Texas Department of Transportation

Freight Transportation Policy, Planning, Programs and Performance Measures

Paper prepared for the

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Introduction

Earlier this year, the Federal Highway Administration, the Minnesota Department of Transportation (MnDOT) and the University of Minnesota Center for Transportation Studies (CTS) asked The Texas Department of Transportation (TxDOT) to participate in their National Freight Transportation Workshop. TxDOT has prepared this paper in response to their request. Accordingly, the report covers select activities that are currently underway or were recently completed as we attempt to address the three questions posed by the workshop hosts:

1) How does the state approach freight transportation planning, policy and programming?

2) How are private industry and their needs incorporated into decisionmaking for freight transportation improvements? What is successful and what isn't?

3) What has been your experience with performance measures, what do you use, and what do you think are the most successful approaches to freight performance measures?

Specifically, this paper details the activities that focus on freight transportation within the following section headings: Texas Transportation Plan, Studies and Reports and the Statewide Analysis Model.

Texas Transportation Plan

Although TxDOT does not currently have a plan that specifically addresses freight transportation, it is addressed in the *Texas Transportation Plan* (TxDOT's multimodal statewide plan adopted in 1994). Section III under the heading of Freight and Passenger Rail (pp. 80-85) describes the existing freight rail facilities and identifies important freight rail issues. Highway freight issues are briefly discussed throughout the plan under the categories of commercial or truck traffic. Performance indicators for highways and rail as modes are located in the Modal Profiles; however, TxDOT does not currently have a freight transportation policy in place.

Several people were involved in the development of the *Texas Transportation Plan.* Six policy papers were specifically prepared by individual committees to support the

development of the final policy document. The committees included representatives from private industry. The six committees were: Economic Development Committee, Mobility and Accessibility Committee, Interjurisdictional Coordination and Cooperation Committee, International Trade Committee, Finance Committee, and Corridor Preservation Committee.

The Transportation Systems Planning section of TxDOT's Transportation Planning and Programming Division is currently under contract with Parsons Brinckerhoff Quade & Douglas, Inc. (PBQ&D) to update the *Texas Transportation Plan*. Under the current scope of work, PBQ&D will analyze transportation needs that include both the existing system and current trends, as well as future demand. From this analysis, the consultant will address future options, proposed policies, future funding, and provide TxDOT with a systems evaluation for both freight and passenger facilities. This update process is scheduled to conclude in November of 2001.

TxDOT has not defined specific performance measures for freight movement. PBQ&D will develop performance measures for the implementation of goals and polices in the plan, taking into consideration the seven planning factors stated in TEA-21. These performance measures are not, however, being developed specifically for freight movement, but for the entire plan and the statewide transportation system in general.

Studies and Reports

TxDOT has conducted or participated in a number of studies that have a strong freight transportation component. This section summarizes selected studies and provides a review of an important report that similarly deals with freight transportation, but focuses on the U.S.-Mexico border region.

Western Trade Transportation Network

TxDOT, representing the State of Texas, participated in the Western Transportation Trade Network (WTTN) study that concluded in July of 1999. The WTTN is "a surface freight transportation concept which seeks to enhance the economic prosperity of the 17 western U.S. states" (p. 1-1, WTTN Phase II Final Report).

Phase I, completed in May of 1997, identified freight transportation systems and commodity movements throughout the WTTN states, identified and described the WTTN network (20 multimodal trade corridors), and identified trade corridor issues and needs. Phase II, completed in July of 1999, builds upon the results of Phase I, and focuses on the

specific highways, rail lines, ports, waterways, airports, COFC/TOFC facilities, and grain elevators within the 20 designated WTTN corridors. Freight transportation performance was evaluated, and deficiencies were identified from the freight transportation perspective (p. 1-1, WTTN Phase II Final Report).

Among the recommendations to the states were the following:

- **Freight Network Planning**: Advancing network planning as opposed to corridor-by-corridor planning. Freight and trade moves over complex networks, just as passengers. Corridor specific approaches may be overly simplistic.

- **Inclusion of Freight Interests in the Planning Processes**: States should strengthen the inclusion of freight issues and needs in their statewide and metropolitan planning processes.

- **Western Freight Partnership**: The Western Freight Partnership suggested by the Western Governors Association should be supported as a logical forum for ensuring that private sector concerns and issues are considered in the public sector transportation decision process.

- **Funding Intermodal Facility Access**: States should continue their efforts to seek sufficient funding for highway and railway access to ports, airports, elevators, COFC/TOFC facilities, and reload facilities.

Latin American Trade and Transportation Study

The research consultants responsible for the Latin America Trade and Transportation Study have conducted a great deal of freight analysis. In a sense, the term trade in the study's title could easily be substituted with the term freight since trade takes place in the form of freight movements, either by highway, rail, air or waterways. The consultants have investigated and evaluated these modal freight movements for the Southeastern Transportation Alliance.

The Southeastern Transportation Alliance was formed in recognition of the increased trade opportunities with Latin America that have emerged in recent times. The Alliance recognized the need for positive, well-planned, and decisive actions to be taken if these opportunities are to be fully taken advantage of.

The Alliance consists of the state transportation agencies in the states of Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South

Carolina, Tennessee, Texas, Virginia, West Virginia, and the Commonwealth of Puerto Rico, in cooperation with the United States Department of Transportation, Federal Highway Administration. The Alliance is an informal agreement between these partners to provide a means of financing and conducting the Latin America Trade and Transportation Study.

The purpose of the study is to help the Alliance enhance economic development, collectively and individually, by taking advantage of the accelerating opportunities for trade with Latin America, defined as all Western Hemisphere nations south of the United States. The study:

- Investigated and identified trade opportunities between the United States and other countries, with special emphasis on Latin America;
- Explained how the economies of the Alliance States could benefit if they are able to capture "their fair share" of this international trade;
- Evaluated existing relevant transportation infrastructure and identified infrastructure investments that would support anticipated growth in international trade; and,
- Developed strategies to optimize investments in the region's ports, waterways, airports, railroads, major highway corridors, and intermodal facilities.

The complete findings and recommendations should be available in October 2000. Some interesting findings relevant to Texas and freight include the following:

- Truck traffic is projected to grow at a greater rate than all other traffic types.
- Truck traffic will require significant highway investments in capacity and pavement rehabilitation.
- Texas is projected to be the Alliance state with the highest highway investment need.
- Texas alone will carry 42 percent of all Latin American truck traffic in 2020. It will have 42 percent of all additional capacity needs and 49 percent of the pavement needs to accommodate Latin American trade.
- Texas currently has infrastructure needs at marine terminals associated with all five types of cargo (container, break bulk, neo bulk, dry bulk and liquid bulk) and these will continue to grow through 2020.

Hidalgo Port of Entry Case Study

Freight movements across the U.S.-Mexico border are of great interest to border communities and to Texas. This effort supplements the port of entry case studies completed under U.S.-Mexico Binational Border Transportation Planning and Programming Study. This study focuses on the U.S. portion of the port of entry system in Hidalgo County and is being coordinated with Mexico's Secretariat of Communications and Transportation (SCT) complementary efforts. The expected result is in an assessment of the system's efficiency, identification of future needs, and recommendations for improvements. The final report will be completed in October 2000.

Corridor Studies

Freight issues have also been examined in corridor studies, such as the I-69 and I-35 corridor studies.

I-69 Corridor Study

Improving the movement of freight within the I-69 (and other) corridors carries with it the potential for a significant increase in overall truck traffic as well as increased use of larger and heavier trucks. Measures will be needed to deal with the ever-growing increase in overall freight traffic. The use of heavy-duty pavement and dedicated truck lanes can best be accomplished during construction of new freeway segments as opposed to rehabilitation of existing roadways. I-69 will provide an opportunity to address such needs from the outset.

I-69 will improve port system links, including marine type trailers, from the Great Lakes, through the Mississippi and Ohio River Basins, to the Texas Gulf Coast and Intracoastal waterway.

The I-69 corridor is served by every major railroad operating in the United States. In addition, I-69 will provide service to each of the principal railroad gateways located in the corridor.

I-35 Corridor Study

Freight issues examined in the I-35 Trade Corridor Study concluded that I-35 is a freight corridor facing increased demands and limited capacity. In order to attempt to rectify the problem, states in the I-35 corridor have participated in CVO (Commercial Vehicle Operations) program studies and have recommended a number of measures to improve freight movement efficiency and safety. Among these are:

1) New and improved roadside administration that will allow trucks to operate more safely and efficiently by eliminating unnecessary stops at intrastate weigh/inspection stations, and interstate/national ports of entry. New roadside technologies would have the capacity to screen and preclear trucks at inception freight points of the corridor. By allowing regulated, precleared trucks to bypass further check stations, states could then focus more readily on trucks that require more compliance attention.

2) New truck designs to enhance efficiency, improve safety, and decrease damage to highways. A new truck concept being worked on by Freightliner/Wabash has increased volumetric capacity by 17% while maintaining legal size limits. The new trucks utilize a longer trailer and shorter cab compared to current models. The concept truck has a lower profile design with trailer weight spread over 5 axles to increase efficiency, provide stability against rollovers and load shifts, and demonstrates a shorter stopping distance. Additional safety controls such as electronic braking, radar-based emergency warnings, and video have been included in the design to assist with monitoring and help prevent rollovers, jackknifing, veering, and driver fatigue.

The Impact of Mexican Rail Privatization on International Trade Corridors with Mexico

This research study, which is currently underway, will provide an impact assessment on how the privatization of the Mexican rail system will affect freight traffic on the Texas' highway and rail facilities. The information will assist the department in ensuring that transportation infrastructure needs in the border region are sufficient in both modes. It will also be used to help answer legislative inquiries, to update the Texas Transportation Plan, and to identify priority projects in both the rail and highway modes. Additionally, by identifying NAFTA trade corridors, the results will help TxDOT avoid future highway maintenance costs if new rail alternatives are identified for shippers due to increased efficiency in the Mexican rail system. At the same time, congestion for non-commercial traffic on some highways could be lessened with the diversion of freight to underutilized rail gateways.

NAFTA Report

Published in 1998, the report identifies the impacts of the additional truck traffic generated by the North American Free Trade Agreement (NAFTA) on Texas' highways and citizens. It also estimates the costs of highway improvements to address the impacts. The department will use the trends reflected in the report and the origin-destination (O-D) study conducted at 12 border sites in the development of the statewide analysis model

(discussed later in this paper). The data collected for the compilation of this report is useful to border area planners in their analysis of the amount of through-truck traffic in their areas, as well as vehicle type, commodity, and delivery location to intermodal facilities.

Statewide Analysis Model

Perhaps the single most important TxDOT initiative related to freight transportation is the development of the Statewide Analysis Model (SAM). In March 2000, TxDOT contracted with Alliance Engineering for services to develop a statewide, multi-modal passenger and commodity flow freight model. TxDOT envisions an expansion of the geographic coverage of its travel demand modeling with a statewide model, which will allow for the consideration of different passenger and freight modes and the interaction between modes.

The SAM is groundbreaking in many respects in that it is TxDOT's: first multi-modal model; first freight model; first model completely in TransCAD format; and first model with statewide coverage. It is expected that this model will launch a continuing series of models to be developed and enhanced in the coming years. The model will bring TxDOT up to the state-of-the-practice for statewide, multi-modal passenger and freight modeling.

The SAM will be integrated with the 25 Texas urban area models, and will provide consistent and accurate analysis of the following general types of projects:

- Forecasting accurate statewide traffic volumes by mode for passenger and freight;
- Forecasting mode shifts for passenger and freight;
- Analyzing state-level, multi-modal alternatives for each mode that should be accurate enough to support analysis for project selection;
- Analyzing concurrent modal and multi-modal network alternatives; and,
- Analyzing the relative impacts of domestic and through traffic for passenger and freight at the statewide and at individual urban area levels.

The passenger component will, at a minimum, model cars and rail. The freight component will, at a minimum, model trucks, rail, truck/rail, rail/seaport and truck/seaport intermodal connections. Provisions will be made for future extension of the model to include other passenger and freight modes without requiring significant restructuring.

Freight commodities will include manufactured and non-manufactured goods, empty trailers and trucks, and permit-issued overweight trucks. The model will aggregate commodities into commodity groups, and maintain the capability of editing the base data sets to define new commodity groups.

The freight model will output trips and tons per commodity group, and will have the capability of assigning loads to various types of trailers and containers. Population forecasts will use the Texas State Data Center forecasts for each county as a control total. Employment forecasts will be compatible with the scenarios and geography used in the population forecasts.

The department will use Reebie's 1996 TRANSEARCH multi-modal freight database to develop the statewide model freight flows. The passenger and freight models will be integrated with each other and with existing urban models to the extent that it is practical. Integration is defined in terms of input and output data set formats, model components and tools, and operation. The statewide model will operate as a suite of related models with a common operating interface. The preferred integration is to have hot links between operating modules, common analysis tools and procedures, seamless access to all data sets with common analysis tools, and consistent zone structures.

Options for using the statewide analysis model in planning processes will be developed and evaluated. Upon its completion in December 2001, TxDOT will implement the SAM as part of the statewide planning process in a variety of ways. Implementation scenarios will depend on the trade-off between resources committed to operation versus response time and accuracy of the process. Analysis of the various scenarios will allow TxDOT to determine relative budgets and to develop an optimum scenario for implementing the models.

Conclusion

To summarize, let us revisit the three original questions.

1) How does the state approach freight transportation planning, policy and programming?

2) How are private industry and their needs incorporated into decisionmaking for freight transportation improvements? What is successful and what isn't?

3) What has been your experience with performance measures, what do you use, and what do you think are the most successful approaches to freight performance measures?

While TxDOT does not have an established freight transportation policy, we consider freight transportation issues through a wide range of activities: multi-state studies, corridor studies, and research. We successfully included freight stakeholders in the development of the *Texas Transportation Plan*, the state's multimodal transportation policy document, and continue to seek their participation in all matters involving freight. Although we have limited experience with freight performance measures, we foresee having a better understanding of how to best select and use performance measures after we complete both the *Texas Transportation Plan* update and the Statewide Analysis Model.