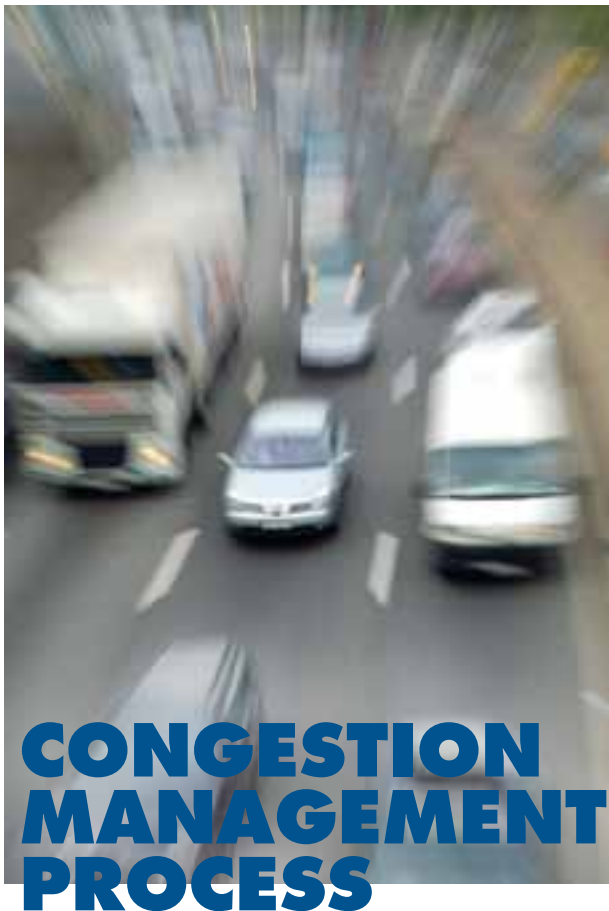


# Regional Mobility Initiatives

Vol. XII, No. 1 April 2008

**The Congestion Management Process (CMP)** seeks a solution to a growing traffic problem by targeting resources to operational management and travel demand reduction strategies. Although major capital investments are needed to meet the growing travel demand, the CMP also develops lower-cost strategies that complement major capital recommendations. The results are a more efficient and effective transportation system, increased mobility, and a leveraging of resources.



With the Dallas-Fort Worth urban area as its center, the North Central Texas region plays an important role in the State of Texas, as well as the entire southwestern U.S. The region provides critical air and ground transportation hubs for the movement of people and goods throughout the United States and internationally. Locally, these transportation systems support many high-tech manufacturers and telecommunications firms, large retail and wholesale distribution centers, and a growing convention and tourism industry.

More than 6 million people reside in the nine urban counties (Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, and Tarrant) in North Central Texas, and population is expected to increase to 8.5 million by 2030. Urban activity in this area is supported by various ground transportation systems, including:

- 750 centerline miles of freeways
- 1,754 miles of regional arterials
- 71 centerline miles of toll roads
- 45 miles of light-rail transit
- 80 miles of high-occupancy vehicle lanes
- 35 miles of commuter-rail transit

These systems will help alleviate a growing traffic congestion problem in the Metroplex. The rapid growth of the Dallas-Fort Worth region in the past decade has led to increasing transportation problems. A favorable business environment, tax advantages, and the availability of undeveloped land

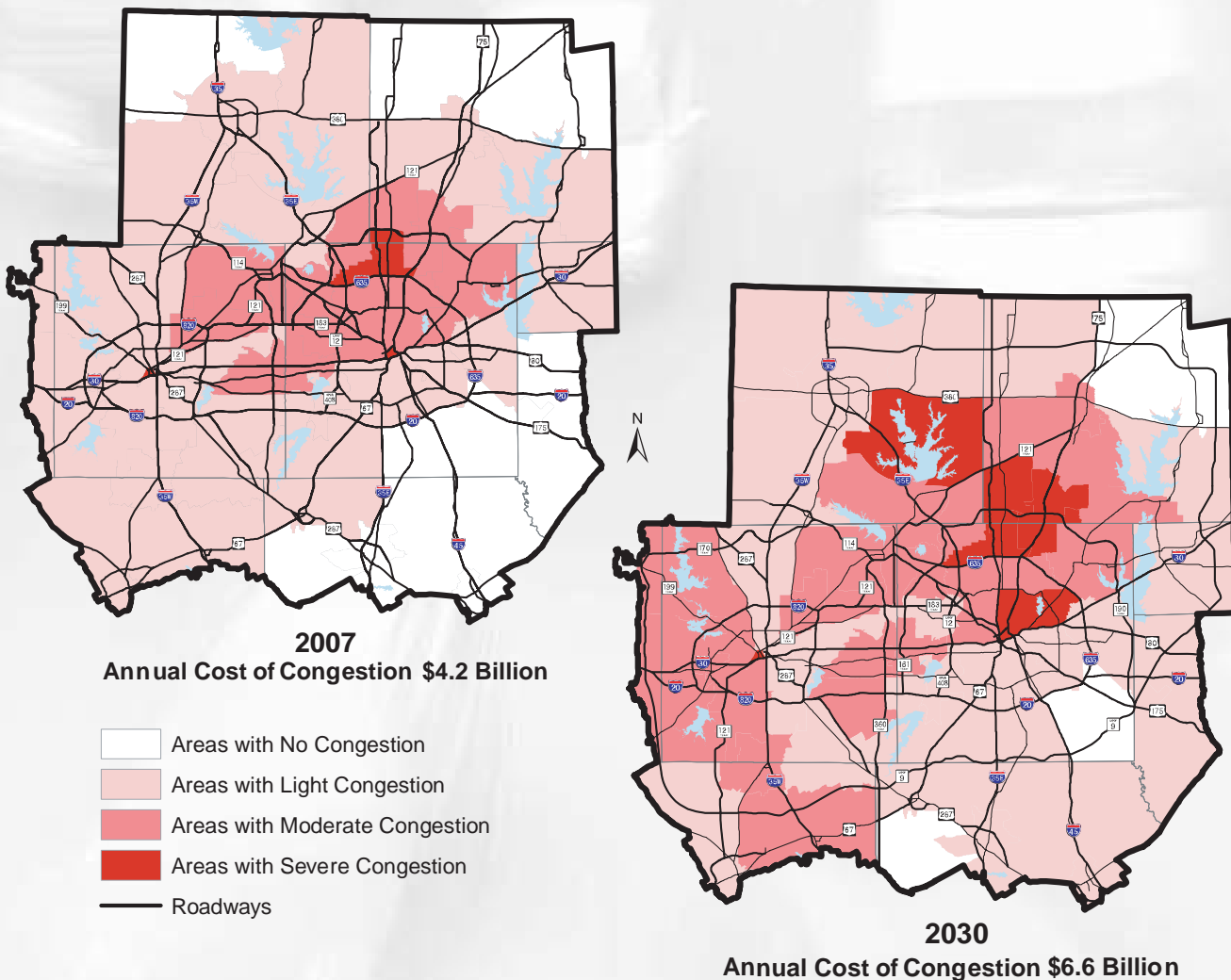
continue to attract many businesses to the region. While growth has many benefits, the recent rate of growth has so overloaded the transportation system that available financial resources to improve transportation have not kept pace. The impacts are increased traffic congestion and delay, and substandard air quality. This report highlights the Congestion Management Process, outlines its importance and provides examples of its implementation.

# Congestion Management Process

Transportation system performance can be measured in several ways, especially when dealing with a multimodal transportation system. It is often measured in terms of how successful the system is in reducing roadway traffic congestion and enhancing mobility. If multimodal options, trip reduction programs, system management projects, and other travel policies are effective, the result will reduce congestion on the roadway system. However, demographic growth may increase faster than transportation system capacity can be provided, either due to implementation issues or financial constraint.

As shown in the maps below, even if the projects, programs, and policies contained in "Mobility 2030: The Metropolitan Transportation Plan" are implemented, travel time due to congestion is expected to increase by 36 percent with an annual congestion cost of \$6.6 billion. Severe congestion will spread to include southeast Denton County and additional portions of northern Dallas and southern Collin counties. The graphic below illustrates the growing congestion in the region from 2007 to 2030.

## System Performance Levels of Congestion



# Congestion Management Process

As shown in the diagram below, the CMP is fully integrated into the region's transportation planning and programming processes. The diagram illustrates the seven components of the CMP and the role of the Metropolitan Transportation Plan, Transportation Improvement Program, Unified Planning Work Program, and the State of the Region report in this process.

The first process in the CMP, system identification, is obtained from the Metropolitan Transportation Plan. The MTP is the transportation plan for the Dallas-Fort Worth region.

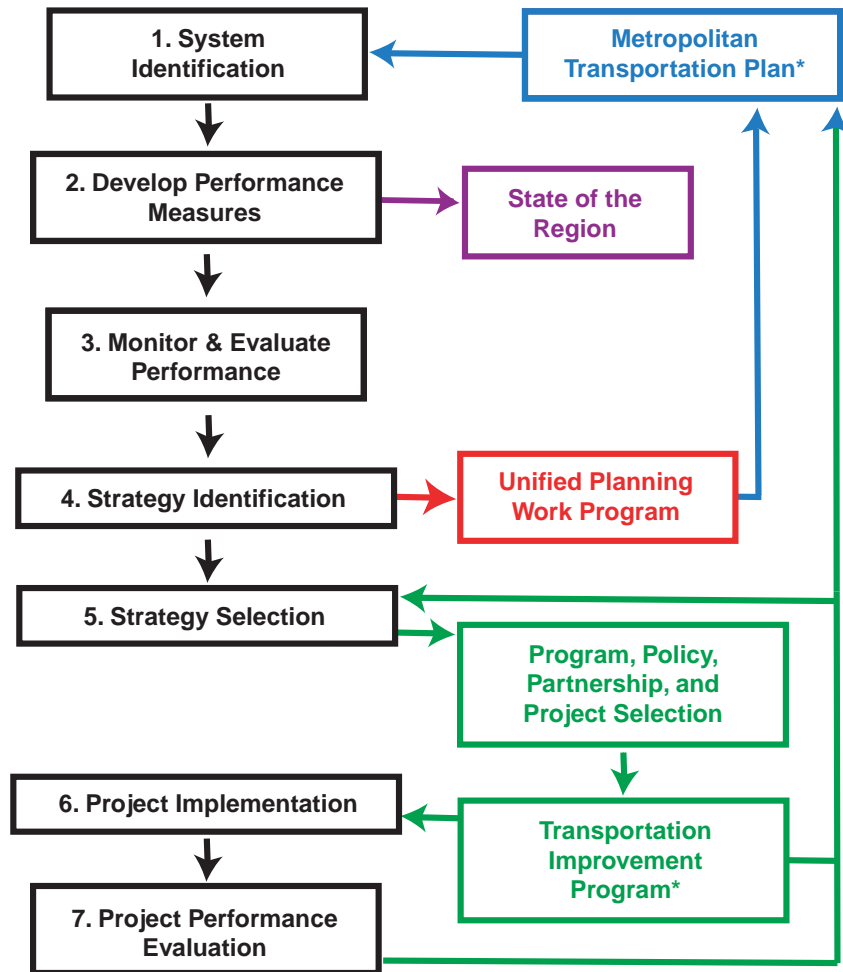
The State of the Region report, outlined in purple, is the outcome of the performance measures developed during the second process of the CMP. The third process is to monitor and evaluate performance.

The fourth process that is part of the CMP, strategy identification, identifies strategies that become part of the Unified Planning Work Program (outlined in red) and the MTP. The UPWP describes the transportation and air quality planning efforts in the North Central Texas region.

The fifth and sixth processes, strategy selection and project implementation, are integrated into the Transportation Improvement Program and are outlined in green in the flow chart. The TIP is a staged, multiyear program of projects approved for funding by federal, State, and local sources within the Dallas-Fort Worth area.

The final process in the CMP, project performance evaluation, provides an assessment of the mobility and air quality benefits of projects to better evaluate them in the future. This process ties back into the TIP and the MTP.

## Congestion Management Process and Products



\* Conforming Plan and TIP

# System Identification

The first step of the CMP is to identify the system or systems that are congested. In the current CMP, four transportation systems are identified: the freeway system, regional arterial system, intermodal/freight system and passenger rail system. An example of system identification for the intermodal/freight system is provided below.

## Intermodal/Freight System

The North Central Texas region represents one of the largest “inland ports” in the nation where freight is moved, transferred, and distributed to destinations around the world. North Central Texas has one of the most extensive surface, air, and rail transportation networks in the world, providing trade opportunities for the more than 600 motor/trucking carriers and almost 100 freight forwarders that operate out of the DFW metropolitan area. As a measure of the region’s strategic geographic position for goods movement, nearly the entire United States population can be reached by truck within 48 hours from the DFW metropolitan area.

Numerous trade routes intersect in the DFW region, creating a need for efficient goods movement flows. Interstate Highway 35 extends from the Texas-Mexico

border to northern Minnesota. Referred to as the North American Free Trade Agreement superhighway, this major north-south route serves both the Fort Worth central business district and the Dallas central business district. NCTCOG has developed an inventory of regional freight transportation facilities, which are highlighted in the map below.



Source: NCTCOG

The location of the Metroplex makes it an important hub for freight moved to points throughout the country.

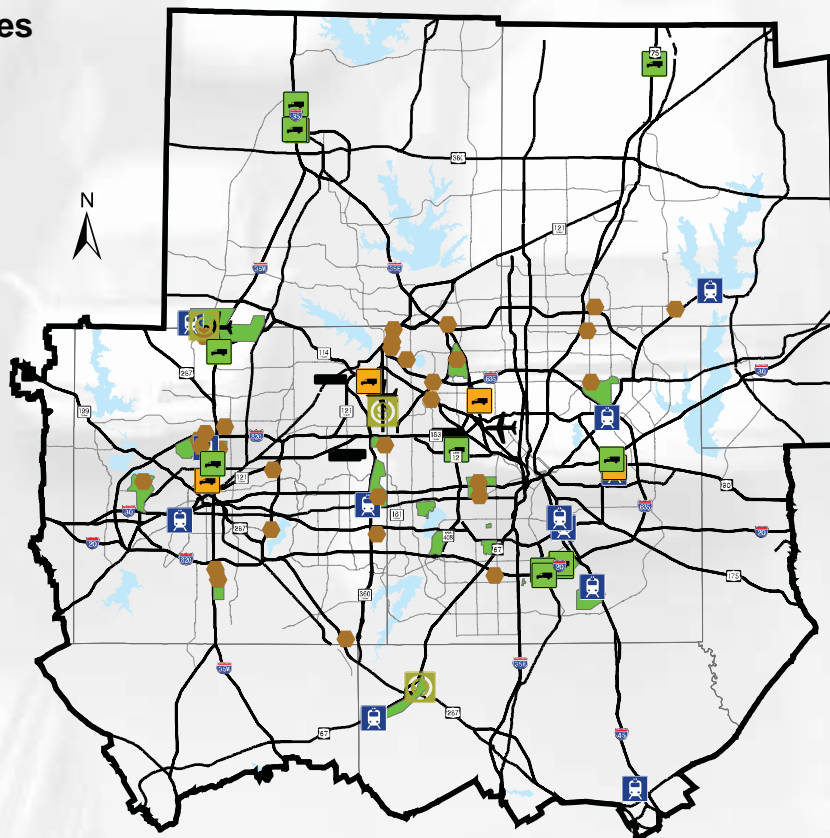
## Existing Freight Facilities

### Legend

- Truck Stop
- Foreign Trade Zone
- Industry Parks
- Major Airport
- Parcel Delivery Hub
- Pipeline Terminal
- Rail Yard / Intermodal Facility
- FODs
- Freeways
- Major Roadways
- Regional Arterials
- County Boundaries
- Metropolitan Planning Area Boundary
- Major Lakes

New facility locations indicate transportation needs and do not represent specific alignments

November 20, 2006





# Develop Performance Measures

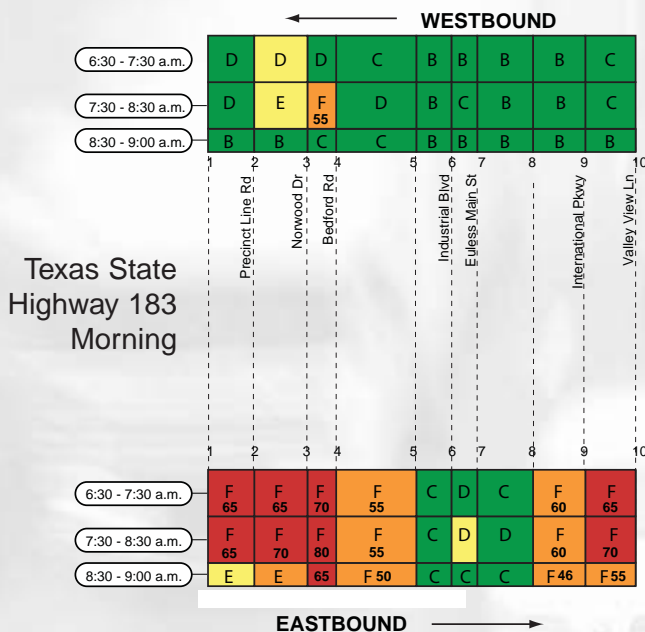
Data collection and system performance monitoring provide a high-level overview of the congested facilities and the severity of congested facilities. The goal of system monitoring and data collection programs is to develop an ongoing system of monitoring and reporting that relies heavily on data already collected or planned to be collected in the nine-county Dallas-Fort Worth area.

The variety of data collection and performance measures are used to look at multiple elements that affect traffic congestion in a multimodal transportation system. These performance measures focus on recurring and non-recurring congestion, as well as the impacts of freight movement. The data collection and

performance measures included in the table below will continue to expand over time as more data become available and other performance measures mature. The table outlines existing system-monitoring and data-collection programs at NCTCOG.

Congested Facility Type	Observed or Forecast Data	Performance Measures
Controlled-Access Facilities	Forecast/Observed Observed	Levels of Service Reliability/Speed
Regional Arterial System	Observed	Volumes (7-day and 24-hour vehicle counts)
Intermodal/Freight System	Forecast Forecast Observed	Freight Rail Forecast Truck Traffic Forecast Vehicle Classification Counts
Passenger Rail Transportation	Observed Observed Observed	DART Light Rail Train Ridership TRE Average Weekday Ridership by Station TRE Ridership from West to East

## Level of Service Description



Source: Dallas Area Rapid Transit



Source: NCTCOG

As the Dallas-Fort Worth area continues to grow, congestion is becoming more severe. NCTCOG is working with its transportation partners to improve mobility throughout the region.

<http://www.nctcog.org/trans/data/aerial/2003/index.asp>

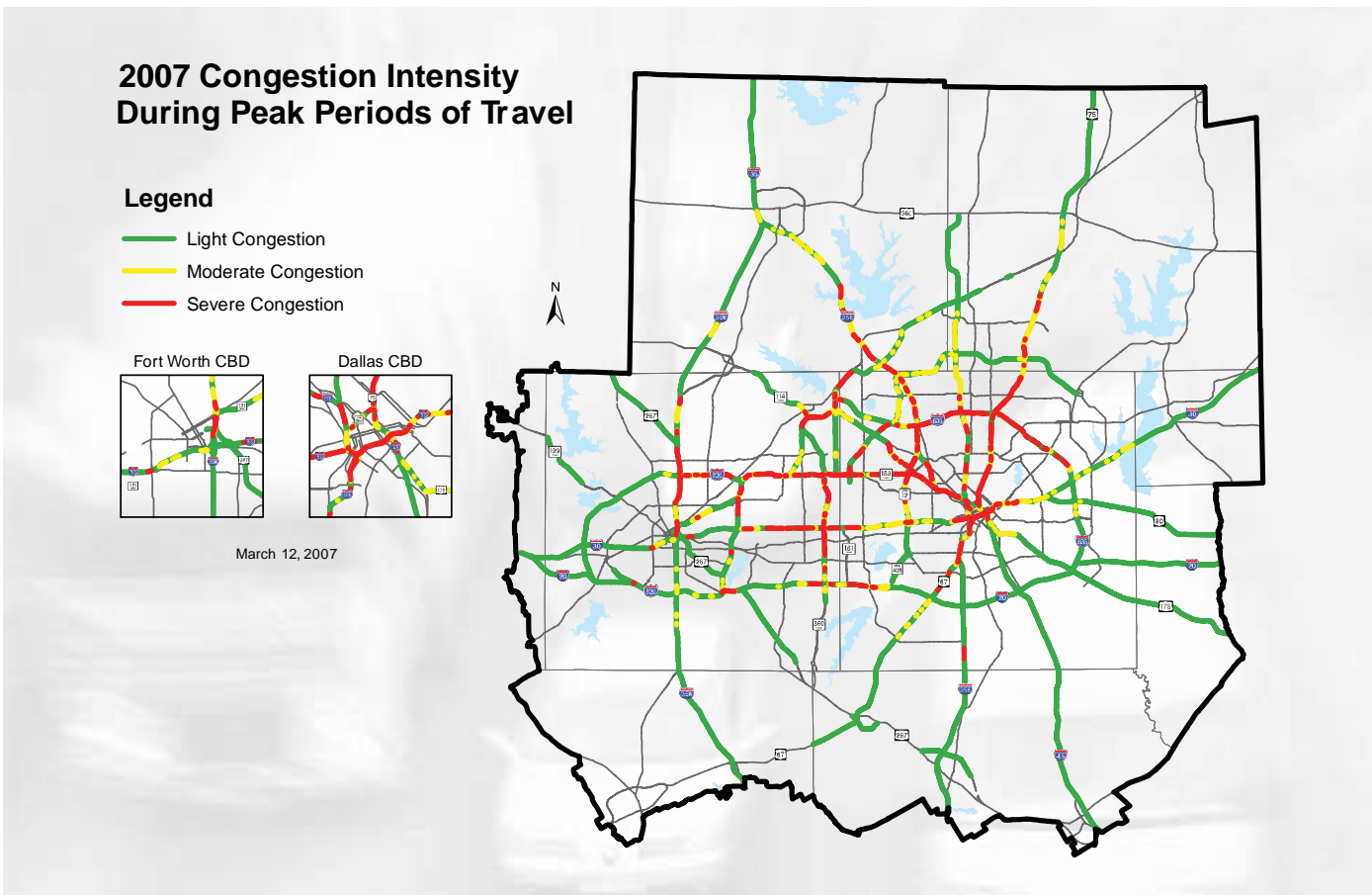
# Monitor and Evaluate Performance

The maps and tables in this section highlight some of the performance measures that have been identified. Increasing traffic congestion and the resulting vehicle emissions are major problems in the Dallas-Fort Worth region. Faced with growing travel demand and limited resources, it is critical that decision-makers understand current transportation system performance.

## Controlled-Access Facilities

The controlled-access-facilities system is made up of freeways, high-occupancy vehicle lanes, tollways, and managed lanes. These controlled-access facilities are major components of the DFW metropolitan transportation system. The system continues to carry nearly half of all vehicular traffic in the area. Given the limited availability of other multimodal options, there will continue to be significant demand placed on the region's roadway system.

The DFW Regional Travel Model output was derived from the level of service map below to better illustrate the extent of congestion on the controlled-access facilities. Light congestion indicates facilities with levels of service "A", "B", or "C" during both or one of the peak periods. Moderate congestion indicates facilities that are levels of service "D" or "E" during both peak periods. Severe congestion indicates facilities that are levels of service "F" during both peak periods.



Aside from recurring congestion or expected delay, non-recurring congestion, or unexpected delay, is another measure quantified on controlled-access facilities. According to the Texas Transportation Institute's Urban Mobility Study, 52 percent to 58 percent of delay experienced by motorists in urban areas is

caused by incidents, such as crashes and stalled vehicles.

The map on page 7 shows the percentage of time commuters on controlled-access facilities encounter speeds of less than 35 mph. The facilities with no color indicate no speed sensor data were available to

# Monitor and Evaluate Performance

## Facilities With Speed Sensors

### 2007 Freeway System

#### Percent of Time Speed Below 35 mph

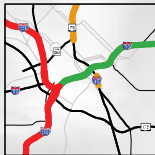
- 0% - 4.99%
- 5% - 14.99%
- 15% >

- Freeways
- Major Roadways
- Regional Arterials
- County Boundaries
- Metropolitan Planning Area Boundary
- Major Lakes

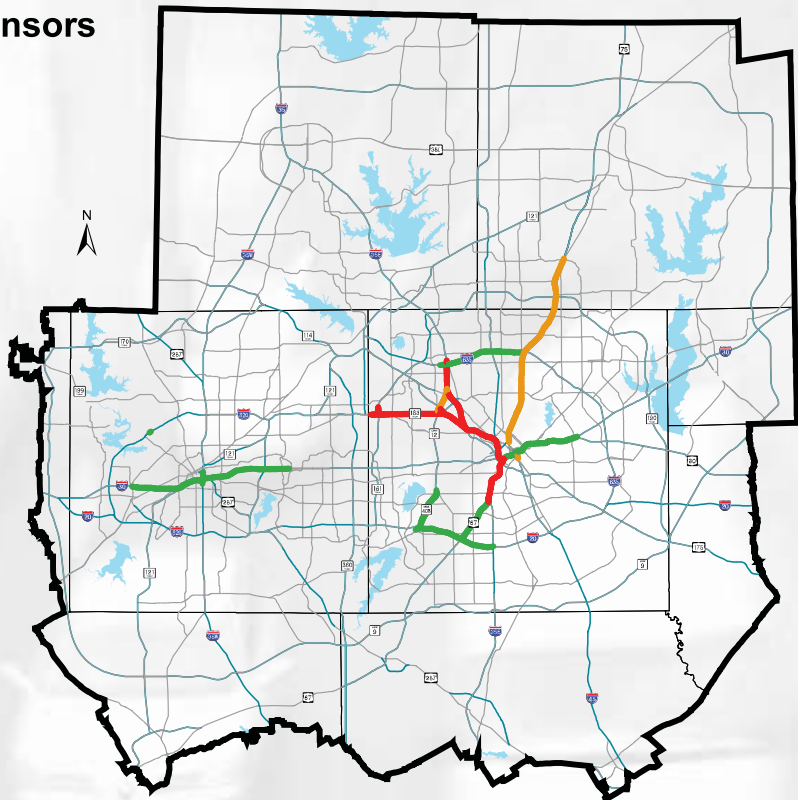
Fort Worth CBD



Dallas CBD



Facilities that are not colored indicate no sensor data available

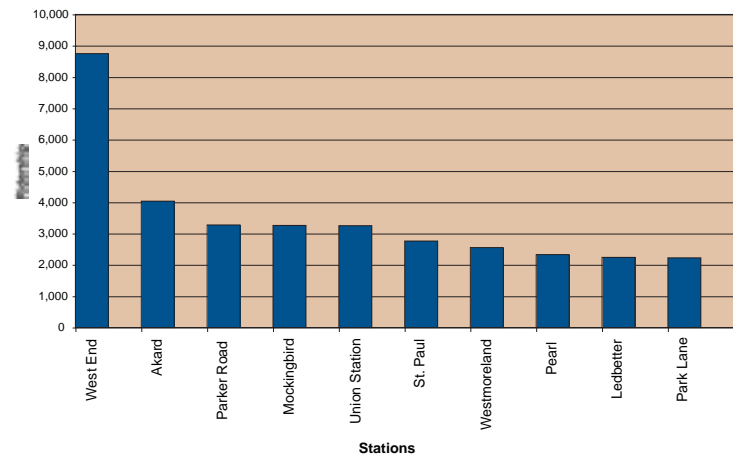


Performance measures for rail transportation can be developed from two sources: forecast ridership or observed data collection. The Dallas Area Rapid Transit (DART) and The Fort Worth Transportation Authority (The T) are the transit agencies that collect and compile the observed transit data, and NCTCOG can provide transit forecasts from the DFW Regional Travel Model. Collected transit data include ridership, subsidy per passenger, and transit timing. DART light rail performance data for the system's top 10 stations are provided at right.

DART will substantially increase its reach when the new Green and Orange lines open. The Green Line will run to Carrollton. The Orange Line will end at Dallas/Fort Worth International Airport.

## Passenger Rail Transportation

Ridership for the top 10 DART stations  
12-month weekday average  
November 2005 to October 2006



# Strategy Identification

Congestion management strategies on the controlled-access-facilities system, regional arterial system, intermodal/freight system and passenger rail system include the implementation of Transportation System Management, Travel Demand Management, and Intelligent Transportation System improvements. Some of the strategies are listed below. All congested facility types have a variety of strategies that can be deployed to alleviate congestion. The strategy or combination of strategies implemented depend on the type of congestion experienced.

## Transportation System Management Strategies

**Traffic Signalization and Control** (new signal installation, signal re-timing, signal hardware upgrades, signal interconnection, and demand-responsive signal system)

**Intersection and Street Improvements** (intersection/street widening, lane assignment changes, installation of turn lanes, land use restrictions, and bus loading bays)

**Bottleneck Removal** (re-striping, installation of signage, addition of lanes, reduction of merging and weaving)

**Special-Event Management** (traffic management plans, signal timing plans, and dynamic lane assignments)

**Access Management** (turn lanes, driveway closures)

## Travel Demand Management Strategies

**Improve Transportation Options** (alternative work schedules, vanpooling/carpooling, park & ride, and bike and pedestrian improvements)

**Incentives to Use Alternative Modes** (parking management/shared parking, congestion pricing/road pricing, and guaranteed ride home programs)

**Sustainable Development** (transit-oriented development, land use density and clustering, and bicycle parking facilities)

**Policy and Institutional Reform** (car-free planning, speed reduction, and context-sensitive design)

**TDM Marketing and Education** (walking and cycling encouragement, transit and alternative-mode encouragement, transportation management associations, "Try Parking It")

## Intelligent Transportation System Strategies

**Public Transportation** (transit vehicle tracking, transit fixed-route operations, transit passenger and fare management, and transit traveler information)

**Traffic Management** (network surveillance, surface street control, freeway control, traffic incident-management system, electronic toll collection, advanced railroad-grade crossing, regional parking management, and roadway closure management)

**Commercial Vehicle Operations** (fleet and freight administration, electronic clearance, weigh-in-motion, roadside commercial vehicle operations safety, HAZMAT management, and freight assignment tracking)

**Emergency Management** (emergency routing, roadway service patrols, and disaster traveler information)

**Maintenance & Construction Management** (maintenance and construction vehicle and equipment tracking, road weather data collection, roadway automated treatment, and work-zone management)



# Strategy Selection/Project Implementation

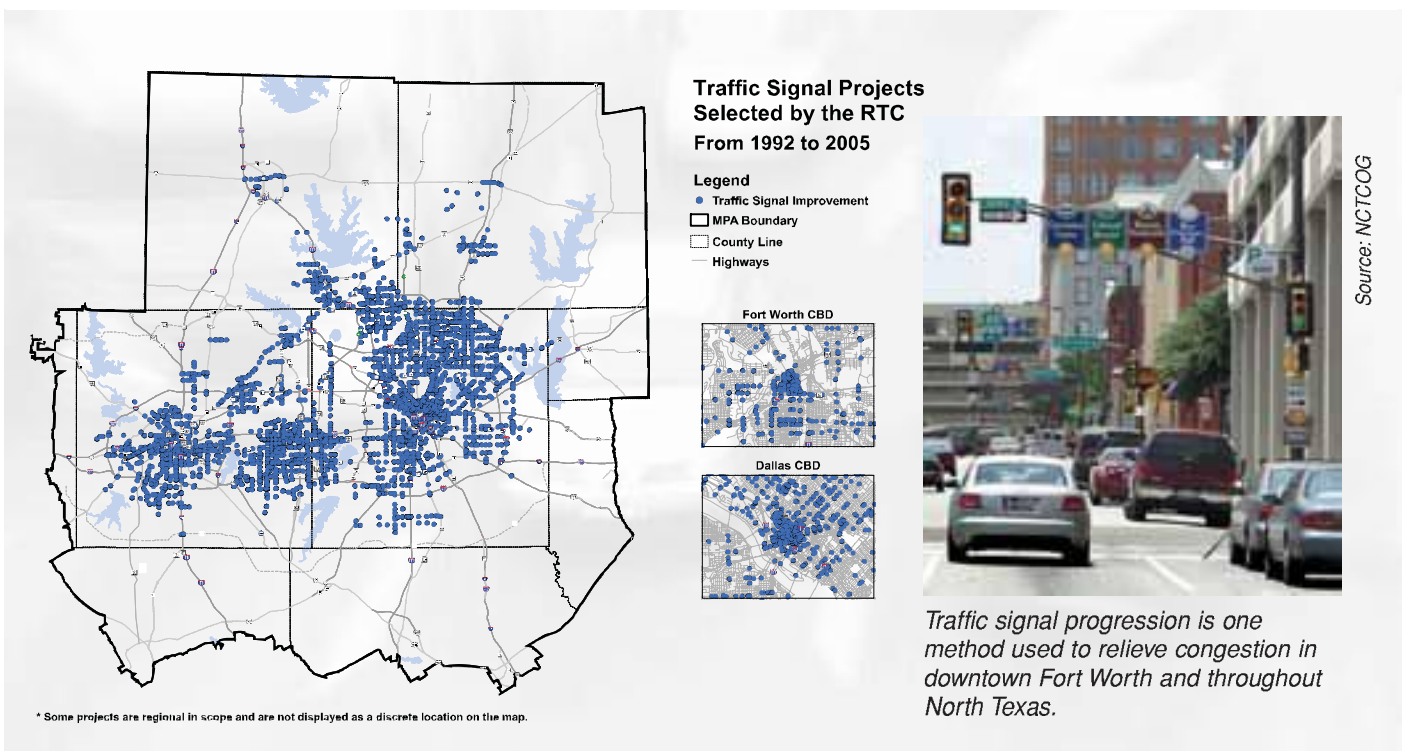
Strategy selection and project implementation are the next steps in the CMP. These steps are initiated through the Transportation Improvement Program. The selection of operational and travel demand reduction strategies for congested modes is based on the strategies that yield the largest mobility and air quality benefit with a low cost. In the current TIP, the transportation funds have been allocated to a variety of strategies. These strategies are also quickly implemented, so results can be determined much sooner than with other capacity projects.

The Regional Transportation Council passed a resolution in 1998 that requires all Major Investment Studies include an evaluation of operational management and travel demand reduction solutions to congestion and air quality concerns. Each congestion management recommendation and commitment documented in the inventory will be monitored to ensure its inclusion in the Metropolitan Transportation Plan and the Transportation Improvement Program by an applicable deadline.

## Regional Arterial System

Locations of traffic signal projects in the Transportation Improvement Program are highlighted in the map below.

One thousand traffic signal improvements are funded under the current TIP. These projects include signal timing optimization, signal equipment upgrades, signal system interconnection, and the Traffic Signal Integration and Monitoring Project (also known as the Thoroughfare Assessment Program).



About 300 arterial intersection improvements will be implemented through the TIP, thus enhancing arterial traffic flow, in addition to reducing the propensity for accidents. Intersection improvements include turn lanes, traffic islands, grade separations, and channelization.

## Intermodal/Freight System

An intermodal freight project in the current TIP is the Goods Movement Corridors Technology Deployment Project. This project includes the installation of Intelligent

Transportation Systems technologies and highway capacity enhancements along the North American Free Trade Agreement corridor as it passes through urban areas. ITS improvements will include traveler information dissemination, advanced traffic management, and weather/ice prediction stations. Deployment of this system on IH 35 will prepare the region for future implementation of such technologies on other major freight corridors and connector routes.

# Project Performance Evaluation

The goal of the project performance evaluation studies is to have an ongoing program to evaluate the benefits of transportation programs and projects that reduce single-occupancy vehicle travel and peak period travel, and improve the efficiency of the existing transportation system through operational and travel demand reduction strategies. Project performance evaluations are conducted to allow NCTCOG and other regional partners to better understand the mobility and air quality benefits of projects.

## Controlled-Access Facilities and Intermodal/Freight System

The Truck Lane Pilot Study is a strategy that was implemented on a portion of the controlled-access facilities. This pilot study restricted trucks from the inside

lane and required that the facility have at least three lanes in each direction. The results from the study, provided in the table below, show an increase in speeds on the roadway facilities. As a result of this study, additional controlled-access facilities could receive similar restrictions in the future.

Project Performance Evaluation			
Truck Lane Pilot Study			
Change in Average Speed			
Lane	Phase 1	Phase 4	Phase 1 vs. Phase 4
Left	71.50	72.38	0.88
Middle	65.63	66.19	0.56
Right	60.75	61.25	0.50

Restrictions prohibiting trucks from traveling on stretches of Interstate Highway 30 and IH 20 have improved speed and traffic flow. The restrictions could be expanded to include other freeways in the Metroplex if they have at least three lanes in each direction.



Source: NCTCOG

## Regional Arterial System

The Thoroughfare Assessment Program is a region-wide traffic-signal improvement program that includes a baseline analysis, recommendation and implementation of low-cost capital improvements, and an improved analysis. The goal of the program is to maximize the capacity of the existing system by improving traffic operations through signal retiming and implementation of low-cost operational improvements along selected corridors. As a result of implementing new optimized signal timing and recommended low-cost operational improvements along corridors, the following benefits have been quantified:

- 16 percent to 31 percent decrease in travel time
- 39 percent to 67 percent decrease in delay
- 30 percent to 58 percent decrease in the number of stops

- 20 percent to 51 percent increase in the average speed
- 9 percent to 13 percent reduction in Volatile Organic Compounds emissions
- 3 percent to 7 percent reduction in Nitrogen Oxides

## Passenger Rail Transportation

Below is a list of some transit project performance evaluations/planning studies that have documented performance measures on the passenger rail transportation system.

- TRE Survey – 2002 Ridership
- D/FW International Airport Rail Planning and Implementation Study
- Denton County Transit Authority Alternative Analysis

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## What Is NCTCOG?

The North Central Texas Council of Governments (NCTCOG) is a voluntary association of local governments within the 16-county North Central Texas region. The agency was established in 1966 to assist local governments in planning for common needs, cooperating for mutual benefit, and coordinating for sound regional development. North Central Texas is a 16-county region with a population of 6.5 million and an area of approximately 12,800 square miles. NCTCOG has 233 member governments, including all 16 counties, 165 cities, 23 independent school districts, and 29 special districts.

Since 1974, NCTCOG has served as the Metropolitan Planning Organization (MPO) for transportation in the Dallas-Fort Worth Metropolitan Area. The Regional Transportation Council (RTC) is the policy body for the MPO. The RTC consists of 40 members, predominantly local elected officials, overseeing the regional transportation planning process. NCTCOG's Transportation Department is responsible for support and staff assistance to the RTC and its technical committees, which comprise the MPO policy-making structure.

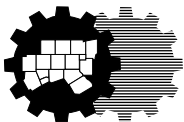
### Regional Mobility Initiatives Issues

**Advanced Transportation Management**, *March 1996*  
**Air Quality**, *July 1996*  
**Traffic Congestion**, *October 1996*  
**Multimodal Solutions in the North Central Corridor**, *July 1997*  
**Toll Roads**, *February 1998*  
**Major Investment Studies**, *August 1998*  
**The Transportation Equity Act for the 21st Century**, *October 1998*  
**High Occupancy Vehicle (HOV) Lanes**, *December 1998*  
**Travel Demand Forecasting Procedures**, *June 1999*  
**Commuter Traffic**, *December 2000*  
**Pedestrian Transportation**, *August 2002*  
**Metropolitan Planning Organization**, *November 2002*  
**Rail Station Access**, *February 2003*  
**Traffic Congestion**, *October 2004*  
**Regional Rail**, *October 2005*  
**Goods Movement**, *January 2006*  
**North Texas Regional ITS Architecture**, *December 2006*  
**SAFETEA-LU**, *June 2007*  
**Metropolitan Planning Organization**, *August 2007*  
**Air Quality**, *September 2007*

### We would like your comments . . .

If you have questions or comments regarding the transportation and air quality programs of the North Central Texas Council of Governments and the Regional Transportation Council or need additional information, please contact the NCTCOG Transportation Department at (817) 695-9240, by fax at (817) 640-3028, via e-mail: [transinfo@nctcog.org](mailto:transinfo@nctcog.org), or visit our website at [www.nctcog.org/trans](http://www.nctcog.org/trans).

*The contents of this report reflect the views of the authors who are responsible for the opinions, findings, and conclusions presented herein. The contents do not necessarily reflect the views or policies of the Federal Highway Administration, the Federal Transit Administration, or the Texas Department of Transportation. This document was prepared in cooperation with the Texas Department of Transportation and the U.S. Department of Transportation, Federal Highway Administration, and Federal Transit Administration.*



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