

# Regional Performance

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## Introduction

Measuring the performance of the region's transportation system is an important step in reaching the desired outcomes of the Metropolitan Transportation Plan. Mobility 2035 was developed around a series of goals that are categorized into four overarching themes; these themes include mobility, quality of life, system sustainability, and implementation. While the policies, programs, and projects contained within Mobility 2035 strive to meet these goals, the success of these elements requires regular evaluation and monitoring. This chapter examines the performance of the region's existing and planned transportation system as it relates to addressing the goals outlined for Mobility 2035.



*Mobility 2035 Goal Themes*

## *Regional Performance at a Glance:*

The Dallas-Fort Worth region is expected to see continued growth between now and 2035. This continued growth will result in:

- 3.2 million additional residents, which is the equivalent of adding the total current population of the cities of Arlington, Dallas, Fort Worth, Grand Prairie, Garland, Irving, and Plano
- 2.0 million additional jobs
- 103 million more vehicle miles of travel daily
- 124 percent increase in vehicle hours spent in delay

## Performance Measurement: Mobility

The primary purpose of Mobility 2035 is to accommodate the multimodal mobility needs of a growing region. The specific goals developed for Mobility 2035 related to the theme of mobility include:

- Improve the availability of transportation options for people and goods.
- Support travel efficiency measures and system enhancements targeted at congestion reduction and management.
- Assure all communities are provided access to the regional transportation system and planning process.

There are a variety of system-level performance measures provided from the travel demand model that assess the relative mobility of the region by evaluating travel at the regional transportation system. The travel demand model is able to evaluate how the region’s transportation system functions as a cohesive unit. However, it should be noted that there are a number of programs and modes that are not accounted for in this model and their performance must be tracked through other methods. *Exhibit 7.1* provides a brief summary of the regional transportation system’s performance. This table illustrates current conditions, future conditions with the Mobility 2035 recommendations implemented, and future conditions if the Mobility 2035 recommendations were not implemented (No-build).

| Regional Performance Measures                    | 2012        | 2035        | No-build    |
|--|-------------|-------------|-------------|
| <b>Population</b>                                | 6,651,887   | 9,833,378   | 9,833,378   |
| <b>Employment</b>                                | 4,210,178   | 6,177,016   | 6,177,016   |
| <b>Vehicle Miles of Travel (Daily)</b>           | 176,461,914 | 279,426,796 | 252,669,404 |
| <b>Hourly Capacity (Miles)</b>                   | 42,331,524  | 50,525,839  | 41,938,766  |
| <b>Vehicle Hours Spent in Delay (Daily)</b>      | 1,112,877   | 2,490,143   | 2,980,988   |
| <b>Increase in Travel Time Due to Congestion</b> | 31.5%       | 44.8%       | 58.1%       |
| <b>Annual Cost of Congestion (Billions)</b>      | \$4.5       | \$10.1      | \$12.1      |

*Exhibit 7.1: Regional System Performance*

The deferral of nearly \$45 billion in needed transportation improvements, coupled with continued growth, will cause travel conditions to deteriorate over time. Currently, travel throughout the region takes approximately 32 percent longer to make due to congestion. By 2035, with Mobility 2035 recommendations implemented, trips will take nearly 45 percent longer to complete due to congestion. While this is a decline in performance, if no improvements are made, by 2035 the average trip would take 58 percent longer to complete. In order to reverse this trend and improve travel conditions in the region, substantial investments would be required. The region, as a whole, will experience an increase in congestion; the exact conditions experienced by users will vary by location. See Appendix F for details regarding the transportation system’s performance for each of the 12 counties in the Metropolitan Planning Area for years 2012 and 2035.

Regional congestion levels are graphically shown in *Exhibits 7.2, 7.3, and 7.4*. These maps depict current and future peak-period congestion levels with and without the Mobility 2035 recommendations in place.

*Exhibits 7.2 through 7.4* provide an area-based analysis of congestion focused on region-wide travel conditions. Additional analytical techniques are used to illustrate facility specific performance. A level of service (LOS) analysis measures the operational performance of a roadway during the most congested times of the day. LOS is expressed using a scale from A to F. Vehicles operating on a roadway performing at a LOS of A, B, or C will be able to travel at posted speeds with little interference from other vehicles. Vehicles driving on roadways operating at LOS D or E can experience speeds much slower than the posted speed limits. When the



**LOS ABC**

A LOS of A, B, or C represents a relatively uncongested facility. Vehicles can move freely with little interference.



**LOS DE**

A LOS of D or E represents a relatively congested facility. Vehicles can move with some interference.



**LOS F**

A LOS of F represents the worst level of congestion. Vehicles are unable to move freely without interference.

*Source: NCTCOG*

volume of traffic on a roadway exceeds the actual capacity, the result is a LOS F condition, causing vehicles to experience stop and go or standstill conditions.

continue to be made, to implement projects that will have a positive impact on travel conditions in the region.

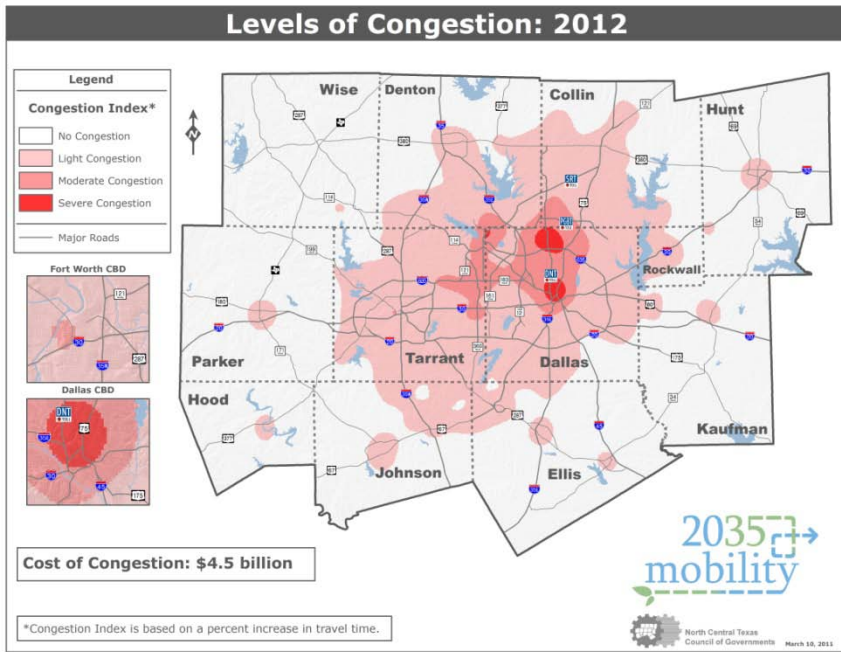


Exhibit 7.2: 2012 Peak-period Congestion Levels

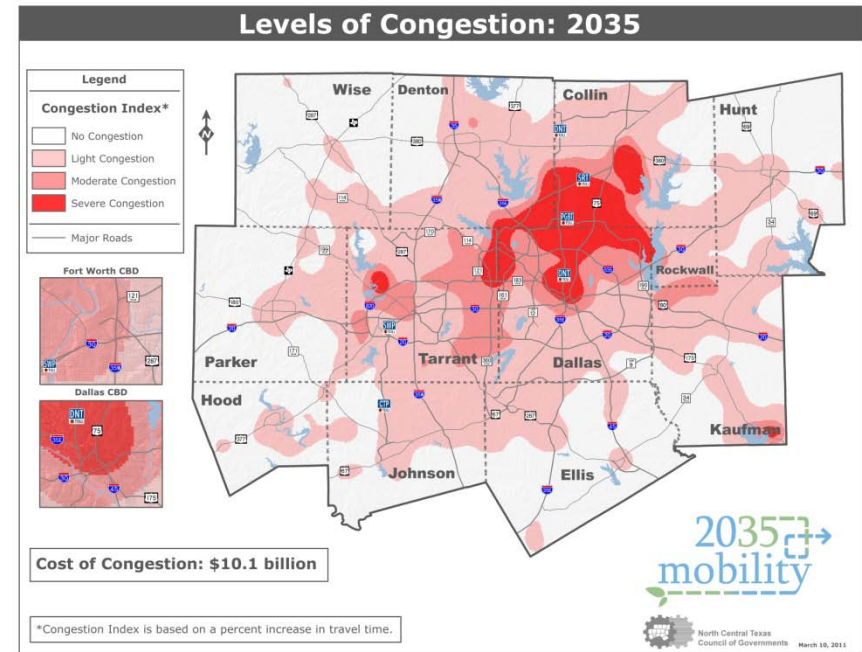


Exhibit 7.3: 2035 Peak-period Congestion Levels with Planned Improvements

Exhibit 7.5 illustrates the percentage of lane miles with LOS conditions of ABC, DE, and F for the Current, 2035 Build, and 2035 No-build scenarios. The charts show that LOS conditions of ABC will decrease and LOS conditions of F will increase while conditions of DE remain relatively constant. An additional LOS analysis was performed on the region's major roadway corridors. This analysis included an evaluation of LOS and lane warrants based on forecasted volume to capacity ratios.

The results of this analysis, along with maps showing LOS conditions for the region's roadway system, are provided in Appendix F.

Meeting the mobility-oriented goals outlined in Mobility 2035 is of critical importance. Despite a number of constraints, efforts are being made, and will

## Performance Measurement: Quality of Life

The Dallas-Fort Worth region has experienced considerable growth over the last 40 years; since 1970, the region's population has grown by 156 percent. This growth can largely be attributed to the region's diverse economy, favorable business climate, and low cost of living. These elements, among others, factor into the region's high quality of life. Maintaining and improving quality of life for the region's residents is central to Mobility 2035. The specific goals developed for Mobility 2035 related to the theme of quality of life include:

- Preserve and enhance the natural environment, improve air quality, and promote active lifestyles.

- Encourage livable communities which support sustainability and economic vitality.

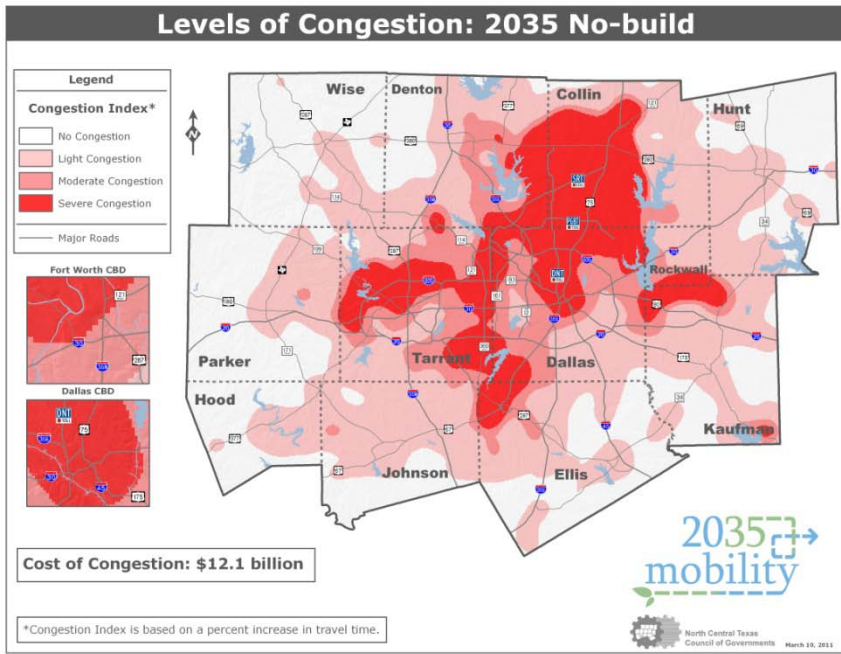
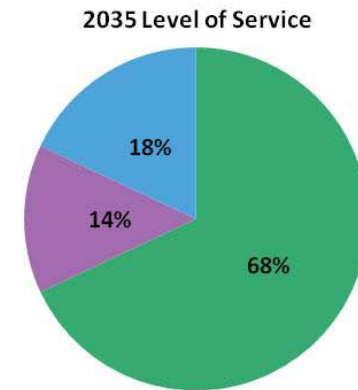
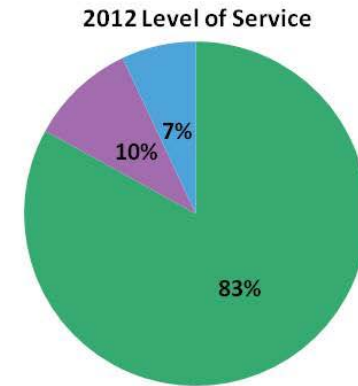


Exhibit 7.4: 2035 Peak-period Congestion Levels without Planned Improvements

There are a variety of ways that the transportation system, and more specifically the recommendations made in Mobility 2035, can impact quality of life. Mobility itself can be very influential on the quality of life an individual experiences. The ability to easily move from one place to another allows people to live where they want; to access jobs, education, and healthcare; and provides a means to cultural and recreational activities. Having a choice in the way one travels is an important factor to improving quality of life.

Access to public transportation can be a substantial quality of life benefit for residents of the region. The Regional Transportation Council has made public transportation a high priority for the region. The recommendations in Mobility 2035 strive to maximize public transportation and to increase access to this mode throughout the Metropolitan Planning Area. Exhibit 7.6 estimates the number of people living in and out of the region’s current transit provider’s service area over



2035 No-Build Level of Service

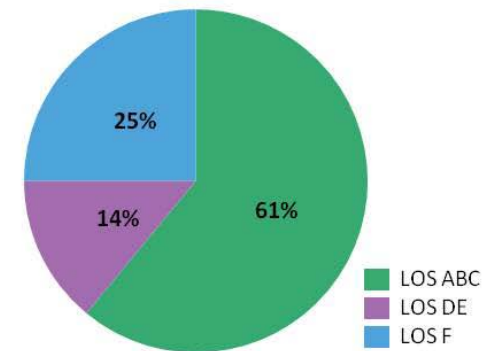
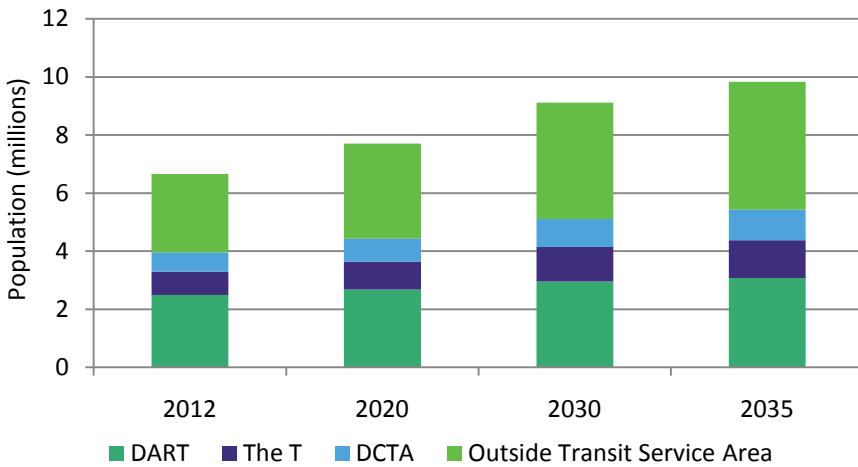


Exhibit 7.5: Lane Miles at Level of Service ABC, DE, and F

the life of Mobility 2035. While the absolute number of people living within the existing service area will increase, the total percentage declines over time. However, there are two important considerations that should be given. First, this analysis assumes that the existing service area would remain static over time. If the authorities are able to grow their service areas, these numbers would be positively impacted. The second consideration is that a number of the public transportation recommendations contained in Mobility 2035 reach areas outside of existing public transportation service areas. This means that residents outside of existing service areas will have access to public transportation.



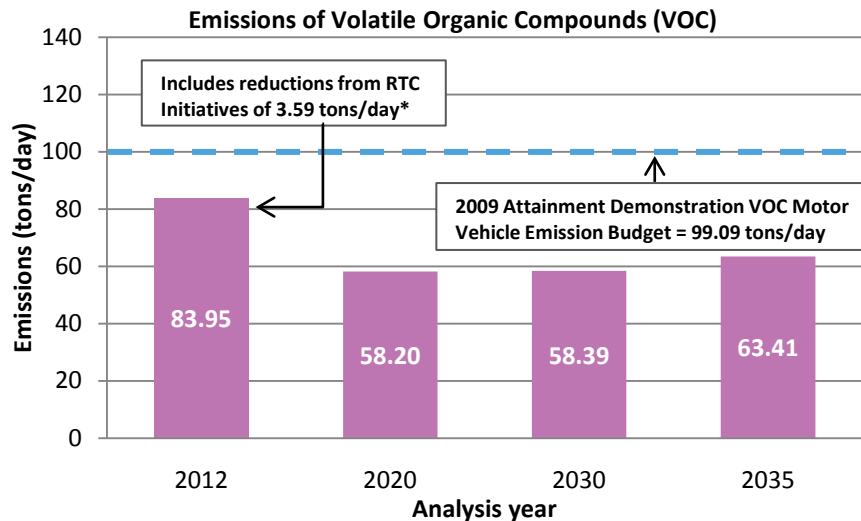
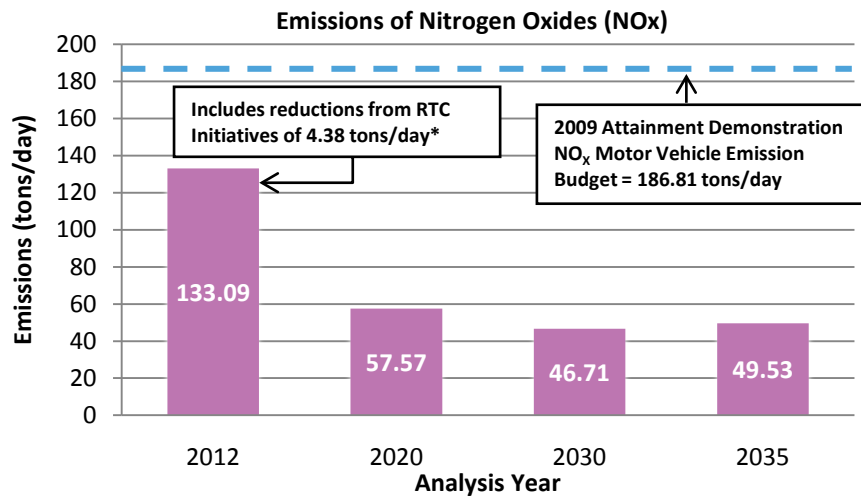
*Exhibit 7.6: Population within Existing Transit Service Areas*

The Regional Transportation Council has long recognized that the region will not be able to solve its transportation problems by simply building more roads. Public transportation provides a way to move large amounts of people in a safe and efficient manner. Analysis shows that by 2035, over three million people will live within one mile of a transit stop or rail station and more than three million jobs will be located within one mile of a transit stop or rail station. As the region continues to grow, public transportation will be an increasingly viable travel option. Increasing opportunities for and access to public transportation will improve quality of life for the region’s residents.

Active transportation modes, which include bicycling and walking, also have a positive impact on one’s quality of life. Not only are these modes a practical means of travel, but they also can reduce congestion, improve air quality, and enhance health. These elements all factor into a high quality of life. The Regional Veloweb is a network of off-street shared-use paths designed for use by bicyclists, pedestrians, and other non-motorized forms of transportation. The Regional Veloweb currently has 237 miles of existing paths, and by 2035, the system is expected to reach 1,668 miles. This is over a 600 percent increase in miles of paths available for travel throughout the region. The Regional Veloweb will directly service 10 counties and 116 cities in the Dallas-Fort Worth Metropolitan Planning Area.

Providing a variety of transportation choices is not the only way that the quality of life goals outlined in Mobility 2035 are addressed. Mobility 2035 includes recommendations that seek to improve air quality and enhance the environment. *Exhibit 7.7* demonstrates how air quality in the region will improve over time as a result of a variety factors including implementation of the Mobility 2035 recommendations.

In addition to improvement in air quality, Mobility 2035 calls for increased consideration for the natural environment during the development of projects. Mobility 2035 represents the first Metropolitan Transportation Plan in the Dallas-Fort Worth region that utilized the North Central Texas Regional Ecosystem Framework (REF) as part of the evaluation for major infrastructure improvements. Detailed information regarding the REF can be found in the Environmental Considerations chapter. The REF process is intended to protect, sustain, and restore vital ecosystems while simultaneously providing recreational and mobility opportunities, and contribute to the positive health of people and communities in North Central Texas. This, in turn, enhances quality of life for the region’s residents. Because this is a new approach in the region, the performance of this method will be tracked and reported in future planning efforts.



\*Local Initiative Benefits Shown Represent Post Processed Estimates, Source: NCTCOG

Exhibit 7.7: Dallas-Fort Worth Ozone Nonattainment Area Air Quality Conformity Analysis Results

The economy is a critical component in assessing quality of life. In 2008, the region accounted for 32 percent of the Texas Gross Domestic Product.<sup>1</sup> To remain a key player in the state and national economy, the Dallas-Fort Worth region must

continue to provide facilities that allow for the steady flow of people and goods. Data collection and monitoring efforts have been established to aid in addressing and ensuring adequate capacity for the region’s logistical centers. For example, in 2006, the region’s major aviation facilities moved more than 832,000 tons of air cargo; by 2010, this number had decreased to 709,000 tons. This decline can be attributed to the recent economic downturn; however, it does show that the region can accommodate additional air cargo. Cargo is also transported throughout the region on the area’s rail and roadway system. Travel model data shows that currently nearly 650,000 truck trips are made daily; by 2035, this number is expected to increase to almost 983,000. It is important that this type of data be monitored, evaluated, and considered as the transportation system is developed and improved. The continued efficient movement of goods will have a positive impact on the region’s economy and the quality of life experienced by the region’s residents.

The examples outlined in this section illustrate how the recommendations made in Mobility 2035 seek to improve the quality of life for the region’s residents by providing transportation choices, promoting environmental stewardship, and accommodating economic growth.

### Performance Measurement: System Sustainability

The theme of system sustainability touches upon several elements that are critical to Mobility 2035. These elements include creating a transportation system that is safe, reliable, and well maintained. In order to provide for these, an adequate and stable source of funding is required. These elements work in partnership to advance a transportation system in the region that is sustainable. The specific goals developed for Mobility 2035 related to the theme of system sustainability include:

- Ensure adequate maintenance and enhance the safety and reliability of the existing transportation system.
- Pursue long-term sustainable revenue sources to address regional transportation system needs.

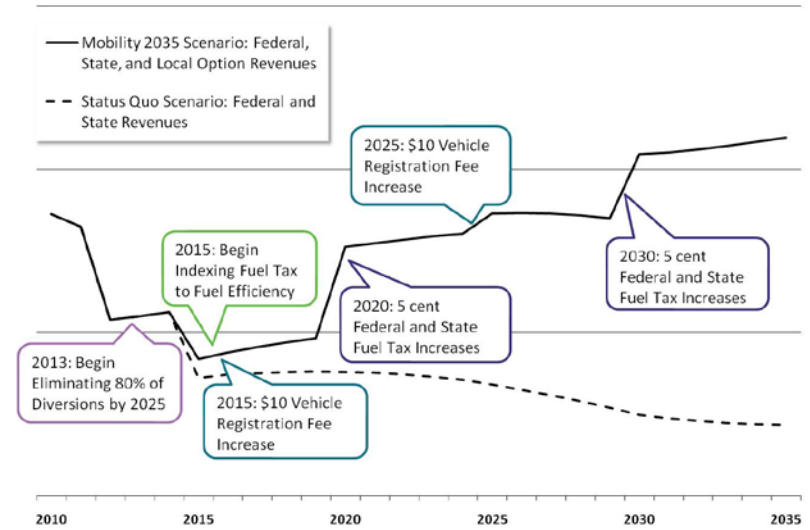
A well functioning transportation system requires regular maintenance and modernization to allow for the safe and efficient movement of people and goods. A stable and sufficient source of revenue is needed in order to execute improvements in the system. Taxes collected on motor fuels are the primary source of funding for

<sup>1</sup> North Texas Commission, 2009 Profile of North Texas, <http://www.ntc-dfw.org/publications/profile2009.pdf>

many transportation improvements. The state gasoline tax is 20 cents per gallon and the federal gasoline tax is 18.4 cents per gallon. For many years, fuel taxes have been a steady and ample source of revenue to fund transportation improvements; however, in recent years a number of factors have contributed to the diminished capacity of this source of revenue to adequately fund the transportation system. Two of the most influential factors include the impacts of inflation and improved fuel efficiency. State and federal fuel taxes were last increased in 1991 and 1993, respectively. Over the last 20 years, the cost of building and maintaining the region’s transportation system has increased substantially and existing fuel taxes are no longer enough to sufficiently fund the system. Further exacerbating this situation is improved fuel efficiency. As vehicles become more fuel efficient, they require less fuel to travel the same distance. This relationship is illustrated in *Exhibit 7.8*. While there are many societal benefits to improved fuel efficiency, it negatively impacts funding for transportation. Motor fuel taxes are collected on a per gallon basis, so no matter how much fuel costs, the amount of tax collected remains the same. As fuel consumption decreases, tax revenue also decreases. Over time, the funds available to build and maintain the region’s transportation system will decrease considerably. For these reasons, a more sustainable revenue stream is required to ensure that the region’s

transportation system can be maintained and improved. *Exhibit 7.9* illustrates how the financial recommendations made in Mobility 2035 perform compared to a status quo situation. For more information on the financial aspects of Mobility 2035, see the Financial Reality chapter.

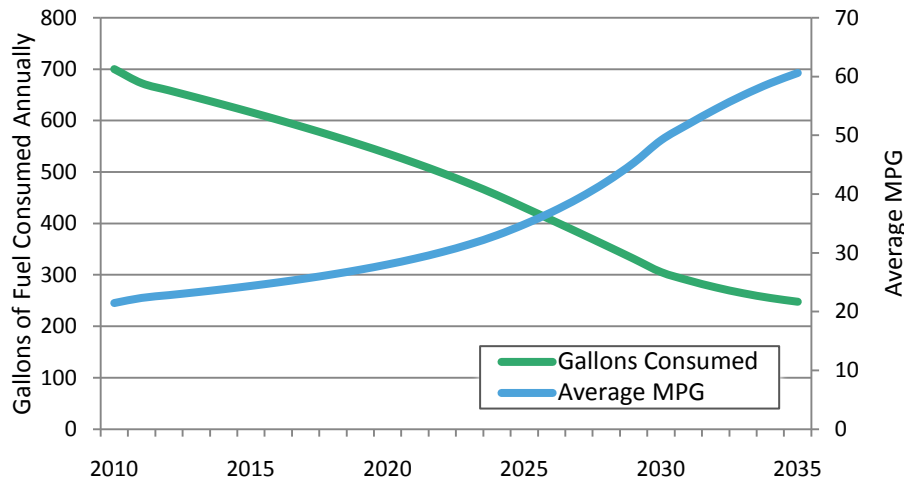
## Mobility 2035 Revenue Enhancements



*Exhibit 7.9: Impact of Mobility 2035 Financial Recommendations*

Because funding is, and will be, a sizeable concern into the foreseeable future, a number of low-cost but highly effective improvements are recommended to improve the safety and efficiency of the regional transportation system.

The implementation of vanpools is one way in which the region will seek to improve the efficiency of the transportation system. Vanpools allow people traveling to similar destinations to ride together, thus reducing the number of vehicles on the road. Currently there are 358 vanpools operating in the region; by 2035, this number is expected to reach 1,041. This represents an increase of more than 190 percent.



*Exhibit 7.8: Relationship between Fuel Efficiency and Fuel Consumption*

Minor improvements to the region’s arterial system can translate into more efficient travel, improved air quality, and major cost savings. Mobility 2035 calls for 1,200 arterial intersection improvements in addition to those identified in the arterial roadway improvements. These improvements are estimated to reduce the cost of congestion and save the region approximately \$171 million annually. Likewise, traffic signal improvements, which may include retiming and synchronization, can have similar benefits. Mobility 2035 recommends 7,800 signal improvements over the life of the plan. These improvements are expected to reduce congestion related costs by \$269 million annually.

Maintenance of the region’s transportation system is also an important factor for the theme of system sustainability in that implemented improvements must be maintained to ensure their reliability and to maximize their useful life. Approximately 27 percent of the funding identified in Mobility 2035 is dedicated to the maintenance of the region’s transportation infrastructure. Like other elements of Mobility 2035, maintenance had an overall reduction in spending from the previous metropolitan transportation plan by nearly \$9 billion. As a result of this reduction in spending, elements such as pavement condition will decline. It should be noted that provisions were made to assure that the region’s bridges would be adequately maintained and improved. Information related to the region’s bridges is included in Appendix F.

The system sustainability goals included in Mobility 2035 are addressed through a variety of initiatives aimed at improving safety, enhancing reliability, ensuring maintenance, and increasing the availability of funding for the region’s transportation system. These initiatives will be continually monitored and evaluated over the life of the Metropolitan Transportation Plan.

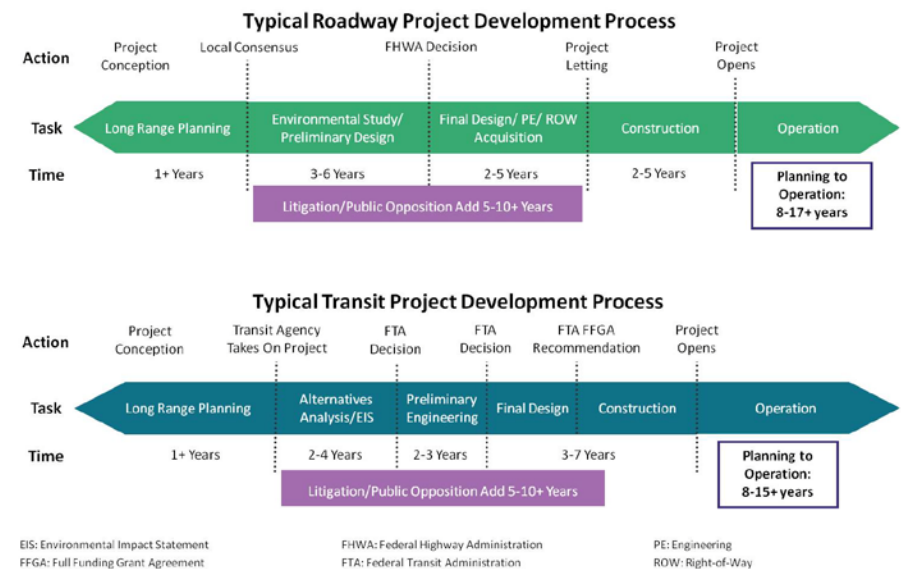
### Performance Measurement: Implementation

The ultimate goal of any planning process is to see the recommendations reach the implementation stage. It is through the implementation of projects, programs, and policies that the other goals outlined in Mobility 2035 can be realized. The specific goals developed for Mobility 2035 related to the theme of implementation include:

- Provide for timely project planning and implementation.

- Develop cost-effective projects and programs aimed at reducing the costs associated with construction, operating, and maintaining the regional transportation system.

The nature of the transportation planning process, in conjunction with federal and state requirements, often means that many years pass from the time a project is conceptualized until the time it is constructed and available for use. There are a number of factors that impact project development and delivery. *Exhibit 7.10* illustrates approximately how long it takes a typical roadway or transit project to go through the planning process.



*Exhibit 7.10: The Typical Project Development Process for Roadway and Transit Improvements*

Identifying innovative methods to plan for and fund transportation improvements can expedite project delivery. Expediting project delivery not only reduces the project’s overall costs, but it also aids in improving congestion because facilities are available for use sooner. *Exhibits 7.11* and *7.12* illustrate major roadway and transit projects, respectively, that have recently reached or are in the implementation stage.

Mobility 2035 calls for \$101.1 billion worth of transportation projects and programs over the life of the plan. More than 6,100 new lane miles of roadways and 346 new miles of rail will be added to the region’s transportation system between now and 2035. Implementing these improvements is key to increasing mobility, maintaining a high quality of life, and creating a sustainable transportation system.

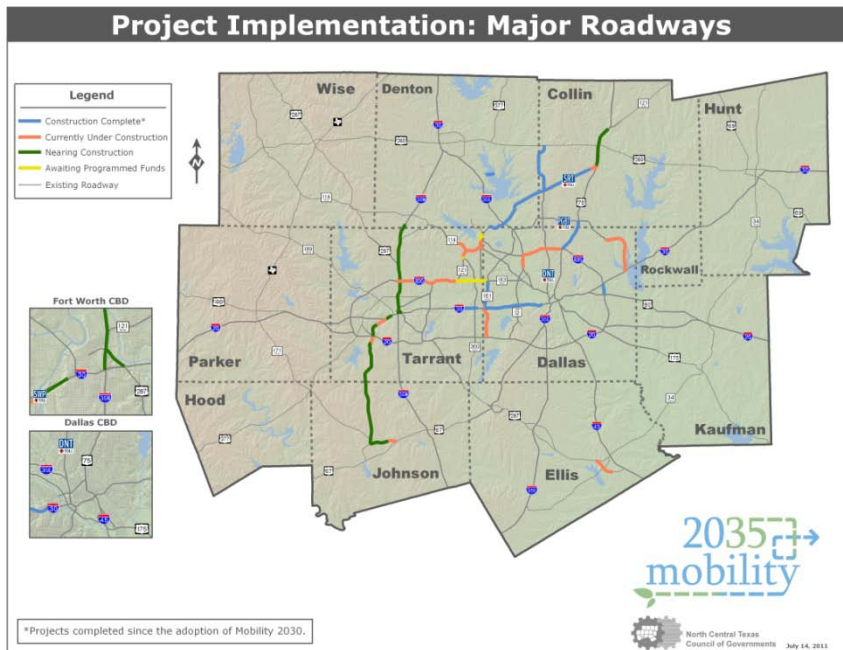


Exhibit 7.11: Recently Implemented Roadway Projects

## Summary

The goals identified in Mobility 2035 focus on improving mobility, enhancing quality of life, creating a sustainable transportation system, and implementing recommendations. These major themes are not mutually exclusive; they complement each other and work together to create a desirable outcome. In order to attain these goals, regular evaluation of the region’s transportation system and the recommended policies, programs, and projects contained within Mobility 2035 is necessary.

The data regarding the regional transportation system’s performance shows that conditions will not improve over time; however, it is important to note that the

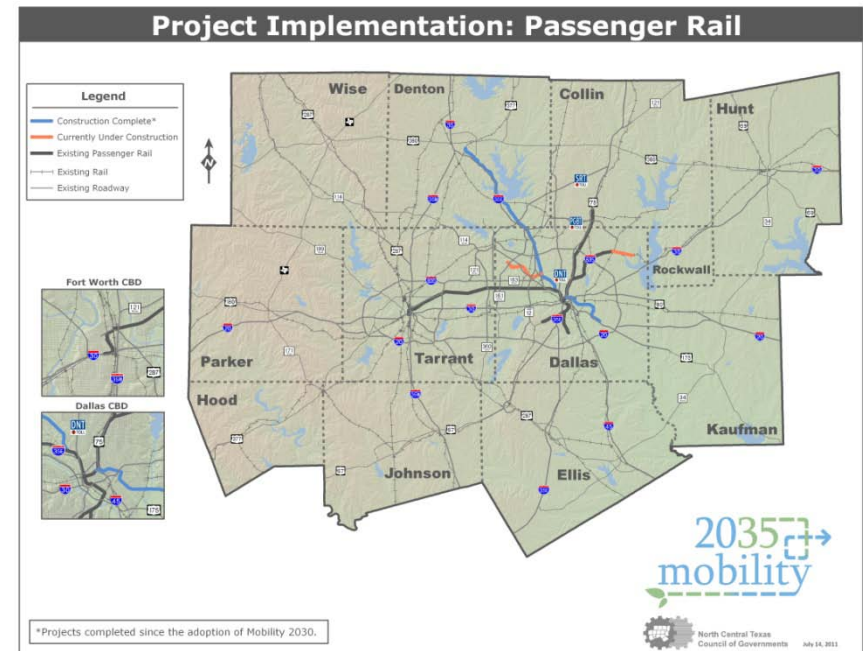


Exhibit 7.12: Recently Implemented Transit Projects

investment of \$101.1 billion identified in Mobility 2035 only represents the improvements that are reasonably expected to be funded over the life of the plan. It is currently estimated that the region would require approximately \$395.3 billion in improvements to eliminate the worst levels of congestion. Despite the overall decline in travel conditions in the region, the improvements identified in Mobility 2035 will have a positive impact versus if they were not implemented. The challenge now and into the future will be to implement transportation improvements that will have a lasting positive impact for the region while working in the face of continued growth and declining financial resources. The continual evaluation and monitoring of the region’s transportation system will allow the most beneficial and effective projects and programs to be implemented.

See Appendix F for additional information related to performance of the regional transportation system.