

# **CONGESTION MANAGEMENT PROCESS**



## **Technical Briefing Report**

**April 2007**



**North Central Texas  
Council of Governments  
Transportation Department**

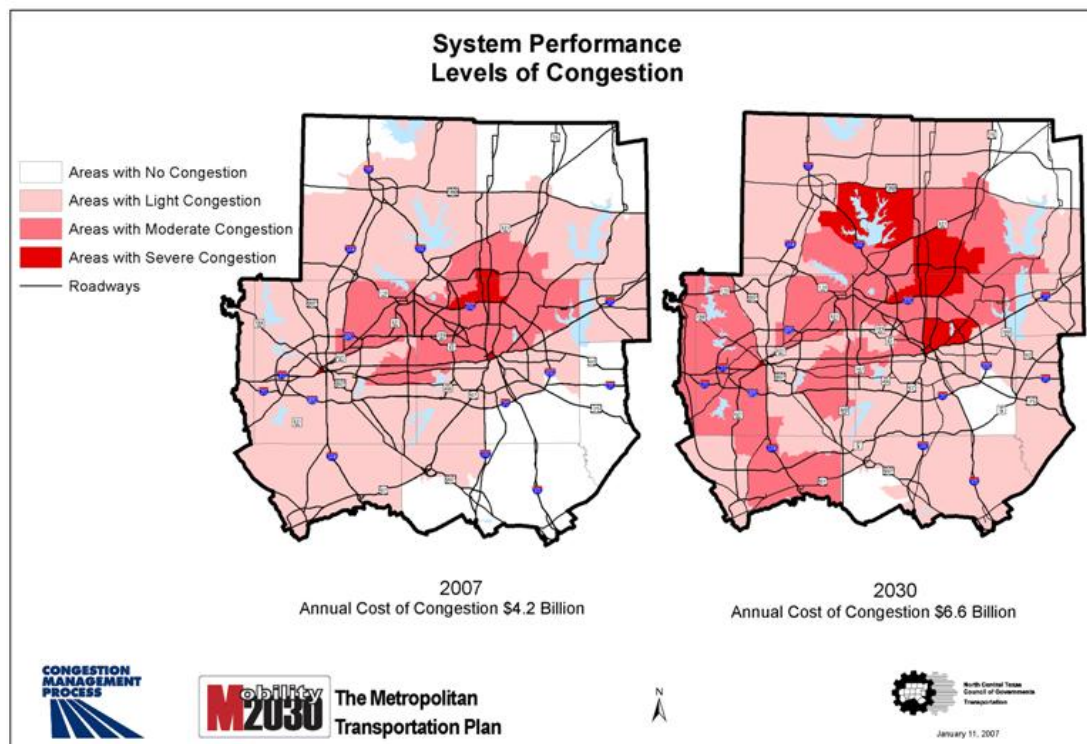
## **CONGESTION MANAGEMENT PROCESS (CMP)**

The Congestion Management Process (CMP) seeks a management 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.

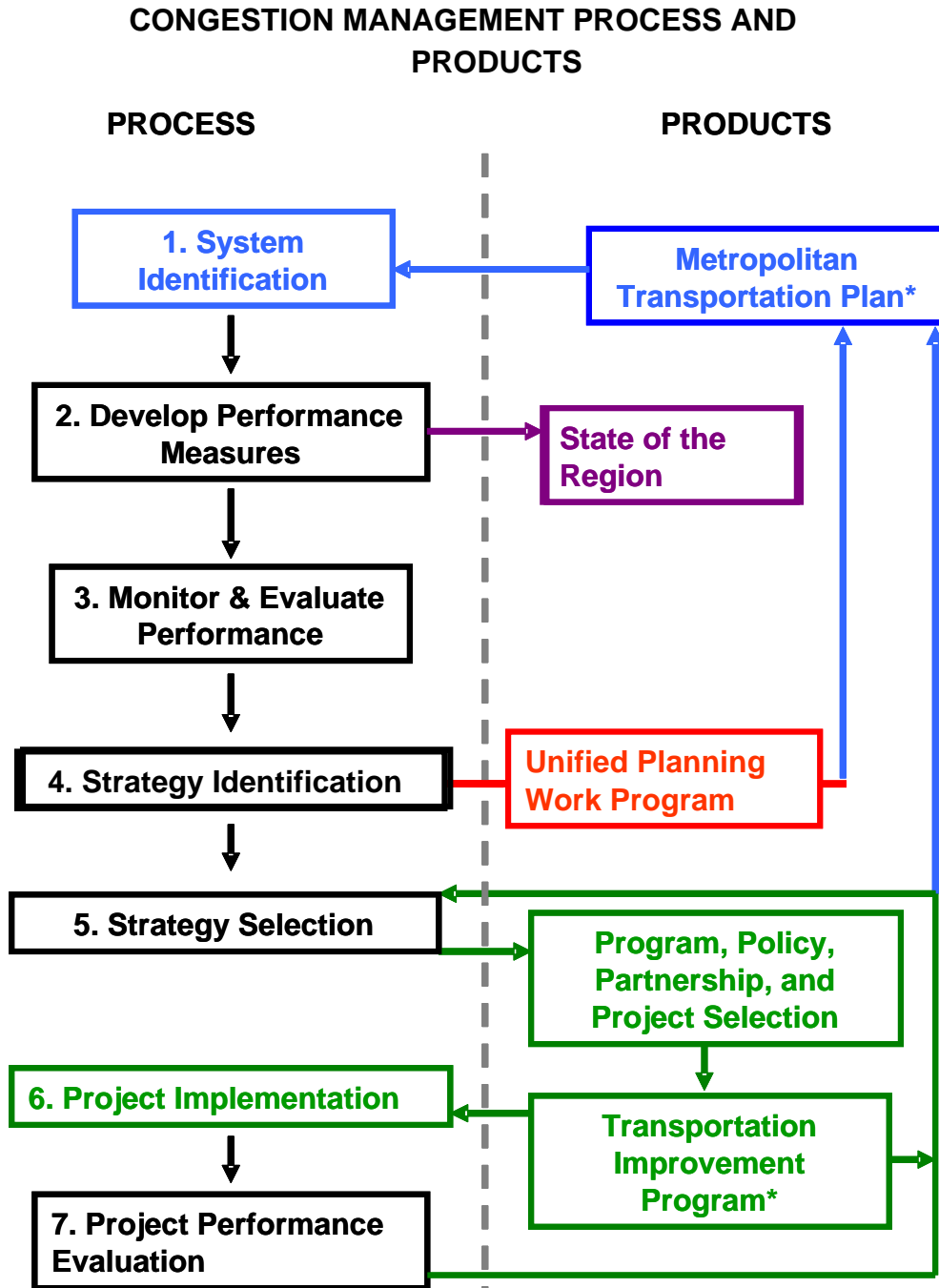
More than six million people reside in the nine urban counties in North Central Texas, and population is expected to increase by 40 percent over the next 25 years. Urban activity in this area is supported by various ground transportation systems, including:

- 750 centerline miles of freeways
- 1,756 miles of regional arterials
- 45 miles of light rail transit
- 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. While growth has many benefits, the recent rate of growth has so overloaded the transportation system that financial resources available to improve transportation have not kept pace. The effects are now evident in increased traffic congestion and delay, and substandard air quality. With the population growth expected to continue, the traffic congestion in the Dallas-Fort Worth region is expected to worsen. The map below illustrates the growing congestion in our region from 2007 to 2030`.



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



\* Conforming Plan and TIP

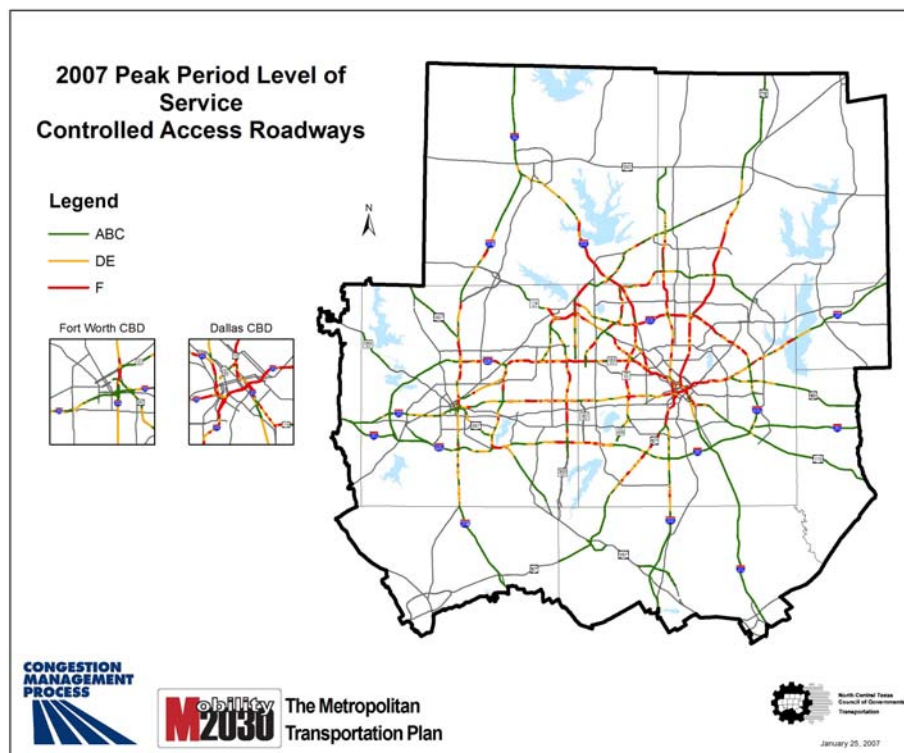
## CONTROLLED ACCESS FACILITIES

### System Identification

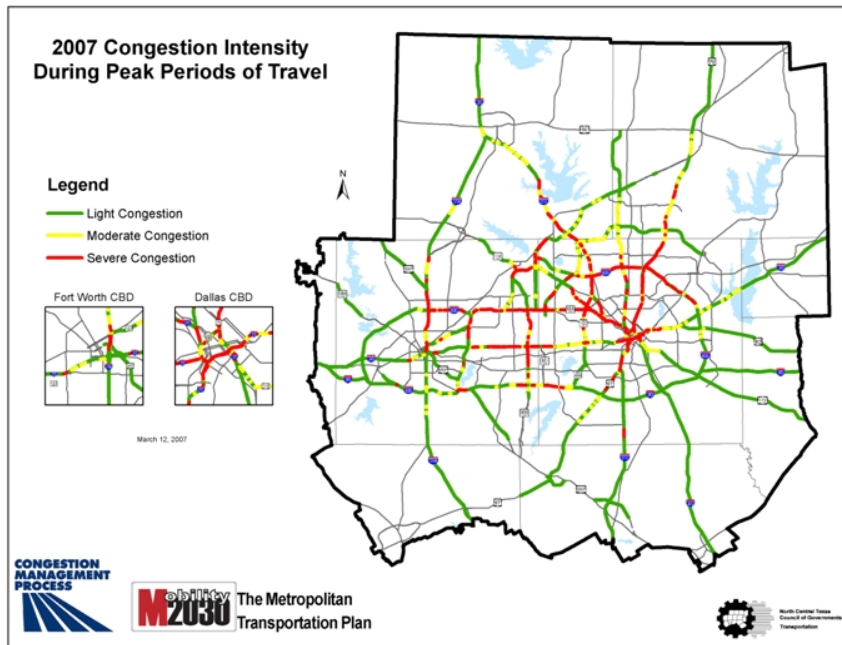
Controlled access facilities are major components of the DFW Metropolitan Transportation System. The system continues to carry nearly half of all vehicular travel in the area. Given consideration to the availability of other multimodal options and advanced traffic management strategies, there will continue to be significant demand placed on the region's roadway system. The controlled access facilities system is made up of freeways, high occupancy vehicle lanes, tollways, and managed lanes.

### **Performance Measures/Monitor and Evaluate Performance**

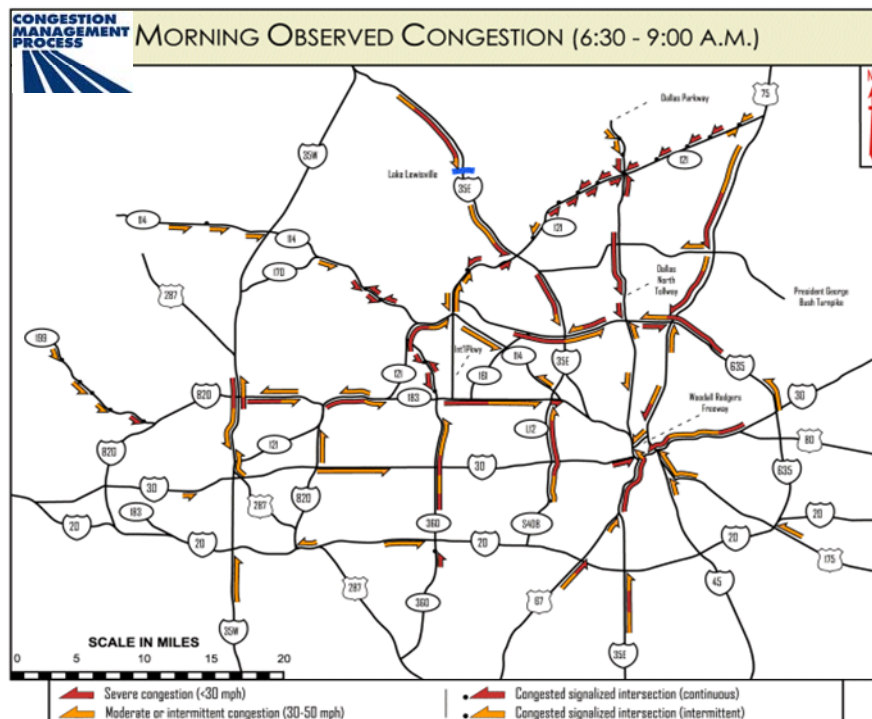
Data collection and system performance monitoring provide a high level overview of congested facilities and the severity of congested facilities. The map below illustrates Dallas-Fort Worth controlled access facilities performance based on roadway level of service (LOS). This information is output from the DFW Regional Travel Model. The ratings are density-based LOS designations "A", "B", "C", "D", "E", and "F", as defined in the Highway Capacity Manual.



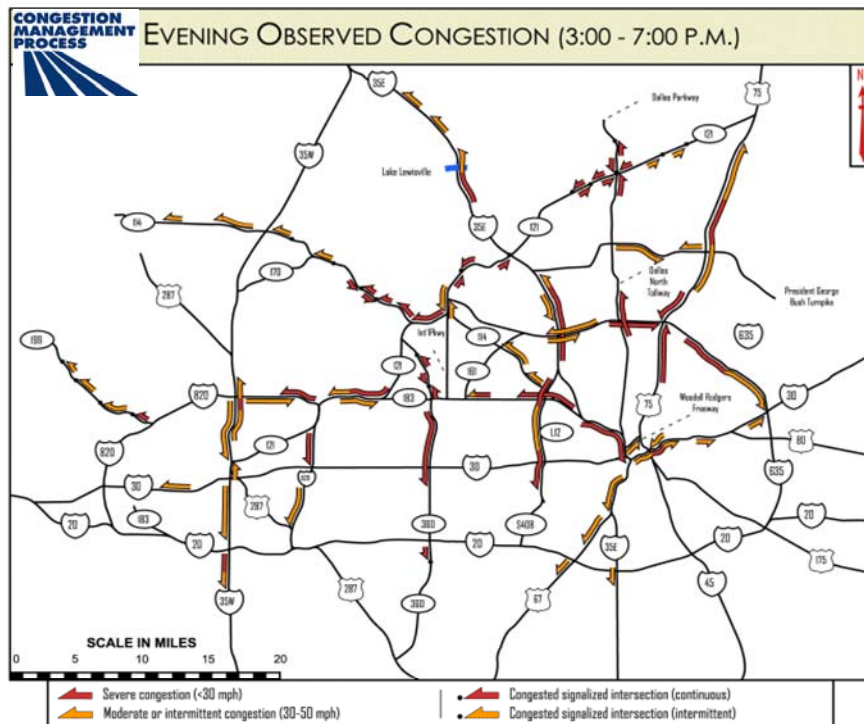
The following DFW Regional Travel Model output was derived from the LOS map above to better illustrate the extent of congestion on the controlled access facilities. Light congestion indicates facilities that are LOS “A”, “B”, or “C” during both or one of the peak periods. Moderate congestion indicates facilities that are LOS “D” or “E” during both peak periods. Severe congestion indicates facilities that are LOS “F” during both peak periods.



In addition to model data output, the observed data from the 2003 low-level aerial photos showing highway traffic performance conducted in the Dallas-Fort Worth Metropolitan Area is displayed in the maps below. The morning and evening maps identify locations of recurring congestion on the controlled access facilities during the peak periods.

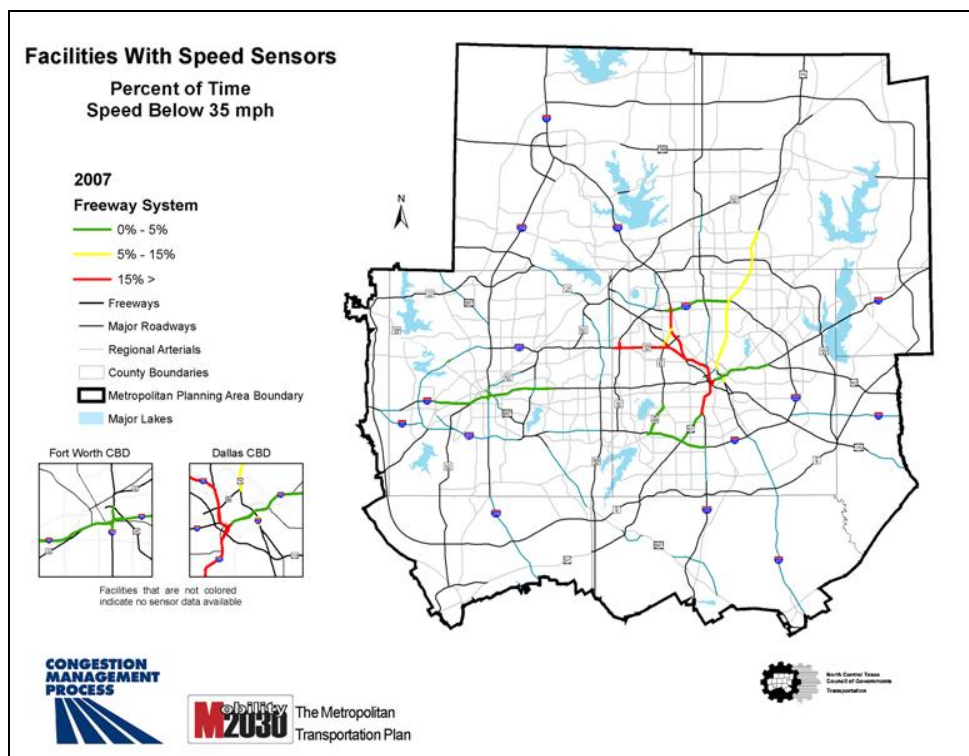


Source: Skycomp, Inc. "Traffic conditions in the Dallas – Fort Worth Metropolitan Area. Final Report". Spring 2003



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Aside from recurring congestion or expected delay, non-recurring congestion or unexpected delay is another measure that needs to be quantified on the 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 accidents and stalled vehicles. Using the Intelligent Transportation System data that is available in the region, non-recurring congestion can be measured. The map below shows the percentage of time commuters on controlled access facilities encounter speeds less than 35 mph. The facilities with no color indicate no speed sensor data was available to measure this performance.



### **Strategy Identification/Strategy Selection**

The controlled access facilities have a variety of strategies that can be deployed to alleviate congestion. The type of strategy implemented depends of the type of congestion experienced. Below is a list of possible strategies:

- Intelligent Transportation System
- Incident Management
- Bottleneck Removal
- Truck Lane Restrictions
- Employer Trip Reduction Program
- Vanpool Program
- Toll Roads/HOV/Managed Lanes

### **Project Implementation/Project Performance Evaluation**

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. As a result of this study, additional controlled access facilities have been flagged as candidate facilities in the future.

#### **Project Performance Evaluation**

##### **Truck Lane Pilot Study – Change in Average Speed**

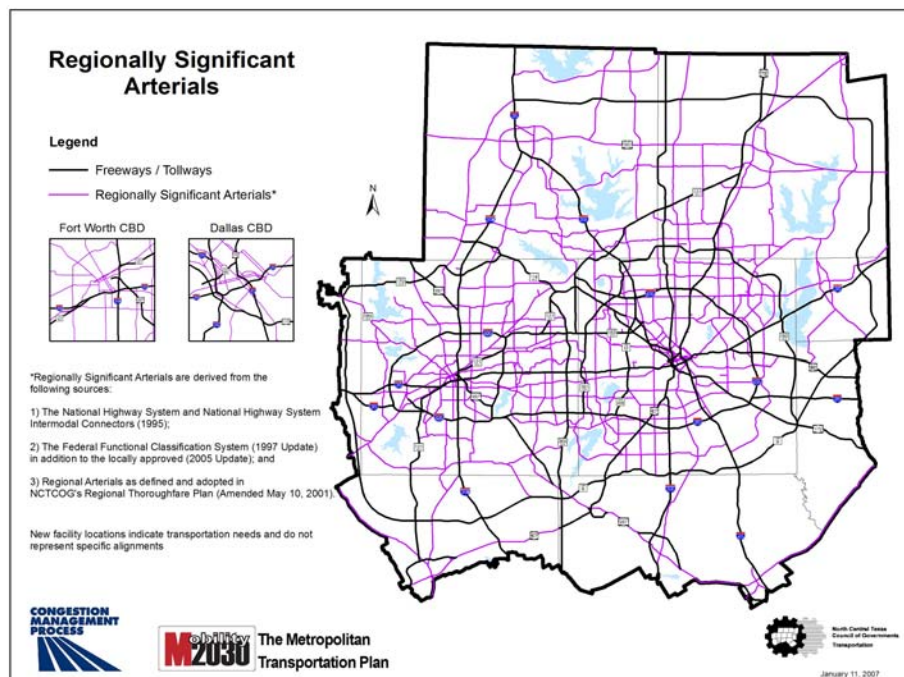
<b>Lane</b>	<b>Phase 1</b>	<b>Phase 4</b>	<b>Phase 1 vs. Phase 4</b>
<b>Left</b>	<b>71.50</b>	<b>72.38</b>	<b>0.88</b>
<b>Middle</b>	<b>65.63</b>	<b>66.19</b>	<b>0.56</b>
<b>Right</b>	<b>60.75</b>	<b>61.25</b>	<b>0.50</b>

## REGIONAL ARTERIAL SYSTEM

### System Identification

The Regional Arterial System is a subcomponent of a broader regional thoroughfare system. The North Central Texas Council of Governments (NCTCOG) Regional Thoroughfare Plan (RTP) recognizes the network of arterial facilities having regional travel significance upon which the Regional Arterial System is based. The RTP includes all roadways classified as principal arterials through the Federal Functional Classification System (FFCS), as well as the National Highway System (NHS). In addition to the basic framework of federally designated facilities, complementary local government principal arterials are incorporated to complete the 1,756 miles of regional arterials.

The Regional Arterial System, shown in the map below, is a critical component of the Metropolitan Transportation Plan in providing transportation support and access. This system of arterials is forecasted to carry 21 percent of all vehicular traffic in the region. The importance of regional arterials to the region's transportation system becomes increasingly essential as reliever facilities to parallel freeways and tollways, as well as supporting accessibility to other regional facilities to and from local land uses. Travel on regional arterials is expected to rise by almost 64 percent over current levels by the year 2030.



### **Performance Measures/Monitor and Evaluate Performance**

The goal of system monitoring and data collection programs is to develop an on-going system of monitoring and reporting that relies heavily on data already collected or planned to be collected in the Dallas-Fort Worth region. Below is a list of data collection and system monitoring component of the regional arterial system.

- Vehicle Miles of Travel (VMT) or Travel Time Contour (Modeled)
- Level-of-Service (Modeled)
- Vehicle Counts (Observed)

### **Strategy Identification/Strategy Selection**

Two types of strategies have been identified to relieve congestion on the regional arterial system. These include Travel Demand Management (TDM) and Transportation System Management (TSM). The deployment of these strategies and programs are tracked on a regional basis. Examples of regional TDM and TSM strategies and programs are highlighted below:

#### **TDM Strategies**

- Improve Transportation Options (Carpooling, Vanpooling, Traffic Calming)
- Incentives to Use Alternative Modes (Commuter Financial Incentives, Fuel Tax, Parking-Time of Day Pricing)
- Sustainable Development (Strong Commercial Centers, Transit Oriented Development (TOD), Bicycle Parking)
- Policy and Institutions Reform (Asset Management, Speed Reduction, Regulatory Reform)

#### **TSM Strategies**

- Traffic Signalization (Signal Re-Timing, New Signal Installation, Signal Hardware Upgrades)
- Intersection Improvements (Installation of Turn Lanes, Channelization)
- Bottleneck Identification and Removal

### **Project Implementation/Project Performance Evaluation**

Project implementation is tracked in the CMP through the Transportation Improvement Program (TIP). A summary of regional arterial system TSM projects in the current TIP are provided below.

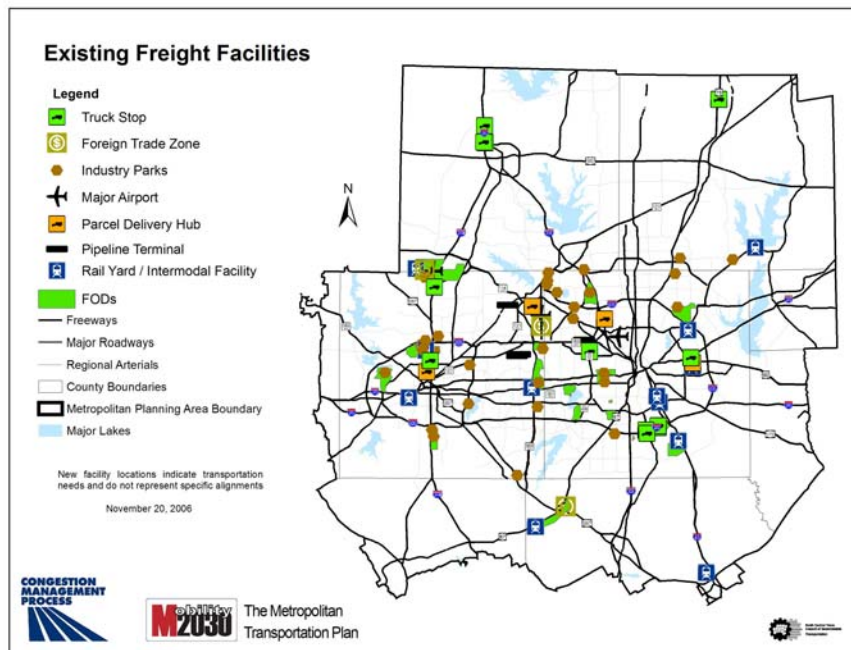
- Approximately 300 arterial intersection improvements will be implemented through the TIP, thus enhancing arterial traffic flow, in addition to reducing the propensity for accidents. Intersection improvements include turn lanes, traffic islands, grade separations, and channelization.
- A total of 1,000 traffic signal improvements are currently slated for implementation as they are funded under the current version of the TIP. These projects include signal timing optimization, signal equipment upgrades, system interconnection, and The Traffic Signal Integration and Monitoring Project (also known as the Thoroughfare Assessment Program).

# INTERMODAL/FREIGHT SYSTEM

## System Identification

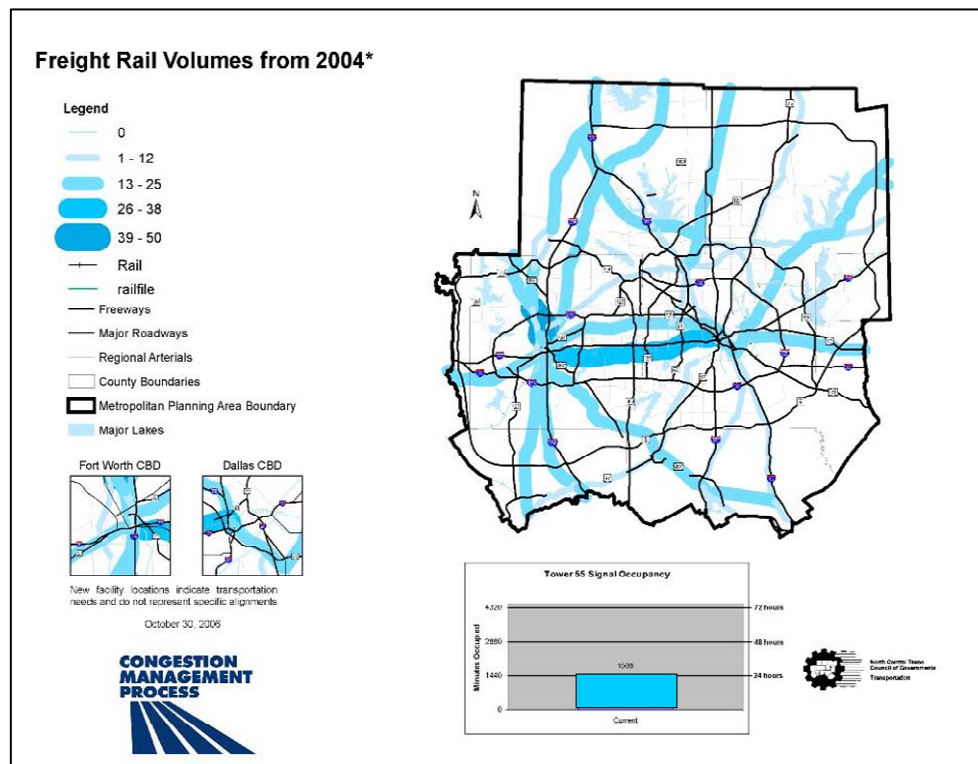
The North Central Texas region represents one of the largest “inland ports” in the nation where freight is moved, transferred, and distributed to destinations across the State and around the world. North Central Texas has one of the most extensive surface, air, and rail transportation networks in the 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 U.S. 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 NAFTA Superhighway, this major north-south route serves both the Fort Worth Central Business District (CBD) and the Dallas CBD. NCTCOG has developed an inventory of regional freight transportation facilities which are highlighted in the map below.



## Performance Measures/Monitor and Evaluate Performance

System performance is measured in a number of different ways. Maps are used to show how intermodal freight is moved and how this affects congestion in general across the region. Rail-Reliever Studies show how goods are moved via rail and how congestion is affected. They also help determine mobility needs and assist in planning for coordinating improvements from other studies. The map below illustrates freight rail volumes in the region derived from the DFW Regional Travel Model. The Model uses information such as roadway networks and population data to calculate the expected demand for transportation facilities in the region.



## Strategy Identification/Strategy Selection

Strategies have been developed to improve the intermodal freight system in the region. Some of these strategies are listed below.

- Truck Lane Restrictions
- Intelligent Transportation Systems
- Highway/Railroad Crossings

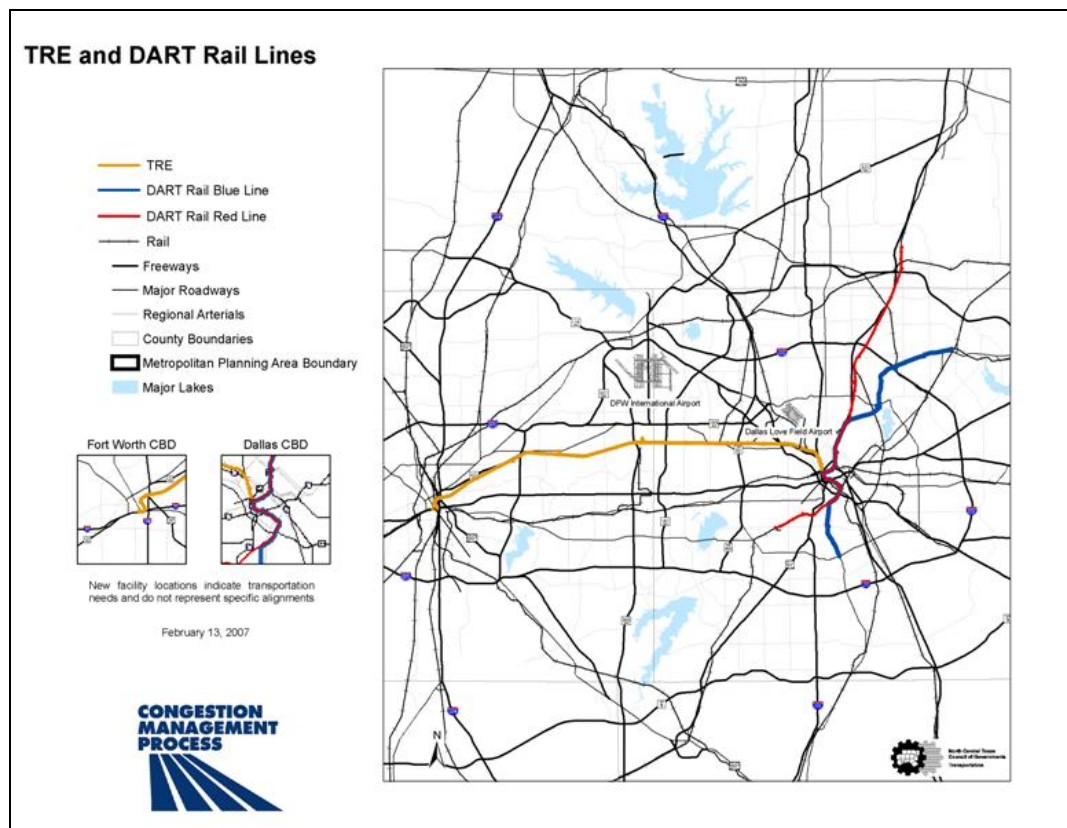
## Project Implementation/Project Performance Evaluation

One intermodal freight project that is in the current TIP is the Goods Movement Corridors Technology Deployment Project. This project includes the installation of Intelligent Transportation Systems (ITS) technologies and highway capacity enhancements along the NAFTA 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 I.H. 35 will prepare the region for future implementation of such technologies on other major freight corridors and connector routes.

## PASSENGER RAIL TRANSPORTATION

### System Identification

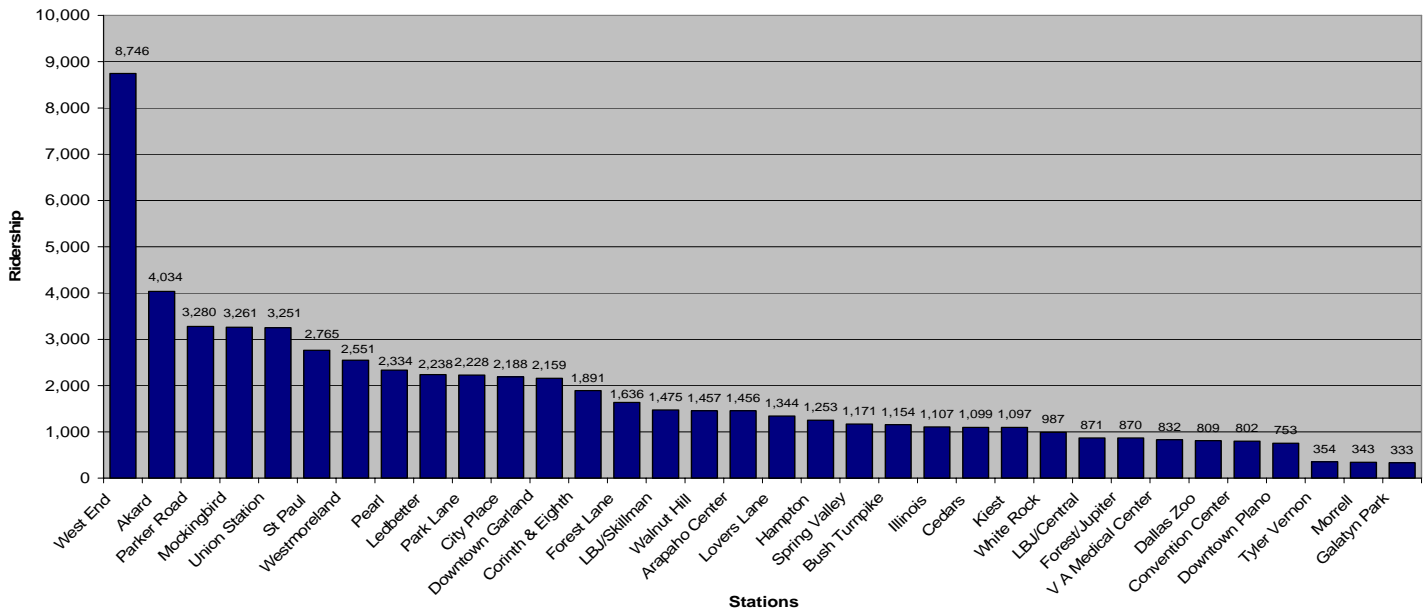
Currently, Dallas Area Rapid Transit (DART), Denton County Transportation Authority (DCTA), and the Fort Worth Transportation Authority (The T) provide traditional transit service throughout the Dallas-Fort Worth Metropolitan Area. The exhibit below illustrates all the existing DART and TRE rail lines. DART currently has 45 miles of light rail transit and the TRE (cooperative commuter rail service provided by DART and The T) includes approximately 35 miles of track, linking downtown Fort Worth, downtown Dallas, and the Dallas/Fort Worth International Airport.



### **Performance Measures/System Performance**

Performance measures for passenger transit can be developed from two sources; modeled or observed data collection efforts. DART and The T are the transit agencies that collect and compile the observed transit data, and NCTCOG can provide modeled transit data from the DFW Regional Travel Model. Currently collected transit data includes ridership, subsidy per passenger, and transit timing. DART light rail performance data is provided in the following graph. This graph illustrates the 12-month weekday average ridership by DART light rail train station, with the West End Station showing heaviest use.

**DART Light Rail Train Ridership  
12 Month Weekday Average  
November 2005 to October 2006**



### Strategy Identification/Strategy Selection

Strategies have been developed to improve the passenger rail transit in the region through provision of more accessible, cost effective and reliable services to transit users. These strategies include the following:

- Intelligent Transportation Systems to better inform the transit agency of the transit vehicle location and to inform the users of when the next transit vehicle is expected to arrive. This also includes system integration to better communicate between transit modes, transit operators and other transportation modes to provide a better overall experience for users.
- Guaranteed Ride Home program provides a ride home for transit users when transit service is not available in case of an emergency situation. This service is free of charge to users.
- Transit pass program offers discounted transit passes to employers for their employees. The cost reduction is based on the number of employees associated with the employer.

### Project Implementation/Project Performance Evaluation

The goal of the project performance evaluation is to have an on-going program to evaluate the benefits of transportation programs and projects that reduce overall congestion in the Dallas-Fort Worth region. Below is a list of some transit project performance evaluations/planning studies.

- TRE Survey – 2002 Ridership
- D/FW International Airport Rail Planning and Implementation Study
- DCTA Alternative Analysis

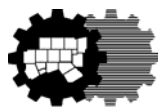
## Information Available on Website

<http://www.nctcog.org/trans/cmp/index.asp>

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