Mobility Options

The Dallas-Fort Worth area is a large, diverse place and the mobility needs of residents and businesses vary greatly across this region. It is of utmost importance that the transportation system satisfies mobility needs and also provides transportation choices. The primary purpose of the Metropolitan Transportation Plan is to accommodate the multimodal mobility needs of this growing region. Mobility has a significant impact on quality of life. It allows people to live where they want; to access jobs, education, and healthcare; and provides a means to cultural and recreational activities. In addition to quality of life impacts, mobility also influences the regional economic vitality and appeal. The ability to move goods easily from producers to consumers has been a major factor in the growth and prosperity North Central Texas has experienced over the past 40 years.

The following sections discuss mobility options for the North Central Texas region. Full-sized versions of the Mobility 2035 recommendations maps contained within this chapter can be found in Appendix E, along with detailed policy, program, and project recommendations.

Mobility Options at a Glance:
A variety of transportation options are available to meet the diverse travel demands of the Dallas-Fort Worth region. These modes work together to move goods, improve mobility, and provide access to/from and throughout the area.

Did You Know …
... there are 27 airports and one military airfield in the region?

... Dallas-Fort Worth is home to the nation’s largest inland port?

... Mobility 2035 recommends that the Regional Veloweb expand to nearly 1,670 miles?

... Mobility 2035 calls for approximately 460 miles of passenger rail?

... by 2035 the region will have nearly 570 miles of HOV/managed lanes?
Aviation

Mobility 2035 Supported Goal
Improve the availability of transportation options for people and goods.

The Importance of Regional Aviation Planning
As the nation’s largest inland port and the fourth largest metropolitan area, North Central Texas relies heavily on aviation facilities to sustain growth and economic prosperity. Through connectivity to global markets, the region’s aviation facilities provide economic development opportunities, the ability to engage in business activities related to aviation and movement of cargo, and leisure and tourism opportunities throughout the world. As such, our airports serve as a non-conventional inland port system, providing global access, thus enhancing the regional economy. Improving and maintaining surface access and land use compatibility is crucial to preserving the regional system of aviation facilities.

Due to the over $4 billion of estimated economic impact of aviation, the Regional Transportation Council has the planning goal that landside access not be a limiting factor for growth at the region’s airports. Ideally these airports should be able to grow to their airside limit without delays due to roadway congestion. This includes intermodal connectors as defined by the National Highway System which provide access for intermodal shipments to airports.

Mobility 2035 Policies and Programs
Policies are an important element in the planning for and implementation of programs and projects. Mobility 2035 supports the following policies associated with aviation:

**AV3-001:** Improve efficiency, safety, air quality, and access related to aviation.

**Aviation at a Glance:**
The goal of regional aviation planning in the Dallas-Fort Worth area is to promote, maximize, protect, and advance regional aviation infrastructure to accommodate future growth in North Central Texas.

**NCTCOG Aviation Initiative Goals**
1. Update general aviation and heliport regional plans.
2. Maintain the Air Transportation Technical Advisory Committee.
3. Develop new policies, partnerships, plans, and programs for aviation.
4. Examine the market and timing for:
   - Additional air carrier aviation facilities
   - Additional air cargo facilities
   - New intercity high-speed rail access to aviation
   - Improving reliever, general aviation, and heliport assets
5. Determine needs related to:
   - Long-term airspace demands
   - Maintaining international competitiveness
   - Surface access to and land use around airports/heliports
   - Improving air quality

**Air Transportation Technical Advisory Committee**
The Air Transportation Technical Advisory Committee is comprised of airport managers, city managers, aviation industry representatives, and aviation experts from throughout the region. This committee provides a regional forum for discussion of aviation needs related to general aviation and heliports. During the Regional General Aviation and Heliport System Plan process, the Air Transportation Technical Advisory Committee serves as the Project Review Committee and performs technical review functions on behalf of the North Central Texas Council of Governments’ Executive Board and Regional Transportation Council on an as-needed basis.

Regional aviation planning at the North Central Texas Council of Governments will NOT address the following: selection of projects for entitlement funding/block grants/Airport Improvement Program funding, airport closures, interference with activities of private commercial pilots, or the performance of air carrier system planning.
AV3-002: Provide input to the National Plan of Integrated Airport Systems and the Texas Airport System Plan.

AV3-003: Encourage compatible land-use planning surrounding airports in the region.

AV3-004: Establish a comprehensive and integrated Aviation Education System in North Central Texas.

Mobility 2035 supports the following programs associated with aviation:

AV2-005: Aviation Surface Access Planning

AV2-006: Data Collection and Performance Tracking

AV2-007: Continuous System Planning

AV2-009: Encroachment Prevention and Compatible Land Use Planning

Aviation Program Performance Measures

Performance measures allow progress to be tracked and help identify areas for future improvement. In order to improve regional aviation planning, the following items are suggested for future evaluation:

- Increase compatible land use surrounding airports.
- Add additional airside and landside capacity at regional airports to meet future demand.
- Reduce airport and airspace congestion.
- Maintain acceptable level of service for airport ground transportation accessibility.

Aviation Planning in Context

There are various levels of planning needed in order to meet the demands on our airport systems. The following explains system planning efforts at all levels of government and the role they play in maintaining our airports.

- At the federal level, the National Plan of Integrated Airport Systems (NPIAS) provides an overview of national aviation capacity needs and funding requirements. The NPIAS identifies more than 3,300 airports that are of national significance and thus are eligible for federal funding under the Airport Improvement Program. Twenty-nine of these facilities are located in the 16-county region of North Central Texas.

AVIATION TERMS TO KNOW

AIRSIDE: The part of an airport directly involved in the arrival and departure of aircraft.

LANDSIDE: The part of an airport farthest from the aircraft, the boundary of which is the security check, customs, passport control, etc. and involves passenger arrival via ground transportation.

- At the state level, the Texas Airport System Plan (TASP) provides an overview of needed capacity and a statewide aviation activity forecast. The TASP covers 300 aviation facilities and seeks to recommend how these airports will be able to serve the transportation, business, and economic development functions which will benefit the state of Texas.

- At the regional level, the Regional General Aviation and Heliport System Plan provides aviation activity forecasts for a specific geography in North Central Texas and will make recommendations about aviation infrastructure that is used regionally by corporate entities, private citizens, and aviation students.

- At the local level, each airport will continue to maintain Airport Master Plans and Airport Layout Plans as required by the Federal Aviation Administration.

In addition, as the Metropolitan Planning Organization (MPO) for the Dallas-Fort Worth region, the North Central Texas Council of Governments (NCTCOG) is responsible for providing surface access and air quality improvement services to aviation facilities, processing data summary requests related to the Airport Improvement Program and Environmental Protection Agency programs, and monitoring capacity and use at the region’s major airports to include air cargo and Foreign Trade Zone activity.

Aviation Facilities in North Central Texas

The 16-county region of North Central Texas is home to a variety of public and private aviation facilities including the following:

- 2 primary commercial service airports
- 11 reliever airports
• 14 general aviation airports
• 1 existing military training airfield
• Over 200 private use facilities
• Over 100 heliports

These facilities are shown on the map in Exhibit 6.1.

Data Collection and Performance Tracking
One of NCTCOG’s roles is that of monitoring aviation trends at the region’s commercial and cargo airports. These trends depict the level of activity in the region and highlight the importance of aviation as North Central Texas’ connection to national and global markets. The data shown in the following two graphs (Exhibits 6.2 and 6.3) illustrates recent trends in passenger volumes and cargo volumes at the region’s major aviation facilities. These trends generally show a decline associated with the events of September 11, 2001 and the recent economic recession of 2008. However, recent growth indicates that the industry may be showing signs of recovery, prompting the need to keep a close eye on future demands. NCTCOG staff will continue to monitor this data on an ongoing basis and assess associated impacts on infrastructure needs at the regional level.

Surface Access to Aviation
The efficiency of air passenger and cargo mobility is affected by capacity at airports and on the surrounding highway system. Congestion in the air or on the ground can significantly impact air cargo operations and efficiency. How well the surface transportation network connects with the region’s air passenger and cargo facilities is vital to the needs of both national and international trade. The map in Exhibit 6.4 displays the travel times to/from Dallas/Fort Worth International Airport. Similar maps for Dallas Love Field and Fort Worth Alliance Airport are located in Appendix E. This analysis was performed based on an average peak-period traffic scenario as represented by the travel demand models under year 2035 conditions, taking into account current plan recommendations.

Fulfilling the role of the MPO, NCTCOG performs this analysis of surface access to regional aviation facilities. Future iterations of this plan will include an inventory of specific improvements on the roadways surrounding the region’s aviation facilities. These inventories will be created to assist decision makers in prioritizing and funding these important connectors.
Continuous System Planning

In addition to traditional MPO roles described above, NCTCOG has been working with the Federal Aviation Administration to finalize a multi-year effort to produce a Regional General Aviation and Heliport System Plan for the 16-county NCTCOG region and surrounding areas. This effort will include a thorough update to the regional inventory, development of an aviation data management system, and analysis of current and forecast system demand. It is also anticipated that this study will include an exploration of market demand, system deficiencies, needed improvements, and economic impacts of the regional general aviation and heliport system. This work will entail increased coordination with federal and state level planning agencies to ensure that regional priorities are being considered in planning and funding decisions at those levels.

In addition, the most recent North Central Texas aviation system plans were performed prior to the construction of Fort Worth Alliance Airport and the closure of Naval Air Station Dallas, implying further impacts on the region’s aviation system which need to be incorporated into regional planning documents.

Increases in passenger and air cargo activity, as well as the advent of business jets as viable travel options, raise the question of regional airspace constraints and highlight the need to capture an accurate picture of the region’s aviation system so that growth constraints and industry trends are fully understood, both landside and airside. In particular, the impacts of new technologies on the aviation system have yet to be studied and understood on a regional level.

Findings will be defined and recommendations will be formulated on how to improve the aviation system in North Central Texas. Strategic coordination with city officials, the public, and aviation stakeholders can then occur to ensure that recommendations are implemented and the regional aviation system continues to be enhanced. This work will be accomplished under the Regional General Aviation and Heliport System Plan effort previously described.
Encroachment Prevention and Compatible Land Use Planning

As urban development pressures continue to increase, land use compatibility will continue to be of critical importance to the region’s aviation facilities. Because of noise associated with airfields, some land uses are not compatible in close proximity to aviation facilities. These land uses include housing, schools, offices, and other public gathering places. Noise disrupts the quality of life for airport neighbors, and safety is also a concern – particularly in close proximity to the ends of the runways. When noise and safety concerns are voiced by airport neighbors, the results can sometimes include restrictions on flight schedules, costly modifications by airports, and in extreme cases, political pressure to close airports. Due to the high level of public investment in aviation facilities, it is the goal of regional government to promote compatible land use planning and land development controls which will assist in the long-term preservation of the region’s aviation system. This effort will be of particular interest as the region continues to experience rapid population growth.

Regional Military Compatible Land Use Planning

In 2006, the Naval Air Station Fort Worth, Joint Reserve Base (NAS Fort Worth, JRB), surrounding communities, and NCTCOG initiated the Joint Land Use Study (JLUS) to identify actions to ensure the long-term viability of the base. NAS Fort Worth, JRB Regional Coordination Committee (RCC) is an initiative by the cities of Benbrook, Fort Worth, Lake Worth, River Oaks, Westworth Village, and White Settlement, in conjunction with Tarrant County, to implement the recommendations of the JLUS. The RCC is a collaborative effort to develop, implement, and monitor programs and projects to ensure that future development in the region around the installation is compatible with current and future operations of the base. The RCC enables enhanced communication and cooperation among the participants and constant monitoring of proposed development in the area. The committee reviews current development, as well as future land use plans, for compatibility with the installation's mission. RCC participants work together to identify and solve issues shared among the communities surrounding the installation including transportation topics such as transit, safety, and infrastructure improvements; emergency preparedness; storm water management; and community education. The goal of the committee is to encourage compatible development that may improve opportunities to expand operations at NAS Fort Worth, JRB in the next Base Realignment and Closure process.

Integrated Aviation Education System

Despite its preeminence in the aviation industry and the demonstrated need to train additional aviation professionals, the region lacks a public university with a comprehensive four-year college program for students who would like to pursue an aviation career. This was first documented by a Texas Transportation Institute report (2003) and later by NCTCOG’s New Technology and Industry Trends Report.
Planning to coordinate with regional industry and academic partners to form a complete and thorough aviation academic program in the region is being conducted. It will address the needs at the university, community college, trade school, high school, and junior high levels to create a strong regional aviation education system.

**Summary**

As regional aviation planning activities continue to grow at NCTCOG, there will be a need for new projects, programs, and policies to support these efforts. These projects, programs, and policies will allow NCTCOG’s Executive Board and the Regional Transportation Council to continue to support important regional aviation goals throughout the Dallas-Fort Worth area.

See Appendix E for a complete listing of policies, programs, projects, and maps related to aviation.
Freight

Mobility 2035 Supported Goal
Improve the availability of transportation options for people and goods.

Freight Planning
Freight transportation is a key component in the Dallas-Fort Worth regional economy. IH 35, the North American Free Trade Agreement (NAFTA) Superhighway, runs through the heart of the region, providing crucial connections to the national Interstate Highway system. As a result, 98 percent of the US population can be reached from the Dallas-Fort Worth region within 48 hours by truck.1 The region is also a major crossroads in the national railroad system. Fort Worth is home to Tower 55, one of the busiest and most congested rail intersections in the country. In addition to truck and rail facilities, the region hosts both national and international air cargo facilities. These facilities allow the region to serve as a major national logistics center.

Freight is vital to the Dallas-Fort Worth regional economy, as well as the Texas economy. In 2008, the region accounted for 32 percent of the Texas Gross Domestic Product.2 The North Central Texas region represents one of the largest inland ports in the nation where freight is moved, transferred, and distributed to destinations across the state and around the world. The region has one of the most extensive surface and air transportation networks in the world, providing extensive trade opportunities for the more than 700 motor/trucking carriers and freight forwarders that operate within the region.

NCTCOG has several goals related to regional freight planning:
• Seek freight community participation in the planning process.
• Monitor freight traffic through the region to identify potential bottlenecks.
• Improve freight movement efficiency to, from, and within the region.
• Promote safety, mobility, and accessibility.

Freight at a Glance
The goal of freight planning in the Dallas-Fort Worth area is to enhance the regional freight system while working with regional partners to perform operational and site specific analyses regarding air cargo, freight rail, truck, and utilities activities.

As outlined in the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users, the freight initiatives within Mobility 2035 seek to support economic vitality, increase the accessibility and mobility of people and freight, and enhance the integration and connectivity of intermodal transportation.

Terms to Know
Intermodal Transportation: The use of multiple modes to transport a particular element of freight.
Inland Port: An inland site operating in a similar capacity to that of a seaport.
Class I Railroads: Freight railroads having annual carrier operating revenues of $250 million or more after adjusting for inflation.
Truck Lane Restrictions: Restrictions along roadways where trucks with three or more axles are prohibited from using the inside left lane except when passing traffic.

Key Regional Freight Transportation Facilities
• Burlington Northern Santa Fe Railway Intermodal and Carload Transportation Center at Alliance
• Union Pacific Railroad Dallas Intermodal Terminal in Wilmer
• Union Pacific Railroad Auto Facilities in Mesquite and Arlington
• Dallas/Fort Worth International Airport and Alliance Airport air cargo terminals
• Four foreign trade zones
• Various freight facilities located at private firms, pipeline terminals, and industrial parks

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- Reduce air quality impacts of freight movements.
- Seamlessly incorporate freight considerations in transportation projects.

Achievement of these goals will result in better planning for the transportation needs of freight transportation facilities and the freight sector as a whole. Regional freight transportation facilities are shown in Exhibit 6.5.

**Exhibit 6.5: Freight Transportation Facilities**

**Mobility 2035 Policies and Programs**

Policies are an important element in the planning and implementation of programs and projects. Mobility 2035 supports the following policies associated with freight:

**FP3-001:** Improve efficiency, safety, economic development opportunities, and air quality related to freight movement.

**FP3-002:** Support planning related to truck and freight rail enhancements including feasibility studies and project implementation.

**FP3-003:** Support freight data collection and monitoring including the placement of Automated Traffic Recorder station sensors on all new/improved freight corridors.

Mobility 2035 supports the following programs associated with freight:

**FP2-110:** Freight Route Planning

**FP2-120:** Hazardous Materials Routing

**FP2-130:** Truck Lane Planning

**FP2-330:** Freight Outreach Activities

**FP2-340:** Freight Data Collection

**FP2-350:** Freight Rail Planning

**FP2-360:** Freight System Planning

**Freight Program Performance Measures**

Performance measures allow progress to be tracked and help identify areas for future refinement or improvement. To improve regional freight planning, the following items are suggested for future evaluation:

- Improved and increased relationships with the freight community.
- Reduced at-grade railroad crossing and trespass fatalities and incidents.
- Increased travel speeds for non-truck traffic.
- Decreased annual number of accidents involving trucks and non-trucks.
- Improved safety, mobility, and air quality of the region through truck lane restrictions.
- Improved effectiveness of truck lane restrictions without enforcement.
- Reduction in nitrogen oxides along the corridors with truck lane restrictions.

**Rail Planning**

Three Class I railroads operate within the region: Burlington Northern Santa Fe Railway, Kansas City Southern Railway, and Union Pacific Railroad. Additionally, several short-line railroads operate in the region including the Dallas, Garland, and Northeastern Railroad and the Fort Worth and Western Railroad. These rail lines combine to serve all 48 contiguous states, Alaska, Canada, and Mexico. Each railroad works cooperatively with trucking firms and ocean shippers to expedite intermodal movements.
In 1991, the Federal Railroad Administration adopted a goal of closing 25 percent of all at-grade highway railroad crossings in the United States. This was done in an effort to reduce the number of at-grade crossing accidents and fatalities, as well as to reduce the amount of infrastructure being maintained. Rail safety is one component of the efficient movement of freight through the region. In 2003, a call for projects was held for at-grade crossing improvements at eligible crossings throughout the region. In 2004, additional crossings along the Dallas Area Rapid Transit and Trinity Railway Express rail lines were also selected. Additional information regarding all of NCTCOG’s freight rail programs can be found in Appendix E.

Located beneath the I-30 and IH 35W interchange in downtown Fort Worth, Tower 55 is a vital intersection for the national rail network. This intersection provides connectivity for freight and passenger rail travel between the West Coast, Midwest, Gulf Coast, and the Southeastern United States, in addition to intercontinental movements between Canada and Mexico. As a result of these linkages, Tower 55 has become one of the busiest and most congested rail intersections in the country. Due to the high volume of rail traffic at Tower 55, each train must come to a complete stop prior to passing through the at-grade intersection, creating significant traffic delays. NCTCOG began a study of Tower 55 in 2006 with the purpose of developing a set of structural and/or operational improvements within and around the existing rail infrastructure. This study identified a set of mid-term improvements. In October 2010, the Tower 55 project received a funding award of $38 million through the Transportation Investment Generating Economic Recovery II Grant Program.

Truck Planning

In 2007, trucks moved more than 51 million tons of freight worth $45 billion each day on US highways. Additionally, long-haul truck traffic (trips over 50 miles) is projected to nearly double by 2035. Population increases, the deregulation of the trucking industry, the passage of NAFTA, reductions in rail service, and growth in time-sensitive freight have increased the number of trucks on the nation’s roadways.

Truck travel characteristics are monitored to enable the Regional Transportation Council (RTC) to identify routes being used for the movement of freight and to assist in the prioritization of recommended projects and infrastructure improvements. Inventorying and monitoring truck movements allows the North Central Texas Council of Governments to review the impact of proposed projects on the movement of freight so that those effects may be considered during project selection. As additional and more precise data is collected and monitored, commodity flow forecasting models may be used to evaluate changes to the transportation system to enhance long-range planning.

Within the Dallas-Fort Worth region there are five significant truck transportation issues including:

- Inadequate highway infrastructure
- Growing congestion on regional roadways
- Limited productivity gains, specifically the restriction of Longer Combination Vehicles
- Safety issues
- Air quality implications

The region has two main hazardous materials routes, one for transuranic radioactive waste cargo and the other for all other types of hazardous materials. The designated routes can be seen in Exhibit 6.6.

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Exhibit 6.6: Hazardous Materials Truck Routes

In June 2009, staff completed the Truck Lane Restriction Expansion Study for the expansion of truck lane restrictions along IH 20, IH 30, IH 45, and IH 820. The corridors included in this study built upon the test segments along sections of IH 30 in Tarrant County and IH 20 in Dallas County put in place during the Truck Lane Pilot Study in 2005/2006. Exhibit 6.7 illustrates the impact of truck lane restrictions on average speed for vehicles on these segments. On October 29, 2009, the Texas Transportation Commission approved the expansion of truck lane restrictions within the region; these expanded restrictions were operational by summer 2010. The long-term plans for expanding the network of truck lane restrictions within the region are included in Appendix E.

<table>
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<tr>
<th>Lane</th>
<th>Without Truck Lane Restrictions (Standard Enforcement) mph</th>
<th>With Truck Lane Restrictions (Standard Enforcement) mph</th>
<th>Change in Average Speed mph</th>
</tr>
</thead>
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<td>72.4</td>
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</tr>
<tr>
<td>Middle</td>
<td>65.6</td>
<td>66.2</td>
<td>0.6</td>
</tr>
<tr>
<td>Right</td>
<td>60.8</td>
<td>61.3</td>
<td>0.5</td>
</tr>
</tbody>
</table>

Exhibit 6.7: Analysis of Truck Lane Restrictions

Summary
From the Dallas-Fort Worth region, goods are moved, transferred, and distributed to destinations across the United States and around the world via truck, train, and aircraft. Making accommodations and planning for freight is crucial to the region’s economy and is a vital element to consider in multimodal transportation planning. Mobility 2035 recommends a variety of polices, programs, and projects to support the efficient, safe, and reliable movement of freight in the region.

See Appendix E for a complete listing of policies, programs, projects, and maps related to freight.

Active Transportation

Mobility 2035 Supported Goals
- Improve the availability of transportation options for people and goods.
- Preserve and enhance the natural environment, improve air quality, and promote active lifestyles.

Introduction
Active transportation, or bicycle and pedestrian elements, is an integral component of Mobility 2035. In a rapidly growing region that has limited resources available to expand the existing transportation system, planning efforts have shifted from expansion to maintaining and enhancing the existing system. Active transportation offers numerous options to improve our existing transportation system efficiently and cost effectively through a variety of systematic enhancements while simultaneously providing benefits to all road users.

The automobile has dictated investments in transportation facilities over the past several decades. However, in recent years we have become increasingly aware of the effects of these decisions in the Dallas-Fort Worth region, from congestion and poor air quality due to increased vehicle miles traveled, to chronic disease and obesity as a result of limited facilities that encourage active transportation options such as bicycling and walking. In a region that is culturally diverse, ranging from low-income populations to individuals with disabilities, it is important to remember that bicycling and walking are the primary forms of independent mobility for many residents. Bicycling and walking are legitimate forms of transportation that have the potential to positively impact the region by shifting travel modes resulting in reduced congestion and improved air quality and public health.

According to the 2001 National Household Travel Survey, in urban areas 50 percent of all trips were less than three miles and 28 percent of all trips were less than one mile. These trips are ideal for biking, walking, transit, or a combination of these alternative modes of travel. By encouraging investments in facilities that support these forms of transportation, the region increases the potential to shift community members to walk or bike for short trips. This could have significant impacts on a

Active Transportation at a Glance:
Active travel is an important element in the regional transportation system. The following goals form the cornerstone of the active transportation recommendations, and were developed in coordination with the Bicycle and Pedestrian Advisory Committee and various stakeholders throughout the region. The policies, programs, and projects identified in this section aim to realize these goals for the region.

Increase accommodation and planning for active transportation.
Promote the integration of complete streets, context sensitive solutions, and other relevant initiatives into roadway planning, design, implementation, and maintenance policies so that all roadways safely accommodate all users including bicyclists, pedestrians, transit riders, children, older individuals, disabled individuals, and motorists.

Improve safety and mobility for active transportation.
Improve safety for active travel by increasing education and training opportunities for cyclists, pedestrians, motorists, and professionals who are designing and implementing roadway facilities, implementing safety infrastructure projects, and by promoting enforcement of traffic laws to reduce bicycle and pedestrian-related conflicts.

Increase active travel in the North Central Texas Council of Governments’ region as an alternative to motor vehicle trips.
Increase active travel for all trip purposes through consistent support of programs and infrastructure projects that address the five Es:
- **Engineering**: Refers to changes to the built environment through engineering improvements.
- **Education**: Outreach campaigns that disperse information in a variety of formats in an effort to increase the effectiveness of bicycle and pedestrian facilities.
- **Encouragement**: Seeks to alter social norms and offer incentives for community members to utilize active transportation facilities.
- **Enforcement**: Programs that target unsafe driving behaviors and reinforce safe walking and bicycling behaviors.
- **Evaluation**: A critically important component in determining the scope and success of a project as it establishes baseline data that can be compared to project results.

The five Es apply to all active transportation components and are all equally important in determining the long-term success of a project.
region that has ozone levels that in 2010 were classified as nonattainment by the Environmental Protection Agency.

The current levels of active transportation in the NCTCOG region (shown in Exhibit 6.8 below) may not reflect the potential it has, but are indicative of the existing commuting modes of a region that has largely focused on motorized transportation. An integrated active transportation infrastructure system is essential in increasing the levels of trips taken by non-motorized transportation.

To realize the potential of active transportation, special attention should be paid to the current barriers this region is experiencing. These include the lack of a complete network of bicycle and pedestrian facilities, consistent design guidelines, funding, regional continuity, and the lack of importance placed on bicycle and pedestrian transportation in public agency planning and federal funding programs. In addition, land use and the built environment play a crucial role to the success of active transportation. While it is often thought that transportation facilities should move people from A to B, what happens between A and B is often just as significant. Therefore, this section seeks to address these barriers and offer a variety of solutions in an effort to support and advance active transportation in the NCTCOG region.

### Active Transportation Planning Efforts

As federal and state directives begin to place a greater importance on accommodating the needs of bicyclists and pedestrians, including more closely examining the use of waivers to exclude bicycle and pedestrian accommodations based solely on funding or right-of-way constraints, NCTCOG’s role is to further support such directives.

Historically, bicycle and pedestrian planning and policies have been established at the local level. While that remains largely true, planning at the regional level provides an opportunity to improve coordination and connectivity between communities and across borders. NCTCOG serves as an information clearinghouse for bicycle and pedestrian data and has a variety of initiatives that ensure and reinforce regional coordination. In addition, the Bicycle and Pedestrian Advisory Committee (BPAC) was assembled to provide technical expertise, public outreach support, review of regional bicycle and pedestrian planning, and assistance in the selection of bicycle and pedestrian projects funded by the Regional Transportation Council and the Executive Board of NCTCOG on an as-needed basis. Regularly scheduled BPAC meetings provide an opportunity for local governments to share best practices, success stories, and discuss common issues in an effort to improve local initiatives and enhance regional coordination.

### Bicycle and Pedestrian Planning at the Federal Level

Since 1999, Federal Statutes have mandated that MPOs include bicycle and pedestrian facilities in the overall Metropolitan Transportation Plan. In addition, in 2005, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) mandated that “the metropolitan planning process for a Metropolitan Planning Area shall provide for consideration of projects and strategies that will increase the safety and security of the transportation system for non-motorized users and enhance the integration and connectivity of the transportation system, across and between modes.”

The US Department of Transportation (DOT) has become increasingly active in their recommendations to accommodate bicyclists and pedestrians and funding opportunities to facilitate these accommodations. As the US DOT continues to offer direction on active transportation, it will become an increasingly important component in transportation planning and design at the state, regional, and local levels.
Bicycle and Pedestrian Planning at the State Level

The Texas Department of Transportation (TxDOT) has long supported the integration of bicycle and pedestrian facilities into the overall transportation system. Beginning in 1992, the Intermodal Surface Transportation Efficiency Act of 1991, Section 1033, required state DOTs to designate a state bicycle and pedestrian coordinator. In 2001, TxDOT appointed district bicycle coordinators to ensure that bicycles are acknowledged as a viable mode of transportation on roadway facilities where use by bicyclists is feasible. Texas Statute now requires both a state coordinator and coordinators in each regional office.

Additionally, TxDOT has updated relevant planning documents and design manuals that outline bicycle and pedestrian requirements and recommendations as listed in Exhibit 6.9.

Exhibit 6.9: State of Texas Bicycle and Pedestrian Transportation Guidance

The Transportation Enhancement (TE) Program – formerly referred to as the Statewide Transportation Enhancement Program – is a federally funded program administered by TxDOT which allocates funds to non-traditional transportation related activities. To be eligible for TE funds, projects must demonstrate a relationship to the surface transportation system and incorporate at least one of 12 categories, one of which is bicycle and pedestrian facilities. The TE Program is the largest funding initiative for bicycle and pedestrian facilities administered by TxDOT. These collective actions formalize the state’s commitment to include, accommodate, and consider the needs of bicyclists and pedestrians in the transportation planning, design, and implementation processes.

Bicycle and Pedestrian Planning at the Local Level

Cities and counties within the NCTCOG region are responsible for the planning, development, and implementation of bicycle and pedestrian transportation infrastructure and amenities within each respective city and county. While NCTCOG plans for bicycling and walking facilities in coordination with local cities and counties, it is ultimately up to local governments to determine feasibility and ensure implementation of said planning efforts. While several local governments in the Dallas-Fort Worth region have adopted bicycle master plans, not all have had the necessary resources to undertake such a plan. Therefore, in May 2010, NCTCOG partnered with the city of Dallas to update the “1985 Dallas Bike Plan”. As part of this initiative, a regional template will be designed for local governments to adopt “in lieu of” their own city- or county-wide plan upon its completion. The regional template will offer facility design guidelines, best practices, and emerging innovations in bicycle and pedestrian transportation. While this plan will not identify specific locations for facilities within a jurisdiction, it will identify ideal roadways for each facility type and roadway types that are best suited for bicycle and pedestrian transportation.

Bicycling

Many local cities and counties have developed bicycle master plans, trail master plans, or a combination of both, resulting in a hiking and biking plan. In addition, many cities have adopted policies at the local level to enforce and encourage bicycling as a legitimate form of transportation. These documents are used in regional planning efforts to ensure regional connectivity and continuity. There are many components that should be considered in advancing bicycle transportation. The majority of these issues are discussed in the following sections.

Types of Bicyclists

As part of the planning, design, and implementation of roadway treatments for bicyclists, the needs of all bicyclists should be addressed. Roadway treatments should accommodate existing bicyclists and encourage increased bicycle use; therefore, any roadway treatments intended to accommodate bicycle use must address the needs of both experienced and less experienced riders. Bicyclists are
typically grouped into one of three riding styles: Group A – Advanced, Group B – Basic, and Group C – Children.

**Group A – Advanced Bicyclists**
- These are experienced riders who can operate under most traffic conditions.
- They prefer direct access to destinations via the existing street and highway systems and like to operate at maximum speed with minimum delays.
- They favor sufficient operating space on the roadway or shoulder to reduce the need for either the bicyclist or the motor vehicle operator to change position when passing.

**Group B – Basic Bicyclists**
- These are casual or new adult and teenage riders who are less confident of their ability to operate in traffic without special provisions for bicycles.
- They prefer comfortable access to destinations, usually by a direct route, using either low-speed, low traffic-volume streets or designated bicycle facilities.
- They favor well-defined separation of bicycles and motor vehicles on arterial and collector streets or separate bike paths.

**Group C – Children**
- These are pre-teen riders whose roadway use is initially monitored by parents.
- They prefer residential streets with low motor vehicle speed limits and volumes.
- They typically need access to key destinations surrounding residential areas, including schools, recreation facilities, shopping, or other residential areas.
- They favor well-defined separation of bicycles and motor vehicles on arterial and collector streets or separate bike paths.

**Types of Facilities**

To facilitate bicycle travel on roadways, facility types are generally grouped into one of three classes: Class I Bikeways, Class II Bikeways, and Class III Bikeways. It is emphasized that the designation of bikeways as Class I, II, and III should not be construed as a hierarchy of bikeways; that is, that one is better than the other. Each class of bikeway has its appropriate application.

**Class I Bikeway**
Typically called a bike path, a Class I Bikeway provides bicycle travel on a paved right-of-way completely separated from any street or highway. Generally, bike paths should be used to serve corridors not served by streets and highways or where wide right-of-way exists, permitting such facilities to be constructed away from the influence of parallel streets. Bike paths should offer opportunities not provided by the road system. They can either provide a recreational opportunity, or in some instances, can serve as direct high-speed commute routes if cross flow by motor vehicles and pedestrian conflicts can be minimized. Another common application of Class I facilities is to close gaps to bicycle travel caused by construction of freeways or because of the existence of natural barriers (rivers, hills, etc.).

Examples of Class I Bikeways include:
- Shared-use paths
- Sidepaths

It is important to note that bicycles are permitted on all roads in the State of Texas (with the exception of access-controlled freeways or where otherwise explicitly prohibited by law). The designation of certain roads as Class II or III bicycle facilities is not intended to imply that these are the only roadways intended for bicycle use, or that bicyclists should not be riding on other streets. Rather, the designation of a network of Class II and III on-street bikeways recognizes that certain roadways are optimal bicycle routes for reasons such as safety, directness, or access to significant destinations.

**Class II Bikeway**
Often referred to as a bike lane, a Class II Bikeway provides a striped and stenciled lane for one-way travel on a street or highway. Bike lanes are established along streets in corridors where there is significant bicycle demand and where there are distinct needs that can be served by them. The purpose should be to improve conditions for bicyclists in the corridors. Bike lanes are intended to delineate the right-of-way assigned to bicyclists and motorists and to provide for more predictable movements by each.
Examples of Class II Bikeways include:
- Bike lanes
- Buffered bike lanes
- Cycle tracks
- Climbing lanes

Class III Bikeway
Generally referred to as a bike route, a Class III Bikeway provides for shared use with motor vehicle traffic and is identified by signing and/or pavement markings. Bike routes are shared facilities which serve either to: 1) provide continuity to other bicycle facilities (usually Class II Bikeways) or 2) designate preferred routes through high demand corridors. As with bike lanes, designation of bike routes should indicate to bicyclists that there are particular advantages to using these routes as compared with alternative routes. Normally, bike routes are shared with motor vehicles. The use of sidewalks as Class III Bikeways is strongly discouraged.

Examples of Class III Bikeways include:
- Signed bike routes
- Shared lane markings
- Paved shoulders

Design Guidelines
Well-designed bicycle facilities are those that are safe, attractive, convenient, and easy to use. They minimize user conflicts and promote good riding habits. As such, well-designed facilities are popular community amenities and are heavily used. Poor bicycle facilities are those that few use, are used irresponsibly because of poor design, or have not been designed for ease of maintenance. Inadequate facilities discourage users from bicycling on a regular basis, waste money and resources, and make future bicycle improvements less favorable with the general public. The best way to ensure good facility design is to include the needs of bicyclists at the inception of a transportation project or improvement so that the bicycle improvement is integrated into the total design of the project. Design guidance at the national and state level encourages the development of bicycle facilities according to the recommendations established by American State Highway and Transportation Officials and TxDOT. For the latest guidance, consult the appropriate organization’s Websites.

There are various other documents that should be consulted during the design and development process, including city and county roadway design manuals, and other relevant planning and design manuals as applicable. These guidelines are required on federal and state roadways, and on roadways constructed with federal or state funding initiatives. Recommendations at the regional level follow the aforementioned national and state guidelines. In addition, as previously mentioned, a Regional Design Guideline document will be produced in the future through coordination with the Dallas Bike Plan and NCTCOG bicycle and pedestrian planning efforts. This document will outline bicycle and pedestrian facility recommendations in more detail in an effort to follow state and federal directives, and provide for continuity of facilities within the region. It is important to note that variations exist among the design guidelines for bicycle facilities and therefore a range of options may be considered. In addition, certain design guidance relies on an engineer’s best judgment and final decisions are based on location and other relevant circumstances at the local, state, and/or federal level(s). Different types of streets and their associated characteristics necessitate different types of bikeway designs. Different design treatments need to be considered for arterial streets, collector or minor arterial streets, and local streets. A detailed table outlining specifics of the facility types is presented in Exhibit E.1 of Appendix E, as well as information related to innovative bicycle facilities and facility implementation.

Additional Considerations
The planning, design, and implementation of bicycle facilities remains the strongest indicator for bicycle transportation. However, there are several other components that should be considered for a successful bicycle system including bicycle end-of-trip facilities, maintenance activities, and signal operations for bicyclists, each of which is discussed in further detail in the following sections.

End-of-Trip Facilities
The term bicycle end-of-trip facilities refers to parking and complementary infrastructure for bicycles.

Bicycle Parking Infrastructure: Includes stands or racks that support bicycles and shelters or enclosures that protect parked bicycles from vandalism, theft, and the elements.
**Complementary Infrastructure:** Includes lockers for stowing helmets, bicycle clothing, and other personal belongings; change rooms and showers; air pumps; and sometimes even bicycle parts and maintenance shops. Public-private partnerships are encouraged to provide complimentary infrastructure at major destinations such as employment and shopping centers, transit stations, schools, etc.

**Maintenance Activities**
On-street bicycle facilities require maintenance activities similar to those that apply to vehicular roadway facilities. There has been a long-standing debate on the practicality of on-street bicycle facilities due to the lack of regular maintenance provided by municipalities for these facilities including routine sweeping of bike lanes. However, when routine maintenance is provided for these facilities, there is a general consensus that on-street facilities are greatly favored over the alternative.

**Signal Operations for Bicyclists**
Signal operations for bicyclists is a major issue as many traffic signals are not set to detect bicyclists. All signals on roadways that allow bicycle travel should be set to detect bicyclists, either through setting adjustments (new signals) or through the installation of a bicycle detector in the pavement (older signals).

**Recommended Off-street Network: The Regional Veloweb**
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 Veloweb serves as the regional expressway for bicycle transportation. Facilities of this type have a proven track of attracting users and provide recreational, air quality, health, economic development, and mobility benefits to communities across the nation.

Linking high quality facilities together to provide intraregional routes which favor bicycle travel will encourage increased use of the bicycle for utilitarian trip purposes. The primary design considerations of the Veloweb include:

- Minimum 12-foot width for heavily traveled shared-use paths.
- 16- to 24-foot Veloweb sections or separated facilities for pedestrians and bicyclists may be warranted along portions of the Veloweb experiencing high-peak pedestrian volumes due to the proximity to transit stations, sporting events, and/or other major venues; Veloweb sections should be sized with a pedestrian level of service analysis to meet those demands.
- Markings and travel speed to meet minimum safety standards for simultaneous bicycle and pedestrian traffic.
- Long-lasting impervious surface.
- Grade-separated crossing of roadways with significant traffic flows.
- Traffic circle intersections with minor roadways where conflicts are a concern.
- Few, if any, signalized or stop sign intersections.
- Easy access from roadways, particularly on-street bicycle facilities.
- Easy access to common trip destinations.

Every section of the Regional Veloweb may not achieve all these elements, but each is an important consideration in providing a favorable bicycle route for utilitarian trips.

**Analysis**
The original Regional Veloweb map was developed in 1997 based on an extensive study conducted by the NCTCOG Bicycle and Pedestrian Transportation Task Force.

In 2008, work began to update the Regional Veloweb alignments based on feedback received by local governments and community members and the general need to reassess the functionally and alignment of the Veloweb.

**Results**
The results of the Regional Veloweb update include approximately 1,024 miles of added facilities, bringing the total Veloweb to approximately 1,668 miles. For a detailed breakdown of the facilities, please refer to Exhibit 6.10.

Additionally, connections to over 60 cities and 6 counties that did not have previous Veloweb connections were identified, as illustrated in Exhibit 6.11.
### Facility Miles

<table>
<thead>
<tr>
<th>Facility</th>
<th>Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regional Veloweb, Existing</td>
<td>237</td>
</tr>
<tr>
<td>Regional Veloweb, Funded</td>
<td>31</td>
</tr>
<tr>
<td>Regional Veloweb, Planned</td>
<td>1,400</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,668</strong></td>
</tr>
</tbody>
</table>

*Exhibit 6.10: Regional Veloweb Miles by Facility Status*

### 1997 Regional Veloweb 2011 Regional Veloweb Update

<table>
<thead>
<tr>
<th></th>
<th>1997 Regional Veloweb</th>
<th>2011 Regional Veloweb Update</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>644</td>
<td>1,668</td>
</tr>
<tr>
<td>Cities</td>
<td>50</td>
<td>116</td>
</tr>
<tr>
<td>Counties</td>
<td>4</td>
<td>10</td>
</tr>
</tbody>
</table>

*Exhibit 6.11: 1997 and 2011 Regional Veloweb Facility Connections*

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**Exhibit 6.12** indicates locations for the Regional Veloweb. For an inventory of trails included as part of the Regional Veloweb, please refer to Appendix E.

### Recommended Veloweb Projects

Recommended routes and trails included in the Regional Veloweb are considered high priority projects and are often used as part of the evaluation process when funding becomes available for various Regional Transportation Council programs.

### Costs

Costs will vary along different sections of the Veloweb. Numerous sections of the Veloweb are already constructed, programmed, or expected to be funded through a variety of funding sources. Some sections may require extensive bridgework while others may not require any. Additional costs for landscaping and amenities such as lighting and maintenance are not calculated into the overall Veloweb construction costs of $800,000 per mile. *Exhibit 6.13* outlines estimated costs for the Regional Veloweb.

The total funding required to complete all Regional Veloweb projects is estimated at $1.12 billion. A variety of funding sources that can be utilized to implement bicycle and pedestrian transportation projects, including those identified as part of the Regional Veloweb, are further outlined in Exhibit E.2 of Appendix E. These funding programs have varying funding cycles and apply to projects in various stages of development. Additional considerations related to costs for the Regional Veloweb can be found in Appendix E.

### Walking

Pedestrian facilities are unique facilities that must accommodate a wide variety of user types, needs, and abilities. Pedestrians also tend to be the most vulnerable road users; therefore, special attention should be paid to pedestrian facility design.
and implementation to increase the safety and effectiveness of these facilities as all users are pedestrians at some point in each journey. In addition, the Americans with Disabilities Act of 1990 mandates guidelines for public buildings and facilities for users with disabilities.

Specific pedestrian design guidelines included in the following documents are often utilized by local governments within the North Central Texas region: the US Department of Justice 2010 Americans with Disabilities Act Standards for Accessible Design, the federal Americans with Disabilities Act Accessibility Guidelines, Texas Accessibility Standards, and the Manual on Uniform Traffic Control Devices. It is important to note that variations exist among the federal, state, and local codes relevant to design guidelines for pedestrian facilities, and new construction and improvements are required to comply with the code that offers the greatest access or protections to individuals with disabilities. Examples of items that should be considered related to pedestrian access include:

- Pedestrian sidewalks
- Curb ramps
- Pedestrian signals
- Signal timing
- Accessible pedestrian signals
- Pedestrian crosswalks
- Maintenance of pedestrian facilities

Policies, Programs, and Performance Indicators
The following policies and accompanying policy actions, programs, and performance indicators are intended to support and advance active transportation within the NCTCOG region. Each element plays an integral role in meeting shared regional goals and needs, from the policies that guide decision-making processes, to the programs that compose the framework, to the performance measures that maintain accountability.

**Mobility 2035 Policies and Policy Actions**
The following policies are broad in language, but have the ability to guide decision-making processes with the support of the accompanying policy actions. The policy actions are intended to represent strategies that can be utilized to further implement the overarching policies.

**BP3-001: Promote bicycle and pedestrian transportation, safety, and education.**
- **Policy Action 3-001.1:** Through the NCTCOG Bicycle Pedestrian Advisory Committee, provide continued guidance on the use of bicycle-friendly designs and innovative treatments through updates to a regional bicycle facility design manual and through other means of communication with local jurisdictions.
- **Policy Action 3-001.2:** Encourage reallocation of roadway rights-of-way where appropriate to accommodate bicycling and walking and bicycle and pedestrian facilities.
- **Policy Action 3-001.3:** Support and create programs that educate bicyclists, pedestrians, and the general public about bicycle operation, bicyclists’ and pedestrians’ rights and responsibilities, and lawful interactions between motorists, bicyclists, and pedestrians.
- **Policy Action 3-001.4:** Support and create marketing and public awareness campaigns aimed at promoting bicycling and walking and improving safety.
- **Policy Action 3-001.5:** Support Bike to Work Month promotional activities and events.
- **Policy Action 3-001.6:** Monitor and evaluate the North Central Texas region’s bicycling and walking efforts by collecting bicycle and pedestrian count data, collecting bicycle and pedestrian crash data, conducting a regional non-motorized travel survey, and publishing findings.
- **Policy Action 3-001.7:** Support programs aimed at increasing bicycle and walking trips by providing incentives, recognition, or services that make bicycling and walking more convenient transportation modes.
- **Policy Action 3-001.8:** Encourage enforcement efforts that target unsafe bicyclist, pedestrian, and motorist behaviors and the enforcement of laws that reduce bicycle/motor vehicle and pedestrian/motor vehicle collisions and conflicts.
Policy Action 3-001.9: Encourage local jurisdictions to install end-of-trip facilities within the public right-of-way and on public property, and incentivize building owners and employers to provide end-of-trip facilities where density warrants.

Policy Action 3-001.10: Encourage local jurisdictions to adopt bicycle parking ordinances and zoning standards that are conducive to encouraging bicycle and pedestrian modes of travel.

Policy Action 3-001.11: Provide current and relevant information to bicyclists and pedestrians regarding existing and planned facilities, existing bicycle and pedestrian amenities, and safety and education throughout the region through a variety of formats.

Policy Action 3-001.12: Encourage development of local bicycle and pedestrian plans.


Policy Action 3-001.14: Encourage local jurisdictions to adopt a Complete Streets policy to include in their general plans.

Policy Action 3-001.15: Provide Complete Streets and other pertinent training to transportation-related professionals.

Policy Action 3-001.16: Provide appropriate bicycle and pedestrian facilities and enhancements as routine accommodations for all new roadway construction or reconstruction.

Policy Action 3-001.17: Support bicycle and pedestrian improvement projects that close gaps, either by implementing specific projects recommended in the plan or through other treatments.

Policy Action 3-001.18: End or strongly curtail the use of waivers for bicycle and pedestrian facility requirements during the development process including implementation of sidewalks at a minimum of five feet wide.

Policy Action 3-001.19: Encourage, fund, and implement local government bicycle and pedestrian projects that connect local facilities to the Regional Veloweb.

Policy Action 3-001.20: Promote consistent signage that directs bicyclists to destinations and increases visibility of the Regional Veloweb per the Manual on Uniform Traffic Control Devices guidelines.

Policy Action 3-001.21: Request local governments include the Regional Veloweb and connections to the Regional Veloweb in the municipal Thoroughfare Plan, Park Plan, and Comprehensive Plan.

Policy Action 3-001.22: Promote the preservation of bicycle and pedestrian access within all roadway rights-of-way, as well as the development of innovative, safety-enhanced on-street facilities.

Policy Action 3-001.23: Support the development of bicycle and pedestrian facilities that provide access to regional and local public transit services wherever possible.

Policy Action 3-001.24: Coordinate with transit providers to ensure accessibility through on-street bicycle facilities and sidewalks, the preservation of right-of-way to support the construction of parallel bicycle and pedestrian facilities within fixed-route transit corridors, and encourage station designs to include end-of-trip facilities.

Policy Action 3-001.25: Continue the RTC Local Funding Program initiatives, including the Local Air Quality and Sustainable Development Funding Programs, which direct funds to local governments to improve and expand bicycle and pedestrian facilities and programs throughout the North Central Texas region.

Policy Action 3-001.26: Encourage local governments to preserve right-of-way for future trail expansion and development, especially in master planned development locations within proximity to the Regional Veloweb network trail system.

Policy Action 3-001.27: New developments, redevelopments, and transit-oriented developments should be responsible to the Regional Veloweb plan and implement new points of access to add continuity to the Regional Veloweb.

Policy Action 3-001.28: Local governments/agencies should modify local transportation plans and standards to provide for on-street bicycle access and connections to off-street trail networks.

Policy Action 3-001.29: Conduct a study of bicycle and pedestrian mobility in all transportation corridor studies, incorporate bicycle and pedestrian modes in corridor studies, and support the funding and construction of bicycle and pedestrian elements of final corridor studies.

Policy Action 3-001.30: Encourage local governments/agencies to provide usable sidewalks whenever there is an installation of American with Disabilities compliant curb ramps for any traffic intersection improvement project.

F3-002: Incorporate sustainability and livability options during the project selection process. Include additional weighting or emphasis as appropriate and consistent with RTC policy objectives including, but not limited to, demand management, air quality, natural environment preservation, social equity, or consideration of
transportation options and accessibility to other modes (such as freight, aviation, bicycle and pedestrian). *(While this is listed as a financial policy, it has specific implications for the bicycle and pedestrian portion of the plan.)*

**Programs**

Programs form the framework of bicycle and pedestrian initiatives at the regional level. Each program was created to target a specific component to meet regional bicycle and pedestrian transportation goals and needs. Programs can be directly related to funding initiatives such as the Local Air Quality Program, or they can offer support in attaining regional goals and needs such as the Bicycle and Pedestrian Outreach Program.

**BP2-001:** Bicycle and Pedestrian Program: Provide technical support in the area of bicycle and pedestrian planning including coordinating regional planning events, promoting multi-modal planning, assisting with prioritization of funds, and other tasks related to the advancement of bicycle and pedestrian transportation.

**BP2-002:** Spot Improvement Program: Prioritize, fund, and implement projects that connect existing bicycle and pedestrian facilities and improve the efficiency of the entire bicycle and pedestrian network.

**BP2-003:** Bicycle and Pedestrian Outreach: Provide bicycle and pedestrian education and outreach to community members and local governments including, but not limited to, safety and education materials. Continue to support the Bicycle and Pedestrian Advisory Committee.

**BP2-004:** Regional Design Guidelines: Produce regional bicycle and pedestrian design guideline recommendations to improve local and regional conformity and continuity.

**BP2-005:** Special Studies: Include bicycle and pedestrian facility strategies as part of the overall systematic approach in addressing current and future transportation demands in transportation corridor planning.

**BP2-006:** Legislation/Local Law: Improve safety and mobility for bicyclists and pedestrians by supporting and incorporating federal and state directives, as well as implementing policies related to bicycle and pedestrian safety and mobility at the local and regional level.

**BP2-007:** Resources/Research: Collect relevant research materials regarding bicycle and pedestrian transportation to utilize in regional initiatives and provide as resources to local governments and area stakeholders.

**BP2-008:** Public Health: Coordinate with public health associations to improve physical activity within the region. Encourage compact land-use patterns and the development of bicycle and pedestrian facilities.

**BP2-009:** Safe Routes to School (SRTS) Program: Provide information and updates to member governments on the SRTS Program and encourage all municipalities and school districts to adopt a SRTS plan. Encourage the development of non-infrastructure projects in addition to infrastructure projects. Track local SRTS implementation projects that have been selected for funding.

**BP2-010:** Transportation Enhancement Program: Continue to designate bicycle and pedestrian projects as priority and rank projects according to regional criteria for TE funds at the state level. Increase competitiveness of projects at the state level. Track local TE implementation projects that have been selected for funding.

**BP2-011:** Local Air Quality Program: Continue to program implementation funds to bicycle and pedestrian projects that demonstrate an air quality benefit.

**BP2-012:** Regional Veloweb: Prioritize bicycle and pedestrian projects that connect multi-jurisdictions and expand the regional network. Improve coordination, connectivity, and continuity between counties and communities.

**BP2-013:** Sustainability and Livability: Support sustainability and livability initiatives that encourage bicycle and pedestrian transportation.

**BP2-014:** Data Collection and Mapping: Continue and improve data collection and analysis for bicycle and pedestrian facilities, trip characteristics, and injuries/fatalities on roadways and provide to local governments. Continue mapping efforts related to the compilation of the data.

**BP2-015:** Complete Streets: Encourage design guidelines that consider the needs of all roadway users in the planning and development process of a roadway or transportation project, from young to elderly, healthy to disabled, pedestrians to school buses, for new construction and retrofit projects alike.
BP2-016: Access to Rail: Provide accessibility to transit for bicyclists and pedestrians through improved infrastructure and the inclusion of end-of-trip facilities at transit stations.

BP2-017: Pedestrian Facilities: Prioritize, fund, and implement sidewalks and other pedestrian facilities such as crosswalks, median islands, signage, and pedestrian signals as part of all new roadway construction or reconstruction projects, new developments and re-developments, and in high pedestrian traffic locations.

BP2-018: Safety Countermeasures: Prioritize, fund, and implement projects that improve safety for bicyclists and pedestrians including, but not limited to, trail/roadway crossings, intersection improvements, and projects located in high pedestrian and/or bicycle crash areas.

BP2-019: On-street Bicycle Facility Initiative: Provide accessibility to bicyclists through the implementation of appropriate on-street bicycle facilities and enhancements as routine accommodations for all new roadway construction or reconstruction, and encourage the update of local government plans and standards to provide for on-street bicycle access and connections.

BP2-020: Congestion Mitigation and Air Quality Improvement Program/Surface Transportation Program-Metropolitan Mobility: Utilize funds aimed at improving air quality within the region, as well as discretionary funds, to advance bicycle and pedestrian transportation. Track projects that have been selected for funding.

Performance Indicators
In an effort to increase accountability for the active transportation initiatives outlined throughout this section, several performance indicators have been developed. These performance indicators are all considered essential to improve and encourage active transportation in the NCTCOG region. The following is a list of baseline data that will be evaluated to then quantify improvements as specified. Performance indicators will be evaluated in future Metropolitan Transportation Plans.

- Number of bicycle and pedestrian facilities and accommodations within the region.
- Bicycle and pedestrian accessibility to transit, major employers, and other major destinations.
- Bicycle and pedestrian use within the region.

- Number of public outreach materials and resources made available.
- Bicycle and pedestrian facility gaps and missing connections.
- Parks, open space, and bicycle and pedestrian infrastructure and amenities built in an effort to increase physical activity and improve quality of life within the region.
- Amount of local governments that are actively involved in bicycle and pedestrian facility planning, design, and implementation.
- Safety enhancements for bicyclists, pedestrians, and motorists through infrastructure improvements.

Financial
Developing a strategy for implementation of the Regional Veloweb and other regionally significant active transportation projects, and the programmatic components identified earlier in this section, includes a financial assessment of projects and programs. Because the Metropolitan Transportation Plan must be constrained to available financial resources, not all of the desired active transportation improvements can be funded. Mobility 2035 has identified approximately $1.5 billion of potential funding for active transportation improvements between now and 2035. Additional funding opportunities will be pursued as needed. Appendix E, Exhibit E.2 identifies examples of potential federal funding sources for active transportation programs and projects.

In addition to federal resources, there are a number of state, local, and private revenue sources that can be used for active transportation accommodations in Texas. Examples of these potential sources include, but are not limited to:

- State and local general revenue collected through taxes, bond sales, etc.
- The Rails-to-Trails Conservancy
- Developer/impact fees
- “In lieu of” payments
- American Hiking Society’s National Trail Fund
- Bikes Belong Coalition grants
- The Robert Wood Johnson Foundation

Summary
Active transportation is an important element to providing for the region’s diverse transportation needs. While there are numerous advantages including, but not limited to, improving health, the environment, and the economy, these modes of
travel are vastly underutilized within our region. The recommendations made within Mobility 2035 seek to increase active transportation as a viable mode for the residents of North Central Texas.

See Appendix E for a complete listing of policies, programs, projects, and maps related to active transportation.
Public Transportation

Mobility 2035 Supported Goals

- 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 the planning process.
- Preserve and enhance the natural environment, improve air quality, and promote active lifestyles.
- Encourage livable communities which support sustainability and economic vitality.
- Develop cost-effective projects and programs aimed at reducing the costs associated with constructing, operating, and maintaining the regional transportation system.

Introduction

Multiple transportation options are desired by residents in North Central Texas. Public transportation can provide commuters with a safe, reliable, stress-free way to work. In addition, it can assist in serving the transportation needs of people without personal automobiles including the elderly or those with disabilities. The regional financial situation impacts the level of investment that can be made for infrastructure. Transit is no different. The transit authorities are cutting back on future projects due to lower than normal sales tax revenues. Although this may continue in the near term, it is likely that the economy will improve during the life of this transportation plan.

Transit Authorities

Public transportation services throughout the Dallas-Fort Worth Metropolitan Area are provided by small and large transit focused organizations. The three largest organizations include Dallas Area Rapid Transit, Denton County Transportation Authority, and the Fort Worth Transportation Authority. Other more local organizations provide complementary services that coordinate transit operations and human services in less densely populated areas in North Central Texas. There are an additional 80 known public, private, and specialized transportation service

Public Transportation at a Glance:

Transit Authority Statistics

Dallas Area Rapid Transit
Member Cities: 13
1. Addison
2. Carrollton
3. Cockrell Hill
4. Dallas
5. Farmers Branch
6. Garland
7. Glenn Heights
8. Highland Park
9. Irving
10. Plano
11. Richardson
12. Rowlett
13. University Park

Service Area: 689 square miles
Service Area Population: 2.4 million
Source: 2009 National Transit Database

Denton County Transportation Authority
Member Cities: 3
1. Denton
2. Highland Village
3. Lewisville

Service Area: 157 square miles
Service Area Population: 235,000
Source: 2009 National Transit Database

Fort Worth Transportation Authority
Member Cities: 3
1. Blue Mound
2. Fort Worth
3. Richland Hills

Service Area: 350 square miles
Service Area Population: 730,000
Source: 2009 National Transit Database
providers in North Central Texas. This offers residents of the region a variety of options to meet their transportation needs. These providers have differing service areas, hours of operation, client eligibility requirements, and available trip types. In an effort to improve travel across the region, the transit agencies have coordinated their fare structures to provide riders seamless connections between service providers and modes. The following briefly summarizes the largest of the providers.

**Dallas Area Rapid Transit**
Within the nearly 700 square mile Dallas Area Rapid Transit (DART) service area are a broad range of transportation services, from modern bus and rail services to high-occupancy vehicle (HOV)/managed lanes, ridesharing programs, and corporate transportation demand management programs. DART adds and upgrades transit facilities throughout the region by reviewing bus routes to maximize efficiency, especially with regard to the orientation of feeder bus routes to rail station destinations. Local feeder routes improve the potential for increased rail ridership by providing reliable connections from residential areas to rail stations. DART system planners evaluate current routes and design improved cross-town and radial routes to serve current and future rail stations and major destinations. Express routes improve commute time to major destinations by utilizing HOV/managed lanes and major highways with limited stop time. Express routes serve both transit centers and park-and-ride lots. DART consists of 13 member cities who contribute a one cent sales tax for services.

**Denton County Transportation Authority**
Denton County Transportation Authority (DCTA) is a coordinated county transportation authority currently providing service between the cities of Denton, Highland Village, and Lewisville. The service plan includes rail service on the A-train between the cities of Denton and Carrollton which opened in June 2011. Other aspects of the service plan are a park-and-ride transfer network along the rail corridor to connect to all planned services, regional connector bus service as an interim measure where rail service will eventually be implemented, local fixed-route bus services operating in Denton and Lewisville serving the most dense portions of the county, demand response service to member cities for the elderly and disabled, and a local assistance program to help improve traffic mobility in the near term. DCTA is funded by three cities that each pay one-half cent sales tax for services.

**The Fort Worth Transportation Authority**
The Fort Worth Transportation Authority (The T) provides fixed-route bus service, express bus service, and Rider Request services throughout the cities of Fort Worth, Richland Hills, and Blue Mound. These cities contribute a half-cent sales tax for services. The Intermodal Transportation Center provides easy access to The T’s fixed-route bus service and to the Trinity Railway Express. The T operates the Trinity Railway Express jointly with DART to provide regional rail service between Fort Worth and Dallas through the mid-cities.

The Rider Request routes offer the choice of having a bus arrive where and when requested as long as travel is within the route’s designated service area. The T’s Mobility Impaired Transportation Service (MITS) offers door-to-door transportation anywhere within The T’s service area. MITS is a transportation service for persons with a verified disability that prevents them from riding fixed-route bus service.

The T is in the process of conducting a rail corridor analysis for the Tarrant Express rail corridor, formerly the Southwest-to-Northeast rail corridor. This rail line would provide rail access between Fort Worth, Grapevine, and the Dallas/Fort Worth International Airport. The city of Grapevine has agreed to contribute to the project a three-eighth cent sales tax to guarantee rail access for its residents.

**Mobility 2035 Policies**
To implement the public transportation recommendations and to continue the development of programs and projects, policy is needed. A listing of policies is provided in the following text and in Appendix E. As opportunities arise to move projects along towards implementation, innovative techniques related to funding, project staging and phasing, and operations will be utilized.

**TR3-001:** Public transportation needs should be met by existing transportation authorities and providers through a comprehensive, coordinated, and cooperative approach to maximize existing transportation resources. Alternative implementation approaches may be necessary if existing transportation authorities and providers are unable to provide needed services in a timely manner (consistent with RTC Policy P09-03).

**TR3-002:** Work with the region’s existing public transit providers to ensure a seamless multimodal transit system through:
Mobility Options

Mobility 2035: The Metropolitan Transportation Plan

6.26

- Seamless connections
- Coordinated fare structure
- One-stop access to services
- Standardization of assets, technologies, and service characteristics that promote interoperability
- Improved interaction between public, private-for-profit, and private-non-profit transit providers (consistent with RTC Policy P09-03)
- Elimination of gaps in service to establish a minimum level of service
- Service expansion

TR3-003: Existing public use rights-of-way should be monitored for appropriate public transportation service.

TR3-004: Transportation authority members who receive funds for the implementation of projects that promote transit accessibility will be required to pay back funds, as determined by the RTC, should the entity choose to not continue as a member of that authority.

TR3-005: Support the planning and development of high/higher speed rail and additional interregional passenger rail corridors including state and federal initiatives as appropriate.

TR3-006: Maximize the efficient use of public transportation resources in North Central Texas including public, private-non-profit, and private-for-profit providers of services.

TR3-007: Implement safety, management and operations, and multimodal system integration projects and programs as appropriate.

TR3-008: Establish policies and procedures that encourage and reward coordination.

TR3-009: Support efforts to make accommodations for rail and other public transportation services to major event centers during special events.

TR3-010: Support efforts by transit authorities to secure funding through local, state, federal, and other sources for the development and implementation of public transportation including the Federal Transit Administration’s New Starts Program.

Types of Public Transportation

Public transportation services are provided by several distinct modes. These include rail, high/higher speed rail, bus, bus rapid transit, and other transit modes.

Rail

The rail mode is comprised of many different types of vehicle technologies. Rail serves an important part of moving people around, to, and through the region. Some technologies are used to move people very short distances while other technologies are used to move people significantly longer distances. The speeds, station spacing, and propulsion vary as well. This plan identifies the most reasonable vehicle technology in its recommendations. Exhibit 6.14 outlines the different rail technologies in Mobility 2035. As the recommended projects are developed further, the use of a specific vehicle technology, station locations, and specific alignments may change. The location of rail stations do not represent specific recommendations, but are used for analysis purposes to indicate transportation needs. New facility locations also indicate transportation needs and do not represent specific alignments. Corridor specific design and operational characteristics and funding for the intercity passenger, regional passenger, and freight rail systems will be determined through the project development process.

High/Higher Speed Rail

The recommendations for Mobility 2035 include high/higher speed rail in the region. Although some of the planning work will be done between major metropolitan areas, Mobility 2035 must prepare for the eventuality of this type of rail in the region. The RTC has discussed where stations would initially be located and identified three points of interest including Fort Worth, Dallas/Fort Worth International Airport, and Dallas. Access includes corridors between North Central Texas and Austin, Houston, Oklahoma City, and Little Rock. The alignment for high/higher speed rail has not been determined for any route. The Federal Railroad Administration identified potential corridors through the High-Speed Intercity Passenger Rail Program, as shown in Exhibit 6.15. TxDOT, through the Texas Transportation Institute, has identified priority corridors for the state. Exhibit 6.16 shows a map prepared for TxDOT in a study titled Potential Development of an Intercity Passenger Transit System in Texas.
### Exhibit 6.14: Types of Passenger Rail Technologies

<table>
<thead>
<tr>
<th>Technology Name</th>
<th>Speed Range (mph)</th>
<th>Station Spacing (miles)</th>
<th>Typical Right-of-Way</th>
<th>Typical Headway (peak/off-peak) (minutes)</th>
<th>Power Source</th>
<th>Estimated Cost per Mile (millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Speed Rail – Express</td>
<td>&gt;150</td>
<td>200</td>
<td>Dedicated, grade separated, no freight sharing</td>
<td>60/60</td>
<td>diesel, electric</td>
<td>$80-$100</td>
</tr>
<tr>
<td>High Speed Rail – Regional</td>
<td>110-150</td>
<td>100</td>
<td>Dedicated, grade separated, minimal freight sharing</td>
<td>60/60</td>
<td>diesel, electric</td>
<td>$80-$100</td>
</tr>
<tr>
<td>Higher Speed Rail</td>
<td>79-110</td>
<td>100</td>
<td>May operate in freight railroad corridors, advanced grade crossing protection required</td>
<td>60/60</td>
<td>diesel, electric</td>
<td>$40-$50</td>
</tr>
<tr>
<td>Intercity Rail (aka Amtrak)</td>
<td>&lt;79</td>
<td>30-100</td>
<td>May operate in freight railroad corridors</td>
<td>Once Daily</td>
<td>diesel</td>
<td>$20-$25</td>
</tr>
<tr>
<td>Regional Rail (aka Commuter Rail)</td>
<td>&lt;79</td>
<td>3.0-5.0</td>
<td>May operate in freight railroad corridors</td>
<td>20/40</td>
<td>diesel</td>
<td>$20-$25</td>
</tr>
<tr>
<td>Light Rail</td>
<td>&lt;60</td>
<td>0.5-2.0</td>
<td>Dedicated, street running</td>
<td>10/20</td>
<td>electric</td>
<td>$60-$70</td>
</tr>
<tr>
<td>Light Rail – New Technology (aka Next Generation Rail)</td>
<td>&lt;79</td>
<td>3.0-5.0</td>
<td>May operate in freight railroad corridors</td>
<td>20/40</td>
<td>diesel, electric</td>
<td>$12-$15</td>
</tr>
<tr>
<td>Streetcar</td>
<td>&lt;30</td>
<td>2 to 3 blocks</td>
<td>Dedicated, street running</td>
<td>10/10</td>
<td>electric</td>
<td>$20</td>
</tr>
</tbody>
</table>

The RTC has identified a need to plan for connections outside of the region but has not selected corridors at this time. Contrasting plans indicate a need for rail service but should be refined to continue the planning process. Flexibility is built into these plans to allow time to refine the vision. Exhibit 6.17 shows a generalized depiction of areas that may be connected in the future by high/higher speed rail.

The connection between Fort Worth, Dallas/Fort Worth International Airport, and Dallas would be a unique corridor providing two types of rail service. It is conceived that when the high-speed rail service is not delivering passengers from points outside the region that a regional rail service could provide service to residents within the region. Using the corridor in this manner could be a cost effective way of providing two different types of services for one overall cost. Exhibit 6.18 shows the high/higher speed passenger rail recommendations for the region that were agreed on by the Regional Transportation Council’s Multimodal/Intermodal/High Speed Rail/Freight Subcommittee.

**Interaction with Freight**

Many of the corridors for which recommendations are identified are in active freight rail corridors. Project sponsors will work with corridor owners to find suitable ways to accommodate passenger rail service in corridors of need. Although passenger rail service is recommended in these corridors, it is not the intent of the RTC to degrade current or future freight rail service, but to enhance the transportation options for the traveling public. Negotiations between the freight rail service and passenger rail service providers will explore many options to implement passenger rail and maintain freight rail service.

**Bus**

The bus system recommendations assume a mature bus system throughout the transportation authority service areas. This includes local and/or express buses...
designed to utilize the HOV/managed lanes and service rail stations, park-and-ride locations, and transfer centers which are ultimately included in transit recommendations. Exhibit 6.19 provides a breakdown of typical bus service types utilized in this plan. The location and timing of buses depend on the location of people and business and can change as needed to meet system and community needs. The transit authorities are responsible for bus route planning and modifications. Transit system improvements, expansions, and management and operations remain important to the Dallas-Fort Worth Metropolitan Area. Efforts will be made to improve bus stop amenities like shelter, lighting, and benches. Bus stops should provide a basic level of service that improves the transit experience. The need for a seamless transit system in North Central Texas is very important. A seamless system would include interaction between all modes of public transit from passenger rail to vanpools. A supplemental bus system is anticipated to complement the rail routes.

Bus Rapid Transit
Bus Rapid Transit (BRT) is a service type that can be in a fixed guide-way similar to a rail line with the flexibility to utilize the existing roadway when needed. Decreased travel times are achievable by signal prioritization, priority queuing, and a fixed guide-way. BRT buses are typically different from the rest of the fleet and are more like a passenger rail vehicle. BRT has a wide range of applications. BRT may provide a staged approach financially and physically to future fixed-rail guide-way systems. BRT routes are more regional in nature and are therefore included in the public transportation recommendations for Mobility 2035.

Other Rail Modes
Although the recommendations made in this section identify specific vehicle technologies, they are not intended to be the only technologies explored for implementation. The MPO encourages other modes as long as they fit into the policies set forth by the RTC and provide the seamless interconnectivity desired.

There may be opportunities to improve accessibility and circulation to localized areas and reduce demand on the roadway system. Potential locations include hospital districts, large retail areas, and the concentration of education facilities. Specific modes are not indicated in this plan and implementation would promote a seamless public transportation system.
Automated People Mover
There are currently two Automated People Movers (APMs) in the region, one at Dallas/Fort Worth International Airport called SkyLink and the other in Las Colinas in Irving. The APMs are computer controlled to serve specific points along a given route. These routes are elevated and are always in dedicated rights-of-way.

Expansion of these systems and development of other systems are encouraged in the region. Potential exists in areas with high congestion and an inherent need to move people around quickly.

Monorail
Monorail is a technology that has not yet been implemented in the Dallas-Fort Worth area. Similar to APM in many respects, it is designed for longer distances and to carry more people. There is potential for pilot studies and test tracks in the region for this type of technology for both passenger and freight services.

Financial
Funds needed to implement the public transportation recommendations come from various sources including state, federal, local sales taxes, fare box, and private funds. Total project costs for each rail corridor have been estimated and coordinated with local transit authorities. The total cost, shown in Exhibit 6.20, for the rail and bus systems are $17.4 billion and $1.5 billion, respectively. Cost components include, but are not limited to, vehicles, track, rail stations, bus stops, and right-of-way. Additionally, transit authorities will continue to update the system as a whole with improvements that provide better accessibility and mobility for passengers. For more information on transportation funding, see the Financial Reality chapter.

<table>
<thead>
<tr>
<th>Type</th>
<th>Typical Right of Way</th>
<th>Number of Stops</th>
<th>Route Length (miles)</th>
<th>Bus Stop Amenities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Express</td>
<td>Freeway and HOV/managed lanes</td>
<td>1-2</td>
<td>&gt;15</td>
<td>Park-and-ride locations</td>
</tr>
<tr>
<td>Bus Rapid Transit</td>
<td>Dedicated or street running</td>
<td>Limited</td>
<td>10-15</td>
<td>A range between bus shelters to light rail station elements</td>
</tr>
<tr>
<td>Local Bus (aka Fixed Route)</td>
<td>City streets</td>
<td>Numerous, depends on length of route</td>
<td>varies</td>
<td>Limited, some with shelters</td>
</tr>
<tr>
<td>On-demand</td>
<td>City streets</td>
<td>Limited, as needed, coordinated with other requests</td>
<td>Dependent on location of pick-up and drop-off</td>
<td>N/A</td>
</tr>
<tr>
<td>Flexible Route</td>
<td>City streets</td>
<td>Numerous, depends on length of route, allows for deviation from published route</td>
<td>Varies</td>
<td>Limited, some with shelters</td>
</tr>
<tr>
<td>Paratransit</td>
<td>City streets</td>
<td>Limited, as needed, coordinated with other requests</td>
<td>Varies</td>
<td>N/A</td>
</tr>
<tr>
<td>Elderly and Disabled</td>
<td>City streets</td>
<td>Limited, as needed, coordinated with other requests</td>
<td>Varies</td>
<td>N/A</td>
</tr>
</tbody>
</table>
### Mobility Options Mobility 2035: The Metropolitan Transportation Plan

<table>
<thead>
<tr>
<th>2010-2035 (Actual $, M)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rail Capital and System Expansion</td>
<td>$17,391</td>
</tr>
<tr>
<td>Bus Capital</td>
<td>$1,484</td>
</tr>
<tr>
<td>Paratransit Capital</td>
<td>$24</td>
</tr>
<tr>
<td>Transit Operations/Maintenance</td>
<td>$17,135</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$36,034</strong></td>
</tr>
</tbody>
</table>

**Exhibit 6.20: Total Costs – Rail and Bus**

Fare integration between transit authorities would promote continuation of service use for passengers. The recommendations identified in this plan reflect a robust future rail system that reaches many parts of the region.

**RAPID Card**

The RAPID Card (Regional Area Access/Payment Interchange Device) is a device that provides for improved transit fare collection methods and development of an intelligent regional transportation system based upon accurate real time, user data provided via the RAPID Card. The implementation of a RAPID Card system is important to optimize the transportation system for all forms of public transportation and associated transportation services. Potential select retail opportunities coupled with the card would enhance its use and effectiveness for users. The intermodal and retail implementation of this device has been in place for the past decade in other global metropolitan transportation systems.

The implementation of the RAPID Card system would be needed for optimization of fare structuring specifically for the Cotton Belt corridor but may be used system wide. The usage of the RAPID Card would enable implementation of a differential fare system that may include variables like distance, destination, time of day, passenger characteristics (student, disabled, economically disadvantaged, etc.), or regional equity (in-system resident or out-of-system resident).

The regional optimization of transportation systems via the RAPID Card could include, but not be limited to, public transportation, toll systems, parking concessions (cities, Dallas/Fort Worth International Airport, and DART station areas), retail vendors (station areas, card recharge locations, rental vehicle concessions, etc.), taxis, and limousines. Some agencies within the region have been approached by providers of this type of system. These potential vendors have expressed interest in analysis and provision of systems concessionaire financing opportunities.

**Recommendations**

Technical tools are used to determine route ridership in the recommended corridors. Certain route attributes like station location, speed, and type of technology are assumed to measure route potential. Station locations do not represent specific locations unless identified from a completed study, but are used for analysis purposes to indicate transportation needs. The recommended rail system and its various components are shown in Exhibit 6.21. Additionally, Appendix E provides a rail rate ridership map that shows the number of riders forecasted on the rail system. Approximately 460 miles of rail is identified in these recommendations. Of that, 117 miles are existing service, 81 miles are programmed projects and projects currently under development, and the remaining 265 miles are projects utilizing funding identified through other sources. Corresponding tables describing recommendations by corridor, limits, and mode are shown in Appendix E.

**Management, Operations, and Other System-wide Improvements**

The funding of management and operations, transit system improvements, and expansions are included as part of the development of specific recommendations of Mobility 2035, and of the entire transit system as a whole, including the existing rail, bus, and paratransit networks. Project examples would include, but are not limited to, double tracking, rail station improvements, bus stop improvements, and system modernization and safety improvements for the system and rail/road crossings.

**Transit Operations and Human Services Coordination**

The goal of the Transit Operations and Human Services Coordination is to work with local governments and transportation providers to move toward more coordinated, efficient, environmentally friendly, and accessible transportation services that eliminate waste and promote use by the general public. As part of this effort, the program oversees the development of the North Central Texas Regional Public Transportation Coordination Plan which guides the region’s coordination efforts.
The coordination plan is also intended to satisfy newly enacted state and federal requirements related to coordination.

Requests for funding under the previous Federal Transit Administration programs will be reviewed for consistency with both the Metropolitan Transportation Plan and the North Central Texas Regional Public Transportation Coordination Plan. Projects shall be considered consistent with the Metropolitan Transportation Plan if they are consistent with, or embody the goals, policies, or strategies of the North Central Texas Regional Public Transportation Coordination Plan.

Americans with Disabilities Act Certification
As required by the Americans with Disabilities Act, implementing regulations issued by the US Department of Transportation, public entities operating a fixed-route system shall provide paratransit or other special service to individuals with disabilities that is comparable to the level of service provided to individuals without disabilities who use the fixed-route system. Projects funded through the Federal Transit Administration will be consistent with the requirements outlined in the American with Disabilities Act, as well as other federal, state, and local regulations.

Summary
As the region anticipates an influx of nearly three million people over the next 25 years, all modes of transportation will need to be enhanced just to keep pace with growth. Increases in population and job creation will continue to place additional strain on an already congested transportation system and will create additional air quality concerns. Identifying the appropriate tools to improve mobility is critical as growth continues. Public transportation offers an alternative that adds capacity while reducing the number of vehicles on the roadways. The North Central Texas Council of Governments will continue to study and examine the implementation of an expanded transit system to help alleviate traffic congestion by enabling seamless service throughout the region without the need for a personal automobile. Public transportation provides benefits to the region in terms of both congestion mitigation and air quality improvement. Exhibit 6.22 shows the vision of rail transit in North Central Texas and the rail corridors that will be examined for expansion opportunities in future mobility plans. Further refinements to the current recommendations may be based on this vision.

See Appendix E for a complete listing of policies, programs, projects, and maps related to public transportation.
Exhibit 6.22: Rail Corridors for Further Evaluation
Roadway

Mobility 2035 Supported Goals

- 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.
- Encourage livable communities which support sustainability and economic vitality.
- 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.
- Provide for timely project planning and implementation.

Controlled-access Roadways

The freeways and tollways in North Central Texas are critical elements in the regional transportation system. These roadway facilities are characterized by controlled-access general purpose lanes, HOV lanes, managed lanes, and frontage roads. The freeway and tollway system accounts for a small percentage of the total roadway lane miles in the Dallas-Fort Worth Metropolitan Area, but carries nearly half of all vehicular travel in the region. Forecasts indicate this pattern is expected to continue through 2035. As a crucial element in the region’s multi-modal transportation system, there will continue to be significant demand placed on freeways and tollways to accommodate regional traffic. This current and expected traffic demand will require strategic bottleneck removal, enhancement and reconstruction of critical corridors, active demand management, expansion of capacity where warranted, and continual system monitoring and improvement.

Regional Roadway Agencies

Freeways and tollways in the Dallas-Fort Worth region are constructed, operated, and maintained by both public and private agencies. The majority of freeways in the region are managed by the Texas Department of Transportation whose Dallas District, Fort Worth District, and Paris District encompass the North Central Texas Roadway at a Glance:

Regional Roadway System Operators

- Texas Department of Transportation Dallas District
- Texas Department of Transportation Fort Worth District
- Texas Department of Transportation Paris District
- North Texas Tollway Authority

Roadway System Figures

Source: Expanded Dallas-Fort Worth Regional Travel Model

<table>
<thead>
<tr>
<th>Freeway/Tollway Lane Miles per County</th>
<th>County</th>
<th>Year 2012</th>
<th>Year 2035</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collin</td>
<td>404</td>
<td>693</td>
<td></td>
</tr>
<tr>
<td>Dallas</td>
<td>1,959</td>
<td>2,539</td>
<td></td>
</tr>
<tr>
<td>Denton</td>
<td>354</td>
<td>521</td>
<td></td>
</tr>
<tr>
<td>Ellis</td>
<td>344</td>
<td>506</td>
<td></td>
</tr>
<tr>
<td>Hood</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Hunt</td>
<td>123</td>
<td>123</td>
<td></td>
</tr>
<tr>
<td>Johnson</td>
<td>122</td>
<td>186</td>
<td></td>
</tr>
<tr>
<td>Kaufman</td>
<td>226</td>
<td>237</td>
<td></td>
</tr>
<tr>
<td>Parker</td>
<td>157</td>
<td>160</td>
<td></td>
</tr>
<tr>
<td>Rockwall</td>
<td>70</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td>Tarrant</td>
<td>1,308</td>
<td>1,712</td>
<td></td>
</tr>
<tr>
<td>Wise</td>
<td>12</td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HOV/Managed Lane Miles Per County</th>
<th>County</th>
<th>Year 2012</th>
<th>Year 2035</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collin</td>
<td>14</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Dallas</td>
<td>110</td>
<td>250</td>
<td></td>
</tr>
<tr>
<td>Denton</td>
<td>6</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>Tarrant</td>
<td>5</td>
<td>218</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Freeway/Tollway Vehicle Miles of Travel per Day</th>
<th>Year 2012</th>
<th>Year 2035</th>
<th>Total Change</th>
<th>Percent Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>80,415,819</td>
<td>123,001,320</td>
<td>42,585,501</td>
<td>53%</td>
</tr>
</tbody>
</table>
area. Additionally, the region’s toll road network has been constructed and is managed by the North Texas Tollway Authority (NTTA). These public agencies work independently and in collaboration in the improvement of existing roadways and development of new corridors to meet the growing demand for regional travel.

TxDOT and NTTA have limited legislative authority to enter into public-private partnerships in the development of new roadway corridors or redevelopment of existing roadways. TxDOT has entered into public-private partnerships contracts to provide for the reconstruction of corridors in both Tarrant and Dallas counties. Under public-private partnerships arrangements, public agencies maintain the ownership of roads while the private sector brings additional funding and resources for the construction and maintenance of major regional roadway facilities.

Roadway Classifications
The controlled-access roadways discussed in this section are described as freeways, tollways, or HOV/managed lanes. Freeways are facilities that are generally funded with gas tax revenues and do not charge a toll for usage. Tollways, or toll roads, and HOV/managed lanes are defined as corridors built and maintained through user fees, or tolls. On a tollway, drivers on all general purpose lanes pay a toll while HOV/managed lanes are typically constructed in the medians of existing corridors and drivers only pay a toll to use the managed lanes, not the parallel general purpose lanes. Currently, tolls on local tollways vary only by vehicle type and are fixed throughout the day for all drivers. However, Mobility 2035 and RTC policies both allow and encourage variable pricing on tollways and HOV/managed lanes based on the time of day, congestion level of the facility, and the occupancy level of each vehicle. Vehicles with three or more occupants will be eligible for a toll discount while one- and two-occupant vehicles will pay the full toll.

Mobility 2035 Policies and Programs
The implementation of improvements to the regional freeway and tollway system is guided by the following policies which can also be found in Appendix E. These policies direct the planning and development of roadway facilities in a consistent manner and recognize, among other principles, the need to identify strategic improvements, to pursue innovative funding opportunities, and to actively manage roadway demand.

FT3-001: The RTC does not support converting existing free non-HOV/managed lane corridors to tollways.

FT3-002: Evaluate all new limited-access capacity for priced facility potential.

FT3-003: To maximize the use of available funds, where reasonable, priced facilities should be developed with no or minimal federal and state funding assistance.

FT3-004: Plan and program non-regionally significant arterial improvements cooperatively with local governments.

FT3-005: Management strategies, consistent with the Regional Congestion Management Process, congestion management plans for regional tollway operators, and federal single-occupancy vehicle justification requirements, unless precluded by existing bond covenants, should be implemented when an existing freeway, tollway, or managed lane adds capacity. Future bond covenants should accommodate a full range of management strategies.

FT3-006: System-wide HOV occupancy will be consistent with the latest RTC policy.

FT3-007: Additional and improved interchanges, frontage roads, and auxiliary lanes should be considered and implemented as appropriate on all freeway/tollway facilities in order to accommodate a balance between mobility, access, operational, and safety needs.

FT3-008: Encourage the early preservation of right-of-way in recommended roadway corridors.

FT3-009: Encourage the preservation of right-of-way in all freeway/tollway corridors to accommodate potential future transportation needs.
FT3-010: Corridor specific design and operational characteristics for recommended roadways will be determined through the project development process.

FT3-011: Support advanced planning activities to aid in strategic decision making regarding long-term plan and project development.

FT3-012: Corridor and environmental studies should be conducted with consideration for the region’s air quality and financial constraints.

FT3-013: Support federal and state interregional corridor initiatives as appropriate.

Mobility 2035 supports the following programs associated with the roadway system:

- TSM2-005: Bottleneck Program for Regional Corridors
- NRSA2-001: Non-regionally Significant Arterial Program

Funding

The nature of extensive freeway and tollway system improvements requires high-cost initial elements including right-of-way acquisition and construction, as well as expensive long-term costs of maintenance, operation, and rehabilitation. Mobility 2035 faces the challenge of balancing huge demands on an aging and heavily-used system with inadequate funding from traditional revenue sources including fuel taxes and vehicle registration fees. For this reason, the North Central Texas region has come to rely more heavily on tolls and innovative financing to satisfy the demand for the construction and maintenance of new roadway facilities and the expansion of existing corridors.

At the state level, the Texas Transportation Commission has also recognized the need to depend on tolls to provide funding for roadway construction and maintenance. The Texas Transportation Commission has directed TxDOT to evaluate potential projects during any phase of development or construction for consideration as a tollway including new location and highway expansion projects. State law allows TxDOT to study, design, construct, operate, expand, enlarge, or extend a tollway project as part of the state highway system.

Traditionally, TxDOT has financed highway projects on a “pay-as-you-go” basis using motor fuel taxes and other revenue deposited in the state highway fund. However, population increases, traffic demand, inflation, and increasing vehicular fuel efficiency have outpaced the ability of this traditional finance mechanism to fully fund necessary transportation improvements. Developing projects as tollways is necessary to bridge the gap between transportation needs and financial resources.

Over the past decade, bills passed by the Texas Legislature, including House Bill 3588 and House Bill 2702, created new and innovative tools for TxDOT and local toll authorities, including NTTA, to allow public-private partnerships to finance, build, and operate tollways and tolled managed lane facilities. The legislation also enables toll bonds, concession fees, and excess revenues to fund supplemental roadway projects that are either adjacent to those new corridors or of greatest need in the TxDOT districts where the corridors are constructed. Senate Bill 792, passed in 2007, updated the public-private partnerships guidelines previously set by the State Legislature. Key provisions in Senate Bill 792 include:

- Ensuring that local toll authorities have the first option to build new toll projects and may use state rights-of-way as needed.
- Allowing local toll authorities to propose that needed state roads be built as toll roads; previously only TxDOT could initiate such a proposal.
- Requiring local toll authorities and TxDOT to agree to certain business terms such as toll rates when a project is first proposed and to perform a Market Valuation Study based on those terms to determine a road’s total value.
- Modifying public-private partnerships by limiting their terms to a maximum of 50 years, mandating that the state’s future buyback cost be stipulated in the public-private partnerships agreement, clarifying that competing tax-funded freeways cannot be built within four miles on either side of a public-private partnerships toll road, and requiring public-private partnerships revenue to be used only for other projects in the region in which it is generated.
- Allowing TxDOT to issue $3 billion in bonds to borrow against future gas tax revenue; this provision allows TxDOT to use these bonds as toll equity for state toll roads.

Tolling Policies and Business Terms

While it has been the Regional Transportation Council’s policy since 1993 to evaluate toll feasibility for all new controlled-access facilities in new rights-of-way, as well as for additional capacity in existing freeway/tollway corridors, the legislative activity of the past decade, combined with the ability for multiple entities to become involved in tollway construction and operation, has compelled decision
makers to expand regional policies for tolled facilities. The RTC currently asserts that no existing freeway general-purpose lanes – non-HOV/managed lanes – will be converted to toll lanes and this is consistent with Texas Department of Transportation policy.

**Toll Road Business Terms**

In April 2006, after consultation with TxDOT, the RTC approved new business terms for tollways on state highways. These terms were subsequently modified by the RTC in July 2006 and September 2006. The business terms are highlighted in Exhibit 6.23. The terms were established to enable more local participation over the review and selection process for public-private partnerships toll projects, set limits for toll rates and toll rate adjustments to maintain equity between various toll projects, and help introduce the region to a concept known as variable time-of-day pricing. This type of pricing establishes a premium for toll rates charged during the peak periods of the day as an incentive to facilitate increased carpool/vanpool and transit usage, and it encourages telecommuting or flexible work hours so that single-occupant travelers may switch to using toll facilities more often during off-peak periods.

These efforts would likely aid in improving peak-period level of service, congestion, and the region’s air quality. In September 2004, the RTC adopted policies related to excess revenue sharing from toll projects sponsored by TxDOT. These policies were later modified by the RTC in April 2006 and September 2006 and do not apply to managed lane facilities. The purpose of this set of policies was to establish a framework for the allocation of future toll revenues from projects in the North Central Texas region. Excess toll revenue is defined as annual toll revenue after the annual debt service is paid and after annual reserve funds have been set aside to cover facility operational costs, anticipated preventative maintenance activities, assigned profit and related expenses for the public-private partnerships, and the expected cost of rehabilitation or reconstruction of the toll facility.

The excess revenue policy for all TxDOT-sponsored toll facilities honors all previous RTC agreements and puts forth the following:

- All excess revenue generated from individual toll projects shall remain in the TxDOT district in which that revenue-generating project is located.

1. Maximum weekday peak period toll rate in 2010 was 17 cents per mile. The weekday peak period is currently defined as 6:30 am to 9:00 am and 3:00 pm to 6:30 pm. The Regional Transportation Council would need to approve any changes to this definition.
2. The maximum off-peak toll rate was 12.5 cents per mile in 2010. The off-peak period is defined as the period outside of the weekday peak period.
3. These peak and off-peak rates will average approximately 14.5 cents per mile.
4. Transit vehicles are exempt from toll charges.
5. Toll rates will be adjusted sooner and later in time using the “all items” Consumer Price Index and “average household income.” For Consumer Price Index values of three percent and under, the Index will be used and calculated applying annual compounded rates. For values over three percent, the “average household income” growth rate will be used. Toll rates will be adjusted every two years. If the Consumer Price Index or the “average household income” growth rates are negative for a two-year period, the growth rate will be set at zero and no adjustments to toll rates will be permitted.
6. Excess revenue will be paid 75 percent up front and 25 percent over time.
7. Excess revenue will be paid 75 percent up front and 25 percent over time.
8. The Texas Department of Transportation has requested that local governments participate in and monitor the Comprehensive Development Agreement procurement process. The Regional Transportation Council requests that local governments assign representatives to this procurement process.
9. The Regional Transportation Council requests that the Texas Transportation Commission reiterate that Comprehensive Development Agreement projects will not contain a “no compete” clause. This will permit additional mobility improvements over time without conflict with this agreement.
10. Duration of a Comprehensive Development Agreement should be less than 51 years.
11. Tolls will remain on projects after Comprehensive Development Agreement duration.
12. Competitive proposals from the private and public sector will be evaluated against the same objective evaluation criteria to be determined by the Regional Transportation Council.
13. The peak and off-peak toll rates will be set at 14.5 cents per mile for an initial interim period. The North Central Texas Council of Governments will conduct a pilot “before” and “after” study in a corridor within the region with the approved “time-of-day” pricing schedule. Results will be presented to the RTC before region-wide implementation of time-of-day pricing. The pilot study and subsequent action will be completed by 2012.

Exhibit 6.23: Business Terms for TxDOT-sponsored Toll Roads on State Highways
Excess revenue generated from individual toll projects shall be placed in county-specific accounts and prorated based on the residential county of all toll payers on all tollways.

Projects funded with excess toll revenue should be selected in a cooperative TxDOT/RTC selection process which considers the desires of the cities and counties where the revenue-generating project is located.

The policy enables non-tolled facilities, either on or off of the state highway system, to be improved or reconstructed with excess toll revenue funds, and much input from local governments will be considered in determining which projects should receive funding. The RTC’s policies regarding business terms and excess revenues further establish the North Central Texas region’s commitment to toll projects where feasible, allowing swifter implementation of some projects which would be delayed if they were funded strictly with traditional revenue sources.

Managed Lane Business Terms

TxDOT and the RTC have developed additional business terms for HOV/managed lane facilities which continue to support regional goals such as HOV and transit incentives and travel reliability while also ensuring revenue for public-private partnerships concessionaires and compliance with toll bond covenants. These policies provide flexibility within specific guidelines in setting toll rates using a concept known as dynamic pricing. This type of pricing allows operators to set market-based toll rates based on corridor demand and real-time congestion levels, and those rates could fluctuate at any time throughout the day in response to changing traffic conditions.

The business terms for managed facilities, as shown in Exhibit 6.24, were approved by the RTC in May 2006 and modified in September 2006 and September 2007.

Separately, new policies regarding excess toll revenue for managed facilities were also approved by the RTC in June 2005. While nearly identical to those established for

Exhibit 6.24: Business Terms for TxDOT-sponsored Managed Lane Facilities

1. A fixed-fee schedule will be applied during the first six months of operation; dynamic-fee pricing will be applied thereafter.
2. The toll rate will be set up to $0.75 per mile during the fixed-fee schedule phase. The established rate will be evaluated and adjusted, if warranted, with Regional Transportation Council approval.
3. Toll rates will be updated monthly during the fixed-fee schedule phase.
4. Market-based tolls will be applied during the dynamic-fee pricing phase. During dynamic operation, a toll rate cap will be established. The cap will be considered “soft” during times of deteriorating performance when a controlled rate increase above the cap will be temporarily allowed.
5. Transit vehicles will not be charged a toll.
6. Single-occupant vehicles will pay the full rate.
7. Trucks will pay a higher toll rate, and no trucks will be permitted in the LBJ tunnel.
8. High-occupancy vehicles of two or more occupants and vanpools will pay the full rate in the off-peak period.
9. High-occupancy vehicles of two or more occupants will receive a 50 percent discount during the peak period (six hours per weekday: 6:30 am - 9:00 am and 3:00 pm - 6:30 pm). This discount will phase out after the air quality attainment maintenance period. Regional Transportation Council-sponsored public vanpools are permitted to add peak-period tolls as eligible expenses. Therefore, the Comprehensive Development Agreement firm will be responsible for the high-occupancy vehicle discount and the Regional Transportation Council will be responsible for the vanpool discount.
10. The toll rate will be established to maintain a minimum average corridor speed of 50 miles per hour.
11. During the dynamic-pricing phase, travelers will receive rebates if the average speed drops below 35 miles per hour. Rebates will not apply if speed reduction is out of the control of the operator.
12. Motorcycles qualify as high occupancy vehicles.
13. No discounts will be given for “Green Vehicles”.
14. No scheduled inflation adjustments will be applied over time.
15. Every managed lane corridor will operate under the same policy.
16. Adoption of this policy will have no impact on the Regional Transportation Council Excess Revenue Policy previously adopted.
17. The Regional Transportation Council requests that local governments and transportation authorities assign representatives to the Comprehensive Development Agreement procurement process.
18. The duration of the Comprehensive Development Agreement should maximize potential revenue.
19. Tolls will remain on the managed lanes after the Comprehensive Development Agreement duration.
TxDOT-sponsored tollways, the policies differ in one notable exception. For managed lane projects, local governments and transportation authorities shall be given the right to invest in a managed lane project as a means to fund the facility, as well as to generate local revenue. Shares offered by the RTC would be allocated into air quality related and sustainable development programs. These shares would also be used to leverage federal transportation funds.

Active Management of the Roadway System
As the North Central Texas area continues to experience population growth and traffic congestion, more emphasis will be placed on the strategy of actively managing the capacity of major roadway facilities. Technological advancements allowing for the increased ability to monitor and operate facilities using new hardware and software technologies will enhance reliability of tax-supported roads, toll roads, and HOV/managed lanes.

Managed lanes are proposed as part of the improvement of existing free roadways in corridors across the urban core of the Dallas-Fort Worth area. Drivers will have the choice of paying a toll to use the managed lanes or traveling for free on the parallel general purpose lanes or frontage roads. All existing free lanes will be maintained in corridors where managed lanes will be constructed, and in some cases, additional free lanes will also be built. The tolls collected from managed lanes will help finance the expansion/reconstruction and operation of not just the tolled lanes, but all elements of the roadway. Because of limited transportation funding, the reconstruction and expansion of the existing facilities would not occur without tolling the managed lanes.

The managed facility concept maximizes the efficiency of a roadway’s capacity through the introduction of tolls and time-of-day pricing. This concept can be applied differently depending on the type of corridor being studied for implementation of active management:

- In the conversion of HOV lanes to HOV/managed lanes, excess capacity may be available to allow vehicles with one or two occupants to access the lanes by paying a toll.
- In selected toll roads, the capacity could be managed through incentives to encourage increased auto occupancy or through the introduction of congestion pricing where the toll would vary based on the time of day.

- In freeway corridors where additional capacity is warranted, the added capacity could be managed through a combination of toll, vehicle type, and auto occupancy restrictions by time of day while existing lanes remain free.

Management of Tollways
Managed lane policies adopted by the RTC are intended to be applied region wide to all managed facilities including tollways. For those roadways which are developed as stand-alone tollways, especially in the early years of operation where revenue streams are critical, occupancy management and congestion pricing may not be feasible. However, operators of tollways should phase in operational strategies such as occupancy management or congestion pricing as the roadway matures and volumes increase. These strategies would work in lieu of, or in conjunction with, future roadway widening. This concept, including a congestion management pilot study, will initially be applied as part of the widening of the Sam Rayburn Tollway (SH 121) recommended in this plan. This congestion management pilot study will collect necessary before and after traffic data to determine the system wide and corridor effect on meeting regional goals of improved mobility, increased safety, system reliability, additional traveler choice, and air quality benefits. The results of this initial pilot study could help to shape and refine the introduction of congestion management strategies in future corridors as improvements are warranted.

For existing tollways with bond covenants, the Regional Transportation Council has committed to serve as a financial backstop to offer assurances and to hold bond holders harmless if revenues are negatively impacted through the introduction of congestion management techniques. NTTA Board approval would be necessary prior to the implementation of any congestion management strategy on all projects impacting their system. It should be noted that there may be geometric or other constraints that could make active management infeasible on certain facilities; however, consideration should be given to exploring alternative application methods such as off-site declaration or new occupancy and enforcement technologies.

Management of HOV/Managed Lanes
When applied in HOV corridors, the managed lane policies are specifically intended for the ultimate recommendations identified in Mobility 2035. However, through a combination of occupancy management and toll structure policy, the managed lane concept will also be applied on the existing interim HOV facilities where possible. It
is not intended that each facility would be treated separately, but the impacts on the entire HOV system should be considered before application in a specific corridor. Geometric and design constraints in some facilities could make pricing impractical.

The HOV facilities in operation today are considered part of an interim system and are based on the more traditional two plus occupancy requirement. Over time, many of these interim HOV facilities have matured to the point where all available capacity is taken, particularly during the peak periods of travel. For this reason, it is intended and recommended that in order to better manage the available capacity in these corridors and to promote reliability of the overall system, the existing interim HOV corridors would evolve, either all together simultaneously or separately over time, into an HOV/managed lane system.

The key components of an integrated HOV/managed lane system are based on maximizing all available capacity, ensuring reliability of the system, and monitoring conditions throughout the day to achieve prescribed travel time goals. This will be accomplished by moving from a two plus auto occupancy requirement to a three plus auto occupancy requirement starting in the year 2012. In addition to occupancy requirements, additional management tools will be employed including time-of-day or dynamic pricing. This HOV/managed lane concept is intended to be fully implemented system wide during the timeframe of this plan with a goal of reaching full conversion prior to the opening of permanent managed facilities on the DFW Connector (SH 114/SH 121), LBJ Express (IH 635), and North Tarrant Express (IH 820/SH 121/SH 183) corridors if required regional policies and management agreements can be adopted by that time.

Mobility 2035 contains recommendations for an extensive and interconnected managed facility system. This system recommendation is the result of analyses of the current and proposed freeway/tollway network in conjunction with the proposed managed facility system. There is recognition that the freeway, tollway, and managed facilities work together and are therefore analyzed in that manner when developing and implementing proposed corridor and system improvements.

**Existing Interim HOV Facilities**

The proposed managed facilities are different than the existing HOV facilities in operation today. HOV lanes on IH 30, IH 35E, IH 635, US 67, and US 75 are considered immediate action or interim facilities. These are considered temporary solutions where a permanent facility is anticipated to be constructed in the future concurrent with freeway widening or reconstruction. Immediate action initiatives do not require the freeway facility to be reconstructed or improved due to the temporary status.

The existing interim HOV lane network includes the following corridors:

- **IH 30: East R.L. Thornton Freeway**
  - Contra-flow lane with a moveable barrier
  - Limits: Dallas central business district to Northwest Drive in Mesquite

- **IH 30: Tom Landry Highway**
  - One- to two-lane reversible, barrier-separated facility
  - Limits: Center Street in Arlington to Sylvan Avenue in Dallas

- **IH 35E: Stemmons Freeway**
  - One lane concurrent flow in each direction, buffer-separated facility
  - Limits: IH 635 in Dallas to FM 3040 in Lewisville

- **IH 635: LBJ Freeway**
  - One lane concurrent flow in each direction, buffer-separated facility
  - Limits: IH 35E to Oates Drive/Galloway Avenue in Mesquite

- **IH 35E/US 67: South R.L. Thornton Freeway/Marvin D. Love Freeway**
  - One reversible, barrier-separated lane on IH 35E and part of US 67
  - One lane concurrent flow in each direction, buffer-separated on US 67
  - Limits on IH 35E: Dallas central business district to US 67
  - Limits on US 67: IH 35E to IH 20

- **US 75: Central Expressway**
  - One lane concurrent flow in each direction, buffer-separated facility
  - Limits: IH 635 in Dallas to Bethany Drive in Allen
Development of Roadway Recommendations

The process to identify specific recommendations on controlled-access facilities for Mobility 2035 is detailed in Exhibit 6.25. As this exhibit shows, programs and projects which maximize the existing transportation system are the first to be evaluated for potential inclusion in the plan. Only after these strategies are reviewed and incorporated into the plan are strategic infrastructure projects including rail lines, HOV/managed lanes, and freeways and tollways considered. This approach ensures that regional travel demand is first addressed through those projects and strategies that have the most air quality benefits and are generally more cost effective than adding single-occupant vehicle capacity to major roadway corridors.

![Exhibit 6.25: Prioritization of Improvements](image)

To begin evaluating freeway and tollway projects for inclusion in the plan, the recommendations from previous Metropolitan Transportation Plans (MTPs) are reviewed. Discussions with TxDOT and NTTA are conducted to determine potential modifications so that the recommendations can be updated to include the latest results from ongoing corridor studies, environmental assessments, environmental impact statements, and advanced planning studies. Following the identification of potential projects, technical, environmental justice, and financial analyses are conducted as inputs in the evaluation, selection, and prioritization process for controlled-access facilities.

Technical Analysis

The technical analysis of controlled-access facilities relies on data from the Expanded Dallas-Fort Worth Regional Travel Model. Travel modeling is used to identify system deficiencies, determine demand on new or expanded facilities, and test the impact of potential improvements on corridor and regional congestion measured by level of service. Level of service is determined based on:
- Projected daily volumes
- Facility type (freeway, tollway, HOV/managed lanes, arterial, etc.)
- Number of lanes
- Area type (urban, suburban, rural)

Due to a lack of financial resources, it is not possible to plan for uncongested level of service conditions, forcing an acceptance of a higher level of congestion in the planning and project selection process.

Regional Toll Analysis

Tolled and managed facilities play an integral role in the recommendations of Mobility 2035. As part of the nondiscrimination efforts detailed in the Social Considerations chapter, analyses are performed to determine if protected populations experience disproportionate negative impacts associated with the addition of these priced facilities. Environmental justice is accounted for at three levels:
- System wide within the MTP
- System wide for the entire proposed tollway and managed lane system
- At the corridor level for each project

At the MTP level, performance indicators are evaluated for a base year and for the MTP Build versus No-build scenarios. These indicators of performance analyze employment accessibility via automobile and transit, average travel time to regional facilities including universities and hospitals, average level of congestion, and overall average travel time. Through these indicators of performance, results are calculated for each protected class versus the non-protected population, and the region as a whole, to determine potential impacts. This analysis is shown in the Social Considerations chapter which details social considerations. The results indicate that implementing the policies, programs, and projects of the MTP do not have disproportionate impacts on environmental justice populations.
For the system-wide tollway and managed lane analysis, origins of trips for drivers are estimated and reviewed to determine whether protected populations experience similar levels of mobility and accessibility with the proposed system compared to the non-protected population. This analysis is performed for the No-build versus Build scenarios for the toll road and managed lane system. System level performance such as overall congestion, vehicle miles of travel, and speeds, are reviewed to determine the regional impacts if the tollways or managed facilities were not constructed. The results of these analyses are shown in Exhibit 6.26 which details travel information for traffic survey zones (TSZ) identified as having a majority of the population either below poverty, belonging to a protected class, or not belonging to a protected class. For each of these TSZ categories, Exhibit 6.26 shows the number of jobs within 30 minutes by automobile, the average roadway speed in the zones, and the number of minutes it would take to travel 20 miles from the zones.

As Exhibit 6.26 shows, for all commuters in North Central Texas, a No-build scenario of the toll and managed system would degrade the entire transportation network affecting all commuters. For all population classes, a Build scenario of the toll and managed system results in more jobs within 30 minutes by car, higher average speed, and shorter times required to travel 20 minutes. These results indicate that construction of this toll and managed system creates no disproportionate impacts on environmental justice populations.

<table>
<thead>
<tr>
<th>Traffic Survey Zone Category</th>
<th>Below Poverty</th>
<th>All Protected Classes</th>
<th>Non-protected Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jobs Within 30 Minutes by Automobile</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No-build</td>
<td>904,452</td>
<td>1,098,098</td>
<td>492,339</td>
</tr>
<tr>
<td>Build</td>
<td>963,835</td>
<td>1,170,663</td>
<td>526,696</td>
</tr>
<tr>
<td>Average Speed (mph)</td>
<td>24</td>
<td>28</td>
<td>29</td>
</tr>
<tr>
<td>Minutes to Travel 20 Miles</td>
<td>50</td>
<td>42</td>
<td>41</td>
</tr>
</tbody>
</table>

Exhibit 6.26: Results of Regional Toll Analysis

Trips are also analyzed at the corridor level for individual roadway studies using an origin-destination method. Build versus No-build scenarios are compared for new environmental documents while Build versus Non-toll alternatives are examined for National Environmental Policy Act re-evaluations where the project was originally cleared as a freeway and is now being pursued as a tolled facility.

**Financial Analysis**

Constraints due to construction costs and available funding had a greater effect on the evaluation of potential controlled-access facility improvements for Mobility 2035 than for any other preceding MTP in North Central Texas. Despite the additional tools and resources made available by the State Legislature for tollways and managed facilities, many important transportation projects will be deferred from Mobility 2035 due to a lack of funding for their construction. Additionally, unit costs for major construction elements such as concrete and steel have increased tremendously over the past decade. Although these cost increases have since slowed and become more stable, major roadway construction still remains extremely expensive.

The reality of roadway construction costs, coupled with an environment of exceptionally limited sources of traditional funding, prompted a new systematic approach to the analysis, prioritization, and recommendation of controlled-access facility improvements throughout the Dallas-Fort Worth Metropolitan Area.

**Project Evaluation, Selection, and Prioritization**

Because of the extremely limited funding available for roadway capacity improvements and the need to be very selective and strategic in how those limited resources are allocated, a technically based scoring and ranking system was developed and applied to all potential candidate roadway projects and corridors. This methodology incorporated six broad screening elements and numerous sub-criteria, as highlighted in Exhibit 6.27.

All freeway and tollway corridors were scored and ranked based upon these evaluation criteria and preference was given to projects which were under construction but still needed additional funding for completion, or projects which were nearly completely funded but had a small remaining balance left to be funded. Such projects would need to meet at least one of the following conditions:

- Funding is identified in the TxDOT Unified Transportation Plan (the state’s ten-year funding and programming document for all projects on the state highway system).
- Funding is identified in the regional Transportation Improvement Program.
- Local government commitment is identified in the Regional Partnership Program or Regional Toll Revenue Program.
- Funding is identified through potential toll bonds, concession fees, or excess revenue that would offset potential construction costs for tollways or managed facilities pursued by TxDOT, NTTA, or a public-private partnership process.

Projects were selected and identified for funding based upon this set of criteria and were required to fit within the limited financial constraints of this plan. The number of needs by far exceeded the amount of available funding to the region.

### Controlled-access Roadway Recommendations

The map displayed in *Exhibit 6.28* indicates the final controlled-access facility recommendations for Mobility 2035. The total cost for the implementation of this freeway, tollway, and managed facility improvements is $36.8 billion. Costs from the plan are based on current planning and engineering studies, were reviewed by TxDOT and NTTA, and represent total project cost reflected in year of expenditure dollars consistent with federal planning requirements.

### Scoring and Ranking Criteria

#### Functional Importance

- Priority given to components of the National Highway System
- Priority given to projects along hazardous materials routes
- Priority given to projects along NAFTA routes
- Priority given to critical infrastructure needs — those identified on the congestion management critical infrastructure list
- Priority given to projects with high levels of project dependency and co-dependency

#### Operational Sufficiency

- Bridge sufficiency — number of bridges rated at 50 or below
- Pavement rating
- Age of current facility versus design life of concrete and materials
- Lack of parallel facility capacity and level of service of parallel routes
- Availability of frontage roads
- Percent truck traffic
- ITS infrastructure completion and support

#### Economic Sustainability

- Support of NAFTA routes
- Inland port access
- Foreign trade zone access
- Airport access
- Freight facilities/goods movement
- Major activity centers
- Employment densities

#### Environmental Sustainability

- Percent undeveloped land adjacent
- Status of environmental study/document/federal approval
- Air quality benefits resulting from short-term implementation

#### Corridor Utilization

Analysis of morning, afternoon, and off-peak period modeled levels of service for 2010 (current year) and 2035 (plan year)

#### Cost Effectiveness

Analysis conducted based on the base year cost for the improvement, the calculated cost per mile and cost per VMT, current funding status, and preference given to tolled and managed lane facilities

*Exhibit 6.27: Mobility 2035 Project Evaluation, Selection, and Prioritization*

*Exhibit 6.28: Mobility 2035 Controlled-access Facility Recommendations*
No Significant Impact. The recommendations detailed on the roadway fact sheets should be used as a reference in identifying the design concept and scope for each of these corridors.

**Priced Facilities**
As detailed in the funding and financial analysis sections of this report on roadway recommendations, the development of Mobility 2035 relies to a significant extent upon the ability to construct and expand toll road and managed lane facilities to meet the growing transportation needs in the region. To counter reductions in traditional transportation funding, the planned network of these priced facilities is necessary to allow construction of new and expanded transportation facilities while also allowing the opportunity for more efficient management of corridor demand using tools including variable pricing and dynamic pricing.

The map shown in Exhibit 6.29 displays the network of priced facilities that is recommended as part of Mobility 2035. The network shown in this map includes the existing toll road system managed by NTTA, new tollways which are expected to be constructed by local toll authorities, regional mobility authorities, and TxDOT; and the managed lane system that is being developed cooperatively between NCTCOG, TxDOT, NTTA, and local transit authorities.

**Unfunded Roadway Needs**
The development of Mobility 2035 required a re-evaluation of expected funding sources that were included in previous MTPs. This re-evaluation has resulted in the removal of nearly $45 billion of funding from the plan which has required the prioritization of needed projects and the deferral of many key controlled-access roadway projects necessary for the management of existing and future congestion.

For the freeway and tollway corridors deferred from Mobility 2035, the reality that they cannot be incorporated into the plan based on projected financial constraints should not diminish the fact that significant congestion will increase in these corridors over time and large-scale improvements will be required at some point in the future. These corridors have been deferred from the plan due to a funding situation that does not allow needed transportation projects to be constructed despite an expectation of growing traffic and worsening congestion.

One of the important goals in this document is to include the recommendations from as many of the ongoing transportation studies as possible to ensure that potential regional projects can continue to move forward in their planning, feasibility, and implementation phases. The expectation is that as development and traffic continue to increase in these corridors, major studies will progress to a point where warranted and cost-effective solutions can be included in future transportation plans.

Exhibit 6.30 is an illustrative map of those freeway and tollway projects and corridors which were unable to be funded in Mobility 2035 due to financial constraint. These projects are still warranted and needed but must be deferred until additional regional funding can be identified.
Statewide Planning Initiative for IH 35

In 2008, a group of Texas residents were appointed by the Texas Transportation Commission to assess the short- and long-term needs of the IH 35 corridor and to develop a vision plan of potential solutions that would accommodate those needs. In November 2008, the IH 35 Corridor Advisory Committee (CAC) issued the Citizens’ Report on the Current and Future Needs of the IH 35 Corridor which concluded that the existing statewide capacity of IH 35 was insufficient to meet future mobility and economic demands, that additional capacity through multiple modes would be needed, and that strong community and inter-agency involvement was essential in successfully planning the evolution of the IH 35 corridor. In the following year, the IH 35 CAC created additional committees and initiated numerous public involvement and education efforts to develop the My-35 Plan, a grassroots-level comprehensive planning and implementation tool to guide future development of the IH 35 corridor.

Approved by the Texas Transportation Commission in 2011, the My-35 Plan relies heavily upon MTPs and other planning documents from various entities as a basis for its recommendations. The My-35 Plan recommendations are primarily focused upon the identification of broad solutions that would best meet local/regional needs in the corridor through the year 2050. Mobility 2035 includes projects recommended as near-term elements of the My-35 Plan such as the IH 35E segment of the LBJ Express project and the IH 35W segments of the North Tarrant Express project. Other My-35 Plan recommendations are illustrated as needs-based projects requiring further evaluation with the expectation that as new or additional funding becomes available, the ultimate feasibility, right-of-way requirements, environmental constraints, and construction priorities may be studied and verified. This serves as a bridge between local and state planning efforts, ensuring continuous refinement of a collective and cooperative process between residents, government, and transportation providers that increases overall communication and interaction, streamlines project delivery, and more readily achieves mobility, economic, and quality of life goals.
Regionally Significant Arterials

In addition to freeways, tollways, and HOV/managed lanes, regionally significant arterials are identified and included in Mobility 2035 based on their role to complement and enhance the major roadway and transit systems by providing the necessary transportation support and access to and from local land uses. This system of arterials is forecast to carry approximately 20 percent of all vehicular traffic in the region.

The North Central Texas system of regionally significant arterials, as included in this plan, is shown in Exhibit 6.31. This network is comprised of several key components including facilities which serve regional transportation needs, provide service to regional activity centers, aid in intra-community connectivity, and maintain access to and from areas outside of the region.

Exhibit 6.31: Regionally Significant Arterials

The regionally significant arterials that are currently funded for improvement, or anticipated to be funded within the timeframe of Mobility 2035, are shown in Exhibit 6.32. Mobility 2035 has designated $5 billion for arterial improvements; a majority of this funding will come from local sources.

Non-regionally Significant Arterials

In addition to regionally significant arterials, Mobility 2035 includes a program of improvement for non-regionally significant arterials which is also reflected in the financial component of the plan. The timing identification of specific funding sources for each facility is reviewed on a quarterly basis in conjunction with development and/or modification of the Transportation Improvement Program (TIP) project programming process. These projects go through a public involvement and an administrative approval process as part of the TIP amendment process.

Summary

The recommendations detailed in Mobility 2035 for the roadway system in North Central Texas amounts to a $46.2 billion investment in improvements, expansion, management, and new capacity. Exhibit 6.33 displays the funded roadway
recommendations found in Mobility 2035, focusing on freeways, tollways, HOV/managed lanes, frontage roads, and selected regionally significant arterials. Managing congestion as North Central Texas continues to grow and develop over the next 25 years will require strategic and ongoing investment in these identified corridors which form the foundation of the regional roadway system and serve millions of travelers every day.

See Appendix E for a complete listing of policies, programs, projects, and maps related to roadways.