

# Assessing the Economic, Fiscal, and Developmental Impacts of the North Texas Tollway Authority Network: 2014 Update



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## Executive Summary

Over the past 50 years the Dallas-Fort Worth (DFW) Metropolitan Area has consistently been among the fastest growing major metropolitan areas in the nation. Even during the recent recession, the region continued to attract new residents, as the local economy out-performed most areas of the country. The capacity of the region to accommodate this new growth has been undoubtedly supported by the North Texas Tollway Authority (NTTA), which has continued to improve corridors and construct new facilities that both support and catalyze development across the DFW region. In this report, we update our previous analyses of the economic, fiscal, and developmental impacts of NTTA and its network of transportation facilities on the regional economy. Among the key findings:

- Since the mid-1960s, construction spending associated with the NTTA network and concession fees total almost \$7.3 billion in constant 2014 dollars. This spending has generated \$14.4 billion in regional economic activity, supporting approximately 97,000 person-years of employment and paying \$5.3 billion in salaries, wages, and benefits (see Table ES1).
- One of the reasons the North Texas economy performed comparably well during the 2008-2009 Recession and subsequent recovery was on-going infrastructure investment in the region. Since 2007, the NTTA has invested over \$4 billion in transportation systems improvements creating \$8 billion in regional economic activity and supporting over 55,000 person-years of employment. These jobs paid an estimated \$3 billion in labor income.
- In 2007, NTTA paid \$3.4 billion in concession fees to the Texas Department of Transportation for the right to build and operate key elements of the network. Of this total, more than \$1.6 billion has been spent on additional non-tolled transportation infrastructure. This investment has sparked more than \$3.2 billion in regional economic activity supporting over 21,000 person-years of employment that paid about \$1.2 billion in salaries, wages, and benefits. These numbers are anticipated to grow as the North Central Texas Council of Governments (NCTCOG) continues distributing the remaining funds.

**Table ES1: Economic and Fiscal Impacts from Construction of the North Texas Tollway Authority Network on the Dallas-Fort Worth Metropolitan Area**

Description	Impact from		Total Impact
	NTTA Network Construction	Concession Supported Projects	
Spending (\$2014)	\$ 5,643,277,000	\$ 1,629,368,000	\$ 7,272,645,000
Economic Activity	\$ 11,176,902,000	\$ 3,227,077,000	\$ 14,403,979,000
Labor Income*	\$ 4,098,535,000	\$ 1,183,359,000	\$ 5,281,894,000
Employment <sup>#</sup>	75,000	21,000	97,000
Other Property Income <sup>+</sup>	\$ 1,402,427,000	\$ 404,919,000	\$ 1,807,346,000
Indirect Business Taxes <sup>^</sup>	\$ 344,158,000	\$ 99,368,000	\$ 443,526,000

\* Salaries, wages, benefits. # Expressed as person-years of employment. + Includes rents, royalties, dividends, and corporate profits. ^ Includes sales taxes, property taxes, permit fee, licensing fees to state and local taxing entities. Sources: NTTA, NCTCOG, IMPLAN, Authors' estimates.

- The recurring spending that supports NTTA's facility operations generates permanent jobs and economic opportunity for businesses across the North Texas region. This spending supports agency procurement, maintenance expenses, and labor costs for administration and operations personnel. These expenditures generate \$285 million in annual economic activity, which supports about 1,400 direct, indirect, and induced jobs that pay \$83.2 million in salaries, wages, and benefits. NTTA recurring operations support an additional \$44.9 million in property income in the form of rents, royalties, and corporate profits each year.
- The Chisholm Trail Parkway project represents over \$1.6 billion in new regional infrastructure spending (once it is entirely completed) with an economic impact exceeding \$3.2 billion through project completion. This level of economic activity will support more than 21,000 person years of employment paying almost \$1.2 billion in salaries, wages, and benefits. (These impacts are included in the Total Impacts column in Table ES1.)
- Consistent with the findings of previous studies, a number of major investments have occurred along the NTTA's corridors. In total, over \$23.5 billion in property value was constructed along NTTA's facilities since 1968, of that \$6.3 billion occurred in the 2007-2013 period, which supports as much as \$149 million in annual property tax revenue to local jurisdictions. Importantly, these development impacts will continue to grow with the addition of notable projects including the new homes for State Farm Insurance and Toyota Motor Sales USA, Inc., a 560,000 square-foot Nebraska Furniture Mart showroom, and the new Dallas Cowboys training facilities and headquarters that do not yet appear in our data.
- Households located in proximity to the NTTA network also have benefited from their location decisions. A 2008 study of residential properties by Dr. Sharada Vadali<sup>1</sup> at the Texas A&M Transportation Institute (TTI) found that houses located between one-quarter mile and one mile from the NTTA roadways were associated with up to a 9 percent price premium. This 9 percent price premium also leads to additional tax revenues for local governments and school districts. Additionally, Dallas Central Appraisal District records show that since 2007 over \$1.0 billion in new residential housing has been constructed within one half mile of the NTTA network in Dallas County alone.
- Mobility enhancements including the development and expansion of the North Texas Tollway Authority system enables the DFW region to continue to compete for businesses and grow. During the 2001 to 2011 period, the population of DFW grew by 27%, yet according to Texas A&M Transportation Institute's Urban Mobility Report, congestion-related delays for commuters only increased about 12%. The Dallas-Fort Worth region

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<sup>1</sup> Sharada Vadali, "Toll Roads and Economic Development: Exploring Effects on Property Values." *Annals of Regional Science*, no. 42 (2008): 591-620.

has among the lowest level of commuter delays among the largest metro areas in the United States.

- Based upon our analysis, recurring operations by the businesses along the NTTA network generate \$25.5 billion in annual economic activity in the DFW region and supported approximately 183,000 direct, indirect, and induced jobs that pay \$10.4 billion in salaries, wages, and benefits (see Table ES2). This activity includes the effects of the business purchases and procurements that stay in the region as well as direct employment of personnel. In addition, they provide approximately \$4.1 billion in property income in the form of rents, royalties, and corporate profits. State and local taxing jurisdictions receive \$1.35 billion in property tax, sales tax, and fee revenue from businesses that developed around the NTTA network. A portion of these tax revenues are the direct result of the improved mobility provided by the NTTA network that would have not otherwise existed.

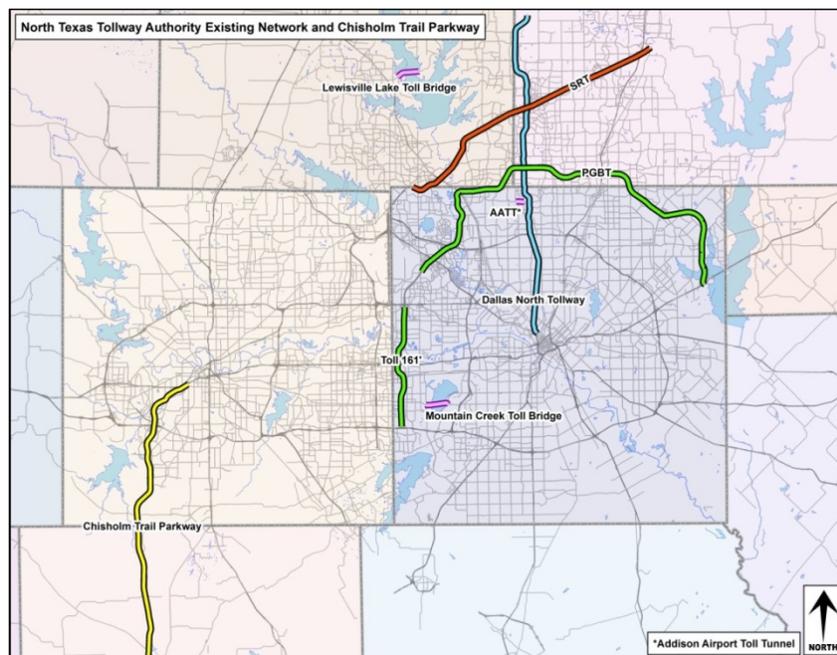
**Table ES2. Recurring Economic and Fiscal Impacts of North Texas Tollway Authority Operations on the Dallas-Fort Worth Metropolitan Area**

Description	Annual Impact
Economic Activity	\$ 25,515,000,000
Labor Income*	\$ 10,407,000,000
Employment <sup>#</sup>	183,000
Other Property Income <sup>+</sup>	\$ 4,109,000,000
Business Taxes <sup>^</sup>	\$ 1,351,000,000

\* Salaries, wages, benefits. # Expressed as person-years of employment. + Includes rents, royalties, dividends, and corporate profits. ^ Includes sales taxes, property taxes, permit fee, licensing fees to state and local taxing entities. Source: IMPLAN, Energy Information Administration, Dallas Central Appraisal District, Denton Central Appraisal District, Collin Central Appraisal District, and Authors Estimates.

## Introduction

The NTTA network is a region-wide transportation system that has expanded mobility options for many of the fastest growing areas within the DFW region (Figure 1). This report analyzes the economic, fiscal, and developmental impacts of this network and how it helps drive the economy. Our analysis considers network-wide impacts as well as those for selected projects. The impacts of constructing the NTTA network are assessed first. This assessment includes planning expenditures currently authorized for the Trinity Parkway and the impacts of construction expenditures and future development along the Chisholm Trail Parkway (CTP). Developmental impacts that NTTA projects have on surrounding areas are then offered for the Dallas North Tollway (DNT), the President George Bush Turnpike (PGBT), the Sam Rayburn Tollway (SRT), and special facilities such as the Addison Airport Tunnel and toll bridges at Mountain Creek and Lewisville Lake. Trends in regional population and employment are detailed in Appendix 1.



**Figure 1. NTTA Network Map**

It has been well documented that good roadway access is an important feature for businesses and individuals when making location decisions. According to a 2012 survey by *Area Development*, 90.1 percent of executives consider highway accessibility to be “very important” or “important” when selecting new sites for development<sup>2</sup>. This puts highway accessibility as the second most important factor for site selection only behind labor cost. The decisions of companies like Toyota and State Farm to locate major operational facilities in the DFW region and next to the NTTA network was likely aided by the improved access the NTTA network provides.

<sup>2</sup> Area Development: 27th Annual Survey of Corporate Executives, accessed 9/23/14 at <http://www.areadevelopment.com/Corporate-Consultants-Survey-Results/Q1-2013/27th-Corporate-Executive-RE-survey-results-37376241.shtml>

Individuals and families also value proximity to tollways when making household location decisions. A 2008 study of residential properties by Dr. Sharada Vadali at the Texas Transportation Institute (TTI) found that houses located between one-quarter mile and one mile from the NTTA roadway were associated with up to a 9 percent price premium. This 9 percent price premium also leads to additional tax revenues for local governments and school districts. Dallas Central Appraisal District records show that since 2007 more than \$1.0 billion in new residential housing has been constructed within a one-half mile of the NTTA network within Dallas County.

The areas around the NTTA network have seen a tremendous number of changes over the past decade. One marked example is the area surrounding the interchange between the DNT and SRT as seen in Figure 2. The aerial photograph in Figure 2 depicts the area in 2013. This area has seen over \$570 million invested in new construction since 2007, which includes about \$340 million in the Shops at Legacy. These new developments include Townhomes at Legacy Town Center and Legacy Town North Apartments, which account for \$170 million in newly constructed improvements. Additionally, the Shops at Legacy Town Center provide for \$160 million in improvements. Alliance Data Systems occupies a newly constructed office building in the area that represents over \$12 million in improvements. This enclave has seen great success in mixing retail, office, and residential spaces. It has also created the opportunity to attract future growth, as large tracts of land surrounding it remain available for development.



**Figure 2. Interchange between the Dallas North Tollway and the Sam Rayburn Tollway, 2013**

Note. Green represents Townhomes at Legacy Town Center and Legacy Town North Apartments. Blue represents the Shops at Legacy Town Center and Alliance Data Systems.

## Economic and Fiscal Impacts of NTTA Network

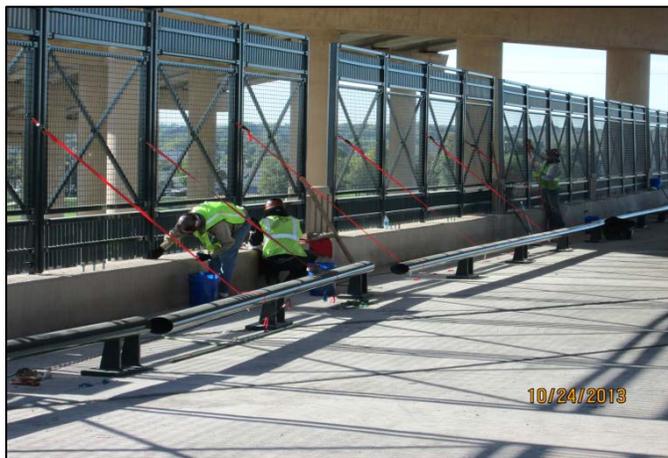
### *Economic and Fiscal Impacts of NTTA Network Construction*

Building the NTTA network in north Texas has been among the region's largest public investments over the past 50 years. Starting with the original DNT running from downtown Dallas to LBJ Freeway (and a budget of \$31.6 million) through the recently opened Chisholm Trail Parkway (CTP), the NTTA network grew from about 55 lane miles of roadway to more than 950 lane miles after the completion of the CTP. As shown in Table 1, the cost to build the NTTA network will exceed \$5.6 billion in 2014 dollars once the CTP is fully completed. This



spending has been a combination of new facility construction, expansion of existing roads, and the reconfiguration of key interchanges that have generated substantial impacts on the north central Texas economy. Additionally, the \$3.4 billion concession fee paid by NTTA for the right to build and operate key elements of its network has funded over \$1.6 billion in additional transportation infrastructure in the region further boosting economic activity in North Texas. This number is anticipated to grow as the funds continue to be distributed.

To estimate the economic and fiscal impacts of capital spending by the NTTA to build its regional transportation network, we employed the IMPLAN (Impact Modeling for Planning) economic input-output model developed by MIG, Inc. The IMPLAN model is widely used in academic and professional research. Input-output models track how spending flows through a specified geography. Given the regional scope of the NTTA network, this analysis defines the impact area as the 12-county Dallas-Fort Worth Metropolitan Area. The IMPLAN model provides estimates of total economic activity including direct, indirect, and induced impacts based on the activities of a given entity. For example, consider the economic impacts of highway construction. The direct effects would include spending for engineering, regulatory compliance, financial and legal services, fees paid to general contractors, cost of materials, equipment, and labor costs. In addition, NTTA will have administrative costs in managing the construction projects.



Indirect effects capture the economic activities of the vendors of the directly affected firms. For example, the engineering design firm buys office supplies, rents space, purchases computer equipment, and hires services for their business needs. The indirect effects also include the janitorial service that cleans the engineers' offices purchasing supplies and hiring workers. Induced effects include the impact of the employees of directly and indirectly affected firms spending a portion of their wages and salaries in the local economy. The IMPLAN model adjusts the impact estimates for spending that leaks out of the local economy. For example, if construction materials are not produced in the DFW area, then only a small amount of the estimated purchase value of those materials is counted as contributing to the regional economy. When added together, the sum of all the activity from direct, indirect, and induced impacts is typically greater than the local portion of the spending, which is known as the "multiplier effect."

The IMPLAN model estimates the total level of economic activity (transactions) supported by the base spending and resulting indirect and induced impacts. Income impacts include labor income (salaries, wages, and benefits) and property income (rents, royalties, corporate profits, dividends, and other income). The model also estimates indirect business taxes, which include sales and use taxes, property taxes, permit and license fees, and other business taxes paid to state and local taxing jurisdictions.

Given that the impacts of building the NTTA network are spread over several decades, there are two important data considerations in conducting and reporting the results of this analysis. The first is adjusting construction spending for inflation. We adjust reported construction costs to constant 2014 dollars using a construction cost index from McGraw-Hill, the Highway Construction Cost index from the Federal Highway Administration, and GDP price deflators from the U.S. Bureau of Economic Analysis. The second issue addresses a caveat in our estimates of employment impacts. Since the spending covers multi-year periods, our estimates of economic activity, labor and property earnings, and tax impacts are for the entire review period. However, employment impacts are expressed as person-years of employment. If a given construction project took three years to complete and created 1,500 person years of employment, on average there would be 500 jobs supported for each of the three years. In reality construction



projects have lower levels of employment in the early (design) phases, high employment during actual construction, and then return to lower levels during finish out phases.

Table 1 shows inflation adjusted construction costs for each of NTTA's tollway segments and projects as reported by NTTA and adjusted to constant 2014 dollars. Total construction related spending will exceed \$5.6 billion by the completion of the CTP.

**Table 1. North Texas Tollway Authority Construction Spending**

<b>Segment/Project</b>	<b>Spending (\$2014)</b>
<b>Dallas North Tollway</b>	
Downtown Dallas to LBJ (Loop 635)	\$ 149,527,799
LBJ to SH 121	\$ 152,777,602
SH 121 to US 380	\$ 237,494,218
DNT/SH 121 Interchange	\$ 27,885,779
DNT 4 <sup>th</sup> Lane	\$ 773,438
DNT/PGBT Interchange and Ramp Modifications	\$ 1,161,462
DNT Phase 3	\$ 284,410,725
DNT Phase 4A	\$ 3,272,287
DNT Phase 4B/5A	\$ 4,740,370
<b>President George Bush Tollway</b>	
Midway Rd. to Coit Rd.	\$ 139,484,672
Coit Rd. to SH 78	\$ 94,582,072
Midway Rd. to IH 35E	\$ 220,928,996
Loop 635 to Belt Line Rd.	\$ 92,410,440
IH 35 E to Loop 635	\$ 300,915,970
Eastern Extension	\$ 777,895,752
Widening between IH 35E and SH 78	\$ 3,815,785
Western Extension	\$ 544,270,668
<b>Sam Rayburn Tollway</b>	
State Highway 170	\$ 5,694,381
State Highway 360	\$ 6,849,327
Trinity Parkway (planning and regulatory review)	\$ 85,483,317
Lake Lewisville Toll Bridge	\$ 136,509,150
All Electronic Toll Collection	\$ 65,426,477
Other Construction	\$ 21,814,789
Planning & Feasibility Studies for Future Projects	\$ 8,194,000
Chisholm Trail Parkway	\$ 1,606,132,385
<b>TOTAL</b>	<b>\$ 5,643,277,276</b>

Sources: NTTA, McGraw-Hill, and FHWA.

Construction spending by NTTA since the mid-1960s, (including the CTP project) has generated \$11.2 billion in regional economic activity supporting approximately 75,700 person-years of employment and paid \$4.1 billion in salaries, wages, and benefits (see Table 2). Additionally, property income in the form of rents, royalties, dividends, and corporate profits increased by \$1.4 billion. Finally, state and local taxing jurisdictions enjoyed \$344.2 million in tax and fee revenues as a result of taxes on indirect and induced spending. Importantly, over \$4.0 billion of the total construction spending is recent – since 2007. By itself, the construction of the CTP represents an investment of more than \$1.6 billion. Construction of the CTP generated almost \$3.2 billion in regional economic activity supporting well over 21,000 person-years of employment paying about \$1.7 billion in salaries, wages, and benefits. In addition, CTP construction contributed about \$400 million to property income in the DFW region.

**Table 2. Economic and Fiscal Impacts from Construction of the North Texas Tollway Authority Network on the Dallas-Fort Worth Metropolitan Area**

Description	Impact from		Total Impact
	NTTA Network Construction	Concession Supported Projects	
Spending (\$2014)	\$ 5,643,277,000	\$ 1,629,368,000	\$ 7,272,645,000
Economic Activity	\$ 11,176,902,000	\$ 3,227,077,000	\$ 14,403,979,000
Labor Income*	\$ 4,098,535,000	\$ 1,183,359,000	\$ 5,281,894,000
Employment#	75,000	21,000	97,000
Other Property Income+	\$ 1,402,427,000	\$ 404,919,000	\$ 1,807,346,000
Indirect Business Taxes^	\$ 344,158,000	\$ 99,368,000	\$ 443,526,000

\* Salaries, wages, benefits. # Expressed as person-years of employment. + Includes rents, royalties, dividends, and corporate profits. ^ Includes sales taxes, property taxes, permit fee, licensing fees to state and local taxing entities. Sources: NTTA, NCTCOG, IMPLAN, Authors' estimates.

In addition to its own construction projects, the NTTA network is supporting other major transportation infrastructure projects in north central Texas. As part of its agreement to acquire the right to build and operate certain facilities, NTTA paid \$3.4 billion in concession fees to be used for other transportation projects. Based on data available from the North Central Texas Council of Governments, more than \$1.6 billion has been spent from concession funds. These expenditures have sparked more than \$3.2 billion in regional economic activity supporting over 21,000 person-years of employment that paid about \$1.2 billion in salaries, wages, and benefits. These numbers will continue to grow as the NCTCOG continues distributing the funds.

### ***Economic and Fiscal Impacts of NTTA Recurring Operations***

The NTTA operates like a business. It hires employees, pays wages, makes purchases in the community, and oversees the maintenance and operations of the entire network. According to the NTTA's financial reports for 2014, total network operating expenses were \$131 million. Unlike capital outlays, operating expenditures are not a one-time occurrence but an ongoing, recurring stream of spending. To estimate the economic, employment, and fiscal impacts of NTTA's recurring spending, we once again utilized the IMPLAN model.

Based on our analysis of 2014 budget data, recurring operations by the North Texas Tollway



Authority generate \$285.2 million in annual economic activity in the DFW region, supporting about 1,400 direct, indirect, and induced jobs that pay \$83.3 million in salaries, wages, and benefits (see Table 3). This activity includes the effects of NTTA purchases and procurement that stay in the region as well as direct employment for administrators and operations personnel. NTTA activities also support an additional \$45 million in property income in the form of rents, royalties, and corporate profits.

**Table 3. Recurring Economic and Fiscal Impacts of North Texas Tollway Authority Operations  
Dallas-Fort Worth Metropolitan Area**

Description	Annual Impact
Economic Activity	\$ 285,237,000
Labor Income*	\$ 83,272,000
Employment <sup>#</sup>	1,400
Other Property Income <sup>+</sup>	\$ 44,958,000

\* Salaries, wages, benefits. # Expressed as person-years of employment. + Includes rents, royalties, dividends, and corporate profits. Sources: NTTA, IMPLAN, Authors' estimates.

## Developmental Impacts of the NTTA Network

This section of the report discusses the pace of development along each segment of roadway within the existing NTTA network. It includes descriptions of development along the DNT, the PGBT, and the SRT, as well as the Lewisville Lake Toll Bridge, the Mountain Creek Toll Bridge, and around the Addison Airport Toll Tunnel. Table 4 provides a summary of real property values associated with NTTA facilities. In total, our analysis finds \$6.3 billion in property values within one-half mile of the existing NTTA network (not including the CTP) since 2006. Much of this value is located along DNT, which represents valuations in excess of \$3.2 billion. Study area properties along the PGBT and SRT are valued at roughly \$1.2 billion and \$1.6 billion, respectively. The two toll bridges (Lake Lewisville and Mountain Creek Lake) and the Addison Airport Toll Tunnel have roughly \$250 million of collective development near those facilities.

Development along each segment of roadway was identified from property data provided by the Collin, Dallas, Denton, Johnson, and Tarrant county appraisal districts. The analysis is based upon each district's 2013 certified appraisal values<sup>3</sup> and focuses on developments that have occurred after 2006. All parcels within a one-half mile buffer of either side of an NTTA roadway (i.e., a study area width of one mile) were included in the analysis. The appraised value of real property (i.e., the value of the land and its improvements, but excluding business personal property) for each segment was also extracted for all parcels. It should be noted that the totals for all the segments are additive even though there are overlapping buffers at the intersections of network segments. For example, an individual property located in Frisco at the intersection of the DNT and the SRT would appear in the buffer (captured property) for both segments. To prevent double counting, wherever there are buffer overlaps, the duplicated properties are assigned to the segment of road built first. Therefore, in our example, properties at the intersection of the DNT and the SRT are counted in the value of properties along the DNT.



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<sup>3</sup> Certified tax roles for 2013 will not reflect all development currently under construction; therefore, 2013 development valuations are for a partial year and should not be compared with previous years.

**Table 4. Total Value of Development Activity along Existing  
NTTA Network 2007 Through Early 2013**

<b>Segment (year opened)</b>	<b>Real Property Value</b>
<b>Dallas North Tollway:</b>	
Original (1968)	\$1,425,630,410
1 (1987)	\$390,864,896
2 (1994)	\$738,067,121
3 (2007)	\$656,319,633
Subtotal	<b>\$3,210,882,060</b>
<b>President George Bush Turnpike:</b>	
1 (1998)	\$305,864,456
2 (2000)	\$222,781,397
3 (2001)	\$100,579,832
4 (2005)	\$155,461,940
5 (2001)	\$177,649,570
161 Toll Road (2010)	\$64,374,210
Eastern (2011)	\$190,665,990
Subtotal	<b>\$1,217,377,395</b>
<b>Sam Rayburn Tollway:</b>	
1 (2006)	\$428,422,168
2 (2008)	\$799,511,931
3 (2009)	\$352,227,038
4 (2010)	\$56,110,849
Subtotal	<b>\$1,636,271,986</b>
<b>Bridges and Tunnels:</b>	
Addison Airport Toll Tunnel (1999)	<b>\$115,159,770</b>
Mountain Creek Toll Bridge (1979)	<b>\$94,513,660</b>
Lewisville Lake Toll Bridge (2009)	<b>\$41,490,489</b>
<b>Grand Total</b>	<b>\$6,315,695,360</b>
<i>Estimated Property Taxes Paid to Local Entities</i>	<i>\$149,000,000</i>

Finally, while some of the property improvements completed during 2013 were entered in the 2013 tax rolls, the dataset for 2013 improvements should be considered incomplete at the time of this study (August 2013).

### ***Dallas North Tollway***

The DNT opened in 1968, initially to connect downtown Dallas to Interstate Highway 635 (IH 635 or LBJ Freeway). Since then the DNT has grown, traversing the cities of Dallas, Highland Park, University Park, Farmers Branch, Addison, Plano, and Frisco. The roadway was primarily designed to aid the commutes of north Dallas residents to and from downtown Dallas. Much of

the development along the original part of the DNT existed before the completion of the tollroad. However, more recently, infill and redevelopment activity has occurred within the one-half mile buffer on either side of the initial section of the DNT. Additional extensions enable commuters to access the many office buildings that have been built along the DNT corridor and to employment centers at both ends of the toll facility. Some of these employment centers include those at Legacy Drive, Spring Creek Parkway, Parker Road, and the intersection of PGBT. Highlights include the new headquarters for Ericsson North America, an office building for MedAssets, and a 13-story office tower for the Trammell Crow Foundation. The DNT does not currently extend to US 380, although future phases will. Regardless, the DNT still provides commuters a link to the northern parts of Collin and Denton counties to access the toll network and employment centers throughout the Metroplex.

Many segments along the DNT corridor have created positive conditions for investment, including the development of corporate centers, operations hubs, and various other types of economic activity. Residential development has occurred in several locations, primarily along El Dorado Parkway and Lebanon Road, while commercial development has occurred along these same roadways and between Warren Parkway and the SRT interchange in Frisco, including future headquarters for Toyota and the Dallas Cowboys. It is important to note that this interchange is the primary access point to Stonebriar Centre Mall, Dr. Pepper Ballpark, IKEA, and a number of other high profile commercial businesses. As such, the mobility enhancements that resulted from both toll facilities contributed to the favorable market conditions for Stonebriar Centre Mall and the associated commercial activity. The DNT also has the opportunity to attract future growth, as large tracts of land surrounding it are available for development.

### ***President George Bush Turnpike***

The first phase of the PGBT opened in 1998. Initially traversing the western edge of Collin County at Midway Road to US 75, subsequent segments have extended it both east and west through the communities of Carrollton, Farmers Branch, Garland, Rowlett, Irving, and Grand Prairie. Development along the PGBT is diverse with varying forms of commercial, industrial, and residential all represented in the mix. Due to the location of the road, a good portion of the surrounding development was already in place before construction began; in some cases, such as the segment from IH 35E to IH 635, pre-existing accessibility and connectivity issues continue to be problematic for development. The segment of PGBT between IH 635 and Belt Line Road is also problematic for developers, as Dallas/Fort Worth International Airport owns several large parcels along this segment with plans for future projects. However, there are also



**Rendering of State Farm Development.**

Source: City of Richardson

large undeveloped areas present along this corridor that could potentially be developed in the future. A good example of this potential is the ground breaking on the future national headquarters of State Farm Insurance adjacent to the PGBT. One of the largest real estate developments in the North Texas region during the past decade, the 186-acre mixed-use headquarters complex will include three office towers, including a new campus for the Raytheon Company, 1,000 multi-family residential units, a 150-room hotel, a health clinic, and 75,000 square feet of retail and restaurant space. The first phase of the project is scheduled for completion in early 2015.

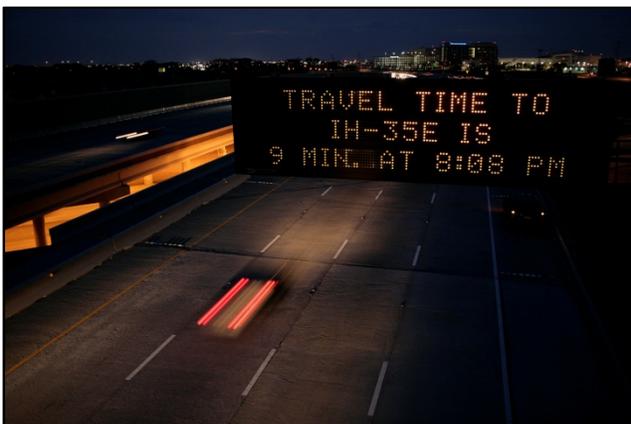
### ***Sam Rayburn Tollway***

Phase 1 of the SRT opened in 2006. Extending northeast from SH 121-Business on the border of Dallas and Denton counties to US 75, the SRT is largely flanked by residential development, but commercial corridors along Hebron Parkway, Denton Tap Road, and IH 35E have also emerged. There are large areas of undeveloped land that offer the potential for future development, excluding the areas north of IH 35E that fall within a flood plain.

Perhaps the most important segment of the SRT (for encouraging development) is at its intersection with the DNT in Frisco. While the commercial cluster that includes IKEA and Stonebriar Centre Mall was developed prior to the actual construction of either tollway, each tollway influenced the site location decisions for these retail trade investments and provides beneficial mobility enhancements in this part of Frisco. In addition to the recent residential development occurring near Parker Road along this stretch, commercial development has also emerged. Planned developments along this segment of the SRT show major new investments not yet reflected in the property valuation data, such as Nebraska Furniture Mart, Top Golf, Rooms to Go, and several other businesses just west of the DNT interchange. Future development opportunities look promising, as large swaths of land adjacent to the SRT's northeastern most extension remain undeveloped.

### ***Bridges and Tunnels***

#### **Addison Airport Toll Tunnel**



The Addison Airport Toll Tunnel opened in 1999 providing an additional direct route between the DNT and IH 35E under the runway of the Addison Airport. A considerable amount of the development in the study area pre-dates the opening of the Toll Tunnel, but there was some development activity in the area during the late 1990s and early 2000s, notably the Addison Circle urban district in the heart of Addison. The value of properties with new improvements was relatively high during the mid- to late-1990s

but decreased in 1999, the year the tunnel opened. In the years that followed, new development was limited due to the area being largely built out. There was a sharp uptick in the total value of properties with development activity in 2007 and additional investment during 2012.

### **Mountain Creek Toll Bridge**

The Mountain Creek Toll Bridge opened in 1978 and provides an east-west crossing of Mountain Creek Lake between the Oak Cliff section of Dallas and Grand Prairie. Linking communities in southern Dallas County, the bridge allows easy access to tourist attractions, sports venues, and other destinations in Tarrant County. Most of the area surrounding the Mountain Creek Toll Bridge was developed before it opened in 1978. The development in proximity to the toll bridge is almost exclusively residential with commercial development in a few locations. The largest development within recent years was the addition of new dormitories at Dallas Baptist University.

### **Lewisville Lake Toll Bridge**

The Lewisville Lake Toll Bridge opened in 2009, connecting communities on the eastern and western shores of Lewisville Lake in Denton County. Much of the development along either end of Lewisville Lake existed before the completion of the toll facility. Some development has occurred since the opening of the bridge, and other activity occurred in the years leading up to the opening. Most development within the study area, however, preceded the bridge. In the two years leading up to the opening of the bridge, housing developments worth approximately \$23.5 million were completed. However, since the recession, development activity in the corridor has been modest.



## **Economic Activities of Businesses along the NTTA Network**

While the NTTA network has grown, so have the number of businesses that have developed around the tollways. In order to quantify the economic impacts of businesses along the NTTA network, we took a random sample of the buildings within a one-half mile of the tollway that were built after each roadway segment was opened. Those buildings were then classified by the use of businesses that currently occupy them, such as office space, restaurants, medical office, warehousing, etc. Using each building's size and data from the U.S. Energy Information Administration, we estimated the number of workers in each of 17 different categories of use. These ratios were then applied to the NTTA network as a whole to arrive at an estimate of 97,236 workers that are directly employed at businesses located within the one-half mile buffer along the NTTA network.

Using these job estimates, we utilized the IMPLAN model to assess the economic activities of the businesses along the NTTA network. The resulting estimates show that these businesses generated over \$12.5 billion in total revenue, employ 97,236 workers, and pay an estimated \$5.6 billion in wages each year. While not all employment could be said to be directly attributable to the NTTA network, it is undoubtedly a significant contributor to the region's competitive advantage. A portion of these economic activities are the direct result of the NTTA network, which create direct and indirect impacts on the regional economy.

We also paired building use (defined within 17 building use categories) with one or more of IMPLAN's 440 industry sectors to build our IMPLAN model. When a building use clearly fell into many sectors, as such office buildings, an allocation scheme was used to assign jobs from that class of building use to all the related sectors based on their representation in the DFW region.

Based on our analysis, recurring operations by the businesses along the NTTA network generated \$25.5 billion in annual economic activity in the DFW region supporting about 183,000 direct, indirect, and induced jobs that pay \$10.4 billion in salaries, wages, and benefits (see Table 5). This activity includes the effects of the businesses purchases and procurement that stays in the region, as well as the direct employment of personnel. Additionally, these expenditures support \$4.1 billion in property income in the form of rents, royalties, and corporate profits. State and local taxing jurisdictions receive almost \$1.4 billion in property tax, sales tax, and fee revenue from businesses that developed around the NTTA network.

**Table 5. Recurring Economic and Fiscal Impacts of North Texas Tollway Authority Operations on the Dallas-Fort Worth Metropolitan Area**

Description	Annual Impact
Economic Activity	\$ 25,515,000,000
Labor Income*	\$ 10,407,000,000
Employment <sup>#</sup>	183,000
Other Property Income <sup>+</sup>	\$ 4,109,000,000
Business Taxes <sup>^</sup>	\$ 1,351,000,000

\* Salaries, wages, benefits. # Expressed as person-years of employment. + Includes rents, royalties, dividends, and corporate profits. ^ Includes sales taxes, property taxes, permit fee, licensing fees to state and local taxing entities. Source: IMPLAN, Energy Information Administration, Dallas Central Appraisal District, Denton Central Appraisal District, Collin Central Appraisal District, and Authors Estimates.

## Conclusions

The North Texas Tollway Authority network continues to provide the mobility required for the DFW region's economic success. In this update to our 2006 analysis, we find that expansion of the tollway network has supported the development of hundreds of commercial properties, and it has kept mobility in the region at a competitive level despite rapid population growth.

Since the NTTA network broke ground on the Dallas North Tollway (more than 50 years ago) through the impending completion of the Chisholm Trail Parkway, over \$5.6 billion in inflation-adjusted dollars will have been spent building the NTTA network. For the right to build and operate key elements of the network, NTTA paid concession fees to the Texas Department of Transportation in 2007. Since then, more than \$1.6 billion of these fees have been spent on additional non-tolled transportation infrastructure. The economic activity in the Dallas-Fort Worth Metropolitan Area supported by this spending totals over \$14.4 billion creating over 97,000 person-years of employment.

As the network has grown, NTTA itself has become a major regional employer and now supports over 700 direct jobs plus almost 900 additional permanent jobs through indirect and induced economic impacts that provide \$83.3 million each year in regional labor income. Total recurring annual economic impacts of NTTA operations now exceed \$285.2 million. Even though NTTA is a public entity, the economic activity associated with facility construction and network operations increased revenues for state and local taxing entities by hundreds of millions of dollars.

The highway facilities built and operated by NTTA have simultaneously supported existing residential and commercial development and have been a catalyst for new development. Our review of properties developed along the NTTA network shows more than \$6.3 billion in real estate has been developed since 2007, based on property tax rolls, which currently generate an estimated \$149 million in annual property tax payments to cities, school, and county entities. A portion of this tax revenue is due to a property value premium that is directly attributable to the NTTA network. This estimate does not include the potential development that will occur along the Chisholm Trail Parkway.

The businesses that occupy commercial buildings developed along the NTTA network represent a major source of economic activity. While the NTTA is not the sole reason why these businesses exist, it is a significant reason why many companies choose to locate in the region. These businesses directly employ an estimated 97,000 workers and generate an estimated \$12.5 billion in total revenue. Furthermore, the economic impact of these businesses on the DFW Metro area is even more profound. The total recurring annual economic activities of these businesses are estimated to be over \$25.5 billion. In addition, more than 180,000 jobs are supported, paying over \$10.4 billion in salaries, wages, and benefits.

## Appendix 1 - Regional Overview and Trends

### Population Trends and Projections

The Dallas-Fort Worth MSA<sup>4</sup> is consistently one of the fastest growing regions in the nation in terms of population. To understand what that means for the NTTA network, it is important to consider the growth spatially. Table A-1 shows historic population counts and estimates for the four counties with NTTA facilities plus Ellis and Johnson counties, which are the Dallas-Fort Worth region's two largest, southern suburban counties. Among the six counties, Dallas County had the largest estimated population in 2012 with 2.4 million residents, and Tarrant County was the second largest with a population of almost 1.9 million residents. Since 1970, the populations of Collin and Denton counties have been the fastest growing in the Dallas-Fort Worth MSA. Between 1970 and 2012, Collin County's population grew more than 12-fold, while Denton County's population grew more than 9-fold.

**Table A-1. Historic Population for Select Counties in the Dallas-Fort Worth MSA, 1970-2012**

TOTAL POPULATION						
County	1970	1980	1990	2000	2010	2012
Collin	66,920	144,576	264,036	491,675	782,341	834,642
Dallas	1,327,695	1,556,419	1,852,810	2,218,899	2,368,139	2,453,843
Denton	75,633	143,126	273,525	432,976	662,604	707,304
Ellis	46,638	59,743	85,167	111,360	149,610	153,969
Johnson	45,769	67,649	97,165	126,811	150,934	153,441
Tarrant	715,587	860,880	1,170,103	1,446,219	1,809,034	1,880,153
COMPOUNDED ANNUAL GROWTH RATE						
County	1970-1980	1980-1990	1990-2000	2000-2010	2010-2012	
Collin	--	8.01%	6.21%	6.41%	4.75%	2.92%
Dallas	--	1.60%	1.76%	1.82%	0.65%	1.59%
Denton	--	6.59%	6.69%	4.70%	4.35%	2.94%
Ellis	--	2.51%	3.61%	2.72%	3.00%	1.28%
Johnson	--	3.98%	3.69%	2.70%	1.76%	0.73%
Tarrant	--	1.87%	3.12%	2.14%	2.26%	1.73%

Note: Population counts for 1970-2010 are based upon the decennial U.S. Census. Population data for 2012 are based upon the U.S. Census Bureau's 2012 population estimates. Source: U.S. Census Bureau, 2013.

During the same period, Dallas County's population increased by almost 85 percent or 1.1 million new residents, and Tarrant County's population also increased by 1.1 million new residents or approximately 163 percent. The populations in Johnson and Ellis counties more than tripled between 1970 and 2012, with each county adding roughly 104,000 new residents. If one were to group the counties by north/south location in regards to Dallas and Tarrant counties with Denton and Collin in the north and Ellis and Johnson in the south, the northern counties have outperformed the southern ones. As a result, the NTTA's toll facilities serve many of the most significantly growing areas of the Dallas-Fort Worth MSA.

<sup>4</sup> For the purposes of this section of the report, "Dallas-Fort Worth MSA" is used to represent the official U.S. Census Bureau classification, Dallas-Fort Worth-Arlington Metropolitan Statistical Area.

Assuming a comparatively conservative future growth scenario, the Texas State Data Center (TxSDC) projects the Dallas-Fort Worth MSA’s population to continue its robust growth reaching just over 9.8 million by 2040.<sup>5</sup> This growth would reflect 2.9 million new residents and an overall population growth for the region of 41.8 percent. Similar growth is projected at the county levels for the Dallas-Fort Worth MSA with some variances. The population of Dallas County is projected to grow relatively slowly, reflecting its low net migration and the lack of easily developable (or re-developable) land. Tarrant County, on the other hand, is projected to have a higher rate of growth. Collin and Denton counties will also experience a high level of population growth with Ellis and Johnson counties following suit at a slightly less robust pace (Table A-2).

**Table A-2. Texas State Data Center Population Projections for Dallas-Fort Worth MSA and Select Counties, 2015-2040**

	DFW MSA	Collin County	Dallas County	Denton County	Ellis County	Johnson County	Tarrant County
2015	6,926,646	879,105	2,503,717	742,002	164,430	161,932	1,926,170
2020	7,445,492	980,666	2,637,053	827,987	180,663	173,835	2,046,408
2025	7,993,435	1,094,333	2,766,677	922,015	198,619	186,904	2,171,227
2030	8,577,819	1,224,988	2,892,297	1,028,537	217,541	200,573	2,300,798
2035	9,189,332	1,369,604	3,020,031	1,144,763	236,533	214,295	2,428,789
2040	9,820,570	1,522,618	3,154,331	1,268,195	255,683	228,160	2,552,459

Note: Projection based on 0.5 Migration Scenario  
Source: Texas State Data Center, 2013.

### **Employment Trends**

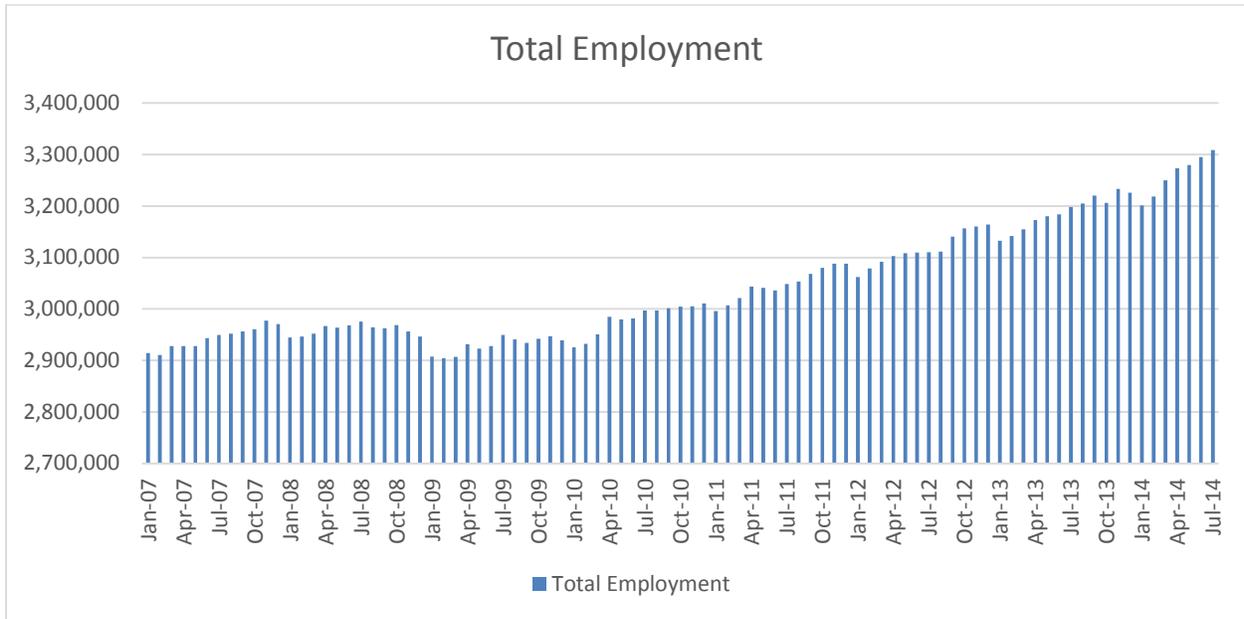
The region’s positive population growth is mirrored by its employment. The Dallas-Fort Worth MSA’s economy is the nation’s fourth largest in terms of total employment and ranked second only to the New York-Northern New Jersey-Long Island MSA in terms of growth during 2013.<sup>6</sup> Like the growth in population, in order to understand what growth trends in employment mean to the NTTA network, it is important to consider them spatially by county. Overall, the Dallas-Fort Worth MSA weathered the 2008-2009 Recession well. Although it lost 200,000 jobs (or almost 7.0 percent of the region’s total employment) during that period, the region gained over 270,000 jobs from 2010 to 2012 – an increase of 9.9 percent (Figure 3).

At the county level, the consequences of the recession were not experienced consistently across the region. Within some counties, the employment decline was disproportionately severe, while other counties escaped relatively unscathed. Dallas County experienced significant job losses during the 2008-2009 Recession with employment continuing to decline overall reaching its lowest level in January 2011. From there, local employment began to grow and was at its highest level (since December 2007) in December 2012. However, Dallas County still had fewer employed workers during 2012 than it did during 2007. Tarrant County fared a little better eventually making up for its job losses during the nationwide economic downturn, but not

<sup>5</sup> The growth scenario referenced is the “0.5 Migration Scenario” which calculates the net migration rate for future periods to be one-half the net migration rate that occurred between 2000 and 2010.

<sup>6</sup> Source: U.S. Bureau of Labor Statistics’ Current Employment Statistics.

experiencing the same growth as other counties. Collin County also experienced a slow comeback of employment.



**Figure 3. Total Employment in the Dallas-Fort Worth MSA, 2007-2012**

Source: Bureau of Labor Statistics, 2014.

Similar to Dallas County, Collin, Ellis, and Johnson counties were able to experience job gains between 2007 and 2012, leaving them at higher employment levels than those experienced before the 2008 to 2010 slump. Denton County was more fortunate and did not experience the significant loss of jobs that affected other counties in the Dallas-Fort Worth MSA, although there were still some job losses during 2008 and 2009. Again, as with population growth, if one were to group the counties by north/south location in regard to Dallas and Tarrant counties, the northern counties outperformed the southern regarding employment.

As employment change in the Dallas-Fort Worth MSA was favorable compared to the national figures during the 2008-2009 Recession and recovery, unemployment rates were equally favorable. Unemployment rates in the Dallas-Fort Worth MSA reached their lowest point in 2007 before rising sharply during the latter half of 2008 and through 2009, peaking in January 2010. The region’s rate of joblessness then declined slowly through mid-2011 before falling more consistently through early 2013. Despite substantial job losses, unemployment rates in the Dallas-Fort Worth region were much lower than those for the country as a whole.