

Operational Efficiency

Operational efficiency is important to maintaining a reliable and safe transportation system that supports an improved quality of life for the traveling public. There are multiple strategies employed to promote efficiency of the transportation system by managing and reducing congestion. These strategies include addressing travel demand management, transportation system management, intelligent transportation systems, and sustainable development.

Mobility 2035 Supported Goals

- Improve the availability of transportation options for people and goods.
- Support travel efficiency measures and system enhancements targeted at congestion reduction and management.
- Assure all communities are provided access to the regional transportation system and the planning process.
- Preserve and enhance the natural environment, improve air quality, and promote active lifestyles.
- 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.

Operational Efficiency Strategies

The need to operate the regional transportation system as efficiently as possible is a top priority to provide a reliable and safe transportation system that will enhance the livability of North Central Texas. The Dallas-Fort Worth area is classified as a transportation management area (urbanized areas with a population over 200,000) and is required by federal law to develop a Congestion Management Process (CMP). The CMP is a systematic process for managing traffic congestion that provides information on transportation system performance and alternative strategies for alleviating congestion and enhancing the mobility of persons and goods.

Operational Efficiency at a Glance:

Mobility 2035 supports an efficient, safe, and secure transportation system that contributes to a high quality of life for the traveling public. Several initiatives improve operational efficiency of transportation systems, ranging from the use of technology to improving the connections and coordination between land use and transportation systems.

With a projected population increase of 48 percent from 2012 to 2035, the demands on the transportation system to carry people and goods will only become greater. With the existing financial climate, the reality is that the Dallas-Fort Worth region will not be able to build enough roads and rail lines to satisfy the demands and needs of this growing population.

The operational efficiency strategies discussed in this chapter provide alternatives to building high-cost infrastructure to reduce congestion.

In This Chapter:

- Travel Demand Management
- Transportation System Management and Operations
- Transportation System Safety
- Transportation System Security
- Sustainable Development

Did You Know ...

... by the end of 2010, 358 vanpools were operating in the Dallas-Fort Worth area and by the year 2035, 1,041 vanpools are anticipated?

... approximately 7,800 traffic signal improvements will be implemented by the year 2035, reducing congestion-related costs by approximately \$269 million per year?

... over \$120 million has funded sustainable development projects in the Dallas-Fort Worth area?

Operational efficiency strategies addressed in this chapter are part of the multi-faceted CMP. These strategies include travel demand management, transportation system management, and intelligent transportation systems. They are cost effective, quick implementation projects and programs that encourage the use of alternative travel modes and improve the efficiency of the transportation system. The Dallas-Fort Worth Congestion Management Process document complements these strategies outlined in Mobility 2035.¹

Additionally, transportation system safety and security is a concern in a region with millions of people. Monitoring and evaluating the safety and security of the transportation system is a key priority.

Mobility 2035 Policies

Effective and comprehensive policies are an important element in the planning and implementation of programs and projects. Mobility 2035 promotes the following congestion management policies:

MO3-001: Ensure the efficient operation of the existing multimodal transportation system by evaluating and/or implementing maintenance, rehabilitation, enhancement, and/or operational type projects in order to maintain safe, efficient travel conditions.

MO3-002: Ensure the existing multimodal transportation system operates efficiently by constructing bridge replacements with approaches, new bridges, overpasses or underpasses for railroads, bicycle/pedestrian facilities, off-system roads, and non-regionally significant facilities.

Travel Demand Management

One of the key congestion management strategies is travel demand management (TDM). TDM promotes strategies that reduce the demand for drive-alone travel on roadways by offering alternatives to single-occupant vehicle driving. Program results should improve mobility, accessibility, and air quality within the region.

Examples of alternatives to drive-alone travel include rail and bus transit, ridesharing options like carpools and vanpools and bicycling which reduce the

demand of the roadway capacity or supply. Fewer vehicles on the road, especially during peak travel periods, allow traffic to move more efficiently along a roadway. Aside from reducing single-occupant vehicle demand, higher-occupancy travel modes, such as rail transit and high-occupancy vehicles (HOV)/managed lanes, are more efficient in the context of person-carrying capacity.

The TDM strategies described and recommended are relatively low-cost, quick-implementation programs and projects that encourage alternate travel modes to driving alone. The higher cost and more complex TDM projects such as transit systems, HOV/managed lanes, and bicycle routes are described in the Mobility Options chapter.

TDM activities also address air quality concerns by reducing the number of vehicles on the roads. TDM programs that shift drive-alone travel from peak periods also serve to reduce vehicle emissions. In addition to mode shifts, other examples of TDM strategies that reduce peak-period travel include flexible work hours, compressed work weeks, and telecommuting.



IH 635 (LBJ Freeway) HOV Lane

Source: DART

¹ DFW CMP, <http://www.nctcog.org/trans/cmp/>, NCTCOG

Mobility 2035 Policies and Programs

Mobility 2035 supports the following policies associated with travel demand management:

TDM3-001: Support the Congestion Management Process which includes explicit consideration and appropriate implementation of travel demand management, transportation system management, and intelligent transportation system strategies during all stages of corridor development and operations.

TDM3-002: Support an integrated planning process that maximizes existing transportation system capacity before considering major capital infrastructure investment in the multi-modal system.

Mobility 2035 supports the following travel demand management programs:

TDM2-100: Employer Trip Reduction Program

TDM2-200: Regional Vanpool Program

TDM2-300: Park-and-Ride Facilities

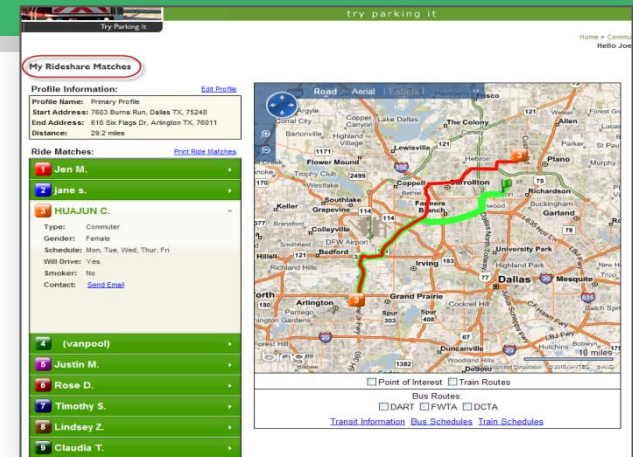
TDM2-400: Transportation Management Associations

Mobility 2035 also recommends the following TDM-related congestion management strategies.

Employer Trip Reduction Program

The Employer Trip Reduction (ETR) Program, a cooperative educational program between the North Central Texas Council of Governments (NCTCOG), Dallas Area Rapid Transit (DART), the Fort Worth Transportation Authority (The T), Denton County Transportation Authority (DCTA), and other public and private sector organizations, targets vehicle trips of employees working for large employers (defined as employers with 100 or more employees) in the region. The ETR Program is a voluntary program that markets alternatives to driving alone on a commute trip. The implementation of rideshare programs (such as carpooling and vanpooling), telecommuting, flexible work schedule programs, transit pass subsidies, and bicycle facilities are examples of travel demand management programs that are encouraged through this marketing effort.

TRYPARKINGIT.COM is a regional commuter-tracking system with rideshare features. It is an essential tool used within the Employer Trip Reduction Program. The Website provides a user-friendly Web interface for employees in the Dallas-Fort Worth area to log daily work commutes and locate various ridesharing options. It also aids regional planners to calculate the mobility and air quality benefits of employee trip reductions from using alternatives to single-occupant vehicle transportation and/or trip elimination strategies and aids in the development and evaluation of the regional transportation system. Commuters can find carpool and vanpool matches and determine availability of existing carpools and vanpools.



My Rideshare Matches Page, www.tryparkingit.com

As of April 2011, 564 employers in the region offer an ETR Program or alternative commute incentive. The degree of implementation within a company or organization varies greatly, but with most employers offering only a few types of commute-trip reduction programs, additional marketing of TDM programs is necessary. As regional commute options expand, such as transit services, employees and employers will have increased opportunities to utilize and implement trip reduction programs.

Employee Trip Reduction Program Policy Guidance

The ETR Program is a voluntary program that requires strong public support to ensure success. Public support is needed in recruiting employers and establishing Transportation Management Associations (TMAs), assisting employers with implementation of their trip reduction programs and training on-site employee transportation coordinators. Education and promotion is required from the public sector, as well as collection, assimilation, and maintenance of program performance data.

Public sector leadership is important and public sector employers within the region develop aggressive trip reduction programs for their employees. By establishing targets and programs in excess of average trip reduction efforts, monitoring their program's effectiveness, and sharing expertise and experience with private sector employers, the public sector can provide a model that is easily duplicated across industry sectors.

Employers that encourage higher-vehicle occupancy by promoting use of carpooling, vanpooling, and transit through trip-making incentives are strongly encouraged to develop policies. For example, parking management and pricing policies save employers' money, and the savings can be passed on to employees in the form of subsidized transit passes and guaranteed ride home programs. It is recommended that program goals of individual employers should target a minimum 20 percent reduction in vehicle commute trips. Creative employer policies that incorporate changes in employee scheduling of work hours, combined with incentives to use alternative travel modes, allows flexibility to achieve such goals.

Vanpool Program

Ridesharing programs are key TDM elements. The Vanpool Program is a popular commuter ridesharing alternative. Vanpools are aimed at increasing average vehicle occupancy during peak travel periods. To increase commuter



The T Commuter Vanpool

Source: FWTA

ridesharing participation, vanpool programs should be aimed at longer commute trips – those home-based work trips of 25 miles or more in distance. The Dallas-Fort Worth area is expected to generate over 6.7 million home-based work trips daily in the year 2035, approximately one quarter of all trips. Gaining additional participants from this subset of trips is a key strategy of future vanpool programs.

Employers, private interest groups, TMAs, and transportation/transit authorities may implement vanpools and transportation/transit authorities can assist large employers in setting up vanpool programs for employees. Federal funds can be applied to vanpool operating costs to assist participating employees and employers financially. Federal funds for vanpool subsidies are recommended not to exceed 50 percent of the operating costs. In recent years, NCTCOG and transportation/transit authorities have contributed funds needed to subsidize vanpool operating costs. The balance of the funds can come from various sources including employer subsidies, vanpool rider fare, private grants, advertisers, and other commercial sponsors.

By the end of 2010, 358 vanpools were operating in the Dallas-Fort Worth area, and by the year 2035, 1,041 vanpools are anticipated to be operating.

Vanpool Program Policy Guidance

Vanpool program development is coordinated with existing public and private sector vanpool programs to limit competition amongst vanpools and to ensure the most efficient use of existing vanpools. Due to the region's air quality, targeting vanpools that remain in the ozone nonattainment area and using fuel-efficient or low-emitting vehicles when possible is another consideration. Regular performance reporting ensures standardization of subsidies and service delivery in the appropriate areas.

The coupling of ETR marketing with a public subsidy for vanpool operations should produce a program that captures nearly 17,130 vanpool riders per day in this region and reduces travel by over 30,776 vehicle trips per day. The program calls for a subsidy directed to the vanpool rider and targets resources to vanpool start-up programs.

Park-and-Ride Facilities

Park-and-ride facilities serve as collection areas for persons transferring to higher-occupancy vehicles. They are often located and designed to serve bus or rail transit, but many are used by car and vanpoolers as well. Park-and-ride facilities can be located near a central business district to serve public transit and pedestrian activity areas or in suburban areas to collect riders near the origin of their trips. Combined with HOV/managed lanes, park-and-ride facilities can be an effective incentive for increasing vehicle occupancy, thus reducing congestion and vehicle emissions.

Existing, planned, and candidate park-and-ride facilities are provided in *Exhibit 5.1*. While many park-and-ride facilities exist in transit service areas, other facilities are planned for counties in the nonattainment area that are not currently served by transit authorities. Federal and local funding has been identified for several projects occurring outside of transit service areas. The development of park-and-ride facilities in Hood, Hunt, and Wise counties may also be evaluated.

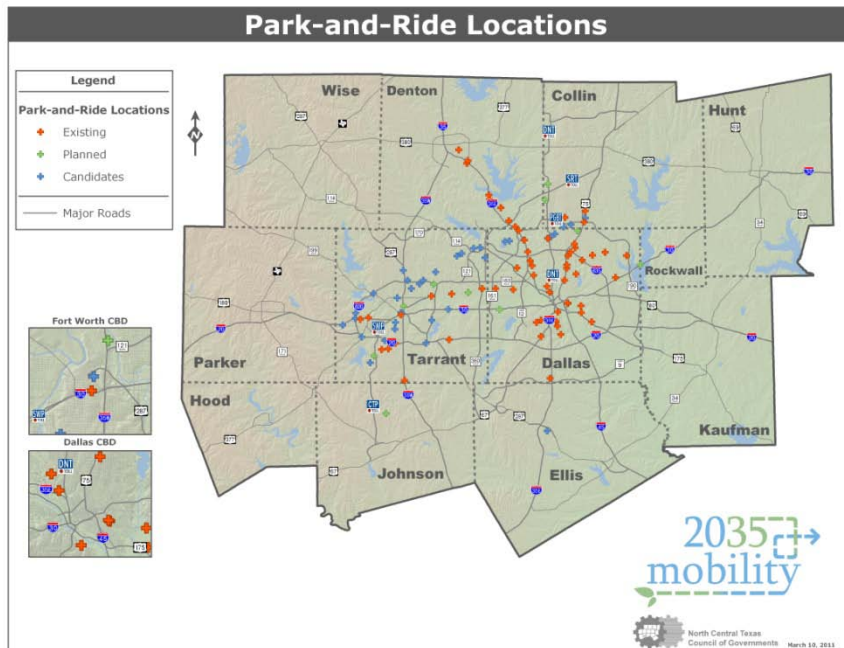


Exhibit 5.1: Existing, Planned, and Candidate Park-and-Ride Facilities

Considering investments in rail and roadway facilities by the year 2035 and the changes in travel behavior that should result, it is estimated that an additional 47 park-and-ride facilities serving nearly 18,200 users will be needed in addition to existing park-and-ride facilities. Technical studies, forecasted congestion levels, transit service planning and simulations, and local government initiatives are the main tools used to identify candidate park-and-ride facilities. Inventories and costs associated with the existing, planned, and candidate park-and-ride facilities are provided in Appendix D.

Transportation Management Associations

Transportation Management Associations, also known as Transportation Management Organizations, are private and public-private organizations that implement congestion mitigation strategies and work together on local transportation issues. Many are incorporated non-profit organizations; they tend to be membership organizations made up of employers, developers, building owners, and local government representatives. Most TMAs are located in areas of dense employment and focus on the TDM programs of public and private employers.

In recent years, TMAs have played increased roles in new areas including CMP development, intelligent transportation system initiatives, and in the development of residential and tourism travel markets. Usually, the principle role of a TMA is to involve the business community in transportation planning and to provide a forum for the private sector to impact strategy development and implementation. The following list demonstrates the variety of transportation activities in which TMAs can be involved:

- Advocacy on transit, roadway, bicycle, pedestrian, land use, and air quality issues
- Transit pass subsidy or voucher programs
- Shuttles or vanpools for employees, customers, or both
- Ride matching services and support for carpools and vanpools
- Parking management programs
- Guaranteed or emergency ride home programs
- Telecommuting/teleconferencing center(s) operation
- Employee transportation coordinator training
- Promotional programs and incentives for alternative travel modes
- Educational programs

Taking advantage of future rail transit and roadway system options, while partnering with transportation/transit authorities and other transportation agencies, will strengthen the influence of TMAs attempting to improve mobility and accessibility within and around major employment and activity centers. Two TMAs currently operate within the Dallas-Fort Worth area. The Central Dallas Association operates a TMA in the Dallas central business district and Downtown Fort Worth, Inc. functions as the TMA for the Fort Worth central business district. Candidate TMA locations have also been recommended through corridor and feasibility studies. Considerations used to identify these locations include employment densities in future years, as well as the location and magnitude of traffic congestion. The environmental process is a forum for further evaluation and refinement of candidate locations. Existing and candidate TMA service areas are listed in Appendix D.

Policy Guidance

Transportation Management Associations requesting start-up funds from the Regional Transportation Council (RTC) must provide a written business plan to access funding for two years. After the first two years, only primary and secondary transportation services are eligible for funding. Primary services reduce drive-alone or peak-period travel by either providing TDM services directly or by promoting the use of alternative travel modes. Secondary transportation services include the provision of information regarding TDM program options and advocacy of alternative travel modes.

Environmental Justice

Environmental justice is taken into account in TDM strategies. Many park-and-ride facilities are located in and around protected class population areas that offer the public alternatives to driving alone. Additionally, DART, The T, and DCTA operate regional vanpool programs that offer vanpool services in environmental justice protected class areas.

Summary

The choices travelers make regarding their mode and time of travel impacts the levels of mobility, accessibility, and air quality. By reducing the number of people driving alone (demand), the capacity of the transportation system (supply) is more efficiently utilized. The importance of TDM strategies cannot be overstated.

Mobility 2035 recommends a set of low-cost, quick-implementation options that complement the various transportation system recommendations.

Changes in technology, the workplace, business travel, and personal travel will improve the effectiveness of TDM strategies. Future updates to the Metropolitan Transportation Plan will include revisions to existing strategies in addition to new and innovative approaches.

All travel demand management policies, programs, projects, and maps are provided in Appendix D.

Transportation System Management and Operations

In addition to TDM strategies, the regional CMP includes transportation system management strategies, also known as transportation system management and operations (TSM&O). This approach seeks to identify and implement cost-effective congestion mitigation strategies to improve traffic flow, safety, system reliability, and capacity. Compared to major capacity and infrastructure improvements, management and operational projects are usually low-cost improvements that can be implemented or constructed quickly and with minimal impacts to the transportation network.

TSM&O projects should be recommended and implemented during planning, engineering, construction, and operation stages of the corridor implementation process. Corridor studies assist in the refinement of transportation recommendations by conducting detailed analyses of travel characteristics and inventories of transportation infrastructure. Corridor studies offer an excellent opportunity to study the feasibility and implementation of TSM&O projects in a transportation corridor. TSM&O projects should be recommended as part of a comprehensive transportation infrastructure improvement strategy in a corridor and can complement the major capacity improvements and infrastructure by providing improved traffic flow on arterials and local streets. No corridor study should be approved without the proper consideration of TSM&O (and TDM) strategies. Appropriate implementation agencies should seek applicable funding sources for the recommended projects and programs.

Mobility 2035 supports the following TSM&O strategies to reduce recurring and nonrecurring congestion in the Dallas-Fort Worth area:

- Intersection improvements
- Traffic signal improvements
- Freeway and arterial bottleneck removal
- Work zone management
- Special events management

RECURRING CONGESTION: Congestion on roadway facilities during peak travel periods that occurs almost every day is “recurring” congestion. This is the type of congestion where the number of vehicles trying to use the roadway system exceeds the available capacity.

NONRECURRING CONGESTION: Nonrecurring congestion is traffic congestion due to nonrecurring causes, such as crashes, disabled vehicles, work zones, adverse weather events, and planned special events. Nonrecurring events dramatically reduce the available capacity and reliability of the entire transportation system.

Federal Highway Administration Office of Operations

Implementation of intersection traffic signal and bottleneck removal improvement projects improve safety and decrease travel time. This in turn results in decreased vehicular emissions and improved air quality. Identifying and eliminating bottleneck locations along the roadway system also reduces congestion. Effective incident management reduces incident clearance time which improves system reliability. Data from these types of projects will be aggregated and analyzed to develop performance measures to prioritize project investments at the regional level.

Mobility 2035 Policies and Programs

Mobility 2035 supports the following transportation system management and operations policies:

TSM3-001: Installation of pedestrian facilities by local agencies as part of intersection improvement and traffic signal improvement programs shall provide access to usable walkways or sidewalks.

TSM3-002: Require regional partners to coordinate during major special events or planned events to ensure minimal impact on the transportation system for individuals traveling to an event or through an event zone.

Mobility 2035 supports the following transportation system management and operations programs:

TSM2-001: Intersection Improvement Program

TSM2-002: Signal Improvement Program

TSM2-003: Bottleneck Improvement Program

TSM2-004: Special Events Management Program

TSM2-005: Bottleneck Program for Regional Corridors

Intersection Improvements

Arterials provide the link between local streets and roadways, aside from providing access to a variety of destinations. On an arterial system, intersections of arterials and other roads are points of traffic conflict as vehicles, pedestrians, and bicyclists engage in various movements. Thus, infrastructure improvements such as turning lanes, grade separations, pavement striping, signage and lighting, bus turnouts, and channelization of traffic can greatly improve traffic flow operation on arterials. It is encouraged that Americans with Disabilities Act compliant ramps installed by local agencies as part of intersection improvement projects shall provide access to useable walkways.

A total of 189 intersections are funded under the 2011-2014 Transportation Improvement Program (TIP). These projects include the installation of traffic control devices, traffic channelization, grade separations, and the addition of turning lanes.

It is projected that approximately 1,200 arterial intersection improvements will be implemented through the year 2035, thus enhancing arterial traffic flow in addition to reducing the propensity for accidents. The cost of implementing these intersection improvements is estimated to be \$910 million. Estimated benefits include a reduction

in congestion delay of \$171 million per year, which consequently will lower vehicle emissions as well.

Traffic Signal Improvements

The signalized intersection is one of the more complex features of a traffic system. As traffic control devices, signals are an effective means to control movement of traffic, bicycles, and pedestrians at intersections. Increases in vehicular, bicycle, and pedestrian traffic can cause older traffic control devices (and traffic signal plans) to become outdated as they cannot accommodate more sophisticated signal timing plans. Installation and operation of state-of-the-art traffic control equipment and implementation of optimized signal timing plans are cost-effective solutions resulting in improved traffic flow in many locations.

Computerized traffic signal systems and signal timing plan improvements greatly enhance traffic flow on arterial streets.



Intersection Improvement at Cooper Street and IH 20, Arlington, TX

Source: NCTCOG

Traffic signals at different intersections can be interconnected resulting in the improved flow of traffic along arterials. This interconnection allows signals to communicate with one another and operate more efficiently. Advances in communication and information technology over the past decade have provided tools to traffic engineers to manage signal systems more efficiently and effectively. The connection of signal systems to a centralized signal operations control center, commonly called a transportation management center, allows traffic operations engineers to respond in real time to high demand situations.

For example, within a coordinated network, traffic-adaptive systems provide several advantages over traffic control fixed-time systems because of their ability to monitor traffic conditions and implement appropriate timing plans that best serve the traffic needs at that time and location. Fixed-time systems are unable to

accommodate variations in traffic flows associated with accidents, weather conditions, special events, or fluctuation in volumes. The inflexibility of the traditional systems warrants the implementation of traffic-adaptive signal systems that can accommodate not only recurring traffic congestion, but can also adjust signal timing for nonrecurring traffic congestion caused by incidents or random fluctuations in traffic patterns.

A total of 1,251 traffic signal improvements are currently funded for implementation in the 2011-2014 TIP. These projects include signal timing optimization, signal equipment upgrades, system interconnection, and adaptive systems. Additionally, the deployment of light emitting diode lamps into all new traffic signal projects and replacement projects is required.

It is estimated that approximately 7,800 traffic signal improvements will be implemented by the year 2035, reducing congestion-related costs by approximately \$269 million per year. As advances in technology are made, it is expected that intelligent transportation system technology can increasingly be incorporated into traffic signal improvements, creating even greater travel time savings. Benefits also include the reduction of vehicle emissions because improved traffic signals reduce delays, braking and acceleration, and idling vehicles at intersections.

Freeway and Arterial Bottleneck Removal

Bottleneck removal strategies are low cost, quickly implementable solutions to improve locations of isolated congestion. These types of strategies include:

- The addition of travel lanes
- Restriping merging or diverging areas
- Reducing lane or shoulder widths to add a travel and/or auxiliary lane
- Providing bypass routes
- Modifying weave patterns
- Metering or closing entrance ramps
- Improving traffic signal timing on arterials
- Implementing HOV/managed lanes

Regional transportation providers coordinate with local governments in the identification and mitigation of bottlenecks. Corridor studies and subregional traffic management teams are forums to identify potential bottleneck locations and recommendations for improvements. The Roadway section in the Mobility Options

chapter of this document provides additional discussion on the Bottleneck Improvement Program on roadways.

In addition to the strategies, innovative active traffic management approaches are being pursued in the Dallas-Fort Worth area to alleviate bottlenecks. These could include:

- Temporary use of shoulder lanes during peak periods to add additional capacity.
- Extending laminar flow and the time of efficient travel to motorists.
- Queue warning to inform drivers of the reason for slower speeds.
- Dynamic merge, which gives priority to the lane with higher volumes, to prevent conflicts at merge and downstream queuing.

These approaches, coupled with TDM strategies, can most effectively maximize person throughput on the transportation system.

Additionally, bottlenecks may result from geometric roadway characteristics which may cause a decrease in travel speed and an increase in traffic accident potential. Identifying and eliminating geometric characteristics such as insufficient acceleration and deceleration lanes and ramps, sharp horizontal and vertical curves, or narrow lanes and shoulders is one element of the Bottleneck Improvement Program that can improve travel conditions and safety.

To identify traffic bottlenecks on limited-access facilities, a photographic inventory was conducted during morning and evening peak periods of travel in 2007. *Exhibits 5.2 and 5.3* identify the morning and evening bottleneck locations identified during this analysis. Short-term solutions to the identified bottlenecks will be considered as standalone projects or as part of larger corridor studies and improvement plans. When corridors undergo reconstruction the design phase of each project needs to address the identified bottlenecks.

The congestion locations identified from the aerial photos were compared to corridor projects currently in the TIP, corridors projected to be reconstructed by 2015, and corridors undergoing large-scale environmental analysis. A map of the non-peak bottleneck projects is displayed in *Exhibit 5.4* and a listing of these projects is provided in Appendix D. Identified bottleneck improvements will be considered and recommended in future funding initiatives.

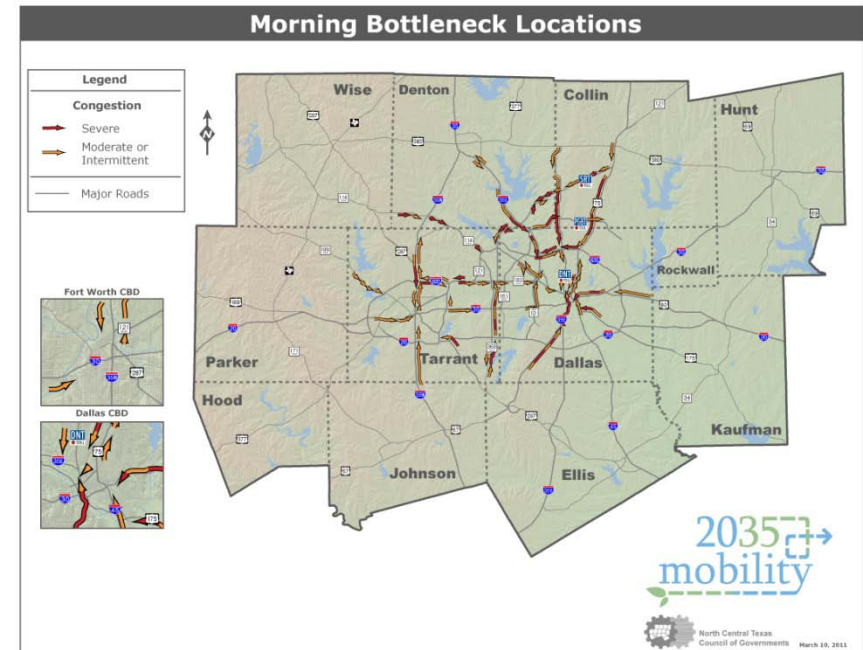


Exhibit 5.2: Morning Bottleneck and Congestion Locations

Additional bottleneck locations will be considered as corridors are reconstructed to provide better transitions from current to future projects and to allow for early implementation of larger corridor projects. The corridor improvement implementation will be monitored to provide early indications of congestion points at the corridor limits. All bottleneck removal projects will be designed to incorporate or transition into the larger permanent facility to reduce overall cost. This approach will help minimize the number of congestion points or bottlenecks in the short term and support the long-term build out of the transportation system.

The Bottleneck Removal Program is estimated to cost \$310 million through 2035. Additional funding to support the bottleneck program will be available as part of the roadway infrastructure budget. These programs will result in improved level of service on roadways and parallel arterials.

Work Zone Management

The various activities required during construction normally cause some disruption to existing travel patterns. Work zone traffic management strategies should be

identified based on the project constraints, construction phasing/staging plan, type of work zone, and anticipated work zone impacts. Once strategies are implemented, they need to be consistently monitored and coordinated to ensure they are effective in mitigating work zone impacts. The frequency of crashes in work zones is disproportionately higher than at other locations. Because maintaining the full capacity and accommodation for all users is usually not possible during construction, improving alternate routes of travel, providing temporary facilities, staging work to occur during off-peak hours, and providing additional enforcement and advance information to travelers are strategies to reduce the impact of construction on roadway operations. Proper signage, safety devices, and lighting are necessary to ensure the safety of facility users and work crews.

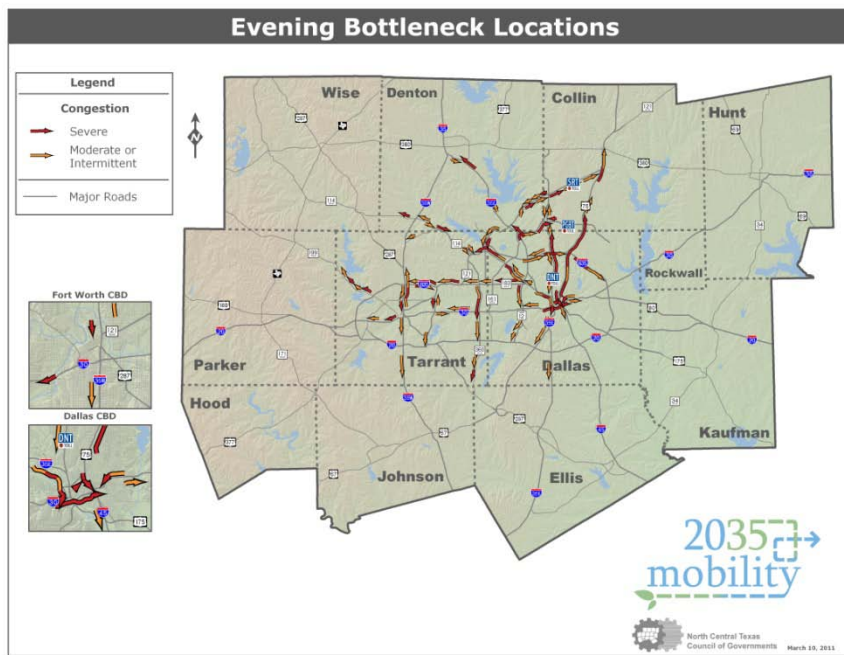


Exhibit 5.3: Evening Congestion Locations

Special Events Management

The Dallas-Fort Worth area is fortunate to be home to year-round major professional, collegiate, and amateur sporting teams and events, as well as cultural and social events and activities. Several major recreational facilities located in the region host multiple events each year. These urban and rural stadium events present special

challenges to surrounding transportation systems and services. As major events approach, work groups are developed to deal with the management of traffic at and around event venues.

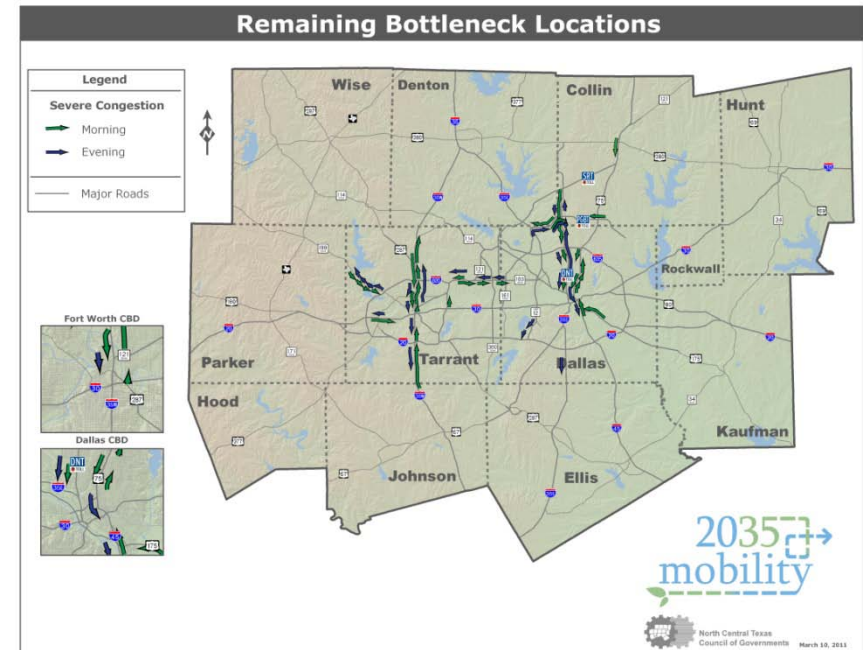


Exhibit 5.4: Remaining Bottleneck Locations

In addition, transit options are considered and implemented, if applicable, for all major special events. Other special events include street festivals, fairs, celebrations, parades, and marathons. The impact of an event is magnified if inclement weather occurs during the event.

In all of these special events, several factors can be identified to affect transportation system performance:

- Time and duration of the event
- Transportation system capacity
- Availability of parking
- Number of participants and/or spectators
- Transportation mode options
- Weather conditions

- Surface conditions
- Amount and type of event information available to drivers

Regional coordination and mitigation of special events can help increase the efficiency of transportation systems when an event occurs. An inventory of special events is maintained and provides detailed information about the event. Primary and secondary transportation impacts can be identified, including the magnitude and duration of those impacts. Follow-up of the special event should take place, including documentation of transportation impacts and an evaluation of mitigation efforts.

Several strategies can be used to minimize traffic disruption and enhance mobility before, during, and after special events. Traffic management, through the use of advanced traffic management systems, parking and lane assignment controls, and customized signal timing plans is essential. In addition, the implementation of three special event practices is recommended:

- Regional partners to coordinate during major special events or planned events to ensure minimal impact on the transportation system for individuals traveling to an event or through an event zone.
- Input from regional partners within the event zone to coordinate during work zone activities to minimize impacts.
- Major events organizers to pay for services such as HOV/managed lanes.

The use of en-route and pre-trip traveler information systems is also a method of addressing travel to special events. Another helpful strategy lies in the travel demand side of mitigating congestion such as use of transit and other high-occupancy modes. It is essential that incident management be addressed in advance in conjunction with special events; an incident occurring when the transportation system demand is already near or exceeding capacity has a far greater impact than during low traffic volumes. See the Transportation System Safety section in this chapter for more information.

Summary

The congestion mitigation strategies identified in Mobility 2035 include the most cost-effective TSM&O strategies. Additional TSM&O programs that are being considered for implementation are shown in *Exhibit 5.5*. In addition to improving mobility and reducing emissions, TSM&O strategies also address community and quality of life goals by supporting sustainable development practices. Access management and

bicycle and walking trips are two examples of how designing the transportation system improves mobility and provides opportunities for improved safety and quality of life.

Result	TSM Program/Strategy
Divert Traffic Away from Congested Areas	<ul style="list-style-type: none"> ▪ Auto-restricted Zones ▪ Residential Traffic Controls
Access Management	<ul style="list-style-type: none"> ▪ Arterials Access Management ▪ Freeways Access Management
Traffic Calming	<ul style="list-style-type: none"> ▪ Roundabouts ▪ Speed Reductions ▪ One-way Streets ▪ Speed Bumps

Exhibit 5.5: Future TSM Programs for Consideration

Intelligent Transportation Systems

In addition to TDM and TSM&O strategies, the regional CMP includes intelligent transportation system (ITS) strategies which seek to integrate advanced communications technologies into transportation infrastructure and in vehicles. ITS encompasses a broad range of wireless and wire line communications-based information and electronics technologies to improve travel conditions on the transportation system.²

Mobility 2035 Policies and Programs

Mobility 2035 endorses the following intelligent transportation system policies:

ITS3-001: Priority funding consideration will be given to projects that meet the regional ITS deployment initiatives as outlined in the Dallas-Fort Worth Regional ITS Architecture.

ITS3-002: ITS projects must be consistent with the architecture and standards described in the Dallas-Fort Worth Regional ITS Architecture.

ITS3-003: Encourage, evaluate, and deploy new energy-efficient, low-cost technologies for ITS and TSM projects.

² USDOT, <http://www.its.dot.gov/>

Mobility 2035 supports the following intelligent transportation system programs:

ITS2-001: Intelligent Transportation System Implementation

ITS2-002: Regional Intelligent Transportation System Architecture Program

ITS2-003: Advanced Traveler Information System Implementation Program

ITS2-004: Advanced Traffic Management System Implementation Program

ITS2-005: Advanced Public Transportation System Implementation Program

ITS2-006: Intelligent Transportation System Interoperability Program

North Texas Regional ITS Architecture

The Regional ITS Architecture has and will continue to guide ITS deployment and build regional consensus for multi-agency systems integrations in the Dallas-Fort Worth Metropolitan Planning Area. ITS projects funded through the highway trust fund must be consistent with the National/Regional ITS Architecture and applicable standards. Regional ITS Architecture must include the following eight requirements:

- A description of the region
- Identification of participating agencies and stakeholders
- Identification of the roles and responsibilities of participating agencies and stakeholders
- New and existing agreements are required for operations affecting intelligent transportation system project interoperability, utilization of ITS-related standards, and the operation of the projects identified in the Regional ITS Architecture
- System functional requirements
- System interface requirements
- Identification of ITS standards supporting regional and national interoperability
- A sequence of projects

The Regional ITS Architecture was developed based on the corresponding transportation services identified by the regional stakeholders in a three- to five-year timeframe. The North Texas Regional ITS Architecture³ document expands upon the efforts associated with ITS deployment in the Dallas-Fort Worth area.

³ North Texas Regional ITS Architecture, <http://www.nortex-its.org/Architecture/ArchHome.htm>

Additionally, subregional ITS plans have been developed to identify priority projects, corridors, and systems for ITS deployment. The implementation criteria for ITS systems development include:

- Filling gaps in the existing ITS communications infrastructure by completing critical system linkages.
- Leveraging transportation resources by targeting investment, where possible, to facilities undergoing reconstruction.
- Leveraging transportation resources by creating or enhancing public-private partnerships which will provide communications infrastructure for Regional ITS Architecture.

Implementing Regional Intelligent Transportation System

Communication infrastructure is being installed in portions of the Dallas-Fort Worth area. Traffic monitoring and incident detection and response systems are operating on portions of the freeway system in Collin, Dallas, Denton, and Tarrant counties. The Texas Department of Transportation (TxDOT) Dallas and Fort Worth Districts each manage and operate traffic management centers (TMCs) in Dallas and Tarrant counties. In addition, the North Texas Tollway Authority (NTTA) manages and operates the TMC for the tolled facilities. The intelligent transportation system components of the TxDOT and NTTA TMCs include closed-circuit television, lane control signals, dynamic message signs, mobility assistance patrols, and vehicle detectors on the limited-access facilities.

In addition to the TxDOT and NTTA TMCs, the region has existing and funded city TMCs and transit management centers throughout the region.

City TMA include closed-circuit television, dynamic message signs, lane control signs, and traffic signals on the arterial street system. Some cities in the region also include traffic signal preemption systems for emergency vehicles and for transit vehicle progression. The transit management center's ITS components include transit vehicle tracking,



Dynamic Message Sign on IH 820

Source: NCTCOG

in-vehicle navigation, integrated radio system/automated vehicle location, automated fleet maintenance system, and automated HOV/managed lane enforcement. User expectations, anticipated funding opportunities, agency policies, and existing investments in ITS infrastructure reveal that a regional, single-site, single-agency solution is not a viable ITS alternative for the Dallas-Fort Worth area. The recommended approach is a distributed model where data and video are a shared resource. Efforts are underway to establish sharing of communication infrastructure, data, and video among the regional partners.

The following regional intelligent transportation system programs are in place to implement ITS strategies:

- Exchange of data and video center-to-center software
- Advanced Traveler Information System
- Advanced Traffic Management System
- Advanced Public Transportation System

Exchange of Data and Video Center-to-Center Software

Current efforts in the region focus on an initiative to exchange data and video between agencies and systems. This initiative includes the development of center-to-center (C2C) software plug-ins and the design of the regional data and video communication system to allow dissimilar TMCs to communicate and exchange information.

The goals and objectives of the C2C software are outlined below:

- To provide a common repository for accessing and archiving traffic information for the Dallas-Fort Worth area.
- To provide an Internet-based graphical map to display traffic conditions in the Dallas-Fort Worth area.
- To provide an application that will allow agencies without a formal TMC to participate in the C2C infrastructure and information sharing.
- To provide a system which supports ITS C2C communications for command, control, and status of various ITS field devices including dynamic message signs, lane control signals, closed-circuit television cameras, and other ITS subsystems that may be deployed in the future.
- To utilize National ITS standards to implement the project.
- To provide a software system that is extensible to all local or regional partners. This would allow a local common repository to be created by linking individual

partners, a regional common repository to be created by linking local common repositories, and a statewide common repository to be created by linking regional common repositories.

Regional partners have initiated sharing of infrastructure, data, and video components for transportation-related information through the Transportation Emergency Responders Uniform Communication System (TERUCS) project, which incorporates the attributes of Regional Data and Video Communication System and Emergency Responder Uniform Communication System. With TERUCS in place, emergency operations centers (EOCs) are provided access to live transportation data and video which allows them to improve incident response and clearance times, as well as make better operational decisions during EOC activation.

Advanced Traveler Information System

An Advanced Traveler Information System (ATIS) is recommended that will provide real-time information on traffic conditions and travel opportunities to travelers in the region. This will require the integration of current and future independent information systems across jurisdictional lines, creating a seamless traveler information system providing pre-trip and en-route traveler information to the public. Varied communication technologies will be explored and used in the region and linked to subregional transportation management centers, creating a virtual regional transportation management center. This decentralized approach will promote cost savings and maximize involvement of various agency groups while allowing technology to support face-to-face decision-making partnerships. The system is shown in red on *Exhibit 5.6* and covers essentially the entire freeway and tollway systems.

The specific communication system media is not indicated in this plan but will be a focus of the ITS planning groups which continue to meet in the region. The system will support future personal, public, and freight transportation in the region and will provide information via dynamic message signs, highway advisory radio, commercial radio and television, kiosks, and through Internet-based communications systems. Also shown on *Exhibit 5.6* are several city and transit TMCs which will be integrated into the ATIS.

A regional traveler card, or Smart Card, is also recommended to enable the actual transfer of electronic information from the transportation patron or client to the provider of the service. This may include the transfer of funds through means of an electronic payment instrument. The device may also hold and update the traveler's information such as personal profiles or trip histories.

Advanced Traffic Management System

Distributed traffic management centers will support traffic management and major incident response and clearance. The Advanced Traffic Management System (ATMS) includes the integration of roadways, managed facilities, and strategic arterials across jurisdictional lines. *Exhibit 5.6* displays the recommended ATMS on the freeway and tollway systems and includes operation of portable changeable message signs to divert traffic around traffic incidents and special events; closed-circuit television cameras for traffic monitoring; incident verification and clearance; lane control signals for traffic management and incident management; and may include automated ramp metering systems to regulate freeway system access during peak travel periods. Traffic control subsystems on arterials which intersect with, or are parallel to, the limited-access freeway and tollway facilities should be integrated with freeway and tollway intelligent transportation infrastructure to support seamless, multimodal traffic management during traffic incidents and peak travel periods.

The continuation of the Mobility Assistance Patrol Program (MAPP) is recommended and increased MAPP coverage should focus on congested systems and peak periods. *Exhibit 5.6* displays the MAPP recommendations for the limited-access systems. MAPP service is not recommended for arterial roadways. MAPP and other incident management tools are particularly critical in construction work zones and during special events and inclement weather. More information on MAPP can be found in the Transportation System Safety and Transportation System Security section of this chapter.

The substantial investment in freeway improvements represented in Mobility 2035 makes it imperative that operational plans be developed to manage and clear freeway incidents in a timely manner. The TxDOT Dallas and Fort Worth Districts and NTTA are encouraged to work closely with the Regional Transportation Council, NCTCOG, and affected local governments' transportation and law enforcement professionals to develop consistent, coordinated freeway operational plans which

include quick incident clearance practices. These plans need to be in place prior to major freeway improvement expenditures in order to ensure that the expected mobility benefits are realized.

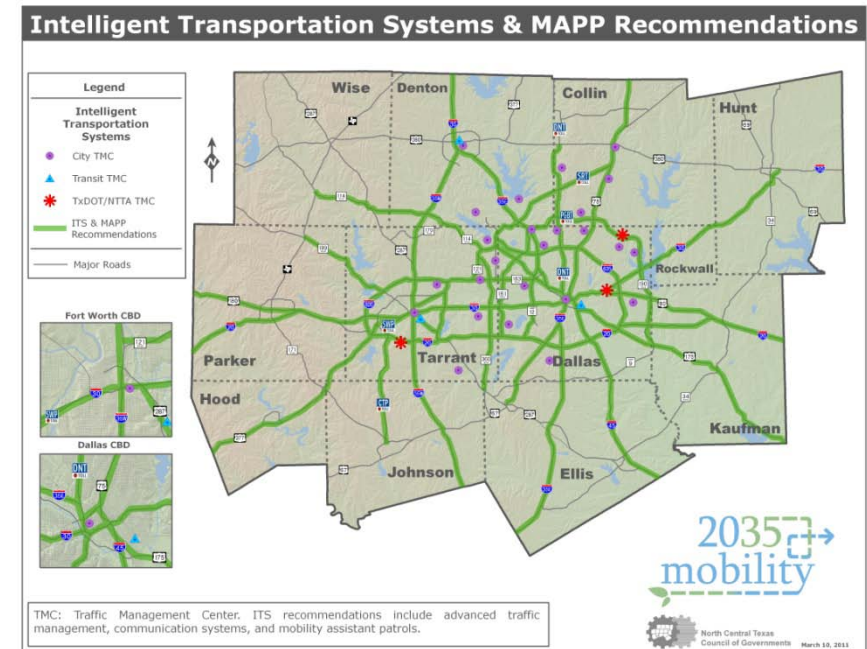


Exhibit 5.6: ITS and MAPP Recommendations

Advanced Public Transportation System

An Advanced Public Transportation System is recommended in Mobility 2035. Transit management centers as shown in *Exhibit 5.6* will serve as communications hubs for The T, DART, and DCTA, and will be integrated with state and local government transportation management centers. Automatic vehicle location technology, automated fare collection, transit signal priority, and transit security systems will enhance transit service, increase the safety of riders, and support greater levels of service to travelers. A more personalized public transportation service will allow more flexible routing and demand responsive service. More advanced communications technology will allow transit operators to monitor traffic conditions on the roadway, managed facilities, and rail systems; verify traffic incident type and severity; automate managed facilities occupancy verification; enforce managed facilities operations; and support special events.

Environmental Justice

Environmental justice was considered during the evaluation of traffic signal improvement, intersection improvement, and ITS deployment. The analysis included the review of TSM&O projects for areas determined to have a high concentration of protected class population. This is based on the total number of centerline miles with TSM&O compared to the total number of centerline miles adjacent to a specific protected class population. Future programming of TSM&O projects will include environmental justice as criteria in the selection of projects, in addition to safety, mobility, and air quality.

Summary

The TSM&O programs include TSM and ITS strategies. Capital costs for ITS and TSM strategies are estimated to cost \$383 million and \$1.7 billion, respectively. Operating costs for ITS are expected to be \$39 million per year at full system implementation. TSM and ITS benefits include a reduction in recurrent traffic congestion of approximately 96,500 and 63,200 person hours per day regionally, respectively. A reduction in nonrecurrent traffic congestion is expected to be approximately 124,700 person hours per day regionally. In addition, benefits will include fuel savings and air pollution reductions, safer streets and highways, and system maintenance cost reductions.

All transportation system management and operations policies, programs, projects, and maps can be found in Appendix D.

Transportation System Safety and Transportation System Security

The safety and security of the North Central Texas transportation system is of vital importance. Therefore, the Transportation System Safety Program focuses on improving traffic safety throughout the region by supporting and coordinating planning efforts to develop safety policies, programs, and projects. The goal of transportation system security is to support ongoing local, state, and federal initiatives to address transportation system security and emergency preparedness planning in the North Central Texas region. These planning and coordinating efforts include partnerships between NCTCOG, TxDOT, local governments, and other partners to develop strategies for data collection, analysis, archiving, and supporting security programs in North Central Texas.

Mobility 2035 Supported Goals

- Ensure all communities are provided access to the regional transportation system and the planning process.
- Ensure adequate maintenance and enhance the safety and reliability of the existing transportation system.

Transportation System Safety

It is through four core concepts that the safety program strives to involve partners in the planning and implementation process of creating a safer transportation system and support the Mobility 2035 goals. The four core concepts include:

- Safety planning and implementation efforts
- Data analysis and information system development
- Safety education and training efforts
- Innovative funding and partnership agreements

Transportation System Safety at a Glance:

Data collection and analysis, training, education, enforcement, and engineering continue to be important aspects to improving transportation system safety in the Dallas-Fort Worth region. Additionally the safety improvements that reduce roadway crashes, fatalities, and injuries include a diverse set of activities implemented by a variety of transportation professionals.

Transportation System Security at a Glance:

Enhancing the security of our transportation system is one of the highest priorities of transportation agencies in the Dallas-Fort Worth region. Regional coordination of information sharing, response plans, response capabilities, and protection of critical infrastructure are key components to addressing transportation system security. Dialogue between local governments, transportation providers, and emergency responders build the ongoing partnerships to secure our system and respond quickly. The topics discussed in this section include:

- Regional Response Plans, Evacuation Plans, and Point of Distribution Plans
- Transportation and Emergency Responders Uniform Communication System

Mobility 2035 Policies and Programs

The safety policies that Mobility 2035 supports include:

TSSF3-001: Require implementation of safety strategies in work zones consistent with industry best practices.

TSSF3-002: Develop safety information partnerships with TxDOT, local governments, local police departments, and other organizations to encourage the sharing of regional/jurisdictional safety data (including, but not limited to, crash data, red light camera data, and incident response and clearance times data).

Mobility 2035 supports the following transportation system safety programs:

TSSF2-001: Freeway Incident Management Program

TSSF2-002: Regional Mobility Assistance Patrol Program

TSSF2-003: Regional Safety Information System

TSSF2-004: Safety Education and Training Program

TSSF2-005: Crash Causal Road Factors Program

All safety policies, programs, projects, and maps are provided in Appendix D.

Core Concept 1: Safety Planning and Implementation Efforts

Safety planning efforts include identifying safety-related issues to advance initiatives to preserve, maintain, and improve transportation safety in the Dallas-Fort Worth area and develop region-appropriate countermeasures that address crash types and locations. The programs also implement roadway safety improvements at high crash locations and projects that reduce the number of crashes and crash severity. Reducing incident clearance times for roadways and improving work zone safety are additional efforts supported to improve safety. Safety is important regardless of the mode of transportation and therefore safety programs associated with pedestrian, bicycling, transit, and freight movement operations are also important and are highlighted in the Mobility Options chapter.

To garner input and feedback from our regional partners, NCTCOG hosts and coordinates various safety related teams and activities. *Exhibit 5.7* is a summary of

safety related subcommittees, task forces, and working groups hosted and coordinated by NCTCOG to implement safety programs.

Working Group	Members	Purpose
Regional Safety	Transportation professionals, TxDOT, FHWA	Develop regional safety policies, programs, projects, and activities.
Work Zone Safety	Transportation professionals	Investigate strategies to reduce the number of fatalities and injuries in work zones.
Mobility Assistance Patrols	Transportation professionals, NTTA, TxDOT, police, mobility assistance patrol representatives	Alleviate congestion and improve safety on congested corridors. Provide assistance to stranded/stalled motorists. Working group evaluates progress and effectiveness of program and maintains/develops routes.
Manual on Uniform Traffic Control Devices	Transportation professionals, emergency responders	Review pending changes to the Texas and federal MUTCD.
School Zones Policy	Transportation professionals, police, school district representatives	Develop and prioritize issues related to operating, maintaining, evaluating, and enforcing school zones. Improve communications between school districts and transportation communities.

Exhibit 5.7: Regional Safety Working Groups

Regional Mobility Assistance Patrol Program

The continued implementation of the Mobility Assistance Patrol Program is a recommendation included under the Intelligent Transportation System Program. The goal of MAPP is to assist in the alleviation of congestion and improve safety on congested highways/freeways in Dallas and Tarrant counties, as well as portions of Collin and Denton counties. MAPP provides assistance to stalled and stranded motorists by helping them to move disabled vehicles from the main lanes of regional highway/freeway facilities and ultimately getting the vehicles operating or off the facility completely. Assistance is also provided to law enforcement with traffic control when deemed necessary or when requested by law enforcement. Assistance is provided free of charge to the motorist and includes such services as assisting with flat tires, stalled vehicles, and minor accidents. MAPP is currently operated by staff from the Dallas County Sheriff's Office, the Tarrant County Sheriff's Office, and the North Texas Tollway Authority. A map of the recommended MAPP routes is included in *Exhibit 5.6*.

Core Concept 2: Data Analysis and Information System Development

Identifying, collecting, and analyzing safety data is important to improving safety in the Dallas-Fort Worth area. This data assists in the development of county-level and regional crash rates for limited-access facility roadways and includes three programs: the Regional Mobility Assistance Patrol Program, Regional Safety Information System, and the Automated Red Light Enforcement Inventory and Database.

Dallas-Fort Worth Regional Safety Information System

One near-term safety data and information system that will be operational within the next five years is the Regional Safety Information System (RSIS). Once developed, the RSIS will be a regional Geographic Information System-based, centralized database for regional traffic crash information system. RSIS will be used to identify regional high crash site locations and will allow end users to conduct online basic crash analyses based on crash data received from TxDOT's Crash Record Information System (CRIS) and other data sources. This system will provide the ability to determine the most prevalent types of fatal, injury, and property damage crashes stratified by type of roadway and identify locations with above average crash histories.

Until the RSIS is developed and operational, NCTCOG is analyzing, mapping, and reporting the regional crash and fatality incidents. CRIS, the National Highway Traffic Safety Administration-Fatality Analysis Reporting System, and the National Response Center data are used to develop regional crash rates for limited-access facilities. In the interim, a Crash Location and HazMat Incident Mapping Project is underway to map crash incidents that have occurred throughout the region. The HazMat Incident Mapping Project will assist in identifying possible roadway segments that are especially affected by hazardous materials carriers.

Automated Red Light Enforcement Inventory and Database

The Automated Red Light Enforcement Inventory and Database is a locally implemented project assisted, supported, and hosted by NCTCOG. The purpose of this program is to develop a database that has detailed information on camera specifics and intersections and catalogs city policies and procedures for the operation of red light cameras for cities with populations over 25,000. *Exhibit 5.8* is a map of the cities that have currently implemented an automated red light camera enforcement program.

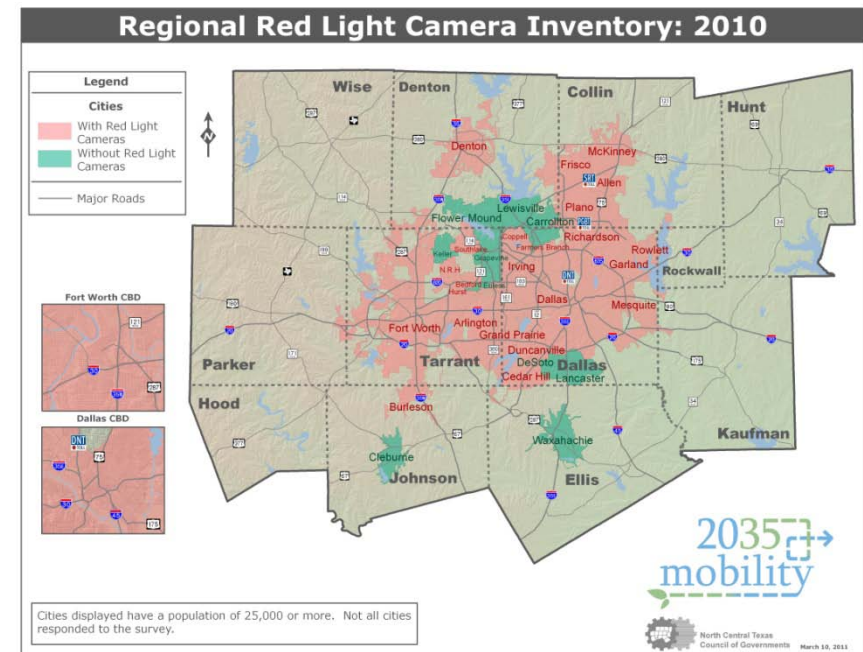


Exhibit 5.8: Map of Cities with Red Light Cameras

Core Concept 3: Safety Education and Training Efforts

Initiating and coordinating safety education and training courses for regional stakeholders and increasing public awareness about safety issues is important to promoting safety in the Dallas-Fort Worth area. Examples of regional safety education and training efforts are shown in *Exhibit 5.9*.

Core Concept 4: Innovative Funding and Partnership Agreements

Continuing to implement safety initiatives requires funding. The safety program continually seeks funding opportunities and promotes the development of public-private partnerships to fund new and innovative safety improvements.

Mobility 2035 supports additional NCTCOG safety related programs that contribute to improving safety and quality of life for all residents in the region, as summarized in *Exhibit 5.10*.

Summary

As the population continues to grow in the Dallas-Fort Worth area, implementing and funding safety initiatives including training, data collection, and various regional safety programs will become increasingly essential to improve reliability, efficiency, and maintenance of the transportation system.

Education/ Training Course	Training Goal	Training Outcomes	Audience
Freeway Incident Management	Initiate common, coordinated response to traffic incidents that builds partnerships, enhances safety for emergency responders, reduces upstream traffic accidents, improves system efficiency, and improves air quality.	Improves safety by notifying motorists of incidents, reducing rear-end collisions due to vehicle queue, and improves responder safety at scene.	First responders, managers, executive level policy makers
Photo-grammetry Training	Complements Freeway Incident Management training. Accident reconstruction and forensic measurements.	Uses image-based 3D system to calculate measurements from photographs and digital camera images.	Traffic incident responders
ITE Web Seminars	Provide training opportunities for regional professionals.	Varied based on topic.	Varied
Driver Safety Initiatives	Teens in the Driver Seat educational program to improve safety amongst teen drivers.	Focuses on driving at night, distractions, speeding, non-wearing safety belts, and drinking and driving.	Texas schools
Work Zone Safety	Work zone traffic control/qualified flagger, planning work zone traffic control, night road work planning and implementation, installation and maintenance of signs and pavement markings.	Varied based on topic.	City, county, TxDOT, NTTA staff

Exhibit 5.9: NCTCOG Supported Regional Safety Education and Training Opportunities

Program	Purpose	Outcome	Safety Component
Thoroughfare Assessment/ Regional Traffic Signal Retiming	Maximize existing roadway system capacity by implementing low-cost capital improvements on selected thoroughfares.	Audit thoroughfares, assess operational characteristics, estimate air quality benefits, implement recommendations.	Signage, restriping, pedestrian signals, signal coordination improvements.
Light-emitting Diode (LED) Traffic Signal Replacement	Replace traditional incandescent bulbs with LED lamps.	Improve management of system; improve air quality.	Improve signal visibility.
Bottleneck Program	Alleviate mobility and safety problems.	Collect data, evaluate freeway performance, identify bottleneck improvement locations.	Improve safety through bottleneck removal.
Intelligent Transportation System	Integrate traffic monitoring, incident detection systems, and traveler information systems.	Reduce congestion on regional roadways.	Reduce number of congestion-related crashes.
Traffic Signal/Intersection Improvement Program	Improve traffic flow operation on arterials and intersections.	Infrastructure improvements and traffic signal improvements.	Enhance safety on arterials and intersections.
Bicycle/Pedestrian Outreach	Increase bicycle and pedestrian mobility.	Collect safety data and conduct bicycle safety education.	Increase bicycle and pedestrian safety.
Regional Railroad Crossing Banking	Reduce number of at-grade crossings and amount of infrastructure.	Marketplace to collect credits for at-grade crossings that are eliminated.	Reduce crashes and fatalities at railroad crossings.
Railroad Crossing Reliability Partnership	Improve 2,000 at-grade railroad crossings.	Upgrade passive warning devices at railroad crossings.	Prevent crashes and reduce injury or death.

Exhibit 5.10: Additional Safety Related Programs

Program	Purpose	Outcome	Safety Component
Railroad Safety Education	Improve safety at rail crossings.	Educate children, driver education instructors, first responders.	Prevent crashes and reduce injury or death.
Truck Lane Planning	Evaluate needs for truck traffic flow, identify probable truck only lane corridors.	Remove trucks from left lane of highways.	Increase safety and mobility of non-truck and truck traffic.
Freight System Plan	Review of all freight facilities and long-term freight needs.	Freight System Plan	Evaluate freight-related safety concerns.
Hazardous Materials Routing	Ensure hazardous materials are not routed through high population/high traffic areas.	Reduce risk associated with hazardous material transport.	Improve safety associated with hazardous materials routing.
Regional General Aviation and Heliport Plan	Plan for and develop Regional Aviation System.	Develop aviation data, management system, forecasting model.	Improve safety associated with aviation and heliport facilities.

Exhibit 5.10: Additional Safety Related Programs Continued

Transportation System Security

The security of the transportation system is a national and regional priority. The goal of Transportation System Security (TSS) is to support ongoing local, state, and federal initiatives to address transportation system security and emergency preparedness planning in North Central Texas. Dialogue continues between local governments, transportation providers, and emergency responders in the region regarding the regional coordination of response plans, response capabilities, and emergency medical services in the event of a major incident or catastrophic event. In addition, critical transportation infrastructure elements are identified to increase surveillance of these systems.

Mobility 2035 Policies

Mobility 2035 supports the following transportation system security policies:

TSSC3-001: Support the regional Transportation Emergency Responders Uniform Communication System.

TSSC3-002: Transportation system security should be considered and mitigation strategies put in place during planning, engineering, construction, and operation stages of corridor implementation for corridors with identified critical infrastructure or key resources.

Mobility 2035 supports the following transportation system security programs:

TSSC2-001: Transportation System Security Improvements, Expansions, Management, and Operations

TSSC2-502: Transportation and Emergency Responder Uniform Communication System

TSSC2-504: Transportation Security Education and Training

TSSC2-506: Regional Response Plan Development

The region's intelligent transportation system infrastructure is an integral part of the TSS Program. Current and future transportation and transit management center ITS components include closed-circuit televisions, lane control signals, dynamic message signs, ramp meters, mobility assistance patrols, vehicle detectors, transit vehicle tracking, in-vehicle navigation, integrated radio systems and automated vehicle location, automated fleet maintenance system, and automated HOV/managed lane enforcement. These traffic monitoring, incident detection, and response systems are utilized in improving the security of the regional transportation system.

Transportation Resource Support for Mass Evacuation Events

NCTCOG and other regional partner agencies are working to establish coordination and organization procedures for using transportation resources for local and county agencies preparing for, responding to, and recovering from incidents which impact the residents of North Central Texas. Transportation support such as providing land, air, rail, or other resources for emergency response or assistance operations, and coordinating resources to facilitate an effective, efficient, and appropriate response and support are being assessed.

The Texas Homeland Security Strategic Plan 2010-2015 is a high-level roadmap for all homeland security efforts across the state. A regional goal that resulted from the Texas Homeland Security Strategic Plan was to provide an overwhelming response capability for any catastrophic incident that poses a significant threat to communities within the State of Texas. To focus on the Dallas-Fort Worth area, regional partners are working closely together to develop a Multi-agency Coordination Plan. This plan will address topics such as regional emergency management, comprehensive resource planning, readiness and response levels, regional coordination centers, situational awareness, pre-positioning of resources, and evacuations.

One example of regional readiness needs is the potential for accommodating hurricane evacuees. The region continues to prepare for possible hurricane evacuees from the Gulf Coast by participating in planned hurricane exercise projects. The Dallas-Fort Worth area roles include:

- Coordinate with the local jurisdictions and state operations centers through the shelter hubs to manage shelters in accordance with priorities established in state and local plans and procedures.
- Manage evacuation in accordance with state and local traffic management plans to ensure desired outcomes.

The regional ITS infrastructure is an integral part of the evacuation planning toolkit. Examples of evacuation planning tools are contra-flow, traveler information sources, signal timing for emergency conditions, ramp closures, supply of heavy equipment and barriers, and ITS components such as closed-circuit television cameras and vehicle detectors. While obtaining information about the status of the regional transportation facilities is critical, it is equally important to provide a mechanism to distribute information to the public. Several methods of disseminating information include dynamic message signs, Websites, a 511 system, and highway advisory radio.



PGBT and US 75 Interchange

Source: NCTCOG

The Center for Disease Control and Prevention, the Texas Department of State Health Services, and the North Central Texas Council of Governments work with local jurisdictions to make full and effective use of the Strategic National Stockpile (SNS) in the event of a possible biological terrorist attack. The region is actively evaluating and planning transportation options for the distribution of SNS items should this occur. These planning efforts include traffic and transit conditions and usage analysis. The planning will ensure that the Dallas-Fort Worth area is prepared to respond within 48 hours of an event.

The region is also actively involved in planning for service distribution during major incidents that require emergency response efforts and delivery of goods. These planning efforts include traffic conditions analysis, transit system usage analysis, and variable assumptions analysis.

Transportation Critical Infrastructure

Annually, NCTCOG and regional transportation partners assess transportation and other regional components for nomination to the Critical Infrastructure Inventory/Key Resources. The US Department of Homeland Security establishes the criteria for the inventory which are subject to change based on the latest security and intelligence information. The confidential inventory is used in developing security measures for surveillance and protection of the identified regional assets.

Transportation and Emergency Responders Uniform Communication System

TERUCS enables network communication between EOCs and TMCs in the Dallas-Fort Worth area. TERUCS evolved from the 2007 Emergency Responder Uniform Communication System study which assessed the benefits of a regional data and video communication network to exchange information between TMCs and EOCs.

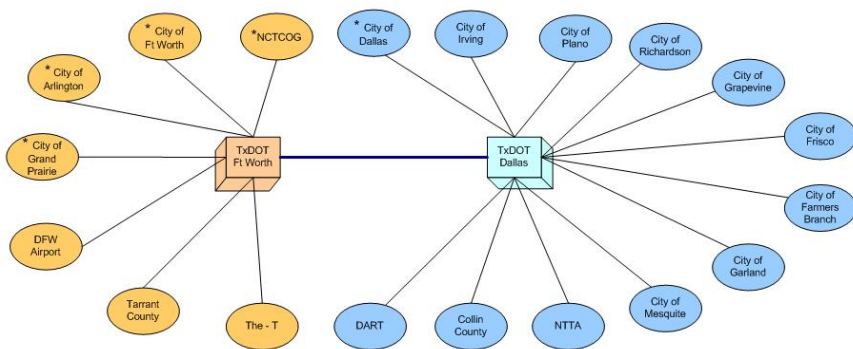
By utilizing the existing fiber optic infrastructure deployed by partner agencies, TERUCS provides a wide area network (WAN) for communication and video and data exchange allowing stakeholders to share resources and leverage funding. TERUCS also provides a template for the flow of data and video across vertical (local, state, federal) and horizontal (local EOC, police, fire, transportation) hierarchies. TERUCS includes the incorporation of data and video sharing a common information exchange protocol developed by transportation stakeholders

in the Dallas-Fort Worth area. This system allows for diverse TMCs to communicate information across a common protocol to share traffic related information.

Regional partners are implementing the TERUCS concept for the sharing of infrastructure, data, and video components for transportation related information. With TERUCS in place, EOCs will be permitted access to live transportation data and video to improve incident response and clearance times, as well as to make better operational decisions during EOC activation.

Participating jurisdictions have identified the primary EOC function as secured video teleconferencing communication. This function would provide the ability for region-wide briefings during regionally significant catastrophic events and other major special events.

The Ten Year TERUCS Fiber Connection Plan outlining participating agencies is displayed in *Exhibit 5.11*. Agencies connected to TERUCS are indicated by asterisks.



* = Connected to TERUCS

Exhibit 5.11: 10 Year TERUCS Fiber Connection Plan

Summary

The primary goal of transportation system security is to support ongoing local, state, and federal initiatives that address transportation system security and emergency preparedness. The policies and programs discussed in this section are intended to improve the security of the transportation system in the North Central Texas region.

All security policies, programs, projects, and maps are provided in Appendix D.

Sustainable Development

Mobility 2035 Supported Goals

- Improve the availability of transportation options for people and goods.
- Support travel efficiency measures and system enhancements targeted at congestion reduction and management.
- Assure all communities are provided access to the regional transportation system and planning process.
- Preserve and enhance the natural environment, improve air quality, and promote active lifestyles.
- Encourage livable communities which support sustainability and economic vitality.

Regional Growth Trends and Forecasts

From 2000 to 2010, the Dallas-Fort Worth Metropolitan Statistical Area (MSA) had the second largest population increase in the nation after the Houston MSA.⁴ The population of the Dallas-Fort Worth area grew by 23.4 percent over the past decade. According to North Central Texas Council of Governments' demographic forecasts,⁵ the total population of the Metropolitan Planning Area is projected to increase 48 percent from 2012 (6,651,887 persons) to 2035 (9,833,378 persons). This considerable population growth over the next 25 years is important to the long-term viability of the region and local economies. Accommodating this growth with an efficient and effective transportation system is important to maintaining a high quality of life. However, considering the financial realities associated with funding additional transportation capacity, the choices that existing and new residents make about where they live, not just how many live in the region, is a critical piece of development of the future transportation and development pattern.

From 2000 to 2010, 52 percent of the regional growth in the Dallas-Fort Worth area was in eight cities. These cities and their respective percentage growth include:

⁴ 2010 US Census, www.census.gov

⁵ NCTCOG, 2040 Demographic Forecast, www.nctcog.org/ris/demographics/forecast.asp

Sustainable Development at a Glance:

Livable communities have been defined as diverse, mixed-income, and mixed-use communities designed at a pedestrian scale. Residents can live, work, and raise their families in a sustainable and affordable community.⁶ The following Sustainable Development program goals were developed to make the Dallas-Fort Worth area more livable.

Improve the economic, environmental, and social sustainability of developments through sustainable transportation.

The purpose of sustainable transportation is to provide for people's mobility needs without offsetting the balance of the three Es: *economic, environmental, and equity*.

Promote the land use/transportation connection.

Because it is not possible to build enough transportation facilities to eliminate congestion or to completely meet future mobility needs, an integrated, multi-modal transportation system is necessary to support balanced job and household growth. This system must also take into account the linkages between housing, employment, retail, education, health, and recreational opportunities.

Fort Worth, 17 percent; Dallas, 10 percent; Frisco, 6 percent; McKinney, 6 percent; Plano, 4 percent; Arlington, 3 percent; Grand Prairie, 3 percent; and Allen, 3 percent. Regional forecasts indicate that population density (persons per square mile) for the 12-county Metropolitan Planning Area will increase by 52 percent between 2012 and 2035; from 2,058 to 3,143 persons per square mile. As shown in *Exhibit 5.13*, regional forecasts indicate that a higher magnitude of population growth is projected to occur in Collin, Dallas, Denton, and Tarrant counties (four core Dallas-Fort Worth counties). The higher population growth in these core counties reflects an increase in density and promotes more sustainable development patterns. Increases in the amount of infill development and the feasibility of transit options become strategies that can be supported by these types of growth trends. Potential results of growth occurring in the four core Dallas-Fort Worth counties as forecasted include reduced greenfield development, reduced amount of agricultural land converted to urban development, decreased vehicle miles traveled, and improved safety and air quality. Mobility 2035 emphasizes multi-modal mobility options and policies, programs, and projects that support sustainable development and transportation; strategies that are integral to facilitating the movement of 9.8 million people in 2035. Additional discussion of regional demographic and growth trends is included in the Social Considerations chapter.

Sustainable Development and Transportation

Sustainable development is an important tool that can be used to increase mobility and improve air quality in the Dallas-Fort Worth area. Sustainable development can generally be defined as “development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs”.⁶

Sustainable development, as it specifically relates to transportation, can be defined more specifically as:

- Land use and transportation practices that promote economic development while using limited resources in an efficient manner.

⁶ World Commission on Environment and Development (WCED), *Our Common Future* (First ed.), Oxford: Oxford University Press, Oxford and New York, 1987.

- Transportation decision making based on impacts on land use, congestion, vehicle miles traveled, and the viability of alternative transportation modes.
- Planning efforts which seek to balance access, finance, mobility, affordability, community cohesion, and environmental quality.

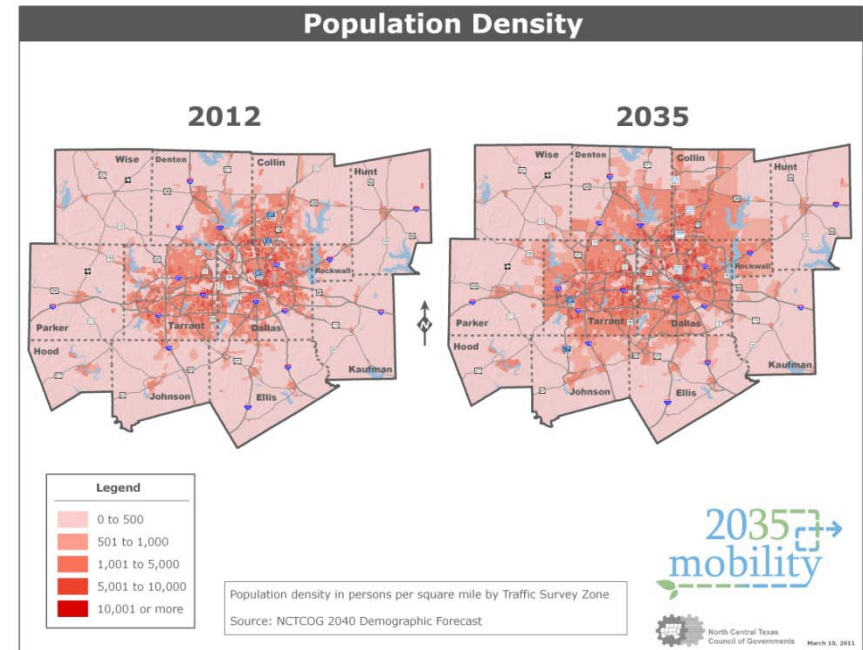


Exhibit 5.13: Regional Population Density Changes from 2012 to 2035

Sustainable development encompasses a holistic approach to growth which combines economic development, environmental protection, and social equity – also known as the three Es: economic, environmental, and equity.

The goal of sustainable transportation is not just moving people and goods, but arriving at the most sustainable way to provide for people’s mobility needs without negative impacts. Traditional mobility options, such as single-occupant and auto-oriented transportation, lead to adverse economic effects such as traffic congestion, longer commutes, and higher accident rates. Auto-oriented transportation also has various environmental effects such as the increase of pollution, depletion of natural resources, and even health related concerns. Auto-oriented transportation also limits the mobility choice of lower income and persons

with disabilities, and impacts social equity.⁷ Alternatively, sustainable transportation strategies, such as multi-modal transportation systems, enable travelers to choose from various modes, location, and pricing options, particularly those that are resource efficient, affordable, healthy, and accommodate non-drivers.

Additionally, alternative transportation services provide affordable options so that households spend a lower percentage of their household income on transportation. According to the Center for Neighborhood Transportation, these figures are 33 percent of household income on housing expenses and 57 percent of household income on housing and transportation expenses for the Dallas region; and 32 and 59 percent, respectively, for the Fort Worth-Arlington region in 2000.⁸ The US Department of Housing and Urban Development (HUD) defined cost burden as households spending over 30 percent of household incomes on a monthly mortgage or rent. Policies that support compact, mixed, connected, multi-modal land use development improve land use efficiency, accessibility and livability, and promote cost reductions associated with housing and transportation.

Residents in the Dallas Region spend 33 percent of their household income on housing expenses and 57 percent of household income on housing and transportation expenses combined. These figures are 32 percent and 52 percent for Fort Worth-Arlington area.

CNT Housing and Transportation Affordability Index, 2000

The coordination and integration of transportation, housing, and environmental policies has renewed the attention of the federal, state, and local governments. In 2009, HUD, the US Department of Transportation (DOT), and the Environmental Protection Agency (EPA) partnered to form the Interagency Partnership for

⁷ Todd Litman and David Burwell, Issues in Sustainable Transportation, Victoria Transport Policy Institute, February 2003.

⁸ Lipman, B., A heavy load: The combined housing and transportation burdens of working families, Center for Housing Policy, October 2006.

Sustainable Communities. The partnership has and will continue to offer federal housing, transportation, and environmental policy, programs, and funding for various programs that will advance the following six Livability Principles:

- **Provide more transportation choices:** Develop safe, reliable, and economical transportation choices to decrease household transportation costs, reduce our nation's dependence on foreign oil, improve air quality, reduce greenhouse gas emissions, and promote public health.
- **Promote equitable, affordable housing:** Expand location and energy-efficient housing choices for people of all ages, incomes, races, and ethnicities to increase mobility and lower the combined cost of housing and transportation.
- **Enhance economic competitiveness:** Improve economic competitiveness through reliable and timely access to employment centers, educational opportunities, services, and other basic needs by workers, as well as expanded business access to markets.
- **Support existing communities:** Target federal funding toward existing communities through such strategies as transit-oriented, mixed-use development, and land recycling to increase community revitalization, improve the efficiency of public works investments, and safeguard rural landscapes.
- **Coordinate policies and leverage investment:** Align federal policies and funding to remove barriers to collaboration, leverage funding, and increase the accountability and effectiveness of all levels of government to plan for future growth, including making smart energy choices such as locally generated renewable energy.
- **Value communities and neighborhoods:** Enhance the unique characteristics of all communities by investing in healthy, safe, and walkable neighborhoods – rural, urban, or suburban.

The goals and programs in Mobility 2035 support and echo these six Livability Principles and are additionally supported by regional policy and programs.

Mobility 2035 Policies and Programs

Mobility 2035 supports the following sustainable development policies:

SD3-001: Support mixed-use, infill, and transit-oriented developments that utilize system capacity, reduce vehicle miles of travel, and improve air quality through improved rail mobility and access management.

SD3-002: Promote livable communities that offer safe, reliable, and economical transportation choices; contain equitable and affordable housing; and enhance economic competitiveness which support the HUD-DOT-EPA Interagency Partnership Principles of Livability.

SD3-003: Plan and implement multimodal transportation options that connect and compliment a variety of land uses while serving diverse demographic groups.

SD3-004: Encourage sustainability through a cooperative process of preservation, integration, and development of land which support healthy transitions between ranges of development possibilities from natural areas to the urban core.

Mobility 2035 supports the following sustainable development programs:

SD2-001: Alternative Future Program

SD2-002: Center for Development Excellence

SD2-004: Sustainable Development Funding Program

SD2-005: Transit-oriented Development Implementation Program

SD2-005: Brownfields Revolving Loan Fund

SD2-006: Resource Efficiency and Sustainable Growth Management

SD2-007: Land Use/Transportation Connection

SD2-008: Livability and Transportation

Land Use, Transportation, Air Quality Connection

Integration of land use, transportation, and air quality policy is a key strategy of Mobility 2035. Transportation and land use are intrinsically linked; transportation provides connections between land uses and the way the land is used imposes demands on the transportation system.

When integrated, land uses have dynamic effects on air quality because the clustering of land uses in proximity decreases the need for automobiles to access the uses. The effects are amplified if the land use cluster includes a residential component. Traditional land use and transportation planning practices encourage segregated land uses connected by a single mode of transportation. This leads to

congestion, pollution, funding shortfalls, and the unsustainable consumption of resources.

Multimodal transportation options and a reduction in auto-oriented vehicular traffic can alleviate the problems such as congestion and pollution resulting from traditional land use and transportation planning. Facilitating transit, bicycle, and pedestrian activity within communities requires supporting infrastructure including transit (rail or bus) improvements, bicycle trails, pedestrian amenities, and landscaping.

The transportation component is important to reducing congestion, but so is the land use component. Because most transportation trips are home based, providing employment or office space, retail, restaurants, and entertainment within



West Village and McKinney Avenue Trolley

Source: NCTCOG

walking distance of residential options, single or multi-family, reduces vehicle miles traveled and provides air quality benefits through reducing automobile emissions.⁹ Providing viable housing choices in urban, mixed-use centers reduces the number of residential units constructed in greenfield suburban areas, thus reducing the overall mileage traveled from suburban areas to employment locations and other major trip generators in the central city.

Land use strategies can be used to not only reduce vehicle miles traveled, but also to improve quality of life and reduce transportation costs. Supporting the combination of interdependent land uses such as residential, retail, and office within walking distance of schools and neighborhood parks is more sustainable, cost efficient, and provides for a better quality of life. These relationships are displayed in *Exhibit 5.14*.

⁹Deborah Degang and David Early, Transportation-Related Land Use Strategies to Minimize Motor Vehicle Emissions: an Indirect Source Research Study, Air Research Board, 1995.

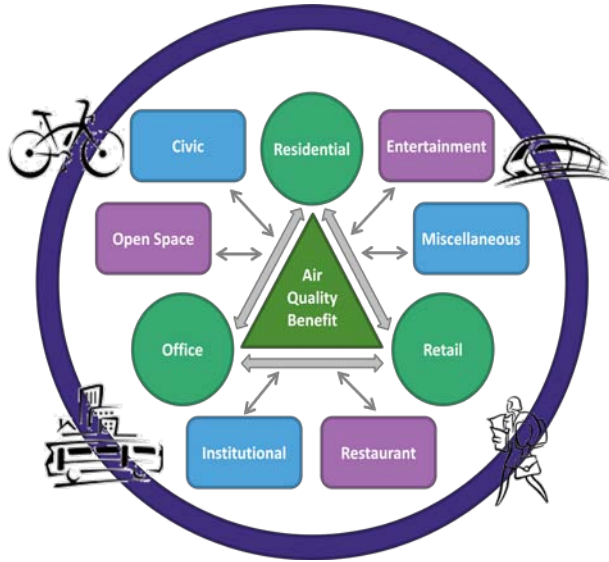


Exhibit 5.14: Mixed-use and Transit-oriented Development

Many developments in the Dallas-Fort Worth area incorporate sustainable strategies such as mixed-use development, transit-oriented developments served by multi-modal transportation options, infill developments that conserve resources, and unique communities with a sense of place. These trends contribute to the increasing emphasis on sustainable development and the likelihood of reaching regional air quality attainment goals.

Sustainable Development in North Central Texas

The North Central Texas Council of Governments supports a number of programs related to developing the region in a more sustainable fashion. Through NCTCOG's sustainable development programs, planning support for a diverse range of mobility options such as transit, automobiles, bicycling, and walking, local governments can present a range of development opportunities to the private sector to encourage a sustainable growth pattern.

Focusing on the responsibilities of the Metropolitan Planning Organization, the Regional Transportation Council established a sustainable development policy with four basic policy directions as shown in *Exhibit 5.15*:

- Utilize existing system capacity
- Improve rail mobility

SUSTAINABLE DEVELOPMENT DEFINITIONS

MIXED-USE DEVELOPMENT: Contain both commercial (office and retail) and residential uses in the same building vertically, or commercial developments with office and retail within a quarter mile of residential.

A mixed-use development should meet all the following criteria:

- A mix of residential and office and/or retail uses
- Mix of uses can be vertical or horizontal mix
- If horizontal mixed use, the residential use should be within a quarter mile of the commercial use
- Different land uses should have pedestrian linkages in the mixed-use development
- Should not develop industrial uses
- Should provide a significant portion of each use within the mix

Mixed-use developments should exclude, for example, the following types of developments: single-family detached development with standalone shopping centers, standalone hotel/residential, studio/light industrial combination, auto-only oriented development, parking structures without ground floor retail, single-use dominant developments with minimal auxiliary uses.

TRANSIT-ORIENTED DEVELOPMENT: A style of land planning and building orientation that encourages pedestrian activity that results from a passenger rail station. The boundary of a transit-oriented development can extend at least from a quarter- to half-mile radius around a passenger rail station depending on the walkability of the area. As shown in *Exhibit 5.14*, the ideal development is mixed use and the area is designed to encourage biking/walking from the station and surrounding area to the development. A network of roadways, bike lanes, and sidewalks connect the developments to the station.

- Promote mixed use
- Improve access management

Additionally, NCTCOG's Center of Development Excellence promotes quality growth in the region through the following Principles of Development Excellence. These principles guide cities, counties, school districts, and other public agencies and the private sector as they plan and create future development and redevelopment in the region:

- **Development Options:** Provide a variety and balance of development options and land use types in communities throughout the region.
- **Efficient Growth:** Foster redevelopment and infill of areas with existing infrastructure and promote the orderly and efficient provision of new infrastructure.
- **Pedestrian Design:** Create more neighborhoods with pedestrian-oriented features, streetscapes, and public spaces.
- **Housing Choice:** Sustain and facilitate a range of housing opportunities and choices for residents of multiple age groups and economic levels.
- **Activity Centers:** Create mixed-use and transit-oriented developments that serve as centers of neighborhood and community activity.
- **Environmental Stewardship:** Protect sensitive environmental areas, preserve natural stream corridors, and create developments that minimize impact on natural features.
- **Quality Places:** Strengthen community identity through use of compatible, quality architectural and landscape designs and preservation of significant historic structures.
- **Transportation Efficiency:** Develop land uses, building sites, and transportation infrastructure that enhance the efficient movement of people, goods, and services.
- **Resource Efficiency:** Provide functional, adaptable, and sustainable building and site designs that use water, energy, and material resources effectively and efficiently.
- **Implementation:** Adopt comprehensive plans and ordinances that support Development Excellence and involve residents and stakeholders in all aspects of the planning process.
- **Educational Opportunity:** Provide opportunities for all of North Texas to have access to schools, people, and technology they need for success in learning throughout their lives.

- **Healthy Communities:** Identify and support sustainable infrastructure and institutions that offer North Texas access to affordable nutritional foods, opportunities for physical activity, and access to wellness and primary care services.

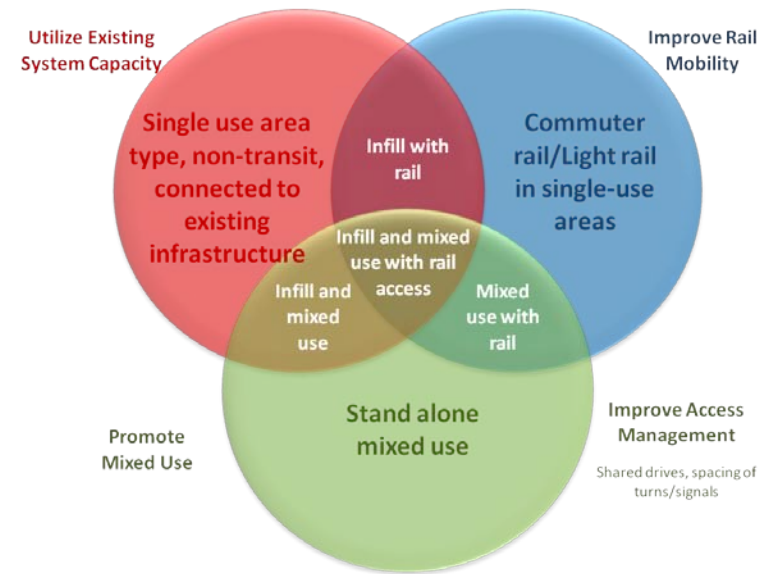


Exhibit 5.15: Regional Transportation Council Sustainable Development Policy Direction

Implementing Sustainable Development

As the region continues to grow and demand for housing and transportation options change, sustainable development principles that promote density and diversity, improve the economic, social, and environmental vitality of communities will become more important.

Implementing sustainable development strategies in the Dallas-Fort Worth area is important to demonstrating the outcomes of investing in new approaches to living and traveling in the region. The Mobility 2035 sustainable development policies are supported by the following initiatives:

- Respond to local initiatives for town centers, mixed-use growth centers, transit-oriented developments, infill/brownfield developments, and pedestrian-oriented projects.
- Complement rail investments with coordinated investments in park-and-ride and bicycle and pedestrian facilities.

- Encourage local government regulations that promote mixed-use, infill, and transit-oriented developments.
- Promote interaction between planning and zoning officials, development community, and transportation interests.
- Coordinate with transit agencies and the development community to incorporate access to facilities early in the design process.
- Incorporate livable communities factors as criteria in funding programs.
- Encourage multimodal transportation options including transit, bicycle, and pedestrian activities and programs.
- Encourage elements that reduce traffic congestion and pollution and offer traffic calming impacts which result in safer environments for pedestrians.
- Encourage mixed-use zoning and form-based codes including Smart Growth¹⁰ and New Urbanism Principles.¹¹

Sustainable Development Funding Program



Plano Transit-oriented Development – Funded through Sustainable Development Funding Program *Source: NCTCOG*

NCTCOG’s Sustainable Development Funding Program is one of the best examples of regional programs supporting Livability Principles in the region. NCTCOG’s Sustainable Development Funding Program was created by the Regional Transportation Council to encourage public-

private partnerships that positively address existing transportation system capacity, rail access, air quality concerns, and/or mixed-land uses. By allocating transportation funds to land-use projects promoting alternative transportation modes or reduced automobile use, regional partners are working to address escalating air quality, congestion, and quality of life issues. Three calls for projects

¹⁰ Smart Growth Network, About Smart Growth, <http://www.smargrowth.org>, accessed October 19, 2010.

¹¹ New Urbanism, Principles of Urbanism, <http://www.newurbanism.org/newurbanism/principles.html>, accessed October 19, 2010.

have been conducted over the past decade that have resulted in many projects supporting Livability Principles, Mobility 2035 sustainable development policies, and other regional and national goals. *Exhibit 5.16* summarizes the three calls for projects under the Sustainable Development Funding Program.

Program Year	Sustainable Development Project Type	Program Funding	Funding Source
2001	Infrastructure and Planning Projects	\$40 Million	CMAQ/STP-MM
2006	Infrastructure, Landbanking, and Planning Projects	\$40 Million	RTC Local Funds
2011	Infrastructure and Planning projects	\$44 Million	RTR/CMAQ/STP-MM/RTC Local Funds

Exhibit 5.16: Sustainable Development Funding Program Calls for Projects Summary

Exhibit 5.17 illustrates the 2011 Sustainable Development Program Areas of Interest. For this funding program, eligible projects included those located within walking distance to an existing or potential future rail station; in an area with a concentration of unemployed persons, high-emitting vehicles, or low-income households; and/or in historic downtowns with multiple contiguous street block frontage of pedestrian-oriented developments. Eligible projects were also required to have zoning in place that allowed the project to be built by right. Providing higher access to sustainable development projects for environmental justice communities was a goal that was incorporated into the selection process through both eligibility and scoring criteria. By taking into account project characteristics related to access to transit, access to jobs, access to housing, provision of workforce housing, provision of jobs in areas of high unemployment, the match between employment and household income, pedestrian connectivity, and overall high unemployment rates, this goal was met.

Vision North Texas

Vision North Texas (VNT), a public-private partnership aiming to improve the future quality of life, economic desirability, and long-term sustainability of the 16-county NCTCOG region, conducted analysis of development patterns in the region. The VNT effort provided Alternative Development scenarios that were compared to a Business as Usual scenario to assess what changing development patterns in the Dallas-Fort Worth area could mean to future sustainability. Appendix D and

the [North Texas 2050](#)¹² provide methodologies and results of the alternative demographic scenarios. In summary, the results of the Alternative Development analysis showed that changes in development patterns can reduce travel time, change commuting patterns, and alter infrastructure needs.

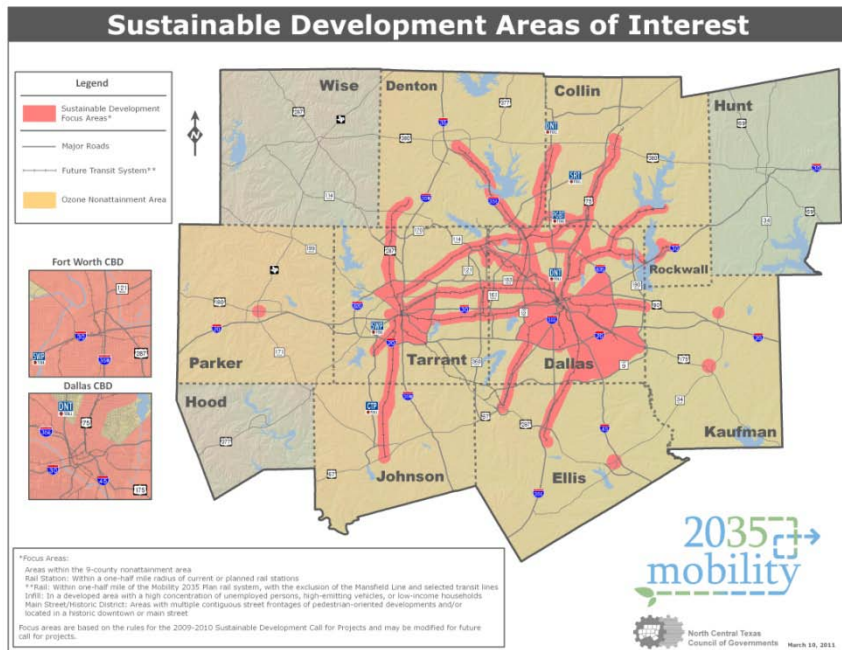


Exhibit 5.17: Sustainable Development Funding Program Focus Areas

Environmental Justice

One of the main components of sustainable development is social equity. Social equity and environmental justice are synonymous with each other. Environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.

Fair treatment means that no group of people, including racial, ethnic, or socioeconomic group, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies.

Many low-income or minority communities are abandoned, targeted for Locally Unwanted Land Uses (LULUs), such as public works maintenance facilities, power plants, and half-way houses.¹³ LULUs not only deter economic development initiatives, but endanger the general health, safety, and welfare of communities. Environmental justice issues, such as housing, employment, transportation, zoning, land use, and public investment in traditionally marginalized areas are often not addressed. Many smart growth initiatives, designed to reinvest in central city neighborhoods, gentrify low-income and/or minority communities and raise the cost of housing beyond the income of longtime residents. Homeowners often have to sell their homes because they can no longer afford the tax rates in their communities due to increased property values. This is because the issue of equity has not been fully integrated into the smart growth movement.

Encouraging housing, commercial, and retail to be compactly developed around transit stations allows people to access these services through various mobility means. This allows people to use their cars less or not at all and therefore spend less money on a vehicle and reduce their contribution to congestion on the roadways, leading to improved air quality.

As the region continues to grow and become more diverse, NCTCOG will utilize sustainable development principles to promote density and diversity, and improve the economic, social, and environmental vitality of communities. More information regarding environmental justice can be seen in the Social Considerations chapter.

Summary

The North Central Texas region has experienced unprecedented growth over the last decade. As the Dallas-Fort Worth area becomes home to millions more people and jobs by 2035, the demand placed on the transportation system will continue to grow. Encouraging and implementing sustainable growth patterns will be extremely important to supporting and maintaining a high quality of life. Sustainable development and the land use/transportation connection is a key initiative supported by Mobility 2035 to create an efficient transportation system that supports a livable and sustainable region.

¹² North Texas 2050, Vision North Texas, www.visionnorthtexas.org/main.html, accessed 2010.

¹³ Bullard, Robert D. ed., *Growing Smarter: Achieving Livable Communities, Environmental Justice, and Regional Equity*. (Massachusetts: Massachusetts Institute of Technology, 2007)

NCTCOG, in coordination with federal, state, and local government partners; the development community; and other stakeholders, will strive to improve the economic, environmental, and social sustainability of developments through sustainable transportation and promoting the land use/transportation connection. Providing the tools for creating livable communities is the goal and vision for the future of the region in 2035.

All sustainable development policies, programs, projects, and maps are provided in Appendix D.