

**ENHANCED PLANNING REVIEW OF THE
DALLAS-FORT WORTH METROPOLITAN AREA**

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ACKNOWLEDGMENTS

This report is the eleventh in a series of Enhanced Planning Reviews (EPRs) of major metropolitan areas produced for the Federal Transit Administration (FTA) and the Federal Highway Administration (FHWA) by the Volpe National Transportation Systems Center (Volpe Center), Research and Special Programs Administration, U.S. Department of Transportation. An earlier series of nine independent planning reviews of major metropolitan areas was published by the Volpe Center for the FHWA and FTA in 1994.

William Lyons is the Volpe Center Project Manager for the EPRs. Robert Brodesky and Beth Deysler were the lead authors and analysts for this report.

Overall guidance for the EPRs, including production of this report, was provided by the Program Manager, Deborah Burns, and Sam Zimmerman, Director, both from the Office of Planning Operations, FTA; and Sheldon Edner and Barna Juhasz, Chief, both from the Metropolitan Planning Division, FHWA.

The federal review team--consisting of staff from FTA Headquarters and Region VI Offices; FHWA Headquarters, Region 6 the Texas Division; and the Volpe Center--participated in all aspects of the EPR, including reviewing drafts of this report.

A draft of the Overview Report was provided to the North Central Texas Council of Governments (NCTCOG), the Texas Department of Transportation (TxDOT), and other participating major transportation agencies in the metropolitan area for review and comment. The Final Report adds background information for the observations and recommendations in the Overview Report and is written for public distribution. The Final Report, which was not reviewed in its entirety by the local agencies, is the responsibility of the federal agencies. Participating federal review team members are listed in the Introduction and state, regional, and local staff are listed in Appendix B.

Copies of the other reports can be requested from the Volpe Center by fax at (617) 494-3260 or by E-mail at vanderwild@volpe2.dot.gov.



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Glossary of Acronyms and Abbreviations

AQAC	Air Quality Advisory Committee
ATTAC	Air Transportation Technical Advisory Committee
CFR	Code of Federal Regulations
CMS	Congestion Management System
CMAQ	Congestion Mitigation and Air Quality Program
DART	Dallas Area Rapid Transit
EPR	Enhanced Planning Review
FTA	Federal Transit Administration
FWTA	Fort Worth Transit Authority
FY	Fiscal Year
GIS	Geographic Information System
HOV	High Occupancy Vehicle Facilities
I&M	Enhanced Inspection and Maintenance Program
IMS	Intermodal Facilities and Systems Management
ISTEA	Intermodal Surface Transportation Efficiency Act of 1991
LOS	Level of Service
MIS	Major Investment Study
MOBILE5a	Environmental Protection Agency's Vehicle Emission Factor Model
MOU	Memorandum of Understanding
MPO	Metropolitan Planning Organization
NCTCOG	North Central Texas Council of Governments
PMS	Pavement Management System
PTMS	Public Transportation Facilities and Equipment System
RSPA	Research and Special Programs Administration, U.S. DOT
RTC	Regional Transportation Committee
SIP	State Implementation Plan
SOV	Single Occupant Vehicle
STIP	State Transportation Improvement Program
STP	Surface Transportation Program
STTC	Surface Transportation Technical Committee
TAQT	Transportation and Air Quality Technical Working Group
TAZ	Traffic Analysis Zone
TCM	Transportation Control Measures
TDM	Transportation Demand Management
TDMC	Travel Demand Management Committee
TIP	Transportation Improvement Program
TNRCC	Texas Natural Resource Conservation Commission
TPUTF	Transportation Providers and Users Task Force
TSM	Transportation Systems Management
TTA	Texas Turnpike Authority
TxDOT	Texas Department of Transportation
UPWP	Unified Planning Work Program
U.S. DOT	U.S. Department of Transportation

U.S. EPA U.S. Environmental Protection Agency
VOC Volatile Organic Compounds
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Executive Summary

The Federal Transit Administration (FTA) and Federal Highway Administration (FHWA) have initiated a series of joint Enhanced Planning Reviews (EPRs) to assess the impact of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) on the planning processes conducted by the transportation agencies serving metropolitan areas. The EPRs are also intended to determine the effects of planning on transportation investment processes. The information collected in the EPRs is intended to be of assistance to individual metropolitan areas in their continuing efforts to improve transportation planning practice, and to federal agencies in formulating policy and identifying technical assistance needs among agencies engaged in metropolitan planning.

The EPR for the Dallas-Fort Worth metropolitan area included a federal site visit from June 12 through June 16, 1995. At the conclusion of the site visit, the federal review team presented preliminary observations and recommendations to the local agencies taking part in the review. The team then formulated several additional observations as a result of the further review of documents and notes. These observations were incorporated into a draft Overview Report which was distributed for review and comment to the Metropolitan Planning Organization (MPO) and other local participants in the EPR. The Overview Report formed the basis for this Final Report, which describes the EPR in greater depth and is intended for public distribution.

The following is the summary conclusion and a complete set of the observations and recommendations presented in the Overview Report. The section where the observations and recommendations are discussed in context is noted under each topic.

The federal team identified several areas where the MPO and the participating agencies in the local transportation planning process have successfully implemented comprehensive and coordinated planning practices. In particular, these include the following areas:

- Development and integration of the congestion management system (CMS) into the transportation plan.
- Integration of technical inputs into systems and project-level analysis and decision making.
- Development of a committee structure to support the regional planning process that includes policy makers and technical staff members from different jurisdictions and transportation agencies.
- Extensiveness of the commitment to air quality analysis.
- Use of geographic information systems (GIS) as a transportation analysis tool.
- Incorporation of a strong public participation component in the major investment study (MIS) process.

Conversely, the federal team identified specific areas to be addressed in order to continually improve the transportation planning process in the Dallas-Fort Worth metropolitan area. These include the following areas:

- Incorporation and documentation of proactive public participation techniques (outside of the MIS process mentioned above), particularly for the Plan and TIP, at the system planning level.
- More realistic assumptions applied to traditional and non-traditional revenue sources for the financial component of the transportation plan.
- Further refinement of the region's CMS to cover all corridors that are congested or likely to become congested, not just those subject to MIS.
- Further incorporation of the fifteen factors early in system planning activities, particularly social, environmental, and economic effects.
- Further public discussion and documentation of regional growth and development assumptions.
- Presentation of financial data in a simple comprehensive form in the transportation improvement program (TIP).

A. Organization and Management of the Planning Process

Discussion of these observations can be found in Section III of this report.

1. MPO and Committee Structure: The MPO and committee structures reflect the spirit of ISTEA by bringing all localities and transportation providers into the regional planning process. Through this structure, technical inputs from the staff are integrated into the policy development process, aiding elected officials and policy makers in the development of regional transportation policy and when making decisions at the project-level.

B. Development of the Transportation Plan, the Transportation Improvement Program (TIP), and Unified Planning Work Program (UPWP)

Discussion of these observations can be found in Section IV of this report.

1. The Plan as a Long Range Planning Tool: This iterative plan development approach developed by the MPO demonstrates how the inclusion of congestion and financial constraint concerns can establish a vision for maximizing the existing transportation system and guiding future investments. The result is a planning document which is a unique and innovative long range planning tool.

2. Documenting Regional Growth Assumptions: Regional growth and development projections are essential ingredients in the travel demand forecasts that the MPO used for developing the Plan Update. These projections could be part of the public discussion if they were explained in the Plan Update. This discussion is important since the region is expected to grow at a rapid pace and these projections could influence the transportation strategies that are adopted.
3. Corridor Evaluation Through the CMS: The CMS will rely on MIS as a method to refine the analysis and strategies for corridors and subareas. However, the documents reviewed at the time of the planning review did not include all corridors or facilities that have been identified as having existing or potential recurring congestion.
4. TIP Development Process: The TIP development process has introduced additional technical inputs for evaluating and rating potential projects. Decision-makers stated that they recognize the process as a tool to build consensus and to justify whether or not to move forward with a project.
5. Selection of Activities: Although not a regulatory requirement, the UPWP could describe how planning activities for all surface transportation modes are selected and prioritized and how they are linked to the goals, objectives, and priorities of the Plan Update and the TIP.
6. Description of Activities: The UPWP currently describes activities being undertaken by local agencies and other regional organizations; however, it also could include a description of all transportation and relevant air quality planning activities in sufficient detail to indicate who will perform the work, the timing, and the product.

C. Financial Planning and Financial Constraint

Discussion of these observations can be found in Section V.A. of this report.

1. Forecasting Alternatives: Although the Plan Update contains a financial component, it is based completely on the premise that increases in traditional revenue sources, as well as some non-traditional sources, will cover the expected shortfall of \$9.4 billion. The MPO may want to demonstrate its consideration of a less optimistic financial alternative (e.g., \$5.8 billion in revenue) in the event that there is a revenue shortfall. The 1993 Plan Update was adopted prior to the issuance of the final rules and guidance by the U.S. DOT. Subsequent versions of the plan will need to reflect the federal regulations.
2. The Transportation Plan as a Planning Tool: The framework that has been developed by the MPO for analyzing system-wide impacts of different financial assumptions can accommodate the dynamic aspect of not knowing the full extent of the total revenues that will be available to the region during the planning period. Using its analytical tools, the MPO can also demonstrate to decision makers the significance of securing new funding sources and levels of funding by specific times in the future to meet the current vision for transportation development. This has the potential of stimulating discussion as to which projects are most

important to the region, which ones should be funded or whether or not new funding alternatives should be considered.

3. Assumptions for Non-Traditional Revenue Forecasts: Two of the MPO's financial assumptions--that is, an increase in vehicle registration fees and the region's ability to secure federal and state discretionary funding at a much higher rate--appear to be optimistic. Due to these assumptions, it is conceivable that the MPO has pushed the limits of the plan's financial constraint, resulting in the inclusion of a number of projects which the region might not be able to afford.
4. Data Supporting Financial Constraint: Although technical personnel can understand the TIP, its presentation of financial data and content are difficult for the average citizen to understand. The federal team suggested that the MPO could supply the public with a separate document that describes the financial data in simpler terms.

D. Major Investment Studies (MIS)

Discussion of these observations can be found in Section V.B. of this report.

1. Role of Federal and Non-Transportation Agencies: The role of Federal agencies and non-transportation stakeholders, such as adjacent landowners, could be more clearly defined in terms of identifying studies and developing alternatives.
2. Public Involvement: The MIS public involvement process, as defined by the MPO, is innovative in that it is considered to be the key mechanism by which to involve the public directly in the planning process. However, the MPO could more clearly define its MIS public involvement process and then incorporate it into its regional public involvement process.
3. Cooperative Team Approach: As described at the planning review and in the documents provided to the federal team, the MPO brings transportation providers and government agencies together early in the MIS process by formally creating a team of all agencies and government entities to develop the scope and analytical procedures for an MIS.

E. ISTEA Management Systems (CMS included in Section B)

Discussion of these observations can be found in Section V.C. of this report.

1. Early Stages of Development: The MPO has begun to conceptualize and, in some cases, develop the computer systems that will support the management systems. It has also begun the difficult task of coordinating data collection with transportation providers and users.

F. Air Quality Planning and Conformity

Discussion of these observations can be found in Section V.D. of this report.

1. Many Resources Dedicated to Air Quality Planning: The MPO is actively addressing transportation-related air quality issues at many levels of the planning process and has dedicated three staff members to address the CAAA requirements. In the event that the nonattainment area's designation is changed and the boundary expanded, the MPO is prepared to provide technical assistance to any counties which may be subject to inclusion in the newly defined nonattainment area and is prepared to meet the enhanced modeling requirements (see Section VII). In addition to its modeling efforts, the MPO acts as an advocate to the general public and the State for clean air.

G. The Public Involvement Process

Discussion of these observations can be found in Section V.E. of this report.

1. The Need for Greater Participation: The MPO's public involvement process is evolving. However, it does not provide for continuous involvement of the public throughout the planning process, particularly in the conceptualization of plans, the ranking of projects for inclusion in the TIP, or the discussion of critical transportation issues. At this point, the process could be more proactive; its focus is on presenting products to elicit public reaction.

H. ISTEA Fifteen Factors

Discussion of these observations can be found in Section V.F. of this report.

1. Integration of the Fifteen Factors in the Planning Process: Since the passage of ISTEA, the MPO has made great strides in addressing congestion management and developing strategies for maximizing the efficiency of the transportation system. Given that the region's transportation plan was prepared prior to the issuance of the federal planning regulations, the MPO's efforts to integrate most of the other factors in the planning process so far have been preliminary. As the MPO continues to move forward with its plan update, it needs to integrate social, economic, and environmental effects into the preliminary stages of its transportation planning. To date, these efforts are reflected in the project evaluation criteria for determining what projects are included in the TIP (Section IV.B.). In addition, the MPO has developed a GIS program, which will become a valuable tool for further integrating the fifteen factors into the planning process.

I. Integration of Strategic Transit Planning

Discussion of these observations can be found in Section VI of this report.

1. Decline in Transit Patronage: Given the declines in transit patronage that have been experienced in the Dallas area, DART should continue to evaluate its marketing strategies as a means to meet growth forecasts that form the basis for future transit investment.

J. Travel Demand Forecasting

Discussion of these observations can be found in Section VII of this report.

1. State-of-the-Art Modeling: Several of the techniques used by the MPO--the transit multi-path, automated walk link generation, and the methods for constructing regionwide microsimulation networks--are very innovative. Members of the federal team thought that other MPOs would benefit from learning about these techniques.

I. Introduction

The Intermodal Surface Transportation Efficiency Act (ISTEA) significantly changed the law governing metropolitan transportation planning. In response to the changes introduced by ISTEA, the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) issued revised planning regulations on October 28, 1993, setting new requirements for the transportation planning processes. The requirements are presented in 23 CFR Part 450 and 49 CFR Part 613, Statewide and Metropolitan Planning Final Rule. The Clean Air Act Amendments of 1990 (CAAA) also imposed rigorous new transportation planning requirements in metropolitan areas, particularly those that are designated nonattainment or maintenance areas for air quality.

In support of the implementation of the revised regulations, FHWA and FTA jointly established a schedule of Enhanced Planning Reviews (EPR). The EPRs are intended to determine the impact of planning on transportation investment processes. The EPRs also provide a technical assessment of the transportation planning and programming processes, including consideration of the six focal points identified by the FHWA and FTA Administrators for certification. The six focal points are: Financial Constraint and Financial Planning, Major Investment Studies, Congestion Management Systems, the Planning Process and Links to the Conformity Requirements of the Clean Air Act Amendments of 1990, the Public Involvement Process, and the ISTEA Fifteen Planning Factors. Of equal importance, EPRs will provide a forum for dialogue and the exchange of information on perspectives and concerns related to ISTEA between FTA and FHWA headquarters and field staff, and state and local officials responsible for metropolitan area transportation planning.

Additionally, EPRs will provide information for future long-term federal policy-making, including possible legislative and regulatory changes; identify national issues and trends; and document national case studies of best professional practice. This information will also be used to help identify how future federal technical assistance programs can best assist Metropolitan Planning Organizations (MPOs) and other planning agencies in carrying out the requirements of ISTEA. Finally, EPRs are intended to support progress toward meeting ISTEA requirements.

The EPR has four parts: a review of planning documents, a site visit to the area, a summary draft Overview Report, and the issuance of this Final Report. At the conclusion of the site visit, the federal agency participants in the EPR presented preliminary observations and recommendations to the local agencies taking part in the review. The team then formulated several additional observations as a result of the further review of documents and notes. These observations were incorporated into a draft Overview Report distributed to MPO and other local participants in the EPR for review and comment. The Overview Report formed the basis for this Final Report, which describes the EPR in greater depth and is intended for public distribution.

This report presents the results of an EPR conducted jointly by FHWA and FTA in the Dallas-Fort Worth metropolitan area. The report considers the regional transportation planning process as it existed at the time of the site visit as well as future trends. The review team acknowledges that this is an evolving process.

A federal review team consisting of FHWA and FTA headquarters and regional staff, FHWA division staff, U.S. Environmental Protection Agency (EPA) regional staff, and U.S. DOT/Volpe Center staff conducted the site visit on June 12 through June 16. The federal team consisted of:

Federal Transit Administration

Paul Verchinski, Office of Planning
Blas Uribe, Region VI
Jesse Balleza, FTA, Region VI
Peggy Crist, FTA, Region VI

Federal Highway Administration

Sheldon Edner, Office of Environment and
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Robert Brodesky, Project Staff
Beth Deysler, Project Staff
Montie Wade, Texas Transportation Institute

U.S. Environmental Protection Agency

John Behnam, Region 6
Tom Diggs, Region 6

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Local participants in the site visit included staff from the following agencies: The North Central Texas Council of Governments (NCTCOG), which is the Metropolitan Planning Organization (MPO) for Dallas-Fort Worth; the Texas Department of Transportation (TxDOT); Dallas Area Rapid Transit (DART); Fort Worth Transit Authority (FWTA); and Texas Natural Resource Conservation Commission (TNRCC). The review team also met with local officials who are members of NCTCOG's Regional Transportation Committee (RTC) and representatives of the general public.

A list of MPO members, local participants in the EPR site visit, and the agenda for the site visit are provided in Appendix A, B, and C of this report. A list of the documents reviewed as part of the EPR is provided in Appendix D.

II. Dallas-Fort Worth Metropolitan Area

A. Population and Employment Trends

The Dallas-Fort Worth region is approximately 12,800 square miles with a population of over 4.2 million. Nine of the fifteen counties in the region are “urbanized” and account for 96 percent of the region’s jobs. The four urban counties of Collin, Dallas, Denton, and Tarrant are considered core counties since they account for 87 percent of the region’s residents and 91 percent of the region’s jobs.

Demographic forecasts are presented in the “North Central Texas Regional Profile: 1990-2010.” These forecasts were developed by NCTCOG, with the guidance of the Demographic Methodologies Task Force in 1994. Trends show that:

- Between 1990 and 2010, residential growth will increase at half the rate of the previous 20 years (32 percent growth rate versus 64 percent). This translates to 1.3 million additional persons in the area between 1990 and 2010, three-fourths the 1.6 million people who were added from 1970-1990.
- Similarly, employment growth rates will fall from 100 percent in the previous 20-year period to 50 percent. The absolute number of jobs added in each period is identical, 1.1 million.
- Household size will continue to fall from its present 2.7 persons/household to 2.5 by the year 2010. Similarly, the residents to employment ratio will also decrease to 1.5 residents per job by 2010.
- Spatially, the four core counties account for 90 percent of all regional population growth in the last 5 years. Dallas and Fort Worth will maintain their dominance over the next 20 years in terms of employment growth. Currently, Plano holds the first, second, and third positions in population, household, and employment growth, respectively. In addition, Arlington, the city between Dallas and Fort Worth, is growing at a rapid rate. By 2010 the MPO anticipates that Arlington will have the second highest population growth in the region. As demonstrated by Plano and Arlington’s growth, suburbanization trends are a continuing factor in regional demographics. In 1970, Dallas and Fort Worth accounted for one-half of the region’s total population; however, in 1990, this share slipped to 35 percent and is expected to fall another five percentage points by 2010.

III. Organization and Management of the Planning Process

A. Metropolitan Planning Organization (MPO) Designation and Membership

NCTCOG, which serves as the MPO, is a voluntary association of 16 counties, 157 cities, 25 independent school districts, and 22 special districts (see Figure 1). This totals to 220 members sitting on the Council, each with one voting representative. These voting representatives make up the General Assembly, which annually elects an 11-member Executive Board (9 local elected officials and 2 regional citizens). The Executive Board establishes overall policy for comprehensive planning coordination in the region, including policy for the MPO and NCTCOG staff, as well as policy for the administration of funds granted to the MPO.

NCTCOG created the RTC to address regional transportation planning policy and activities. The RTC is composed of thirty-five policy leaders of local government and transportation service providers. Thirty are elected city and county officials; the other five are appointed and represent TxDOT, the FWTA, DART, and the Texas Turnpike Authority (TTA).

The primary functions of the RTC are to provide guidance for multimodal transportation planning and to assure coordination among transportation modes, local government entities, and planning activities. The RTC is responsible for directing and approving the Regional Transportation Plan, TIP, Congestion Management System (CMS), and the UPWP and for satisfying and implementing federal and state laws and regulations pertaining to the regional transportation planning process.

To date, the RTC and the Executive Board have worked cooperatively to support regional transportation planning. Transportation planning documents or policies are first approved by the RTC and then are endorsed by the Executive Board. Currently, four members of the Executive Board also sit on the RTC.

The regional transportation planning process is supported by four committees. The members of these committees include engineers and planners from local jurisdictions and regional and local transportation providers, and representatives from the trucking, rail, and air industries. The committees are the following:

- Surface Transportation Technical Committee (STTC) - reviews, comments on, and prepares recommendations regarding surface transportation planning and development.
- Travel Demand Management Committee (TDMC) - provides technical support and coordination for the implementation of the travel demand actions contained in the state implementation plan (SIP) for air quality. The Committee reports progress to the Air Quality Advisory Committee (AQAC), the STTC, and the RTC.

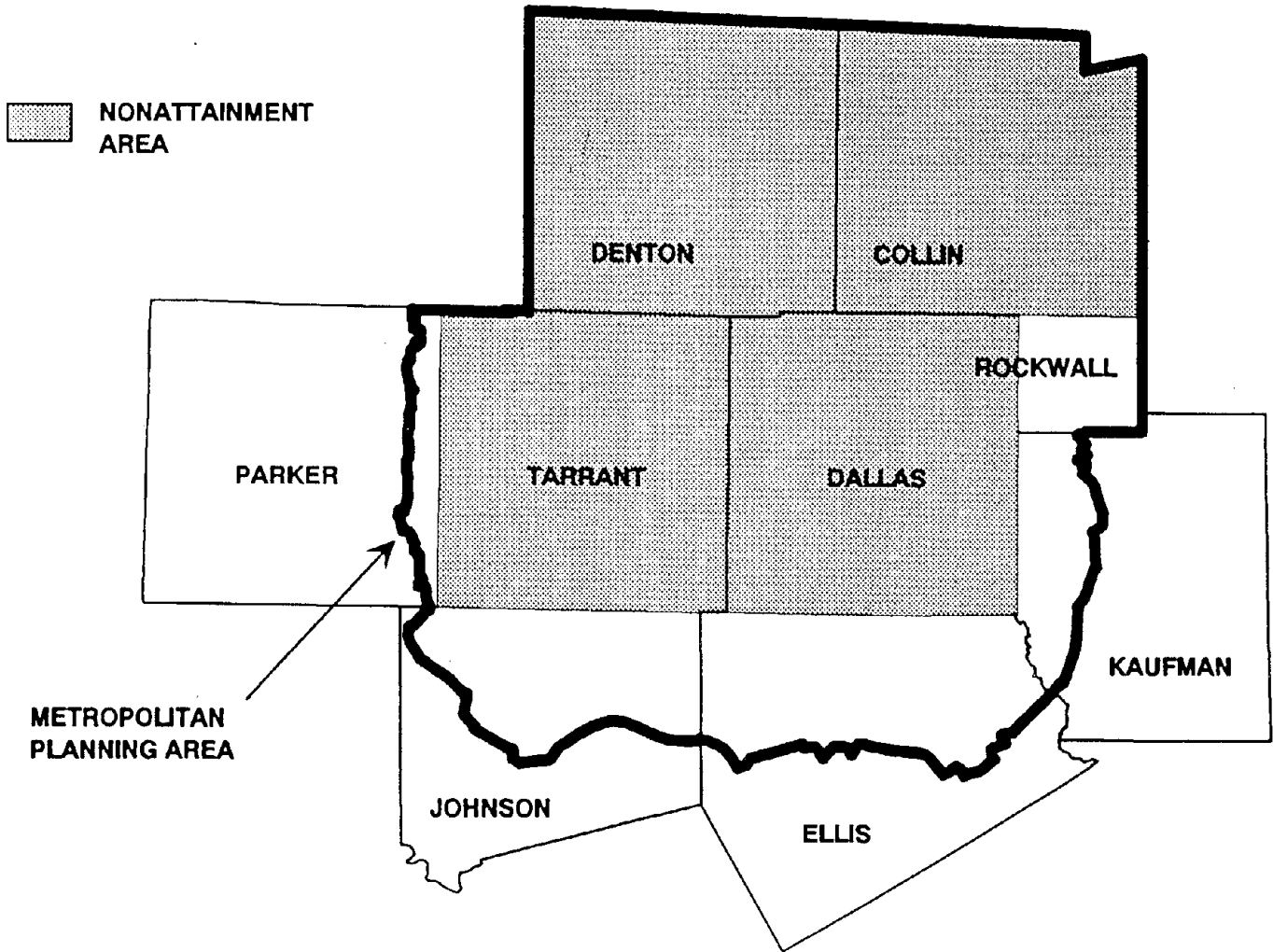


Figure 1. Map of Dallas-Fort Worth Metropolitan Planning Area

- Air Transportation Technical Advisory Committee (ATTAC) - provides expertise and guidance in the development and maintenance of the Regional Airport and Heliport System Plans.
- Transportation Providers and Users Task Force (TPUTF) - consists of representatives from the trucking and rail industry as well as various highway user groups and federations. The purpose of this committee is to increase private sector involvement in the MPO planning process and to seek public/private partnerships in the implementation of transportation programs in the region.

B. Institutional Relationships

The MPO has established relationships with the State, transportation providers, and air quality agencies regarding transportation planning. The NCTCOG has established formal agreements addressing transportation planning with TxDOT and air quality planning with the Texas Natural Resource Conservation Commission (TNRCC). The MOUs define activities such as data collection, and distribution and improvement of communication between organizations. An MOU is being completed between the MPO and the transit authorities that will formalize this relationship.

The RTC maintains a particularly close working relationship with TxDOT. TxDOT's Regional Planning Office supplies data such as traffic counts and auto occupancy surveys, while the Dallas and Fort Worth Districts review and comment on planning documents and conduct feasibility and design studies on projects in the TIP.

NCTCOG fosters relationships with other participants in the transportation planning process, although they are not formalized in MOUs. The MPO funds the COG to generate demographic data, which are reported directly to the Executive Board for approval. The RTC cannot influence the data, which, according to the MPO staff, are used in most policy decisions.

Technical assistance is provided to the approximately 150 local governments through the Technical Assistance Program. The Program gives up to \$5,000 in technical assistance to each local government.

In an effort to heighten the discussion and consideration of financial issues, the MPO has adopted and formalized a policy position on state transportation funding issues that it has presented to the state. It identifies revenue sources and suggests more efficient ways to use them for transportation.

Observations and Recommendations

1. MPO and Committee Structure: The MPO and committee structures reflect the spirit of ISTEA by bringing all localities and transportation providers into the regional planning process. Through this structure, technical inputs from the staff are integrated into the policy

development process, aiding elected officials and policy makers in the development of regional transportation policy and when making decisions at the project-level.

IV. Development of the Plan, Transportation Improvement Program (TIP), and Unified Planning Work Program (UPWP)

A. Regional Transportation Plan

In 1990, the MPO finalized a regional transportation plan, known as Mobility 2010: The Regional Transportation Plan for North Central Texas, which presented a system of transportation improvements needed to maintain mobility in the Dallas-Fort Worth metropolitan area over twenty years. In response to ISTEA, the MPO prepared an update, known as the Mobility 2010 Plan Update. In October 1993, the Plan Update was adopted by the RTC and endorsed by the Executive Board of NCTCOG. The Plan Update was prepared in response to the federal requirement for a financially constrained regional transportation plan. As such, it serves as a guide for the expenditure of federal, state, and local transportation funds through the year 2010. The MPO staff stated that it will be preparing a transportation plan update that will extend the horizon year to 2020.

Over and above the inclusion of financial considerations, the MPO's plan development process and final document were unique, as well as innovative, due to the consideration and treatment of congestion management concerns. The MPO staff developed and documented an analytical and iterative approach for fully incorporating congestion management into the planning and decision-making process. The region's Congestion Management Plan is a major ingredient in the transportation plan, establishing a vision for maximizing the existing transportation system and guiding future capital investments. To accomplish this, the MPO staff modified a somewhat traditional plan development approach, which began with the consideration of alternative system forecasts but then shifted to the evaluation of congestion management strategies. This modification, along with financial constraint concerns, sparked a reassessment of system-wide design criteria based on targeting the capacity needs of the peak hour of the day.

With the adoption of this approach, the MPO shifted from a needs-based planning philosophy to one that attempts to achieve a critical balance between financial constraint and planning for a level of service that meets future mobility needs. The Congestion Management Plan--which evaluates and recommends transportation systems management (TSM), transportation demand management (TDM), and non-single occupant vehicle (SOV) strategies--plays a critical part in striking this balance. According to MPO staff, the adoption of this strategy has also provided it with an effective means to communicate with its Board members the impact of declining revenues on maintaining an acceptable level of service.

The first step in evaluating transportation system improvements in the Plan Update process consisted of the preparation of two travel forecasts. The first forecast was a no-build scenario in which 2010 travel demand data were assigned to the 1990 roadway network, simulating the impact of no further improvements to the network. The second forecast, known as the build alternative, simulated the effects of what the Plan Update calls the Existing and Committed Transportation System (E & C System). This is the system that would be in place by the year 2010 if no additional investment strategies are pursued. The projects in this forecast are included in the 1993 TIP as projects programmed for funding and scheduled for construction between

1993 and 2010. As expected, the performance of the build alternative was slightly better than that of the no build alternative; however, it did not perform as well as the current system.

The MPO staff then pursued the development of a CMS, using the E & C System as a starting point. The CMS determined where congestion occurs or is likely to occur, identified its causes, evaluated strategies for managing congestion and enhancing mobility, and developed a multimodal approach to implementing effective strategies.

Many of the recommended strategies are short-range, relatively non-capital intensive measures designed to manage the existing transportation system and reduce travel demand. Some of the strategies, which have been included in the TIP, are arterial road separations, bottleneck removal, carpool/vanpool incentives, central business district fringe parking lots, and high occupancy vehicle facilities. Other strategies include the construction of bicycle and pedestrian facilities and toll roads, the initiation of programs that would affect home-to-work trips (e.g., guaranteed ride home, compressed work week, and flexible work hours), and installation of intelligent transportation system technologies. The estimated cost of these strategies is \$1.0 billion of the \$15.2 billion transportation plan.

As stated earlier, this congestion management approach, along with financial constraint concerns, resulted in the MPO re-thinking the design benchmark that it had historically used to ensure a certain level of service (LOS) on the region's freeway system at the peak hour. Generally, the expectation was that the majority of the region's freeway system would operate at LOS C conditions or better for the entire day, including peak travel periods. This approach would likely obligate the region to build more physical capacity. However, the MPO chose not to use traditional design standards to evaluate capacity needs but rather to explore other evaluation options which would not require as much additional physical capacity. The decision was made to discontinue targeting the capacity needs of the peak hour of the day as a basis for developing the transportation plan and instead to evaluate the third, fourth, and sixth busiest hours of the day.

As part of this effort, the MPO evaluated what impact TSM, TDM, and non-SOV system alternatives such as high occupancy vehicle (HOV) facilities and rail system options would have on reducing future traffic congestion. The final results of this analysis indicated that travel demand for the fourth busiest hour of the day could be satisfied at LOS C on the majority of the existing and planned freeway system. This LOS has since been adopted as the planning benchmark by the MPO for the Congestion Management Plan and incorporated in the freeway system recommendations contained in the Plan Update. The MPO concluded, however, that this LOS could only be achieved by aggressively implementing TDM and TSM strategies and introducing non-SOV modes.

Mobility 2010 contains 66 miles of light rail as part of the DART rail system and 37 miles of commuter rail on the RAILTRAN line extending between the Dallas and Fort Worth CBDs. As part of the Plan Update, a series of rail simulations were conducted with various combinations of rail technologies in an effort to improve the recommendations included in Mobility 2010. The Plan Update recommends the continued construction of the 20-mile DART Light Rail Starter System Plan as well as additional light rail in other portions of the Dallas sub-area. Commuter

rail is also being implemented on the RAILTRAN line connecting Dallas and Fort Worth and recommended for other portions of the region.

Although the MPO's planning efforts are based on regional growth and development assumptions and forecasts created by a division of NCTCOG, the MPO does not include discussions of them in its planning documents. By not including this level of detail, the MPO loses an opportunity to discuss the links between regional growth and development, land use, and transportation. These are potentially controversial subjects since the region is growing rapidly, and its jurisdictions compete for economic development resources.

B. Transportation Improvement Program (TIP)

The TIP for the Dallas-Fort Worth metropolitan area is prepared by the MPO staff in cooperation with TxDOT, DART, and the FWTA. NCTCOG's Executive Board, the RTC, STTC, TDMC, and the Air Quality Advisory Committee also participate in the development, review, endorsement, or approval of the TIP. Currently it is prepared annually, however the MPO is considering shifting to a biennial TIP in order to be on the same schedule as the state transportation improvement program (STIP).

Development of the 1995 TIP was based on a reprioritization of projects included in the 1993 and 1994 TIPs and the programming of available Congestion Mitigation and Air Quality (CMAQ) funds. Projects were evaluated for inclusion in the TIP using a five-criteria, 100-point rating system, which was first developed for evaluating projects for the 1993 TIP. To create this system, a preliminary list of 21 criteria was selected which, according to the TIP, encompassed multi-modalism, mobility enhancements, and air quality considerations. A series of surveys among the RTC, technical committees, and the public were conducted to choose those criteria that would positively impact regional mobility.

This process resulted in the MPO adopting the following criteria for rating categories of projects: 1) current cost effectiveness; 2) future cost effectiveness;¹ 3) air quality/energy conservation benefits; 4) local cost participation; and 5) intermodal/multimodal projects/social mobility. For each criterion, separate evaluation methodologies are developed for different project categories (e.g., roadway, transit, bicycles, and other enhancements). For example, the current cost effectiveness of roadway projects is calculated by estimating the travel time savings of motorists using the proposed facility if it were built today. Travel time savings of proposed facilities are estimated from the average travel time saved by motorists using them if they were built in the future. Air quality benefits are calculated from the reduction in vehicle emissions caused by increasing vehicle speeds through the construction of the proposed roadway facility in 1990. Transit projects are evaluated for both cost effectiveness, by determining the vehicle hours removed from the main traffic stream, and air quality benefits, by estimating the volatile organic compound (VOC) reduction of the vehicle miles removed from the main traffic stream.

¹Criteria for CMAQ projects are slightly different. Instead of using a future cost effectiveness criterion, a CMS/TCM criterion is used.

For TIP development, the MPO scores and ranks projects for STP Metropolitan Mobility, CMAQ, Enhancement, Urban Street, Section 16, and Section 9 funds. In total, this makes the MPO responsible for ranking roughly 33 percent of federal transportation funds for the 1995-97 time frame. The rating process is used as a consensus-building mechanism with the MPO staff initially assigning a project score, and then soliciting feedback. Scores can be challenged and have been changed, although the MPO has no formal process for doing this. Once in the TIP, projects can be rescored and subsequently withdrawn from the TIP.

For Section 9 funds, the transit operators submit information that corresponds to the five criteria discussed above, and the MPO staff use this information to assign a score. Transit agencies can ask that projects be reevaluated, for example, if the cost estimates change. The MPO does not assign scores to Section 3 projects since funding is contingent purely on Congressional appropriations; however, the MPO ensures that these discretionary funded projects will not cause any problems with the TIP when conducting analyses such as air quality conformity.

The TxDOT rates projects for all other funds (NHS, IM, bridge, etc.) with input from the MPO. Enhancement projects are selected on a statewide competitive basis by TxDOT. The rating assigned by the MPO serves as one of several factors in the TxDOT's decision-making process.

The MPO considers the TIP to be an implementation document for the transportation plan. Attempts were made to prioritize programmed projects according to their scores, but the MPO found this to be impractical. For the most part, the planning and implementation of the different projects are too complex, requiring a sufficient number of years to stage the different elements. This is the reason that the TIP programs roadway and transit projects up to nine years in the future. The current policy of the RTC is that higher scored projects will be implemented first only if early construction is possible, and funding caps set by the State are not violated.

The MPO considers monitoring projects funded through the CMAQ program to be important since administrative delays prevented the initiation of some of the first CMAQ projects. Another reason for monitoring these funds stems from their state regulation, which allows the State to fine MPOs if TCMs (which are eligible for CMAQ funds) listed in the SIP are not implemented. At the time of the review, the MPO staff were planning to implement a monitoring program specifically for projects funded with CMAQ and STP Metropolitan Mobility funds. However, the local governments believed this would be too burdensome on their own time and resources. Instead, the MPO staff continually monitor projects funded under these two programs along with all other TIP projects. The MPO staff monitor a project's scope, finances, and conformity status and maintain a dialogue with local governments to track implementation status.

C. Unified Planning Work Program (UPWP)

Total funding for the 1994-95 UPWP is \$7.4 million. The MPO--along with TxDOT, DART, FWTA, and counties and local governments in the Dallas-Fort Worth metropolitan area--prepares the UPWP annually. Each year, specific planning needs for the region are identified through requests solicited from representatives of these agencies and local governments. These needs are combined with those at the regional level, identified by the MPO, and then allocated to

available planning resources. The UPWP document is presented as a work program to the transportation technical committees for review prior to submission to a public meeting for comments. Final approval is granted by the RTC and the Executive Board.

The document covers six program areas, which are identified by TxDOT for all MPOs in the state: 1) Administration/Management; 2) Data Development and Maintenance; 3) Short-Range Planning and Programming; 4) Metropolitan Transportation Plan; 5) Management Systems; and 6) Special Studies. Most of the functional and financial responsibilities of the participating agencies and the planning activities to be undertaken by them are defined in the UPWP. The mix of tasks includes both transit and highways and appears to address ISTEA and CAAA regulatory planning requirements.

Observations and Recommendations

1. The Plan as a Long Range Planning Tool: This iterative plan development approach developed by the MPO demonstrates how the inclusion of congestion and financial constraint concerns can establish a vision for maximizing the existing transportation system and guiding future investments. The result is a planning document which is a unique and innovative long-range planning tool.
2. Documenting Regional Growth Assumptions: Regional growth and development projections are essential ingredients in the travel demand forecasts that the MPO used for developing the Plan Update. These projections could be part of the public discussion if they were explained in the Plan Update. This discussion is important since the region is expected to grow at a rapid pace, and these projections could influence the transportation strategies that are adopted.
3. Corridor Evaluation Through the CMS: The CMS will rely on MIS as a method to refine the analysis and strategies for corridors and subareas. However, the documents reviewed at the time of the planning review did not include all corridors or facilities that have been identified as having existing or potential recurring congestion.
4. TIP Development Process: The TIP development process has introduced additional technical inputs for evaluating and rating potential projects. Decision makers stated that they recognize the process as a tool to build consensus and to justify whether or not to move forward with a project.
5. Selection of Activities: Although not a regulatory requirement, the UPWP could describe how planning activities for all surface transportation modes are selected and prioritized and how they are linked to the goals, objectives, and priorities of the Plan Update and the TIP.
6. Description of Activities: The UPWP currently describes activities being undertaken by local agencies and other regional organizations; however, it also could include a description of all transportation and relevant air quality planning activities in sufficient detail to indicate who will perform the work, the timing, and the product.

V. FHWA and FTA Administrators' Focal Points

A. Financial Planning and Financial Constraint

Regional Transportation Plan

The 1993 Plan Update was adopted prior to the issuance of the final rules and guidance by the U.S. DOT. The plan identifies \$15.2 billion (in 1993 dollars) in transportation system investments to be applied over the next 17 years. This contrasts sharply to the MPO revenue estimates available to the region during the planning period if current funding practices continue. If no new sources are secured and funding levels do not change, the MPO expects that the region will receive \$5.8 billion during the planning period, resulting in a \$9.4 billion shortfall.

The Plan Update contains a financial component that is based on the premise that increases in traditional revenue sources, as well as some non-traditional sources, will cover this \$9.4 billion shortfall. It assumes that real growth in travel and fuel consumption will continue, motor fuel tax rates will increase, and that the public will accept higher transportation user fees to finance transportation projects; all of these assumptions result in increased revenues.

Revenue projections of traditional sources appear to reflect trends and historical averages. Even without new taxes, federal and state motor fuel revenues are forecasted to increase on average by 1 percent per year as a result of the region's growth in vehicles mile of travel (VMT) and its increase in motor vehicle fuel usage.

Other less traditional revenue forecasts may be based on optimistic assumptions, such as the increase in vehicle registration fees from an average of \$50 per year to \$200 by the year 2000. The Plan Update also assumes that TxDOT, DART, and FWTA will double their rate of expected federal and state discretionary fund receipts. According to the Plan Update, this is based on the assumption that, "historically, large urban areas which are making capital expenditures on new rail systems, HOV lanes, and major roadways in high cost corridors receive higher levels of discretionary funding." Even so, the MPO has not demonstrated in its documents or the planning review any analysis to support this conclusion.

The plan's financial component supports only one "vision," yet the MPO staff indicated during the planning review that they have designed analytical tools, such as financial spreadsheets, which can be used to test the impact of different funding assumptions. Along with their travel demand capabilities, they can demonstrate the system-wide effects of not proceeding with different projects. According to Michael Morris, Director of Transportation for the MPO, this capability provides him and his staff with a means to communicate more effectively to policy makers regarding hard choices; e.g., what new revenue sources or funding mechanisms are necessary if the region is to move forward with its transportation vision? The MPO might use these analytical tools to evaluate other less optimistic financial alternatives than the vision in the transportation plan.

Transportation Improvement Program

The MPO relies on historic sub-allocations of state and federal funds to develop funding estimates for the TIP. Funding allocations come from TxDOT but, according to the MPO, there is a collaborative approach. TxDOT imposes an obligation ceiling on funds allocated to the region after which the MPO prioritizes its categories of projects, including those for the CMS.

The region places a high priority on the implementation of TCMs, since they are included in the SIP, and because state regulation fines the MPO if TCMs are not implemented in a timely manner. The MPO is concerned that obligation ceiling limitations set by TxDOT make it technically and politically difficult to fulfill the region's SIP commitments as well as other projects which are important to the region's mobility.

The TIP is financially constrained for FY 1995-97. However, the information is not presented in a manner that would be clear to the average citizen. The MPO states that it is working with TxDOT, which supplies it with financial tables and project information for inclusion in the TIP, to improve the readability and usability of these tables.

Observations and Recommendations

1. Forecasting Alternatives: Although the Plan Update contains a financial component, it is based completely on the premise that increases in traditional revenue sources, as well as some non-traditional sources, will cover the expected shortfall of \$9.4 billion. The MPO may want to demonstrate its consideration of a less optimistic financial alternative (e.g., \$5.8 billion in revenue) in the event that there is a revenue shortfall. The 1993 Plan Update was adopted prior to the issuance of the final rules and guidance by the U.S. DOT. Subsequent versions of the plan will need to reflect the federal regulations.
2. The Transportation Plan as a Planning Tool: The framework that has been developed by the MPO for analyzing system-wide impacts of different financial assumptions can accommodate the dynamic aspect of not knowing the full extent of the total revenues that will be available to the region during the planning period. Using its analytical tools, the MPO can also demonstrate to decision makers the significance of securing new funding sources and levels of funding by specific times in the future to meet the current vision for transportation development. This has the potential of stimulating discussion as to which projects are most important to the region, which ones should be funded, or whether or not new funding alternatives should be considered.
3. Assumptions for Non-Traditional Revenue Forecasts: Two of the MPO's financial assumptions--that is, an increase in vehicle registration fees and the region's ability to secure federal and state discretionary funding at a much higher rate--appear to be optimistic. Due to these assumptions, it is conceivable that the MPO has pushed the limits of the plan's financial constraint, resulting in the inclusion of a number of projects which the region might not be able to afford.

4. Data Supporting Financial Constraint: Although technical personnel can understand the TIP, its presentation of financial data and content are difficult for the average citizen to understand. The federal team suggested that the MPO could supply the public with a separate document that describes the financial data in simpler terms.

B. Major Investment Studies (MIS)

At the time of the planning review, the MPO had completed a preliminary report, which broadly defined the participants and federal process for conducting an MIS. The underlying rationale of the report is that each MIS must evolve from the transportation plan. At the conclusion of an MIS, it is expected that the transportation plan and TIP will be modified to incorporate whatever design concept is selected. At the same time, these changes are expected to affect the CMS and financial elements of the plan and TIP.

Since the beginning of the 1995 fiscal year, four MISs have been developed, and one feasibility study has been modified to conform with the current MIS guidelines. Additional efforts will wait completion of the guidelines.

TxDOT, TTA, DART, FWTA, local governments, the MPO, FTA, and FHWA are expected to participate in the creation of an interagency agreement for each MIS. Participants will determine a lead agency for the MIS and work as a team, defining geographical limits of corridor studies and evaluation/analysis procedures. The nature of the alternatives under consideration will almost always determine which agency is selected to lead an MIS. This has been the case for the four MISs that have been initiated since the beginning of the year. The MPO will serve as the lead agency for corridors in which a single modal solution is not obvious.

The MIS public involvement process is being designed to be a prime component of the regional public involvement process. The MPO believes that its MIS public involvement process, which will be tailored to each project, will generate more active public participation than the regional one, which covers regional planning products and activities that can be more abstract and difficult to comprehend by the average citizen.

Public involvement in an MIS is to be defined at the start of each study by the lead agency, which is responsible for compiling a comprehensive list of participants (e.g., current users of the facility, potential users, and adjacent landholders). The lead agency is also responsible for developing a strategy for ongoing participation throughout the study.

During the planning review, individuals from the STTC and DART stated that the public involvement processes of two MISs improved the level of education and dialogue between the public and transportation agencies at the project level. The STTC member stated that the public "now realizes that what they ask for has to be met, in the way of alternatives." The individuals from the STTC and DART also stated that a number of agencies that had been unintentionally excluded were now being brought into the process.

Observations and Recommendations

1. Role of Federal and Non-Transportation Agencies: The role of Federal agencies and non-transportation stakeholders, such as adjacent landowners, could be more clearly defined in terms of identifying studies and developing alternatives.
2. Public Involvement: The MIS public involvement process, as defined by the MPO, is innovative in that it is considered to be the key mechanism by which to involve the public directly in the planning process. However, the MPO could more clearly define its MIS public involvement process and then incorporate it into its regional public involvement process.
3. Cooperative Team Approach: As described at the planning review and in the documents provided to the federal team, the MPO brings transportation providers and government agencies together early in the MIS process by formally creating a team of all agencies and government entities to develop the scope and analytical procedures for an MIS.

C. Management Systems

As a Transportation Management Area (TMA - defined as an urban area with a population greater than 200,000) and an ozone nonattainment area, the Dallas-Fort Worth metropolitan region is required to develop a Congestion Management System (CMS). The MPO has taken the lead role in developing the CMS and expects the State to perform a similar role in other management systems. The CMS is discussed in section IV.A. of this report, since the MPO has incorporated it in detail into the transportation plan.

The staff stated that there were ongoing efforts between TxDOT and MPOs across the State to identify roles and responsibilities for implementing each management system. At the time of the review, the MPO anticipated some level of involvement in all systems and had begun gathering data, but was hesitant to create any database without State involvement to avoid duplication and the development of incompatible databases. Discussions were ongoing between the MPO, TxDOT, and its consultants on how to proceed.

The MPO acknowledged, during the planning review, that it has had difficulty moving forward due to the complexities in identifying common measures of performance and in gathering the data needed to develop the management systems. For example, the Pavement Management Task Force conducted a review of local and nationwide pavement management systems, which revealed the wide variance of these systems from one locality to the next. No common method of measurement or comparison existed for the MPO to adopt. In developing the safety management system, the MPO encountered data management issues when attempting to combine databases that were never designed to work together to create a regional accident information database. For almost four years, the MPO's efforts to move forward with the development of this management system were also hampered by its inability to secure a database from the State of Texas until legal issues were resolved.

During the planning review, the MPO staff stated that it had only recently started working on the system for Intermodal Facilities and Systems Management (IMS), which will address airports, passenger rail, public transit, heavy rail, and trucking. It is expected that the TPUTF will participate in the development of this management system.

Pavement Management Systems (PMS)

NCTCOG's Pavement Management Systems Evaluation Report is a first step in defining a Pavement Management System. The evaluation was conducted by the 1993-94 Pavement Management Task Force, which included public works and transportation officials from cities and entities in the region. The report reviews pavement management systems locally and nationwide in order to identify the essential components of a network-level pavement management system. Five components as well as minimum data collection requirements were recommended. The five components are: 1) System Development and Implementation; 2) Data Collection; 3) Database Management; 4) Analysis Methods; and 5) Communication of Results.

Safety Management Systems

According to the UPWP, safety management systems were defined during FY 1993-94. NCTCOG staff stated that this definition process is still in the early stages, that the principal interest has been accident data, and that the State has been expanding the definition of safety.

Work has begun on the development of a regional accident information database to support safety management systems. According to NCTCOG staff, a local government traffic accident survey has been taken to provide information for the database; however, all of the data sets are incompatible.

Funding in the 1994-95 UPWP continues the development and implementation of the regional safety information system. A consultant will be contracted to link the necessary database elements with NCTCOG's existing transportation system database to create reports and graphically display the information using GIS.

Intermodal Transportation Facilities and Systems (IMS)

According to NCTCOG staff, there has been little activity in IMS until recently. More has been accomplished for airports, passenger rail, and public transit than for freight rail and trucking. Rail is being addressed by a new feasibility study showing heavy rail activity; also the MPO intends to identify key facilities and corridors for both rail and trucks. NCTCOG has generated a report summarizing truck routing, geometric design, and Texas intrastate regulation. The report also presents a method to evaluate truck routing alternatives and their potential impact on present and future roadways, arterial street operations, and the environment.

Traffic Monitoring Management System

According to NCTCOG staff, the Traffic Monitoring Management System serves as an underlying database for the six management systems. It will provide a comprehensive process for collecting and storing personal and vehicular traffic patterns on highways. Part of this process involves establishing collection and updating procedures. The system will help create performance measures for the other management systems and identify data-exchange issues, such as requests for data from outside of the agency.

Public Transportation Facilities and Equipment (PTMS)

TxDOT collects PTMS data for Sections 9, 16, and 18 program categories, and NCTCOG has created a system for assimilating that information. The MPO is most concerned with Section 16, since it selects projects for these funds. A directory of 1993 providers, updated using surveys, has also been created. Eventually, they would like to put the directory on line for anyone to use. A third product shows the elderly population using '90 census data.

Observations and Recommendations

1. Early Stages of Development: The MPO has begun to conceptualize and, in some cases, develop the computer systems that will support the management systems. It has also begun the difficult task of coordinating data collection with transportation providers and users.

D. Air Quality Planning and Conformity

Four of the sixteen counties in the NCTCOG area are designated as "moderate" nonattainment areas for ozone, with an attainment date of 1996. A conformity determination was passed by the MPO for the transportation plan and TIP on October 12, 1994, followed by the Federal government on January 9, 1995. Another conformity determination was passed by the MPO for a TIP revision on February 9, 1995, followed by the Federal government on June 16, 1995. A NOx waiver was granted by the Environmental Protection Agency (EPA) in November 1994.

The MPO is actively involved with implementing CAAA requirements because vehicles are a major contributor to ozone in the nonattainment area. The MPO staff conduct all modeling for transportation related air quality analyses, including the regional emissions analysis for conformity, and the on-road mobile emissions inventory for the SIP, with the exception of urban airshed modeling. Formal procedures have been adopted by the State and submitted to the EPA, in the form of a SIP revision, that define the roles and responsibilities of the MPO, the State, and other relevant parties for air quality related transportation planning, SIP development, and conformity requirements. The EPA has not yet approved the SIP revision.

The SIP revision also defines the Transportation and Air Quality Technical (TAQT) Working Group, which consults on air quality planning and conformity-related topics, including evaluating and choosing models to be used for hot-spot and regional emissions analysis; determining which projects are regionally significant or have a regionally significant change in

design concept and scope; reviewing exempt projects; and discussing TCM implementation. The TAQT's members include representatives from the MPO, TNRCC, TxDOT, EPA, FHWA, FTA, and local transit. Originally begun as a technical working group, the TAQT's role has been expanded and now also focuses on administrative and policy issues.

As a major player, the MPO faces some difficult issues, discussed below, regarding conformity requirements, TCM implementation, and passage of the state enhanced inspection and maintenance (I&M) program.

The Dallas-Fort Worth ozone nonattainment area is in a "transitional" period, since the EPA has not yet approved either the Attainment Demonstration SIP or the 15 percent Volatile Organic Compound (VOC) Reduction SIP. Completing the conformity analysis during the transitional period requires extensive staff resources because of the more burdensome analytical requirements. Not only must the MPO staff demonstrate that emission estimates from the TIP and transportation plan are consistent with emissions budgets in the SIP, but they must also demonstrate that the build scenario will produce fewer emissions than the no-build scenario for each analysis year (1996, 2005, and 2010).

The MPO staff stated that there is no discernible difference between the levels of emissions for the build and no-build scenarios. Similar slight differences have been reported by almost all major metropolitan areas across the nation. This results in completing an analysis using procedures that add the air quality benefits of individual projects to the systems level air quality analysis. This will be the case for the Dallas metropolitan area until either SIP is approved by the EPA, which will remove both the transitional status and the requirements for the build/no-build demonstration.

The MPO's Air Quality Conformity report states that TCMs are now being implemented according to the Plan Update and 1995 TIP. TCMs are estimated to reduce only about 7 tons per day of the 104 tons per day reduction expected from all on-road mobile sources in 1996. TCM implementation is a high priority to the MPO because of the consequences of not meeting the conformity requirements. However, TCMs contribute only marginally to reducing mobile source emissions. As with the build versus no-build scenario, many metropolitan areas across the nation are estimating small emissions reductions from implementing TCMs.

On-road mobile sources are estimated to contribute 38 percent of total VOC emissions in the nonattainment area, while they are expected to reduce total VOCs 71 percent by 1996. The largest reduction is realized by the enhanced vehicle inspection and maintenance (I&M) program. In the wake of widespread discontent with enhanced I&M programs and the EPA's revised regulations for them, the Governor of Texas has proposed a different I&M strategy called "Motorists Choice." The MPO is evaluating the proposal and is reviewing how the conformity analysis and emissions inventory will be affected.

The MPO expressed concern that the ozone nonattainment area could be bumped up to a higher nonattainment classification due to periodic monitored exceedances of the standard. The boundaries of the nonattainment area may be expanded if the area is bumped up. The definition

of the boundaries would be subject to development through the air quality planning process. As part of this process, the MPO would provide technical assistance to help determine if the new counties being considered for inclusion in the nonattainment area should be added.

The MPO is involved with various other initiatives to improve air quality in the region, such as implementing an Ozone Alert program, which alerts citizens when ozone is expected to reach levels that could be dangerous for human health and that could trigger violations of the EPA's air quality standard. The MPO also participates in the North Central Texas Clean Cities Program, which coordinates public and private interests and promotes alternative fuels. A total of \$8.5 million in CMAQ funds is being used to convert fleets to alternative fuels in order to clean the air.

Observations and Recommendations

1. Many Resources Dedicated to Air Quality Planning: The MPO is actively addressing transportation-related air quality issues at many levels of the planning process and has dedicated three staff members to address the CAAA requirements. In the event that the nonattainment area's designation is changed and the boundary expanded, the MPO is prepared to provide technical assistance to any counties which may be subject to inclusion in the newly defined nonattainment area and is prepared to meet the enhanced modeling requirements (see Section VII). In addition to its modeling efforts, the MPO acts as an advocate to the general public and the State for clean air.

E. Public Involvement Process

On June 1, 1994, the RTC adopted the NCTCOG Public Involvement Process in response to ISTEA requirements. Its documented program reflects a conscious decision on the part of the MPO to include only minimum procedures which reflect federal requirements. By doing this, the MPO is attempting to set the standard so that a legal challenge based on failure to follow its public involvement procedures may be avoided.

Although the MPO's policy statement stresses the importance of public participation in every step of the process, there appears to be limited formal opportunity for citizens to participate, particularly in the early or system planning stages. The MPO has no standing committees composed of representatives from the general public for the purpose of advising staff and the Executive Board. The membership of the advisory committees that support the planning process consist primarily of technical staff from member jurisdictions and regional and local transportation agencies.

The MPO's public involvement policy states that all committee and task force meetings are open to the public. Even so, it does not appear that the MPO actively encourages attendance or solicits input at these meetings from citizens who represent a variety of communities or interest groups. The Director of Transportation for the MPO stressed that public involvement is more meaningful at stages other than the system planning level, since at that point the process is no longer abstract; that is, providing opportunity for public participation when project concepts or alternatives have

been identified. Consistent with this approach, the MPO is designing the MIS process to be the “cornerstone” of the public involvement process. This is discussed further in Section V.B. of the report.

Prior to the approval of the TIP, the transportation plan, and the UPWP by the RTC, the MPO's public involvement policy requires that its staff hold public meetings. In preparation for public meetings, public notices are sent by the MPO to selected newspapers, local public entities, chambers of commerce (including minority chambers), and the Texas Register. In addition, the MPO maintains a mailing list containing names of individuals and organizations who wish to be contacted prior to all public meetings.

According to the Plan Update, the public involvement program, which was implemented to support the development of the plan, included 26 meetings. A review of the list of the meetings in the Plan Update indicates, however, that almost all of them were conducted with technical advisory committees and policy-making boards of different transportation agencies. The TIP also lists 37 meetings that were part of the public involvement process. Thirty-four of the meetings were with the RTC, other technical committees, and the MPO's Executive Board; whereas, the remaining three were public meetings held at different locations in the region. Considering that no citizens (only technical staff from different jurisdictions and transportation agencies) attended the public meeting that was held during the planning review, it was uncertain at the time of the review whether the MPO had developed effective methods for eliciting public comment.

As part of its evolving public involvement process, the MPO has initiated through the Internet a transportation bulletin board providing electronic information on meetings and agendas, and has produced professionally made videos for Cable TV. These techniques, which have not been included in the MPO's public involvement policy, are innovative. However, they target, for the most part, segments of the citizenry that have access to these technologies.

Observations and Recommendations

1. The Need for Greater Participation: The MPO's public involvement process is evolving. However, it does not provide for continuous involvement of the public throughout the planning process, particularly in the conceptualization of plans, the ranking of projects for inclusion in the TIP, or the discussion of critical transportation issues. At this point, the process could be more proactive; its focus is on presenting products to elicit public reaction.

F. ISTEA Fifteen Factors

According to the MPO staff, many of the 15 factors had been implicitly understood and incorporated into the region's planning and decision-making activities even before ISTEA. Since the passage of ISTEA, the MPO has adopted policies and initiated efforts to directly address some of the factors. This is evident in the goals that have been adopted to guide the development of the transportation plan and the TIP project ranking criteria. The MPO has also initiated additional programs and created new committees that support the implementation of several of the 15 factors.

To address congestion, as discussed in previous sections, the MPO had made great strides in the preparation of a regional transportation plan which incorporates congestion management strategies as an essential ingredient for maximizing the efficiency of the existing transportation system. In doing so, the MPO has recognized the significance of the growth in congestion, the need to adopt strategies to relieve it, and the importance of these strategies, along with financial constraint, to create a new transportation planning vision.

Another factor is to consider the effects of all transportation projects, regardless of funding source, in the planning process. The MPO has been tracking privately funded projects in the region. For example, it has been following the development of Alliance Airport, which is expected to have a dramatic impact on regional growth and development patterns, as well as the transportation network.

The MPO is currently forming the TPUTF to enhance freight movement. The task force will be composed of private sector entities, including representatives from railroad companies, airlines, freight forwarders, and major shippers in the region. The formation of this task force will move the region toward a better understanding of goods movement issues. It is also timely since the North American Free Trade Agreement is expected to result in an increase in the movement of goods on the region's highways and through the Dallas-Fort Worth International Airport.

The MPO has incorporated transportation enhancement activities in the Plan Update, which include the Bicycle and Pedestrian, Common Heritage Corridors, and Scenic and Environmental Enhancements elements. At this time, these elements, as described in the plan, appear to be primarily conceptual, with few activities under way. In support of enhancements, the TxDOT has initiated the Statewide Transportation Enhancement Program (STEP), which is a statewide competition for funding. In the Dallas-Fort Worth area, the MPO is the nominating agency for eligible enhancement projects.

The MPO has considered social, economic, and environmental effects in examining corridor improvements. For example, it has been participating in the Trinity Corridor initiative with the Army Corps of Engineers to identify a range of transportation projects which would be compatible in the river valley. The initiative is examining all modes and considering noise and visualization impacts. The MPO has also begun to prepare case studies documenting the extent to which new transportation facilities and services have stimulated development. The case studies compare the level of development that has occurred in corridors that have been supplied with transportation improvements and those that have not. Given the inherent relationship between providing transportation services and land development, the MPO perceives that these case studies will help it and the region's transportation providers to market new projects. Although this type of analysis is occurring in corridor studies (and will occur in future MISs), the federal team pointed out that the MPO will want to more thoroughly consider the social, economic, and environmental effects at the system planning level.

Observations and Recommendations

1. Integration of the Fifteen Factors in the Planning Process: Since the passage of ISTEA, the MPO has made great strides in addressing congestion management and developing strategies for maximizing the efficiency of the transportation system. Given that the region's transportation plan was prepared prior to the issuance of the federal planning regulations, the MPO's efforts to integrate most of the other factors in the planning process so far have been preliminary. As the MPO continues to move forward with its plan update, it needs to integrate social, economic, and environmental effects into the preliminary stages of its transportation planning. To date, these efforts are reflected in the project evaluation criteria for determining what projects are included in the TIP (Section IV.B.). In addition, the MPO has developed a GIS program, which will become a valuable tool for further integrating the fifteen factors into the planning process.

VI. Integration of Strategic Transportation Planning

The Dallas and Fort Worth areas are served by two different transit operators: the Dallas Area Rapid Transit Authority (DART) and the Fort Worth Transportation Authority (FWTA). Neither of the transit operators is represented on the MPO's Executive Board, however both are represented on the RTC. Formal agreements between the MPO and transit agencies were not in place at the time of the review, although the transit staff stated that they rely on the MPO to achieve consistency in their planning and they coordinate with the MPO in the strategic transit planning process. The transit operators' plans are reflected in the Congestion Management Plan and other parts of the Plan Update.

Through the years, the MPO has provided assistance to the transit operators for travel demand forecasts to support system and project planning activities. DART has in-house staff that are able to run the MPO's travel demand model. Whenever DART uses the model to generate forecasts, its work is reviewed by the MPO staff. The FWTA relies on the MPO staff to do the bulk of its planning. Also, the transit agencies work together, providing staff members for study teams. The transit operators and the MPO have worked together to coordinate the planning of RAILTRAN, which is a rail link between the Dallas and Fort Worth central business districts, that is currently under construction.

Besides the RAILTRAN project, DART has a number of major capital projects under way, which include the construction of a 20-mile light rail starter system by 1997, transit centers, commuter rail lines, and two more HOV lanes. These could be considered extremely aggressive transit improvements, particularly in light of the patronage decline that has occurred in the Dallas area.

Between FY 1991 and FY 1994, DART's bus ridership declined by 5.0 percent, primarily as a result of a decrease in travel to the central business district. For example, ridership on radial limited stop, radial local, and regional express routes decreased by 19.5 percent, 6.9 percent and 1.1 percent, respectively. A DART study, "DART Fixed-Route Service Review Study: Executive Summary" suggests, as did DART staff during the planning review, that rail implementation presents an opportunity for restructuring bus service and, in particular, examining routes with below average performance.

The FWTA, which began operating in 1983, has adopted a "pay as you go" approach. It has used its resources to develop a range of services that include fixed route bus service, a demand-response paratransit service for the mobility impaired, a commuter bus service between Fort Worth and Dallas's central business districts, and employer services to encourage ridesharing. In addition to its commitment to the RAILTRAN commuter rail project, it is constructing an Intermodal Transportation Center in downtown Fort Worth as a link between its buses and the RAILTRAN terminus. This project has been financed in part by a transfer of about \$30 million in CMAQ funds.

The FWTA's annual fixed route bus miles increased 40 percent between 1989 and 1994, and total revenue from fixed route services increased each year from 1989 to 1992 by 19 percent. Despite

the revenue growth, the cost of service increased 40 percent during the period. Between 1992 and 1993, revenues fell by 2.5 percent resulting in a fare increase.

Observations and Recommendations

1. Decline in Transit Patronage: Given the declines in transit patronage that have been experienced in the Dallas area, DART should continue to evaluate its marketing strategies as a means to meet growth forecasts that form the basis for future transit investment.

VII. Travel Demand Forecasting

The MPO's modeling capabilities represent a very advanced state-of-the-practice in travel forecasting. In some instances, the MPO is pushing the state-of-the-art. Specific comments on the modeling process follow:

Stated Preference/Activity Based Forecasting - The MPO is in the process of conducting surveys on travel behavior. These surveys will include revealed as well as stated preference data. Including stated preference will enable the MPO to conduct much more effective analysis on new policies, especially those for which there is no existing experience (e.g., congestion pricing). The surveys will also support the eventual redesign of the travel forecasting process as activity based rather than trip based.

Level of Detail - The MPO uses a very comprehensive database to support its modeling process. The database consists of 8000 zones and is constructed on a GIS platform. Aggregations of the 8000 zones are created to support individual applications. Typical travel demand model runs operate at the 800 traffic analysis zone (TAZ) level.

Land Use - The DRAM and EMPAL models are used for the basic land use forecasts. These models forecast land use to 191 sub-zones, with other procedures to suballocate to 8000 zones. In the allocation to 8000 zones, planners' judgment can alter the forecast. However, the 191-zone forecast of DRAM and EMPAL remains fixed.

Feedback - Feedback occurs between the assignment and distribution steps and from assignment to land use. The distribution process begins with a congested network. After assignment, one initial feedback is made to distribution and a second assignment made. If there are significant changes between the first and second iterations, further runs are made. To date, nearly all analysis has required only one feedback loop.

The DRAM and EMPAL models are used to forecast population and employment developed in five-year increments. Staged transportation networks consistent with the air quality conformity process are used as accessibility measures. DRAM/EMPAL provides an initial base year forecast of land use. Base year travel times are in part developed from this process. The travel times are fed back to DRAM and EMPAL to determine allocation changes. In each succeeding time period, a revised transportation system reflecting programmed improvements (both highway and transit) is used to calculate zone to zone travel time between each of the 191 zones. The updated travel times resulting from highway and transit assignment are then provided as input to the DRAM and EMPAL runs for the next time period. Final transportation plan networks are used to compare zone to zone travel times before and after the demographic forecasts to insure equilibrium.

Mode Choice - The MPO has two highly innovative mode choice capabilities: transit multi-path assignment and automated coding of transit walk links. For the multi-path assignment, several related transit modes are identified in mode choice, including HOV, walk to transit, and drive to transit. The pathbuilding routine identifies more than one path per mode. After the mode choice

model has been run, a further split is made among the paths through the denominator of the logit model.

An automated coding procedure is in place to code transit walk links. The procedure will code links up to 2 miles and also code multiple transit links for each zone.

TRANSIMS - The MPO is a test site for the first application of TRANSIMS. The application is in the experimental phase and will push the state-of-the-art in travel forecasting. The MPO is developing a method for coding a regional network in sufficient detail to support a regionwide traffic microsimulation. The construction of the network itself, in addition to the TRANSIMS application, is highly innovative.

Observations and Recommendations

1. State-of-the-Art Modeling: Several of the techniques used by the MPO--the transit multi-path, automated walk link generation, and the methods for constructing regionwide microsimulation networks--are very innovative. Members of the federal team thought that other MPOs would benefit from learning about these techniques.

VIII. Meetings with RTC Policy Committee Officials

During the on-site review, the federal team met with RTC Policy Committee officials to gain their perspective on the transportation planning process. The RTC officials made the following observations:

1. Technical Capabilities: In comparison to other MPOs, they consider the MPO staff to be technically “top-notch,” and to have an excellent understanding of the political process.
2. Project Scoring: The financial constraint requirement of ISTEA coupled with the MPO’s process of scoring projects has made a difference in the distribution of funds among projects. The ranking process has provided a good vehicle for examining alternatives and has forced elected officials to have more input into the process. The Board members stated that better transportation decisions are being made because the project scoring process lessens bias.
3. Financial Constraint: The financial constraint requirement has provided a “dose of reality.” Along with the integration of the CMS into the transportation plan, the officials have been forced to reconsider their positions on alternative funding sources, including ones that are not politically popular (e.g., the construction of toll roads, the placement of tolls on existing roadways, and other congestion pricing alternatives).
4. ISTEA and Federal Requirements: One participant stated that ISTEA has resulted in over-planning, and that MIS and environmental analysis requirements make it difficult to bring projects to fruition. The same participant stated that funding restraints are forcing movement toward environmental and enhancement activities and away from road maintenance, at a time when the condition of the roads is deteriorating.
5. State Officials and Planning: State elected officials are not educated on the requirements of the regional transportation and air quality planning process.
6. Participation of New Organizations in the Planning Process: Some of the area’s nonprofit organizations are becoming involved in the planning process for the first time.
7. CMAQ Funding: There is concern with CMAQ projects being tied to funding the TCMs that are listed in the SIP. Because of the obligation ceiling imposed by TxDOT, channeling more funds toward CMAQ to meet TCM commitments results in the lessened availability of funds for other needs, such as maintenance.

Conclusion

As reflected in the observations throughout this overview, the federal team identified several areas where the MPO and the participating agencies in the local transportation planning process have successfully implemented comprehensive and coordinated planning practices. In particular, these include the following areas:

- Development and integration of the congestion management system (CMS) into the transportation plan.
- Integration of technical inputs into systems and project-level analysis and decision making.
- Development of a committee structure to support the regional planning process that includes policy makers and technical staff members from different jurisdictions and transportation agencies.
- Extensiveness of the commitment to air quality analysis.
- Use of geographic information systems (GIS) as a transportation analysis tool.
- Incorporation of a strong public participation component in the major investment study (MIS) process.

Conversely, the federal team identified specific areas to be addressed in order to continually improve the transportation planning process in the Dallas-Fort Worth metropolitan area. These include the following areas:

- Incorporation and documentation of proactive public participation techniques (outside of the MIS process mentioned above), particularly for the Plan and TIP, at the system planning level.
- More realistic assumptions applied to traditional and non-traditional revenue sources for the financial component of the transportation plan.
- Further refinement of the region's CMS to cover all corridors that are congested or likely to become congested, not just those subject to MIS.
- Further incorporation of the fifteen factors early in system planning activities, particularly social, environmental, and economic effects.
- Further public discussion and documentation of regional growth and development assumptions.

- Presentation of financial data in a simple comprehensive form in the transportation improvement program (TIP).

Appendix A

RTC's Board of Commissioners

Collin County
Dallas County
Denton County
Ellis County
Johnson County
Tarrant County

City of Arlington
City of Cedar Hill
City of Denton
City of Hurst
City of Dallas
City of Farmers Branch
Town of Flower Mound
City of Fort Worth
City of Garland
City of Grand Prairie
City of Irving
City of Mesquite
City of North Richland Hills
City of Plano
City of Richardson
City of University Park

Dallas Area Rapid Transit
Fort Worth Transportation Authority
Texas Turnpike Authority
TxDOT, Fort Worth District
TxDOT, Dallas District

Appendix B

Local Participants in the EPR of the Dallas-Fort Worth Metropolitan Area

RTC Board Members

Kenneth Barr, Councilmember, City of Fort Worth
Bob Hampton, Commissioner, Tarrant County
Ron Harmon, Commissioner, Johnson County
Charles Heald, District Engineer, TxDOT, Fort Worth District
Henry Wilson, Councilmembers, City of Hurst
Donna Halstead, Councilmember, City of Dallas
Jim Jackson, Commissioner, Dallas County, and RTC Chairman
Jack Miller, Councilmember, City of Denton

North Texas Council of Governments

Michael Morris, Director of Transportation
Vickie Alexander
Everett Bacon
Michael Burbank
Ken Cervenka
Michael Copeland
Julie Dunbar
David Faria
Lynn Hayes
Dan Kessler
Ken Kirkpatrick
Chris Klaus
Dan Lamers
Edward Owens
Vercie Pruitt-Jenkins
Dan Rocha
Stephania Roth
LaDonna Smith

Texas Department of Transportation (TxDOT)

John V. Blain, Jr., Dallas District
Roger Beall, TxDOT, Austin
Mark A. Young, Regional Planning Office
Arnold Breedon, Regional Planning Office

Dallas Area Rapid Transit

Trip Brizell
Doug Allen
Beverly LaBenske
John Hoppie
Kyle Keahey

Fort Worth Transportation Authority
John Bartosiewicz
Nancy Amos

Texas Natural Resource Conservation Commission
Larry Anderson
Wayne Young

NCTCOG, TexDOT, DART, FWTA, Counties & Cities

Wednesday June 14, 1995

8:30 - 10:30 Transportation Modeling Overview & GIS Capabilities

Fred Ducca Status/Update/Discussion
Federal Team Discussion Leader

NCTCOG, TexDOT, DART, FWTA, Counties & Cities, TNRCC, USEPA

10:30 - 11:30 Air Quality Planning

George Hadley Status/Update/Discussion
Federal Team Discussion Leader

NCTCOG, TexDOT, DART, FWTA, Counties & Cities, TNRCC, USEPA

11:30 - 1:00 Lunch

1:00 - 2:00 Air Quality Planning

George Hadley Status/Update/Discussion
Federal Team Discussion Leader

NCTCOG, TexDOT, DART, FWTA, Counties & Cities, TNRCC, USEPA

2:00 - 5:00 Congestion Management Systems and other Management Systems

Barbara Maley Status/Update/Discussion
Federal Team Discussion Leader

NCTCOG, TexDOT, DART, FWTA, Counties & Cities, TNRCC, USEPA

2:00 - 5:00 Transportation Modeling Specifics
Concurrent

Fred Ducca Status/Update/Discussion
Federal Team Discussion Leader

NCTCOG, TexDOT, DART, FWTA, Counties & Cities, TNRCC, USEPA

Appendix D
List of Documents Received and Reviewed

Full Reports

1. "Unified Planning Work Program for Regional Transportation Planning," NCTCOG.
2. "Transportation Improvement Program for the Dallas-Fort Worth Metropolitan Area," NCTCOG, 1995.
3. "Mobility 2010 Plan Update," NCTCOG.
4. "Mobility 2010 Plan Update: Congestion Management System," NCTCOG, January, 1995.
5. "Congestion Management System Work Plan for the Dallas-Fort Worth Area," NCTGOC, October, 1994.
6. "Developing an Effective Congestion Management System, Report 1," NCTCOG, April, 1995.
7. "Metropolitan Planning Factors Report," NCTCOG, June, 1995.
8. "Regional Trucking Issues: Truck Route Alternatives, Geometric Considerations for Large Trucks, and Regulations of Texas Trucking," NCTCOG, May, 1994.
9. "Railroad Maintenance and Operations Handbook for Local Governments and Rail Carriers," NCTCOG, April 27, 1995.
10. "Pavement Management Systems Evaluation Report, Environmental Resources Department," NCTCOG, March, 1995.
11. "Air Quality Conformity for the Mobility 2010 Plan Update/1995 Transportation Improvement Program," NCTCOG, January, 1995.
12. "Land Use Inventory, Research and Information Services," NCTCOG, Fall, 1994.
13. "Urban Transportation Planning Contract," July, 1992.
14. "Proposed Agreement with Air Quality Agency, Proposed Rules, 19 TexReg 5599," July 19, 1994.
15. "DART Transit System Plan, Final Draft, Dallas Area Rapid Transit," January, 1995.
16. "Service Analysis and Development Plan, Executive Summary," (for FWTA), LKC Consulting Services, Barton Aschman Assoc, Inc., NuStats, Inc., March, 1995.

17. "DART Fare Structure Study, Final Report, Multisystems," July, 1994.
18. "Assessment of Transit Forecasts in the RAILTRAN Corridor," Transportation Department, NCTCOG, September 16, 1993.
19. "Multimodal Transportation Analysis Process (MTAP): A Travel Demand Forecasting Model," Transportation Department, NCTCOG, January, 1990.
20. "Travel Demand Forecasting Process for the Dallas-Fort Worth Metropolitan Area, NCTCOG, April, 1994.
21. "Travel Demand Forecasting and Transportation Planning Process for the Dallas-Fort Worth Metropolitan Area," Transportation Department, NCTCOG, September, 1993.
22. "635/LBJ Project: Modal Development and Validation," Transportation Department, NCTCOG, February, 1994.

Executive Summaries

1. "North Central Texas Regional Profile, 1990-2010," Research and Information Services, NCTCOG, 1994.
2. "Regional Thoroughfare Plan," NCTCOG, December, 1994.
3. "Regional Policy Position on State Transportation Funding Issues for Consideration During the 74th Texas Legislative Session," RTC, NCTCOG.
4. "NCTCOG 1994 Annual Report," NCTCOG, March, 1995.
5. "Major Investment Study: General Information and Procedures," Transportation Department, NCTCOG.
6. "DART Fixed-Route Service Review Study Executive Summary," Booz Allen & Hamilton, Inc., February, 1995.

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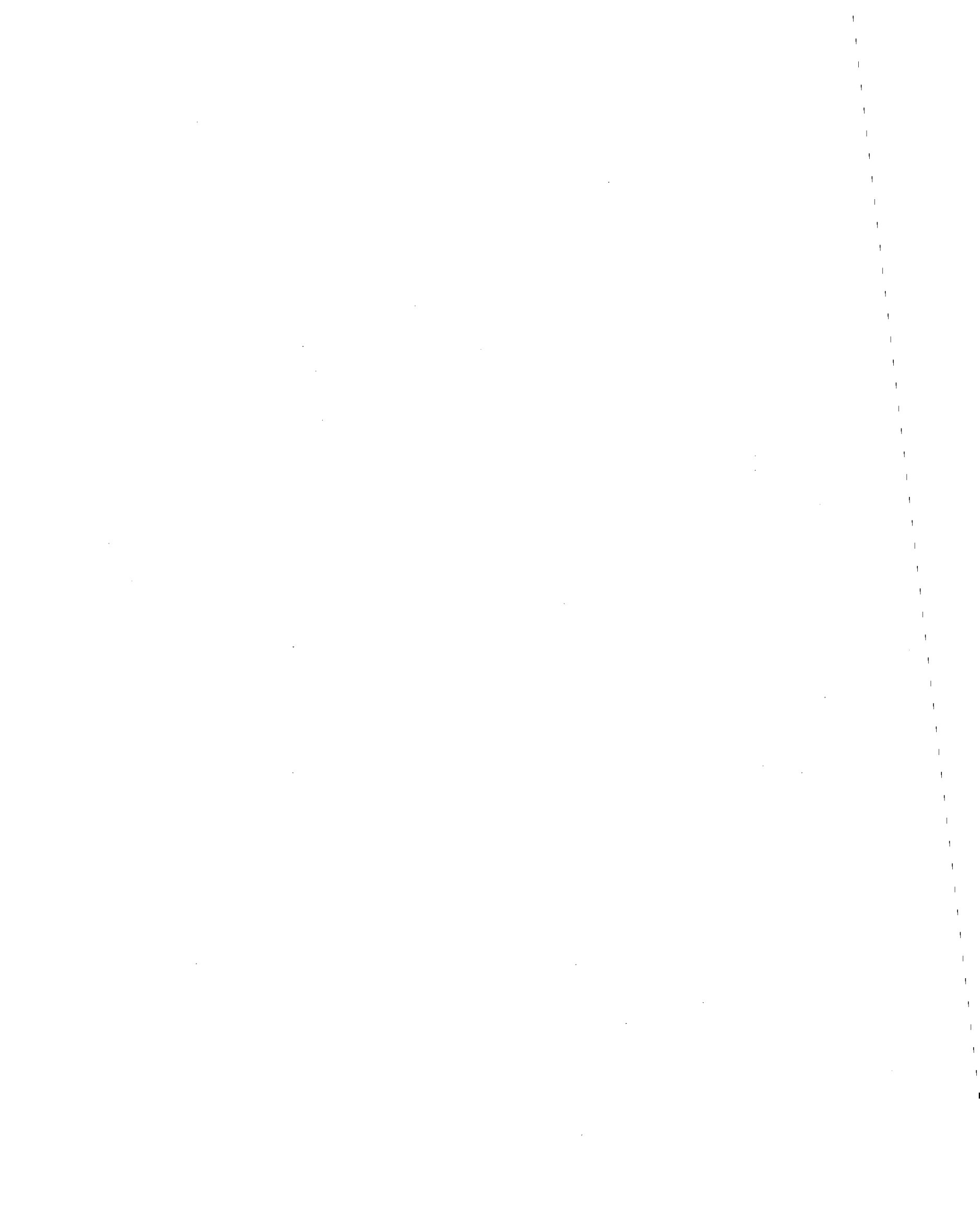
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