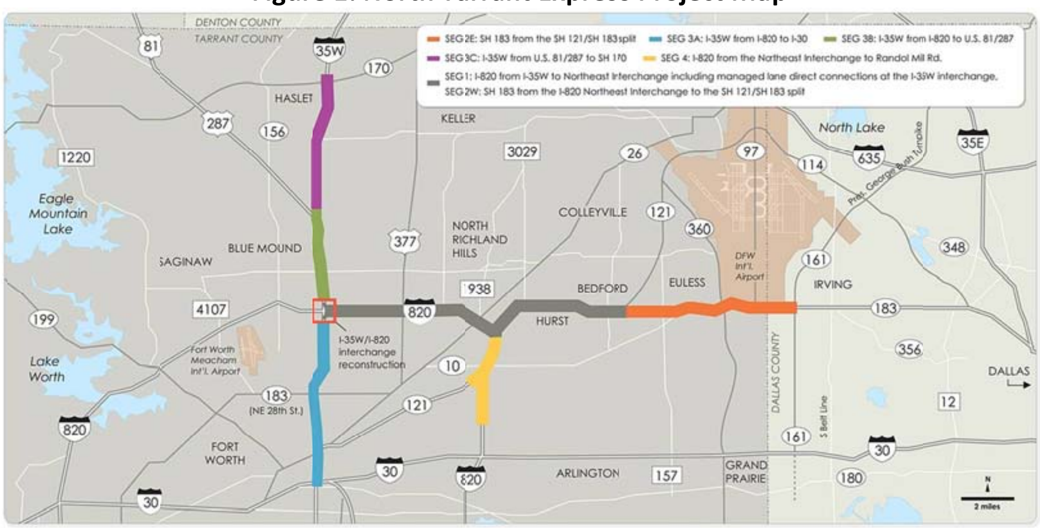
Introduction

The NTE Project has significant positive benefits for both the Dallas-Fort-Worth region and the nation as a whole. This report summarizes the result of the benefit-cost analysis performed for the NTE Project. The NTE Project involves the development, design, construction, financing, operation and maintenance of toll managed / transit lanes, and reconstruction of the main lanes and frontage roads along the Interstate Highway 35W in the Fort Worth area. The total collective length of Segments 3A and 3B of the NTE is approximately 12 miles. The Project is segmented as follows:

- Segment 3A: North of IH 35W / IH 30 Interchange to Meacham Blvd. (5.4 miles).
- IH 35W / IH 820 Interchange: north of Meacham Blvd. to north of Fossil Creek Blvd. on IH 35W (1.7 miles) and west of Mark IV Parkway to N. Riverside Dr. on IH 820 (1.9 miles).
- Segment 3B: North of Fossil Creek Blvd. to North Tarrant Parkway (3.4 miles)

Figure 1 below shows Segments 3A, 3B and the IH 35W / IH 820 interchange in the context of the larger NTE project.

Figure 1: North Tarrant Express Project Map



SEG*	Roadway and Limits	Existing lanes (Each dir.)	Frontage lanes (Each dir.)	Configuration as proposed in Regional Mobility 2030 Plan** General purpose lanes (Each dir.)***	Managed lanes (toll) (Each dir.)	Frontage lanes (Each dir.)
2E	SH 183 from the SH 121/SH 183 split	3	2*	4	3	2**
3A	I-35W from I-820 to I-30	2 - 3	2*	4	2	2*
3B	I-35W from I-820 to U.S. 81/287	2	2	4	2 - 3	2
3C	I-35W from U.S. 81/287 to SH 170	2	2	3	2	2
4	I-820 from the Northeast Interchange to Randol Mill Rd.	2 - 4	0	5 (SH 121N to SH 121S)	1 (SH 121N to SH 121S)	0

* Segments identified by number do not denote priority or sequence. ** All segments will include one-way frontage roads at identified locations and connections to all existing and proposed improvements.
* Discontinuous. ** Continuous. *** Potential deferment of additional general purpose lanes.

This report provides a preliminary estimate of the traffic, cost, and livability, economic, safety and sustainability benefits that will be realized by the relevant segments of the NTE Project.

Estimation Approach

For this study, project cost and benefits were analyzed beginning with the start of construction and extending forward to the horizon year of 2037. Construction of the Project is estimated to begin in 2013. In the case of the NTE Project, although the physical improvements are centered along the IH 35W corridor and connecting roadways, the impact is regional. Hence, the benefit cost analysis was conducted in the same manner and project impacts were measured for the region as a whole under a build and no-build scenario.

Methodology

TxDOT reviewed potential analysis tools and selected the methodology in the California Lifecycle Benefit/Cost Analysis Model (Cal-B/C) for application to this study. This software tool was developed by Booz-Allen & Hamilton for Caltrans and it is used primarily to prioritize highway projects. Cal-B/C is consistent with the procedures outlined in the Federal Highway Administration's (FHWA) Economic Analysis Primer (2003). Cal-B/C is an easy to use Excel spreadsheet for benefit cost analysis of highway and transit projects in a corridor that already contains a highway facility or transit service. Highway projects may include HOV and passing lanes, interchange improvements, and bypass highways. Transit improvements may include bus service, light-rail, and commuter rail projects. The applicable methodology from this tool was utilized for the project BC analysis.

California default values were appropriately modified to ensure the spreadsheet will model a more accurate benefit cost analysis for the State of Texas and local regions within the IH 35 W corridor. Default data, such as cost of emissions, vehicle operating costs, etc., were not modified from the California conditions. Specific changes are listed below:

- Traffic and speed inputs: in accordance with AECOM's calibrated MPO regional travel demand model.
- Values of Time to derive value of time savings: in accordance with AECOM's traffic and revenue study for the Project.
- Emission rates: In accordance with TxDOT studies.
- Cost Fuel / gallon: In accordance with the AAA daily fuel gauge (Oct 2011 $).

Project Costs

Project costs considered in this analysis include the up-front construction related expenditures, followed by annual estimates for ongoing operations, maintenance and rehabilitation. Cost estimates used in the analysis have been independently prepared by NTE Mobility Partners consortium, comprising Cintra Infraestructuras S.A. (Cintra) and Meridiam under the scope of the Facility Implementation Plan approved by TxDOT on July 6, 2011. The total capital and projected costs of the proposed project through the year 2037 are provided in Table 1 below. All costs are presented in 2011 dollars. The capital costs of the proposed project will be approximately $ 1,421 million, and total operating and capital renewal costs will be approximately $ 341 million.

Table 1: NTE Project Capital and Operations Costs

Year	Capital Costs	Operations and Maintenance Costs	Capital Maintenance Costs
2013	254,813,500	8,284,721	
2014	254,813,500	8,920,964	
2015	339,075,000	8,110,326	
2016	339,075,000	7,373,090	
2017	233,464,000	7,472,490	
2018		7,512,014	268,182
2019		7,538,624	212,562
2020		8,702,935	827,032
2021		8,764,943	283,622
2022		10,144,673	827,032
2023		10,470,021	603,599
2024		9,920,414	1,162,449
2025		9,993,925	547,978
2026		10,288,890	15,633,201
2027		10,380,092	15,366,336
2028		11,944,063	4,442,830
2029		11,166,156	2,142,289
2030		11,166,156	2,231,522
2031		12,616,110	2,231,522
2032		11,896,799	2,635,369
2033		12,509,529	10,504,502
2034		13,163,766	10,815,895
2035		13,173,524	6,143,199
2036		13,796,169	2,945,614
2037		13,730,129	2,093,168
Totals	**1,421,241,000**	**259,040,524**	**81,917,902**

Source: NTEMP Financial and Technical Submittal

The capital and operating expenditures are based on the anticipated contract terms for the NTE Project. Additionally, please note the following:

For Capital Expenditures:

- Construction payments consist of guaranteed lump sum price payable to the design and build contractor. The construction cost is based on a guaranteed, 60 month construction and completion schedule.
- Other direct costs during the construction phase includes ROW acquisition and the implementation of the ITS and electronic toll collection system. The estimate is based on the actual tolling scheme as set forth in the current draft of the Facility Agreement.

For Operational Expenditures:

- Operational expenditures during the construction period include:
  - Overhead costs associated with the private partner's management structure.
  - Cost associated with the independent engineer.
- Operational expenditures during the operations period include:
  - Overhead costs associated with the private partner's management structure.
  - Fixed costs associated with operation and maintenance activities on the main lanes as necessary to satisfy the maintenance and operations performance requirements provided under the Facility Agreement.
  - Tolling and collection costs including fees paid to the North Texas Tollway Authority (NTTA) as per the Tolling Service Agreement.
  - ITS and ETC routine maintenance.
  - Insurance costs based on contractual insurance policy requirements.

For Capital Maintenance Expenditures during the Operations

- Pavement renewal schedule
  - Main lanes - every eight years
  - Frontage roads and cross streets – every 11 years
  - Managed / Transit lanes – every 13 years
- Bridges and major structures schedules
  - Bridges - every 20 years
  - Signage – every 10 years
  - Drainage – every 15 years
  - Retaining walls – every 15 years
  - Attenuators – every 20 years
- ITS and ETC systems
  - Every 10 years

Project Benefit Estimates

Using Cal B/C benefits were estimated separately for the principal user benefits provided below:

- Travel time savings
- Vehicle operating cost reductions
- Emission reductions, including greenhouse gases.

Results for each of these categories are presented and discussed below.

Travel Time Benefits

Using AECOM's calibrated MPO regional travel demand model, vehicle miles traveled were computed for each roadway located within the study area under the build and no-build scenario. As shown in Table

2 below, the model shows that the vehicle-miles travelled (VMT) would increase under the build scenario relative to the no-build scenario by approximately 10 million in 2018 and 27 million by 2037. This increase in VMT reflects the increased accessibility and attractiveness of the corridor as implementation of the managed / transit lanes will offer users up to a 22 minute travel-time savings in 2037. It should also be noted that the calculated increase in VMT does not account for the increased transit ridership in the corridor. Further work is needed to refine those estimates for the entire twenty year time horizon. In spite of the increase in VMT, there are expected to be benefits due to the reduced travel times and increased average vehicle speeds. In fact, analysis shows that these travel time savings will translate to nearly 275 million hours of delay saved, which translates to a total travel time savings benefit of $ 1,548.5 million over the 20 year analysis period (NPV @ 7%).

Table 2: VMT (System-wide) and Travel Time Savings

Measure of Effectiveness	2018 Conditions			2037 Conditions		
	No-Build	Build	Change	No-Build	Build	Change
VMT (million VMT/Year)	22,602.8	22,612.9	10.1	30,963.9	30,990.8	26.9
Travel Time (million person hours / year)	674	668	(6.6)	984	963	(20.8)
Travel Time Savings (million 2011$)	--	119.53	119.53	--	378.93	378.93

Source: AECOM 2010 Network Model Extractions (Aug 18, 2010)

The detailed excel spreadsheets that show the stream of annual travel time benefits are included as an exhibit at the end of this study.

Motor Vehicle Emissions

Motor vehicle emissions and related benefits were calculated for carbon monoxide (CO), fine particulates (PM10), nitrogen oxides (NOx), sulfur oxides (SOx), and volatile organic compounds (VOC). The benefit-cost analysis includes emission rates based on research performed by TxDOT for heavy and light vehicles. The cost per emissions of CO, PM10, NOx, Sox, and VOC were calculated using the CAL-B/S default values. The unit costs of emissions used for this analysis are shown in Table 3 below.

Table 3: Cost Estimates per Ton of Emissions (2011 dollars)

CO	PM10	NOx	SOx	VOC
$68	$15,536	$125,532	$62,698	$1,086

Source: CAL-B/S urban area default values

Compared to the no-build scenario, the NTE Project would save a total $ 8.8 million by reducing vehicle emissions over the 20 year analysis period (NPV @7%). The detailed excel spreadsheets that show the stream of emission benefits are included as an exhibit at the end of this study. A snapshot of the emission savings for years 2018 and 2037 is shown below in Table 4. It should also be noted that the assumptions of vehicle emissions did not take into account already mandated federal fuel-efficiency improvements. While this will not necessarily change any of the benefits of the build to no-build scenario, it will amount to a reduction in the absolute value of emissions over the evaluated time horizon.

Table 4: Motor Vehicle Emissions Benefits

Measure of Effectiveness	2018 Conditions			2037 Conditions		
	No-Build	Build	Change	No-Build	Build	Change
Tons of Emissions						
CO	78,727	78,923	196	94,010	94,407	398
NOx	5,338	5,349	11	3,241	3,249	8
PM10	1,338	1,331	(7)	1,882	1,864	(17)
SOx	310	310	0	450	449	(1)
VOC	5,442	5,425	(17)	4,681	4,646	(35)

Source: AECOM 2010 Network Model Extractions and TxDOT Emission Factors

Vehicle Operating Costs

The NTE Project produces vehicle operating cost benefits worth about $ 174.9 million over the 20 year analysis period (NPV @7%). A significant portion of these benefits result from the addition of the managed / transit lanes as travelers are able to move at more efficient travel speeds, saving nearly 154 million gallons of fuel over the 20 year analysis period. Other operating cost benefits expected to be created by the project include reduced wear and tear on vehicles. However, benefits associated with reduced wear and tear were not examined here since the distance traveled per trip under the no-build and build scenario would be identical and the bulk of operational cost savings would be derived from any reduction in fuel consumption. Further, benefits associated with the reduction of stop and go conditions were not considered as the speed data is considered as a point value (the average speed). Stop and go conditions generate significantly higher emissions which would improve the environmental impact of the managed/transit lanes.

Table 5: Vehicle Operating Costs

Measure of Effectiveness	2018 Conditions			2037 Conditions		
	No-Build	Build	Change	No-Build	Build	Change
Fuel Consumption (1,000,000 Gallons/Year)	1,090	1,086	(4.3)	1,467	1,456	(11.1)
Fuel Cost (1,000,000 $/Year)	4,778	4,762	(15.5)	6,584	6,544	(39.6)

Source: AECOM 2010 Network Model Extractions and AAA Fuel Prices (Aug 18, 2010)

The detailed excel spreadsheets that show the stream of vehicle operating benefits are included as an exhibit at the end of this study.

Project Life Cycle Benefit and Costs

Table 6 below shows the results of the benefit-cost analysis for the NTE Project using a 7-percent discount rate. The net benefit equals the total discounted benefits minus the total discounted costs, while the benefit-cost (B/C) ratio represents the benefits divided by the costs. The Table also shows the discounted value for the total reduction in travel time, vehicle emissions, and vehicle operating costs over the 20 year period in 2011 dollars using the methodology described earlier.

Table 6: NTE Project Capital and Operations Costs (in million $)

Year	Capital Costs	Operations and Maintenance Costs	Capital Maintenance Costs	Total Costs Discounted at 7%	Travel Time Benefits	Motor Vehicle Emissions	Vehicle Operating Costs	Total Benefits Discounted at 7%
2013	254.81	8.28		229.79				
2014	254.81	8.92		215.28				
2015	339.08	8.11		264.87				
2016	339.08	7.37		247.01				
2017	233.46	7.47		160.54				
2018		7.51	0.27	4.84	119.5	0.7	15.5	84.49
2019		7.54	0.21	4.51	133.1	0.8	16.8	87.67
2020		8.70	0.83	5.18	146.8	0.8	18.0	90.07
2021		8.76	0.28	4.60	160.4	0.9	19.3	91.79
2022		10.14	0.83	5.21	174.1	1.0	20.6	92.90
2023		10.47	0.60	4.92	187.7	1.1	21.8	93.48
2024		9.92	1.16	4.60	201.3	1.1	23.1	93.58
2025		9.99	0.55	4.09	215.0	1.2	24.4	93.27
2026		10.29	15.63	9.39	228.7	1.3	25.6	92.60
2027		10.38	15.37	8.72	242.3	1.4	26.9	91.62
2028		11.94	4.44	5.19	256.0	1.4	28.2	90.37
2029		11.17	2.14	3.94	269.6	1.5	29.4	88.90
2030		11.17	2.23	3.71	283.3	1.6	30.7	87.23
2031		12.62	2.23	3.84	296.9	1.7	32.0	85.40
2032		11.90	2.64	3.51	310.6	1.7	33.2	83.43
2033		12.51	10.50	5.19	324.3	1.8	34.5	81.36
2034		13.16	10.82	5.06	337.9	1.9	35.8	79.20
2035		13.17	6.14	3.81	351.6	2.0	37.0	76.98
2036		13.80	2.95	3.09	365.3	2.0	38.3	74.71
2037		13.73	2.09	2.72	378.9	2.1	39.6	72.40
Totals	**1421.24**	**259.02**	**81.91**	**1213.61**	**4983.34**	**28.00**	**540.00**	**1729.07**

Results:

Net Benefit	**515.46**	**B/C Ratio**	**1.42**

Other Non-Quantifiable Benefits

Other potential non-quantifiable benefits from the proposed roadway improvements are discussed below.

Safety

The NTE Project will significantly improve traveler safety in a corridor that has been identified as one of the most traveled and heavily congested in the State of Texas and the nation.

Reconstruction of the main lanes will allow existing facilities to be built up to current design standards, which will in turn improve operations and provide higher levels of safety. In addition, repair of structurally and functionally deficient pavement along the IH 35W corridor will alleviate pavement roughness and rutting that leads to increase crash rates on urban highways[1].

Incremental safety benefits will also be derived from the addition of two managed / transit lanes per direction. Research shows that fatality rates on U.S. toll facilities compared with the same statistics for urban U.S. Interstate Highways typically result in a 9% fatality rate reduction[2]. However, this safety benefit is not included in the Project cost / benefit analysis as the net safety benefits derived from the addition of the managed lanes is difficult to calculate in light of the potential for an increased level of weaving on the facility as drivers move from the main lanes to the managed / transit lanes. TxDOT is working to ensure a design which will minimize any risk associated with weaving.

In particular, deficient areas of the project that will see significant safety improvements include:

Segment 3A:
The existing IH 35W from IH 820 to IH 30 is a four- to six-lane divided highway with limited access entrances and exits along with discontinuous frontage roads. The existing right of way width is typically 350 feet. From 1963 to 1967, the transportation facility was constructed as a four to six-lane freeway. The freeway has limited interchange access with Spur 280/US 287, Belknap-Weatherford (SH 121), Northside Drive, SH 183 (Northeast 28th Street), Papurt Drive and Meacham Boulevard.

Much of the original IH 35W facility remains in operation today, including many of the cross street bridges and original ramping, and predates many of the requirements of current design standards. Construction of Segment 3A will address operational deficiencies on IH 35W and update the freeway to current design standards. Examples of current deficiencies include the following:

- The distance from exit ramps to cross street intersections on IH 35W is too short in some instances. This results in excessive traffic queues which back up into the general purpose lanes and create congestion on IH 35W.

[1] Transportation Research Board, "Effects of Asphalt Pavement Conditions of Traffic Accidents in Tennessee Utilizing Pavement Management Systems", Chang, Huang, Yan and Richards (2009).
[2] Tollways Journal - IBTTA, ""Toll vs Nontoll: Toll facilities are safer", Jeff Campbell (2008).

- The inside shoulders of IH 35W from 28th Street/SH 183 to Spur 280/US 287 are substandard in some locations.
- The vertical bridge clearances under IH 35W at the Meacham Boulevard u-turns, 28th Street/SH 183, 4th Street, and Papurt Street, and over SH 121 at Sylvania Avenue and Riverside Drive are less than the standard 16.5 feet.
- The interchange between IH 35W, US 377/SH 121, and Spur 280/US 287 contains merging and weaving conditions that occur within general purpose lane traffic. The distances provided for these maneuvers are substandard and result in bottleneck situations.

Segment 3B: In 1967, the portion of IH 35W containing Segment 3B opened. In the last 10 years traffic has doubled. To address this growth, five new interchanges and 16 miles of frontage roads have been added since its initial construction. The existing segment is a four-lane divided highway with limited-access entrances and exits with discontinuous frontage roads. The existing right of way width is typically 350 feet. Much of the original IH 35W facility remains in operation today, including many of the cross street bridges and original ramping, and predates many of the requirements of current design standards.

Construction of Segment 3B will address operational deficiencies on IH 35W and update the freeway to current design standards. Examples of current deficiencies include the following:

- The distance from exit ramps to cross street intersections on IH 35W is too short in some instances. This results in excessive traffic queues which back up into the general purpose lanes and create congestion on IH 35W.
- The inside shoulders of IH 35W are substandard in some locations.
- The interchange between IH 35W and US 81/287 contains merging and weaving conditions that occur within general purpose lane traffic. The distances provided for these maneuvers are substandard and result in bottleneck situations.

Transit

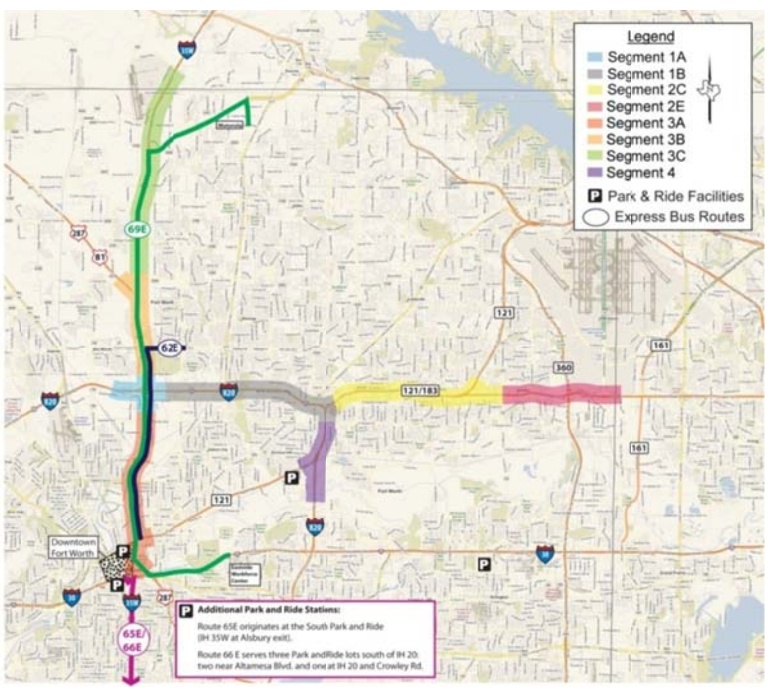
The DFW Metroplex is served by two transit agencies, the Dallas Area Rapid Transit Authority (DART) and the Fort Worth Transportation Authority (The T). As of 2005, the DFW Metroplex had a 0.7 % transit share and ranked 33rd in transit trips per capita among U.S. urban areas. The addition of the DART Rail System in the Dallas area increased the use of transit between the Dallas suburbs and downtown Dallas.

Among the range of possible transit options, high-speed options such as rail and express buses typically generate the highest level of demand. Transit users prefer these routes because they provide a shorter or more reliable travel time with fewer stops and more dependability in appointed route scheduling. This is the service currently being planned for by the T on the NTE Project managed/transit lanes.

In the Houston area, the Harris County Toll Road Authority (HCTRA) operates the Katy managed lanes in a similar fashion to the future NTE managed / transit lanes with the use of dynamic tolling to regulate the speed and capacity of the managed / transit lanes. Thus, users of the managed / transit lanes, including express buses, are guaranteed a minimum average speed and maximum travel time, which ensures dependable route scheduling (express buses ride for free). Further, the number of buses in rotation in routes along the corridor has decreased while still providing the same level of service to their users.

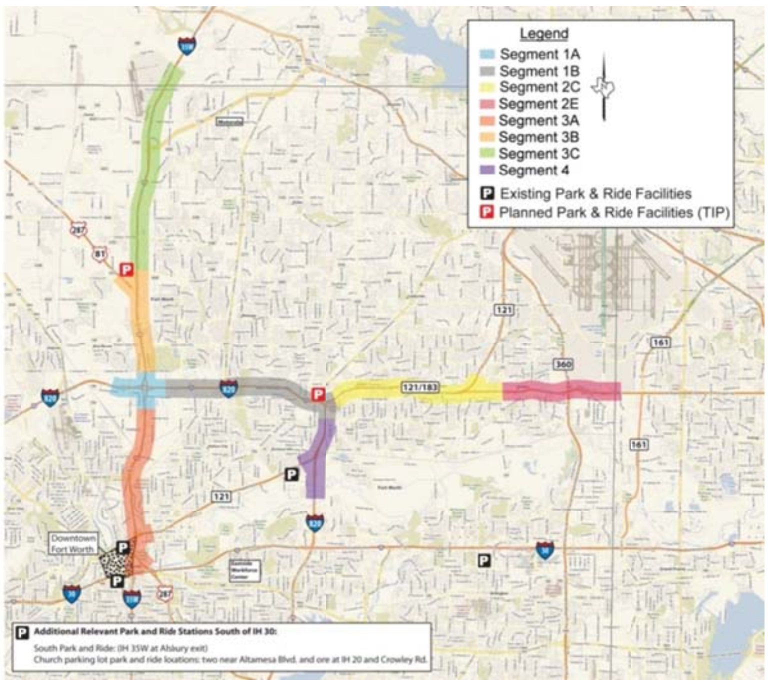
Similar to the Houston experience, Miami opened the I-95 Express Lanes in December 2008, adding two northbound managed lanes to the freeway. Two additional southbound managed lanes were added in January 2010. After the opening of the I-95 Express Lanes, Broward County Transit and Miami-Dade Transit began operating three new express, peak period routes along the I-95 Express Lanes. Express bus ridership has reported a 30% year-on-year increase since the opening of the I-95 Express Lanes[3]. This growth is only expected to continue as Broward County Transit plans to increase and improve the bus stops along its I-95 express route due to the route's increasing popularity[4].

As in Houston and Miami, bus lines are currently operating along the portions of IH 35W making up the future corridor of NTE Segments 3A and 3B. Four of the five routes utilizing this corridor are express routes transporting individuals between the northern and southern areas of Fort Worth and downtown. Some of the express routes are linked to park and ride facilities to further support commuter usage. The current express routes and park and ride facilities within the corridor are displayed below.



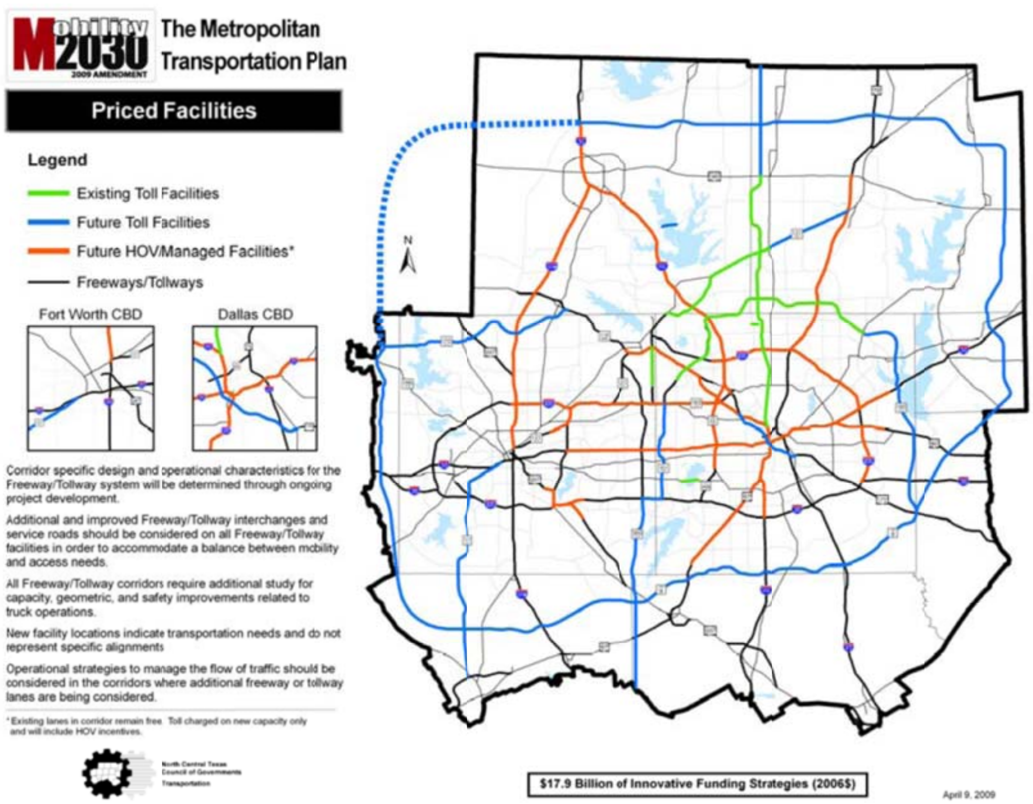
[3] Reason Foundation, *Surface Transportation Innovations #73*, http://reason.org/news/show/surface-transportation-innovat-72, Accessed June 2010.
[4] I-95 Express Lanes, *Bus Rapid Transit Information*, http://www.95express.com/home/bustransit.shtm. Accessed June 2010.

The construction of managed / transit lanes in the NTE Corridor will gurantee users a maximum travel time and a minimum travel speed, providing users with a reliability which is currently lacking due to the high levels of congestion. This reliability will make the express buses more attractive to users, in turn drawing more users to transit – an increase of 80% as projected by the T. As transit becomes a more attractive option, the T can plan for further expansions of its express bus system. The T has outlined plans to add additional Park and Ride locations along the NTE Project. One of these new park and ride facilites will be located along Segment 3A, near IH 35W and US 287, and another will be located along Segment 1B, near the interchange between IH 820 and Airport Freeway. These new facilities will add a combined 600 park and ride spaces to the transit system.



The addition of these new park and ride facilities will increase demand for expanded bus routes. Assuming new express routes will provide service to downtown or the airport, both of these new facilities will have the option of utilizing the NTE managed / transit lanes for a portion of their routes.

Beyond the managed / transit lanes to be built as part of the NTE Project, the NCTCOG Metropolitan Transportation Plan details a network of managed / transit lanes to be constructed in the Metroplex over the next 20 years. In combination with the NTE managed / transit lanes, users will have the option of using managed lanes for extended portions of their trip.



This choice will also exist for transit providers. Both the T and DART currently run express routes that will be able to utilize the future managed/transit lanes network across the Metroplex, if they so choose. The resulting increased transit ridership is a critical component of the NCTCOG's long-term sustainability efforts to reduce per-capita vehicle miles traveled and improve land uses to ensure the region's sustained growth and quality of life.

BENEFIT-COST ANALYSIS DOCUMENTATION

Exhibit A: Project Direct Costs

The capital costs to acquire right-of-way, address utility relocation and construct the Project have been estimated to be approximately $1,421million. These costs are summarized in Table 1 below.

Table 1: Capital Cost Breakdown (2011$)

Segment	Civil Work	Right of Way	Tolling & ITS	Total
3A	1,013,000,000	97,727,000	29,631,000	1,140,358,000
3B	220,000,000	42,000,000	18,883,000	280,883,000
Totals	**1,233,000,000**	**139,727,000**	**48,514,000**	**1,421,241,000**

For purposes of this benefit-cost analysis the following capital payment schedule was used.

Table 2: Capital Payment Schedule

	Year 1	Year 2	Year 3	Year 4	Year 5
Civil Works	15.00 %	15.00 %	27.50 %	27.50 %	15.00 %
Right of Way	50.00 %	50.00 %	0.00 %	0.00 %	0.00 %
Tolling & ITS	0.00 %	0.00 %	0.00 %	0.00 %	100.00 %

Exhibit B: Travel Time Benefits

Travel Time Savings System Wide

AECOM 2010 Network model extractions. Aug 18-2010

System wide

	subarea annual VMT		Total	subarea annual VMT		Lights	subarea annual VMT		Heavies
	wo project	w project	diff	wo project	w project	diff	wo project	w project	diff
2017	22,162,712,150	22,171,986,413	9,274,263	20,343,153,482	20,351,666,328	8,512,846	1,819,558,667	1,820,320,084	761,417
2018	22,602,771,831	22,612,925,930	10,154,099	20,733,924,603	20,743,233,631	9,309,027	1,868,847,227	1,869,692,299	845,072
2019	23,042,831,511	23,053,865,447	11,033,935	21,124,695,724	21,134,800,933	10,105,209	1,918,135,787	1,919,064,513	928,726
2020	23,482,891,192	23,494,804,964	11,913,772	21,515,466,845	21,526,368,236	10,901,390	1,967,424,347	1,968,436,728	1,012,381
2021	23,922,950,873	23,935,744,481	12,793,608	21,906,237,966	21,917,935,538	11,697,572	2,016,712,906	2,017,808,942	1,096,036
2022	24,363,010,553	24,376,683,998	13,673,444	22,297,009,087	22,309,502,841	12,493,753	2,066,001,466	2,067,181,157	1,179,691
2023	24,803,070,234	24,817,623,515	14,553,280	22,687,780,208	22,701,070,143	13,289,935	2,115,290,026	2,116,553,371	1,263,345
2024	25,243,129,915	25,258,563,032	15,433,117	23,078,551,329	23,092,637,446	14,086,116	2,164,578,586	2,165,925,586	1,347,000
2025	25,683,189,596	25,699,502,548	16,312,953	23,469,322,450	23,484,204,748	14,882,298	2,213,867,145	2,215,297,800	1,430,655
2026	26,123,249,276	26,140,442,065	17,192,789	23,860,093,571	23,875,772,051	15,678,479	2,263,155,705	2,264,670,015	1,514,310
2027	26,563,308,957	26,581,381,582	18,072,625	24,250,864,692	24,267,339,353	16,474,661	2,312,444,265	2,314,042,229	1,597,964
2028	27,003,368,638	27,022,321,099	18,952,461	24,641,635,813	24,658,906,656	17,270,842	2,361,732,825	2,363,414,444	1,681,619
2029	27,443,428,319	27,463,260,616	19,832,298	25,032,406,934	25,050,473,958	18,067,024	2,411,021,384	2,412,786,658	1,765,274
2030	27,883,487,999	27,904,200,133	20,712,134	25,423,178,055	25,442,041,261	18,863,206	2,460,309,944	2,462,158,873	1,848,928
2031	28,323,547,680	28,345,139,650	21,591,970	25,813,949,176	25,833,608,563	19,659,387	2,509,598,504	2,511,531,087	1,932,583
2032	28,763,607,361	28,786,079,167	22,471,806	26,204,720,297	26,225,175,866	20,455,569	2,558,887,064	2,560,903,301	2,016,238
2033	29,203,667,042	29,227,018,684	23,351,643	26,595,491,418	26,616,743,168	21,251,750	2,608,175,623	2,610,275,516	2,099,893
2034	29,643,726,722	29,667,958,201	24,231,479	26,986,262,539	27,008,310,471	22,047,932	2,657,464,183	2,659,647,730	2,183,547
2035	30,083,786,403	30,108,897,718	25,111,315	27,377,033,660	27,399,877,773	22,844,113	2,706,752,743	2,709,019,945	2,267,202
2036	30,523,846,084	30,549,837,235	25,991,151	27,767,804,781	27,791,445,076	23,640,295	2,756,041,303	2,758,392,159	2,350,857
2037	30,963,905,765	30,990,776,752	26,870,988	28,158,575,902	28,183,012,378	24,436,476	2,805,329,862	2,807,764,374	2,434,511

	System wide					VOT (2010$ AECOM Study)				
	travel times (million passenger hours)					Lights	Heavies			
	wo project	w project	diff	Lights	Heavies	14.97	55.88	TTSavings	NPV	
2017	658	652	(5.9)	(5.4)	(0.4)	(81.1)	(24.8)	**$ (105.9)**	**$ (70.6)**	2017
2018	674.3	667.7	(6.6)	(6.1)	(0.5)	(91.2)	(28.3)	**$ (119.5)**	**$ (74.4)**	2018
2019	691	683	(7.4)	(6.8)	(0.6)	(101.3)	(31.8)	**$ (133.1)**	**$ (77.5)**	2019
2020	707	699	(8.1)	(7.4)	(0.6)	(111.4)	(35.3)	**$ (146.8)**	**$ (79.8)**	2020
2021	723	714	(8.9)	(8.1)	(0.7)	(121.5)	(38.9)	**$ (160.4)**	**$ (81.5)**	2021
2022	740	730	(9.6)	(8.8)	(0.8)	(131.7)	(42.4)	**$ (174.1)**	**$ (82.7)**	2022
2023	756	745	(10.4)	(9.5)	(0.8)	(141.8)	(45.9)	**$ (187.7)**	**$ (83.3)**	2023
2024	772	761	(11.1)	(10.1)	(0.9)	(151.9)	(49.5)	**$ (201.3)**	**$ (83.6)**	2024
2025	788	777	(11.9)	(10.8)	(0.9)	(162.0)	(53.0)	**$ (215.0)**	**$ (83.4)**	2025
2026	805	792	(12.6)	(11.5)	(1.0)	(172.1)	(56.6)	**$ (228.7)**	**$ (82.9)**	2026
2027	821	808	(13.4)	(12.2)	(1.1)	(182.2)	(60.1)	**$ (242.3)**	**$ (82.1)**	2027
2028	837	823	(14.1)	(12.8)	(1.1)	(192.3)	(63.7)	**$ (256.0)**	**$ (81.0)**	2028
2029	854	839	(14.8)	(13.5)	(1.2)	(202.4)	(67.2)	**$ (269.6)**	**$ (79.8)**	2029
2030	870	854	(15.6)	(14.2)	(1.3)	(212.5)	(70.8)	**$ (283.3)**	**$ (78.3)**	2030
2031	886	870	(16.3)	(14.9)	(1.3)	(222.6)	(74.4)	**$ (296.9)**	**$ (76.7)**	2031
2032	902	885	(17.1)	(15.5)	(1.4)	(232.7)	(77.9)	**$ (310.6)**	**$ (75.0)**	2032
2033	919	901	(17.8)	(16.2)	(1.5)	(242.8)	(81.5)	**$ (324.3)**	**$ (73.2)**	2033
2034	935	917	(18.6)	(16.9)	(1.5)	(252.9)	(85.1)	**$ (337.9)**	**$ (71.3)**	2034
2035	951	932	(19.3)	(17.6)	(1.6)	(263.0)	(88.6)	**$ (351.6)**	**$ (69.3)**	2035
2036	968	948	(20.1)	(18.2)	(1.6)	(273.1)	(92.2)	**$ (365.3)**	**$ (67.3)**	2036
2037	984	963	(20.8)	(18.9)	(1.7)	(283.2)	(95.8)	**$ (378.9)**	**$ (65.2)**	2037

% in the system

	2017	2037
Lights	91.79%	90.94%
Heavies	8.21%	9.06%

Exhibit C: Motor Vehicle Emissions

Motor Vehicle Emissions

Sources: Aecom 2010 Network Model Extractions and TxDOT emission factors

	Emissions										Savings ($)			NPV
			wo project					w project			wo project	w project	diff	
	CO	Nox	PM10	Sox	VOC	CO	Nox	PM10	Sox	VOC				
2018	78,727	5,338	1,338	310	5,442	78,923	5,349	1,331	310	5,425	281,611,457	280,912,863	(698,593.7)	**$ (435,049.1)**
2019	79,532	5,228	1,366	318	5,402	79,738	5,239	1,359	317	5,384	283,963,618	283,190,188	(773,430.2)	**$ (450,143.4)**
2020	80,336	5,117	1,395	325	5,362	80,553	5,128	1,387	325	5,343	286,315,780	285,467,513	(848,266.6)	**$ (461,400.9)**
2021	81,140	5,007	1,424	332	5,322	81,368	5,018	1,415	332	5,302	288,667,942	287,744,839	(923,103.1)	**$ (469,258.8)**
2022	81,945	4,897	1,452	340	5,282	82,183	4,907	1,443	339	5,261	291,020,103	290,022,164	(997,939.6)	**$ (474,113.9)**
2023	82,749	4,786	1,481	347	5,241	82,998	4,797	1,471	347	5,220	293,372,265	292,299,489	(1,072,776.0)	**$ (476,325.4)**
2024	83,553	4,676	1,510	354	5,201	83,813	4,686	1,499	354	5,179	295,724,427	294,576,814	(1,147,612.5)	**$ (476,218.4)**
2025	84,358	4,566	1,538	362	5,161	84,628	4,576	1,527	361	5,138	298,076,588	296,854,139	(1,222,448.9)	**$ (474,086.8)**
2026	85,162	4,455	1,567	369	5,121	85,443	4,465	1,556	369	5,097	300,428,750	299,131,465	(1,297,285.4)	**$ (470,195.9)**
2027	85,966	4,345	1,595	376	5,081	86,258	4,355	1,584	376	5,056	302,780,912	301,408,790	(1,372,121.9)	**$ (464,785.1)**
2028	86,771	4,234	1,624	384	5,041	87,073	4,244	1,612	383	5,015	305,133,073	303,686,115	(1,446,958.3)	**$ (458,069.9)**
2029	87,575	4,124	1,653	391	5,001	87,888	4,133	1,640	391	4,974	307,485,235	305,963,440	(1,521,794.8)	**$ (450,244.2)**
2030	88,379	4,014	1,681	399	4,961	88,703	4,023	1,668	398	4,933	309,837,397	308,240,765	(1,596,631.2)	**$ (441,481.8)**
2031	89,184	3,903	1,710	406	4,921	89,518	3,912	1,696	405	4,892	312,189,558	310,518,091	(1,671,467.7)	**$ (431,939.0)**
2032	89,988	3,793	1,739	413	4,881	90,333	3,802	1,724	413	4,851	314,541,720	312,795,416	(1,746,304.1)	**$ (421,755.3)**
2033	90,792	3,683	1,767	421	4,841	91,148	3,691	1,752	420	4,810	316,893,882	315,072,741	(1,821,140.6)	**$ (411,055.4)**
2034	91,597	3,572	1,796	428	4,801	91,962	3,581	1,780	427	4,769	319,246,043	317,350,066	(1,895,977.1)	**$ (399,950.5)**
2035	92,401	3,462	1,825	435	4,761	92,777	3,470	1,808	435	4,728	321,598,205	319,627,392	(1,970,813.5)	**$ (388,539.2)**
2036	93,205	3,351	1,853	443	4,721	93,592	3,360	1,836	442	4,687	323,950,367	321,904,717	(2,045,650.0)	**$ (376,909.3)**
2037	94,010	3,241	1,882	450	4,681	94,407	3,249	1,864	449	4,646	326,302,528	324,182,042	(2,120,486.4)	**$ (365,138.2)**
													(28,190,801.6)	(8,796,660.5)

Motor Vehicle Emissions

Sources: Aecom 2010 Network Model Extractions and TxDOT emission factors

Model Year 2018

Speed	subarea annual VMT wo project	subarea annual VMT w project	Total diff	subarea annual VMT wo project	subarea annual VMT w project	Lights diff	subarea annual VMT wo project	subarea annual VMT w project	Heavies diff
5-10 mph	355,460,106	339,226,306	(14,891,636)	326,069,877	311,178,241	(14,891,636)	29,390,229	28,048,065	(1,342,164)
11-15 mph	749,708,217	691,773,265	(53,144,930)	687,720,681	634,575,751	(53,144,930)	61,987,536	57,197,514	(4,790,022)
16-20 mph	1,165,147,987	1,176,435,773	10,354,201	1,068,810,971	1,079,165,172	10,354,201	96,337,016	97,270,601	933,586
21-25 mph	2,376,111,031	2,292,998,619	(76,241,052)	2,179,648,909	2,103,407,857	(76,241,052)	196,462,122	189,590,762	(6,871,360)
26-30 mph	3,287,727,719	3,272,931,234	(13,573,876)	3,015,891,111	3,002,317,235	(13,573,876)	271,836,608	270,613,999	(1,222,609)
31-35 mph	2,959,192,644	2,929,586,859	(27,158,628)	2,714,520,044	2,687,361,416	(27,158,628)	244,672,601	242,225,442	(2,447,158)
36-40 mph	2,082,810,198	2,104,748,344	20,123,739	1,910,598,839	1,930,722,578	20,123,739	172,211,359	174,025,767	1,814,407
41-45 mph	1,336,718,814	1,316,094,975	(18,918,935)	1,226,195,942	1,207,277,007	(18,918,935)	110,522,872	108,817,967	(1,704,904)
46-50 mph	1,246,040,530	1,215,504,011	(28,011,988)	1,143,015,140	1,115,003,152	(28,011,988)	103,025,390	100,500,859	(2,524,531)
51-55 mph	1,500,148,246	1,498,698,332	(1,330,397)	1,376,112,667	1,374,782,270	(1,330,397)	124,035,579	123,916,062	(119,517)
56-60 mph	2,112,977,431	2,172,738,121	54,819,014	1,938,271,778	1,993,090,792	54,819,014	174,705,653	179,647,328	4,941,675
61-65 mph	2,196,403,591	2,335,488,640	127,584,620	2,014,800,079	2,142,384,699	127,584,620	181,603,513	193,103,941	11,500,429
66-70 mph	1,234,325,316	1,266,701,451	29,698,896	1,132,268,565	1,161,967,461	29,698,896	102,056,750	104,733,990	2,677,239
	22,602,771,831	22,612,925,930	9,309,027	20,733,924,603	20,743,233,631	9,309,027	1,868,847,227	1,869,692,299	845,072

Speed	Emissions (Tons) wo project CO	wo project Nox	wo project PM10	wo project Sox	wo project VOC	w project CO	w project Nox	w project PM10	w project Sox	w project VOC	Savings ($) wo project	Savings ($) w project	Savings ($) diff
5-10 mph	1,608	115	45	7	167	1,539	110	43	7	160	7,544,575	7,211,608	(332,967)
11-15 mph	2,709	191	78	13	260	2,503	176	72	12	240	12,919,685	11,939,602	(980,083)
16-20 mph	3,805	265	98	18	342	3,836	267	99	18	344	16,800,126	16,903,816	103,689
21-25 mph	7,494	525	170	34	635	7,230	507	164	33	612	30,339,556	29,257,992	(1,081,564)
26-30 mph	10,180	713	208	45	825	10,134	710	207	45	821	38,448,493	38,268,424	(180,069)
31-35 mph	9,133	633	169	39	704	9,042	627	168	39	697	32,250,119	31,919,966	(330,153)
36-40 mph	6,639	447	110	27	476	6,712	452	111	27	481	21,658,866	21,880,640	221,774
41-45 mph	4,492	294	67	17	296	4,423	289	66	17	291	13,524,750	13,316,165	(208,585)
46-50 mph	4,416	285	60	16	269	4,309	278	58	15	262	12,473,716	12,167,814	(305,903)
51-55 mph	5,597	360	70	19	317	5,589	360	70	19	317	15,107,994	15,091,933	(16,061)
56-60 mph	8,298	542	99	28	441	8,536	558	101	28	454	21,760,917	22,381,057	620,140
61-65 mph	9,069	612	104	29	456	9,642	650	110	31	485	23,536,201	25,023,513	1,487,312
66-70 mph	5,288	356	59	17	255	5,429	366	61	17	262	13,546,910	13,904,616	357,706
	78,727	5,338	1,338	310	5,442	78,923	5,349	1,331	310	5,425	259,911,909	259,267,146	(644,764)

Model Year 2037

Speed	subarea annual VMT wo project	subarea annual VMT w project	Total diff	subarea annual VMT wo project	subarea annual VMT w project	Lights diff	subarea annual VMT wo project	subarea annual VMT w project	Heavies diff
5-10 mph	407,654,918	395,388,437	(11,155,138)	370,721,382	359,566,244	(11,155,138)	36,933,536	35,822,192	(1,111,343)
11-15 mph	950,129,966	805,741,600	(131,306,781)	864,048,191	732,741,411	(131,306,781)	86,081,775	73,000,189	(13,081,586)
16-20 mph	1,689,656,347	1,594,556,184	(86,484,089)	1,536,573,482	1,450,089,394	(86,484,089)	153,082,865	144,466,790	(8,616,075)
21-25 mph	3,175,915,267	3,022,503,166	(139,512,965)	2,888,177,344	2,748,664,379	(139,512,965)	287,737,923	273,838,787	(13,899,136)
26-30 mph	4,298,769,932	4,286,034,426	(11,581,669)	3,909,301,376	3,897,719,707	(11,581,669)	389,468,556	388,314,719	(1,153,837)
31-35 mph	3,808,930,561	3,706,517,334	(93,134,589)	3,463,841,452	3,370,706,863	(93,134,589)	345,089,109	335,810,470	(9,278,638)
36-40 mph	2,946,588,845	2,969,322,001	20,673,532	2,679,627,896	2,700,301,428	20,673,532	266,960,949	269,020,573	2,059,624
41-45 mph	2,126,428,879	2,114,888,471	(10,494,847)	1,933,774,423	1,923,279,576	(10,494,847)	192,654,456	191,608,896	(1,045,561)
46-50 mph	1,979,430,945	1,942,604,546	(33,489,927)	1,800,094,501	1,766,604,574	(33,489,927)	179,336,444	175,999,972	(3,336,472)
51-55 mph	2,427,755,951	2,521,066,062	84,856,215	2,207,801,262	2,292,657,477	84,856,215	219,954,689	228,408,585	8,453,896
56-60 mph	3,007,431,380	3,172,414,853	150,035,971	2,734,958,097	2,884,994,067	150,035,971	272,473,283	287,420,786	14,947,503
61-65 mph	2,564,563,039	2,780,485,716	196,360,082	2,332,213,628	2,528,573,710	196,360,082	232,349,411	251,912,006	19,562,595
66-70 mph	1,580,649,733	1,679,253,956	89,670,681	1,437,442,867	1,527,113,548	89,670,681	143,206,866	152,140,408	8,933,543
	30,963,905,765	30,990,776,752	24,436,476	28,158,575,902	28,183,012,378	24,436,476	2,805,329,862	2,807,764,374	2,434,511

Speed	Emissions (Tons) wo project CO	wo project Nox	wo project PM10	wo project Sox	wo project VOC	w project CO	w project Nox	w project PM10	w project Sox	w project VOC	Savings ($) wo project	Savings ($) w project	Savings ($) diff
5-10 mph	1,663	67	54	8	143	1,615	65	52	8	138	7,945,110	7,710,757	(234,353)
11-15 mph	3,036	112	102	17	230	2,572	95	87	15	195	14,887,517	12,609,905	(2,277,612)
16-20 mph	4,854	174	148	28	334	4,580	164	140	26	316	21,874,901	20,639,902	(1,234,998)
21-25 mph	8,785	318	236	49	557	8,359	303	225	46	530	35,871,211	34,122,442	(1,748,769)
26-30 mph	11,642	421	282	63	692	11,607	420	281	63	690	43,801,865	43,649,684	(152,181)
31-35 mph	10,252	366	226	54	571	9,976	356	220	52	555	35,727,741	34,764,514	(963,227)
36-40 mph	8,186	282	161	41	417	8,247	285	162	41	420	26,015,682	26,222,875	207,193
41-45 mph	6,223	208	110	29	287	6,184	207	109	29	286	18,046,405	17,958,732	(87,673)
46-50 mph	6,098	200	98	27	257	5,985	196	96	26	252	16,418,070	16,112,214	(305,856)
51-55 mph	7,875	256	117	33	307	8,174	266	122	34	319	19,991,944	20,760,517	768,573
56-60 mph	10,270	334	145	42	374	10,836	353	152	44	395	24,971,674	26,343,760	1,372,086
61-65 mph	9,211	304	125	36	317	9,982	330	135	39	343	21,818,955	23,649,554	1,830,599
66-70 mph	5,914	199	78	23	194	6,289	211	83	24	207	13,788,238	14,657,363	869,125
	94,010	3,241	1,882	450	4,681	94,407	3,249	1,864	449	4,646	301,159,314	299,202,222	(1,957,093)

Exhibit D: Vehicle Operating Costs

Vehicle Operating Costs

Sources: Aecom 2010 Network Model Extractions and TxDOT emission factors

	Fuel Consumption			Fuel Costs ($)			NPV
	wo project	w project	diff	wo project	w project	diff	
2018	1,090,294,999	1,085,948,397	(4,346,601)	4,777,559,600	4,762,057,682	(15,501,918.0)	**$ (9,653,815.4)**
2019	1,110,126,568	1,105,425,536	(4,701,032)	4,872,613,257	4,855,843,941	(16,769,316.2)	**$ (9,759,894.7)**
2020	1,129,958,138	1,124,902,675	(5,055,463)	4,967,666,914	4,949,630,199	(18,036,714.3)	**$ (9,810,777.5)**
2021	1,149,789,708	1,144,379,814	(5,409,893)	5,062,720,570	5,043,416,458	(19,304,112.5)	**$ (9,813,231.9)**
2022	1,169,621,278	1,163,856,953	(5,764,324)	5,157,774,227	5,137,202,716	(20,571,510.7)	**$ (9,773,376.5)**
2023	1,189,452,847	1,183,334,093	(6,118,755)	5,252,827,883	5,230,988,975	(21,838,908.8)	**$ (9,696,736.7)**
2024	1,209,284,417	1,202,811,232	(6,473,185)	5,347,881,540	5,324,775,233	(23,106,307.0)	**$ (9,588,295.9)**
2025	1,229,115,987	1,222,288,371	(6,827,616)	5,442,935,197	5,418,561,492	(24,373,705.2)	**$ (9,452,543.1)**
2026	1,248,947,556	1,241,765,510	(7,182,047)	5,537,988,853	5,512,347,750	(25,641,103.3)	**$ (9,293,515.8)**
2027	1,268,779,126	1,261,242,649	(7,536,478)	5,633,042,510	5,606,134,008	(26,908,501.5)	**$ (9,114,840.4)**
2028	1,288,610,696	1,280,719,788	(7,890,908)	5,728,096,166	5,699,920,267	(28,175,899.7)	**$ (8,919,768.3)**
2029	1,308,442,266	1,300,196,927	(8,245,339)	5,823,149,823	5,793,706,525	(29,443,297.8)	**$ (8,711,209.4)**
2030	1,328,273,835	1,319,674,066	(8,599,770)	5,918,203,480	5,887,492,784	(30,710,696.0)	**$ (8,491,763.4)**
2031	1,348,105,405	1,339,151,205	(8,954,200)	6,013,257,136	5,981,279,042	(31,978,094.2)	**$ (8,263,747.2)**
2032	1,367,936,975	1,358,628,344	(9,308,631)	6,108,310,793	6,075,065,301	(33,245,492.3)	**$ (8,029,221.5)**
2033	1,387,768,545	1,378,105,483	(9,663,062)	6,203,364,449	6,168,851,559	(34,512,890.5)	**$ (7,790,013.8)**
2034	1,407,600,114	1,397,582,622	(10,017,493)	6,298,418,106	6,262,637,817	(35,780,288.7)	**$ (7,547,740.4)**
2035	1,427,431,684	1,417,059,761	(10,371,923)	6,393,471,763	6,356,424,076	(37,047,686.8)	**$ (7,303,826.2)**
2036	1,447,263,254	1,436,536,900	(10,726,354)	6,488,525,419	6,450,210,334	(38,315,085.0)	**$ (7,059,522.9)**
2037	1,467,094,824	1,456,014,039	(11,080,785)	6,583,579,076	6,543,996,593	(39,582,483.2)	**$ (6,815,925.2)**
						(550,844,011.6)	(174,889,766.3)

Vehicle Operating Costs

Sources: Aecom 2010 Network Model Extractions and AAA Fuel Prices (Aug 18, 2010)

Model Year 2018

	subarea annual VMT		Total	subarea annual VMT		Lights	subarea annual VMT		Heavies
	wo project	w project	diff	wo project	w project	diff	wo project	w project	diff
Speed									
5-10 mph	355,460,106	339,226,306	(14,891,636)	326,069,877	311,178,241	(14,891,636)	29,390,229	28,048,065	(1,342,164)
11-15 mph	749,708,217	691,773,265	(53,144,930)	687,720,681	634,575,751	(53,144,930)	61,987,536	57,197,514	(4,790,022)
16-20 mph	1,165,147,987	1,176,435,773	10,354,201	1,068,810,971	1,079,165,172	10,354,201	96,337,016	97,270,601	933,586
21-25 mph	2,376,111,031	2,292,998,619	(76,241,052)	2,179,648,909	2,103,407,857	(76,241,052)	196,462,122	189,590,762	(6,871,360)
26-30 mph	3,287,727,719	3,272,931,234	(13,573,876)	3,015,891,111	3,002,317,235	(13,573,876)	271,836,608	270,613,999	(1,222,609)
31-35 mph	2,959,192,644	2,929,586,859	(27,158,628)	2,714,520,044	2,687,361,416	(27,158,628)	244,672,601	242,225,442	(2,447,158)
36-40 mph	2,082,810,198	2,104,748,344	20,123,739	1,910,598,839	1,930,722,578	20,123,739	172,211,359	174,025,767	1,814,407
41-45 mph	1,336,718,814	1,316,094,975	(18,918,935)	1,226,195,942	1,207,277,007	(18,918,935)	110,522,872	108,817,967	(1,704,904)
46-50 mph	1,246,040,530	1,215,504,011	(28,011,988)	1,143,015,140	1,115,003,152	(28,011,988)	103,025,390	100,500,859	(2,524,531)
51-55 mph	1,500,148,246	1,498,698,332	(1,330,397)	1,376,112,667	1,374,782,270	(1,330,397)	124,035,579	123,916,062	(119,517)
56-60 mph	2,112,977,431	2,172,738,121	54,819,014	1,938,271,778	1,993,090,792	54,819,014	174,705,653	179,647,328	4,941,675
61-65 mph	2,196,403,591	2,335,488,640	127,584,620	2,014,800,079	2,142,384,699	127,584,620	181,603,513	193,103,941	11,500,429
66-70 mph	1,234,325,316	1,266,701,451	29,698,896	1,132,268,565	1,161,967,461	29,698,896	102,056,750	104,733,990	2,677,239
	22,602,771,831	22,612,925,930	9,309,027	20,733,924,603	20,743,233,631	9,309,027	1,868,847,227	1,869,692,299	845,072

	Fuel Consumption (1000 gallons/yr)			Fuel Costs ($)		
	wo project	w project	diff	wo project	w project	diff
Speed						
5-10 mph	39,363,348	37,632,231	(1,731,117)	156,506,775	149,597,321	(6,909,454)
11-15 mph	65,672,722	60,704,242	(4,968,480)	266,622,918	246,413,342	(20,209,577)
16-20 mph	80,432,030	80,777,125	345,095	334,631,557	336,278,180	1,646,623
21-25 mph	135,272,171	130,391,396	(4,880,774)	577,073,851	556,343,787	(20,730,065)
26-30 mph	161,455,055	160,677,132	(777,923)	704,686,943	701,329,215	(3,357,727)
31-35 mph	128,782,895	127,443,251	(1,339,644)	574,161,092	568,231,352	(5,929,740)
36-40 mph	83,347,900	84,179,203	831,303	377,679,943	381,489,662	3,809,720
41-45 mph	50,792,946	50,009,766	(783,180)	232,635,284	229,047,958	(3,587,326)
46-50 mph	46,602,765	45,460,559	(1,142,205)	214,185,186	208,936,039	(5,249,147)
51-55 mph	57,315,369	57,244,145	(71,225)	262,285,500	261,974,481	(311,019)
56-60 mph	85,514,346	87,978,345	2,463,998	386,868,520	397,975,979	11,107,460
61-65 mph	97,389,076	103,527,647	6,138,571	433,152,428	460,477,655	27,325,227
66-70 mph	58,354,377	59,923,356	1,568,979	257,069,604	263,962,712	6,893,108
	1,090,294,999	1,085,948,397	(4,346,601)	4,777,559,600	4,762,057,682	(15,501,918)

Model Year 2037

	subarea annual VMT		Total	subarea annual VMT		Lights	subarea annual VMT		Heavies
	wo project	w project	diff	wo project	w project	diff	wo project	w project	diff
Speed									
5-10 mph	407,654,918	395,388,437	(11,155,138)	370,721,382	359,566,244	(11,155,138)	36,933,536	35,822,192	(1,111,343)
11-15 mph	950,129,966	805,741,600	(131,306,781)	864,048,191	732,741,411	(131,306,781)	86,081,775	73,000,189	(13,081,586)
16-20 mph	1,689,656,347	1,594,556,184	(86,484,089)	1,536,573,482	1,450,089,394	(86,484,089)	153,082,865	144,466,790	(8,616,075)
21-25 mph	3,175,915,267	3,022,503,166	(139,512,965)	2,888,177,344	2,748,664,379	(139,512,965)	287,737,923	273,838,787	(13,899,136)
26-30 mph	4,298,769,932	4,286,034,426	(11,581,669)	3,909,301,376	3,897,719,707	(11,581,669)	389,468,556	388,314,719	(1,153,837)
31-35 mph	3,808,930,561	3,706,517,334	(93,134,589)	3,463,841,452	3,370,706,863	(93,134,589)	345,089,109	335,810,470	(9,278,638)
36-40 mph	2,946,588,845	2,969,322,001	20,673,532	2,679,627,896	2,700,301,428	20,673,532	266,960,949	269,020,573	2,059,624
41-45 mph	2,126,428,879	2,114,888,471	(10,494,847)	1,933,774,423	1,923,279,576	(10,494,847)	192,654,456	191,608,896	(1,045,561)
46-50 mph	1,979,430,945	1,942,604,546	(33,489,927)	1,800,094,501	1,766,604,574	(33,489,927)	179,336,444	175,999,972	(3,336,472)
51-55 mph	2,427,755,951	2,521,066,062	84,856,215	2,207,801,262	2,292,657,477	84,856,215	219,954,689	228,408,585	8,453,896
56-60 mph	3,007,431,380	3,172,414,853	150,035,971	2,734,958,097	2,884,994,067	150,035,971	272,473,283	287,420,786	14,947,503
61-65 mph	2,564,563,039	2,780,485,716	196,360,082	2,332,213,628	2,528,573,710	196,360,082	232,349,411	251,912,006	19,562,595
66-70 mph	1,580,649,733	1,679,253,956	89,670,681	1,437,442,867	1,527,113,548	89,670,681	143,206,866	152,140,408	8,933,543
	30,963,905,765	30,990,776,752	24,436,476	28,158,575,902	28,183,012,378	24,436,476	2,805,329,862	2,807,764,374	2,434,511

	Fuel Consumption (1000 gallons/yr)			Savings ($ millions)		
	wo project	w project		wo project	w project	diff
Speed						
5-10 mph	45,300,633	43,968,073	(1,332,560)	182,379,163	177,000,950	(5,378,214)
11-15 mph	82,680,383	70,021,248	(12,659,135)	340,911,054	288,751,862	(52,159,191)
16-20 mph	115,876,645	109,326,980	(6,549,665)	490,629,451	462,912,558	(27,716,893)
21-25 mph	179,732,055	170,934,302	(8,797,754)	781,847,972	743,655,043	(38,192,929)
26-30 mph	209,298,710	208,519,909	(778,801)	933,641,424	930,294,427	(3,346,997)
31-35 mph	164,465,155	160,026,122	(4,439,033)	750,579,641	730,336,489	(20,243,153)
36-40 mph	116,748,036	117,689,972	941,935	542,466,076	546,801,139	4,335,063
41-45 mph	80,075,294	79,691,934	(383,360)	376,305,629	374,448,979	(1,856,650)
46-50 mph	73,412,896	72,047,028	(1,365,868)	346,237,332	339,795,619	(6,441,713)
51-55 mph	91,971,414	95,470,523	3,499,109	431,762,954	448,226,430	16,463,476
56-60 mph	120,631,117	127,302,091	6,670,974	559,405,257	590,288,797	30,883,540
61-65 mph	112,613,658	121,984,834	9,371,176	512,794,936	555,564,566	42,769,630
66-70 mph	74,288,827	79,031,025	4,742,197	334,618,187	355,919,734	21,301,547
	1,467,094,824	1,456,014,039	(11,080,785)	6,583,579,076	6,543,996,593	(39,582,483)