

## **SECTION II – CONTROLLED ACCESS FACILITIES**

### **SYSTEM IDENTIFICATION**

A critical component of the Dallas-Fort Worth (DFW) Metropolitan Transportation System is the regional freeway and tollway systems, which are typically characterized by controlled-access general purpose lanes, high occupancy vehicle (HOV) lanes, managed lanes, and frontage roads. The freeway and tollway system carries nearly half of all vehicle travel in the area, and this is anticipated to continue through the year 2030. Despite ongoing technological advances, expanded transit systems, and increased awareness/sensitivity to environmental concerns, there will continue to be significant demand placed on the regional freeway/tollway systems. The continued demand will warrant continued system improvement and expansion well into the future.

System expansion, operation and maintenance of this system are expensive ventures. Mobility 2030: The Metropolitan Transportation Plan faces the challenge of balancing a huge demand on an already over-used system with less than adequate funding resources from traditional fuel tax and vehicle registration fee revenues. Over the last few years, the idea of user-fee based roadways has been growing in popularity and acceptance. Recently the Texas Transportation Commission adopted a favorable toll road policy to promote the implementation of additional toll roads throughout the state.

Through this new policy direction, the Texas Transportation Commission authorized the Texas Department of Transportation (TxDOT) to evaluate a roadway project during any phase of development or construction for consideration as a toll road. This also includes new location and expansion highway projects on controlled-access roadways, such as adding lanes or

constructing new main lanes. State law allows TxDOT to study, design, construct, operate, expand, enlarge, or extend a toll road project as part of the State highway system.

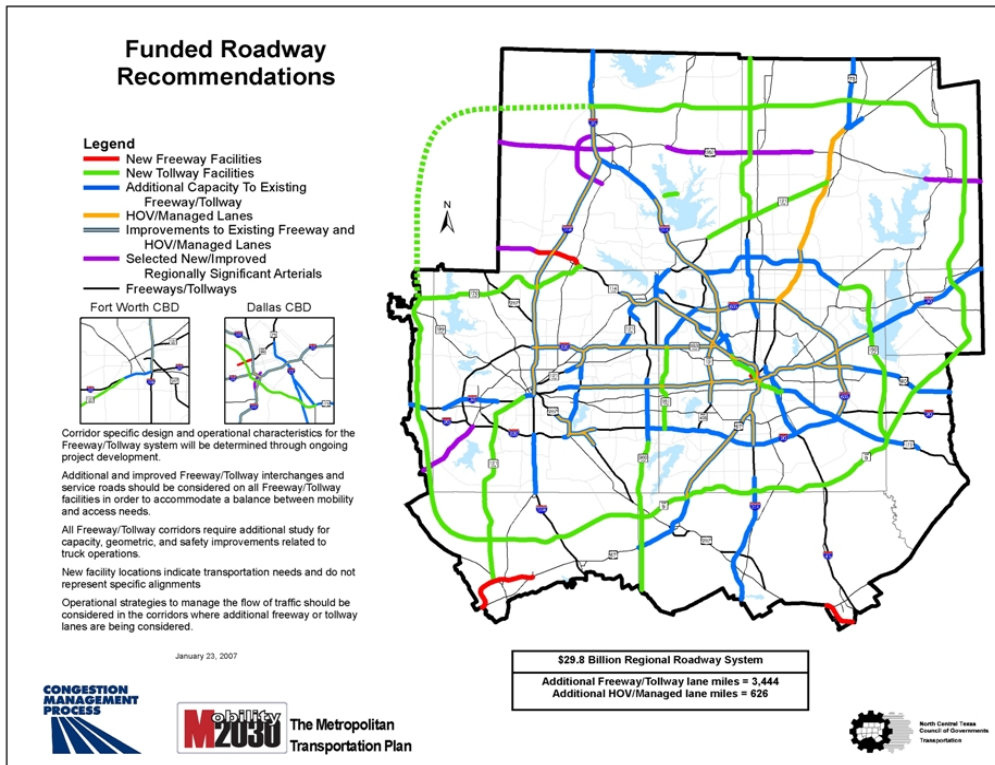
Historically, TxDOT has financed highway projects on a “pay-as-you-go” basis, using motor fuel taxes and other revenue deposited in the State highway fund. However, population increases and traffic demand have outpaced the efficiency of this traditional finance mechanism. Developing projects as toll roads can help bridge the gap between transportation needs and financial resources, and people are gradually becoming more receptive to this user-fee based system. Recent bills by the Texas Legislature, including House Bill (HB) 3588 and HB 2702, have provided new and innovative tools for TxDOT, the North Texas Tollway Authority (NTTA), and public-private partnerships through Comprehensive Development Agreements (CDA) to finance, build, and operate toll roads and managed facilities. The legislation also enables toll bonds, concession fees, and excess revenues to fund supplemental roadway projects that are either adjacent to those new corridors or of greatest need in the TxDOT districts where the corridors are constructed.

Mobility 2030: The Metropolitan Transportation Plan contains recommendations for an elaborate and widespread managed facility system. These recommendations are the result of analysis of the current and proposed freeway/tollway system in conjunction with the proposed managed facility system. There is recognition that the freeway and managed facilities work together and thus are analyzed in that manner.

Exhibit II-1 graphically indicates the final controlled-access facility recommendations for Mobility 2030. The overall regional cost for the implementation of these freeway, toll road, and managed facility improvements is approximately \$30 billion. Costs from the plan were reviewed by

TxDOT and NCTA based on subsequent planning and engineering studies, and were estimated in year 2006 dollars.

**EXHIBIT II-1**  
**FUNDED ROADWAY RECOMMENDATIONS**



**DEVELOP PERFORMANCE MEASURES**

Data collection and system performance monitoring provide a high level overview of congested facilities and the severity of congested facilities. Exhibit II-2 outlines the existing and planned system monitoring and data collection programs at NCTCOG, which focuses on the controlled access system.

The mix of data collection and performance measures outlined in Exhibit II-2 were chosen to look at multiple elements that effect traffic congestion on controlled access facilities. These performance measures focus on recurring and non-recurring congestion, as well as the impacts

of truck traffic. The data collection and performance measures included in the table will continue to expand over time as more data becomes available and as other performance measures mature.

**EXHIBIT II-2**  
**DATA COLLECTION/PERFORMANCE MEASURES**  
**Controlled Access Facilities**

| <b>Observed or Modeled Data</b> | <b>Data Element</b>           | <b>Source</b>   |
|---------------------------------|-------------------------------|---|
| Modeled/Observed                | LOS                           | Regional Travel Model<br>Low-Level Aerial Photos  |
| Observed                        | Reliability/Speed             | ITS Data Archive Project  |
| Modeled/Observed                | Travel Time/Speed             | ITS Data Archiving Project<br>NTTA<br>DFW Airport<br>Addison Tunnel                             |
| Modeled                         | Vehicle Miles of Travel (VMT) | Regional Travel Model   |
| Modeled/Observed                | Vehicle Classification        | Regional Travel Model<br>ITS Data Archive<br>TxDOT Saturation Counts<br>Low-Level Aerial Photos |

Gray shading = possible future data elements.

**MONITOR AND EVALUATE PERFORMANCE**

The following maps highlight the performance measures that have currently been identified as part of the controlled access facilities for the CMP. These maps address both recurring (or expected) and non-recurring (or unexpected) congestion. 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 have an understanding of current transportation system performance.

Level of service is one performance measure that has been identified in the CMP to assess the performance of the controlled access system. The ratings are density-based LOS designations “A”, “B”, “C”, “D”, “E”, and “F”, as defined in the 2000 Updated Highway Capacity Manual. Level of service is a grading system for amount of congestion, using the letter “A” to represent the least

amount of congestion and “F” to refer to the greatest amount. These ratings are shown graphically in Exhibit II-3.

**EXHIBIT II-3**

**Summary of Freeway Traffic Condition Ratings (Density-Based Level-of-Service)**

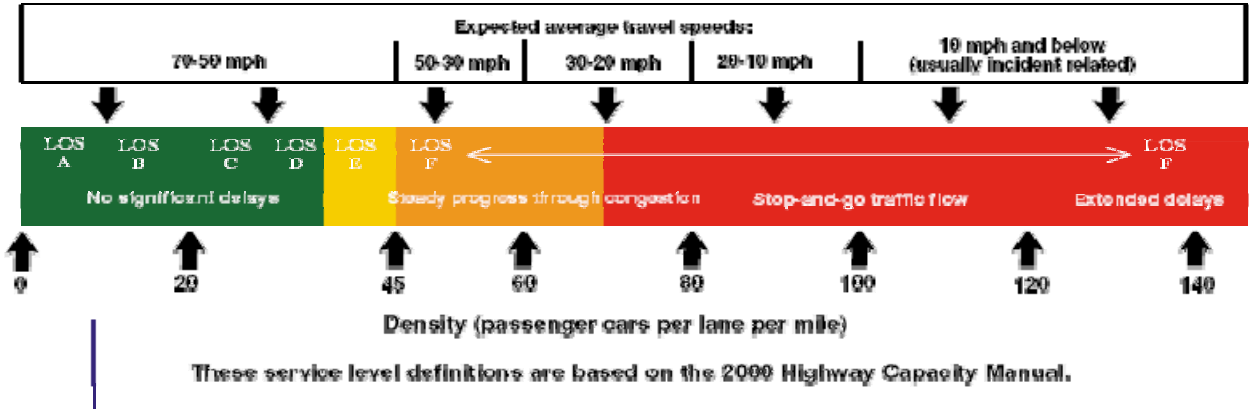


Exhibit II-4 illustrates the performance of the Dallas-Fort Worth controlled access facilities, based on peak period roadway level of service. This information is an output of the DFW Regional Travel Model.

## EXHIBIT II-4

### PEAK PERIOD LEVEL OF SERVICE

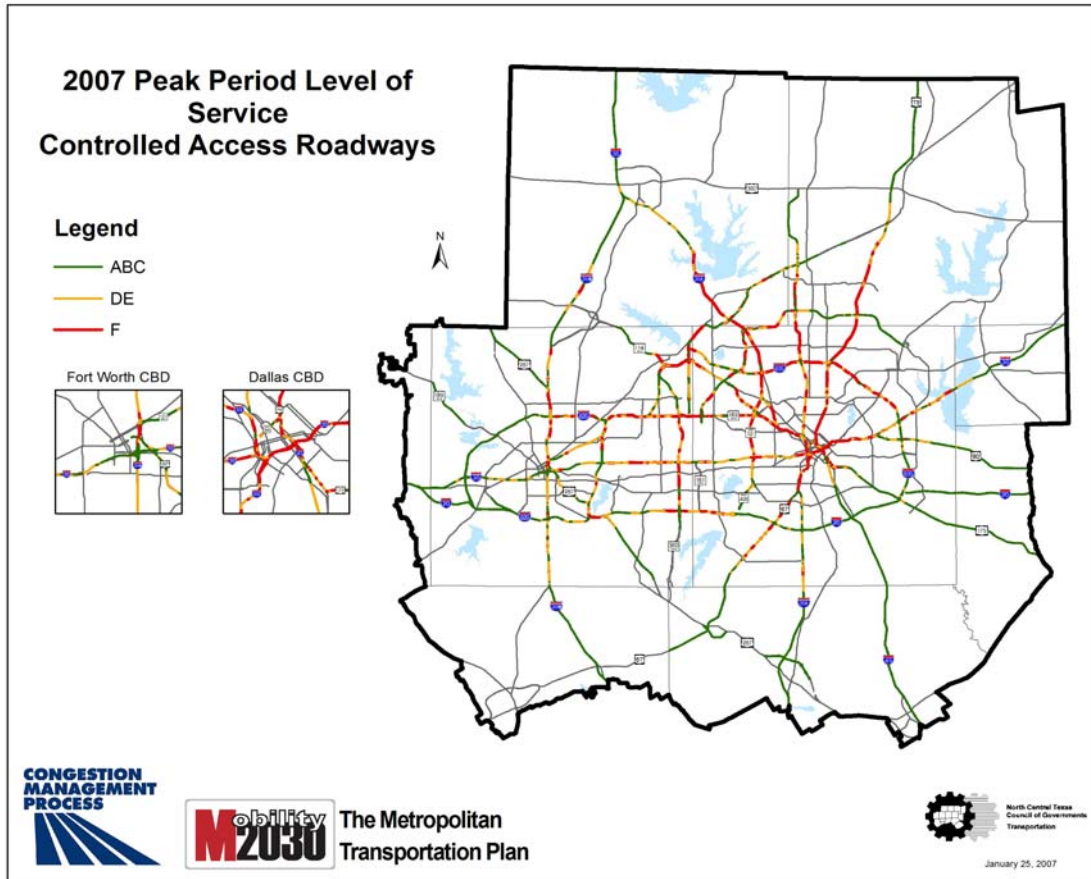
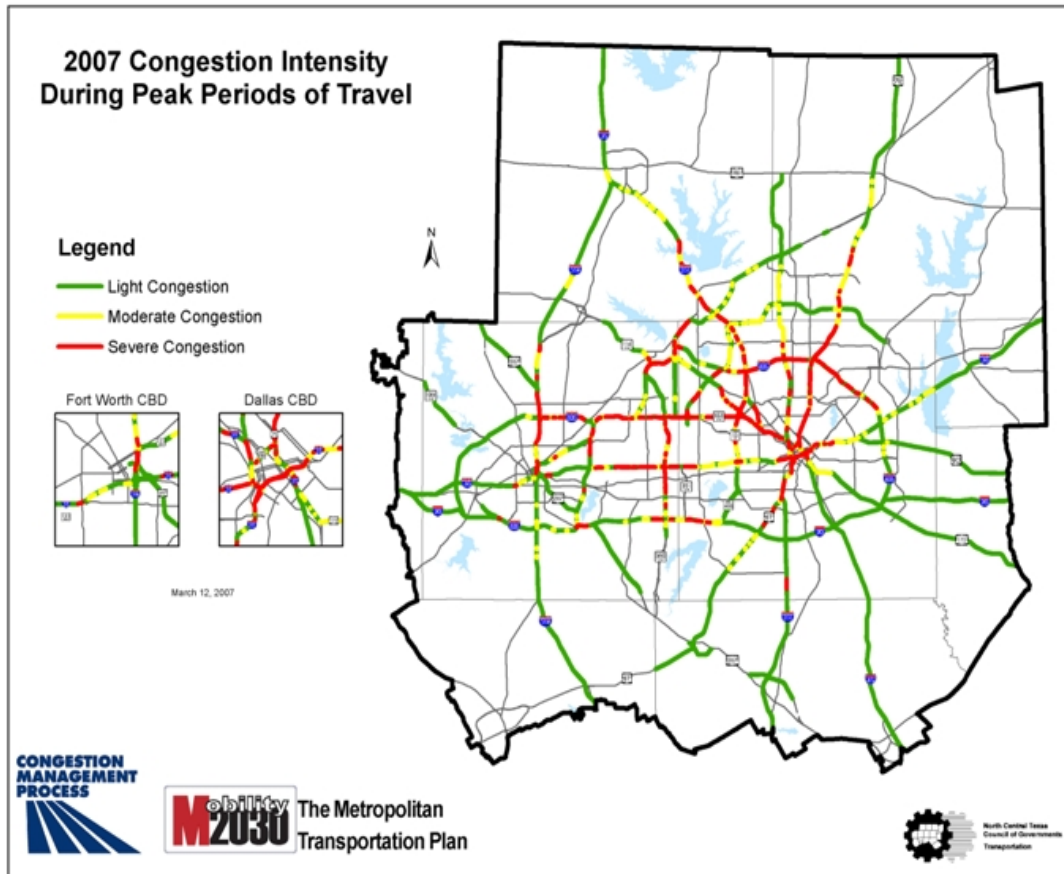


Exhibit II-5 shows DFW Regional Travel Model output derived from the LOS map above to better illustrate the extent of congestion on the controlled access facilities. Light congestion indicates facilities that are LOS “A”, “B”, or “C” during one or both of the peak periods. Moderate congestion indicates facilities that are LOS “D” or “E” during one or both peak periods. Severe congestion indicates facilities that are LOS “F” during one or both peak periods.

## EXHIBIT II-5

### CONGESTION INTENSITY DURING PEAK PERIODS OF TRAVEL



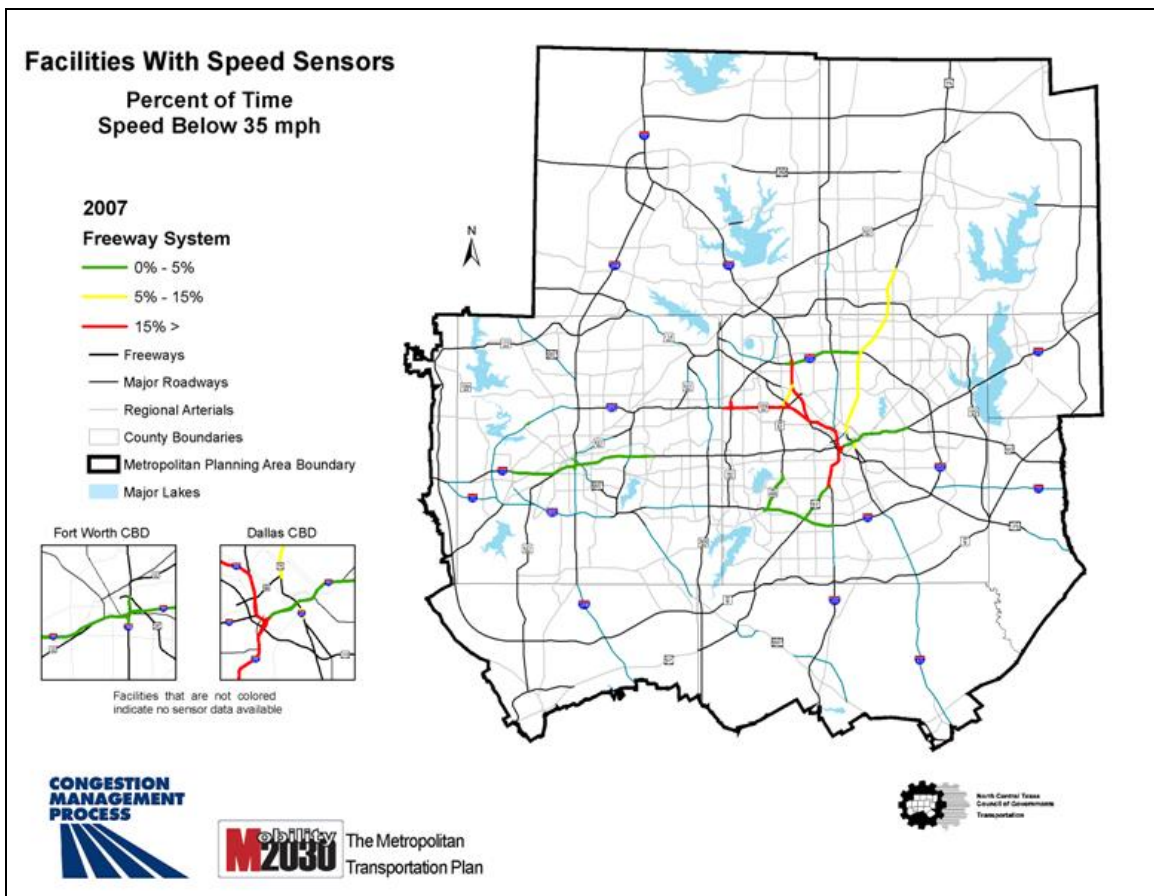
Another performance measure that assesses recurring congestion and identifies potential locations for freeway bottleneck improvements as well as major corridor needs is the low-level aerial photo survey data collection effort. A complement to the modeled data output provided in the LOS maps above, the low-level aerial photo survey is observed data that is collected every four years. Additional information regarding this data collection effort is available in the attached Commuter Traffic Update Regional Mobility Initiative dated October 2004.

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 to 58 percent of delay experienced by motorists in urban areas is caused by unexpected 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. Exhibit II-6 shows the percentage of time commuters on controlled access facilities encounter speeds less than 35 mph on a 24-hour basis. The facilities with no color indicate no speed sensor data was available to measure this performance.

### **EXHIBIT II-6**

### **FACILITIES WITH SPEED SENSORS**



## **STRATEGY IDENTIFICATION**

Congestion management strategies on the controlled access system include the implementation of Transportation System Management (TSM), Travel Demand Management (TDM), and Intelligent Transportation System (ITS) improvements. All TSM, TDM and ITS strategies are outlined in Appendices A, B and C. The controlled access facilities have a variety of strategies that can be deployed to alleviate congestion. The type of strategy implemented depends on the type of congestion present, or expected. Some of the strategies suggested through the MTP are outlined below:

Toll roads, HOV lanes, and managed lanes are used to encourage more high-occupant vehicle travel and off-peak travel in the region by charging a toll to travel alone or during the peak travel periods. TDM strategies attempt to reduce the demand for single-occupant vehicle (SOV) travel on roadways by offering alternatives to driving alone. Some TDM strategies include employer trip reduction programs, vanpool programs and rideshare matching programs. Operational strategies offer low-cost improvements to get more capacity out of the transportation network. Recommended ITS strategies include operation of changeable message signs to divert traffic around traffic incidents and special events, closed-circuit television for traffic monitoring, incident verification and clearance, lane control signals for traffic management/incident management, and automated ramp metering systems to regulate freeway system access during peak travel periods. In addition to ITS technology deployment, the continuation of the Mobility Assistance Patrol (MAP) is recommended, and increased MAP coverage should focus on congested systems and peak periods. Other strategies include freeway incident management training, truck lane restrictions and freeway bottleneck removal.

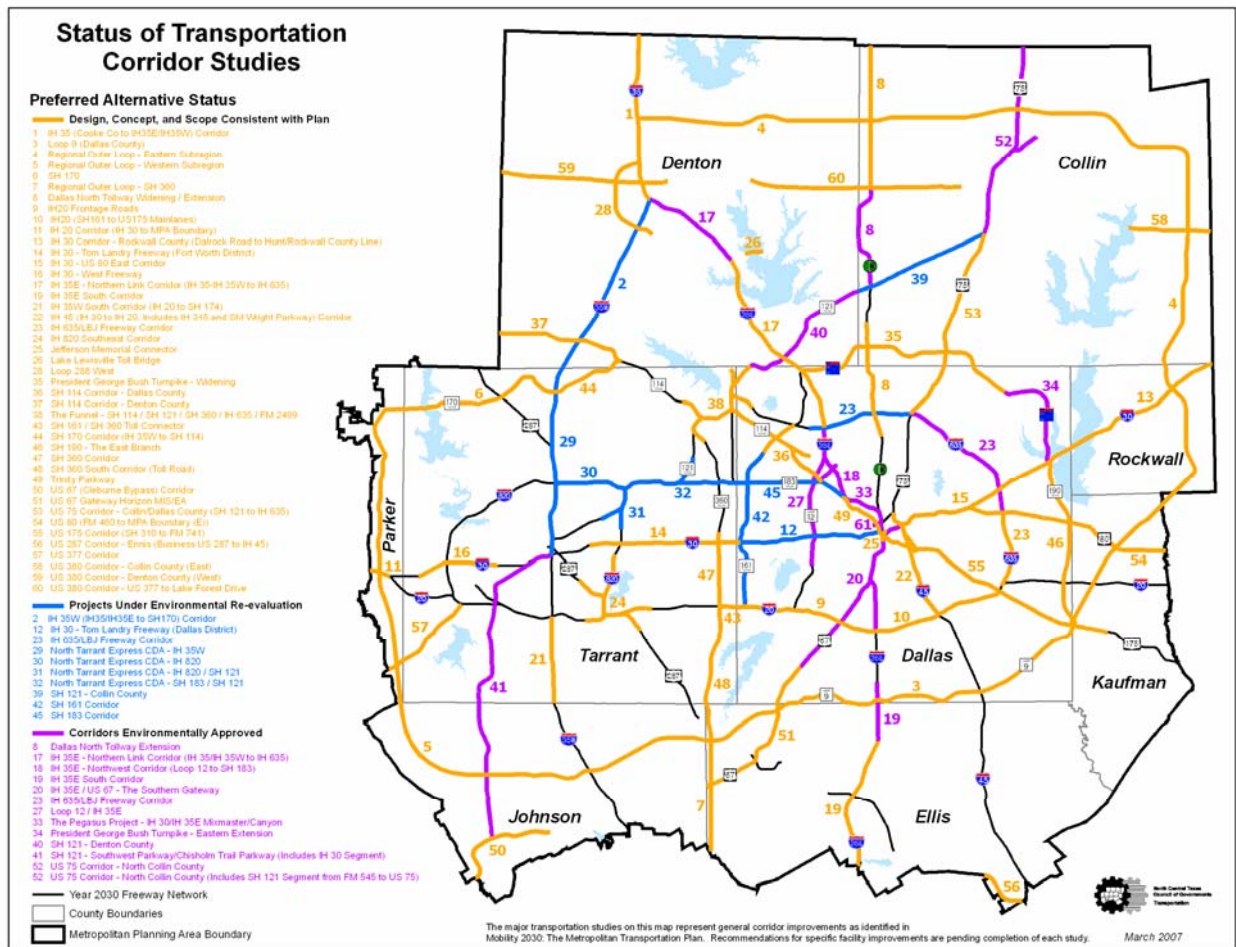
## **STRATEGY SELECTION/PROJECT IMPLEMENTATION**

As mentioned in Section I of this document, the Regional Transportation Council (RTC) passed resolution number R98-01 (Appendix D), which requires that all Major Investment Studies (MIS)

include an evaluation of operation management and travel demand reduction strategies to accommodate expected travel demand. Each congestion management recommendation and commitment documented in the inventory will be monitored to ensure its inclusion in the Metropolitan Transportation Plan (MTP) and the Transportation Improvement Program (TIP) by an applicable deadline. An inventory and status of the transportation corridor studies is provided in Exhibit II-7.

## EXHIBIT II-7

### STATUS OF TRANSPORTATION CORRIDOR STUDIES

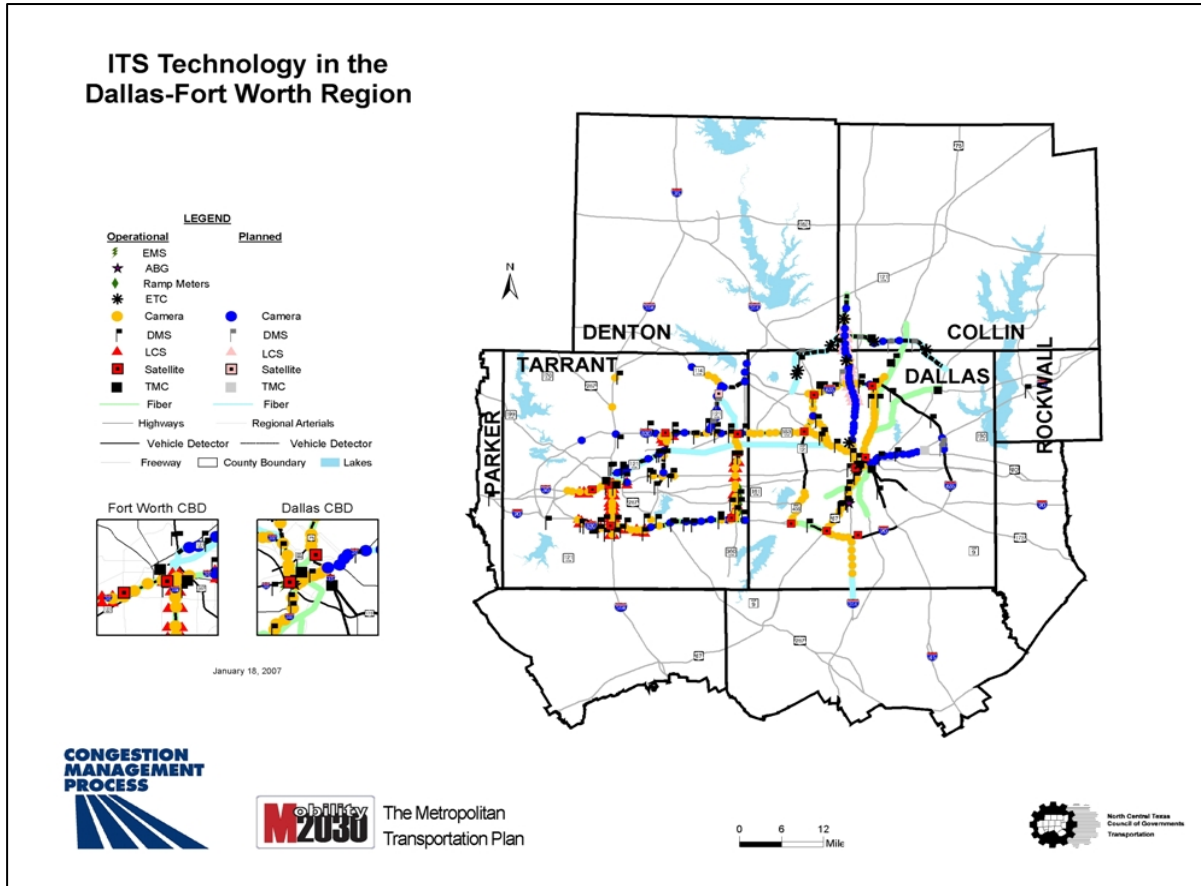


In the current TIP, the transportation funds have been allocated to a variety of strategies. These strategies include freeway bottleneck removal, employer trip reduction strategies, vanpool

program and ITS deployment. Exhibit II-8 illustrates the funded ITS deployment in the region on the limited access facilities.

## **EXHIBIT II-8**

### **ITS TECHNOLOGY IN THE DALLAS-FORT WORTH REGION**



## **PROJECT PERFORMANCE EVALUATION**

The goal of the project performance evaluation studies is to have an on-going program to evaluate the benefits of transportation programs and projects that reduce SOV travel and peak period travel, and improve the efficiency of our existing transportation system through operational improvements. Exhibit II-9 identifies current and future project performance evaluations.

**EXHIBIT II-9**

**PROJECT PERFORMANCE EVALUATION  
CONTROLLED ACCESS FACILITIES**

| <b>Project Type</b>  | <b>Source</b>             | <b>Implementation</b> | <b>Comments</b>   |
|--|---------------------------|-----------------------|---|
| Freeway Bottleneck Removal   | NCTCOG                    |                       | Analyze impacts of bottleneck improvements made between 1999 data collection effort and 2003 data collection effort. See attached Traffic Congestion RMI. |
| Truck Lane Pilot Study   |                           |                       | See CMP Fact Sheet (Attachment 1).  |
| Intelligent Transportation System (ITS) <ul style="list-style-type: none"> <li>• Cameras</li> <li>• Dynamic Message Signs</li> <li>• Vehicle Detectors</li> <li>• Ramp Meters</li> <li>• Mobility Assistance Patrols</li> <li>• FIM</li> </ul> | TxDOT<br>Cities<br>NCTCOG |                       | Mobility Assistance Patrols provide monthly motorist assistance statistics.   |
| Travel Time Survey   | NCTCOG<br>(UPWP)          |                       | Future  |
| HOV Lanes  | DART/TTI                  |                       | TTI Report  |

**SUMMARY**

A major component of the Dallas-Fort Worth Metropolitan Transportation System is the regional freeway/toll road/HOV/managed lane system. The system continues to carry nearly half of all vehicular travel in the area. Even considering the availability of other multimodal options and advanced traffic management strategies, there will be significant demand placed on the region's roadway system. In the region, many initiatives are underway to address current and future traffic congestion. Currently, over \$1 billion per year is being spent to improve the freeway/toll road/HOV/managed lane system. In addition to constructing new facilities, a number of cost-effective programs are in place in the Dallas-Fort Worth area to manage both existing freeway/toll road/HOV/managed lane system facilities and travel demand. These programs are being used to maximize the capacity of the system and increase the system's overall efficiency.

ATTACHMENT 1

# Truck Lane Demonstration Corridor Project Summary Report

Report 1, February 2007<sup>2</sup>

The Truck Lane Pilot Study was undertaken to implement left lane truck restrictions on portions of the Dallas-Fort Worth interstate system and measure their effectiveness under varying enforcement phases. Overall, the results of this study were successful and the enhancement and expansion of truck lane restrictions were recommended.

The Truck Lane Pilot Study was deployed along the I.H. 20 Corridor from I.H. 45 (in Dallas) to Cedar Ridge Road (in Duncanville), and along the I.H. 30 Corridor from Collins Street (in Arlington) to Hulen Street (in Fort Worth). The study restricted multi-trailer truck traffic to the inner lanes. The results of the study are quantified below:

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

| Lane   | Phase 1   | Phase 4   | Phase 4 vs. Phase 1 |
|--------|-----------|-----------|---------------------|
| Left   | 71.50 mph | 72.38 mph | + 0.88 mph          |
| Middle | 65.63 mph | 66.19 mph | + 0.56 mph          |
| Right  | 60.75 mph | 61.25 mph | + 0.50 mph          |

Based on the results from the Truck Lane Pilot Study, additional truck lanes along the NAFTA Superhighway have been recommended through the Metropolitan Transportation Plan and are highlighted in the map below. The recommendations were that the lane restrictions will be expanded into a regional system and adhere to the Texas Transportation Commission administration of State Law regarding truck lane restrictions, site specific conditions and traffic operations analysis, and regional policy regarding truck lane restrictions.

<sup>2</sup> This information was obtained from the “Truck Lane Restriction Study Final Report.”

## Truck Lane Recommendations

- Legend**
- █ Recommended Near-term Truck Lane Restrictions
  - ▤ Potential Long-term Intercity Truck Lane Restrictions
  - Freeways
  - Major Roadways
  - Regional Arterials
  - County Boundaries
  - ▭ Metropolitan Planning Area Boundary
  - Major Lakes

- Recommendations Include:**
- 3+ lanes
  - Moderate to High Truck Volumes
  - Continuous system
- Further site specific study needed to evaluate:**
- Segments with geometric constraints
  - Current or pending reconstruction
  - Capacity and congestion levels
  - Public opinion

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

November 20, 2006

