proposed work is not environmentally cleared and needed ROW has not fully identified, acquired, and/or purchased throughout the entire project area. However, it should be noted through materials presented at the October 2017 Public Hearing and accompanying documentation that stakeholders fully support the IH 820 East Project component. For the IH 20/IH 820/US 287 Southeast Connector project, though several iterations of the study have not yet resulted in environmental clearance, that result previously had been based almost exclusively on lack of funding for further development. Public/stakeholder involvement and feedback had been generally positive during earlier study efforts, and it is likely that sentiment will either be maintained or increased with this most recent study.
- b. Potential Procurement Delays – To keep up with the tremendous population growth across the North Central Texas region, TxDOT has used innovative project delivery methods (i.e., design-build, comprehensive development agreements) to build project faster. In the past seven years, TxDOT has built six roadway project in the Dallas-Fort Worth Metropolitan 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 the 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 20 Y-Connection Upgrade. TxDOT staff is highly capable of delivering a project of this magnitude quickly and efficiently.

VII. Large/Small Project Requirements

Large Project Determination

1. *Does the project generate national or regional economic, mobility, safety benefits?*

Yes. The project enhances capacity and improves safety within a congested critical regional roadway system used for access to/from large economic and commercial centers.

2. *Is the project cost effective?*

Yes. As noted in Section V (Merit Criterion #1), the BCA indicates that the project will result in a positive return on investment of 31 percent (\$489 million/\$1.54 billion). The results of the BCA clearly indicate that this project will provide significant regional benefits and will substantially improve quality of life for businesses and residents in this region.

3. *Does the project contribute to one or more of the Goals listed under 23 U.S.C. Code 150?*

Yes. The proposed project improvements (direct connector ramps, frontage roads, bridge replacement) promote the following Goals listed under 23 U.S.C. Code 150: Safety; Infrastructure Condition; Congestion Reduction; System Reliability; Freight Movement and Economic Vitality; and Reduced Project Delivery Delays.

4. *Is the project based on the results of preliminary engineering?*

Yes. As noted in Section VI, a Finding of No Significant Impact (FONSI) for the IH 820 East Loop project component is expected by December 2017. The environmental assessment for the Southeast Connector portion is underway with approval expected in spring 2020.

5a. *With respect to non-Federal financial commitments, does the project have one or more stable and dependable funding or financing sources to construct, maintain, and operate the project?*

Yes. A combination of federal, state, and regional sources can be used to design, construct, operate, and maintain the project (see **Exhibit 13**).

5b. *Are contingency amounts available to cover unanticipated cost increases?*

As noted in Section VI, Regional Toll Revenue (RTR) funds can be utilized to cover potential cost overruns or shortages of federal/state funds. Cost savings from other construction phases and from lower-than-anticipated construction bids for other on-system Tarrant County projects may also be utilized.

6. *Is it the case that the project cannot be easily and efficiently completed without other Federal funding or financial assistance available to the project sponsor?*

The cost to complete the IH 20 Y-Connection Upgrade is estimated at \$1.54 billion. The need for the project has resulted in an expedited schedule that will require funding to materialize sooner rather than later. The INFRA Grant is one of the funding sources available to expedite the entire project rather than building it in phases and delaying benefits.

7. *Is the project reasonably expected to begin construction not later than 18 months after the date of obligation of funds for the project?*

Yes. Although the Southeast Connector component has not yet been environmentally cleared, TxDOT has long established a firm and consistent precedent for expediting procurement and construction for numerous large projects in the region. Given the strong support for the region and the state for this project, the same progress can be expected.