DFW Connector North Airport Interchange

FASTLANE FUNDING APPLICATION – PROJECT NARRATIVE

North Central Texas Council of Governments

Transportation Department

A. Project Name: DFW Connector North Airport Interchange

B. Previously Incurred Project Cost.	$ 1,020,000,000
C. Future Eligible Project Cost.	$ -
D. Total Project Cost.	$ 106,881,185
E. Nationally Significant Freight & Highway Projects (NSFHP).	$ 64,000,000
F. Total Federal Funding.	$ 85,504,948
G. Are matching funds restricted to a specific project component?	NO
H. Is the project or a portion of the project currently located on the National Highway Freight Network?	YES
I. 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?	NO
ii. Is the project in a national scenic area?	NO
J. Do the project components include a railway-highway grade crossing or grade separation project?	NO
K. 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
L. If answered yes to either of the two component questions above, how much of the requested NSFHP funds will be spent on each of these project components?	($)
M. State(s) in which project is located.	TEXAS
N. Small or large project?	LARGE
O. Also submitting an application to TIGER for this project?	NO
P. Urbanized Area in which project is located, if applicable.	DALLAS - FORT WORTH - ARLINGTON
Q. Population of Urbanized Area.	5,121,892
R. Is the project currently programmed in the:	
i. TIP	YES - 2015-2018 APPENDIX D 2017-2020 UNDER FEDERAL REVIEW
ii. STIP	NO - TO BE ADDED TO 2015-2018
iii. MPO Long Range Transportation Plan	YES - MTP 2035 - 2014 AMENDMENT MTP 2040 - UNDER FEDERAL REVIEW
iv. State Long Range Transportation Plan	YES - TEXAS TRANSPORTATION PLAN 2040
v. State Freight Plan	NO

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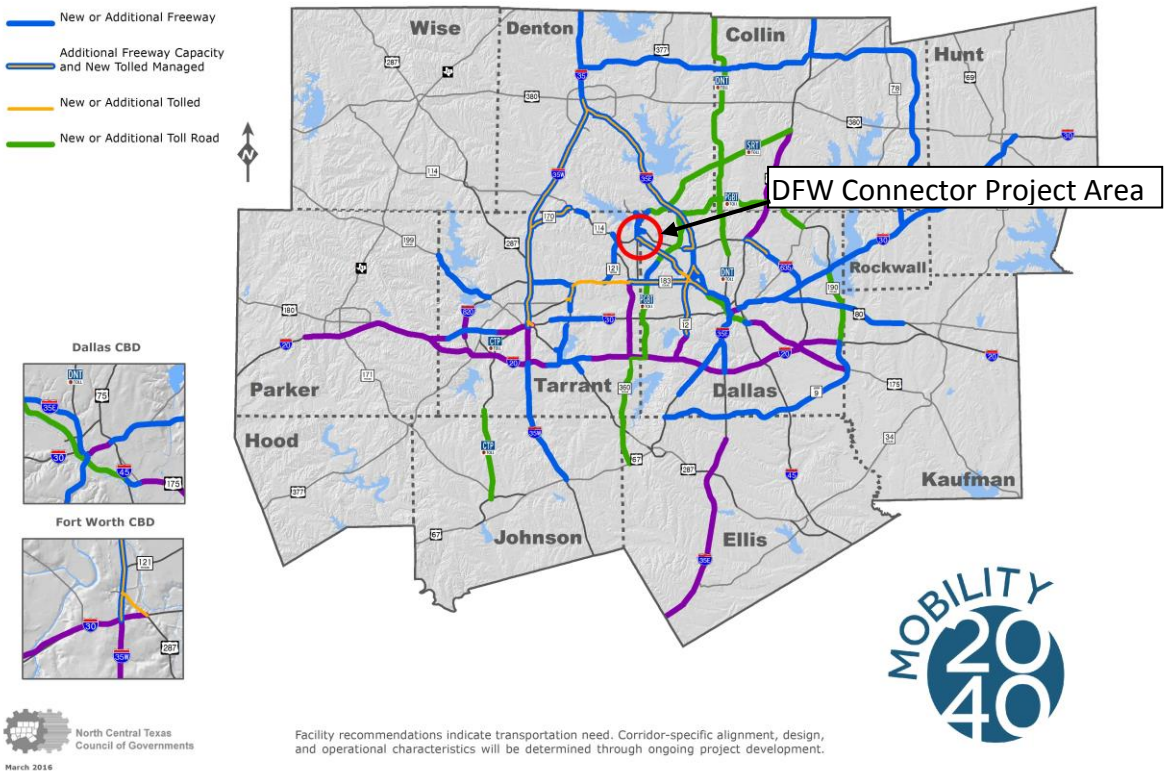
LIST OF ABBREVIATIONS:

ADT	Average Daily Traffic
ARRA	American Recovery and Reinvestment Act
BCA	Benefit-Cost Analysis
CDA	Comprehensive Development Agreement
DART	Dallas Area Rapid Transit
DFW	Dallas-Fort Worth
DFW Airport	Dallas-Fort Worth International Airport
EA	Environmental Assessment
EB	Eastbound
FAST LANE	Fostering Advancements in Shipping and Transportation for the Long-Term Achievement of National Efficiencies
FHWA	Federal Highway Administration
FM	Farm-to-Market Road
FONSI	Finding of No Significant Impact
FTZ	Foreign Trade Zone
FY	Fiscal Year
HOV	High-Occupancy Vehicle
IH	Interstate Highway
MPA	Metropolitan Planning Area
MPH	Miles-per-Hour
MPO	Metropolitan Planning Organization
MTP	Metropolitan Transportation Plan
NB	Northbound
NCTCOG	North Central Texas Council of Governments
NSFHP	Nationally Significant Freight and Highway Projects
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
SB	Southbound
SH	State Highway
SRT	Sam Rayburn Tollway
STIP	State Transportation Improvement Program
STP-MM	Surface Transportation Program – Metropolitan Mobility
TIP	Transportation Improvement Program
TRIP	Terminal Renewal and Improvement Program
TSA	Transportation Security Agency
TxDOT	Texas Department of Transportation
WB	Westbound

Executive Summary

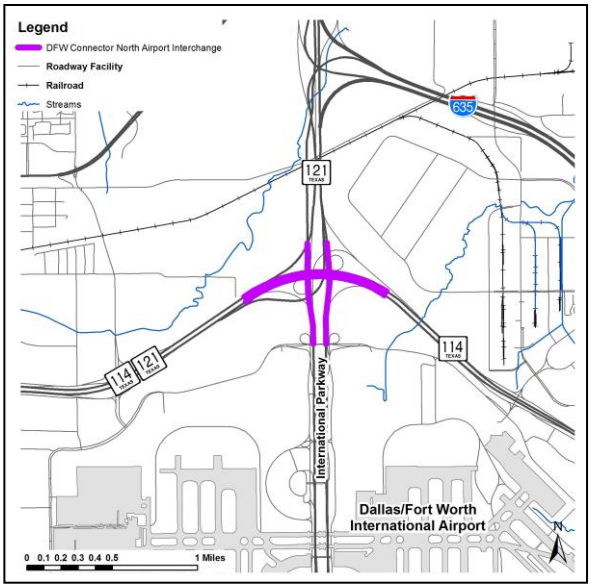
The DFW Connector Project was a successful public-private partnership between the Texas Department of Transportation (TxDOT) and Northgate Constructors that reconstructed a highly-congested and complex convergence of multiple freeway facilities near the north entrance of Dallas-Fort Worth International Airport (DFW Airport). Built between 2009 and 2013, and partially funded by the American Recovery and Reinvestment Act (ARRA), the DFW Connector Project was designed to eliminate existing transportation system deficiencies, improve mobility, and enhance access to/from one of the world's busiest airports, as well as the largest economic engine for the North Central Texas region.

Figure E1: Dallas-Fort Worth Area Funded Roadway Recommendations



The $1.02 billion initial DFW Connector construction phase completed substantial improvements to the North Airport Interchange, the junction of Interstate Highway (IH) 635, State Highway (SH) 114, SH 121, and the DFW Airport limited-access facility known as International Parkway, as well as its parallel frontage roads. However, due to funding constraints, not all elements of the overall $1.6 billion in approved ultimate improvements could be constructed, and extensive deferments resulted in more limited mobility and accessibility enhancements in several critical locations. The various deferments, in addition to the location, configuration, and access patterns of new ramps built at the North Airport Interchange, particularly those that access to/from the International Parkway frontage roads, resulted in some longer-distance and lower-speed local trips on alternate routes in/out of the airport that affect DFW Airport freight operations, airport-related large employer sites, and long-term passenger parking locations.

Figure E2: Project Overview and Limits



The North Central Texas Council of Governments (NCTCOG), in cooperation with TxDOT, is preparing this application to seek funding assistance of **$64 million** through the FY 2016 Fostering Advancements in Shipping and Transportation for the Long-Term Achievement of National Efficiencies (FASTLANE) Discretionary Grant Program for a project that will implement all remaining approved airport-related DFW Connector Project features at the North Airport Interchange. Construction of the deferred ramps, as well as the proposed modifications to various nearby on-airport roadway facilities, will fully restore direct International Parkway frontage road access to/from each of the North Airport Interchange intersecting freeways. The project, with a **total cost of approximately $107 million,** will also deliver new direct DFW Airport connector ramps to/from the SH 114 TEXpress Lanes under construction, via the Midtown Express Project.

This application includes estimates of the project's expected benefits based on the requirements and outcomes specified in the Nationally Significant Freight and Highway Projects (NSFHP) Final Notice of Funding Opportunity. This application narrative and benefit-cost analysis (BCA) appendix identify the benefit calculation methodology, quantify the monetary benefit in net present value for the DFW Connector North Airport Interchange, and substantiate the expected benefits and costs in accordance with federal requirements.

The costs and benefits contained within this application were derived using travel demand model data, assumptions from TxDOT safety and performance data/documents, NCTCOG demographic and economic trends/forecasts, and additional relevant information from all levels of government. The BCA appendix was utilized to analyze the benefits verses the costs for the project. The analysis summarizes net benefits and the benefit/cost ("B/C") ratio for a net present value utilizing a 7 percent discount rate scenario. Net benefits of nearly **$540 million** over the 20-year time horizon are attainable with a B/C ratio of **5.05**. **Table E1** outlines a summary of costs and benefits for the DFW Connector North Airport Interchange project.

Table E1: Benefit-Cost Summary Results

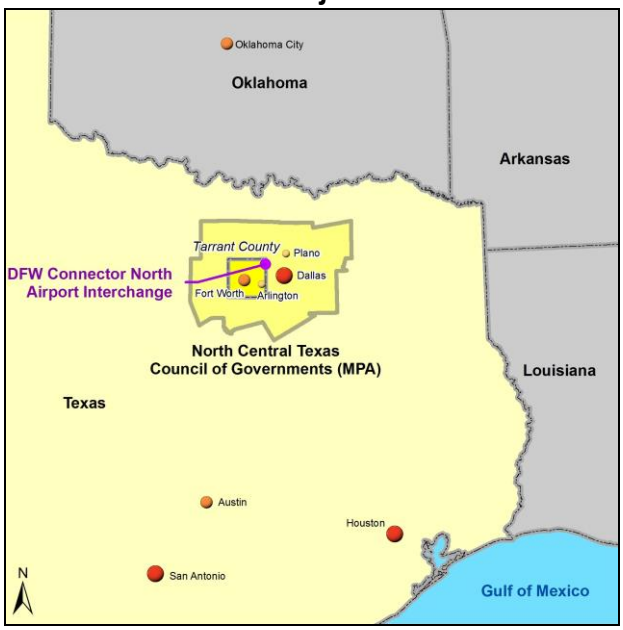
Benefit-Cost Summary Results			***Average Annual***	***Total Over 20 Years***
Life-Cycle Costs (mil. $)	$106,881,185	***ITEMIZED BENEFITS***		
Life-Cycle Benefits (mil. $)	$1,539,102,857	Travel Time Savings (mil. $)	$26.0	$547.3
Net Present Value (mil. $)	$539,825,003	Safety Cost Savings (mil. $)	$6.1	$128.9
BENEFIT/COST RATIO	**5.05**	Emissions Cost Savings (thou. $	$34	$733
		TOTAL BENEFITS 7% NPV (mil. $)	**$22.4**	**$539.8**
Return on Investment (rate):	20%	Person Hours of Delay Saved	3,139,308	75,343,402
Payback Period:	3 years			

1.0 Project Description

1.1 Project Overview

Located in the United States Census-designated Fort Worth – Arlington Urbanized Area at the far northeastern corner of Tarrant County, Texas, the project identified for this fiscal year (FY) 2016 Fostering Advancements in Shipping and Transportation for the Long-Term Achievement of National Efficiencies (FASTLANE) Discretionary Grant Program application will advance the next construction phase for the **DFW Connector North Airport Interchange**. **Exhibit 1** displays the project area location with respect to the spatial extent of the North Central Texas Metropolitan Planning Area (MPA) and the Fort Worth – Arlington Urbanized Area. The project will build six direct connector ramps and additional planned local thoroughfare network improvements at the north entrance of Dallas-Fort Worth International Airport (DFW Airport) in an effort to complete the ultimate access and circulation pattern at the North Airport Interchange between Interstate Highway (IH) 635, State Highway (SH) 114, SH 121, International Parkway, and its parallel frontage roads. The infrastructure improvements will help fulfill the DFW Airport ultimate vision for effective ground capacity and optimal connectivity to the regional surface transportation system, ensuring that the largest economic engine for North Central Texas can successfully meet current and future demands for growth, convenience, efficiency, and economic vitality.

Exhibit 1: Project Location



The North Airport Interchange is a major component of the 14.4-mile-long DFW Connector Project, a comprehensive improvement plan developed through an intensive public involvement process beginning in 1996, for a critical convergence zone of multiple freeways and local thoroughfares surrounding the north entrance of DFW Airport. The DFW Connector Project was designed to eliminate existing transportation system deficiencies, reduce numerous weaving conflicts, improve safety, and enhance capacity and accessibility to/from major commercial centers, employment sites, and large economic activity areas along SH 114 and SH 121 through

four cities in far northeastern Tarrant County and far northwestern Dallas County. The unique characteristics of the project, including its large size and proposed incorporation of managed lanes, provided considerable design-build advantages through implementation as a public-private partnership (PPP), and the Texas Department of Transportation (TxDOT) was authorized in 2006 to initiate a bidding process in preparation for a comprehensive development agreement (CDA). Shortly after receipt of a Finding of No Significant Impact (FONSI) from the Federal Highway Administration (FHWA) in April 2009, TxDOT selected a consortium of design and engineering contractors known collectively as Northgate Constructors to deliver an initial phase of the DFW Connector Project (www.dfwconnector.com). The $1.02 billion construction package was executed in October 2009 and completed in November 2013 (nearly a full year ahead of the originally scheduled completion date), and it included a $250 million allocation from the American Recovery and Reinvestment Act (ARRA), which was the nation's largest single-project transportation allotment.

Though the initial construction phase of the DFW Connector Project incorporated significant portions of the $1.6 billion ultimate improvement plan, there were substantial elements that were deferred due to lack of available funding resources. One of the largest deferments were direct freeway ramp connections and proposed local thoroughfare network upgrades in the area of the North Airport Interchange. The various deferments, in addition to the location, configuration, and access patterns of numerous new ramps built with the initial DFW Connector construction, resulted in some longer-distance and lower-speed local trips on alternate routes in/out of the airport that affect DFW Airport freight carriers, airport-related large employer sites, and long-term passenger parking locations.

The North Central Texas region is centrally located within the lower 48 states, allowing the Dallas-Fort Worth Metropolitan Area a logistics advantage in serving as a primary distribution center, or inland port, for the southwestern United States and the nation at-large. Trucks can travel between the region and a majority of the country within 72 hours, and the IH 635 corridor provides the direct connection between the National Freight Highway Network and DFW Airport via the North Airport Interchange. Air cargo shipments can be flown between DFW Airport and nearly every domestic airport within 4 hours, and as a growing international hub with air cargo services to/from cities on five continents, a diverse range of commodities including electronics, machinery, medical equipment, and pharmaceuticals are being shipped through the airport in greater quantities and frequency as the region's population, employment, and overall economic activities continue to increase. Implementation of this proposed FASTLANE project, ensuring delivery of all remaining deferred DFW Connector Project improvements to better serve the great variety and magnitude of trips to/from DFW Airport, will help provide a critical multimodal freight linkage to improve long-term transportation efficiencies all for users simultaneously.

1.2 Socio-Economic Context

DFW Airport Statistics 2015
- 27 square miles in area (world rank – 3rd)
- 7 runways
- 5 terminals with 165 gates
- 680,000 aircraft movements (world rank – 3rd)
- 64 million passengers (world rank – 9th)
- 737,000 tons of cargo (world rank – 29th)
- $37 billion in regional economic impact

DFW Airport www.dfwairport.com/about/index.php opened in 1974 through a joint venture between the cities of Dallas and Fort Worth to become the principal commercial airport and international gateway for the North Central Texas region. Ranked as second largest aviation facility by land area in the United States and third largest in the world, the airport covers approximately 27 square miles with seven runways, five terminals (including space reserved for a future sixth terminal), 165 gates, and nearly 6,000 acres of land designated for commercial and industrial development. In 2015, 10 domestic and 16 foreign airlines, as well as 21 cargo carriers, provided service from DFW Airport to 209 total destinations, including 58 cities in international territories. This level of service generated over 680,000 aircraft movements which enplaned more than 64 million passengers and 737,000 tons of cargo shipments, respectively ranking third, ninth, and twenty-ninth among airports worldwide in those statistics. These massive activities, in combination with nearly 60,000 jobs provided by various employers on DFW Airport property, contributed to an annual economic output of approximately $37 billion into the North Central Texas economy. Of that robust figure, nearly $17 billion was estimated to be attributed to freight movements and logistics operations, and it also translated indirectly to the creation and support of an additional 228,000 regional jobs. All of these factors in tandem have and will continue to generate copious passenger and freight traffic on numerous regional surface roadways, and an extensive concentration of that activity occurs in the vicinity of the DFW Connector North Airport Interchange.

Overall, the initial DFW Connector construction completed in 2013 represented an innovative means to efficiently collect and distribute regional traffic within a complex junction of five major limited-access facilities. The fact that those roadways all converged together around the north side of DFW Airport certainly added extra complexity and constructability issues, however enhancing capacity at the north entrance and direct access in all directions to/from the passenger terminals was also a critical priority. Furthermore, the project concurrently provided improved local access ramps, reconstructed cross-street bridges, and additional frontage road capacity to serve smaller-scale mobility, connectivity and convenience demands through the adjacent cities. The project succeeded in eliminating the most chronic congestion locations, but with continued changes in local/regional demographics and land use development, safety and delay issues are becoming more prevalent where substantial deferments or lower-capacity staged construction elements remain. This is why two original project segments, including one (in **bold**) whose limit includes the North Airport Interchange, were identified recently among the top 100 congested Texas roadways:

- #48 – SH 121 between SH 26/SH 114 and IH 820
- **#81 – SH 121 between Business SH 121 (Lewisville) to SH 114/International Parkway**

Exhibit 2 shows existing TxDOT average daily traffic counts and future traffic estimates in 2014 for the freeway segments within the project area.

Exhibit 2: Current/Future Daily Volumes - North Airport Interchange Approach Segments

Location	2014 Traffic Volumes[1]	2040 Traffic Volumes[2]	Change	% Change
IH 635 (East of SH 121)	92,100	139,400	47,300	51%
International Parkway (South of SH 114)	84,500	97,400	12,900	15%
SH 114 (West of International Parkway)	188,800	348,700	159,900	85%
SH 114 (East of International Parkway)	90,400	137,300	46,900	52%
SH 121 (North of SH 114/International Parkway)	115,700	233,800	118,100	102%
SH 121 (North of IH 635)	123,200	193,300	70,100	57%

Sources:
1. *TxDOT average daily traffic counts in 2014*
2. *NCTCOG DFWDFX regional travel demand model*

The projected high traffic growth for the North Airport Interchange freeways can certainly be attributed to forecasted population increases for both adjacent cities and the North Central Texas region at-large. **Exhibit 3** highlights both the past trends and future forecasts for population growth within the adjoining DFW Connector Project cities, Dallas and Tarrant Counties, and the 12-county MPA. While forecasted city populations are expected to slow as they approach build-out area within their jurisdictions, growth elsewhere in the region (particularly in Tarrant County) and the strong economic draw of DFW Airport will continue to attract significant traffic surges over time.

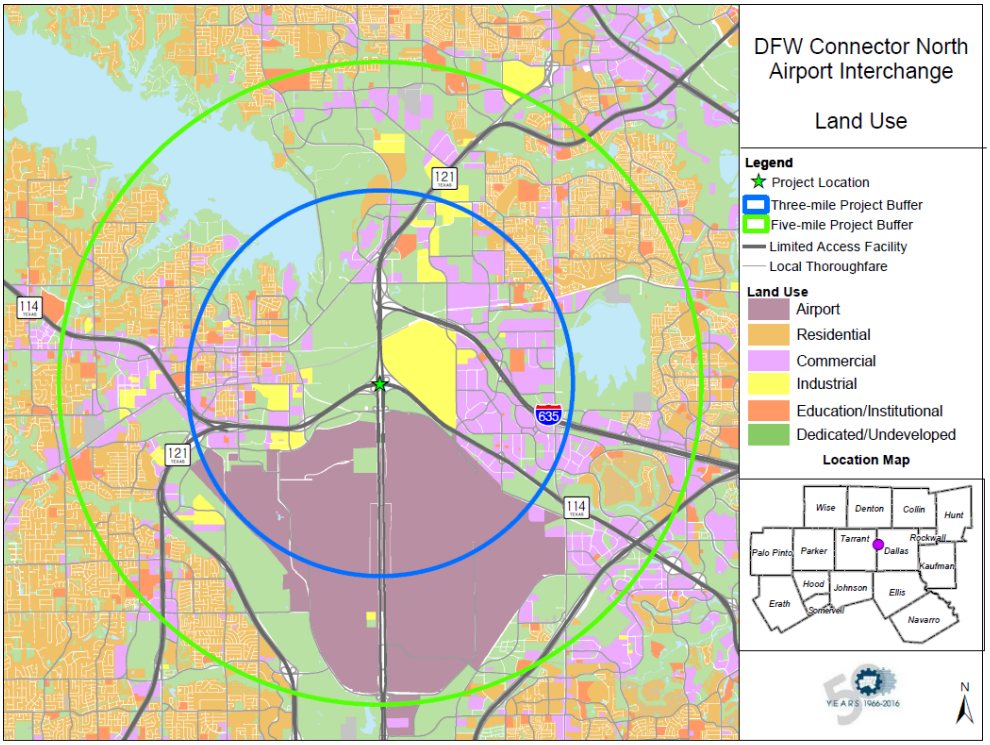
Exhibit 3: Population Trends and Forecasts for Project-Related Locations

Location	1980 Census[1]	1990 Census[1]	2000 Census[1]	2010 Census[1]	2020 Forecast[2]	2040 Forecast[3]	Growth 2010-2040
Coppell	**3,826**	**16,881**	**35,958**	**38,659**	**41,460[2]**	**42,953[2]**	**11%**
Grapevine	**11,801**	**29,202**	**42,059**	**46,334**	**52,414[2]**	**60,000[2]**	**29%**
Irving	**109,943**	**155,037**	**191,615**	**216,290**	**260,752[2]**	**284,500[2]**	**32%**
Southlake	**2,808**	**7,065**	**21,519**	**26,575**	**27,818[2]**	**36,669[2]**	**38%**
Dallas County	**1,556,390**	**1,852,810**	**2,218,899**	**2,368,139**	**2,566,134[2]**	**3,357,469[3]**	**42%**
Tarrant County	**860,880**	**1,170,103**	**1,446,219**	**1,809,034**	**2,006,473[2]**	**3,094,649[3]**	**71%**
NCTCOG MPA	**3,030,053**	**4,013,418**	**5,197,317**	**6,417,724**	**7,504,200[2]**	**10,676,844[3]**	**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).*

The type, intensity, distribution, and availability of specific land uses can be an important determinant for identifying travel demand characteristics and prioritizing transportation needs. **Exhibit 4** illustrates the distribution of current land uses in and around the DFW Connector North Airport Interchange, and buffer limits of three-mile and five-mile radii are displayed to highlight proximity to the project location.

Exhibit 4: Project Area Land Use Map

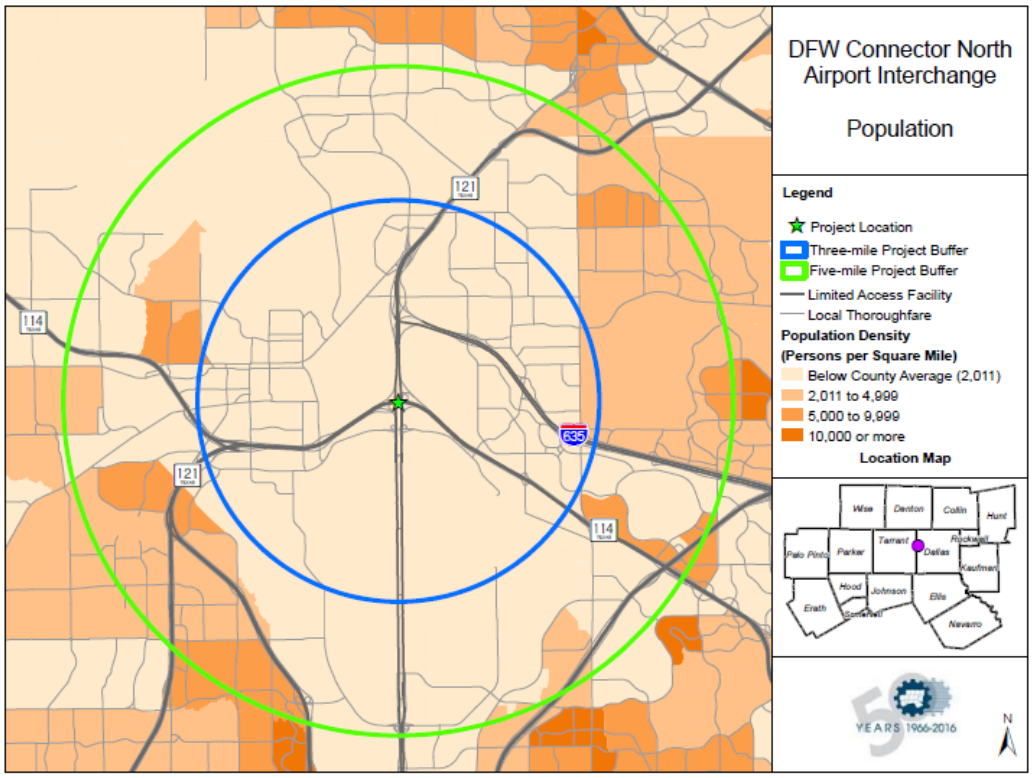


Map Date: April 2016 Source: NCTCOG

DFW Airport dominates overall land use activities south of SH 114 with a large mix of commercial and industrial land uses related to its numerous passenger and freight-related operations, as well as appropriate quantities of dedicated open space preserved for safety purposes at the approaches to the seven DFW Airport runways. Other high-intensity land uses occur north of SH 114, particularly in the project area's northeast quadrant in the city of Irving. Two locations of interest occur there, including a 774-acre DFW Airport-controlled tract designated as the United States Foreign Trade Zone (FTZ) #39, and a 550-acre development immediately to the east managed by Woodbine Development Corporation (company originally responsible for land acquisition to develop DFW Airport known as DFW Freeport. Undeveloped land and dedicated open space dominates the northwest quadrant of the project area (also primarily controlled by DFW Airport, but several large commercial tracts in the area are locations recently developed as major tourism destinations such as the Gaylord Texan Resort and Conference Center, Great Wolf Lodge, and Grapevine Mills Mall. Residential land uses are generally removed from immediate project area, but this condition is attributed to the configuration of DFW Airport runways and their approach clear zones. The overall intensity and distribution of residential development is further

reflected in **Exhibit 5** which highlights population density. While population density is certainly a key indicator of transportation needs in most other cases, movements around DFW Airport are more clearly governed by it being one of the region's most concentrated industrial and commercial employment centers.

Exhibit 5: Project Area Population Density

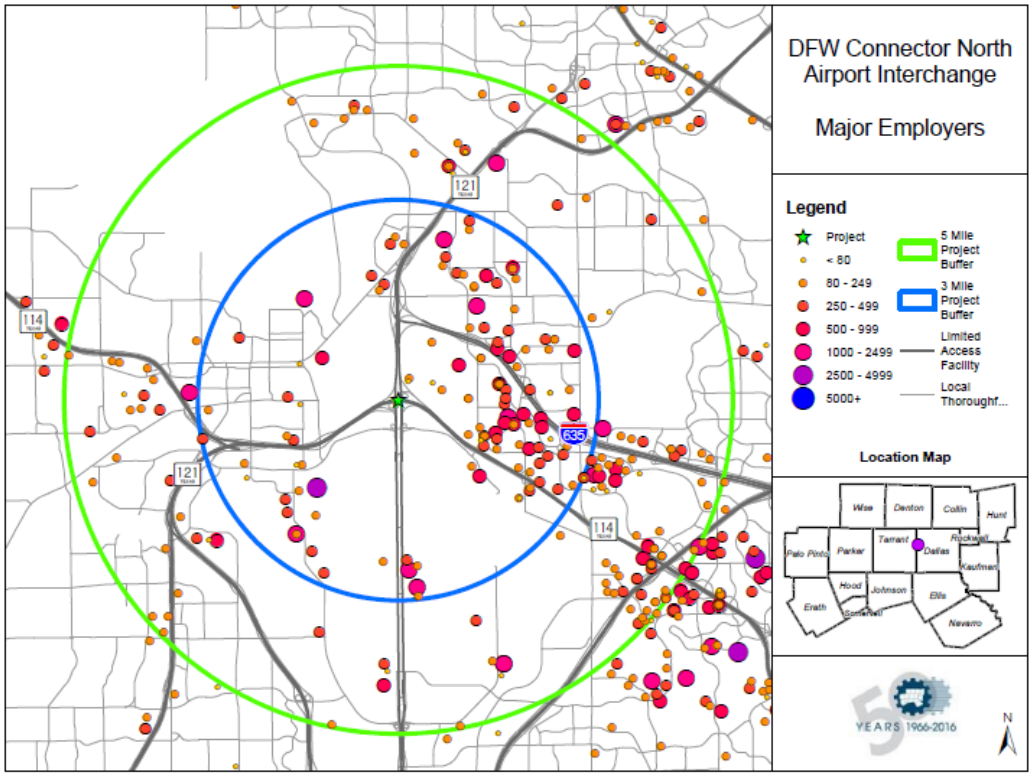


Map Date: April 2016 Source: US Census Bureau (American Community Survey 2010-2015 5-Year Data by Census Tract)

Exhibit 6 displays the size and location of major employers in the vicinity of the North Airport Interchange. The map illustrates that the largest clusters of employers closest to the project location occur either on DFW Airport property south of SH 114, the FTZ #39/DFW Freeport development north of SH 114 in Irving, or in Coppell north of IH 635. The most notable presence on DFW Airport property is American Airlines, the world's largest airline by fleet size, with approximately 26,700 jobs scattered among various branches of its corporate headquarters, on-site service and aircraft maintenance facilities, and major destination hub operations which are devoted exclusively to three of the five terminal buildings and a large share of the international terminal. Other private entities on DFW Airport property with greater than 1,000 employees include United Parcel Service and FedEx Corporation, each with large cargo operations near the North Airport Interchange. The FTZ #39/DFW Freeport area contains a variety of corporate tenants occupying more than 13 million square feet of warehouse/distribution center space and over 2 million square feet of office space, and the area is also home to numerous large hotels and other lodging facilities (www.woodbinedevelopment.com/properties/master-planned/dfw-freeport). Locations in the city of Coppell near IH 635 are also home to several large office

complexes and distribution centers that have attracted major employers in recent years, including Amazon.

Exhibit 6: Project Area Major Employers



Map Date: April 2016 Source: NCTCOG

Projected increases in traffic volumes for North Airport Interchange will be most greatly attributed to changes in economic activity at DFW Airport and the broad regional impacts resulting from enhanced job growth. The current Metropolitan Transportation Plan (MTP), *Mobility 2040: The Metropolitan Transportation Plan for North Central Texas* (www.nctcog.org/trans/mtp/2040), indicates that employment within the 12-county MPA is projected to grow from 4,584,235 jobs in the present year to 6,691,449 jobs by 2040. A vast majority of those additional jobs will be added in Dallas (1,050,448 jobs) and Tarrant (542,806 jobs) Counties, and it seems clear that development trends will continue to favor DFW Airport as one of the region's strongest employment clusters. According to the 2009 Airport Development Plan Update, year 2030 DFW Airport projections indicate annual service to more than 80 million total passengers, nearly 900,000 aircraft operations, and almost 2.2 million tons of cargo shipments https://dfwairport.com/development/masterplan/index.php. Those figures represent increases of 25%, 32%, and 199% respectively. In moving toward those ends, DFW Airport is already well underway with a 10-year, $2.7 billion Terminal Renewal and Improvement Program (TRIP) that will provide upgrade four of the five existing terminals with modern aesthetic features, enhance security and safety provisions, revised baggage-handling infrastructure, new self-service technologies, extra amenities and concession opportunities, and reconstructed parking facilities.

Advanced planning toward adding a sixth terminal within the next decade, as well as new cargo and ancillary aircraft storage facilities, is occurring as well.

In August 2014, the Dallas Area Rapid Transit (DART) Orange Line was extended 4.7 miles to connect DFW Airport to a 90 mile light-rail system (largest in North America) and 55 miles of commuter rail. DFW Airport also anticipates significant land development to occur on many of its property tracts near the north end of the airport following construction and opening of the TEXRail commuter rail connection to/from downtown Fort Worth by late 2018. New transit-oriented development tied to a planned station location north of SH 114 will likely boost demand for more large tourism destinations similar to the nearby Gaylord Texas Resort. All of these activities will ultimately translate to greater amounts of local and regional traffic that justify delivery of remaining DFW Connector improvements to the North Airport Interchange as soon as possible.

1.3 Targeted Transportation Challenges

As stated in Section 1.2, the initial DFW Connector construction phase successfully addressed the primary goal of reconfiguring access patterns to more efficiently and reliably distribute traffic through the North Airport Interchange between the five existing freeway facilities. The original project accomplished that objective while also improving local access/connectivity through the affected cities, and upgrading capacity for all traffic traveling to/from the DFW Airport terminals along International Parkway. However, all of the various freeway-to-freeway connections at the North Airport Interchange required longer, wider, and higher ramps which created a much larger right-of-way (ROW) footprint than the previous interchange. This also eliminated the past ability to provide shared access to/from International Parkway and its parallel frontage roads as traffic traveled in both directions through the airport's north entrance. Changes in ramp distance and geometry, a consistent configuration concept for ramp entry/exit points throughout the DFW Connector project, the demand for future direct access to/from the ultimate SH 114 managed lanes, and increased traffic speeds overall through the North Airport Interchange required that:

- New dedicated ramps between various freeways and the International Parkway frontage roads be built in both directions
- International Parkway frontage road access to/from North Airfield Drive must be rebuilt
- New bypass lanes must be built around the DFW Airport north entrance toll plaza for additional reorientation of International Parkway and frontage road traffic to maximize local access and circulation for nearby land uses and airport operations.

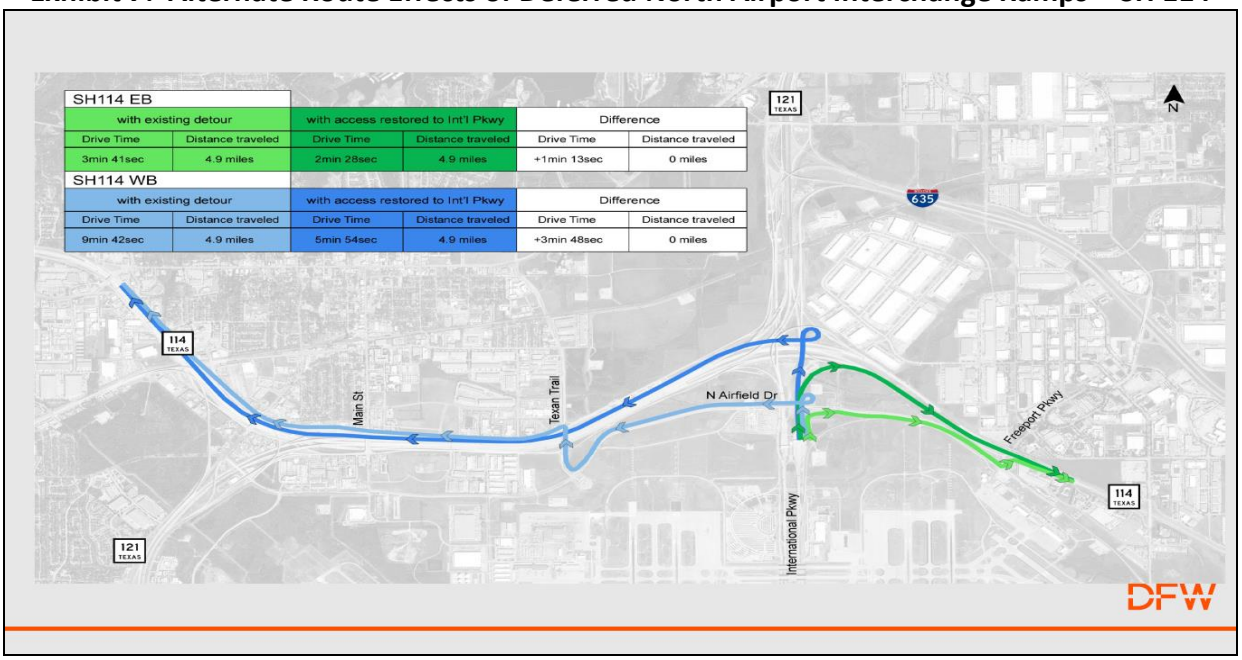
Unfortunately, these improvements could not be incorporated within the initial DFW Connector construction phase given available financial resources. Various local thoroughfare network connections were determined available and capable of accommodating International Parkway frontage road traffic on alternative routes to/from each of the freeway facilities. Utilization of alternate routes was beneficial during the initial DFW Connector construction to help reduce overall traffic traveling through the North Airport Interchange. However, with the project completed, continued area-wide economic growth, and substantial latent demand redistribution resulting from other nearby transportation projects (e.g. Loop 12/SH 114/SH 183 Midtown Express), it is becoming more critical to build the deferred ramps and restore the lost connections.

DFW Airport passengers wishing to use the two large long-term parking facilities at the north side of the airport are affected by the loss of direct freeway access to the International Parkway frontage roads. As a result of the North Airport Interchange reconfiguration and toll plaza reconstruction, all traffic from IH 635, SH 114, and SH 121 accessing the DFW Airport "Remote North" Parking Lot are unable to enter or leave the lot directly using the north airport entrance. Users must either exit each freeway at upstream or downstream locations and use frontage road and local thoroughfare connections to reach the lot off of North Airfield Drive, or travel south deeper into DFW Airport property along the International Parkway frontage roads and complete a U-turn to backtrack toward North Airfield Drive. Each of these paths require extra distance and travel time as a result of the DFW Connector initial construction phase, and the shortest route to enter the "Remote North" Parking Lot from IH 635 and SH 121 is also not the same route travelers must use to leave. This same inconvenience and probable confusion for potential users also applies to the DFW Airport "Express North" Parking Lot. This facility, located farther south and closer to the DFW Airport terminals, can be reached directly from the freeways via the North Airport Interchange, but users wanting the travel the same route entering/exiting the lot must proceed through the north entrance toll plaza. To bypass the toll, users exiting the lot must travel the northbound (NB) International Parkway frontage road and leave the airport via North Airfield Drive and local thoroughfare connections back to the freeway system.

Similar conditions also exist for a vast majority of DFW Airport employees who work at the terminal buildings, including concession workers, airline ticket agents and baggage handlers, Transportation Security Agency (TSA) enforcement personnel, and other professionals. The primary parking lot and internal bus transit center for those commuters is located adjacent to the DFW Airport North "Express" Parking Lot along the southbound (SB) International Parkway frontage road. Directly opposite from this location along the NB International Parkway frontage road is the American Airlines Cargo Operations Facility, one of the largest freight-oriented employers on DFW Airport property and a major generator of truck trips. These and other numerous centers of on-airport activities represent a substantial portion of overall DFW Airport traffic relocated to alternate routes as a result of the North Airport Interchange changes to original access patterns. It should also be noted that prior to the initial DFW Connector construction, the straight-line path of the International Parkway frontage roads through the north and south DFW Airport entrances had been a commuting choice for travelers of various origins/destinations wishing to avoid circumventing the airport. This option has also been negated by frontage road access removal at the North Airport Interchange.

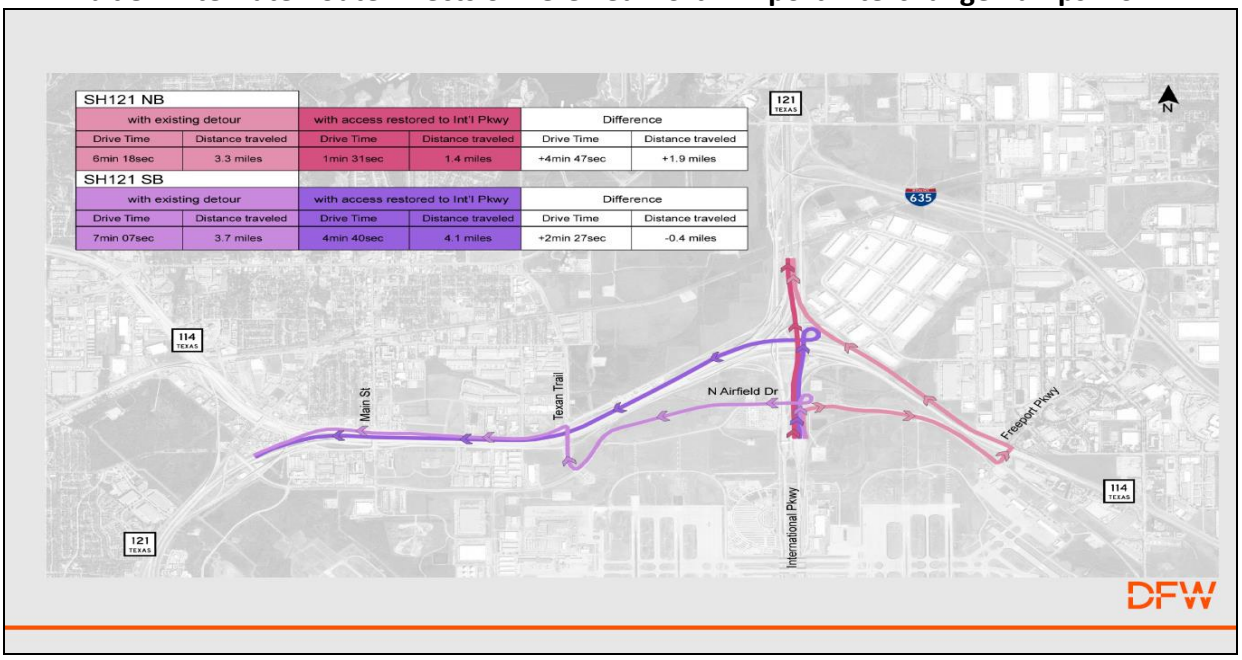
The following maps highlight the alternate routes from the NB International Parkway frontage road that commuters and trucks must utilize to exit DFW Airport on each freeway in absence of the deferred North Airport Interchange ramp connections. Prepared in 2013 shortly after the initial DFW Connector construction phase was completed, the maps also indicate the measured travel time and distance savings if original International Parkway frontage road access was restored. **Exhibit 7** illustrates the effects for eastbound (EB) and westbound (WB) travelers on SH 114, **Exhibit 8** displays the same information for NB and SB traffic on SH 121, and **Exhibit 9** shows the differences for EB IH 635 travelers based on two route options.

Exhibit 7: Alternate Route Effects of Deferred North Airport Interchange Ramps – SH 114



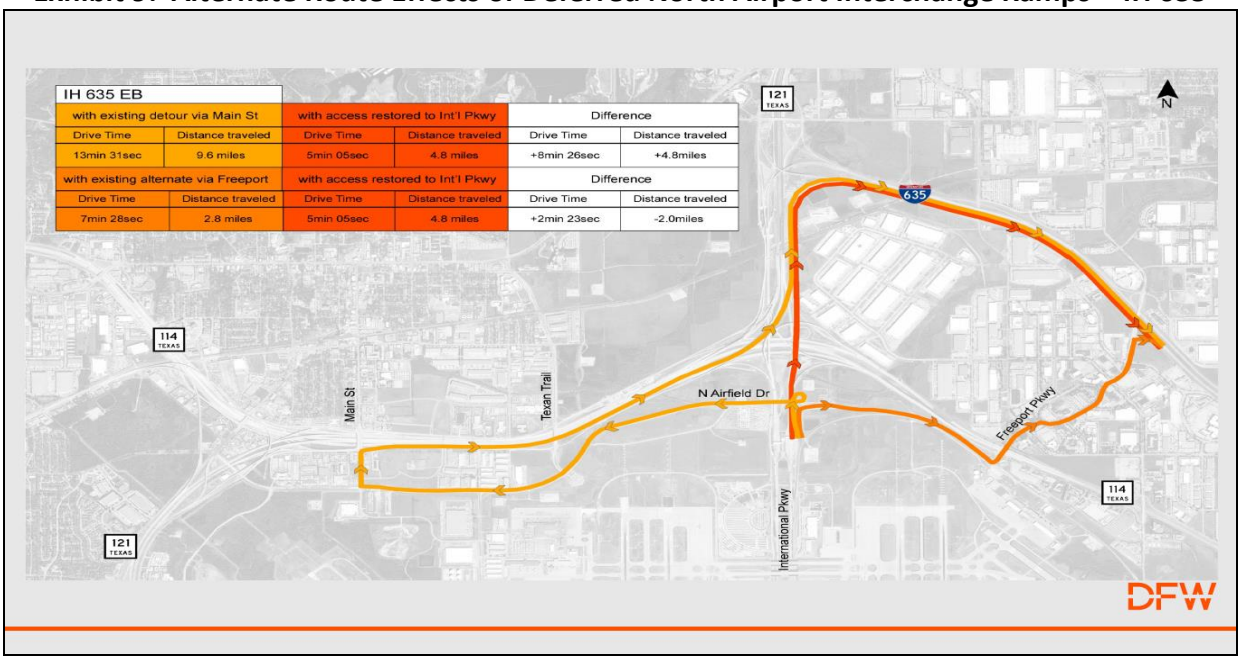
Source: Dallas-Fort Worth International Airport, Traffic Count and Travel Route Survey (2013)

Exhibit 8: Alternate Route Effects of Deferred North Airport Interchange Ramps – SH 121



Source: Dallas-Fort Worth International Airport, Traffic Count and Travel Route Survey (2013)

Exhibit 9: Alternate Route Effects of Deferred North Airport Interchange Ramps – IH 635



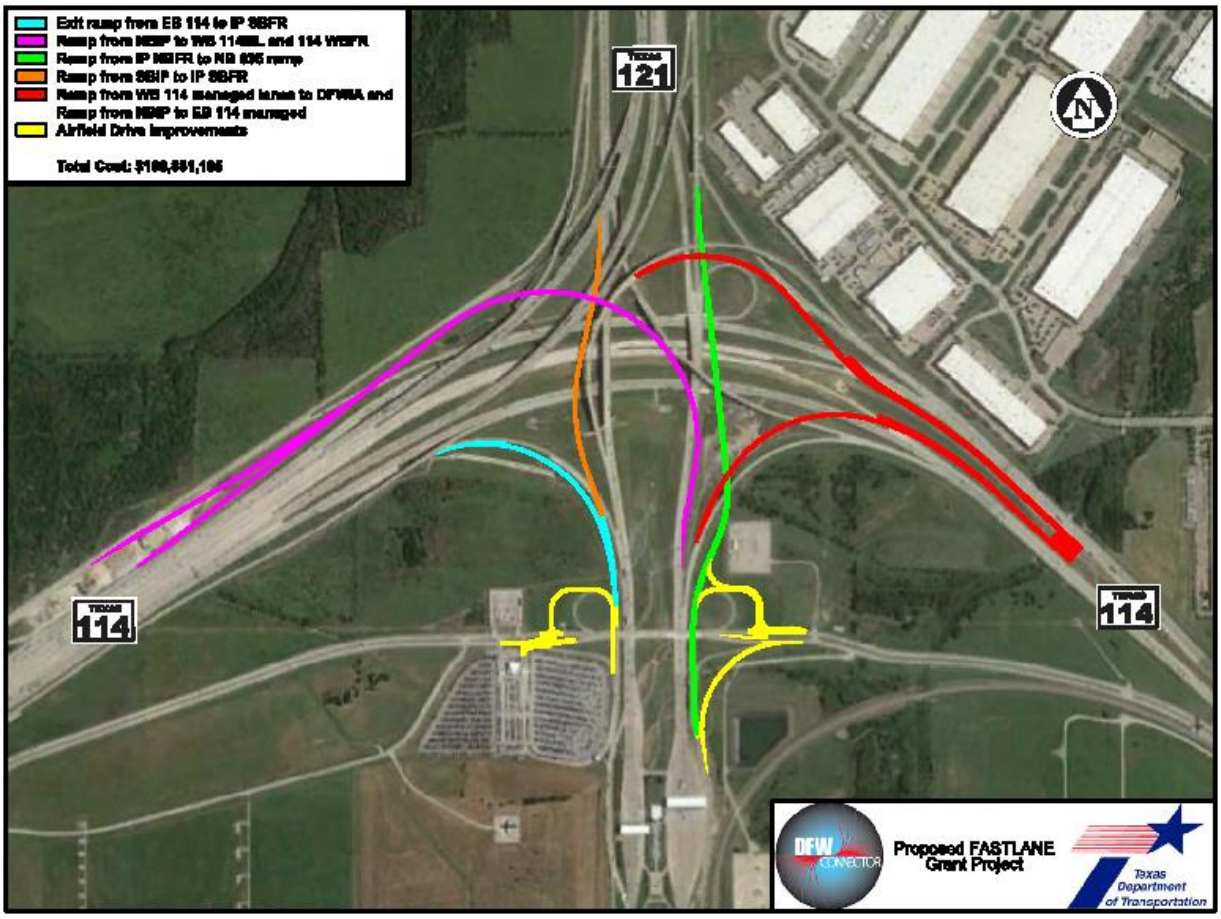
Source: Dallas-Fort Worth International Airport, Traffic Count and Travel Route Survey (2013)

Each of the above maps identify significant extra time and distance required for multiple trips exiting DFW Airport in all directions. Combined with other trip purposes along various frontage roads, as well as local thoroughfares that extend into the cities of Grapevine and Irving, this condition allows for congestion to spread beyond the original DFW Connector project limits. This is especially the case for IH 635, a major regional corridor on the National Highway Freight Network, to which one of the alternate access routes takes traffic across multiple traffic signals through the dense DFW Freeport employment cluster (northeast of the project area). Because daily peak truck traffic flows to/from DFW Airport occur at or on the fringes of typical peak-period times for home-based-work trips, substantial delay can occur frequently in this area, and it also limits effective incident management options if a major accident or closure affects the freeways through the North Airport Interchange.

1.4 Challenges Addressed

The project identified for this FASTLANE application, as illustrated in **Exhibit 10**, will build the following elements that were deferred during the initial DFW Connector construction phase:

Exhibit 10: DFW Connector North Airport Interchange – Proposed FASTLANE Project Map



Source: Texas Department of Transportation/Northgate Constructors (2016)

a. **WB SH 114 – SB International Parkway Frontage Road Direct Connector Ramp**
b. **NB International Parkway – WB SH 114 Mainlanes/Frontage Road (with direct access to Texan Trail) Direct Connector Ramp**
c. **NB International Parkway Frontage Road – EB IH 635 Direct Connector Ramp**
d. **SB International Parkway (including access from SB SH 121 and WB IH 635) – SB International Parkway Frontage Road Direct Connector Ramp**
e. **WB SH 114 Managed Lanes – SB International Parkway Direct Connector Ramp**
f. **NB International Parkway – EB SH 114 Managed Lanes Direct Connector Ramp**
g. **DFW Airport On-Airport and North Airfield Drive Improvements**

Implementation of this project, estimated to cost approximately $107 million, will deliver all remaining approved airport-oriented DFW Connector Project features. Construction of the deferred ramps, as well as the proposed on-airport modifications to North Airfield Drive and access ramps surrounding the DFW Airport north entrance toll plaza, will fully restore direct International Parkway frontage road access to/from each of the North Airport Interchange

intersecting freeways. With IH 635 as part of the National Highway Freight Network, DFW Airport cargo operations and other freight-oriented employers will become fully integrated into the system with direct high-speed ramp access as a result of this project. Freight movements to/from SH 114 and SH 121 in/out of the airport will also be enhanced, reducing overall truck volumes on large portions of the local thoroughfare system. Original local/regional access and circulation patterns to/from the DFW Airport "Remote North" and "Express North" parking lots will be restored due to the project, adding extra time and cost convenience for airport passengers. The project will also benefit on-airport commuting and parking conditions for DFW Airport employees, and through movements using the International Parkway frontage roads between various off-airport locations can once again become a potentially effective commuting option.

Included with this project is construction of two direct connector ramps between International Parkway and the SH 114 tolled managed lanes, and known as TEXpress Lanes (www.texpresslanes.com). Opened in 2013 as part of the initial DFW Connector construction phase, the SH 114 TEXpress Lanes (two lanes in each direction) extend approximately three miles from west of Freeport Parkway in Irving to east of Farm-to-Market Road (FM) 1709 in Grapevine. The TEXpress Lanes were built as an innovative congestion-pricing tool to allow SH 114 travelers' opportunity via tolls to bypass general purpose lane congestion between the split interchanges with SH 121, as well as added friction caused by various integrated entrance/exit ramps to from local cross-streets, through the city of Grapevine. Starting in 2015, TxDOT initiated construction of another design-build CDA project called Midtown Express (www.drivemidtown.com). Teaming with its PPP developer, a joint venture entity known as SouthGate Mobility Partners, TxDOT will build interim improvements with new and modified existing infrastructure including additional TEXpress Lanes, general purpose lanes, ramps, and frontage roads along extensive sections of Loop 12, SH 114, and SH 183 in western Dallas County. For SH 114 in particular, the Midtown Express project will add one continuous WB TEXpress Lane that will flow seamlessly from SH 183 near the IH 35E split in the city of Dallas directly into the existing DFW Connector TEXpress Lanes as they pass around DFW Airport, a total distance of nearly 15 miles. The Midtown Express project will also build an EB TEXpress Lane on SH 114, although due to funding and right-of-way limitations a three-mile gap will remain between the DFW Connector TEXpress termination point (where it becomes the far left general purpose lane) and the new facility's starting point near the President George Bush Turnpike (PGBT). Bridging the gap will be accomplished in a future construction phase as funding becomes available.

Direct TEXpress lane connections to/from DFW Airport provide an extra benefit of convenience and reliability for users when the value of time is critical, particularly for frequent business travelers. Roadside monitoring equipment for real-time communication of traffic conditions, demand-based variable pricing strategies, and mobile app-based registration for high-occupancy vehicle (HOV) discounts during peak periods are all used collectively to provide predictable and expedient drive times at set speeds greater than 50 miles-per-hour (MPH). The overall length of the SH 114 TEXpress facility, and the proposed location of several intermediate access points along the route, will allow more direct and dependable high-speed travel to DFW Airport from major regional employment centers such as:

- Southwestern Medical District (www.swmeddistrict.org) – 1,000-acre multi-faceted medical complex in Dallas with a bio-technology business park, four hospitals with over 2,000 beds and 29,000 employees, and anchored by the University of Texas Southwestern Medical Campus
- Las Colinas (www.irvingtexas.com/about-irving/las-colinas) – 12,000-acre master planned development in Irving containing over 25 million square-feet of total office space, home to 2,000 companies and 400 corporate headquarters

At the time of proposed completion of this project, direct connections to/from DFW Airport via the SH 114 TEXpress Lanes would be the first such provisions to/from a major airport in the nation outside of the metropolitan areas of Washington D.C. (Dulles) and the New York City (Newark Liberty). It should also be noted that TEXpress Lanes are designed for accommodation of trucks as well as passenger vehicles. With MTP policies in place to encourage and expand utilization of tolled managed lanes by trucks given available capacity, this project would enable the same potential for travel time savings and reliability to be realized for cargo shipments and other freight-oriented activities to/from DFW Airport.

In all, this project is consistent with the ultimate DFW Connector Project vision for maximizing mobility, safety, and accessibility for the IH 635, SH 114, and SH 121 corridor as they converge at DFW Airport, and the project is warranted given past demographic and economic development growth trends and the likelihood for strong future activity projections at the airport to reach fruition. Comprehensive and effective ground access is just as essential for an airport's success as efficient aircraft service and capacity, and this project provides a critical link to accomplish both at DFW Airport.

2.0 Project Parties

2.1 North Central Texas Council of Governments (Submitting Agency)

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. Currently, the Council has 233 members, including 16 counties, 165 cities, 23 independent school districts, and 29 special districts. The regional area is nearly 12,800 square miles, larger than nine states, and the regional population is over 6.4 million, greater than that of 35 states. 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. The department provides technical support and staff assistance to the Regional Transportation Council (RTC) and its technical committees, which compose the MPO policy-making structure. The department also provides technical aid to local governments and transportation providers in planning, coordinating, and implementing transportation decisions.

2.2 Texas Department of Transportation (Roadway 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.

3.0 Grant Funds and Sources/Uses of Project Funds

Exhibit 11 details the project funding sources, and **Exhibit 12** details the estimated project costs to be funded through this FASTLANE Grant. All costs are in 2016 dollars. The amount of this FY2016 FASTLANE Grant request is $64 million, designated for use in the project's construction phase.

Exhibit 11: DFW Connector North Airport Interchange Funding Sources

Funding Source	Type	Funding Amount	Percent
State	TxDOT PE Funding	$943,000	(1%)
State	TxDOT ROW Funding	$785,800	(1%)
State	TxDOT State Matching to FASTLANE Grant	$16,000,185	(15%)
State	State Match to Leveraged STP-MM Funding	$3,647,400	(3%)
Total of Non-Federal Funding Sources		**$21,376,385**	**(20%)**
Federal (MPO-Selected Funds)	Leveraged STP-MM (Federal)	$14,589,600	(14%)
Federal	TxDOT PE Funding	$3,772,000	(3%)
Federal	TxDOT ROW Funding	$3,143,200	(3%)
Federal	NSFHP FASTLANE Grant	$64,000,000	(60%)
Total of Federal Funding Sources		**$85,504,800**	**(80%)**
TOTAL PROJECT FUNDING		**$106,881,185**	**(100%)**

Exhibit 12: DFW Connector North Airport Interchange Cost Estimate

Cost Category	Total Cost	Funding Source	
		Federal (Percent)	Non-Federal (Percent)
Design	$4,715,000	$3,772,000 (80%)	$943,000 (20%)
Utility Relocation	$3,929,000	$3,143,200 (80%)	$785,800 (20%)
Construction	$69,406,185	$55,524,985 (80%)	$13,881,385 (20%)
Miscellaneous	$8,831,000	$7,064,800 (80%)	$1,766,200 (20%)
Contingency	$20,000,000	$16,000,000(80%)	$4,000,000 (20%)
TOTAL PROJECT COST	**$106,881,185**	**$85,504,985 (80%)**	**$21,376,385 (20%)**

NCTCOG currently manages federal, as well as state-administered, grants that are in various stages of development, implementation, and closeout. In FY 2014, NCTCOG facilitated expenditures of $22.5 million from various federal grants including awards from the Department of Energy, Environmental Protection Agency, Federal Transit Administration, Federal Aviation Administration, Department of Housing and Urban Development, Department of Labor, and the Department of Defense. Also in FY 2014, NCTCOG facilitated expenditures of $99.6 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 RTC recently approved and adopted the new MTP, *Mobility 2040: The Metropolitan Transportation Plan for North Central* Texas, which 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. These models track and project revenue based on historical trends and anticipated future growth. State legislative action in the 2013 and 2015 sessions allowed for the additional transportation revenue approved by voters as Proposition 1 and Proposition 7. TxDOT developed the estimate for the funding available to the region from these propositions. Overall, the MTP financial forecast used 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
- Proposition 1 funds
- Proposition 7 funds

Should funds be needed for the proposed project as a result of potential cost overruns or shortage of federal or state funds, Regional Toll Revenue (RTR) funds can be utilized by the RTC. The 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, through Collin, Dallas and Denton Counties. The NTTA agreement provided more than just the expedited construction of a major roadway. It also enabled delivery of a $3.2 billion upfront payment in exchange for operating, maintaining, and upgrading the Sam Rayburn Tollway as appropriate 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 Eastern Extension of the President George Bush Turnpike (PGBT) 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 multiple public and private transportation partners for a comprehensive list of projects and programs all across the region, collectively with total user benefits and economic values that greatly exceed the overall funds received.

4.0 Results of the Benefit-Cost Analysis

The benefits described in previous sections were monetized in the BCA Appendix. The project benefits documented in the BCA are shown in **Exhibit 13**. The net present value of the DFW Connector North Airport Interchange is shown in **Exhibit 14**. Applied to a total project cost of approximately $107 million, a substantial net benefit is achieved for both discounting scenarios. Based on a 20-year project life, the overall effect of this transportation investment will result in a positive lifetime net benefit of $960.7 million at three percent and $539.8 million at seven percent, after netting out the cost of the project and direct costs to managed lane system users. The calculations used to determine these totals are discussed in more detail in the BCA Appendix (Appendix A).

Exhibit 13: Total Project Benefits

Benefit Category	Benefits 7% Discount Rate	Benefits 3% Discount Rate
Direct User Fees	$(3,608,448)	$(6,175,510)
Time Savings	$547,328,440	$890,773,715
Crash Reduction	$128,934,681	$205,638,093
Air Quality Emission Savings	$727,924	$1,238,689

Exhibit 14: Net Project Benefits

Discount Rate	Net Present Value of Total Benefits	Rounded Net Present Value of Total Benefits	Return on Investment
7 Percent	$539,825,003	$540.0 Million	**505 percent**
3 Percent	$960,794,619	$960.0 million	**898 percent**

The overall net effect of this transportation investment will result in a positive lifetime return on investment of **505 percent ($540 million/$107 million)** and **898 percent ($960 million/$107 million)**, after discounting at three percent and seven percent, respectively. The results of this BCA clearly indicate that this project will provide a lifetime of regional benefits and substantially improve quality of life for its residents.

This project will increase the economic competitiveness and freight movement of the United States over the medium and long-term by increasing accessibility to jobs and other activities at DFW Airport and the cities surrounding the north side of the airport. There will be direct freight and economic competitiveness benefits to those who use the DFW Connector North Airport Interchange including reduced air quality emissions, auto and commercial vehicle travel-time savings, and reductions in vehicle crashes. By providing direct International Parkway frontage road access to each of the primary limited-access facilities, 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.

Managed Lane System users pay a direct cost for using the service, but the benefits to each user in travel time savings outweigh the user cost. The annual estimate of direct cost paid by users of the WB SH 114 TEXpress Lane is between $257 and $696 thousand. The calculations of costs to managed lane users associated with the new WB SH 114 TEXpress Lane direct connector ramp to SB International Parkway are included in the BCA. The net present value of the anticipated user cost is $3.6 million assuming a discount rate of seven percent and $6.1 million with a discount rate of three percent. The travel time savings due to reducing the number of intersections between connections ranges from $14.5 million to $41.6 million. The calculations of regional benefits from reduced congestion and travel times associated with the new direct connector ramps are included in the BCA. The net present value of the travel time savings to transportation system users is $547 million assuming a discount rate of seven percent and $890 million assuming a discount rate of three percent.

As with all infrastructure improvements, this project would create construction jobs in the short term. Incorporation of the proposed DFW Connector Airport North Interchange project will generate an additional increment of new jobs as well. 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 $107 million dollar project would generate approximately 1389.6 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.

Regional safety is increased by providing an opportunity for the bypass of multiple intersections. The additional capacity allows traffic to transition to limited access facilities with the conversion to an above grade direction connection interchange. Therefore, the annual crash frequency for this project was calculated based on a three mile buffer from the center of the project. The net present value of crash reduction benefits is $128 million assuming a discount rate of seven percent and $205 million assuming a discount rate of three percent. Similar to the safety improvements, air quality emissions are reduced as a result of bypassing multiple intersections. The emission reduction ranges from $60.6 thousand to $138.5 thousand. The net present value of emission reductions is $656.8 thousand assuming a discount rate of seven percent and $1.2 million assuming a discount rate of three percent.

5.0 Project Readiness and NEPA

5.1 Project Schedule

The DFW Connector North Airport Interchange project is set for an expedited delivery that will be in a position to move ahead well before the FASTLANE requirement of September 30, 2019 for obligation of funding and construction commencement within 18 months thereafter. The project

schedule shown in Exhibit 15 indicates obligation of funding and construction letting in mid-2017, and completion of the project anticipated by the end of 2019.

Exhibit 15 – DFW Connector North Airport Interchange Project Schedule

DFW Connector North Airport Interchange	Comments	2016				2017				2018				2019			
		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
Activities																	
Contracting	Change Order Amendment																
Design																	
Utility Relocation																	
Construction																	
Traffic Control																	
Misc. (Illum, SPM)																	
Landscaping / Punchlist																	
Final Acceptance																	

5.2 Procurement Mechanism

The DFW Connector North Airport Interchange project will be added to the scope of the existing design-build contract with NorthGate Constructors. The contract addition is the most efficient means of advancing construction, because TxDOT can elect to request pricing for additional scope from the current design-build developer. This allows for the best schedule for construction with the ability to early release some packages for construction. Some benefits to using the existing developer:

- Key design staff, contractor staff, and TxDOT staff are already familiar with each other and 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 work by Northgate Constructors to deliver other deferred DFW Connector Project items (FM 2499 grade separations and SH 121/SH 360 interchange).

5.3 NEPA Status

The scope of the DFW Connector North Airport Interchange project, identified within ultimate plans for the overall DFW Connector Project, received a FONSI in April 2009. An environmental re-

evaluation checklist is necessary to document that this work within the original EA will be completed; otherwise, no changes to the EA are needed.

5.4 State and Local Approvals

Permits involving waters of the United States would be relatively minor in nature for culvert crossings. No major Section 404 (of the Clean Water Act) issues have been identified. A revision to the STIP/TIP will be necessary. The modification would be coordinated between NCTCOG and TxDOT with an anticipated revision timeframe of November 2016 (assuming grant award in September 2016). No ROW will need to be acquired for the project.

5.5 Project Risks and Mitigation Strategies

a. Potential procurement delays – If this project were to proceed in a conventional manner, TxDOT would likely need to perform many preconstruction activities (design, ROW, utilities, etc.) utilizing existing contracts to eliminate the time to procure those professional services. Amending the existing contract with the current developer would mitigate these risks. The existing contract available should have available capacity for this work, provided that TxDOT Contract Services agrees with proposed usage of the contract capacity.

b. Environmental uncertainties - Project risks should be minimal because the proposed work is already environmental cleared, all ROW has been purchased and all stakeholders fully support the project.

6.0 Federal Wage Rate Certification

NCTCOG supports entities that comply with federal labor laws. Any procurement activities sponsored by these entities require compliance with all federal, state, and local laws. In addition, in order to qualify for incentives, businesses must abide by all federal, state, and local laws.

As indicated above, NCTCOG complies with Title VII of the Civil Rights Act of 1964 and the Americans with Disabilities Act. Both of these laws require all private employers, state and local governments, and education institutions that employ 15 or more individuals, private and public employment agencies, labor organizations, and joint labor management committees controlling apprenticeship and training to comply. As a matter of policy and law, these agencies will follow these laws and principles for this (and all) projects.

As the submitting agency, NCTCOG certifies compliance with federal wage rate requirements as indicated in the attached letter provided as Appendix C.