

6. Mobility Options

North Central Texas is a large, diverse place, and the mobility needs of residents and businesses vary greatly across the region. It is of utmost importance that the transportation system satisfies mobility needs and 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 2045 Update

recommendations maps contained within this chapter can be found in the **Mobility Options** appendix, 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 North Central Texas 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 2 military training airfields in the region.



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



Mobility 2045 Update recommends expanding the Regional Veloweb to approximately 2,165 miles.



Mobility 2045 Update calls for almost 235 miles of new passenger rail.



Mobility Options in North Central Texas (Source: NCTCOG)

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6. Mobility Options: Aviation

The Importance of Regional Aviation Planning

As the nation's largest inland port and its fourth-largest metropolitan area, North Central Texas relies heavily on aviation facilities to sustain growth and economic prosperity. By connecting the region to global markets, aviation facilities provide economic development opportunities, the ability to engage in business activities related to aviation and the movement of cargo, and leisure and tourism opportunities throughout the world. More information can be found in the **Travel and Tourism** section of the **Social Considerations** chapter.

The region's airports serve as a nonconventional inland port system, providing global access and enhancing the regional economy. Improving and maintaining surface access and land-use compatibility is crucial to preserving the regional system of aviation facilities.

The region has approximately 400 aviation facilities and is home to over 300 aerospace and aviation employers. Collectively, aviation in North Central Texas accounts for over \$22 billion in economic impact.

Because of this economic impact, the Regional Transportation Council has a planning goal that landside access should not limit growth at the region's airports. Ideally, these airports should be able to grow to their airside limit without delays from roadway congestion. This includes intermodal connectors, which provide access for intermodal shipments to airports.

Aviation facilities are vital transportation assets, and to remain competitive, they require coordinated planning, land-use protection, and funding support.

NCTCOG AVIATION INITIATIVE GOALS



Update general aviation and heliport regional plans



Maintain the Air Transportation Advisory Committee



Develop new policies, partnerships, plans, and programs for aviation



Examine the market and timing for:

- Additional aviation facilities
- New intercity high-speed rail access to aviation
- Improvements to reliever, general aviation, and heliport assets



Determine needs related to:

- Long-term airspace demands
- Maintaining international competitiveness
- Surface access to and land use around airports/heliports
- Improving air quality

Aviation at-a-Glance

The goal of regional aviation planning in North Central Texas is to promote, maximize, protect, and advance regional aviation infrastructure to accommodate future growth in the region.

Achieving this goal will require integrating transportation connections while ensuring adequate future air and ground access and capacity within the region's aviation system.

Regional aviation planning at the North Central Texas Council of Governments does not address 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.

Air Transportation Advisory Committee

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

Aviation Policies and Programs

Policies are an important element in the planning and implementation of programs and projects. The Mobility 2045 Update supports the following policies associated with aviation:

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

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.

AV3-005: Implement operational restrictions and other requirements of uncrewed aircraft systems around regionally significant aviation facilities.

AV3-006: Safely and efficiently integrate vertical mobility technology (advanced air mobility, urban air mobility, unmanned traffic management, uncrewed aircraft systems) into the North Central Texas Council of Governments region.

The Mobility 2045 Update supports the following programs associated with aviation:

AV2-005: Aviation Surface Access Planning

AV2-006: Data Collection and Performance Tracking

AV2-007: Continuous Aviation System Planning

AV2-009: Encroachment Prevention and Compatible Land-Use Planning

AV2-010: Integrated Aviation Education System

AV2-011: Coordination of Uncrewed Aircraft Systems

AV2-012: Air Taxi and Air Cargo Corridor Identification and Demand Determination

AV2-013: Scaling Advanced Air Mobility Pilot Ecosystems to Other Metroplex Locations

AV2-014: Test Multimodal Integration and Proof of Concept for Air Taxis into the Dallas-Fort Worth Metroplex

AV2-015: Development of a Scalable Vertical Mobility Public Engagement Program

FACTORS AFFECTING AIRPORT SYSTEM PLANNING

Physical Considerations

Consider the geographical and engineered location of a new airport or of the expansion of an existing airport.

Operational Considerations

Evaluate airside and landside access.

Environmental Considerations

Consider regulatory guidelines and mandates, including those addressing air quality, noise, and surrounding land use.

Economic Considerations

Evaluate the short- and long-term costs, as well as the source and timing of funding used to facilitate development of the aviation system.

Socio-Political Considerations

Ask the public: "Will the idea and development of new projects work for the surrounding community and our region?"

Aviation Planning in Context

Various levels of planning are needed to meet the demands on the region's airport system. System planning occurs at all levels of government and plays a role in maintaining the region's airports.

At the federal level, the NPIAS (National Plan of Integrated Airport Systems) provides an overview of national aviation capacity needs and funding requirements. The 2017-2021 NPIAS identifies 3,332 existing and 8 proposed airports of national significance. These airports 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.

At the state level, the TASP (Texas Airport System Plan) provides an overview of needed capacity and a statewide aviation activity forecast. Out of more than 1,600 landing facilities in the state, 292 airports meet TASP requirements. TASP provides guidelines that help determine how to maximize the value of public funds and identify capital improvements that best serve the state's aviation needs such as transportation, business, and economic development functions that will benefit 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 for the 12-county Dallas-Fort Worth Metropolitan Planning Area, NCTCOG (North Central Texas Council of Governments) is responsible for providing surface access and services to improve air quality at aviation facilities; for processing data summary requests related to the Airport Improvement Program and Environmental Protection Agency programs; and for monitoring capacity and use at the region's major airports, including air cargo and foreign trade zone activity.

Aviation Facilities in North Central Texas

The 12-county Metropolitan Planning Area is home to a variety of public and private aviation facilities, including:

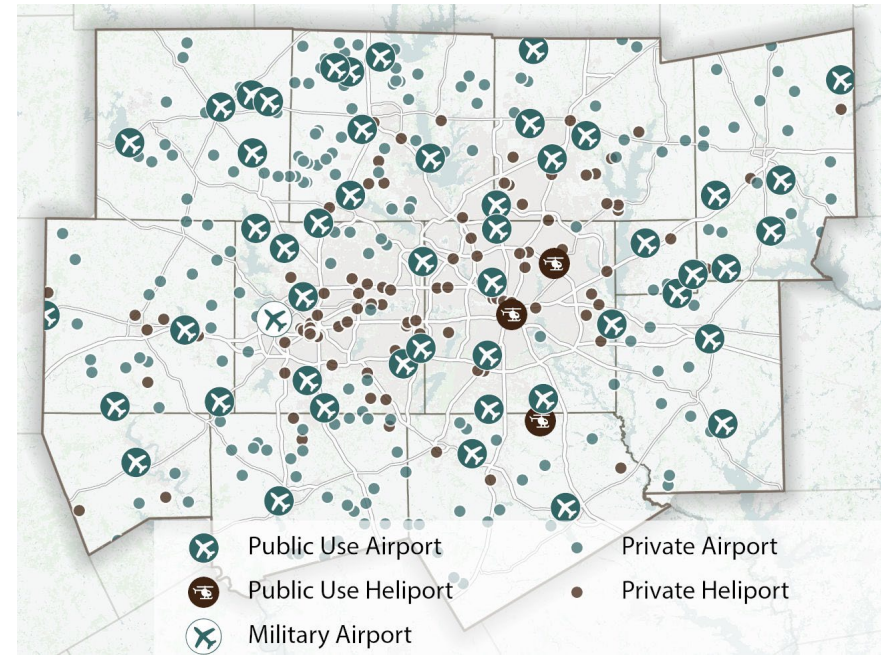
- **2 Primary Commercial Service Airports:** Airports that serve the needs of the flying public by hosting scheduled commercial airline service. These include Dallas Fort Worth International Airport and Dallas Love Field.
- **11 Reliever Airports:** Designated by the Federal Aviation Administration to relieve congestion at major commercial aviation locations by diverting general aviation traffic.
- **14 General Aviation Airports:** Designed to meet the needs of corporate aviation, small-scale cargo use, and recreational flight.
- **2 Existing Military Training Airfields:** Located at the Naval Air Station Joint Reserve Base Fort Worth and at Redmond Taylor Army Heliport in Dallas.
- **4 Public-Use Heliports:** Dallas Central Business District Vertiport, Garland/Dallas-Fort Worth Heloplex, Ferris-Red Oak Municipal Heliport, and DeSoto Heliport.
- **Over 300 Private-Use Airports and Heliports:** Serving the needs of private pilots and businesses. This includes private facilities serving recreational flight, short takeoff and landing, and sail planes.

These facilities are shown in **Exhibit 6-1**.

Data Collection and Performance Tracking

One of NCTCOG's roles is to monitor aviation trends at the region's commercial and air cargo airports. NCTCOG tracks the impact of uncrewed aircraft systems and the innovative technologies introduced through the Federal Aviation Administration's NextGen (Next Generation) Air Transportation System. Planning procedures for these technologies should benefit the long-term viability of the aviation system.

Exhibit 6-1: Aviation Facilities in North Central Texas



Aviation connects North Central Texas to national and global markets. The data shown in the following two graphs (**Exhibit 6-2** and **Exhibit 6-3**) illustrate recent trends in passenger and cargo volumes at the region's major aviation facilities. As a result of the COVID-19 pandemic, annual passenger volumes saw a great decrease compared to the trend of forecasted 2004-2019 data. In contrast, cargo volumes exceeded a seasonally adjusted forecast of historical data in 2020 and 2021.

NCTCOG staff will continue to monitor these volumes and trends in aviation technology to assess infrastructure needs at the regional level.

Exhibit 6-2: Annual Passenger Enplanements

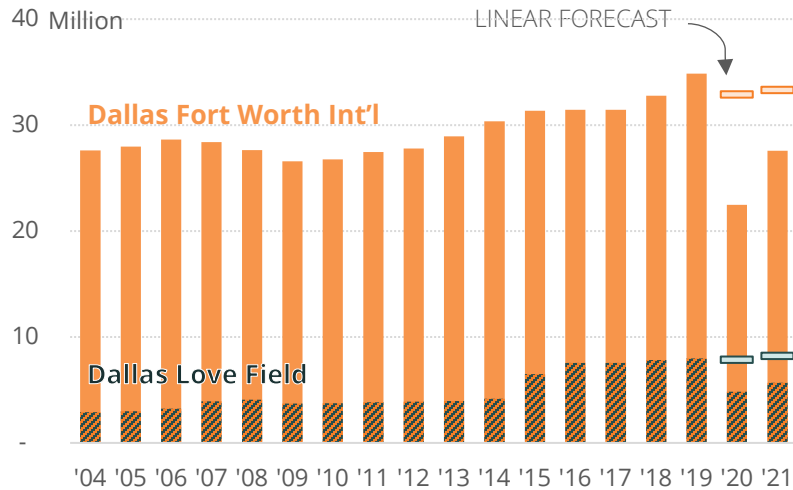
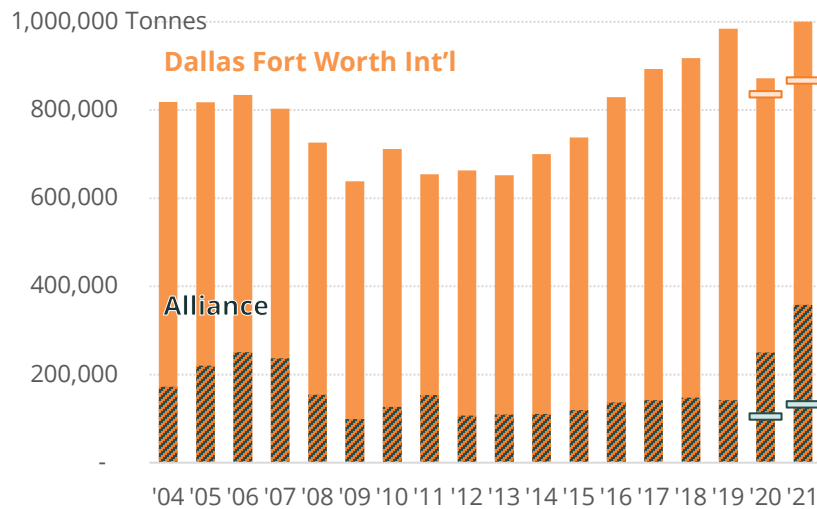


Exhibit 6-3: Total Regional Air Cargo Transported Annually



Aviation Surface Action Planning

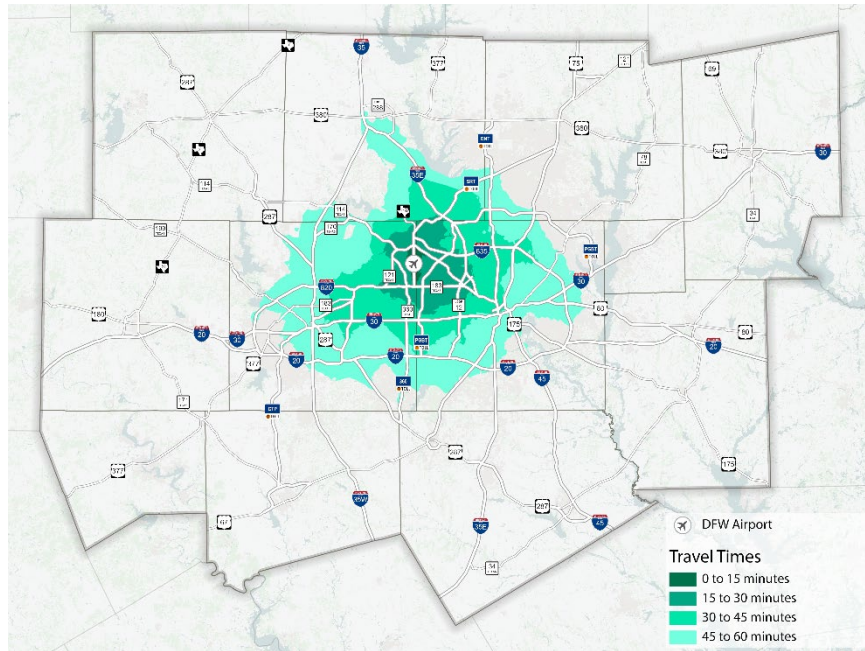
The mobility of air passengers and cargo is affected by the capacity of airports and surrounding highway and transit systems. Congestion in the air or on the ground can significantly impact air cargo operations and efficiency. National and international trade and travel require a surface transportation network that successfully connects with facilities for air passengers and cargo. The map in **Exhibit 6-4** displays projected travel times to or from Dallas Fort Worth International Airport. Similar maps for Dallas Love Field and Fort Worth Alliance Airport are located in the **Mobility Options** appendix. This analysis was performed based on models for the average peak-period traffic in 2045 and it assumes the recommendations in the Mobility 2045 Update have been constructed.

This analysis fulfills NCTCOG’s role as the region’s Metropolitan Planning Organization. NCTCOG also will inventory specific improvements to the roadways surrounding the region’s aviation facilities. This inventory will be created to assist decision makers in prioritizing and funding these connectors.

Continuous Aviation System Planning

NCTCOG also worked with the Federal Aviation Administration to produce a Regional General Aviation and Heliport System Plan for the 16-county NCTCOG region and surrounding areas. This effort updated the regional inventory, developed a system to manage aviation data, and analyzed demand on the current and forecast system. This study explored market demand, system deficiencies, needed improvements, and economic impacts of the regional general aviation and heliport system. NCTCOG coordinated with federal- and state-level planning agencies to ensure regional priorities are considered in planning and funding decisions at those levels.

Exhibit 6-4: Surface Travel Time Contours for the Dallas Fort Worth International Airport in 2045



This study also addressed potential constraints on regional airspace, including changes to passenger and air cargo activity, changes in business travel, and the influence of new technologies. NCTCOG will coordinate with city officials, the public, and aviation stakeholders to ensure recommendations are implemented to enhance the regional aviation system.

Encroachment Prevention and Compatible Land-Use Planning

As urban development increases, it will be vital for neighboring land use to be compatible with the region's aviation facilities. The noise associated with airfields makes some land uses incompatible when located in close proximity to aviation facilities. These land uses include housing, schools, offices, and public gathering places. Safety is also a concern, particularly near the ends of the runways. When

airport neighbors voice noise and safety concerns, the results can include restrictions on flight schedules, costly modifications by airports, and in extreme cases, political pressure to close airports. Aviation facilities require a high level of public investment; promoting compatible land-use planning and land development controls can protect this investment. This effort will be of particular interest as the region's population continues to grow.

Regional Military-Community Planning

Joint Land Use Study

In 2018, NCTCOG completed work with NAS JRB (Naval Air Station Joint Reserve Base) Fort Worth, surrounding communities, and other regional military installations to develop a regional Joint Land Use Study. The study identified strategies to allow military installations and surrounding communities to develop in a compatible manner to ensure the military presence in North Central Texas is sustained. This Joint Land Use Study follows up on a similar study that focused on NAS JRB Fort Worth and was completed in 2008. At the conclusion of the 2008 study, NAS JRB Fort Worth and surrounding communities created the NAS JRB Fort Worth RCC (Regional Coordination Committee). The RCC is a collaborative effort to ensure future development near the installation is compatible with current and future operations of the base. The RCC enhances communication and cooperation among the base and local governments. RCC participants 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.

Strategic Highway Network

Transportation facilities providing access to NAS JRB Fort Worth are important for national security. Additionally, NAS JRB Fort Worth and other related companies are major regional employers which generate substantial volumes of commuter and freight traffic.

NCTCOG is fortunate to work closely with NAS JRB Fort Worth and surrounding communities to ensure adequate access to the facility and will continue to monitor transportation needs and coordinate with federal partners on Strategic Highway Network designations as appropriate.

Integrated Aviation Education System

With a high concentration of aviation and aerospace companies operating in North Texas, it is vital the industry workforce pipeline is prepared to meet current and future employment demands. According to the Texas Workforce Commission, these employers needed nearly 50,000 highly skilled and trained workers in 2020 to remain competitive in a rapidly evolving global market. Considering the industry's annual economic impact of over \$40 billion, it is imperative that the local workforce is informed, educated, and skilled. NCTCOG's Aviation Education Initiative, begun in 2009, has emphasized science, technology, engineering, and math courses at Independent School Districts, community colleges, and universities. By July 2013, about 800 students were enrolled in Independent School District aviation programs and about 300 students were enrolled in college and university aviation programs. Embry Riddle Aeronautical University's Worldwide Campus announced in 2012 that it would offer bachelor's and master's degrees at Alliance Airport, and in 2013, Tarrant County College expanded its Aviation Maintenance Program. In 2012, NCTCOG launched www.NCTaviationcareers.com to provide information about aviation training and careers. Over the next five years, four Independent School Districts implemented aviation/aerospace programs for high school students and there is a new regional aviation maintenance school.

Coordination of Uncrewed Aircraft Systems

Technological advances are leading to new uses of uncrewed aircraft. Historically used almost exclusively by the military, UAS (uncrewed aircraft systems) use has grown in both the public and private

sectors. NCTCOG is working with municipalities, first responders, and transportation partners to ensure uncrewed and crewed aircraft can coexist in the busy skies above North Central Texas. NCTCOG compiled a report, *Unmanned Aircraft: Policy, Operations, and Local Integration*, which serves as a framework for how the agency, with guidance from the Air Transportation Advisory Committee, will approach UAS coordination. With Uber Elevate announcing its goal of making Dallas one of the test hubs for its urban air transportation platform, featuring uncrewed helicopter taxi services and the eventuality of last-mile package delivery by UAS, North Central Texas is poised to become a frontrunner in UAS integration.

In addition, the city of Mineral Wells has been utilized as a center of UAS testing in the region. NCTCOG will continue working with its partners and private-sector entities, such as UAS operators or manufacturers, government entities, emergency responders, and others, to accelerate safe UAS integration. Through workshops and other outreach efforts, NCTCOG will continue to help facilitate a regional effort that allows UAS technology to realize its potential while ensuring the skies remain safe for traditional aviation activities.

Summary

The goal of the aviation planning efforts in North Central Texas is to promote, maximize, protect, and advance regional aviation infrastructure to accommodate future growth in the region. This goal will be accomplished by collecting data, tracking performance, reviewing and monitoring surface transportation access to aviation facilities, conducting continuous aviation system planning, planning for compatible land use to prevent encroachment, integrating aviation education systems, and coordinating UAS efforts. The policies, programs, and projects discussed in this section are intended to advance the aviation planning activities and coordination efforts within North Central Texas.

New projects, programs, and policies will be developed as needed, and they will enable NCTCOG's Executive Board and the Regional Transportation Council to continue to support important aviation goals throughout the region.

See the **Mobility Options** appendix for a complete listing of policies, programs, projects, and maps related to aviation.

6. Mobility Options: Freight

Freight Planning Introduction

Freight and goods movement are essential to our daily lives. Homes could not be built, fuel could not be delivered, and store shelves could not be filled without freight movement. In Texas, 20 tons per household and 12,700 tons per business of freight were moved in 2018.¹ If freight ceased to move, the effects would be felt within hours.

Freight transportation is a key component in our regional, state, and national economies. Freight-related employment constitutes approximately 21 percent of all regional employment.² In 2021, \$17 billion of transportation and warehousing gross domestic product occurred in the North Texas region.³

The region is the nation's largest inland port where freight is moved, transferred, and distributed to destinations across the state and around the world. Four major Interstate Highways crisscross the region: IH 20, IH 30, IH 45, and IH 35 (including IH 35E and IH 35W branch routes). The region is a national railroad crossroads and a domestic and international air cargo hub, making it a national logistics hub. Ninety-eight percent of the US population can be reached from North Central Texas within 48 hours by truck.⁴ The region has one of the most extensive surface and air transportation networks in the world, providing widespread trade opportunities for the more than 600 motor/trucking carriers and almost 100 freight forwarders operating within the region.⁵

As domestic and international freight demand continues to grow, the ability of infrastructure to meet that demand is crucial to the region's economy and mobility and to the safety of its residents. As such,

freight integration is a critical component in the overall transportation planning process. Effective freight planning impacts Transportation Management and Operations, Transportation Safety, Intelligent Transportation Systems, Sustainable Development, Environmental Justice, Roadway/Rail Infrastructure, and Air Quality. These programs are addressed in the **Operational Efficiency**, **Mobility Options**, and **Environmental Considerations** chapters.

Effective freight planning must consider the following five significant freight transportation issues in the North Central Texas region:

- First/last mile connections
- Inadequate infrastructure
- Growing congestion on major regional transportation facilities
- Truck parking
- Safety

To help overcome these freight transportation issues, NCTCOG (North Central Texas Council of Governments) has multiple regional freight planning goals:

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

¹ Texas Freight Mobility Plan 2018, <https://ftp.dot.state.tx.us/pub/txdot/move-texas-freight/studies/freight-mobility/2018/plan.pdf>

² North Texas Commission, <https://indd.adobe.com/view/d4f5cff0-8916-4894-91d8-c550ae78c0d7>

³ North Texas Commission, <https://indd.adobe.com/view/d4f5cff0-8916-4894-91d8-c550ae78c0d7>

⁴ Freight North Texas, <https://www.nctcog.org/trans/plan/freight/regional-freight-system>

⁵ Dallas Fort Worth International Airport, <https://www.dfwairport.com/business/opportunities/cargo/freightforwarders/>

- Develop and use a sustainable and reliable funding source for freight programs and projects.
- Develop a regional freight database.
- Improve railroad safety and reliability.

Achievement of these goals will enable NCTCOG to better plan for the needs of freight transportation facilities and the freight sector.

Mobility 2045 Update Supported Goal

Improve the availability of transportation options for people and goods.

Freight Policies and Programs

The Mobility 2045 Update includes the following policies to guide attainment of freight goals:

FP3-001: Foster regional economic activity through safe, efficient, reliable freight movement while educating elected officials and the public regarding freight’s role in the Dallas-Fort Worth region’s economy.

FP3-002: Encourage the freight industry to participate in freight system planning and development to improve air quality and delivery time reliability.

FP3-003: Identify and maintain regional freight networks to meet business and consumer demand benefiting everyday life.

FP3-004: Enhance intermodal freight activity through innovation, facility development, and improved connections to the freight network by requiring local governments to create a dedicated and recurring funding source for projects that enhance freight mobility.

FP3-005: Enhance freight-oriented land-use sustainability by requiring local governments to adopt compatible zoning requirements and address environmental justice pertaining to freight-oriented development land uses.

FP3-006: Incorporate technological advancements into the freight system.

FP3-007: Improve efficiency by promoting safety, mobility, and accessibility on the freight networks.

FP3-008: Monitor freight traffic annually along major corridors and major freight facilities through the creation and maintenance of a regional freight database.

FP3-009: Incorporate freight analysis and involve the freight community in the planning process of all transportation projects.

FP3-010: Improve air quality related to freight through adopting local ordinances prohibiting truck engine idling.

FP3-011: Improve railroad safety through public education, innovation, and partnering with local governments to address railroad crossing safety improvements.

FP3-012: Incorporate technological advancements into the regional freight network.

FP3-013: Encourage regional railroads to participate in rail system planning, identifying issues, and the development of integrated operations with local commuter rail agencies.

Programs are an important element in the planning and implementation of the freight goals and policies. The Mobility 2045 Update supports the following programs associated with freight:

FP2-110: Data Collection

FP2-120: Freight System/Network Planning

FP2-130: Freight Outreach Activities

FP2-140: North Texas Multimodal Operations, Velocity, Efficiency, and Safety Program (NT MOVES)

FP2-330: Land-Use Planning

Selected programs are described in more detail in the following sections.

FP2-110: Data Collection

The program's purpose is to collect data and monitor freight traffic in the region, including:

- Vehicle classification counts and vehicle movements
- Freight Travel Demand Forecasting Model
- Freight transportation facility inventory
- Federal Highway Administration, state, local, and private data sources
- Economic information regarding impact of freight

Data will be collected for the region, and particularly for areas with freight facilities and high freight traffic. Capital improvement needs will be documented as well.

Data will be used to help determine where potential issues may arise in the freight system and will help to create projects addressing these issues. It will also be used in outreach to elected officials and policy makers to communicate freight's importance to the region.

FP2-120: Freight System/Network Planning

The planning efforts and studies listed below are part of the Freight System/Network Planning Program:

Safety: Increase public and freight operators' safety through education and projects.

Freight Rail: Continue various regional rail planning efforts, including:

- Complete the Regional Rail Study and implement recommendations
- Railroad Crossing Banking Program

- Railroad Safety Education Program
- Railroad Crossing Quiet Zone Planning
- Railroad Crossing Reliability Partnership Program

Freight Routes: Identify, analyze, and improve freight routes, including:

- Innovative solutions (e.g., truck only lanes)
- Develop and keep Critical Urban Freight Corridors up to date
- Bottleneck removal projects
- New technologies (e.g., automated vehicles)
- Improve truck parking availability
- Infrastructure improvements on primary and secondary freight networks and local truck routes
- First/last mile access improvements
- Operations improvement on key freight routes
- Implement projects to enhance network connectivity

Hazardous Materials Routing: Analyze/reevaluate hazardous materials routing to ensure safe movement of hazardous materials and reevaluate current routes to account for current population and employment data.

FP2-130: Freight Outreach Activities

This program's purpose is to engage in education and outreach activities within and outside the freight sector. Outreach participants include professionals in the freight industry, public officials, and the general public. This outreach will increase understanding of freight's importance to the region and of long-term freight planning for the public, industry professionals, and decision makers.

FP2-330: Land-Use Planning

This program's purpose is to help ensure compatible land uses are considered near freight development, including:

- Railroad tracks
- Intermodal facilities

- Freight-oriented developments
- Truck routes and other major freight carry roadways
- Truck parking facilities

This program will help create safer and more efficient freight centers.

FP2-140: North Texas Multimodal Operations, Velocity, Efficiency, and Safety Program

This program’s purpose addresses long-range freight rail planning needs. The program seeks to address rail mobility issues through collaboration and strategic investment into rail infrastructure. The program resolves long standing congestion issues by working with both public and private rail sectors to help identify and resolve rail bottlenecks and operations issues within the North Central Texas region. There are several elements and projects to this program, including:

Better Utilizing Investments to Leverage Development Grant:

Work with regional rail partners to complete the projects outlined in the Fiscal Year 2020 Better Utilizing Investments to Leverage Development Grant award.

Regional Railroad Information System: Implement Clear Path technology to be used to assist in creating capacity of the Dallas-Fort Worth rail network by facilitating inter-carrier operations and enhancing the flow of passenger and freight trains through the complex.

Professional Engineering Agreements: Establish engineering agreements with freight and passenger railroads, allowing for streamlined design and review of design plans for regionally significant transportation projects.

Transit Rail Insurance: Administer funds allocated for required insurance, which would allow passenger rail integration onto active freight rail lines.

Freight North Texas



Freight North Texas is an ongoing planning program led by NCTCOG to enhance the safety, mobility, efficiency, and air quality associated with freight movements within the North Central Texas region. As a part of creating the Freight North Texas

Program, in September 2011, NCTCOG staff convened the Regional Freight Advisory Committee, consisting of freight professionals. The Regional Freight Advisory Committee provides guidance to NCTCOG staff and regional policy makers regarding freight activities, and the committee also continues to provide strategic product and project review. The guiding document for Freight North Texas is *The North Central Texas Regional Freight System Inventory*, published in May 2013. This document highlights policies, programs, and projects needed to improve freight planning and operations in North Central Texas. Several follow-up studies from the report include:

- Freight Congestion and Delay Study, completed in 2016
- Regional Truck Parking Study, completed in 2018
- Land-Use Compatibility Analysis, completed 2021
- Economic Impact of Freight on the Region, completed in 2021
- Freight Project Evaluation System, completed in 2021

Completing these studies has provided a more comprehensive and accurate representation of regional freight and will help to identify and prioritize effective initiatives. With the completion of the follow-up studies, work has begun on the new Freight North Texas Regional Freight Plan. This document will continue to be the guiding document for the Freight Program at NCTCOG.

Rail Planning

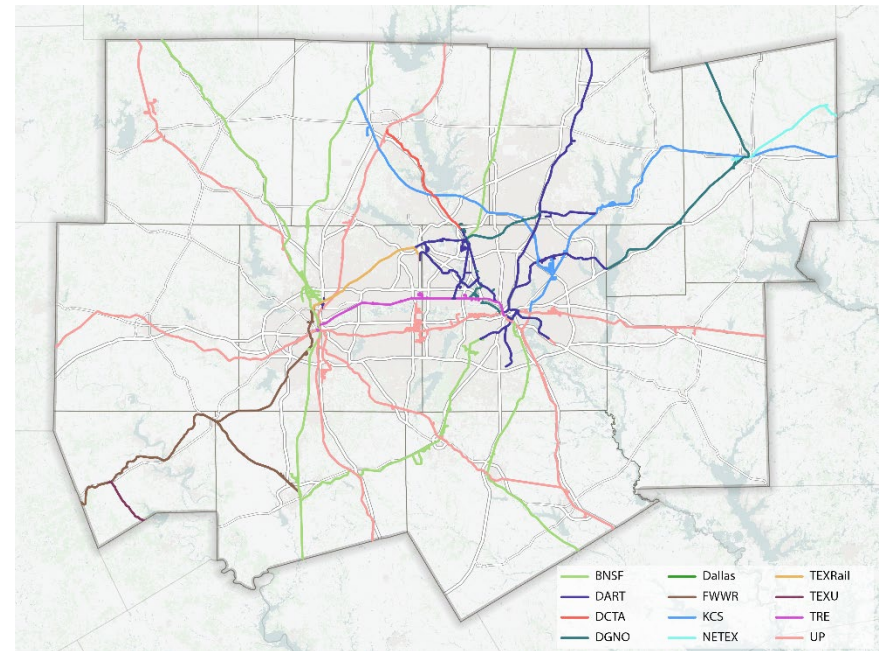
As a vital part of the nation's freight network, Texas has over 10,000 miles of freight tracks, the most of any state.⁶ Three of the nation's Class 1 railroads operate within North Central Texas: 1) BNSF Railway, 2) Kansas City Southern, and 3) Union Pacific Railroad. These railroads can be seen in **Exhibit 6-5**. Each of these Class 1 railroads operates at least one intermodal facility in the region. In addition, several short-line railroads have local operations in the region, including the Dallas, Garland & Northeastern Railroad and the Fort Worth & Western Railroad. These rail lines combine to serve all 48 contiguous states, Alaska, Canada, and Mexico, and they work cooperatively with trucking firms and ocean shippers to expedite intermodal freight movements.

Key freight railroad facilities in North Central Texas include:

- BNSF Railway Intermodal and Carload Transportation Center at Alliance
- Kansas City Southern Wylie Intermodal Terminal in Wylie
- Union Pacific Railroad Dallas Intermodal Terminal in Wilmer
- Union Pacific Railroad Mesquite Intermodal Terminal in Mesquite

Rail is an important part of the region's freight system and working with the rail industry to create a more complete freight network is critical. NCTCOG has several policies and programs pertaining to freight rail planning. These include promoting proper land-use planning, monitoring and/or preserving right-of-way for future transportation projects, encouraging safe and efficient rail crossings, and improving access to the intermodal facilities.

Exhibit 6-5: Regional Rail Network Owners



North Texas Multimodal Operations, Velocity, Efficiency, and Safety Program

NCTCOG's NT MOVES (North Texas Multimodal Operations, Velocity, Efficiency, and Safety) Program is a program focused on railroad and road improvements in the North Texas region intended to enhance freight and passenger mobility across all modes. NT MOVES is a long-range program that seeks to address rail mobility issues through collaboration and strategic investment into rail infrastructure. The program is an ambitious and innovative approach to resolving longstanding congestion issues. Both public and private rail sectors have come together to help identify and resolve rail bottlenecks and operational issues within the North Central Texas region. This has resulted in the identification of high priority projects that, in turn,

⁶ Texas Department of Transportation, <https://www.txdot.gov/inside-txdot/modes-of-travel/rail.html>

have been submitted to federal grants with all partners committing funding to the efforts. As a result, NCTCOG was awarded \$25 million through the Fiscal Year 2020 Better Utilizing Investments to Leverage Development Grant to progress projects.

Better Utilizing Investments to Leverage Development Grant

As stated above, NCTCOG's NT MOVES submittal for the BUILD (Better Utilizing Investments to Leverage Development) Grant was selected and awarded \$25 million to progress projects. These projects will eliminate 3.6 miles of single track, bringing the single-track mileage to just 11.4 miles and increasing the double-track mileage to 23.6 miles on the TRE (Trinity Railway Express) corridor. The TRE corridor is used as the main passenger rail corridor between Dallas and Fort Worth, with TRE, Amtrak, and multiple freight railroads operating on the corridor. It is one of the region's most congested rail corridors being highly used for both freight and passenger rail. These improvements include:

- Double track Medical Market Center to Stemmons Freeway (milepost 639.5) to the beginning of the existing double-tracked section west of Medical Market Center Station (approximately milepost 640.7), a distance of about 1.2 miles. Rehabilitate the existing bridge over Inwood Road (milepost 640.41) and add an adjacent bridge for the second track. Add a new bridge at Knights Branch (milepost 640.32) for a second track. Replace current Noble Branch Bridge and add an adjacent bridge for a second track (milepost 639.62).
- Replace bridges at Walkers Creek (milepost 620.60) and Mesquite Creek (milepost 621.06) and construct 2.4 miles of a new second track from east of Handley Ederville Road to east of Precinct Line Road (milepost 618.7 to milepost 621.1).

Regional Rail Information System

In addition to the physical infrastructure project, the BUILD Grant award also included funding for the implementation of a Regional Rail Information System, using Clear Path technology developed for the Chicago Rail Complex. The goal is to design and develop the concept of operations and implement a hardware and software backbone structure. This will enable all agencies and users of the Dallas-Fort Worth regional rail system to exchange timely, accurate, and actionable information on train movements in the terminal complex. This system will increase the capacity of the Dallas-Fort Worth rail network by facilitating intercarrier operations and enhancing the flow of passenger and freight trains through the complex.

FM 429 Realignment

Through the collaborative approach of NT MOVES, the FM 429 Realignment project was identified. Union Pacific Railroad plans to construct a new siding along US 80 on the east side of Terrell. With the new siding, a second track would be located across the at-grade crossing at FM 429. NCTCOG has worked with Union Pacific Railroad, the city of Terrell, and the Texas Department of Transportation to create a solution for potential safety and efficiency concerns. The determined solution is to realign FM 429 away from the new siding and eliminate an offset intersection at FM 429 and US 80. This will correct the offset intersection and be in line with NCTCOG's Policy TSSF3-005 of correcting offset intersections in the region, as they are safety hazards. Policy TSSF3-005 calls for implementation of intersection safety countermeasures to assist in reducing severe intersection crashes. For more information, see the **Transportation System Safety** section in the **Operational Efficiency** chapter. As with all NT MOVES projects, the emphasis is on collaboration. All parties agree on the approach, and all are financially committed to completing the project.

Regional Rail Study

A Regional Rail Study has been conducted by NCTCOG and the Texas Department of Transportation to inventory rail assets, constraints, and safety issues on the rail network. The Regional Rail Study was completed in September 2020. The study includes a list of rail enhancements prioritized in the best interest of the North Central Texas region; the enhancements will address current passenger- and freight-rail performance concerns. To improve coordination between regional transit agencies and freight rail carriers, the study identified policies, programs, and agency-specific strategies to reduce freight delays and maintain on-time passenger rail service. The study contains information and project recommendations for the rail system as a whole and emphasizes the integration of passenger and freight rail.

NCTCOG currently has several rail initiatives, including the Railroad Crossing Reliability Partnership Program and the Regional Railroad Crossing Banking Program. These help to create safer and more efficient rail movement in the region.

Air Cargo

North Central Texas has two major air cargo facilities: Dallas Fort Worth International Airport and Alliance Airport. Alliance is exclusively an air cargo airport. Trucks are the primary method used to transport cargo away from the airports. Although air cargo carries a higher value than the other modes of freight, it does not have as big an impact on the regional freight network as other modes. Air cargo creates less impact because it has a relatively low weight compared with that of truck or rail cargo. Despite this low weight, the location of air cargo terminals and the volume of their goods movements still need to be considered in freight transportation

planning. For more information about air cargo in the region, please refer to the **Aviation** section of this chapter.

Highway Planning

The US transportation system moved 11.9 billion tons of freight on America's highways in 2020.⁷ Most freight in the US is moved via truck. Deregulation of the trucking industry, the passage of the United States-Mexico-Canada Agreement, reductions in rail service, and growth in time-sensitive freight have greatly impacted the number of trucks on the nation's roadways, including those in North Central Texas.

Key freight truck facilities in North Central Texas include:

- BNSF Railway Intermodal and Carload Transportation Center at Alliance
- Kansas City Southern Wylie Intermodal Terminal in Wylie
- Union Pacific Railroad Dallas Intermodal Terminal in Wilmer
- Union Pacific Railroad Mesquite Intermodal Terminal in Mesquite
- Dallas Fort Worth International Airport
- Alliance Airport Air Cargo Terminals
- Peterbilt Motors Company Manufacturing in Denton
- FedEx Ground Dallas Hub in Dallas
- United Parcel Service in Dallas
- Coca-Cola Bottling and Distribution in Mesquite
- Foreign Trade Zone Numbers:
 - 39: Dallas Fort Worth International Airport
 - 113: Ellis County
 - 168: Dallas-Fort Worth
 - 196: Fort Worth (Alliance)

Truck travel characteristics and routes are continuously monitored and inventoried. This information helps to forecast the impact of proposed transportation planning and infrastructure project on the

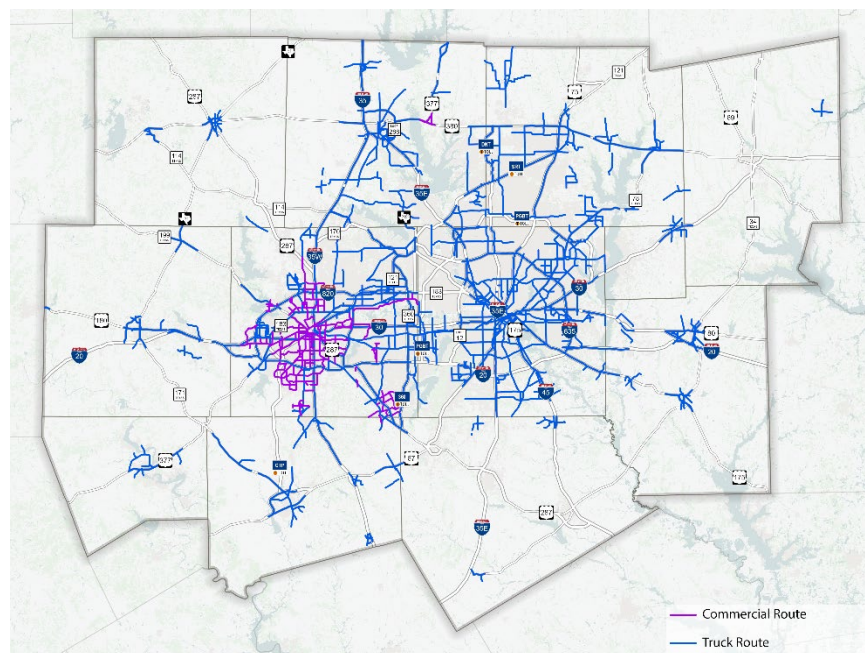
⁷ Federal Highway Administration, <https://highways.dot.gov/>

movement of freight. Additionally, as more precise data is collected and monitored, models that forecast truck flow may be used to evaluate proposed changes to the transportation system.

Regional Truck Routes

Dedicated truck routes are an important component of the regional freight system. The truck routes for the region can be seen in **Exhibit 6-6**. Federal, state, and local governments may establish truck routes as a means to direct freight traffic to minimize congestion for both passenger and freight vehicles. Truck routes also offer designated routes to key freight facilities. Within North Central Texas, 100 municipalities have some form of truck route designated by ordinance.

Exhibit 6-6: Regional Truck Routes



Connecting the region's freight network to FHWA's (Federal Highway Administration) NHFN (National Highway Freight Network) is vital to the region's freight movement. NCTCOG engaged in developing a

Regional Critical Urban Freight Corridor system. The goal was to identify important freight corridors that provide critical connectivity to the state freight network and the NHFN. The Regional Critical Urban Freight Corridor system aligns with the Mobility 2045 Update, the Transportation Improvement Program, and the state's 10-Year Plan.

CUFCs (Critical Urban Freight Corridors) are a requirement of the Fixing America's Surface Transportation Act as part of FHWA's NHFN. Being a part of the NHFN allows these corridors to be eligible for state and federal funding. Twelve corridors were identified and approved by the Regional Transportation Council to submit to TxDOT (Texas Department of Transportation) and FHWA as the current CUFCs. These corridors are illustrated in **Exhibit 6-7**. NCTCOG will work with TxDOT staff every year to ensure the proper roads in the region are identified as CUFCs.

Truck Lane Restrictions

The truck lane restrictions first proposed in the 2005 Truck Lane Pilot Study and 2009 Truck Lane Restriction Expansion Study are operational along sections of highway segments in Collin, Dallas, Ellis, Parker, Rockwall, and Tarrant counties. These were further expanded in 2013. Then, in 2019, NCTCOG and the TxDOT Dallas District worked together on an expansion of the region's truck lane restrictions across the eastern side of the region. **Exhibit 6-8** illustrates these sections. As portrayed, the majority of the operational truck lane restrictions are in Dallas and Tarrant counties. **Exhibit 6-8** also illustrates plans for future truck lane restrictions, which will eventually reach Denton County. Combined, these truck lane restrictions are expected to improve highway safety and mobility and the region's air quality. The implementation of these additional truck lane restrictions will help to ease congestion for passenger vehicles and increase safety in the proposed corridors. The table in

Exhibit 6-9 details the new 2019 additions to the truck lane restriction network.

Exhibit 6-7: Critical Urban Freight Corridors

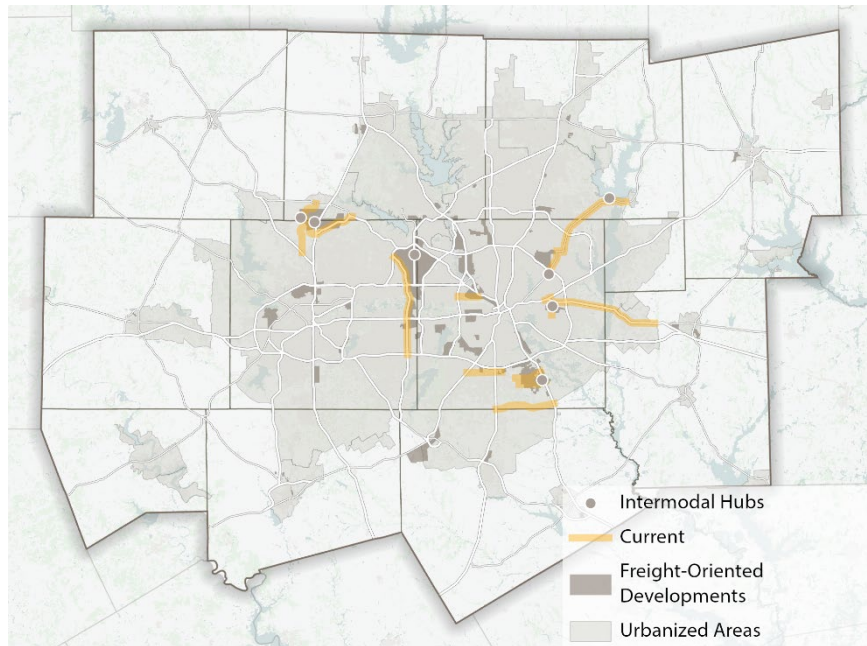


Exhibit 6-8: Regional Truck Lane Restrictions

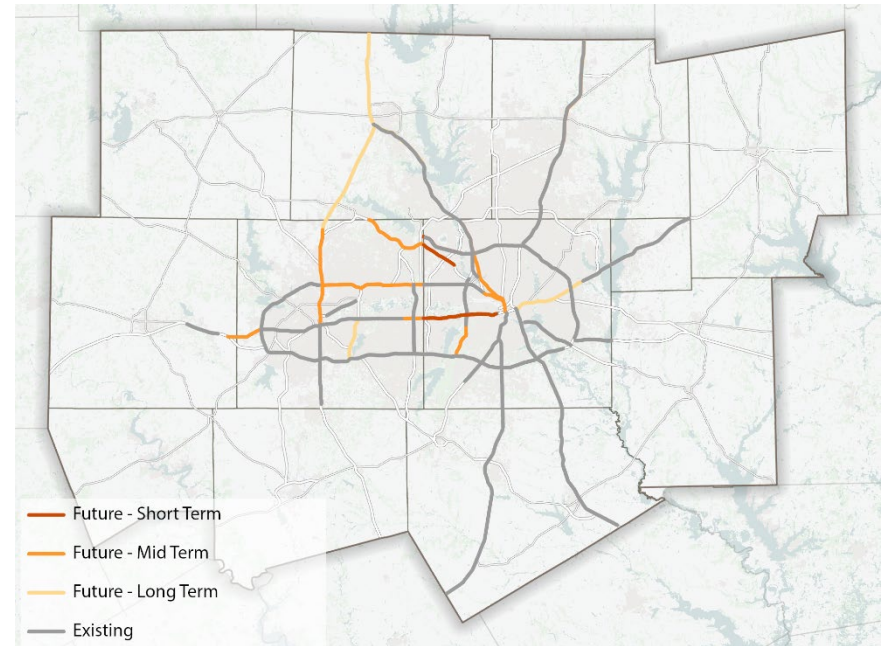


Exhibit 6-9: 2019 Truck Lane Restriction Update

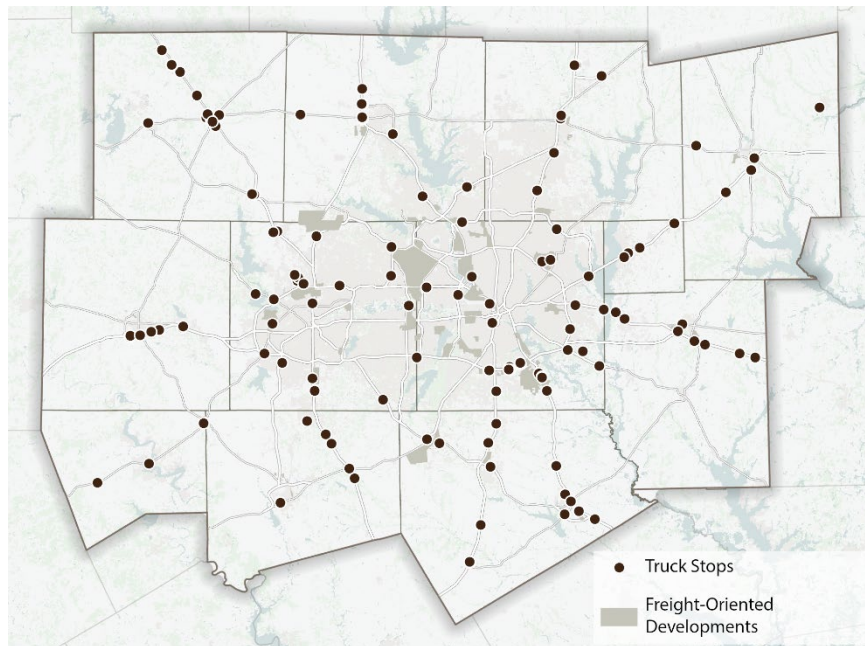
Corridor Sections	
US 75	SH 121 South to Collin/Grayson County Line
IH 45	Navarro/Ellis County Line to Navarro/Freestone County Line
IH 35E	US 77N to Ellis/Hill County Line
IH 35E	Spur 366 to Corinth Parkway
SH 183	IH 35E to Dallas/Tarrant County Line
US 67	IH 35E to FM 1382
IH 635	US 75 to Dallas/Tarrant County Line
IH 30	SH 205 to Rockwall/Hunt County Line

Source: North Central Texas Council of Governments

Truck Parking

In 2018, the North Central Texas Council of Governments completed the Regional Truck Parking Study. The recommendations included in this study provide verifiable data to local, regional, state, and private entities such as truck parking locations, truck counts, and truck travel times. The recommendations also include opportunities to improve truck parking infrastructure by enhancing existing, and developing additional, truck parking facilities. Increasing the number of viable truck parking spaces would help truck drivers comply with federally mandated regulations, improve safety on roadways, and enhance regional economic development (see **Exhibit 6-10**).

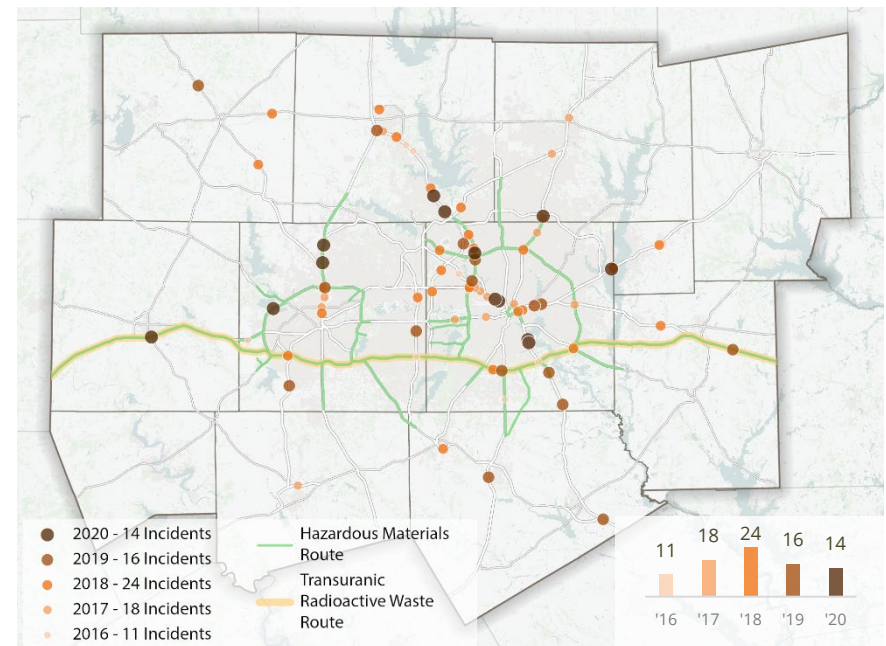
Exhibit 6-10: Regional Truck Stops



Freight Safety

As stated earlier, safety in freight movement is a high priority in the goods movement industry and needs to be properly tracked and evaluated on a consistent basis. Freight highway safety in the region is annually tracked by reviewing and analyzing truck-involved crashes. Analysis focuses on the crash location, possible causes, impact on traffic congestion, and potential solutions to improve highway safety involving truck movements. Please see **Exhibit 6-11** for hotspots related to truck-involved crashes. For more information about safety, see the **Operational Efficiency** chapter, **Transportation System Safety** section.

Exhibit 6-11: Commercial Vehicle Incidents



The 2021 Safe Driving Campaign began in early spring and ended in the fall. The last safety campaign took place in 2018. The goal for the 2021 campaign was to reduce freight-related accidents and inform the public about safe driving practices near large commercial motor vehicles. Truck and passenger vehicles interact daily, which can present possible life-threatening incidents. These can be mitigated through a greater awareness and safer driving habits. The saying goes, “reduce the risk, prevent the crash.” **Exhibit 6-12** is an example of a freight advertisement that was used to promote the 2021 Safety Campaign.

Exhibit 6-12: Freight Creative



Operation Lifesaver, which aims to reduce rail crossing related accidents and inform the public about safe rail crossing practices, will again collaborate with NCTCOG for the 2021 Railroad Crossing Safety Campaign. It is important to keep our communities safe through continued rail crossing safety education so NCTCOG will continue doing safety campaigns.

Logistics and the Economy

Logistics operations have far-reaching impacts in nearly every major commercial, institutional, and industrial sector. As such, the infrastructure that facilitates goods movement plays a vital role in sustaining and developing the economy. Therefore, broad spectrum land-use policies that do not consider the needs of the freight industry are both environmentally and economically detrimental. NCTCOG seeks to assist with comprehensive analysis of freight land uses in the North Central Texas region and will provide a toolkit to

municipal governments as an aid in refining and updating current land-use policies. Ensuring that freight industry needs are accounted for in municipal and county codes maximizes the economic benefit of freight activity while minimizing any environmental and quality-of-life externalities that result from logistical operations.

Environmental Justice

Environmental justice analysis is an important part of reviewing freight activity. Environmental justice analysis helps identify locations in the region where there is a potential for disproportionate negative impacts to occur because of freight land use or land developments near populations protected by environmental justice laws and policies. The results will help determine the locations and potential adequate areas for freight located in the North Central Texas region. For more information on environmental justice, see the **Social Considerations** chapter.

Technology

New and emerging technologies have the potential to affect freight transportation. These include electronic driver logs, automated vehicles, connected vehicles, and alternative delivery methods. In addition to these, NCTCOG has moved forward with automated transportation system and freight signal optimization. These projects represent a technological approach to traditional freight problems such as truck congestion caused by signal timing in freight-oriented areas and the need for short, closed freight networks. These and other new technologies will have a sizable impact on the movement of freight. NCTCOG will continue to monitor and incorporate potential impacts of new technologies into the planning process as they emerge. For more information on automated vehicles, see the **Transportation Technology** chapter.

NCTCOG will also continue to monitor the impacts on freight movement that result from major infrastructure projects external to

the region, including the Panama Canal Expansion and potential Red River Navigation projects.

Performance Measures

Performance measures provide a means to assess how freight goals and policies are being met. In recent years, federal transportation legislation set forth requirements for Metropolitan Planning Organizations to establish and report on performance measures and encouraged voluntary performance measures above and beyond those required.

MAP-21 (Moving Ahead for Progress in the 21st Century Act) focused on safety, infrastructure condition, congestion reduction, system reliability, freight movement and economic vitality, environmental sustainability, and reduced project delivery delays. For freight movements in particular, the MAP 21 performance measure is the Truck Travel Time Reliability Index that measures the reliability of travel times on the Interstate system within the metropolitan area.

MAP-21 first required these performance measures, then they were carried out into the Fixing America's Surface Transportation Act. In addition to the federally required performance measures, NCTCOG also measures the Regional Ratio of Truck Travel Time Index to the Passenger Vehicle Travel Time Index to improve the availability of transportation options for people and goods. The aim is to help improve congestion issues that disproportionately impact freight movement.

Additional regional freight performance dimensions tracked in the Freight Program include:

- Yearly vehicle classification counts
- Complete (commercial vehicle) freight travel model
- Updated freight transportation facility inventory
- Reduction in annual number of accidents between trucks and non-trucks

- Increased travel speeds for non-truck traffic
- Reduction in accidents/incidents at at-grade railroad crossings
- Reduction in the number of at-grade railroad crossings
- Increased number of truck parking locations
- Reduction of incidents involving hazardous materials
- Improved and increased relationships with the freight community
- Improved attendance at Regional Freight Advisory Committee meetings
- Improved compatible land uses near freight development

For more information on voluntary and other federally required performance measures, please see the **Regional Performance** chapter.

Summary

Goods are moved, transferred, and distributed from North Central Texas to destinations across the United States and around the world via truck, train, and aircraft. Providing reliable infrastructure and freight planning that integrates multiple moves is crucial to the region's economy and is vital to the local, state, and national economies and residents' quality of life. The Mobility 2045 Update recommends a variety of goals, policies, and programs to support the efficient, safe, and reliable movement of freight in North Central Texas.

6. Mobility Options: Active Transportation

Introduction

Active transportation, or bicycle and pedestrian modes, is an integral component of the Mobility 2045 Update. Active transportation offers numerous options to improve the existing transportation system efficiently and cost-effectively through a variety of systematic enhancements. Active transportation also includes micromobility; as defined by the Federal Highway Administration, micromobility is any human- or electric-powered transportation device, including bicycles, scooters, electric-assist bicycles (e-bikes), electric scooters (e-scooters), and other small, lightweight, wheeled conveyances.

Active transportation benefits all road users and creates more livable, safe, cost-efficient communities. The region's active transportation network is used as a mode of transportation by people of all ages and abilities to walk and bicycle. The network is not only for recreational use; it is also used for non-recreational trips and a variety of purposes such as traveling to work or school, and as first/last mile connections with transit services, including bus stops and rail stations. A current federal statute, United States Code, Title 23, Chapter 2, Section 217 (23 USC 217), mandates that *"bicycle transportation facilities and pedestrian walkways shall be considered, where appropriate, in conjunction with all new construction and reconstruction of transportation facilities, except where bicycle and pedestrian use are not permitted."*

The USDOT (United States Department of Transportation) policy statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations signed on March 11, 2010 is *"to incorporate safe and convenient walking and bicycling facilities into transportation projects. Every transportation agency, including DOT, has the responsibility to improve conditions and opportunities for walking and bicycling and to integrate walking and bicycling into their transportation systems. Because of the numerous individual and community benefits*

that walking and bicycling provide—including health, safety, environmental, transportation, and quality of life—transportation agencies are encouraged to go beyond minimum standards to provide safe and convenient facilities for these modes."

The USDOT policy emphasizes that active transportation accommodations should be given the same priority as other transportation modes. Walking and bicycling facilities should meet accessibility requirements and provide safe, convenient, and interconnected transportation networks that ensure transportation choices are available for people of all ages and abilities, especially children. With this stronger emphasis for multimodal transportation facilities by USDOT, the Texas Department of Transportation has also established guidance, updated on April 2, 2021, to proactively plan, design, and construct facilities to safely accommodate bicycles and pedestrians.

Mobility 2045 Update 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.

Ensure all communities are provided access to the regional transportation system and planning process.

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

Encourage livable communities which support sustainability and economic vitality.

Ensure adequate maintenance and enhance the safety and reliability of the existing transportation system.

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

Providing Traveler Choice

The following are considerations that should be given when planning and implementing active transportation facilities:

- All trips less than two miles in length in the urbanized area should have options available to be accomplished by nonmotorized, transit, or micromobility modes of travel.
- All roadways in the urbanized area should be designed and constructed to accommodate at least three modes of transportation.
- Roadway projects should implement context-sensitive design approaches compatible with the community and neighborhood in which the roadway is located.

Policies, Programs, and Projects

This section describes the policy framework that guides the implementation of the regionwide network of urban and rural active transportation facilities. This includes the integration of context-sensitive Complete Streets, context-sensitive solutions, and other relevant initiatives into roadway planning, design, implementation, and maintenance policies. This multimodal network vision of the Mobility 2045 Update will create a seamless and interconnected transportation network that safely accommodates users of all ages and abilities, including pedestrians, bicyclists, transit riders, and motorists.

Three policies form the foundation of the Mobility 2045 Update active transportation vision; these policies are supported by a variety of programs and projects. Each element plays an integral role in meeting shared regional goals and needs. Policies guide decision-making processes, programs compose the policy framework, and performance measures maintain accountability. See

the **Mobility Options** appendix for a complete listing of policies, programs, projects, and maps related to active transportation.

Policy BP3-001: Support the planning and design of a multimodal transportation network with seamless interconnected active transportation facilities that promotes walking and bicycling as equals with other transportation modes.

The active transportation network must be interconnected with transit services and integrated as part of Complete Streets to connect key destinations, including employment centers; education, medical, retail, and entertainment centers; and other destinations for daily activities. The Mobility 2045 Update promotes roadways in the urbanized area that are designed and constructed to accommodate at least three or more modes of transportation.

Program BP2-001: Active Transportation Planning and Design

- A. Multimodal Transportation Plans:** Encourage development of local pedestrian and bicycle plans, as well as modifications to local transportation plans and standards that provide for pedestrian accommodations, on-street bikeways, and the network of off-street trails.
- B. Context-Sensitive Complete Streets:** Facilitate and support the adoption of local policies and the implementation of context-sensitive Complete Streets projects with bicycle and pedestrian facilities as routine accommodations for new roadway construction and reconstruction projects.
- C. Context-Sensitive Design:** Incorporate bicycle and pedestrian modes in all transportation corridor studies, support the adoption of regional and local policies, and implement context-sensitive Complete Streets projects and roadway projects that are sensitive in design to the context of their surroundings.
- D. Corridor Studies:** Integrate 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.

- E. Active Transportation Safety Plans:** Implement the regional Pedestrian Safety Action Plan and develop a regional Bike Safety Action Plan.
- F. Americans with Disabilities Act Transition Plans:** Encourage local agencies to adopt and implement Americans with Disabilities Act transition plans.
- G. Local Regulations:** Encourage local jurisdictions to adopt ordinances, zoning standards, engineering standards, and guidelines that accommodate bicycle and pedestrian modes of travel through such means as context-sensitive Complete Streets policies, thoroughfare technical specifications, right-of-way and easement preservation, bicycle parking ordinances, bicycle passing ordinances, and end-of-trip facilities.
- H. Data Collection and Analysis:** Monitor and evaluate the North Central Texas region's bicycling and walking efforts by collecting bicycle and pedestrian count data, analyzing bicycle and pedestrian crash data, conducting regional nonmotorized travel surveys, developing an appropriate methodology indicating active transportation's modal share goal, and publishing findings.
- I. Technical Support/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.

Policy BP3-002: Implement pedestrian and bicycle facilities that meet accessibility requirements and provide safe, convenient, and interconnected transportation for people of all ages and abilities.

The Mobility 2045 Update promotes bicycle and pedestrian projects that connect multiple jurisdictions and expand the regional network by improving coordination, connectivity, and continuity between counties and communities. To realize the potential of active

transportation, special attention must be paid to the current barriers and safety issues the region is experiencing. These include:

- An incomplete network of bicycle and pedestrian facilities, including those that serve environmental justice and transit-dependent populations.
- High rates of pedestrian and bicycle crashes and fatalities involving motor vehicles.
- Limited funding for safe routes to school projects.
- Infrastructure that is not compliant with Americans with Disabilities Act.
- Significant barriers to safe active transportation travel; these barriers include freeways, major streets with high traffic volumes and speeds, and waterways.

Improving safety is a top priority for USDOT, and the Mobility 2045 Update is committed to reducing fatalities and serious injuries on the transportation network throughout North Central Texas.

Program BP2-002: Active Transportation Network Implementation

- A. Complete the Regional Active Transportation Network:** Continue the Regional Transportation Council Local Funding Program initiatives and Sustainable Development Funding Programs. The Local Funding Program initiatives include the Local Air Quality Transportation Alternatives Program. Sustainable Development Funding Programs direct funds to local governments to improve, expand, and complete the bicycle and pedestrian facilities network and related programs throughout the region. Implementation priorities include:
 - 1. Close Gaps and Improve Connectivity in the Regional Veloweb, On-Street Bikeway Network, and Pedestrian Network:** Eliminate major gaps in the regional network and complete connections to address major barriers such as freeways, railroads, and waterways.

2. **Linkages to Transit and Major Destinations and Areas with Highest Demand:** Support and complete the development of pedestrian and bicycle facilities that provide access from neighborhoods to public transportation services, education facilities, employment centers, medical, retail, and other destinations.
 3. **Environmental Justice Areas and Transit-Dependent Populations:** Improve accommodations for pedestrians and bicyclists in environmental justice areas and improve connections for transit-dependent populations.
 4. **Safety Improvements:** Implement Regional Pedestrian and Bike Safety Plans and related projects that improve accommodations and safety for pedestrians and bicyclists, with special attention given to vulnerable road users and disadvantaged communities.
 5. **Safe Routes to School:** Coordinate with Independent School Districts, municipalities, public safety officials, and other agencies throughout the region to ensure safe and accessible walking and bicycling corridors to education facilities.
- B. Safety Improvements:** Support efforts to reduce crashes and fatalities between motor vehicles and pedestrians and bicyclists, including the implementation of Proven Safety Countermeasures outlined by the Federal Highway Administration Office of Safety. Prioritize infrastructure design techniques and safety countermeasures projects in areas with high rates of pedestrian and bicycle crashes and fatalities.
- C. Americans with Disabilities Act Compliance:** Support efforts to identify American with Disabilities Act accessibility needs and incorporate improvements into the overall transportation network.

Policy BP3-003: Support programs and activities that promote pedestrian and bicycle safety, health, and education.

Walking and bicycling 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. The Mobility 2045 Update promotes enhanced 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 promoting enforcement of traffic laws to reduce bicycle and pedestrian-related conflicts.

Program BP2-003: Active Transportation Education and Outreach

- A. Safety Education Programs and Campaigns:** Support and create programs and campaigns 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 to increase safety for all road users. Support programs aimed at increasing bicycle and walking trips by providing incentives, recognition, or services that make bicycling and walking more convenient transportation modes.
- B. Healthy and Livable Communities:** Create healthier and more livable communities by encouraging the use of bicycle and pedestrian facilities for work and non-work trips, and for daily physical activity.
- C. Enforcement:** Encourage enforcement efforts of traffic laws and target unsafe bicyclist, pedestrian, and motorist behaviors to improve safety and reduce collisions and conflicts between motorists, bicyclists, and pedestrians.
- D. Technical Training and Education:** Provide pertinent training to transportation-related professionals.
- E. Mapping Facilities and Plans:** Maintain a regional database and provide information regarding existing and planned active transportation facilities and related amenities throughout the region.

Active Transportation Context in North Central Texas

Many cities and counties in the region have developed and adopted bicycle master plans, trail master plans, or a combination of both. Various communities are also developing plans for local pedestrian networks and programs to provide safe routes to schools. In addition, numerous cities and transportation agencies have adopted local policies for bicycle accommodations to encourage bicycling as a form of transportation. The number of locally adopted community bicycle and trail master plans in the region grows each year. These documents are used in the development of the Mobility 2045 Update to ensure regional connectivity and continuity.

The types of pedestrian and bicycle facilities available differ from community to community, and their conditions vary based on the context and density of the surrounding area where they are located. These projects provide for nonmotorized modes of transportation, and enhance travel and tourism throughout the region, including access to destinations of statewide significance such as the Fort Worth Stockyards National Historic District, the Arlington Entertainment District, Fair Park in Dallas, and others.

In urban areas, the active transportation network typically includes a wide mix of interconnected sidewalks, off-street shared-use paths, and on-street bikeways, including designated or separated bike lanes and cycle tracks and marked shared lanes. The network concentration is the greatest in higher density urban areas and where there are high volumes of users requiring connections to transit and major destinations. These areas also have a significant number of short trips that can be achieved by walking, bicycling, and micromobility devices.

In suburban areas, the active transportation network typically includes similar facilities to those in urban areas. However, the overall network and mix of the active transportation network may

vary from urban areas due to differences in the physical design and density of land uses and the opportunities for short walking, biking, and micromobility trips.

In rural unincorporated areas, the active transportation network may consist of signed wide shoulders on roads for safe bicycle travel between rural towns.

In order to support regional goals related to mobility, land use, the environment, the economy, and public health, the Mobility 2045 Update recognizes the active transportation network in the region cannot be treated as stand-alone facilities. Sidewalks, off-street shared-use paths, and on-street bikeways should be integrated as part of context-sensitive Complete Streets, and they should be interconnected with transit services and other modes of transportation such as micromobility devices. This seamless multimodal transportation network can connect housing and key destinations, including employment centers, education, medical, retail and entertainment centers, and others. Much of the region's 2045 active transportation network of pedestrian facilities and on-street bikeways will be implemented through context-sensitive Complete Streets designed and operated to enable safe access and travel for users of all ages and abilities.



The Mobility 2045 Update supports the development of local context-sensitive Complete Streets policies and the implementation of context-sensitive Complete Streets infrastructure on both new and reconstructed streets; such design will safely accommodate all users in the region. Additional information on context-sensitive Complete Streets can be found in the **Sustainable Development** section of the

Operational Efficiency chapter, the **Healthy Communities** section of the **Environmental Considerations** chapter, and in the **Roadway** section of this chapter. According to the 2017 National Household Travel Survey for households located in urban areas, 45 percent of all trips were three miles or less in distance, and 18 percent of all trips were one mile or less.

These trips are ideal for biking, walking, transit, micromobility, or a combination of these modes of travel. By encouraging investment in facilities that support these forms of transportation, the region has the opportunity to shift short trips to walking and bicycling modes, resulting in more transportation choices and improved air quality. Therefore, the Mobility 2045 Update aims to provide options for nonmotorized or transit modes of travel for all trips in the urbanized area that are less than two miles in distance.

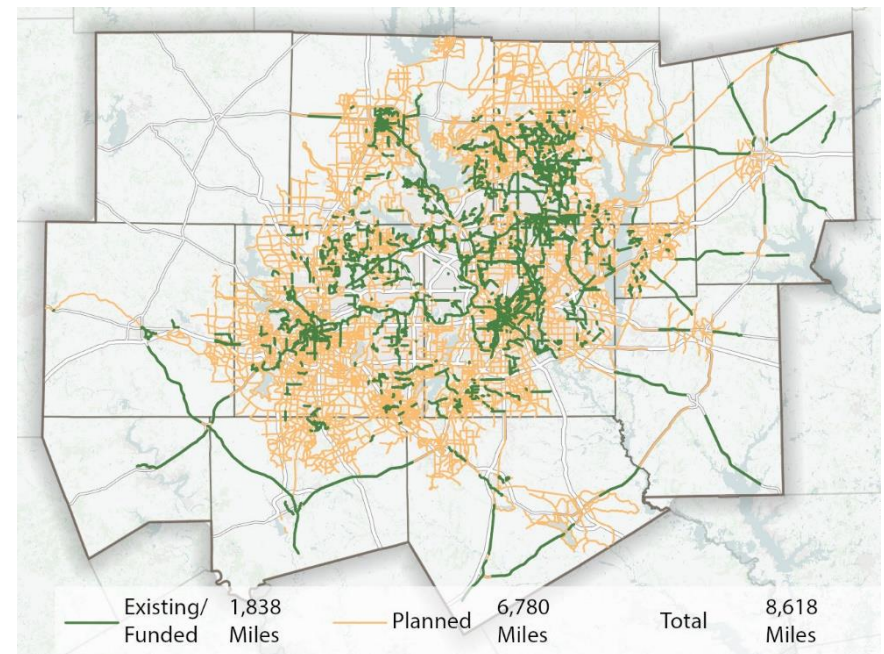
Combined Regional Paths and Bikeway Network

The active transportation network in the region consists of regional shared-use paths (Regional Veloweb), supporting community shared-use paths, and the on-street bikeway network (including on-street wide shoulders in rural areas). This network is reflected in the map in **Exhibit 6-13** and the table in **Exhibit 6-14**. This network plays a key role in supporting the Mobility 2045 Update and the implementation



of the multimodal context-sensitive Complete Streets and transit infrastructure that safely accommodate all travelers throughout the region.

Exhibit 6-13: Combined Regional Veloweb, Community Paths, and On-Street Bikeway Network



- The Regional Veloweb and Community Shared-Use Path network does not include recreational paths/loops, private paths, equestrian or nature trails, or wide sidewalks less than 10 feet in width.
- On-street bikeways in the urbanized area include separated or protected bike lanes/cycle tracks, bike lanes, marked shared lanes, and marked bicycle boulevards. On-street bikeways in the urbanized area do not include signed bike “routes,” signed “share the road,” unmarked wide outside lanes, or signed wide shoulders.
- The use of wide shoulders is included on various roadways linking rural communities outside of the urbanized area.
- Facility recommendations indicate transportation need. Corridor-specific alignment, design, and operational characteristics for the network will be determined through ongoing project development.
- Regional Veloweb and Community Path facility mileages are based on linear miles. On-street bikeway facility mileage is based on centerline miles.

Exhibit 6-14: Combined Regional Veloweb, Community Shared-Use Paths, and On-Street Bikeways Network Miles by Facility Status
(February 2022)

Facility Type	Miles
Regional Veloweb Paths¹	
Regional Veloweb, Existing	538
Regional Veloweb, Funded	131
Regional Veloweb, Planned	1,496
Total Regional Veloweb Paths	2,165
Community Shared-Use Paths¹	
Community Shared-Use Paths, Existing	470
Community Shared-Use Paths, Funded	94
Community Shared-Use Paths, Planned	3,135
Total Community Paths	3,699
Total Regional Veloweb and Community Paths	5,864
On-Street Bikeways²	
On-Street Bikeways, Existing	276
On-Street Bikeways, Funded	82
On-Street Bikeways, Planned	2,051
Total On-Street Bikeways (Urbanized Area)	2,409
On-Street Wide Shoulders, Existing (rural areas between communities)	247
On-Street Wide Shoulders, Planned (rural areas between communities)	98
Total On-Street Wide Shoulders (Rural Area)	345
Total On-Street Bikeways	2,754
Total All Facilities	8,618

¹ The Regional Veloweb and Community Shared-Use Path network does not include recreational paths/loops, private paths, equestrian or nature trails, or wide sidewalks less than 10 feet in width. Regional Veloweb and Community Shared-Use Paths facility mileages are based on linear miles.

² On-street bikeways in the urbanized area include separated or protected bike lanes/cycle tracks, bike lanes, marked shared lanes, and marked bicycle boulevards. On-street bikeways in the urbanized area do not include signed bike “routes,” signed “share the road,” unmarked wide outside lanes, or signed wide shoulders. The use of wide shoulders is included on various roadways linking rural communities outside of the urbanized area. On-street bikeways facility mileage is based on centerline miles.

The Mobility 2045 Update includes extensive research on and the compilation of the locally adopted master plans for active transportation infrastructure throughout the region. By working with local and regional stakeholders, the plan prioritizes corridors for improvement as represented by the Regional Veloweb, areas of highest demand for active transportation travel, and other policies for active transportation infrastructure investment and safety. The Mobility 2045 Update represents the compilation of 71 locally adopted plans with shared-use paths (trails) and 37 locally adopted plans that include on-street bikeway facilities. Various new or updated plans are adopted each year throughout the region, and the North Central Texas Council of Governments regularly coordinates with local jurisdictions to update a database of existing, funded, and planned active transportation facilities.

Recommended Off-Street Network: The Regional Veloweb

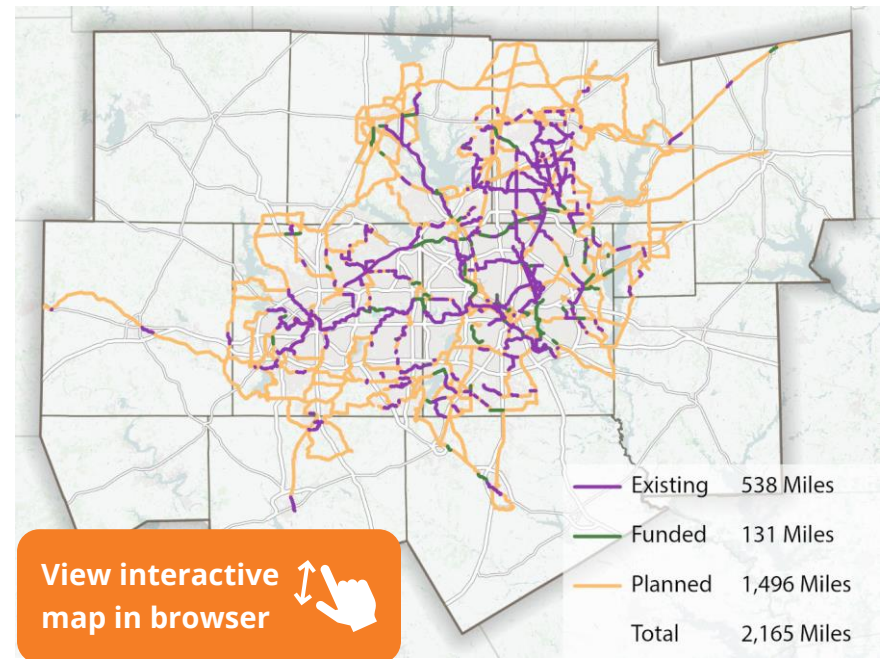
The Regional Veloweb is a network of off-street shared-use paths (trails) designed for non-recreational trip purposes by bicyclists, pedestrians, and other nonmotorized forms of transportation. The Regional Veloweb serves as the regional expressway network for active transportation, and it extends the reach of the region’s roadway and passenger rail transit network for nonmotorized transportation. The Regional Veloweb has planned connections in 10 counties and 105 cities in North Central Texas. Alignments were determined through the cooperative efforts of local governments and North Central Texas Council of Governments staff by:

- Identifying existing and funded facilities
- Reviewing locally planned bicycle and pedestrian facilities
- Locating routes that would provide air quality benefits and access to transit stations and major destinations
- Identifying corridors that provide the greatest potential for regional connectivity

- Identifying routes that provide opportunities to enhance travel and tourism

The Regional Veloweb is reflected in **Exhibit 6-15** and includes approximately 2,165 miles of shared-use path facilities in various stages of development. These shared-use paths are expected to be consistent with the recommendations and design guidance set forth by AASHTO's (American Association of State Highway and Transportation Officials) *Guide for the Development of Bicycle Facilities, 4th edition*. The primary design considerations of Regional Veloweb paths typically include wider cross sections (minimum 12-foot width) and grade-separated crossings of roadways with significant traffic flows. They may have wider 16- to 24-foot sections or separated facilities for pedestrians and bicyclists in areas experiencing high-peak user volumes due to the proximity to transit stations, employment and education centers, and/or other major venues. Design considerations for regional and community pathways are described in more detail in **Exhibit 6-16**. The Regional Veloweb network incorporates certain alignments that are reflected as state-wide priorities in the Texas Department of Transportation statewide Bicycle Tourism Trails Study. The statewide network is comprised of cross-state spines, connecting spurs, and regional routes which extend throughout the North Central Texas region. As such, these corridors are prioritized in the plan for implementation. These alignments are reflected in the **Mobility Options** appendix.

Exhibit 6-15: The Regional Veloweb



Facility recommendations indicate transportation need. Corridor-specific alignment, design, and operational characteristics for the Regional Veloweb network will be determined through ongoing project development.

**Exhibit 6-16: Regional Veloweb 2045 Pathways
Classifications and Primary Design Considerations**

Regional Pathways 2045 Primary Design Considerations	Community Pathways Primary Design Considerations
Consistent with the guidance set forth by AASHTO for the development of bicycle facilities.	Consistent with the guidance set forth by AASHTO for the development of bicycle facilities.
<u>Minimum width:</u> 12 to 14 feet (typical) with 16- to 24-foot-wide sections or separated facilities for pedestrians and bicyclists in areas with high-peak user volumes.	<u>Minimum width:</u> 10 to 14 feet (typical) with wider sections where warranted due to high-peak volumes.
Typically, independent right-of-way corridors such as greenways, along waterways, freeways, active or abandoned rail lines, utility rights-of-way, and unused rights-of-way.	May include more alignments adjacent to local collector and arterial roadways, and through neighborhoods and areas where right-of-way is more constrained and user volumes are lower.
Continuous linear corridors that provide long-distance connections through cities and across counties; provide connections to major destinations, including transit stations, employment and education centers, and/or other major activity venues with high volumes of users.	Corridors generally shorter in length and may terminate within a community, may supplement adjacent on-street bikeways along roadways with higher traffic speeds and volumes not suitable for less experienced bicyclists, and may provide short connections between on-street bikeways and neighborhoods.
Grade-separated crossing of roadways with significant traffic flows. Few, if any, driveway crossings and signalized or stop sign intersections.	May include more at-grade crossings of roadways with signalized or stop sign intersections while minimizing any conflicts with motor vehicles and associated operational and safety issues.
Supported by a network of local community paths, sidewalks, and on-street bikeways that provide connections to local neighborhood destinations.	Serves as an extension of the regional pathway network by providing connections to local neighborhood destinations.
Constructed with a long-lasting impervious surface.	Constructed with a long-lasting impervious surface.

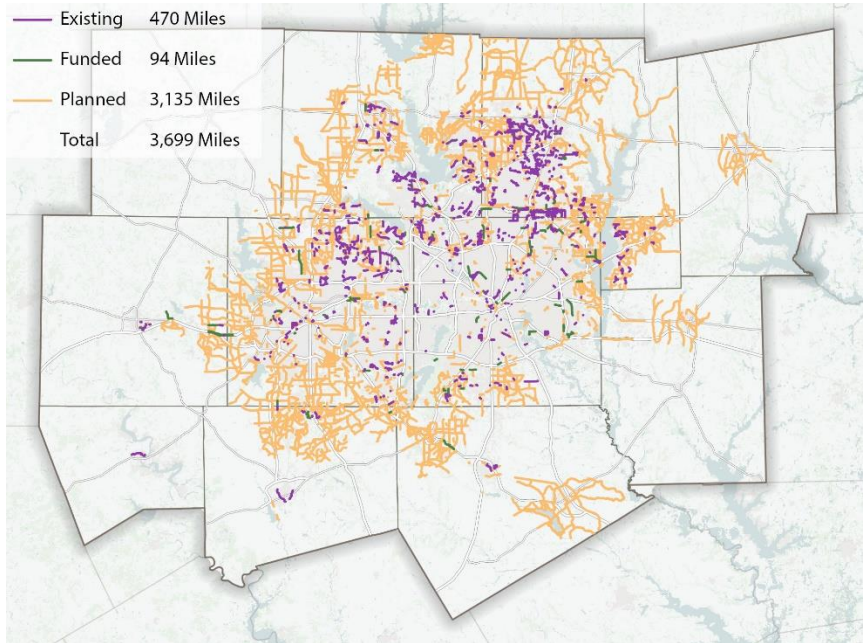
Off-Street Network: Community Shared-Use Paths

Community shared-use path facilities support the Regional Veloweb and help extend the reach of the regional network by connecting it to local and neighborhood destinations. Approximately 3,699 miles of these paths, shown in the map in **Exhibit 6-17**, are in various stages of development. These facilities are also expected to be consistent with the recommendations and guidance set forth by AASHTO's *Guide for the Development of Bicycle Facilities, 4th edition*. This network of facilities does not include recreational park loops, private paths, equestrian or nature trails, or wide sidewalks less than 10 feet in width. The Mobility 2045 Update forecasts that a portion of the network of community shared-use paths will be implemented. The paths that will be constructed are primarily located in corridors that serve as extensions of the Regional Veloweb and provide connections to transit facilities and other local major destinations. While not fully funded by the Mobility 2045 Update, community shared-use paths provide important connections within communities and will be implemented as funding is available.

Regional On-Street Bikeway Network

On-street bikeways facilitate safe and convenient travel for bicyclists, and they serve as extensions of the Regional Veloweb and community shared-use path network by providing nonmotorized travel connections between housing, employment, major destinations, and transit facilities. The existing and planned on-street bikeway network, shown in **Exhibit 6-18**, provides the densest network of bicycle facilities in a growing number of communities throughout the region. Currently more than 37 locally adopted plans include on-street bikeway facilities representing more than 2,754 linear miles in various stages of development.

Exhibit 6-17: Community Shared-Use Paths

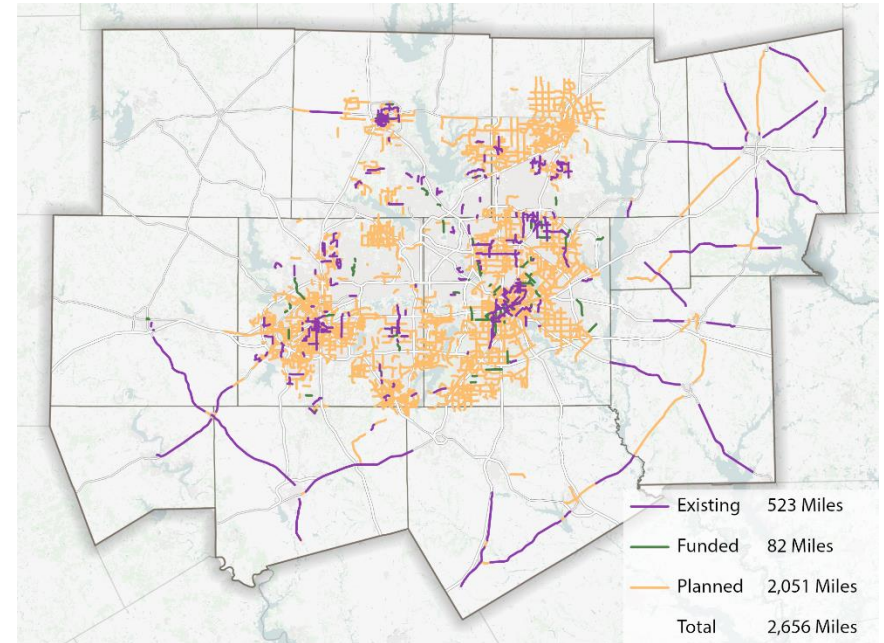


- Community Shared-Use Paths supplement the Regional Veloweb network. These paths do not include recreational paths/loops, private paths, equestrian or nature trails, or wide sidewalks less than 10 feet in width.
- Facility recommendations indicate transportation need. Corridor-specific alignment, design, and operational characteristics will be determined through ongoing project development.
- Community Path facility mileages are based on linear miles.

Consistent with guidance from AASHTO, National Association of City Transportation Officials, and the Federal Highway Administration’s *Separated Bike Lane Planning and Design Guide*, the type and design of on-street bikeways can vary based on the community and context in which they are located. Bikeways in urban and suburban areas of the region are recommended to include the following:

- Separated or protected bike lanes/cycle tracks
- Bike lanes
- Marked shared lanes
- Marked bicycle boulevards

Exhibit 6-18: On-Street Bikeway Network



- On-street bikeways in the urbanized area include separated or protected bike lanes/cycle tracks, bike lanes, marked shared lanes, and marked bicycle boulevards. On-street bikeways in the urbanized area do not include signed bike “routes,” signed “share the road,” unmarked wide outside lanes, or signed wide shoulders.
- The use of wide shoulders is included on various roadways linking rural communities outside of the urbanized area.
- Facility recommendations indicate transportation need. Corridor-specific alignment, design, and operational characteristics for the network will be determined through ongoing project development.
- On-street bikeway facility mileage is based on centerline miles.

Communities may also provide on-street bicycle accommodations that include signed bike routes and signed shared roadways without designated bikeway pavement markings, including wide outside lanes. However, these facilities are not represented in the Mobility 2045 Update. Bikeways between communities in rural unincorporated areas of the region generally consist of paved shoulders, particularly on roadways with higher speeds or traffic

volumes. Paved shoulders in these rural areas provide opportunities for travel between small communities.

Pedestrian Network

Pedestrian facilities must accommodate a diverse group of travelers of all ages and abilities, including people who walk, jog, use wheelchairs or walkers, or push strollers. Pedestrians tend to be the most vulnerable road users; therefore, pedestrian facilities should be designed and implemented to increase their safety and effectiveness.

The pedestrian network provides a primary mode of travel for short trips and it supports other transportation modes. The network of pedestrian facilities should be complete, direct, safe, and enjoyable to use. This can be accomplished by addressing the continuity of the sidewalk network, the streetscape, and the physical context in which the sidewalk is located.

Planning for the pedestrian network requires similar consideration and analysis as planning for roadways. The pedestrian network enhances economic development by connecting places where people like to live and visit, and it improves safety by supporting safe routes to school. When fully developed, the pedestrian network should provide safe links between destinations such as schools, employment, and transit facilities. Programs that invest in this network should prioritize improvements that connect to major destinations, improve safety, and help promote community livability and a healthy lifestyle.

The primary considerations of the pedestrian network include:

- Completing gaps in the sidewalk network
- Completing first/last mile connections to transit services
- Providing safe routes, including crossings of busy streets and major barriers, that are compliant with the Americans with Disabilities Act
- Providing context-sensitive streetscapes

Americans with Disabilities Act and Transition Plans

The ADA (Americans with Disabilities Act) of 1990 is a civil rights statute that prohibits discrimination against people with disabilities. Title II of the ADA addresses public services and the accessibility of public transportation to people with disabilities. After the ADA became effective, public facilities were required to be designed and constructed to be accessible by people with disabilities. Failing to design and construct facilities accessible by people with disabilities constitutes discrimination and is prohibited by law. Title II of the ADA applies to facilities built after 1990, pre-existing facilities, and any organization with 50 or more employees.

State and local governments are required to perform self-evaluations of current facilities and develop a transition plan to address deficiencies by building new projects and by altering existing projects, including performing reconstruction, major rehabilitation, widening, resurfacing, signal installation, and upgrades. This affects pedestrian facilities in the public right-of-way, including sidewalks, curb ramps, and warnings detectable by a range of users. In the case of noncompliance for state or local governments, the Federal Highway Administration will seek a voluntary compliance agreement. If an agreement cannot be met, the Federal Highway Administration will send the case to the Attorney General for action.

The North Central Texas Council of Governments is helping local jurisdictions comply with ADA through policy, funding, and training for officials.

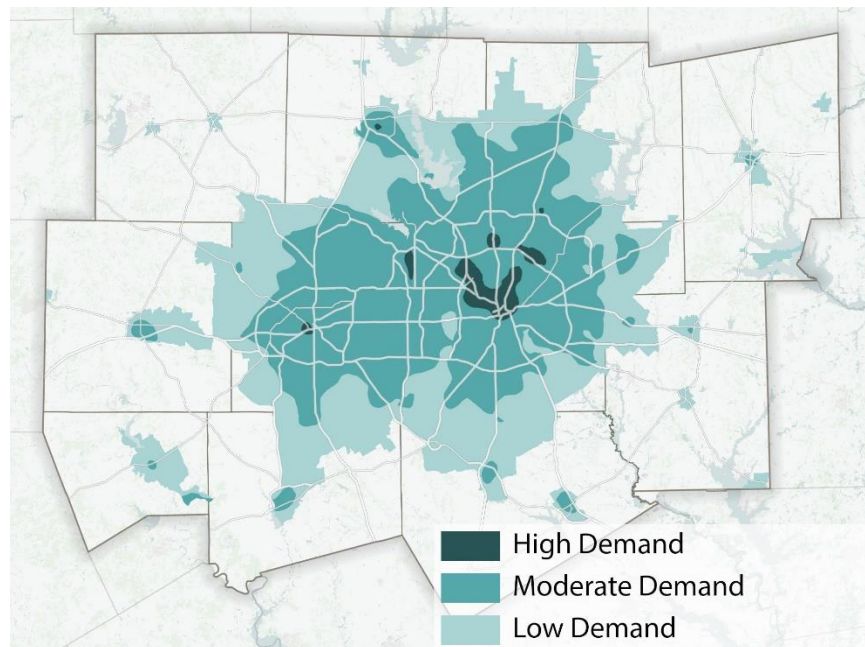
Demand Zones for Walking and Bicycling Travel

Demand for pedestrian and bikeway facilities varies across the region, with multiple factors affecting where people can and will walk and bicycle as a means of travel. To identify the demand for walking and bicycling travel, a variety of criteria were used to identify geographic areas of the region with the greatest demand to walk or bicycle for transportation. Those criteria include:

- Employment and population density
- Density of short trips
- Density of low-income populations
- Density of zero-car households
- Areas with high vehicle congestion

The general areas represented in **Exhibit 6-19** are expected to have the highest demand for walking and bicycling travel, thus also have the greatest demand for active transportation infrastructure. As such, these areas with the highest demand should be prioritized for future infrastructure investment, particularly those suited for an urban environment such as on-street bicycle accommodations and sidewalks.

Exhibit 6-19: Demand Zones for Walking and Bicycling Travel



Demand Zones depict areas with greater demand for walking and bicycling infrastructure. Areas shown as high demand are not project recommendations. These areas have high population/employment density, density of short trips, density of low-income populations, density of zero-car households, and vehicle congestion. As such, these areas with the highest demand should be prioritized for future infrastructure investment, particularly those suited for an urban environment such as on-street bicycle accommodations and sidewalks.

Priority Areas to Improve Facilities and Accessibility

The Mobility 2045 Update recommends prioritizing improvements to active transportation facilities to close gaps within the larger network, increase the use of facilities, improve safety and the level of comfort for pedestrians and bicyclists, and create easier access to destinations in areas with the highest demand for walking and bicycling trips.

In addition to the criteria used in developing the Demand Zones for walking and bicycling travel, prioritization of pedestrian and bicycle facilities improvements should be based on:

- Access to public transportation facilities (transit stations and bus stops)
- Destination density (e.g., mixed-use/transit-oriented development areas, employment centers, central business districts, education institutions, neighborhood services, community centers)
- Safe crossings of existing travel obstacles (e.g., major roadways, Interstate interchanges, railroads, and bodies of water)
- Neighborhoods with transit-dependent populations
- Areas with pedestrian and bicycle safety concerns and high rates of crashes
- Routes of statewide and regional significance identified by the Texas Department of Transportation Bicycle Tourism Trails Study

These destinations and routes are places that generate higher than average pedestrian and bicycle traffic. Prioritizing improvements in these areas and corridors will create the greatest benefit for people who travel by walking or bicycling. Other factors to consider when prioritizing projects include community support, cost/benefit analysis, sharing of construction costs, and geographic balance to ensure facilities are evenly constructed throughout the region.

Map Your Experience: Accessibility Assessment

NCTCOG (North Central Texas Council of Governments) has established the Map Your Experience tool in order to receive public comments on the issues affecting travelers in our region. Using these comments, NCTCOG has identified several areas of concern for improving transportation throughout the region. This section highlights findings from feedback submitted through the Map Your Experience tool related to accessibility of the bicycle/pedestrian system.

Accessibility Definition

Accessibility is traditionally defined as the ability of mobility-impaired populations (such as persons with disabilities and the elderly) to reach destinations. NCTCOG has taken a broader definition for the purposes of this section. Using guidance from the Transportation Research Board’s report NCHRP 08-121, accessibility is defined as “the ease with which people can reach desired destinations.” Accessibility can vary by mode; a convenient five-minute drive can be a difficult and dangerous 20-minute walk. Studying accessibility allows transportation planners and providers to understand how travelers utilize transportation facilities and identify deficiencies in the transportation network across various modes.

Furthermore, the report defines multiple dimensions by which accessibility can be assessed. One dimension is impedance, or “the ease or difficulty of traveling through space.” Traditional analyses typically consider travel times or distances, but the report includes factors such as sidewalk width, curb cuts, street lighting, and parking availability. Perceptions of safety and security are important factors but can be more difficult to quantify. Put simply, measurements of impedance can help answer the question, “How easy is it to get from A to B via different modes of transportation”?

Assessment

Using responses to the Map Your Experience tool between May 2020 and January 2022, NCTCOG has compiled qualitative feedback from residents of the region in order to identify areas of improvement. Comments in the tool are entered in three different maps: a Bike/Ped (bicycle/pedestrian) map, a Roadway map, and a Transit map. Each comment may be assigned to one of several categories classifying the type of comment such as bike/ped safety, a need for crosswalks, roadway traffic signal timing, or transit frequency. NCTCOG reviewed each comment to determine if it pertained to accessibility concerns and totaled them across the various categories, locations, and map types.

It should be noted that while this is not a quantitative, representative sample, the information gathered from the Map Your Experience tool helps NCTCOG and members of the Regional Transportation Council identify patterns and hotspots for accessibility issues reported by users of the transportation network—those with intimate knowledge of their travel experiences and the difficulties they face. Thus, these results should be interpreted as guidance for further analysis and research, focusing on accessibility issues in North Central Texas.

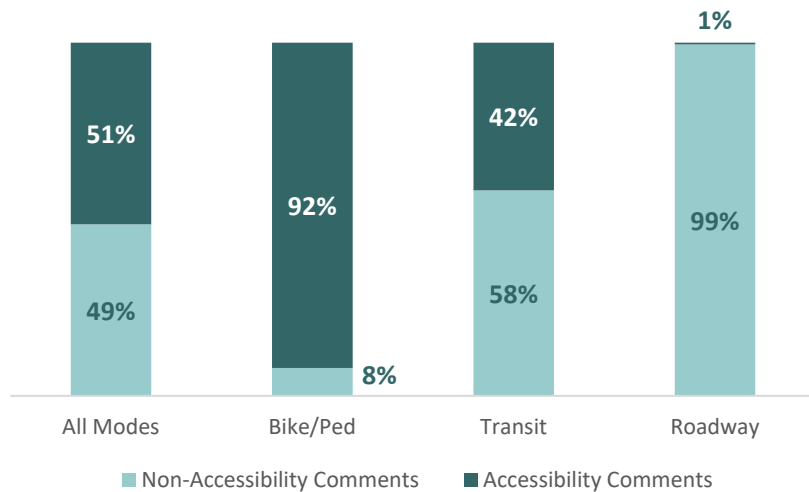
Findings

	Total Comments*	Total Accessibility Issues	% of Total Comments	% of Accessibility Comments
All Modes	531	273	51%	-
Bike/Ped	265	244	92%	89%
Transit	67	28	42%	10%
Roadway	199	1	1%	0%

*Includes responses to parent comments; total comments on dashboard may be lower due to exclusion of response comments in that platform

For total comments overall, 92 percent of bike/ped comments raised accessibility concerns; 42 percent of transit comments addressed accessibility, and 0.4 percent of roadway comments were about accessibility, as shown in **Exhibit 6-20**. Of all reported accessibility issues, 89 percent were related to the bike/ped mode of transportation, while 10 percent were for transit and 0.5 percent were for roadway. Overall, out of 531 comments (including both original comments and responses to comments) received in the Map Your Experience tool, 51 percent were identified as accessibility concerns.

Exhibit 6-20: Percentage of Accessibility Comments by Mode

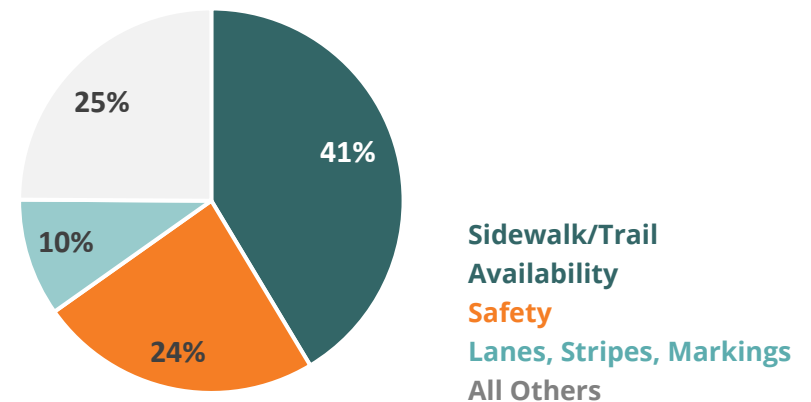


It should be noted that the tally for roadway-related accessibility issues is low because traffic congestion was not counted as an impedance toward mobility. This is not to suggest that congestion is unimportant; rather, NCTCOG measures and addresses congestion and congestion management through existing programs and policies.



Out of the various subcategories for each comment, 75 percent (205 comments) fell under three categories: sidewalk or trail availability; bike and pedestrian safety; requests for lanes, stripes and markings for bikes and pedestrians (see **Exhibit 6-21**).

Exhibit 6-21: Share of Accessibility Issues by Category



Finding Solutions/Next Steps

In reviewing the comments from the Map Your Experience tool, a general theme emerged: there is great potential for improvement to pedestrian accessibility throughout the region. Many comments identified a need for wider sidewalks, completion of sidewalks, protected bicycle lanes, and safer speeds on non-arterial roads. Crosswalks across arterial streets would benefit from higher visibility markings and signals.

Improving the experiences of pedestrian and transit users is a joint effort across multiple stakeholders. Cities, counties, transit authorities, NCTCOG, and the Texas Department of Transportation each have roles to play in the implementation of changes. NCTCOG recommends that governments and governing bodies use the inputs

from Map Your Experience as starting points for further outreach and study to understand the accessibility issues they face. Departments of transportation should consider developing bike/ped toolkits that would serve as a quick guide to solving different types of accessibility problems such as incomplete sidewalks or unsafe road crossings. Accessibility improvements can be implemented as a focus area for capital improvement programs, with funds allocated specifically to address these problems.

NCTCOG is committed to improving the transportation experience for all users throughout our region and supporting our regional partners in finding solutions for transportation issues. The Mobility 2045 Update addresses many of these issues in the **Mobility Options** and **Social Considerations** chapters.

Impacts of Emerging Technology

In the future, the multimodal network and related policies, programs, and projects may be considered in the context of automated vehicles. Such vehicles have the potential to both benefit (through vehicle safety features) and harm (through infrastructure such as dedicated lanes) efforts to safely implement active transportation. Appropriate policies could help ensure automated vehicles improve safety for bicyclists and pedestrians. More information on automated vehicles can be found in the **Transportation Technology** chapter.

Performance Measures

Federally required performance measures for Metropolitan Planning Organizations are addressed in the **Regional Performance** chapter. Additional performance dimensions related to active transportation include:

- Number of pedestrian fatalities
- Number of pedestrian serious injuries
- Number of bicyclist fatalities
- Number of bicyclist serious injuries
- Number of miles of existing Regional Veloweb
- Number of miles of existing community shared-use paths
- Number of miles of existing on-street bikeways

Summary

Active transportation is an important element in providing for the region's diverse needs and enhancing transportation choice. Walking and bicycling provide low-cost mobility options that place fewer demands on local roads and highways. Increased commitment to, and investment in, walking networks and bicycle facilities can help meet goals for cleaner, healthier air; less congested roadways; and more livable, safe, cost-efficient communities. The recommendations made in the Mobility 2045 Update seek to increase active transportation as a viable transportation mode for the residents of North Central Texas.

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6. Mobility Options: Public Transportation

Introduction

Public transportation provides thousands of people in North Central Texas with daily access to life-essential opportunities, reduces the number of cars on the roads, relieves congestion on the roadway system, improves regional air quality, and supports regional economic competitiveness. The Mobility 2045 Update supports the creation of a seamless, well-maintained, and technology-supported regional transit system that provides travelers with more choices for getting around.

To achieve this regional transit vision, the Mobility 2045 Update includes policies and programs that guide future public transportation investments. This section outlines opportunities to cost-effectively expand, improve, and modernize public transportation service throughout the region. Information about transit system performance, including transit asset state of good repair, is included in the **Regional Performance** chapter.

Public transportation funding is limited at the federal, state, and local levels, and it competes with other funding priorities in our region. The need to balance equity, environmental, social, and economic factors influence the implementation of existing and future transit services. Demographic trends also influence existing and future transit needs and demand. These trends include the extent, timing, and location of population growth and job growth, as well as residents' age, ability, income, and mobility preferences. Communities can customize public transportation services to meet their residents' specific needs (see *Right-Sizing Public Transportation Services* in the **Public Transportation** section of the **Mobility Options** appendix).

Transit Industry Trends

Emerging trends in technology, public-private partnerships, and even the COVID-19 pandemic are shaping the types of public transit service available, how people access services, and demand for services. Public transit is becoming a key element of an integrated transportation system where users view mobility as a service, rather than focusing on a specific mode of transportation like a privately-owned vehicle. The transit industry is placing new emphasis on mobility-on-demand services where traditional bus or rail service may not be a good fit for a community.

Mobility-on-Demand

Transit providers in the North Central Texas region are implementing innovative transit services, including partnerships with transportation network companies, to put mobility-on-demand into practice. To support these efforts, NCTCOG (North Central Texas Council of Governments) formed a transit mobility-on-demand working group in 2017 to provide a forum for transit agencies, local governments, and other interested parties to discuss, coordinate, and promote demonstration of mobility-on-demand concepts and solutions in the region (www.nctcog.org/mod).

Vehicle Automation and Technology Advancements

Cities like Arlington and Frisco have already tested leveraging autonomous vehicle technology for low-speed, short transit trips within their community. As autonomous vehicles begin to enter the transit mainstream, transit agencies are working to proactively address the evolution of workforce needs, availability, training, and skillset. Additionally, NCTCOG is actively pursuing other technologies, such as high-speed rail and hyperloop, for longer distance transit trips within the region and beyond.

The RTC (Regional Transportation Council) recently adopted a policy, P22-02, Policy Support to Develop Process for the Innovative Transportation Technology Infrastructure Certification Program, to outline the process by which the RTC and NCTCOG can coordinate transparently with emerging transportation technology providers and encourage new transportation solutions to help solve the region's growing needs. Hyperloop and other similar emerging transportation technologies now have a path forward to implementation within the region.

Mobility 2045 Update 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.

Ensure all communities are provided access to the regional transportation system and 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.

Mobility 2045 Update Public Transportation Policies

The RTC has shown policy support for transit to further provide direction as the region creates successful public transportation services. This plan's policies for public transportation are outlined below.

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 Regional Transportation Council Policy P09-03).

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

- 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-nonprofit transit providers (consistent with Regional Transportation Council Policy P09-03)
- Elimination of gaps in service to establish a minimum level-of-service
- Service expansion

TR3-003: Existing and future 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 Regional Transportation Council, should the entity choose to not continue as a member of that authority.

TR3-005: Support the planning and development of high-speed rail to, through, and within the North Central Texas region by leading project development efforts and coordinating with federal and state initiatives as appropriate.

TR3-006: Maximize the efficient use of public transportation resources in North Central Texas, including public, private-nonprofit, 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 events 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 Capital Investment Grant Program.

TR3-011: Establish policies fostering high-speed rail system interoperability, resulting in a “one-seat” ride system operation to, through, and within the North Central Texas region.

TR3-012: Establish policies encouraging regional access by identifying grade-separated high-speed rail station locations in downtown Fort Worth, Arlington, and downtown Dallas.

TR3-013: Support the planning and development of sustainable land uses near grade-separated high-speed rail locations by coordinating with the cities of Fort Worth, Arlington, and Dallas.

TR3-014: Support the planning and development of sustainable land uses near at-grade high-speed rail station locations by coordinating with the cities’ hosting stations.

TR3-015: Support investment of general-access public transportation service that addresses existing and forecasted transit needs/demand

in communities and promotes the integration of transportation services through shared technology, transit policy, or other means.

Mobility 2045 Update Public Transportation Programs

Meeting transit demand requires multiple forms of transit to ensure mobility for residents across North Central Texas. The five transit programs outlined below summarize the types of transit service that collectively serve the diverse mobility needs of North Central Texas communities.

TR2-001: Community Access Transit Program

The Community Access Transit Program supports transit services, primarily demand-response transit, that link people to life-essential opportunities such as employment, education and job training, medical care, healthy food, and enriching activities. Some of these transit services are limited to customers prequalified based on income, age, or disability.

Because of its high flexibility in operation, including routing and scheduling, demand-response transit is common in areas with low passenger demand where fixed-route bus service would not be financially viable. Demand-response transit typically operates in shared-ride mode with van-size vehicles and requires riders to book their trip in advance. In recent years, technology has increasingly enabled instant dispatch of vehicles, which can significantly improve the booking timeframe.

TR2-002: Last-Mile Transit Connections Program

The Last-Mile Transit Connections Program supports transit services that provide last-mile transit solutions for passengers to access their final destinations after using regional transit. While enhanced bicycle and pedestrian networks play a critical role in first- and last-mile connections (see the **Active Transportation** section of this chapter),

the program focuses on last-mile transit connections. The Mobility 2045 Update includes several last-mile transit connection projects, which are outlined in the project listing in the **Public Transportation** section of the **Mobility Options** appendix.

The suite of transit solutions includes rail, fixed-route bus, and on-demand service. Streetcars, trolleys, and ATS (automated transportation systems) are fixed-route services moving people around within a specific area such as a downtown, regional activity center, or transit-oriented development. Buses can provide last-mile connections via local bus service or site-specific shuttles that feed into the regional transit system. On-demand service (i.e., microtransit) can also satisfy needs for short trips—as well as autonomous transit vehicles in the future. Streetcars and ATS, examples of last-mile transit solutions, are highlighted below.

Streetcars

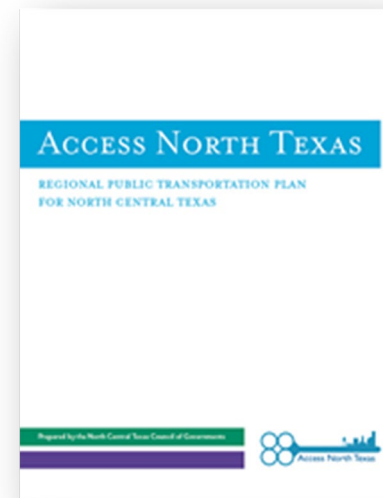
Streetcars tend to be more adaptable to the existing urban built environment and are widely recognized as a tool to attract development along a streetcar corridor. The Mobility 2045 Update supports the transit role streetcars serve, which typically connects local residents to employment and other life-essential opportunities in the urban core, as well as supports multimodal connections.



Source: NCTCOG

Two streetcar lines connect to downtown Dallas: the Dallas Streetcar and the M-Line Trolley. DART (Dallas Area Rapid Transit) operates the former under agreement with the owner (city of Dallas), and the McKinney Avenue Transit

Spotlight on Planning for COMMUNITY ACCESS TRANSIT



Access North Texas is the regional public transportation coordination plan for the 16-county North Central Texas region, focusing on the transportation needs of older adults, individuals with disabilities or lower incomes, and others with transportation challenges. The plan outlines strategies to address identified needs and serves as a guide for implementing agencies.

Access North Texas Website: www.accessnorthtexas.org

Authority operates the latter. The 2.45-mile modern Dallas Streetcar line connects downtown Dallas' Union Station to the Bishop Arts District in Oak Cliff. The 4.6-mile M-Line Trolley, a modern-vintage streetcar system, connects the downtown Dallas Arts District with

shops, entertainment, dining, and attractions in Uptown, as well as provides convenient access to DART's light rail system at the Cityplace/Uptown Station on the northern end and the St. Paul Station or Pearl/Arts District Station on the southern end.

Efforts to integrate the Dallas Streetcar and the M-Line Trolley into a seamless, connected system (Dallas Streetcar Central Link project) are underway. An important goal of this effort is to reconcile the differences between the two systems while maintaining the best of both. Additionally, planning efforts are underway to develop a study that examines the feasibility of modernizing and extending the M-Line Trolley north into the Knox-Henderson neighborhood, while being mindful of the future vision for the comprehensive streetcar system (M-Line and Dallas Streetcar).

Automated Transportation Systems

ATS (formerly people movers) circulate travelers across a geographically small area, typically using automated, electrically powered vehicles operating on elevated guideways. ATS connects districts or single destinations to larger-scale regional transit. While these systems can be similar to regional light rail, ATS typically operate smaller vehicles that serve small areas with stations spaced closer together and a more frequent level-of-service.

When properly planned and carefully implemented, these systems can reduce congestion, enhance transit-oriented developments, optimize parking, and expand the reach of transit.

ATS are commonly built in the following locations:

- Airports, where terminals are large and/or not immediately adjacent to one another (Dallas Fort Worth International Airport, Newark, and Tampa, for example).
- Entertainment districts where a large number of visitors travel between closely spaced destinations (Las Vegas, Orlando).

- Downtowns, in areas where an ATS could connect to other forms of transit or serve areas with many residents and non-office commercial activity (Miami, Las Colinas, Jacksonville).

Two automated transportation systems currently operate in North Central Texas. The Dallas Fort Worth International Airport Skylink, a monorail system on the air-access side of airport security checkpoints, shuttles passengers between Dallas Fort Worth International Airport's terminals.



Skylink people mover trainset in operation at Dallas Fort Worth International Airport. (Source: Dallas Fort Worth International Airport, 2014)

Completed in 1989, the Las Colinas Area Personal Transit is one of the oldest ATS in the United States. With connection to DART light rail, the system was poised to provide transit access to the Las Colinas Urban Center from the rest of the DART transit area; however, low ridership, complicated by the effects of the COVID-19 pandemic and aging vehicle technology, have halted the operation indefinitely. Current efforts described below offer potential for a retrofit of the existing system to accommodate next-generation ATS technology and a recommissioning of the Las Colinas ATS.

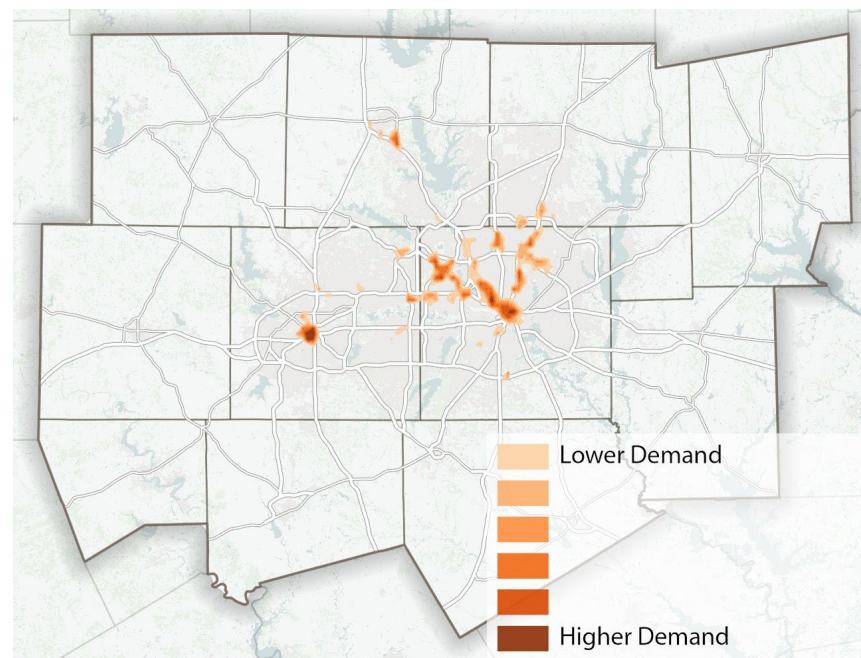
An area gaining increased attention with regard to automated transportation systems is freight applications. The original ATS at

Dallas Fort Worth International Airport did accommodate freight operations. The recent advancements in ATS technology have led to more manufacturers entering into this automated transportation development space, creating more flexible vehicles/systems for various applications.

In response to renewed interest from regional stakeholders in the form of proposals and requests, NCTCOG developed a stepped approach to evaluating the feasibility of automated transportation systems in the region. The initial step utilizes Geographic Information Systems tools to perform a regionwide spatial analysis. This analysis revealed areas that are generally conducive to automated transportation systems focused on the movement of people based on factors such as population and employment densities and land uses (**Exhibit 6-22**). Through this overall analysis and other related studies, a focused group of projects were identified as warranting additional examination. This group is shown in **Exhibit 6-23**. Future studies will examine the applicability of these areas using subarea methods (step two) and ridership models (step three) to quantify local demand and the feasibility of specific systems. Two project locations, one in Dallas County and one in Tarrant County, are being advanced to the engineering phase with construction activities likely to follow shortly thereafter.

NCTCOG is also developing a regional standard and guide for implementing the next-generation ATS at any feasible location. This guide includes evaluation and short-listing of available vehicle technologies, modular infrastructure designs to serve as a grade-separated guideway for ATS, and evaluation of wireless charging technology—all with the goal of maximizing economies of scale in developing separate ATS facilities across the region.

Exhibit 6-22: Areas of Potential Demand for People Movers

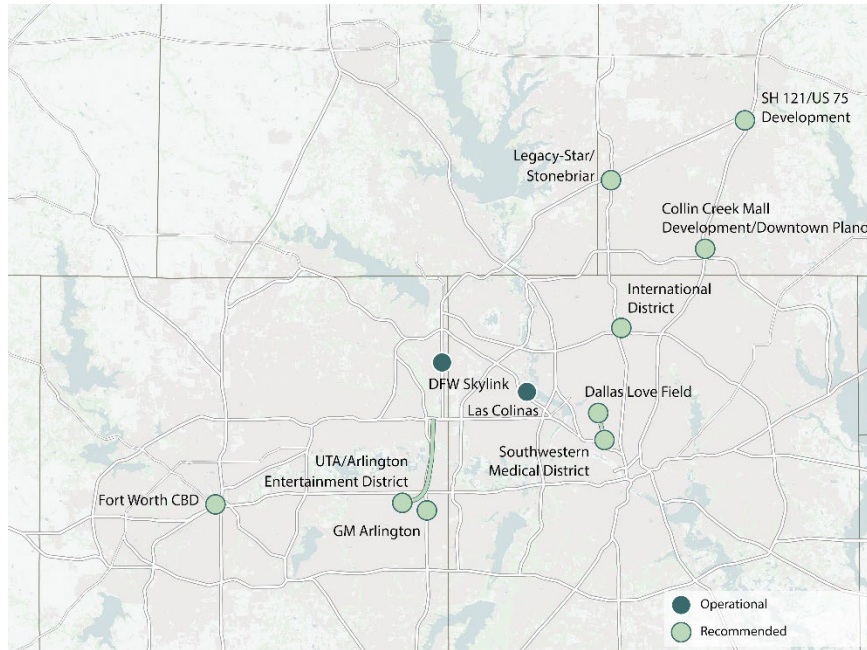


The Mobility 2045 Update recommends the following strategies to further the implementation of automated transportation systems in the region:

- Continue research and analyze the feasibility of ATS in the region.
- Support efforts to retrofit and expand the Las Colinas Area Personal Transit System with next-generation ATS technology to serve the Irving Convention Center and future developments in the area.
- Continue ongoing efforts to implement automated transportation systems identified by regional stakeholders at Dallas Love Field, the Southwestern Medical District, Dallas International District (formerly Midtown/Galleria), Dallas Fort Worth International Airport to Arlington, and General Motors' Arlington assembly plant.
- Encourage developers and local governments to work cooperatively using land use and complementary policies on

existing and planned developments to increase and enhance access to regional transportation systems.

Exhibit 6-23: List of Projects



TR2-003: Regional Connections: Next Generation Transit Program

The Regional Connections: Next Generation Transit Program supports a broad range of innovative bus and rail services as part of the region’s robust transit network. The program includes, but is not limited to, regional rail, light rail, peak-only commuter and special event rail, high-intensity bus, and high-capacity transit. The Mobility 2045 Update calls for transit service expansion, including:

- New service in high-intensity transit corridors
- Extensions of transit lines into emerging transit markets
- Expansion of core capacity aimed at improving overall system capacity

Regionally significant projects are outlined in the **Public Transportation** section of the **Mobility Options** appendix. The success of all transit services depends on supportive land uses, which should be developed well in advance of new service. More information about transit-oriented development is included in the *SD2-003: Transit-Oriented Development Program* section of the **Operational Efficiency** chapter.

Rail Network

The Mobility 2045 Update envisions a long-term, high-performance rail transit network linking communities throughout North Central Texas. Due to the high cost of implementing new light-rail corridors compared to regional rail (approximately half the capital cost of a light-rail corridor), the number of new light-rail corridors expected in the Dallas-Fort Worth region is limited. The only new light-rail project included in this plan is D2, DART’s light-rail tunnel in downtown Dallas, to add core capacity to accommodate increasing demand, enabling the operation of more frequent service to and through downtown Dallas. As the rail network continues to expand, most of the recommended rail corridors in the Dallas-Fort Worth region are anticipated to be “regional rail” instead of “light rail” due to the cost differential and the presence of active freight rail traffic on those corridors. Creating seamless connections between this growing regional rail network and the existing light-rail network and finding opportunities to provide passengers with a “one-seat” ride wherever possible is critical to efficient operation of the rail system as a whole. Further analysis and coordination with existing transit authorities is required to explore this potential.

Building on the concept of gaining regional efficiencies, the recently completed Irving to Frisco Corridor Study (along the Frisco Line) recommended interlining operations (or running a single service between two connected rail corridors, also known as a “one-seat” ride, between the west leg of the Trinity Railway Express and the Irving to Frisco rail corridor, which connect at the Trinity Railway

Express station in downtown Irving. This interlined operation is expected to increase ridership for both corridors given the apparent commuter demand between job centers on one corridor and residential areas of the other. While this recommendation requires further analysis and coordination with the affected entities, including DART and Trinity Metro, it serves as an example of the efficiencies gained by expanding and integrating the current rail infrastructure into a cohesive system that effectively and expeditiously connects people to destinations.

Regional rail corridors vary in existing conditions, future travel demand, interaction with freight, financial requirements, level of station area planning efforts by the communities along the corridor, inclusive transit friendly land uses, first/last mile connections, and other factors; therefore, they reflect different levels of opportunities for implementation. As regional funding is limited, these factors influence regional priorities on which projects (new corridors or extensions) to advance first.

Including TEXRail’s extension to the Fort Worth Medical District and the construction of DART’s Silver Line, 14 regional rail projects are being planned in the region, as shown in the **Public Transportation** section of the **Mobility Options** appendix. Planning for future rail corridors includes technical analysis, as well as extensive participation and commitment from transit agencies and communities, to ensure the right factors are in place to build, operate, and sustain regional rail over the long term.

Exhibit 6-24 outlines two critical variables and their impact on implementing regional rail service: ridership potential and existing track condition. Many of the future rail corridors in the region are proposed for existing freight corridors, and the track condition in those corridors is one factor in determining what implementation scenarios are possible.

Exhibit 6-24: Two Factors Affecting Regional Rail Implementation

		Track Condition	
		Good (lower-cost opportunities)	Poor (higher-cost opportunities)
Ridership	Higher	Interim Implementation Followed by Full Buildout <i>Frisco Line</i>	Full Buildout <i>McKinney Line</i>
	Medium	Interim Implementation <i>Cleburne Line</i> <i>Mansfield Line</i> <i>Waxahachie Line</i>	Full Buildout <i>Silver Line East Extension</i> <i>Green Line – Southeast Extension</i> <i>Midlothian Line</i> <i>Scyene Line</i> <i>Southwest TEX Rail</i>
	Very Low	Deferred Implementation <i>Not included in Mobility 2045 Update</i>	Deferred Implementation <i>Not included in Mobility 2045 Update</i>

Corridors with higher projected ridership in active freight corridors with good track condition may enable lower-cost opportunities to implement interim service (such as peak-only commuter and special event rail, described in the following section). This interim service can be followed by investment for a full buildout of the corridor as the ridership grows. Corridors with medium projected ridership located in active freight corridors with good track condition may also be good candidates for interim implementation. Consideration for full buildout should follow dependent on ridership growth. Corridors not in active freight corridors or with poor track condition generally require full buildout and higher capital costs (estimated to be \$45 to \$50 million per mile).

Implementing transit rail service involves rigorous planning and engineering. Without first/last mile transit connections and dense transit-oriented land uses around the stations, the rail service will

never generate and support very high ridership levels. As many of the planned regional rail projects are along existing freight corridors, consideration of the ridership-land use dynamic becomes increasingly important. As existing freight corridors are often characterized by land uses that are not compatible with transit (low density uses, industrial uses, etc.), planning for future transit service along such corridors should stress the critical importance of developing transit-supportive conditions in the built environment via land use, zoning, infrastructure, and policy. All transit modes, especially high-capacity transit such as rail, benefit directly from supportive land use and transportation policies along a transit corridor, which promote mixed-use development, higher densities, and well-connected and pedestrian-friendly infrastructure—especially near rail stations. Transit-supportive conditions at planned stations emphasize walkability (while discouraging unnecessary vehicle trips), mobility choices, accessibility for all users, economic development, and competitiveness. As mentioned above, the **Sustainable Development** section of the **Operational Efficiency** chapter more fully illustrates the important connection between land use and transit service.

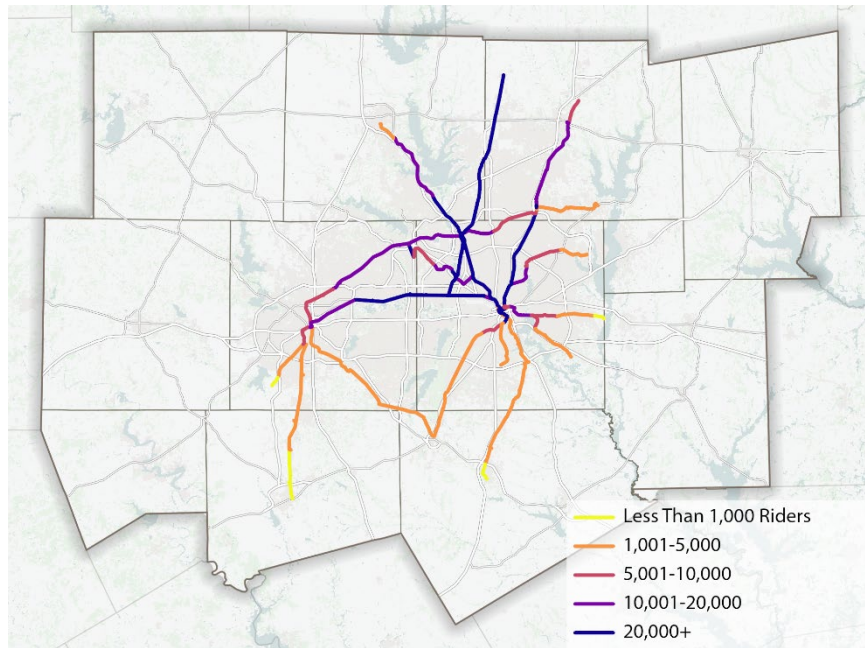
Such conditions will have to be developed over time (phased approach) along planned transit corridors and can be accomplished in conjunction with the phased approach of implementing the rail service (see *Commuter and Special Event Rail* section below). The success of this multi-pronged phased approach, however, will depend on a comprehensive planning effort for each station, as well as the long-term commitment of various stakeholders, including the cities, transit agency, and Class 1 railroad(s) involved in the project development process.

In addition to sustainable funding for operations, rail service also requires extensive capital investment in stations, rail cars, maintenance facilities, rail guideways on which the rail cars travel, signals along guideways and at crossings, and overpasses and

underpasses. Based on the factors discussed above, regional passenger rail service can take 10 to 20 years to plan and implement. The time required depends on funding availability, collaborative support for a project, development of a single governance entity to own and operate the system (usually an existing transit authority), and other factors. In many cases, phasing in service on applicable corridors can be an attractive alternative to generating all the project funding required up front. For certain projects in active freight corridors where, at a minimum, rail infrastructure is expected to be in operable condition, advancing peak-only commuter and/or special event rail may only require a fraction of the capital and operational funds to implement as compared to full buildout. For other projects not located in active freight corridors where the track is in poor condition, high-intensity bus service (described in the next section) may be considered as an initial phase to generate ridership before implementing full buildout of a regional rail facility. After initial phases are implemented and ridership grows, funding would need to be identified to plan and implement expansions to a full buildout. Monitoring and preserving rail right-of-way for future public transit use is an important step in community planning to maintain the future potential of rail transit corridors.

Exhibit 6-25 shows potential ridership in year 2045 for rail service recommended in this plan based on regional standard headways (frequency) assumptions, potential station locations, the 2045 demographic forecast, future connecting transit services, and other planning factors. Further corridor-specific planning efforts, which inform these planning factors affecting rail ridership forecasts, will be incorporated to continually test these planning judgments, developing a more comprehensive and robust ridership forecast.

Exhibit 6-25: Ridership on Recommended Rail Transit Corridors



Recent studies have been completed on various high priority corridors throughout the region, including the Cotton Belt corridor (combination of TEXRail and the Silver Line), the Waxahachie Line, and most recently, an updated look at the Irving to Frisco corridor (Frisco Line). Given the high growth in Collin County, the next high priority rail corridor for study is the McKinney Line, most of which is not in use by freight operators and has fallen into disrepair. This study will review necessary improvements for full buildout, estimate ridership, and opportunities for interim implementation such as high-intensity bus along parallel roadway corridors.

Peak-Only Commuter and Special Event Rail

Peak-only commuter rail in active freight corridors with available capacity is a cost-effective strategy to address high travel demand during peak hours with limited funding. High demand for commuting trips in the peak direction during peak hours may be served by “stacked” commuter rail. This type of rail service operates inbound in

the morning, stacks (holds) the trains during the day, then operates trains outbound in the evening peak. Special event rail shares the same philosophy as peak-only commuter rail and is operated to address the temporary spike in demand during special events. Both commuter and special event rail service may make use of new, low-cost locomotives and spare commuter railcars that are already located in the region to operate service at startup.

Another recommendation from the recently completed Irving to Frisco Corridor Study included developing a phased approach to delivering transit rail service in the active freight corridor by coordinating with the freight operator, BNSF, on implementing incremental improvements to serve both the freight and transit needs on this corridor. These incremental improvements could include strategic double- or triple-tracking/siding locations, grade separations for high volume roadways, or any number of strategic improvements that create additional capacity for freight operations and open windows for limited transit operations. This incremental approach, including its partnership with existing freight operators in the region, provides an opportunity for phased implementation of all recommended regional rail corridors that would operate in conjunction with active freight lines.

Strong communication, coordination, and cooperation with freight rail operators is essential for the success of passenger rail and freight rail operating on shared tracks. Although passenger rail service is recommended in freight corridors, the Regional Transportation Council does not intend to degrade current or future freight rail service, but rather to enhance transportation options for the traveling public. Key elements of successful interaction between passenger rail and freight rail generally include identifying and addressing physical constraints on infrastructure and facilities for both types of services through pathing studies, integrated dispatching and scheduling, transparent and shared costs, shared responsibility, and technology upgrades.

Infill Stations

Infill stations can be a cost-effective tool by cities and transit agencies to improve transit access within existing transit service areas. Infill stations may be newly built between existing stations on existing fixed guideways in areas experiencing significant growth or redevelopment. Several infill stations have been built or are planned within the region; the Hidden Ridge station along DART's Orange Line is a recent example.

Non-Rail Network

High-Intensity Bus

As development takes place, HIB (high-intensity bus) service can respond to growing demand for transit relatively quickly. HIB can operate in areas where the capital cost requirements of rail service may be prohibitive, in areas where passenger rail demand is uncertain or expected to slowly mature over time, and where a parallel roadway facility is available to provide reliable trip making for the HIB service. Successful services can evolve over time and lay the groundwork for higher capacity transit options in the future such as passenger rail. **Exhibit 6-26** summarizes opportunities for high-intensity bus service. Specific projects are included in the **Public Transportation** section of the **Mobility Options** appendix and are shown in the Major Transit Corridors Recommendations map, **Exhibit 6-27**.

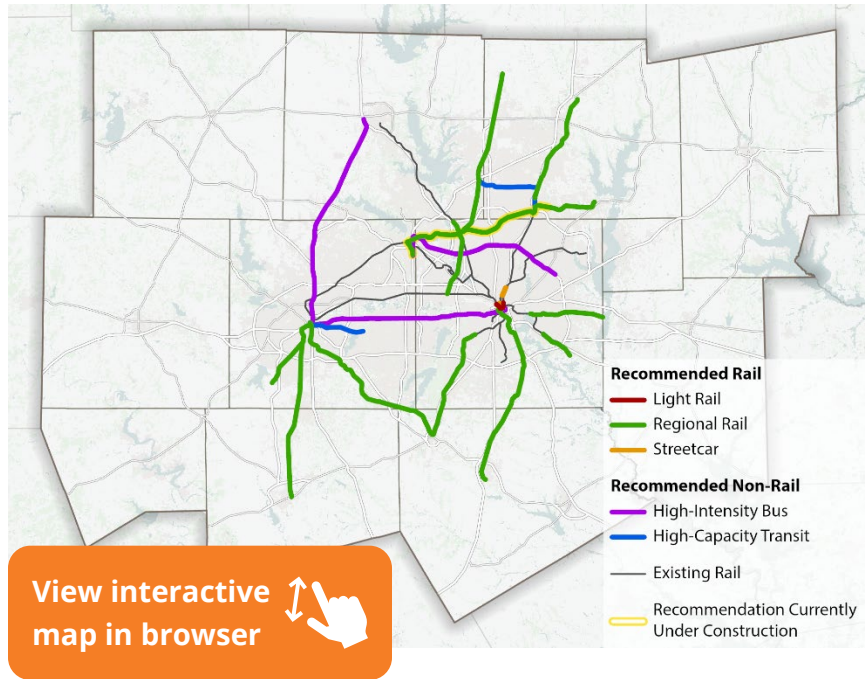
HIB features enhanced operating characteristics and service attributes, which collectively represents a higher class of transit service to attract riders. The primary objective of HIB service is to ensure travel time reliability to provide a competitive mode choice for riders. Guaranteed Transit, a service attribute in which passengers are reimbursed in some form for trips that fail to arrive on schedule, emphasizes the importance of maintaining travel time reliability.

Exhibit 6-26: High-Intensity Bus Service Opportunities

High-Intensity Bus Service	Where
Lower cost alternative to rail service	In corridors where rail service is not feasible.
Precursor for rail service	In unused rail corridors or on parallel facilities with excess capacity before rail service is implemented. (Not considered an option in active freight rail corridors.)
Other opportunities	In other high-demand corridors, including corridors with toll managed lanes or toll roads with excess capacity; grant commitment in multimodal corridor.

As envisioned for the region, reliability of HIB service can be achieved by operating on tolled managed lanes (to the extent possible) where travel speeds and corresponding travel times can be maintained. In conjunction, Guaranteed Transit can be implemented to encourage riders to use HIB services without having to worry about service reliability. **Exhibit 6-28** highlights key service features and amenities that can be pursued as HIB services are planned, designed, and implemented.

Exhibit 6-27: Major Transit Corridors Recommendations



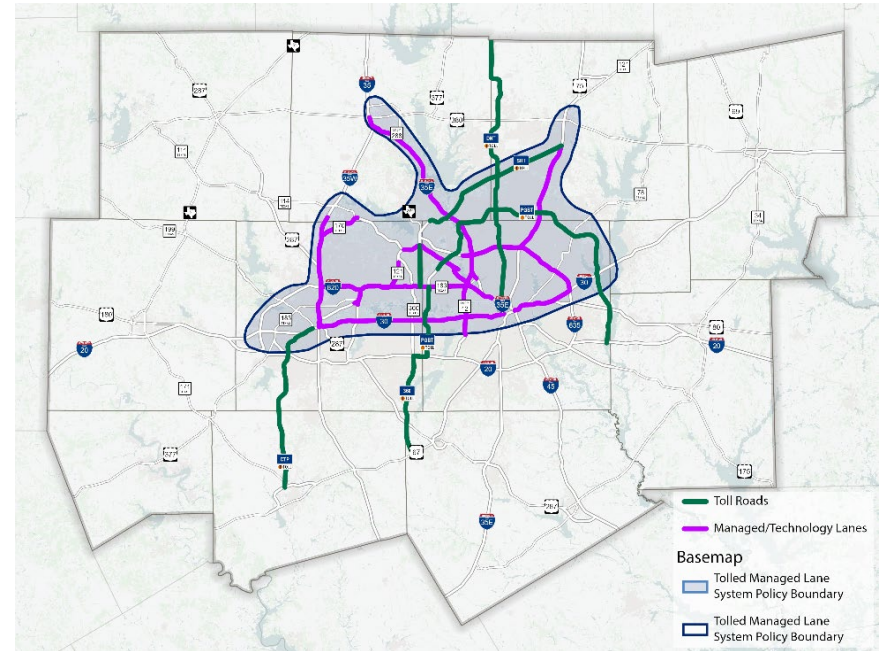
View interactive map in browser

Exhibit 6-28: High-Intensity Bus Key Services and Amenities

HIB Features	Planned HIB Corridors
Enhanced stops and on-board amenities	IH 35W between downtown Fort Worth and Alliance
Guaranteed transit	Early Planning:
More frequent service (than conventional local bus service)	IH 635 in north Dallas
Off-board fare collection	IH 30 between downtown Fort Worth and downtown Dallas
Technology integration	
Operation on tolled managed lanes	

The Mobility 2045 Update supports strategically operating high-intensity bus in all existing and future tolled managed lanes in the region, as shown in **Exhibit 6-29**.

Exhibit 6-29: Guaranteed Transit on Existing and Future Tolled Managed Lanes



High-Capacity Transit

High-capacity transit refers to transit modes, including buses along designated corridors such as major arterials, designed to move a large volume of passengers more efficiently and effectively than conventional public transit by using a combination of smart city technology integration (e.g., signal prioritization) for transit priority, operating improvements (e.g., more frequent service), and infrastructure enhancements (e.g., dedicated lanes or turnouts). In North Central Texas, there are several corridors for which high-capacity transit is being considered, including Spring Creek Parkway in Plano and East Lancaster Avenue in Fort Worth.

The East Lancaster Technology Corridor is a 9-mile segment between Fort Worth Central Station and Dottie Lynn Parkway/Green Oaks Boulevard (east Fort Worth) and is undergoing preliminary analysis to better define the scope and limits of potential high-capacity service

options. Stakeholders and the public are collaboratively shaping the broader economic development vision for East Lancaster, which will influence the follow on multimodal, access management, and context-sensitive street and streetscape designs.

TR2-004: State and National Transit Connections Program

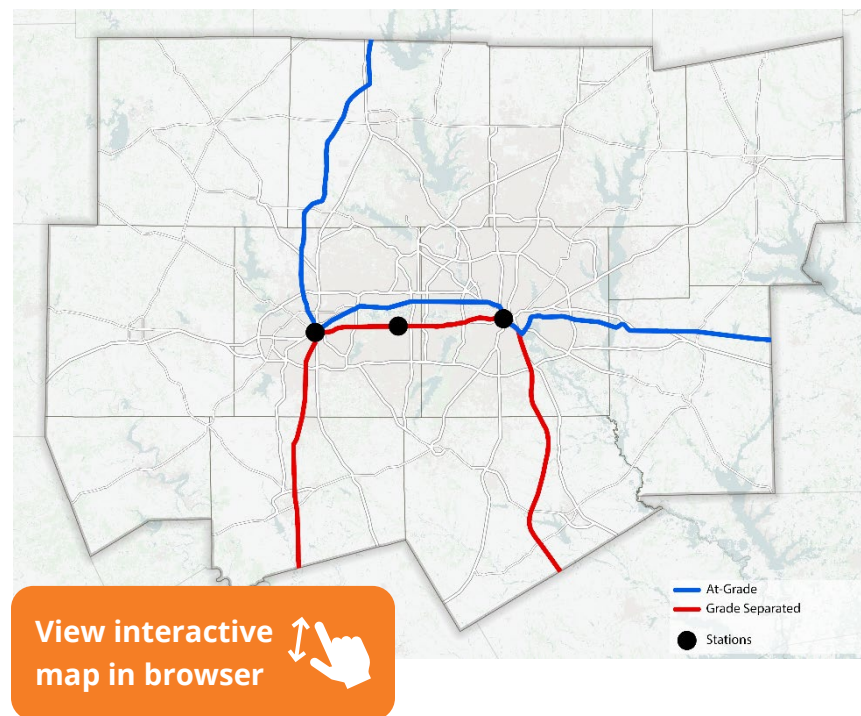
Transit also links North Central Texas to neighboring regions, the rest of Texas, and the nation. Existing services include intercity bus and intercity rail via Amtrak. The Mobility 2045 Update includes plans for high-speed transportation service that will connect North Central Texas to other regions.

High-Speed Transportation

The North Central Texas region has been identified as a potential hub for passenger rail routes serving distant regions. Federal and state plans indicate a need for high-speed passenger rail service to, through, and within the region. Corridors traveling through North Central Texas include proposed service to Oklahoma City; Austin; San Antonio; Houston; Shreveport, Louisiana; and Little Rock, Arkansas. Planning is progressing for some of these corridors. With new high-speed technologies such as maglev (magnetic levitated trains) and hyperloop advancing rapidly, some of these corridors could utilize a technology other than high-speed rail.

Four corridors are proposed: 1) Dallas to Houston, 2) Oklahoma City to South Texas, 3) Fort Worth to Shreveport, and 4) Fort Worth to Dallas. Recommendations for the Mobility 2045 Update include at-grade and grade-separated high-speed transportation service within the region, as identified in **Exhibit 6-30**.

Exhibit 6-30: High-Speed Transportation Recommendations



The Regional Transportation Council determined the most effective and efficient plan for the region would provide a seamless service—a “one-seat” ride—for passengers, meaning passengers would not be required to transfer to reach their destination.

High-speed passenger service within North Central Texas is not intended to be a stand-alone service; rather, service within the region is an integral component of a larger statewide and potential national network.

The Dallas-to-Houston corridor has been identified as having the most potential for grade-separated high-speed passenger rail service. An effort led by the private sector has analyzed the corridor for environmental impacts, alignment options, station locations, and

funding options. The region’s high-speed rail recommendations are shown in **Exhibit 6-30**.

The proposed corridor extending from Oklahoma City to South Texas also exhibits high ridership potential, particularly segments south of Fort Worth. Initial planning indicates a need for at-grade higher-speed passenger rail service from Fort Worth to Oklahoma City. From Fort Worth southward, the appropriate high-speed technology is yet to be selected through future planning efforts. However, this corridor has been identified as a grade-separated high-speed transportation corridor viable for high-speed rail, maglev, or hyperloop technology. Additional analysis is needed to refine the corridor alignment, specific high-speed technology, and service types.

Planning for the proposed corridor extending eastward from Dallas to Shreveport, Louisiana indicates a need for higher-speed at-grade passenger services.

Within the North Central Texas region, both at-grade high-speed passenger rail and grade-separated high-speed transportation rail is recommended from Fort Worth to Dallas. The grade-separated high-speed rail service in this corridor, recommended to follow the IH 30 alignment for a majority of the distance, includes three stations, per Regional Transportation Council policy, in downtown Fort Worth, Arlington, and downtown Dallas as identified in **Exhibit 6-30**. Additionally, the Regional Transportation Council approved the Phase 1 study recommendations, which included a travel time of 20 minutes or less between downtown Dallas and downtown Fort Worth, to provide fast and reliable travel regardless of traffic conditions. By connecting the identified grade-separated high-speed transportation corridors, a “one-seat” ride could potentially be achieved from South Texas to Houston through North Central Texas. The region supports the development of one-seat/one-ticket high-speed transportation connectivity between Fort Worth, Arlington, Dallas, Houston, and South Texas through the Dallas station. Should regulatory, environmental, financial, or other challenges prohibit the

timely development of a one-seat/one-ticket connection through the Dallas station, the region will support and coordinate with high-speed transportation system implementers to develop a cross-platform transfer solution for all passengers that is as close to a one-seat/one-ticket connection as possible.

Cost estimates for grade-separated high-speed transportation within North Central Texas are provided in **Exhibit 6-31**. The Fort Worth-to-Austin and Dallas-to-Houston corridors will be funded through private-sector initiatives. The Fort Worth-to-Dallas project will be funded through a public-private partnership.

Exhibit 6-31: Cost Estimates

ID	From	To	Distance	Private	Public	Total
			(within MPA)	Revenue Sources (\$millions)		
1	Johnson/Hill County Line	Fort Worth	38	\$7,100	\$0	\$7,100
2	Fort Worth	Dallas	32	\$2,000	\$2,000	\$4,000
3	Ellis/Navarro County Line	Dallas	41.6	\$5,100	\$0	\$5,100
Totals			111.6	\$14,200	\$2,000	\$16,200

MPA: Metropolitan Planning Area

TR2-005: Transit Enhancements and Mobility Improvements Program

The Transit Enhancements and Mobility Improvements Program supports optimizing the lifespan and utilization of existing transit assets by prioritizing the following in the transit system: safety improvements, capacity-expansion projects, coordinated services, accessibility improvements, and technology integration. Optimization of existing transit assets will enhance the efficiency, effectiveness, and safety of the transit system while continuing to support transit as a mode of choice for the region.

The Mobility 2045 Update supports the implementation of transit agency-developed asset management and safety plans to achieve program objectives for the region. **Exhibit 6-32** summarizes the types of improvements this program supports.

Exhibit 6-32: Transit Enhancements and Mobility Improvements

Type of Improvement	Example Enhancements
Operations	Asset management plans and performance measures Coordination of services across transit providers
Mobility Management	Wayfinding signage Trip planning information and services Service for special events
Capital	Platform extensions at rail stations Double-tracking along passenger rail corridors Expansion of bus fleets Bicycle and pedestrian accessibility to stations, including sidewalks
Safety and Security	Positive train control Security equipment Safety management plans
Technology Integration	Signalization equipment and software Scheduling/dispatch software

Public Transportation Providers

Public transportation in the North Central Texas region encompasses a variety of services. Public agencies provide a majority of the fixed-route bus, light rail, and demand-response services. The private sector, detailed in the next section, has an active role in providing public transportation services such as intercity bus and rail. The private sector also partners with public agencies to enhance public transportation services. The region’s public service providers are described below.

Transit Authorities

The region’s three transit authorities, state-authorized taxing authorities with dedicated sales tax funding for transit services, operate most of the transit service in the region. DART, Trinity Metro, and DCTA (Denton County Transportation Authority) serve thousands of customers each day and tailor their services to local markets. For an interactive view of the Dallas-Fort Worth region’s public transportation providers, please visit www.nctcog.org/coordination.

Collectively, the transit authorities covered more than 78 million trips in the metro region in 2019, with bus and rail as the predominant modes. DART is the main contributor to that annual total as it accounts for nearly 89 percent of all trips, followed by Trinity Metro and DCTA, nearly 7 percent and 4 percent, respectively. As shown in **Exhibit 6-33**, the transit authorities provide regional and local services through various modes: fixed-route (bus or rail), demand-response, and vanpool. Additionally, transit authorities operate complementary Americans with Disabilities Act paratransit service within their respective service area for individuals whose abilities limit their use of fixed-route services.

Exhibit 6-33: Summary of Service Consumption by Transit Authority

Transit Authority	Member Cities*	Annual Passenger Trips by Mode			
		Bus	Demand Response	Rail**	Vanpool
DART	13	37,230,755	1,005,634	30,569,277	495,882
DCTA	3	2,355,857	61,581	393,700	128,171
Trinity Metro	2	5,066,227	352,459	407,418	190,502

*Some cities may only pay a portion of the required sales tax to be a “junior” member of a transit authority, where only rail access is provided; however, only cities that allocate a full portion of the required sales tax to the respective transit authority are shown

**Rail includes commuter, regional, and light rail

Source: National Transit Database, 2019

In addition to providing services to cities that opt to join a transit authority by dedicating a portion of their sales and use tax revenue to fund transit services (i.e., member cities), transit authorities also

provide contracted services to non-member cities that are still interested in providing a transit option to their communities' residents. For example, the cities of Wylie, Allen, and Fairview currently contract with DART to operate Collin County Rides; the cities of Crowley and Everman, and River Oaks contract with Trinity Metro to operate transit service in their communities; and the city of Frisco contracts with DCTA for transit service. Some of these contracted services are limited to seniors, individuals with disabilities, and low-income residents.

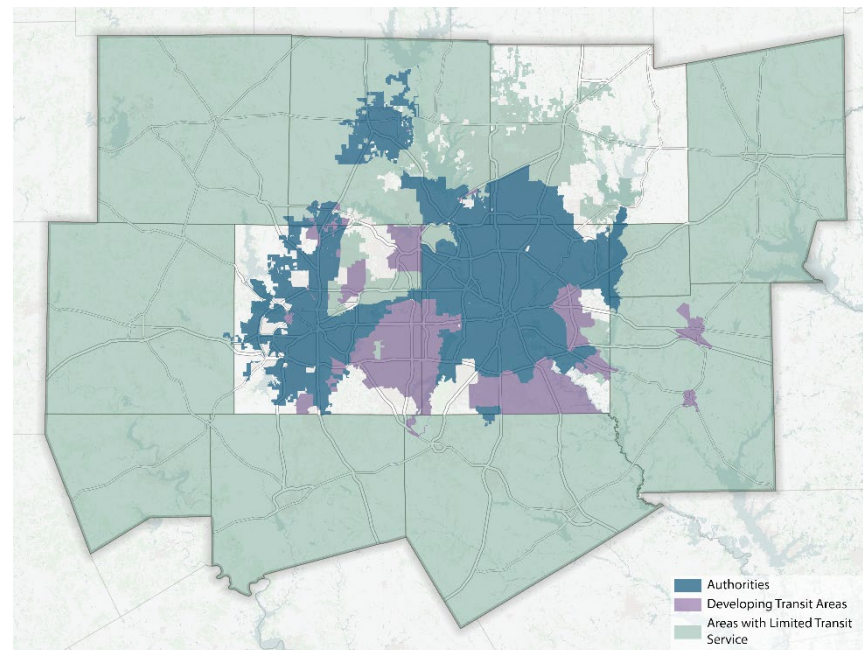
Recently, the three transit authorities each underwent bus network redesigns to improve the customer experience and better serve customers by optimizing bus service delivery, while maximizing the efficient use of limited transit resources. Though the network redesign efforts are tailored to meet the unique needs of each respective service area, the separate efforts share a common objective: attract higher transit ridership through strategic placement of bus routes and deployment of right-sized service options in areas where transit demand is still developing.

An example of a right-sized service option is on-demand transit (i.e., microtransit). In fact, microtransit is a key service element of all bus network redesigns completed by the region's transit authorities. Microtransit offers convenience with its curb-to-curb service, as well as flexibility to areas where transit demand is developing or to communities that are exploring their transit and shared mobility needs for the first time.

Transit Outlook and Regional Growth

A range of transit services is available in the metroplex, ranging from demand-response to fixed-route services, from prequalified services to services open to the general public (*general access*). **Exhibit 6-34** illustrates the range of transit services based on service type(s) and access eligibility.

Exhibit 6-34: Transit Authorities, Developing Transit Areas, and Areas with Limited Transit Service



Transit Authorities (DART, DCTA, and Trinity Metro) offer a full suite of services as options to member cities, whereas *Developing Transit Areas* are non-member cities that generally provide on-demand rideshare services to members of their respective communities without becoming full-fledged members of a transit authority; the exception in this group is certain TEXRail cities (e.g., North Richland Hills and Grapevine) that allocate transit funding specifically for that commuter rail service alone and are considered “junior” member cities. And *Limited Transit Service Areas* are those that offer limited transit services (typically demand-response) to prequalified populations based on income, age, and/or disability.

Exhibit 6-35 shows existing and forecasted growth trends in the region relative to existing transit areas: a large proportion of the region's population lives outside of Transit Authority and Developing Transit areas (combined, these areas form *general access* areas).

Much of the forecasted growth is expected to occur outside of these areas.

Exhibit 6-35: Growth Patterns Relative to Existing Transit Areas

Estimated Population Total				
		2023: 8,153,519	2045: 11,411,548	
Category	Inside Population		Outside Population	
Authorities	2023	46%	2023	54%
	2045	40%	2045	60%
Authorities + Developing	2023	60%	2023	40%
	2045	54%	2045	46%

To ensure the region’s public transportation system develops in a manner that meets existing and forecasted transit demand/needs, NCTCOG is proactively working with partners to prioritize investment in public transportation to expand access, mobility, and development of a multi-modal transportation network and to increase the reach of these *general-access* areas so that all have access to quality transit services.

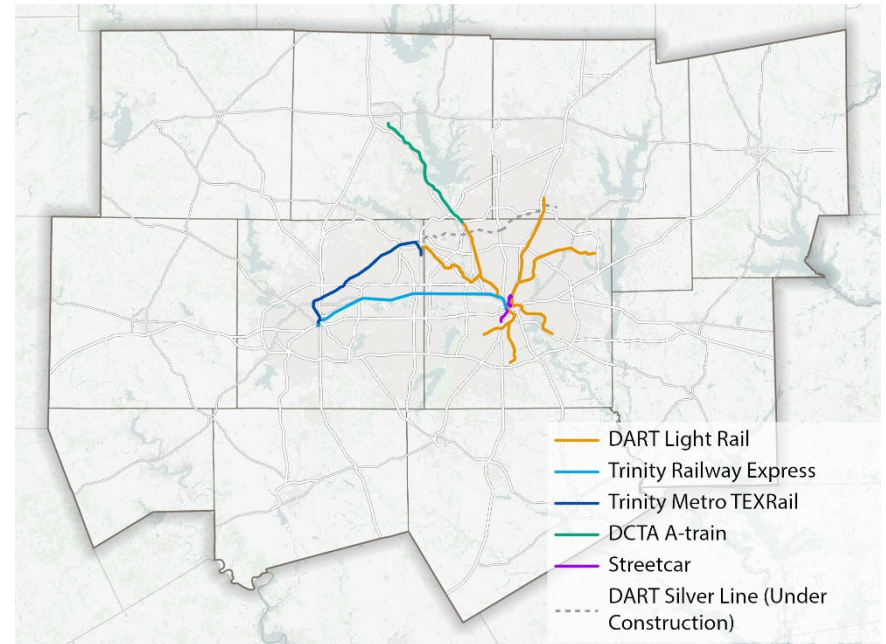
Rail Services

Each transit authority operates passenger rail service. DART’s rail services are concentrated primarily within Dallas County but provide essential connections to other rail services operated by Trinity Metro and DCTA in neighboring counties. The region’s rail system is shown in **Exhibit 6-36**.

The Trinity Railway Express is jointly owned and operated by DART and Trinity Metro and connects downtown Fort Worth to downtown Dallas. DART operates a hub-and-spoke light-rail system with four light-rail lines, which connect to other key transit nodes of the regional system. DART’s Green Line connects to DCTA’s regional rail service (A-train), which extends rail service to the city of Denton

(terminus) in Denton County. DART’s Orange Line connects to Dallas Fort Worth International Airport. At the airport, passengers can also connect to Trinity Metro’s recently completed regional rail line, TEXRail.

Exhibit 6-36: Existing Rail Services



TEXRail extends from downtown Fort Worth, across northeast Tarrant County, and into Dallas Fort Worth International Airport. The 27-mile regional rail line began service in January 2019 and is served by nine stations, serving several neighboring communities along the corridor. A 2.1-mile extension of TEXRail is currently being planned and designed between downtown Fort Worth (terminus) and the Fort Worth Medical District. The TEXRail extension is slated to be complete and ready for revenue service in late 2025/early 2026. Additionally, the Silver Line, a new regional rail line connecting Dallas Fort Worth International Airport to southern Collin County, is currently under construction.

Dallas Area Rapid Transit’s Silver Line, extending along a 26-mile corridor, will provide passenger rail service between the city of Plano and Dallas Fort Worth International Airport, while serving several communities in the northern part of DART’s service area. The Silver Line will link to other key passenger rail services in the regional system, interfacing with three DART light-rail lines and connecting to Trinity Metro’s TEXRail line at Dallas Fort Worth International Airport. The Silver Line will have 10 uniquely designed stations along the corridor. Construction began in November 2019 and is expected to be complete in 2024. Service on this new passenger rail line is anticipated to open its doors to the public in late 2024. Once operational, future connections between TEXRail and the Silver Line can provide a potential opportunity for a one-seat ride between Plano and Fort Worth’s Medical District. The Regional Transportation Council has taken a policy position for a seamless connection between these two systems as further described in P16-01: Regional Transportation Policy Position on Transit Implementation in the Cotton Belt Corridor located in the **Public Transportation** section of the **Mobility Options** appendix.

Smaller Providers

Smaller transit providers in the region provide essential service to many areas outside of transit authorities’ service areas, as well as complement several areas currently served by transit authorities. Since smaller providers do not have a dedicated sales and use tax revenue source to fund transit service (or other comparable local funding source), many of them focus their limited resources on serving specific prequalified populations (by age, disability, or income), certain trip purposes (e.g., medical trips, commute trips), or activity centers at certain times of the day.

Demand-response service, which requires customers to schedule a trip in advance by telephone, is the common transit mode operated by small providers, though not in all cases. For example, STAR Transit operates demand-response service, but also several bus routes

(fixed-route) and on-demand (microtransit) service in parts of its service area. Several smaller providers operate demand-response service only for “lifeline” trips on a limited basis (hours per day or days per week). Additionally, nonprofits or others offer client-specific transportation in support of their overall mission, which may be job training, nutrition, or services for specialized populations like cancer patients, individuals with disabilities, or older adults. **Exhibit 6-37** summarizes the extent of services provided by smaller providers in 2019.

Exhibit 6-37: Summary of Service Consumption for Smaller Providers

Smaller Providers	Service Modes*	Cumulative Annual Passenger Trips**
16 providers	DR, OD, Bus	Over 1.2 million

*DR: Demand Response, OD: On-Demand

**Reflects data for 12 of 16 providers for which data is available; includes entire service area of respective providers.

Source: National Transit Database, 2019

As the region continues to grow, smaller providers that historically served the region’s smaller communities and rural areas have expanded to serve communities with suburban development and emerging growth. Some of these providers connect outer communities to the region’s core so riders can access jobs and services. For example, Public Transportation Services connects residents of Mineral Wells and Weatherford to Fort Worth; and City/County Transportation connects residents of Cleburne and Burleson to Fort Worth.

Private Transportation Providers

The private sector also plays a significant role in providing public transportation services. Because of its business-friendly environment and growing need for innovative transportation solutions, North Central Texas has become a service hub for private companies offering public transportation options. In addition to traditional for-hire transportation services like taxis and airport shuttles,

transportation network companies and other mobility providers, described below, provide ride hailing services to many areas in the region.

Shared Mobility Services

Transportation network companies, like Uber or Lyft, connect individual riders with drivers that operate their personal vehicles to provide transportation services. Transportation network companies have also partnered with transit agencies to provide supplemental services such as first/last mile connections to transit stations and a same day alternative service option for paratransit riders. For example, Uber and Lyft are working with DART, DCTA, and Trinity Metro to provide convenient mobility options that can be accessed via mobile applications (smartphone) or by a call-in option.

In late 2017, the city of Arlington partnered with Via Transportation to provide an on-demand shared mobility service to its residents that aims to fill a public transportation need in the city. Initially, Arlington focused its shared mobility service in select activity centers within city limits but, since January 2021, has expanded its service area to include the entire city limits, while also continuing to provide a connection to an important regional transit node in the region: CentrePort Station on the Trinity Railway Express.

Though on-demand shared mobility services typically focus on first/last mile connections or on serving communities with lower densities and public transit demand, the service model may also be used to serve a much larger area (as in the case of Arlington) to provide mobility options with lower implementation costs. Given the flexibility of on-demand service (can scale up or down with fluctuating demand for ridership), and that it's a relatively low-cost and quick-to-implement service option, the attractiveness of on-demand services as an alternative mobility option for communities within the region is likely to grow.

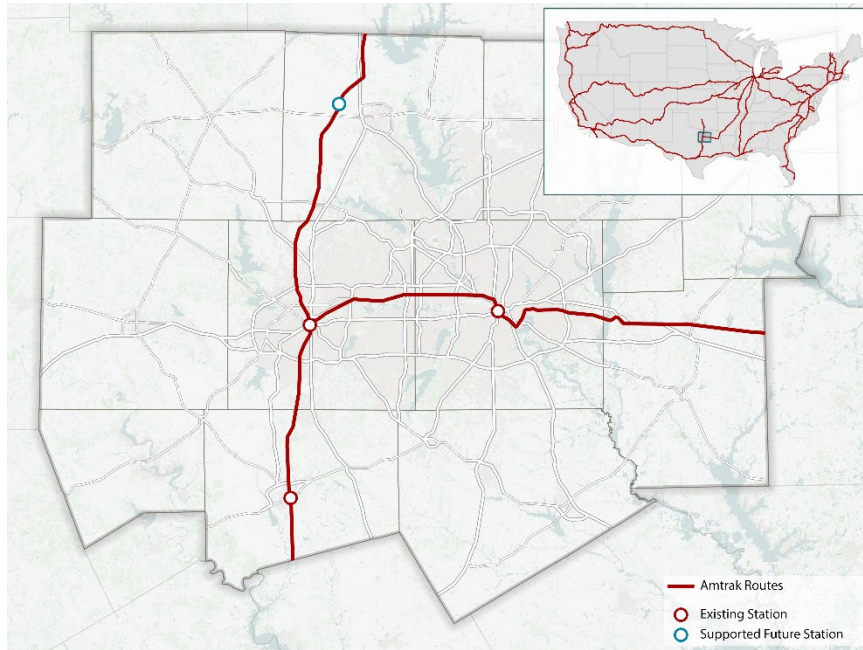
As shared mobility services become more prevalent in the region, it is critical to ensure that equitable access to such services is ensured for all users, including cash-dependent populations and those with limited to no access to an internet-enabled device—given that such devices (e.g., smartphones) are the primary means through which shared mobility services are accessed.

Intercity Bus and Rail

Regional and national rail and bus carriers link the region to outside destinations with services operated by Amtrak, Greyhound, Megabus, Tornado Bus Company, and El Expreso Bus Company. Several of these bus carriers also provide a direct connection to Mexico.

Amtrak is the nationwide passenger rail system that provides medium- and long-distance intercity service. Two Amtrak routes travel through North Central Texas, as shown in **Exhibit 6-38**. The Texas Eagle Amtrak route connects the region to major cities, including Chicago, St. Louis, San Antonio, and Los Angeles. The Texas Eagle provides daily connections between Chicago and San Antonio through North Central Texas with continuing service to Los Angeles via San Antonio three times a week. The Heartland Flyer is a daily Amtrak route between Oklahoma City and Fort Worth. The three Amtrak stations serving North Central Texas are Dallas Union Station in downtown Dallas, the Fort Worth Central Station in downtown Fort Worth, and the Intermodal Transportation Depot in Cleburne. Future service improvements along the Heartland Flyer by Amtrak, including increased service frequency and an additional station in Krum near Denton, are supported by the Regional Transportation Council as a part of a national, interconnected rail system.

Exhibit 6-38: Amtrak Routes and Stations



Regional Transit Initiatives

Transit Studies

In 2018, the Regional Transportation Council approved funding for NCTCOG to develop coordinated implementation plans for innovative transit and mobility service options in three study areas: Collin, southern Dallas, and Tarrant counties. The three studies focused on municipalities that are currently not member cities of an existing transit authority. The recommended transit implementation strategies focused on near-term implementation (within 10 years) within the context of the transit policies and projects outlined in the Mobility 2045 Update.

Exhibit 6-39 summarizes key elements of the three studies. Each study examined transit demand and the needs for local (internal travel) and regional service. After assessing the existing transit system in each respective study area, opportunities for service

expansion and improvements were identified based on transit demand and needs. Moreover, the nexus between transit and land use was analyzed and highlighted in all three studies, as appropriate land use strategies are critical to the success of any transit system (all transit modes). For more information on the transportation and land use nexus, refer to the **Sustainable Development** section of the **Operational Efficiency** chapter.

Exhibit 6-39: Common Elements of Transit Studies

Study Elements	Collin County	Dallas County	Tarrant County
Internal & Regional Connections	✓	✓	✓
Rail Corridor Analysis	✓	-	-
People & Goods Movement	-	✓	-
Transportation Options & Innovation	✓	✓	✓
Funding Options	✓	✓	✓
Near-Term Strategic Implementation	✓	✓	✓

Projects Website: www.nctcog.org/transitstudies

Transit service options were developed based on key findings from technical analyses, as well as input from stakeholders and the public. Service options range from shared mobility (often referred to as microtransit) to fixed-route bus service (including passenger rail consideration in the Collin County study). Associated service cost estimates and service delivery options were outlined to assist communities in planning for implementation of recommended transit services. Implementation plans were developed to guide communities throughout the phased implementation process.

The common theme among all three of these study areas was that a unified governance and operations management approach is needed to advance transit recommendations outside of traditional transit authority boundaries. Additionally, each study recognized the near-term advantage of implementing microtransit, in appropriate areas throughout each county, as the first phase in developing a unified

approach to transit in these areas. Other transit recommendations identified in each study can easily build upon this unified framework to layer in a successful and comprehensive transit system over time. This layered approach to implementing transit can be adopted for other parts of the region that are located outside of transit authority boundaries.

The year-long studies were completed in mid-2021, and two additional transit studies that aim to achieve similar objectives are expected to begin in early 2022: one for Denton County and another for eastern Dallas, Kaufman, and Rockwall counties.

Transit Strategic Partnerships Program

In September 2021, NCTCOG launched a redesigned funding program to fund innovative, solutions-oriented transit and shared mobility projects in the region. The program utilizes Federal Transit Authority funding sources (Sections 5307 and 5310) to fund selected projects located within two urbanized areas: Dallas-Fort Worth-Arlington, and Denton-Lewisville. Submissions are accepted on a rolling basis to be more responsive to immediate needs. The Regional Transportation Council calls for 2 percent of the funding of the Federal Transit Administration awards to North Texas annually to be set aside for eligible transit and shared mobility projects.

For a project to be selected and awarded program funds, it is evaluated to ensure that it addresses identified transit needs based on NCTCOG-led studies and planning documents, as well as other key criteria. The program's evaluation criteria for project proposals are: Needs Assessment, Strategic Value and Innovation, Project Funding and Sustainability, and Implementation Capacity and Collaboration.

Mobility as a Service in the Region

Mobility as a Service (MaaS) is a concept that describes the effort to integrate various transportation services into one easy-to-use, accessible platform (service). An effective MaaS platform enables users to easily plan their trips (including payment) across different

transportation modes, providing a seamless experience from origin to destination. The keys to accomplishing this are technology and collaboration among the various transportation service providers. One of the industry leaders in MaaS development is DART. Since 2013, DART has been developing and refining its MaaS platform (GoPass), expanding transportation service offerings each year. Currently, GoPass links service to DCTA, Trinity Metro, and STAR Transit, as well as third-party mobility providers (e.g., transportation network companies).

To support and promote regional coordination on MaaS, NCTCOG established a working group in 2017, which continues its proactive efforts in the region. The Mobility-on-Demand working group provides a forum for transit agencies, local government, and other interested parties to discuss, coordinate, and promote demonstration of Mobility-on-Demand concepts and solutions in the region.



As technology-driven transportation services continue to change the way users access and experience a range of services (including transit), a high priority is to ensure the needs of unbanked users are met, as well as those for whom access to a reliable, internet-enabled device is challenging. The potential benefits and convenience delivered by a robust MaaS platform are plentiful and wide reaching; however, to maximize this potential return on investment, technology-driven services must not act as an added convenience for some, yet a barrier for others, but rather as a tool that expands and facilitates access for all users.

Map Your Experience: Transit Comment Assessment

NCTCOG has established the Map Your Experience tool in order to receive public comments on the issues affecting travelers in our region. Using these comments, NCTCOG has identified several areas of concern for improving transportation throughout the region. This section highlights findings from feedback submitted through the Map Your Experience tool related to public transportation.

It should be noted that while this is not a quantitative, representative sample, the information gathered from the Map Your Experience tool helps NCTCOG and members of the Regional Transportation Council identify patterns and hotspots for issues reported by people using the transit network. Thus, these results should be interpreted as guidance for further analysis and research, focusing on transit issues in North Central Texas.

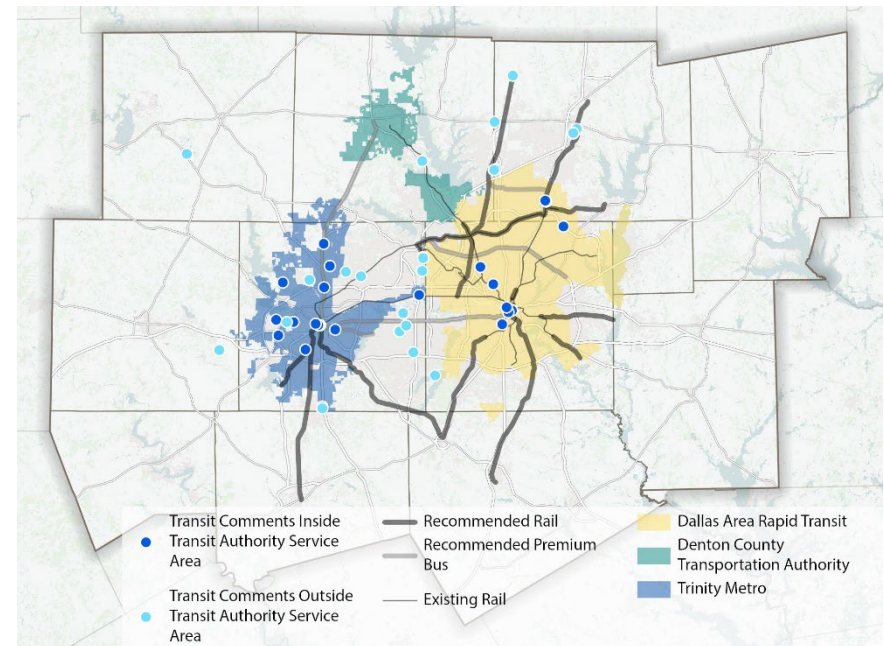
The majority of comments received on the Map Your Experience transit map expressed a desire for increased service on existing transit lines and expansion to new areas. This includes both existing transit authority service areas and places not currently part of a transit authority. **Exhibit 6-40** shows an overlay of transit-related comments against existing transit service areas, existing rail services, and recommended rail and premium bus services.

This map suggests that the proposed rail extensions into Collin County will meet the needs of residents who have expressed a desire for transit service within Collin County. Additionally, with a majority of comments originating in Tarrant County, we can see that the proposed bus and rail lines will also serve residents in the county.

A more detailed look into the comments reveals that existing transit services for residents within existing transit authority areas do not seem to meet their needs. A common theme, particularly within Tarrant County, is a lack of nearby bus routes and low service frequencies. Transit access to major employment or residential centers, notably northern Fort Worth, remains an issue for residents.

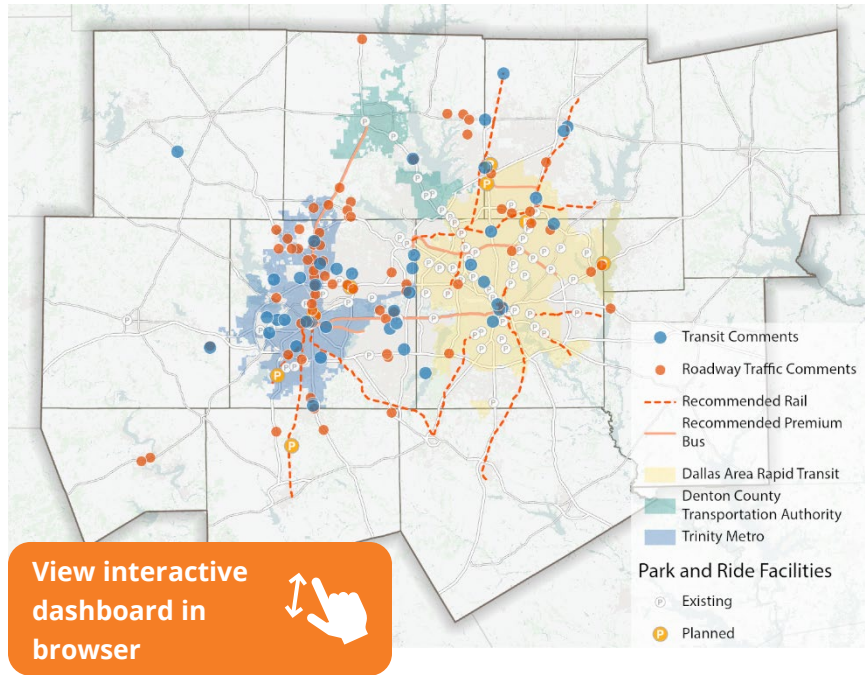
Commentors in Arlington were largely supportive of increased public transit service beyond the Via rideshare program that currently operates in Arlington, with an emphasis on connections to area transit and to the Entertainment District.

Exhibit 6-40: Transit Comments with Service Areas and Proposed Enhancements



Another common refrain was a desire to avoid heavily congested roadway corridors. **Exhibit 6-41** displays an overlay of both transit comments and traffic-related comments from the roadway map against transit service areas and park-and-ride facilities. Tarrant County, particularly the northern Fort Worth area, shows significant overlap between traffic comments and transit comments, and with far fewer park-and-ride facilities along IH 35W.

Exhibit 6-41: Transit Comments and Roadway Traffic Comments with Park-and-Ride Facilities



Two major insights can be gleaned from this information: the proposed major corridors for new rail and premium bus services will help meet the needs of commenters, and that additional planning needs to be done to serve travelers in Tarrant County. Local jurisdictions, transit authorities, and NCTCOG will need to work together to develop these plans and improve services and transit access for residents of the North Central Texas region. NCTCOG recommends that municipalities and transit authorities assess the distribution of transit service and park-and-ride facilities, and plan for access to bus and rail lines in areas with especially high congestion.

Financial Summary

This section summarizes the financial resources supporting the public transportation programs described in the Mobility 2045 Update, including capital and operating costs.

Exhibit 6-42 outlines the costs to implement public transportation programs through 2045. The programs are financially constrained to expected revenues. The **Financial Reality** chapter provides information on the overall financial resources supporting implementation of this plan.

Exhibit 6-42: Public Transportation Programs

Transit Cost Categories, 2023-2045	Total Cost (Actual \$, M)
Community Access Transit Program	\$3,183.3
Last-Mile Transit Connections Program	\$15,859.2
Regional Connections: Next Generation Transit Program	\$27,864.7
State and National Transit Connections Program	\$11,600.0
Transit Enhancements and Mobility Improvements Program	\$1,279.0
Total	\$59,786.2

Federal Funding

Federal funding for public transportation in North Central Texas, including funding from the Federal Transit Administration, is programmed by the Regional Transportation Council. Federal funding sources are available for capital investments, pilot projects, and transportation planning. In limited cases, this funding also is available for transportation operations, with some sources intended specifically for transit-dependent populations. Federal funding programs are either formula-based or discretionary. Formula-based programs allow transit providers to access federal funds that are distributed to urbanized areas based on a formula using population, population density, and other factors related to ridership.

Discretionary funding, when available, typically involves submitting a project or program as part of a competitive selection process.

State Funding

The Texas Department of Transportation also provides funding for public transportation allocated by the Texas Transportation Commission. Public transportation formula programs through the Texas Department of Transportation primarily focus on rural and small urban systems, but state funding is sometimes available on a discretionary basis for other public transportation projects.

Local Funding

Cities and counties have the option to contribute to transit services through their own revenue sources such as general funds and sales tax revenues. Aside from federal sources, most transit funding for operations and maintenance comes from local sources. Public transportation competes for local funds against other priorities such as roadway projects, crime prevention, libraries, and parks, unless funding is specifically dedicated to transit. Local sales tax can provide a reliable and dedicated revenue for transit services.

Currently, the State of Texas limits the combined sales tax for all taxing authorities to 8.25 percent. The state sales tax rate is 6.25 percent, leaving up to 2 percent for cities to apportion in a variety of ways. Cities that are members of DART, Trinity Metro, and DCTA currently dedicate a portion of their sales tax to those transit authorities. Cities that want to support public transportation, but do not already dedicate a transit sales and use tax, may have opportunities to reallocate existing sales tax revenue to fund transit services or identify a different source of public funds to support transit.

Innovative Finance, Public-Private Partnerships, and Private-Sector Funding

Depending on the scale of the transit service to be implemented, a variety of innovative financing techniques, public-private partnerships, and private-sector participation may be needed to leverage other federal, state, and local funds. To implement the system of rail service included in the Mobility 2045 Update, creative partnerships involving all of these approaches will be needed. For bus service, private-sector participation from employers, merchants, retail establishments, and private-nonprofit organizations can be incorporated on a case-by-case basis.

Summary

This **Public Transportation** section outlines opportunities to cost-effectively expand, improve, and modernize public transportation service throughout the region in the form of recommended projects, programs, and policies. The Mobility 2045 Update supports the creation of a seamless, well-maintained, and technology-supported regional transit system that provides travelers with more choices for getting around.

6. Mobility Options: Roadway

Introduction

The roadway system recommendations included in the Mobility 2045 Update represent strategic investment in improvements, expansions, management, and new capacity for the region's mobility. The following sections detail these improvements, which include freeways, tollways, managed lanes, frontage roads, and major arterials. Managing congestion as North Central Texas grows to a region of 11.4 million people by 2045 will require strategic and ongoing investment in these identified corridors, which form the basis of the regional roadway system and serve millions of travelers each day.

Mobility 2045 Update 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.

Ensure 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.

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

Roadway Policies and Programs

The implementation of improvements to the regional roadway system is guided by the following policies, which can be found in the **Mobility Options** appendix. These policies direct the planning and development of roadways 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 Regional Transportation Council does not support converting existing free non-high-occupancy vehicle/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: Systemwide high-occupancy vehicle occupancy will be consistent with the latest Regional Transportation Council policy.

FT3-007: Additional and improved interchanges, collector-distributor roads, 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 such as thoroughfare planning and subarea studies to aid in strategic decision making regarding Metropolitan Transportation 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.

FT3-014: Evaluate and implement all reasonable options such as Asset Optimization to maximize corridor capacity, functionality, accessibility, and enhancement potential utilizing existing infrastructure assets and right-of-way.

FT3-015: Support the asset management objectives in the Texas Transportation Plan to maintain and preserve multimodal facilities using cost-beneficial treatments and to achieve a state of good repair for pavement, bridge, and transit assets.

FT3-016: Use multimodal level-of-service analysis as part of the roadway planning and design process to evaluate the level-of-service for each mode, to holistically balance the level-of-service needs of automobile drivers, transit riders, bicycle riders, and pedestrians, with priority given to the safety and comfort of the most vulnerable road users.

The Mobility 2045 Update supports the following programs associated with the roadway system:

TSMO2-005: Bottleneck Program for Regional Corridors (see the **Operational Efficiency** appendix)

NRSA2-001: Non-Regionally Significant Arterial Program

SPD2-001: Asset Optimization Program

Providing Traveler Choice

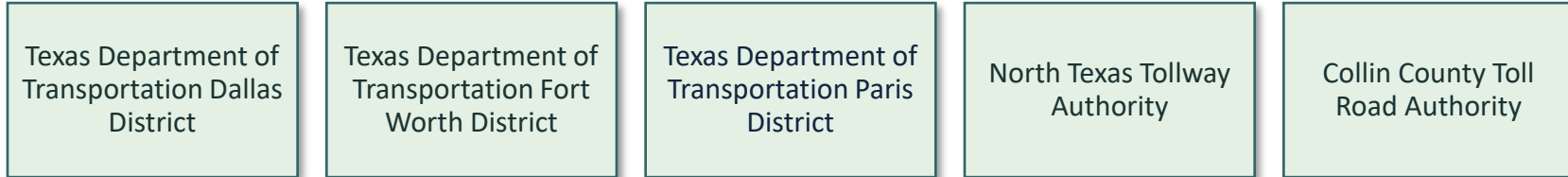
The following are considerations that should be given when planning and implementing roadway facilities:

- All roadways in the urbanized area should be designed and constructed to accommodate at least three or more modes of transportation.
- All roadway projects should implement a context-sensitive design approach compatible for the community and neighborhood in which the roadway is located.

More information about traveler choice can be found in the **Active Transportation** section of this chapter.

ROADWAY AT-A-GLANCE

Regional Roadway System Operators



Roadway System Figures

Freeway/Tollway Lane Miles per County		
County	Year 2023	Year 2045
Collin	525	1028
Dallas	2194	2473
Denton	429	788
Ellis	428	560
Hood	0	0
Hunt	118	183
Johnson	158	218
Kaufman	225	284
Parker	161	195
Rockwall	78	156
Tarrant	1536	1965
Wise	12	40

Express/HOV/Tolled Managed Lane Miles Per County		
County	Year 2023	Year 2045
Collin	11	24
Dallas	181	283
Denton	23	83
Tarrant	141	223

Freeway/Tollway Vehicle Miles Traveled Per Day	
Year 2023	98,267,384
Year 2045	139,550,746
Total Change	41,283,362
Percent Change	42%

Source: Transportation Analytical Forecasting Tool

Regional Roadway Agencies

Freeways and tollways in North Central Texas are constructed, operated, and maintained by both public and private agencies. The freeways in the region are managed by TxDOT (Texas Department of Transportation) whose Dallas, Fort Worth, and Paris districts encompass the North Central Texas region. The toll roads in the region have been constructed and are managed by the North Texas Tollway Authority. These public agencies work independently and in collaboration to improve existing roadways and develop new corridors to meet the growing demand for regional travel.

Controlled Access Roadways

The freeways and tollways in North Central Texas are primary elements in the regional roadway system. These roadways are characterized by controlled access freeway and tollway lanes where traffic enters via ramps, and cross streets use overpasses or underpasses rather than halting the flow of traffic on the freeways and tollways. Controlled access roadways often include parallel frontage roads. The freeway and tollway system accounts for a small percentage of the total miles of roadway lanes in the region, but the system carries nearly half of all vehicular travel. Mobility 2045 Update projections indicate that significant demand will continue to be placed on freeways and tollways.

Roadway Classifications

The controlled access roadways discussed in this section are described as freeways, tollways, and managed lanes; the latter include express lanes, express/HOV (high-occupancy vehicle) lanes, technology lanes, and tolled managed lanes. Freeways are generally funded with tax revenues and do not charge a toll for usage. Tollways, or toll roads, are corridors built and maintained primarily through user fees or tolls.

On general purpose toll lanes, tolls only vary by vehicle type and are fixed throughout the day. However, as a form of congestion management, toll roads could be managed through additional pricing variations such as time of day, occupancy, or other forms of operational management. Express/HOV lanes and tolled managed lanes are typically barrier-separated from general purpose freeway lanes. Drivers can pay a toll to use these lanes instead of using the parallel freeway lanes.

Mobility 2045 Update and Regional Transportation Council policies both allow variable pricing on express/HOV and tolled managed lanes based on the time of day, the facility's congestion level, and the number of occupants in the vehicle. During certain hours of the peak morning and evening commute periods, and possibly in only the peak direction, technology lanes and tolled managed lanes will be either free or discounted for vehicles with at least two occupants.

Technology lanes are typically improvements where the shoulder lane is utilized during peak periods to allow additional capacity in a congested corridor. Vehicles with more than one occupant in a technology lane would receive an incentive, monetary or otherwise. As with all forms of managed lanes, these operating requirements may be adjusted or changed due to system or corridor conditions. For example, in the recommended US 75 technology lane, the inside shoulder lane will operate as a technology lane for certain hours in the peak direction of the AM and PM peak periods. HOV travel will be incentivized by a differential cost relative to single-occupant vehicles using the region's GoCarma occupancy verification system, consistent with a recently awarded Surface Transportation System Funding Alternatives Grant. In the off-peak, the cost differential may not be necessary.

Interstate Designations within Mobility 2045

Update

TxDOT, in collaboration with local governments and the North Central Texas Council of Governments, may choose to designate existing or future freeways as Interstate Highways. This requires building or updating the road to federal Interstate Highway standards, as well as including the designation in legislation.

Constructing a completely new Interstate Highway or upgrading existing roadways to Interstate Highway standards can take multiple years, or even decades. It requires coordination with partners, identifying funding, and completing environmental assessments, public involvement periods, and design before beginning construction. Upon construction completion, the Interstate designation process can begin, which may take months or years to complete.

Exhibits 6-43 and **6-44** highlight the Interstate designation methods and procedures/requirements for Interstate conversion, as directed by the Federal Highway Administration. It is recommended that when freeway improvements are recommended and implemented, they do not preclude future conversion to Interstate standards, if there is interest in a future Interstate corridor by local governments, TxDOT, or the North Central Texas Council of Governments.

Exhibit 6-43: US Department of Transportation Designation Process

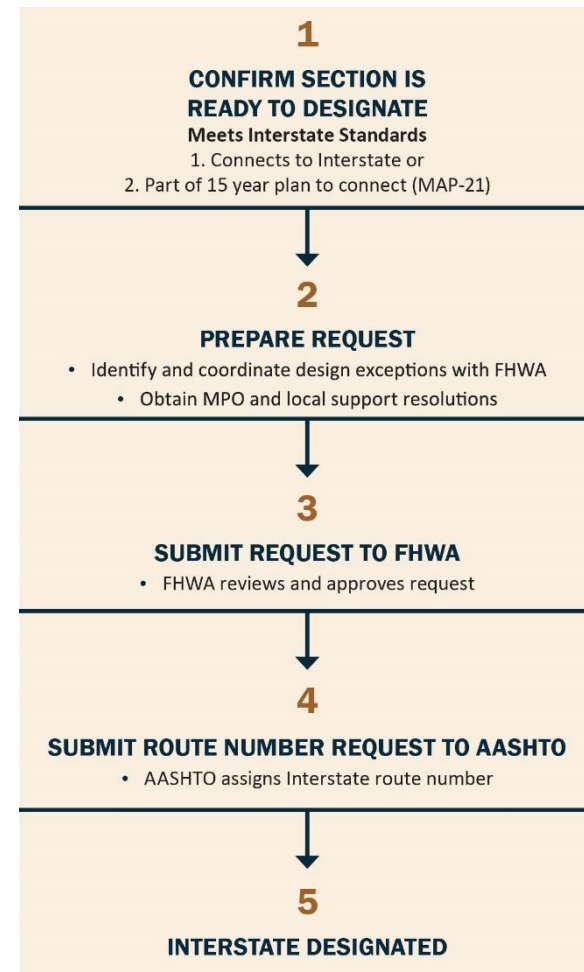


Image Source: TxDOT;
<https://www.dot.state.tx.us/drivenbytexas/designation.htm>

Exhibit 6-44: Congressional Designation

FEDERAL GUIDANCE ON INTERSTATE DESIGNATION METHODS		
1	2	3
<p>BY CONGRESSIONAL ACT Some of the High Priority Corridors have been congressionally designated as future parts of the Interstate Highway System by the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) and amendments. Once they are constructed to interstate standards, and once they connect to other interstates, then by law, they will become interstates.</p>	<p>IF THE CORRIDOR CURRENTLY MEETS INTERSTATE STANDARDS Some of the High Priority Corridors have been congressionally designated as future parts of the Interstate Highway System by the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) and amendments. Once they are constructed to interstate standards, and once they connect to other interstates, then by law, they will become interstates.</p>	<p>REQUESTING DESIGNATION AS A FUTURE INTERSTATE Some of the High Priority Corridors have been congressionally designated as future parts of the Interstate Highway System by the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) and amendments. Once they are constructed to interstate standards, and once they connect to other interstates, then by law, they will become interstates.</p>
Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) and amendments.	23 USC 103(c)(4)(A)	23 USC 103(c)(4)(B)

Image Source: TxDOT

Roadway Funding Considerations

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, increasing population, growing traffic demand, inflation, and increasing fuel efficiency have outpaced the ability of traditional funding and financing mechanisms to implement necessary transportation improvements.

Extensive improvements to the freeway and tollway system require high-cost initial elements, including right-of-way acquisition and construction, as well as expensive long-term costs, including maintenance, operation, and rehabilitation. The Mobility 2045 Update continues to face 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, previous Metropolitan Transportation Plans for the region relied heavily on tolls and

innovative funding and financing to satisfy the demand for new roadway facilities and the expansion of existing corridors.

Past sessions of the State Legislature have focused on the reliance on tolls and the need to reevaluate the balance between tolled and non-tolled roadways. A guiding principle in the development of the previous Mobility 2045 plan considered a pendulum swing away from tolled roadways and toward more tax-funded facilities. State Proposition 1 and State Proposition 7 continue to provide the region with more transportation funding toward general purpose lanes, and the state gas tax will no longer be diverted to non-transportation uses, aside from the constitutionally protected transfer of 25 percent to education.

The funding from these changes only accounts for approximately one-quarter of the identified need for transportation projects. For this reason, the Mobility 2045 Update still includes recommendations for toll roads and tolled managed lanes both to manage congestion and to leverage funds to deliver both tolled and non-tolled capacity. The Mobility 2045 Update supports managed lane implementation within a tolled managed lane policy area, known as the Tolled Managed Lane System Policy Boundary. A map of the Tolled Managed Lane System Policy Boundary can be found in the **Roadway** section of the **Mobility Options** appendix. This boundary contains 13 percent of the region’s land area but 78 percent of the region’s congestion.

Additionally, it is expected the increased negative attention toward tolling and other innovative funding and financing mechanisms will be viewed as a short-term reaction and that the pendulum will swing back toward a more balanced position as is demonstrated in these plan recommendations. As elected officials grapple with realistic options for additional funding, combined with recent input on managed lanes and informal polling demonstrating the lanes’ users value reliability, tolling and innovation will continue to be viewed as viable options under certain conditions and in certain corridors.

Management of the Roadway System

As North Central Texas continues to experience population growth and traffic congestion, emphasis will continue to be placed on actively managing the capacity of major roadway facilities. New hardware and software technologies that provide an increased ability to monitor and operate roadways will enhance the reliability of tax-supported roads and toll roads. Tolloed managed lanes have been added to existing freeways across the urban core of North Central Texas. In these corridors, drivers have the choice of paying a toll to use the tolloed managed lanes or traveling for free on the parallel freeway lanes or frontage roads. It is Regional Transportation Council policy that no existing free lanes will be eliminated in corridors where tolloed managed lanes are constructed. Additionally, in some corridors, the construction of tolloed managed lanes leverages funding to build more freeway lanes. The tolls collected from tolloed managed lanes help finance the expansion, reconstruction, and operation of not just the tolloed lanes, but the freeway lanes and frontage roads as well.

Managed lanes maximize the efficiency of a roadway through the introduction of tolls, time-of-day pricing, vehicle occupancy, and/or vehicle type requirements. Different forms of managed lanes can be implemented based on the circumstances of the corridor:

- In the conversion of HOV lanes to express/HOV lanes or technology lanes, excess capacity may allow vehicles with one occupant to access these lanes by paying a toll.
- In selected toll roads, capacity could be managed through incentives that encourage a higher number of occupants per vehicle or by using congestion pricing that varies the toll based on traffic levels at different times of day.

- In freeway corridors where additional capacity is warranted, added capacity could be provided based on vehicle type, vehicle occupancy restrictions, or tolling while existing lanes remain free.

Tolling Policies and Business Terms

Because of the ability for multiple entities to become involved in tollway construction and the operation of toll roads and tolloed managed lanes, the RTC (Regional Transportation Council) has expanded regional policies for these priced facilities.

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 the **Mobility Options** appendix. The terms were established to enable more local participation in the review and selection of public-private partnership toll projects, to set limits for toll rates and toll rate adjustments that maintain equity between various toll projects, and to help introduce the region to a concept known as variable time-of-day pricing. This pricing charges higher toll rates during the peak periods of the day to encourage the use of carpools/vanpools and transit, and it encourages telecommuting. It also encourages flexible work hours that allow single-occupant travelers to use toll facilities during off-peak periods when tolls are lower. These efforts are expected to help improve peak-period level-of-service, congestion, and the region's air quality.

Roadway Terms to Know

TOLL ROAD: On a toll road, or tollway, all drivers using the general purpose lanes pay a toll.

MANAGED LANE: In managed lanes, operational strategies are proactively implemented in response to changing conditions. Managed lanes improve traffic operations and maximize the efficiency of a roadway through active management of the lane(s). According to Federal Highway Administration guidance, strategies for managing lanes typically fall into one of three categories:

Vehicle eligibility based on occupancy requirements and/or vehicle type restrictions (e.g., trucks, buses).

Access based on limiting access point(s) to the lane(s), time of day, contraflow and/or reversible operations, and/or ramp metering.

Pricing/tolling based on occupancy, vehicle type, and/or time of day.

EXPRESS/HOV LANES: Existing interim HOV lanes that will be converted to managed operation with minimal reconstruction efforts are called express/HOV lanes. These lanes will allow single-occupant vehicular use for a toll based on a fixed-fee schedule while high-occupancy vehicles, vanpools, transit vehicles, and motorcycles will remain free at all times. Vehicles using parallel freeway lanes or frontage roads in the corridor do not pay a toll.

TOLLED MANAGED LANES: New toll lanes added to existing freeway corridors where significant reconstruction occurs are called Tolled Managed Lanes. The existing number of free lanes in the corridor remains the same or is increased, while dynamically priced toll lanes provide additional capacity and mobility choices with a discounted toll for high-occupancy vehicles during peak periods. The tolled managed lanes in the North Central Texas region are called TEXpress lanes. Vehicles using parallel freeway lanes or frontage roads in the corridor do not pay a toll.

EXPRESS LANES: Similar to tolled managed lanes, express lanes are typically built in the median of freeway corridors and separated from parallel traffic by barriers. Express lanes do not have a toll component, so they cannot offer a guaranteed speed. Express lanes have significantly fewer entrance and exit ramps than parallel freeway lanes and allow through traffic to avoid congestion that results from local trips. Express lanes are a new concept for the North Central Texas region and are being planned for corridors previously designed for tolled managed lanes where additional tax funding allows the roadway to be built without tolls.

TECHNOLOGY LANES: Typically, interim improvements, the shoulder lane is utilized during peak periods to allow additional capacity in an already congested corridor.

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.
- 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 roadways, either on or off the State Highway System, to be improved or reconstructed using excess toll revenue funds. It also ensures that input from local governments will help determine 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 that would be delayed if they were funded strictly with traditional revenue sources.

Tolled Managed Lane Policy

TxDOT and the RTC have developed additional policies for tolled managed lane projects. These policies support regional goals such as ensuring travel reliability, providing revenue for public-private partnership projects, and providing incentives for travelers to use HOV and transit. These policies support dynamic pricing, which provides flexibility in setting the toll rate within allowable limits. This type of pricing allows operators to set market-based toll rates based on the demand being placed on the corridor and real-time congestion levels; the toll rates could fluctuate throughout the day in

response to changing traffic conditions. Dynamic pricing is currently used on some managed lanes in the region.

The policies for tolled managed lanes, as shown in the **Mobility Options** appendix, were approved by the RTC in May 2006 and modified in September 2006, September 2007, and December 2012.

The RTC approved other existing policies regarding excess toll revenue for tolled managed lanes in June 2005. The policies are nearly identical to those established for TxDOT-sponsored tollways, with one notable exception—local governments and transportation authorities shall be given the right to invest in a tolled managed lane project as a means to fund the project, as well as to generate local revenue. Shares offered by the RTC would be allocated into programs related to air quality and sustainable development. These shares would also be used to leverage federal transportation funds. In some corridors, the RTC has committed to serve as a financial backstop to offer assurances and to hold bond holders harmless if revenues are negatively impacted by techniques used to manage congestion.

Express/HOV Lanes Policy

The freeway corridors that currently include HOV lanes will be completely rebuilt over time, improving the flow of traffic on the general purpose freeway lanes and frontage roads. In some cases, the HOV lanes may be reopened as tolled managed lanes, but some of the existing HOV lanes will be converted into express/HOV lanes as an interim improvement until the corridor can be fully reconstructed. Due to geometric and design constraints, the express/HOV lane facilities would have a fixed toll schedule that will vary by time of day and vehicle occupancy, but in some corridors, pricing could be impractical. In December 2012, the RTC adopted a new policy to specifically address the operation of the express/HOV lane system as provided in the **Mobility Options** appendix.

The proposed express/HOV lanes differ from the existing HOV lanes in operation today. HOV lanes on IH 30 and US 75 are considered immediate action or interim facilities. These are temporary solutions in a corridor where a permanent facility is expected to be constructed at the same time the freeway is widened or reconstructed. The Mobility 2045 Update recommends reconstruction for all corridors that currently include interim HOV lanes. These lanes will eventually be replaced with express lanes, technology lanes, tolled managed lanes, or general purpose lanes.

The existing interim HOV lanes are located in the following corridors:

- IH 30: East R.L. Thornton Freeway
 - Contraflow lane with a moveable barrier; operates during peak travel hours only
 - Limits: Dallas central business district to Northwest Drive in Mesquite
- US 75: Central Expressway
 - One lane concurrent flow in each direction, buffer-separated facility; operates 24 hours per day
 - Limits: IH 635 in Dallas to Bethany Drive in Allen

Development of Roadway Recommendations

As **Exhibit 6-45** shows, the process to select programs and projects to include in the Metropolitan Transportation Plan first considers those that maximize the existing transportation system. Only after these strategies are reviewed and incorporated into the plan are strategic infrastructure projects such as rail lines, arterial roadways, freeways, and tollways considered. This approach ensures that regional travel demand is first addressed through those strategies that have the greatest air quality benefit; these programs and projects also are generally more cost effective than adding capacity for single-occupant vehicles on major roadways.

To begin evaluating which freeway and tollway projects should be included in the plan, the recommendations from previous Metropolitan Transportation Plans are reviewed. Discussions with TxDOT and the North Texas Tollway Authority are conducted to determine potential modifications to those recommendations. The recommendations are then updated to include results from ongoing corridor studies, environmental assessments, environmental impact statements, and advanced planning studies. After potential projects are identified, technical, environmental justice, and financial analyses take place. These analyses are considered while the potential freeway and tollway projects are evaluated, selected, and prioritized.

Exhibit 6-45: Prioritization of Improvements



Technical Analysis

The technical analysis of freeway and tollway projects relies on data from the Transportation Analytical Forecasting Tool, the 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, managed lane, arterial, etc.)
- Number of lanes
- Area type (urban, suburban, rural)

Project Evaluation, Selection, and Prioritization

Mobility 2045 Update projects were evaluated, selected, and prioritized using a technical and analytical process carried over from Mobility 2045. The approach strategically prioritizes projects, a

necessity because of the limited amount of funding available for improvements to roadway capacity. All candidate roadway projects and corridors were scored and ranked based on the seven national performance goals identified in MAP-21 (Moving Ahead for Progress in the 21st Century) and the Fixing America’s Surface Transportation

Act. These national performance goals were used to determine what criteria would be used to score the projects and corridors, as highlighted in **Exhibit 6-46**. Future mobility plans will address and respond, as appropriate, to any goals which may be released as part of the Infrastructure Investment and Jobs Act.

Exhibit 6-46: Evaluation and Project Selection Criteria

MAP-21/FAST Act Goal	Criteria Used	Unit Measure
Congestion Reduction	Traffic Volume/Roadway Capacity	Traffic Volume/Roadway Capacity Ratio
System Reliability	Level of Travel Time Reliability	80 th Percentile of Travel Time Divided by the Median (50 th percentile) Travel Time
Safety	Crash Rate	Fatal, Serious, and Total Crashes per 100 Million Vehicle Miles Traveled
Infrastructure Condition	Pavement and Bridge Conditions	Good, Fair, and Poor Ratings Associated with PM2 Performance Measures
Freight Movement	Truck-to-Car Travel Time Ratio	Truck Travel Time Index Divided by Passenger Vehicle Travel Time Index
Freight Movement	Truck Volume Percentage	Daily Truck Volume Divided by Daily Volume
Economic Vitality	Recent Activity Density Change	Percent Change in Activity Density (population and employment) from 2000 to 2023
	Future Activity Density Change	Percent Change in Activity Density (population and employment) from 2023 to 2045
Environmental Sustainability	Estimate of Environmental Impact Based on Project Type	High Impact: New Location Project Moderate Impact: Expansion of Existing Facility Low Impact: Asset Optimization
Reduced Project Delivery Delay	Planning Status, Funding Availability, Constraints, and System Continuity	Information Only

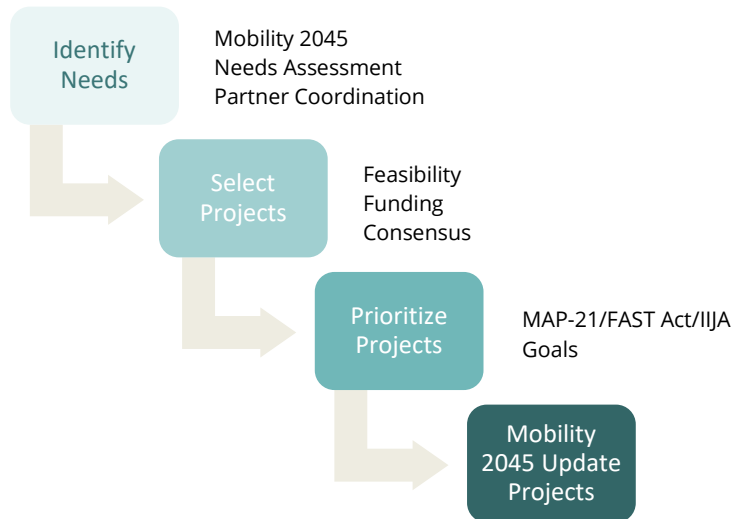
Roadway and transit project recommendations for inclusion in the Mobility 2045 Update went through a continuous, coordinated, and comprehensive process. The process began, as illustrated in **Exhibit 6-47**, by identifying the needs of the region. Recommendations in Mobility 2045 were reanalyzed to determine whether their scope was sufficient for the 2045 Update. All other corridors in the region were also evaluated based on the goals identified in **Exhibit 6-46**.

The candidate corridors must meet technical feasibility, have acquired local consensus, and have an anticipated funding source identified. Project delivery was an essential factor because it focused on planning elements such as system continuity, physical barriers, and right-of-way constraints. It also focused on the project’s planning status; for example, whether it had received environmental clearance

or been included in previous Metropolitan Transportation Plans. Preference was given to projects that had a stage or stages under construction but needed additional funding to complete the final elements. Continuous coordination with transportation partners was essential in all areas of Mobility 2045 Update development.

The final methodology incorporates input from the RTC and absolute data for performance metrics related to each MAP-21 goal. Each performance metric was assigned a weight based on feedback and polling data received from the RTC. The weighted scores were then used to rank the candidate corridor segments.

Exhibit 6-47: Project Prioritization



Map-21: Moving Ahead for Progress in the 21st Century; FAST Act: Fixing America’s Surface Transportation Act; IJA: Infrastructure Investment and Jobs Act

Lastly, the rankings were analyzed to identify whether federally protected populations may face a delay in benefits. No delay was found. The methodology and results of this analysis are described in the *Regional Nondiscrimination Analysis* section of the **Social Considerations** chapter.

Asset Optimization

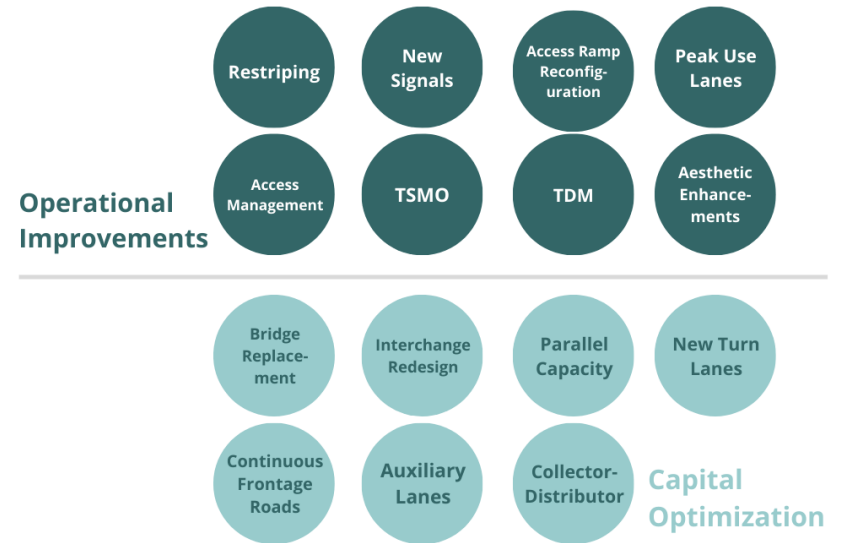
Financial realities make it difficult to continue large-scale projects that require total reconstruction to improve capacity; other options to optimize the regional transportation system must also be considered. Consistent with Federal Highway Administration initiatives on context-sensitive solutions and performance-based practical design, Asset Optimization involves a strategic design and performance-oriented approach to address corridor improvement planning through incorporation of the business principles of asset management.⁸ Projects identified as Asset Optimization are those

⁸ <https://www.fhwa.dot.gov/planning/css/> and <https://www.fhwa.dot.gov/design/pbpd/>

where corridor deficiencies or performance gaps can be addressed using lower-cost techniques that are quicker to implement than higher-cost capacity expansion projects. These cost-effective and time-saving techniques are examples of asset management. The range of potential Asset Optimization improvements include, but are not limited to, those in **Exhibit 6-48**.

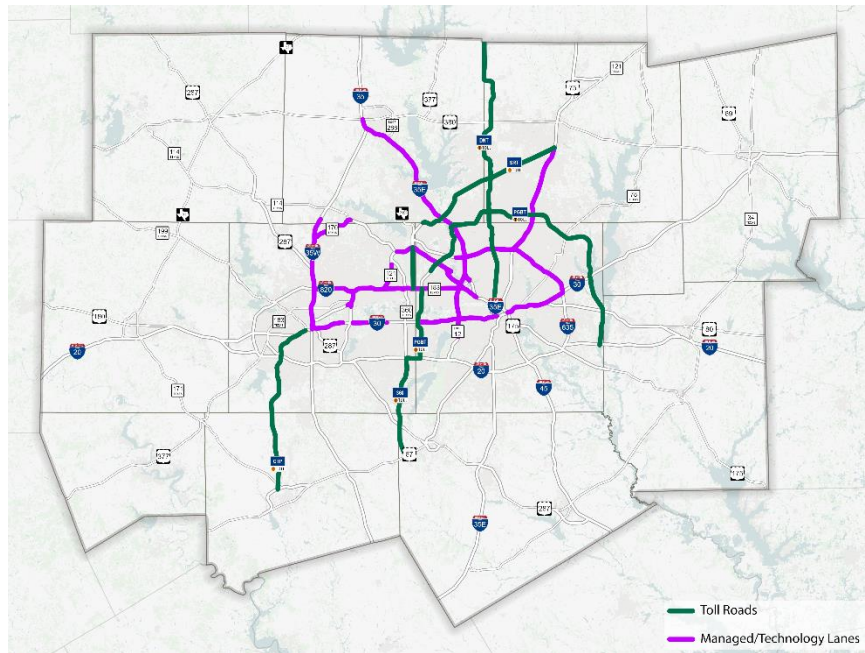
Exhibit 6-48: Asset Optimization

Asset Optimization Types



In North Central Texas, initial pilot projects have identified the Asset Optimization improvements shown in **Exhibit 6-49**. These projects have provided valuable lessons and potential direction for future efforts, including strategies to alleviate bottlenecks and promote greater system efficiency. Partnerships were formed with transportation providers and local stakeholders to collect and

Exhibit 6-51: Tolted Facilities



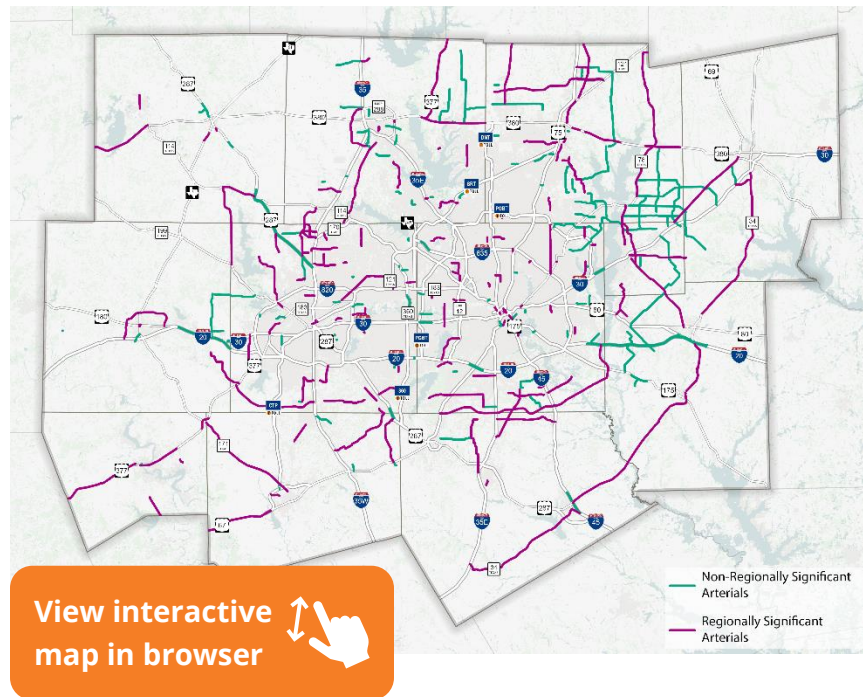
As part of nondiscrimination efforts, analyses were performed to determine whether protected populations experience disproportionate negative impacts associated with the addition of tollways and tolled managed lanes. These results indicate that construction of this toll road and tolled managed lane system creates no disproportionate impacts on protected populations. These analyses are detailed in the **Social Considerations** chapter.

Regional Arterials

In addition to larger, controlled access roadways, arterial streets play a key role in urban mobility, carrying traffic from highways to local streets. By 2045, approximately 38 percent of vehicle miles traveled will be on the region's principal and minor arterials. Arterials pass through areas where a controlled access roadway would be unwarranted or undesirable and through areas with high concentrations of intensive land use such as central business districts. These streets may also supplement highways by providing an alternative route in the event of crashes, road construction, or recurring congestion. While arterials must provide needed transportation capacity, they also must be compatible with adjacent land uses and provide access to those land uses. The arterials that are currently funded for improvement or are anticipated to be funded within the timeframe of the Mobility 2045 Update are shown in **Exhibit 6-52**.

RSAs (regionally significant arterials) form the backbone of the arterial roadways. Arterials are identified as regionally significant if they serve regional transportation needs, provide service to regional activity centers, connect communities, and maintain access to and from areas outside of the region. RSAs are forecast to carry approximately 19 percent of all vehicular traffic in the region by 2045. Roadways that are designated as RSAs require federal review for air quality conformity. The designation does not imply that all RSAs will be guaranteed funding. Other non-regionally significant arterials are also eligible for federal funding but are not required for federal review for Transportation Conformity.

Exhibit 6-52: Funded Major Arterial Improvements



The Design of Arterials and Thoroughfares

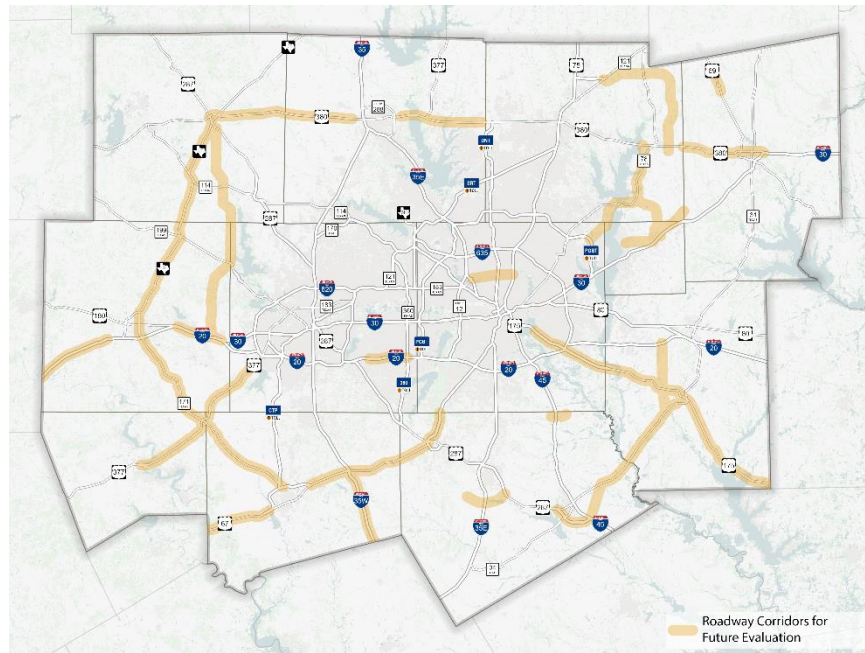
As mentioned in the **Healthy Communities** section of the **Environmental Considerations** chapter, the Mobility 2045 Update encourages the use of Federal Highway Administration’s endorsed principles for context-sensitive solutions and the development and implementation of local Complete Streets policies to accommodate all users (e.g., pedestrians, transit users, bicyclists, motorists, freight providers). Street design should depend on the context of the community, street, and potential users. The goal is not necessarily to include all of these components to make a street complete; the goal is to balance the safety and convenience of all road users, regardless of development density.

The Mobility 2045 Update further encourages a multimodal approach to arterial and thoroughfare design, inclusive of level-of-service assessment for all modes, defined as a multimodal level-of-service; thus, giving consideration to the safety and comfort levels for all roadway users, including all motorized and nonmotorized modes of travel.

Corridors for Future Evaluation

The North Central Texas Council of Governments continues to partner with transportation partners and local governments to identify needs and priorities on the roadway system. For example, recent studies have taken place in Collin County, Dallas County, Denton County, and western Tarrant County and have identified corridors to be considered in future Metropolitan Transportation Plans, as shown in **Exhibit 6-53**. Exhibit 6-53 is an illustrative map of roadway corridors not included in the financially constrained portion of the Mobility 2045 Update. This map identifies specific corridors or wider study areas where additional analysis or funding are needed before recommendations can be included in the Metropolitan Transportation Plan. These corridors highlight areas of additional transportation need or locations where thoroughfare or subarea studies are beginning or ongoing; however, finalized recommendations must be produced before these corridors can be considered in future Metropolitan Transportation Plans. For that to occur, the corridors will be subject to a project development process that includes feasibility studies, environmental analyses, the development of locally preferred alternatives, and identification of funding sources.

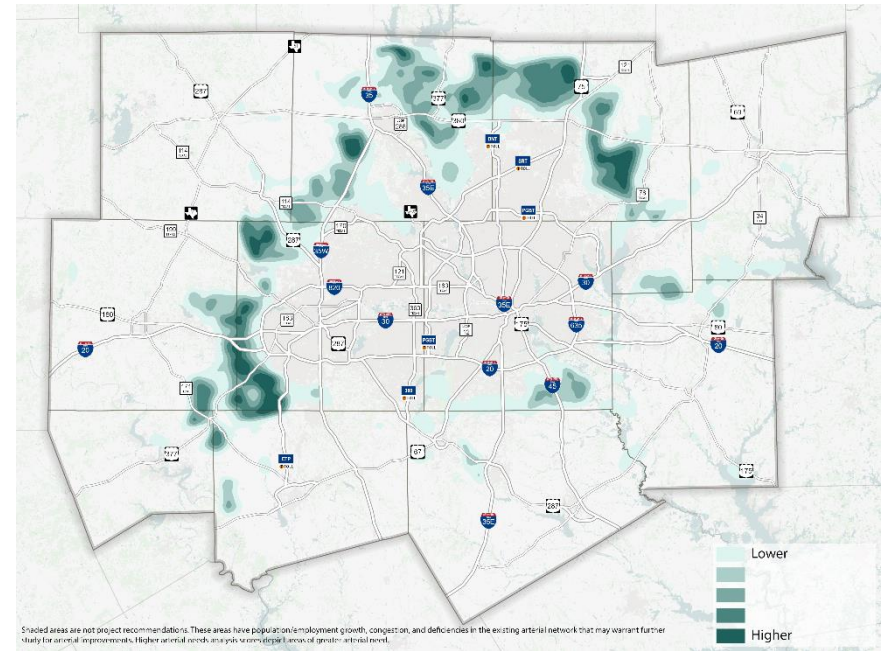
Exhibit 6-53: Illustrative Major Roadway Corridors for Future Evaluation



Arterial Network Deficiency Analysis

In addition to coordinating with local transportation partners in developing the illustrative roadway corridors for future evaluation, a technical analysis was done to identify areas where anticipated growth in population and/or employment would occur, but the existing arterial framework may be deficient in handling the future demand. The analysis considered forecasted growth in population and employment density, arterial spacing and connectivity, and congestion on the arterials, as well as congestion on any surrounding facilities. These areas, as depicted on **Exhibit 6-54**, are not project specific recommendations but may warrant further study.

Exhibit 6-54: Arterial Network Deficiency Areas



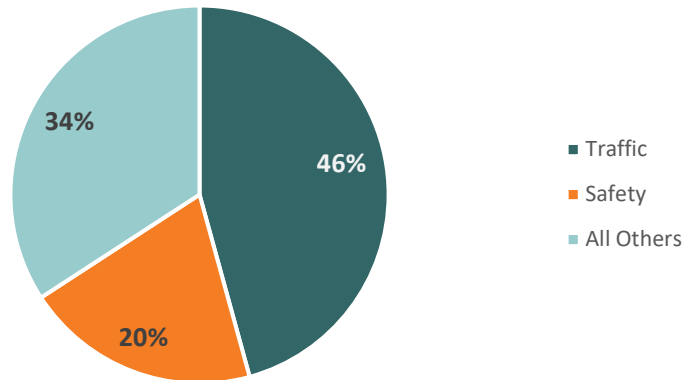
Map Your Experience: Major Roadway Themes

NCTCOG (North Central Texas Council of Governments) has established the Map Your Experience tool in order to receive public comments on the issues affecting travelers in our region. Using these comments, NCTCOG has identified several areas of concern for improving transportation throughout the region. This section highlights findings for roadways reflecting comments North Texans submitted through the Map Your Experience tool.

It should be noted that while this is not a quantitative, representative sample, the information gathered from the Map Your Experience tool helps NCTCOG and members of the Regional Transportation Council identify patterns and hotspots for issues reported by people using the roadway network. Thus, these results should be interpreted as guidance for further analysis and research, focusing on roadway issues in North Central Texas.

Out of 199 comments entered on the roadway map, 66 percent pertain to either traffic or safety (**Exhibit 6-55**). Concerns regarding roadway conditions and signal timing made up the third- and fourth-highest categories.

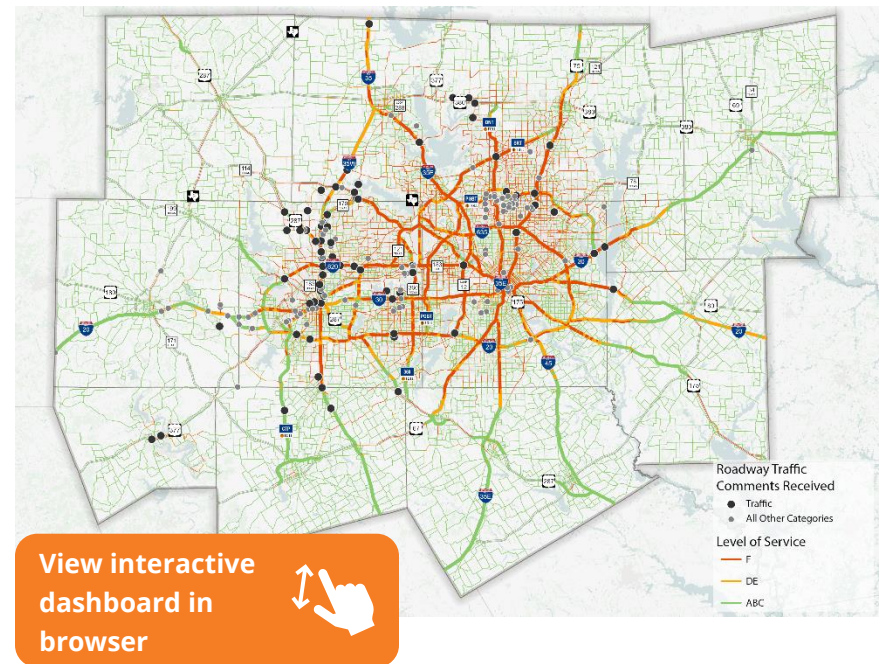
Exhibit 6-55: Share of Roadway Comments by Category



By overlaying the traffic-related comments on our regional level-of-service map, we can identify hotspots for congestion that seem to weigh more heavily on travelers' minds.

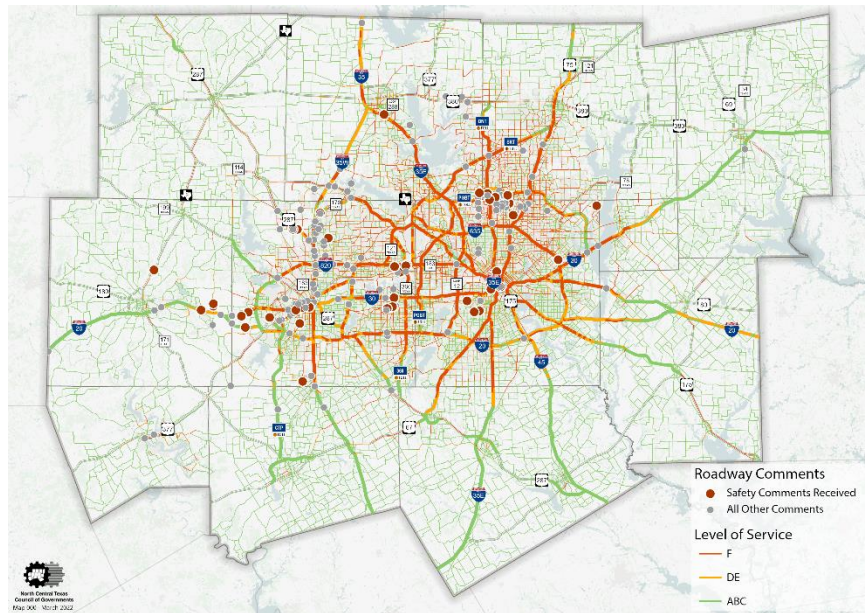
As shown in **Exhibit 6-56**, most traffic comments appear along IH 35W and other major highways with 'F' levels-of-service. This would corroborate the measurement of level-of-service in those corridors. Conversely, traffic-related comments along corridors with higher levels-of-service may indicate an issue with inconsistent levels-of-service (reliability issues). This can provide a starting point for assessing areas that might benefit from additional travel options like rail or bus to help alleviate congestion issues. For more information, and Map Your Experience comments for transit, see the **Public Transportation** section of this chapter.

Exhibit 6-56: Roadway Traffic Comments Compared to Level-of-Service



Turning towards safety, **Exhibit 6-57** shows safety-related comments overlaid on the same level-of-service map. Much like the comments on traffic, these comments are mostly found along roadways with lower levels-of-service. In many cases, these comments are not concerned with speeds, but rather with the safety of merging onto a road or poor visibility and blind spots when turning onto a surface road, which may be addressed in the future through operational improvements.

Exhibit 6-57: Roadway Safety Comments Compared to Level-of-Service



NCTCOG recommends that local and state roadway authorities use these comments to hone in on the issues present in the most problematic parts of the road network. Quantitative data, such as levels-of-service, average vehicles per peak period, and number of motor vehicle collisions, provides information on where problems are occurring; comments from tools such as Map Your Experience can provide useful information on why people perceive such problems occur from the perspective of the user of the transportation system.

Urban Thoroughfare Revitalization

The region contains many corridors where Complete Streets principles could be applied. Aging urban thoroughfares in the Metropolitan Planning Area are good examples. Many of these facilities are state highways once serving through traffic that is largely now served by the region's freeway system. Many aging urban thoroughfares are underutilized, in need of repair and maintenance, and may have adjacent land uses requiring reinvestment and

revitalization. While no longer heavily used for through traffic, many of these streets remain key gateways traversing the center of communities. They are good candidates for Complete Streets improvements and multimodal level-of-service assessment due to their underutilized capacity and generally wide right-of-way. For more information on Complete Streets, see the *Designing Transportation Facilities to Support Healthy Communities and the Environment* section in the **Environmental Considerations** chapter.



River Oaks Blvd. (SH 183) in River Oaks. The SH 183 Corridor Master Plan currently underway is exploring revitalization options. (Source: NCTCOG)

Since transportation projects can influence land use indirectly by increasing or decreasing mobility and accessibility, it is essential to integrate land-use contexts when planning the revitalization of urban thoroughfares. When transportation projects are context sensitive, they spur reinvestment in the surrounding area compatible with the community vision.

Local governments seeking to revitalize urban thoroughfare corridors have undertaken various planning and implementation efforts. NCTCOG has partnered with local governments and TxDOT on several corridor studies, including the Garland Road Vision, SH 5 Corridor Planning Study, SH 183 Corridor Master Plan, SH 199

Corridor Master Plan, Harry Hines Master Transportation Plan, and the Preston and Northwest Highway Area Plan.

Regional guidelines now under development should provide consistent strategies for selecting corridors to redevelop based on the needs of a community. These guidelines will form the basis of a needs assessment through which strategic investments can be selected to revitalize thoroughfares. Such guidelines could include the following strategies:

- Repairing and maintaining aging infrastructure.
- Completing streets as necessary by adding alternative modes of transportation.
- Coordinating with school districts on school location decisions and school related traffic safety, and working with local governments, TxDOT, and public-private partnerships to complete projects.

Automated Vehicles and Impacts of Technologies on Roadways

The roadway recommendations contained within the Mobility 2045 Update are based on the assumption that the current highway system will continue to operate until 2045 as it has for the past half century. This operating model features humans driving vehicles that are owned by individuals and typically carry a single person.

These longstanding operating assumptions may be subject to extensive changes between now and 2045, and those changes will be reflected in later editions of the region's long-range transportation plans. The possible changes to consider include:

Vehicle Automation: Multiple companies and countries around the world are developing automated vehicle systems. These vehicles range from low-speed shuttles to high-speed vehicles. Test deployments are going on all over the world.

Shared Mobility: The emergence of transportation network companies such as Uber and Lyft, and other forms of shared mobility such as bike share, has given birth to a mobility-as-a-service approach. This approach allows people to seek mobility through ridership on fleet vehicles purchased and operated by third parties.

Electrification: Numerous countries in Asia and Europe plan to transition from internal combustion engine vehicles to electric vehicles before 2045. Electric vehicles are increasingly competitive with internal combustion engine vehicles on performance and price. A majority of the automated vehicles are being developed on an electric platform. Electric powertrains can support a wide variety of vehicle types and use cases.

Developing technologies have the potential to provide the region with more options in managing its highway system. Automated vehicles, coupled with wireless communications, may allow vehicles to travel with shorter distance between vehicles, increasing the carrying capacity of roadways without physically expanding the road. Vehicle types may emerge that are less bulky than today's vehicles and are able to operate with greater precision so lane widths can be reduced, increasing the capacity of roadways. Roadway-related improvements that help optimize the operation of automated vehicles on the highway may have a higher return on investment than the traditional added capacity of a roadway. The type of improvements range from good quality highway striping to roadway electronics that supplement the onboard capabilities of automated vehicles.

NCTCOG and its regional partners will continue to monitor these developments, looking for opportunities to cost-effectively improve the operation of the region's highway system. For more on the impact of technologies, including automated vehicles, see the **Transportation Technology** chapter.

Maintenance and Preservation of the Roadway System

The maintenance and preservation of the existing roadway system is an important factor for reasons related to safety, operations, economics, and sustainability. Existing roadways must be maintained to ensure their reliability and to maximize their useful life.

Maintenance activities can be routine (simple cleaning or sweeping, restriping, and pothole repairs), preventive (overlays, crack sealing), or major (complete reconstruction and replacement).

The Texas Department of Transportation currently maintains more miles of highway and more bridges than any other state in the US. There are currently 88,710 lane miles of public roadways in the 12-county Dallas-Fort Worth Metropolitan Planning Area that must be maintained and preserved.⁹ This number is expected to increase over 7,800 lane miles as new roadways are constructed and widened to accommodate future population and economic growth. To address this existing and future demand, approximately 10 percent of the funding identified in the Mobility 2045 Update is dedicated to maintaining and operating the region's roadway system.¹⁰

Existing federal regulations now require Metropolitan Transportation Plans to identify strategies to preserve the existing and future transportation system and evaluate the condition and performance of transportation assets through the preparation of Transportation Asset Management Plans.¹¹ Additional information related to these regulations, and performance measures for pavement and bridge conditions, is provided in the **Regional Performance** chapter.

Roadway Policies and Programs

The improvement and management of the regional roadway system is guided by the following policy, which can be found in the **Operational Efficiency** appendix. This policy directs the planning and development of roadways in a consistent manner and recognizes, among other principles, the need to:

- Determine more cost-effective strategic improvements that consider asset life cycle
- Pursue innovative funding opportunities
- Actively manage roadway demand

FT3-015: Support the asset management objectives in the Texas Transportation Plan to maintain and preserve multimodal facilities using cost-beneficial treatments and to achieve a state of good repair for pavement, bridge, and transit assets.

Summary

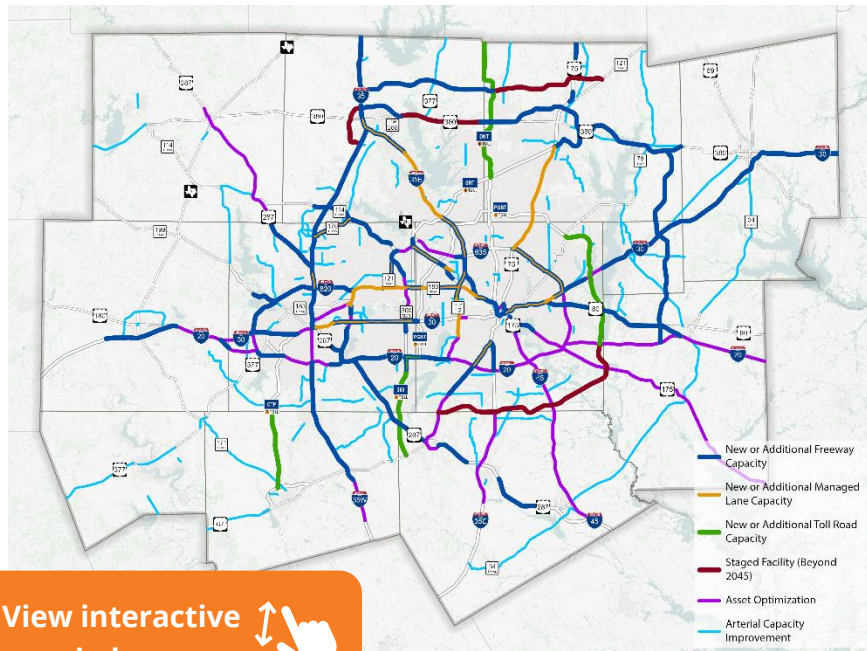
The roadway system recommendations included in the Mobility 2045 Update amount to a significant investment in improvements, expansions, management, and new capacity for the region's mobility. **Exhibit 6-58** displays the funded roadway recommendations found in the Mobility 2045 Update, including freeways, tollways, managed lanes, frontage roads, and major arterials. Managing congestion as North Central Texas grows to a region of 11.4 million people by 2045 will require strategic and ongoing investment in these identified corridors, which form the basis of the regional roadway system and serve millions of travelers each day.

⁹ Texas Transportation Plan 2040 and TxDOT Roadway Inventory Annual Reports 2016

¹⁰ Approximately 28 percent of the funding identified in the Mobility 2045 Update is dedicated to maintaining and operating the transportation system, including roadway and transit.

¹¹ 23 CFR 450.324(f)(7) and 23 CFR 450.324 (f)(4)

Exhibit 6-58: Roadway Recommendations



View interactive map in browser 