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Freight Matters

*Trucking Industry Guide to Freight and
Intermodal Planning Under ISTEA*

Prepared by



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A Word About the Sponsor

ATA Foundation and Trucking Research Institute

The ATA Foundation is a future-oriented research organization dedicated to the advancement of a safe and efficient trucking industry through research, education, and promotion. Affiliated with the American Trucking Associations, the Foundation specializes in the analysis of economic and public policy issues that affect trucking and transportation. The Foundation also conducts educational meetings for trucking executives and works to improve the industry's image.

The Trucking Research Institute (TRI), a Foundation subsidiary, sponsors research studies and analyses concerning the nation's transportation systems, and makes such studies available to the government and the general public. Since its establishment in 1986, the TRI has conducted nearly 30 studies on topics including driver fatigue, highway cost allocation, effect of using alternative fuels in heavy duty trucking, highway incident management, and worker accident and illness. The TRI, along with its parent, the ATA Foundation, and its sister organization, the Western Highway Institute, are regarded as the research arm of the U.S. trucking industry. Together, they are advancing programs and projects that will have positive long-term effects on trucking, the economy, and public policy.

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1.0 Introduction

■ 1.1 Why Does the ISTEA Matter to the Trucking Industry?

The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) has changed the rules of the transportation decision-making game. Previously narrow, restrictive funding categories have been collapsed into a few broad, flexible programs, and states and metropolitan areas have been given much greater latitude in defining and funding projects within these programs.

The trucking industry must actively participate in the resource allocation process to ensure that its views are represented when decisions are made – otherwise, there is no guarantee that the industry’s needs will be heard, much less met. This means that motor carriers must go beyond their traditional focus on the legislative process and on issues of taxation and regulation. Now, the industry must develop the capability to focus on planning and programming issues as well. This guide provides information and a starting point on that process for the trucking industry.

■ 1.2 How Has the ISTEA Changed the Rules of the Game?

ISTEA and the Freight Transportation Revolution

The ISTEA was enacted in the midst of a freight transportation revolution, as the increasingly global scope of competition drives changes in business practices that reduce costs while increasing productivity. Within the trucking industry, the demands for greater efficiency have been met by innovations including the introduction of larger trucks and more fuel-efficient engines; just-in-time delivery scheduling; and increasingly, intermodal services which combine truck, rail, air, and water operations to provide high quality services at low prices both around the corner and around the world. The need for American firms to compete globally and the opportunity to market American goods and services worldwide will sustain the pressure for more innovative, cost-effective freight transportation services for the foreseeable future.

This revolution in freight transportation is occurring as our domestic highway programs face a major crossroads. New highways will be built, but the pace of construction will be slow compared to that of the last 40 years. As the interstate highway construction era comes to a close, the focus of our highway programs will shift from construction to management – to making more efficient use of the existing transportation system, rather than expanding highway capacity.

The ISTEA explicitly recognizes this transition. It closes out the interstate highway construction program and mandates the development of new programs and procedures to improve the efficiency of our highway systems. The ISTEA also explicitly recognizes the importance of freight transportation to the nation's economic development and competitiveness by calling for the development of innovative and cost-effective freight transportation services, and by stressing the importance of an intermodal freight system.

Opportunities and Challenges

At this critical juncture, the motor carrier industry faces both opportunities and challenges. There are opportunities for investing in the facilities necessary to create a freight movement system that is safer, less congested, and more efficient. There is the opportunity for preserving the access provided by the existing highway system through better pavement and bridge management, and for building new links to intermodal ports, airports, rail terminals, and manufacturing and distribution centers.

But there also are challenges. For the first time, the motor carrier industry must not only define its needs, but also must compete for its share of projects and funds. Prior to the enactment of the ISTEA, the highway portion of the transportation infrastructure was guaranteed the highest priority in the allocation of transportation resources. The trucking industry's need for better rural and urban interstate highways was shared by a large and rapidly growing population of automobile owners from the beginning of the interstate construction program through the program's expansion in the 1960s and 1970s; this made it easy to secure public support for highway funding. Because these highway monies were expended on facilities that were used heavily by motor carriers, the linkage between motor carrier taxation, federal highway appropriations, and trucking industry benefits was clear and direct.

Under the ISTEA, the share of federal monies dedicated to highways is no longer guaranteed; now all transportation users and providers have a voice in setting the priorities that will create the transportation system of the future. Consequently, those in the transportation industry concerned with the movement of freight on highways must work to ensure that federal transportation funds will be spent to their benefit.

The focus of the industry's efforts must shift from the federal government and state legislatures to the state departments of transportation (DOTs) and the metropolitan planning organizations (MPOs). The state DOTs and MPOs, in turn, must reorganize their overall transportation and highway planning and programming procedures to conform to the requirements of the ISTEA. Because the legislation requires that public participation be considered as state and local officials make their transportation investment decisions, the state departments of transportation and the MPOs are looking to individual citizens and private industry for advice as they formulate these new procedures. The ISTEA provides general policy direction and guarantees that the process will be open to input by the motor carrier industry, but it provides little guidance on specific solutions, especially in the areas of freight and intermodal systems. It leaves up to the states, metropolitan areas, and the transportation industry the responsibility to shape the process and solutions. It also is important that these solutions be developed in the context of two related pieces of major federal legislation: the Clean Air Act Amendments of 1990 and the National Energy Policy Act of 1992.

■ 1.3 What's in this Guidebook?

Section 2.0, *ISTEA Matters*, summarizes the policies and programs of the ISTEA, focusing on those aspects of most importance to freight transportation.

Section 3.0, *Participation Matters*, describes key elements of an action plan for the trucking industry to work with state departments of transportation and metropolitan planning organizations in setting priorities for transportation investments.

Section 4.0, *Planning Matters*, provides general guidance for state motor trucking association executives and motor carrier managers on building a freight and intermodal planning process under the ISTEA.

The Appendices include information on related environmental and energy legislation, descriptions of the ISTEA-related responsibilities of state DOTs and MPOs, listings of contacts at MPOs and state DOTs, and a glossary of important terms.

2.0 ISTEAA Matters

■ 2.1 ISTEAA: An Overview

Declaration of Policy: Intermodal Surface Transportation Efficiency Act

It is the policy of the United States to develop a National Intermodal Transportation System that is economically efficient and environmentally sound, provides the foundation for the Nation to compete in the global economy, and will move people and goods in an energy efficient manner.

The National Intermodal Transportation System shall consist of all forms of transportation in a unified, interconnected manner, including the transportation systems of the future, to reduce energy consumption and air pollution while promoting economic development and supporting the Nation's preeminent position in international commerce.

The National Intermodal Transportation System shall include a National Highway System which consists of the National System of Interstate and Defense Highways and those principal arterial roads which are essential for interstate and regional commerce and travel, national defense, intermodal transfer facilities, and international commerce and border crossings.

The National Intermodal Transportation System shall include significant improvements in public transportation necessary to achieve national goals for improved air quality, energy conservation, international competitiveness, and

mobility for elderly persons, persons with disabilities, and economically disadvantaged persons in urban and rural areas of the country.

The National Intermodal Transportation System shall provide improved access to ports and airports, the Nation's link to world commerce.

The National Intermodal Transportation System shall give special emphasis to the contributions of the transportation sectors to increased productivity growth. Social benefits must be considered with particular attention to the external benefits of reduced air pollution, reduced traffic congestion and other aspects of the quality of life in the United States.

The National Intermodal Transportation System must be operated and maintained with insistent attention to the concepts of innovation, competition, energy efficiency, productivity, growth, and accountability.

The National Intermodal Transportation System shall be adapted to "intelligent vehicles," and other new technologies wherever feasible and economical.

The National Intermodal Transportation System must be the centerpiece of a national investment commitment to create the new wealth of the Nation for the 21st century.

In the post-ISTEA world, highways no longer rule – all modes of transportation, including automobiles, public transit, bicycles, and walking must be considered in building a transportation system that best meets the nation's transportation needs and goals. In addition, the emphasis is on better management of the existing system (i.e., operations, maintenance, and control systems) rather than on new construction. A positive sign for the trucking industry, however, is the Act's emphasis on the importance of transportation and freight movement to economic development.

Key ISTEA features and their implication for motor carriers include:

- **Funding flexibility:** the ability to transfer funding among the various modes of surface transportation, types of improvements, and classes of highways. **Motor carrier implication:** highways are no longer guaranteed a dominant share of federal funds.
- **Decentralized decision making:** now, the decisions that affect investments in local and regional surface transportation facilities will be made at the local and regional level by state DOTs and by MPOs. **Motor carrier implication:** the industry must decentralize its efforts to influence the resource allocation process.
- **Increased planning requirements:** the ISTEA requires a new statewide planning process and expands the planning required of MPOs. **Motor**

carrier implication: the industry should gear up to assist the states and MPOs in shaping these processes.

- **New management systems:** these systems are intended to provide better information for transportation decision making. **Motor carrier implication:** private sector participation is required to ensure that the collected information accurately reflects existing and forecasted conditions that are critical from a freight transportation perspective.
- **Public participation requirements:** citizens, public interest groups, public and private transportation providers, and other interested parties must have a "reasonable opportunity" to provide early and ongoing input into planning and project selection at the state, regional, and local levels. **Motor carrier implication:** the industry must make a strong case for its point of view, and be prepared to argue the costs and benefits of investing in freight transportation.
- **Consideration of clean air goals:** projects funded by the ISTEA must be consistent with the attainment of federal clean air standards. **Motor carrier implication:** pay special attention to the emission-related impacts of proposed projects and to the relationships between emissions and congestion on major routes.
- **Use of advanced technologies:** the ISTEA promotes research and development activities, including the use of intelligent vehicle-highway systems (IVHS), that are designed to increase the efficiency and safety of the transportation system. **Motor carrier implication:** support IVHS activities related to commercial vehicle operations, as well as congestion relief on major routes.

■ 2.2 Major ISTEA Programs

The ISTEA programs of primary interest to motor carriers are listed in Exhibit 1, along with the Congressional authorizations for FY 1992-1997. Brief descriptions follow for each of these programs.

National Highway System

"The purpose of the National Highway System is to provide an interconnected system of principal arterial routes which will serve major population centers, international border crossings, ports, airports, public transportation facilities, and other intermodal transportation facilities and other major travel destinations; meet national defense requirements; and serve interstate and inter-regional travel."

Exhibit 1. ISTEA Programs Affecting Trucking and Freight/Goods Movement Planning

Programs	Authorized Funding Over Six Years (\$billions)
National Highway System	\$21.0
Surface Transportation Program	24.0
Congestion Mitigation and Air Quality Improvement Program	6.0
Interstate Maintenance Program	17.0
Intelligent Vehicle Highway Systems Act	0.7
Bridge Program	16.0

Components

The components of the NHS will include:

- All of the Interstate System;
- Strategic Highway Network Routes and Major Strategic Highway Network Connectors (linking important military sites identified by the Defense Department);
- Congressional High Priority Routes and other specific routes identified in the ISTEA;
- Additional Rural Principal Arterial routes; and
- Additional Urban Principal Arterial routes.

Also included in the NHS will be routes providing access to major ports, airports, public transportation, and intermodal facilities.

The NHS is expected to include about 150,000 miles, almost four times as many as the current Interstate System (about 43,000 miles). Approximately two-thirds of the NHS miles will be rural; the rest will be urban. A map of NHS routes is being constructed by the FHWA with input from the states and local jurisdictions.

Although much attention has been given to the process of defining the NHS, and many interest groups have emphasized the need to get important routes on the NHS map, there is no assurance that inclusion in the NHS guarantees that improvements will be made to these roadways. First, no standards have been set for the NHS at the national level, although individual states may adopt standards. In addition, there is no assurance that standards for the NHS will be uniform across states, although the FHWA will undoubtedly seek to coordinate such standards within regions. The FHWA urges states to follow AASHTO standards; however, the AASHTO does not have uniform standards for the NHS. The AASHTO has minimum and recommended standards for freeways and for arterials in urban and rural areas, with variations based on terrain, traffic volumes, and other factors. Because of the potential importance of the NHS to freight transportation, states may wish to consider adopting higher standards for the NHS and giving higher priority to the programming of improvements to NHS routes that do not meet adopted standards.

Distribution of Funds/Transferability

NHS funds are distributed among the states primarily on the basis of each state's share of federal funds for the FY 1987-1991 period. However, because of the ISTEA's flexibility provisions, there is no requirement that

all of these funds be spent on the NHS. Without federal approval, a state may transfer up to half of its NHS funds to the Surface Transportation Program (STP); with federal approval, all of a state's NHS funds can be transferred to the STP.

Eligible Activities

Within the NHS itself there is significant funding flexibility. NHS funds may be used for start-up costs for traffic management and control projects as well as for construction on a non-NHS highway. In addition, the funds may be used for transit projects that are in the corridor of a fully access-controlled NHS facility and will improve the level of service on the NHS component more cost-effectively than would a direct improvement to the NHS facility.

Federal Share

The basic federal share is 80 percent for the NHS, but the share rises to 90 percent for High-Occupancy Vehicle (HOV) lanes and related projects on the Interstate System.

Surface Transportation Program (STP)

Purpose/Eligible Activities

The STP, which reflects the most significant policy changes prescribed by the ISTEA, was created to plan for and fund a broad range of surface transportation needs. Unlike the NHS, the STP does not have a statement of national purpose written into the ISTEA. It is a block grant program whose funds may be used for projects on NHS or other federal-aid roads. The funds also may be used for traffic management and control systems; bicycle and pedestrian facilities; and bridge, safety, and improvement projects on almost any public road. In addition, these funds may be used for transit capital projects.

Distribution of Funds

Similar to the NHS, STP funds are distributed to the states primarily according to each state's share of federal funds for the fiscal years 1987 through 1991. The funds must be distributed by each state as follows:

- Ten percent to safety construction projects such as improving railroad crossings;
- Ten percent to transportation enhancement activities such as historic preservation projects and scenic byways;

- Fifty percent to urban areas with populations of over 200,000 and to other areas of the state based on population; and
- The remaining 30 percent may be used for projects in any area of the state.

Project Selection

STP projects are selected in one of the following ways for various types of jurisdictions:

- In large urban areas: by the MPO in consultation with the state;
- In areas with populations ranging from 50,000 to 200,000: by the state in cooperation with the MPO;
- In smaller urban areas: by the state in cooperation with affected local officials.

Federal Share

The basic federal share is 80 percent for the STP, rising to 90 percent for HOV and related projects on the Interstate System.

Congestion Mitigation and Air Quality (CMAQ) Improvement Program

Purpose

The CMAQ program was created to fund programs and projects designed to achieve federal clean air standards by reducing transportation-related emissions. These funds may not be used for conventional highway projects providing new capacity unless they include improvements in HOV facilities for peak period use. A variety of projects are eligible for CMAQ funds, including mass transit improvements.

Eligible Activities

Funds are provided for eligible projects in "nonattainment areas" – areas that fail to achieve National Ambient Air Quality Standards (NAAQS) for ozone and/or carbon monoxide. In all states with nonattainment areas, the U.S. Department of Transportation must consult with the EPA to determine whether any proposed transportation project or program will contribute to achieving a standard unless the proposal is already included in an approved State Implementation Plan (which deals with achieving compliance with the NAAQS).

Distribution of Funds/Transferability

CMAQ funds are distributed to states based on a formula involving the population of ozone nonattainment areas of each state weighted by the severity of the air quality problems. Each state gets a minimum of one-half of one percent of the total funding available under the CMAQ program. States may use CMAQ funds with the same flexibility as STP funds only if the state has no area classified as a nonattainment area, but most states have them.

Federal Share

The federal share for CMAQ projects is 80 percent.

Interstate Maintenance (IM) Program

Purpose

The new IM program was created by the ISTEA to ensure that the existing Interstate System is maintained to adequate, continually monitored national standards.

Eligible Activities

IM funds can be used for HOV and auxiliary lanes (such as truck climbing lanes) but cannot be used to build new lanes for general traffic. IM funds also can be used for reconstruction of bridges, interchanges, and overpasses along existing interstate routes, as well as for the acquisition of right-of-way. In addition, a state may use these funds for preventive maintenance if it can prove that bridge and pavement life can be cost-effectively extended through this activity.

Distribution of Funds/Transferability

Funds are distributed according to interstate lane miles and vehicle miles of travel – the same basis as the old I-4R program, which covered reconstruction, resurfacing, and related minor capital improvements, but not routine maintenance. Without federal approval, a state may transfer up to 20 percent of its IM funds to the NHS or the STP. Additional transfers may be made upon certification that 3R needs and adequate maintenance requirements are being satisfied.

Federal Share

To assure priority for the IM objective, the federal share is 90 percent, the highest of any basic federal match in any program category.

Bridge Program

Purpose/Eligible Activities

The bridge program provides for inspection as well as some types of maintenance, rehabilitation, and replacement of bridges on any public roadway. The program also funds newly eligible activities such as bridge painting and seismic retrofitting on otherwise deficient bridges.

Distribution of Funds and the Federal Share

This program is continued essentially unchanged with respect to the formula for the distribution of funds, the 80 percent federal share, and other provisions.

Intelligent Vehicle-Highway Systems Act of 1991

"The Secretary shall conduct a program to research, develop, and operationally test intelligent vehicle-highway systems and promote implementation of such systems as a component of the Nation's surface transportation systems."

The Intelligent Vehicle-Highway Systems (IVHS) Act created a program to invest in researching, planning, and implementing IVHS technology. The program's objectives include improving the transportation network and promoting economic development. With respect to transportation, the program seeks to "enhance the free flow of goods and commerce" through widespread implementation of IVHS to enhance the capacity, efficiency, and safety of the nation's highways, as well as mitigating the costs of congestion. As an economic initiative, the program is aimed at developing a national IVHS technology base and fostering the development of a privately-owned IVHS industry.

The legislation's definition of IVHS includes commercial vehicle operations, vehicle control systems, and other advanced systems for tracking and communicating with vehicles, managing traffic, providing traveler information, and operating public transit. The program aims to enlist the efforts of numerous federal agencies, state and local governments, educational institutions, and the private sector.

Activities

The Act authorizes the development of:

- An information clearinghouse of IVHS "technical and safety data."
- "Standards and protocols" for IVHS technology.
- A strategic plan for the IVHS program. Completed in 1992, the plan addresses:
 - Five-, ten-, and twenty-year program goals;
 - Technical and non-technical obstacles;
 - An implementation plan;
 - "Standards and protocols" for IVHS technology; and
 - Speedy introduction of IVHS in highly congested areas.
- A test track implementing fully automated vehicles and highways by 1997.
- Reports on technical and non-technical issues in IVHS development.
- A limited number of IVHS corridors: at least half of the funding will be spent on a few corridors demonstrating particularly challenging transportation problems and a variety of infrastructure and vehicle types. The remainder will be devoted to other corridors where IVHS implementation is consistent with the strategic plan and would benefit users or reduce regulations.
- An evaluation of commercial vehicle collision avoidance technology.

The Act also authorizes:

- Technical and planning aid to state and local governments evaluating IVHS;
- Funding for state and local governments planning IVHS implementations; and
- Grants for public and private IVHS testing projects.

The act provides \$501 million for the corridors program and \$158 million for the other IVHS projects from the Highway Trust Fund for the fiscal years 1992-1997. The maximum federal share is 80 percent, except for a limited number of "innovative, high-risk operational or analytical tests" in the corridor program (which may exceed this limit).

■ 2.3 Planning

Prior to the enactment of the ISTEA, many states developed statewide transportation plans, and large urbanized areas were required to conduct a continuing, comprehensive transportation planning process. The new ISTEA planning requirements, however, mandate the establishment of comprehensive statewide planning processes, and increase the role of metropolitan planning organizations in the decision-making process for highway system development. As the new state and MPO planning processes evolve, the motor carrier industry has a significant opportunity to influence their development, and to identify important issues to be addressed. Funding for both statewide and metropolitan planning is available through the NHS and the STP.

Statewide Planning

"It is in the national interest to encourage and promote the development of transportation systems embracing various modes of transportation in a manner that serve all areas of the state efficiently and effectively... Such plans and programs shall provide for development of transportation facilities...which will function as an intermodal state transportation system. The process...shall provide for consideration of all modes of transportation and shall be continuing, cooperative, and comprehensive..."

Under the ISTEA, the statewide planning process must include (at a minimum):

- Data collection and analysis.
- Coordination of planning activities with various other related activities and organizations, including "...large-scale private transportation providers and multi-state businesses..." and agencies responsible for "...economic development and for the operation of airports, ports, and other intermodal facilities."
- Development of a statewide long-range (20-year time horizon), multimodal transportation plan. This plan must consider a wide range of social, environmental, energy, and economic factors in determining overall transportation goals and how they can best be met.
- Development of a statewide transportation improvement program (statewide TIP, or STIP) with at least a three-year time horizon; the program is to be updated at least every two years. This program addresses the goals of the long-range plans and lists priority projects and activities for the region. Projects can be included in the STIP only if full funding

is reasonably expected to be available for the project within the time period contemplated for its completion.

- Development and evaluation of alternative transportation solutions and projects.

The state also must coordinate with its MPOs in developing these plans. The state must ensure that the process for developing both the statewide long-range plan and the STIP is both open and participatory.

Public Involvement

The Final Rule requires a "proactive" public involvement process. Key elements of this process include the following:

- Early and continuing opportunity for public involvement;
- The provision of timely information to interested parties;
- Reasonable public access to technical and policy information used in the development of the plan and the STIP;
- Adequate notice of public involvement activities and time for public review and comment at key decision points;
- A process for demonstrating explicit consideration of and response to public input; and
- A process for seeking out and considering the needs of those traditionally underserved by existing transportation systems.

At various decision-making points, the state is required to provide a "reasonable opportunity" for comment. When proposing new or revised public involvement procedures, a minimum of 45 days must be allowed for public review and written comment before such procedures may be adopted.

State Planning Factors

The ISTEA also specifies 22 factors that must be considered in the state-wide planning processes. Those of most direct concern to motor carriers are the following:

- "(4) International border crossings and access to ports, airports, inter-modal transportation facilities, major freight distribution routes..."
- "(7) Connectivity between metropolitan areas within the state and with metropolitan areas in other states;"

- "(10) Transportation system management and investment strategies designed to make the most efficient use of existing transportation facilities;"
- "(12) Methods to reduce traffic congestion...including methods which reduce motor vehicle travel, particularly single-occupant motor vehicle travel;"
- "(16) The use of innovative mechanisms for financing projects, including...tolls and congestion pricing;"
- "(17) Preservation of rights-of-way for construction of future transportation projects;" and
- "(19) Methods to enhance the efficient movement of commercial motor vehicles."

Management Systems

A major element of the new statewide planning process is the set of management systems required by the ISTEA. This requirement is described below in Section 2.4.

Implementation Schedule

The effective date for the full implementation of the statewide planning requirements is January 1, 1995.

Metropolitan Planning

"It is in the national interest to encourage and promote the development of transportation systems embracing various modes of transportation in a manner which will efficiently maximize mobility of people and goods within and through urbanized areas and minimize transportation-related fuel consumption and air pollution."

The ISTEA requires MPOs to develop both long-range plans and transportation improvement programs. These plans are to be developed in cooperation with the state and with local transit operators, and must include all highway and transit projects in the metropolitan area proposed for federal funding. As in the statewide planning requirements, the MPOs must ensure public participation in the development of their long-range plans and their TIPs by providing a "reasonable opportunity" for comment.

MPO Planning Factors

Under the ISTEA, the new MPO planning process must include considerations such as intermodal connectivity and the needs identified through the six management systems required under the Act. These transportation components must be considered comprehensively, rather than independently.

A set of 15 factors (similar to the 22 statewide planning factors), must be considered in the metropolitan planning process. The factors include the overall social, economic, energy, and environmental effects of transportation decisions. Those of most direct concern to motor carriers are the following:

- "(1) Preservation of existing transportation facilities and, where practical, ways to meet transportation needs by using existing transportation facilities more efficiently;"
- "(3) The need to relieve congestion and prevent congestion from occurring where it does not yet occur;"
- "(7) International border crossings and access to ports, airports, intermodal transportation facilities, major freight distribution routes, national parks, recreation areas, monuments and historic sites, and military installations;"
- "(8) Connectivity of roads within the metropolitan area with roads outside the metropolitan area;"
- "(9) The transportation needs identified through use of the management systems;"
- "(10) Preservation of rights-of-way for construction of future transportation projects, including future transportation corridors;" and
- "(11) Enhancement of the efficient movement of freight."

Public Involvement

Similar to the state planning process, the metropolitan planning process must include a "proactive public information process that provides complete information, timely public notice, full public access to key decisions, and supports early and continuing involvement of the public in developing plans and TIPs..." The comment period must be at least 30 days for the plan, the TIP, and major amendments in nonattainment areas classified as serious, severe, or extreme. In addition, the metropolitan public involvement process must be coordinated with the statewide public involvement process "wherever possible to enhance public consideration of the issues, plans, and programs..."

Long-Range Plans

The MPO long-range plans must "...identify transportation facilities (including but not necessarily limited to major roadways, transit, and multimodal and intermodal facilities) that should function as an integrated metropolitan transportation system, giving emphasis to those facilities that serve important national and regional transportation functions."

Most MPOs have been preparing long-range plans for highways and transit for some years. What is new under the ISTEA:

- The requirement that plans include "multimodal and intermodal facilities," which can be interpreted to include freight modes. In the past very few MPOs have included freight modes in their plans.
- The requirement that emphasis be given "to those facilities that serve important national and regional transportation functions." Previously, relatively little attention was paid by most MPOs to facilities serving important national and regional (multi-state) functions because the planning for such facilities was almost always the responsibility of various other groups – the states, the federal government, other regional agencies, and special purpose authorities (e.g., for airport and seaport facilities). No single agency was responsible even for coordinating the planning for all these facilities.
- An additional requirement that the plans "Include a financial plan that demonstrates how the long-range plan can be implemented..." In this area, the past record of MPOs was irregular; very few MPO long-range plans included formal commitments to financial plans for project implementation.

Plan Objectives

The Final Rule for the implementation of metropolitan planning requirements (Federal Register, October 28, 1993) defines 11 objectives that the long-range plan must achieve. Those of most direct concern to motor carriers are the following:

- "(1) Identify the near-term transportation demand of persons and goods..."
- "(2) Identify adopted congestion management strategies including... freight movement options..."
- "(5) Assess capital investment and other measures necessary to preserve the existing metropolitan transportation system..."

"(7) Reflect a multimodal evaluation of the transportation, socio-economic, environmental, and financial impact of the overall plan..."

"(11) Include a financial plan that demonstrates the consistency of proposed transportation investments with known and projected sources of revenue..."

Implementation Schedule

For most nonattainment areas, the planning process and plans must comply to the extent possible with the requirements for metropolitan planning procedures by October 1, 1994; other metropolitan areas have until December 1, 1994 to meet the planning requirements that apply in those areas. These plans must be reviewed and updated at least every three years in nonattainment areas.

Transportation Improvement Programs (TIPs)

The requirement that MPOs develop TIPs is not new – TIPs were required of all MPOs in the past, but in most metropolitan areas the requirement was almost meaningless because few MPOs had control over any significant amount of funds, and there was no federal requirement for the TIP to be constrained to a realistic financial plan. Under the ISTEA, TIPs are to be prepared in cooperation with the state and affected transit operators, and they must be financially constrained. The frequency and cycle for updating the TIP must be compatible with the STIP development and planning process. In addition, there must be reasonable opportunity for public comment on the TIP.

■ 2.4 Management and Monitoring Systems

"The primary purpose of the management systems is to provide additional information needed to make effective decisions on the use of limited resources to improve the efficiency of, and protect the investment in, the nation's existing and future transportation infrastructure at all levels of jurisdictional control."

Overview

The ISTEA requires the states to develop, establish, and implement systems for managing each of the following:

- Highway pavement of federal-aid highways;
- Bridges on and off federal-aid highways;
- Highway safety;
- Traffic congestion;
- Public transportation facilities and equipment; and
- Intermodal transportation facilities.

In metropolitan areas, the systems must be developed and implemented in cooperation with the MPOs. Both the state and metropolitan planning processes must consider the transportation needs identified through the use of these management systems in developing their short- and long-range plans and programs.

The Final Rule for Statewide and Metropolitan Planning (Federal Register, October 28, 1993) defines "management system" as a "systematic process designed to assist decisionmakers in selecting cost-effective strategies/actions to improve the efficiency and safety of, and protect the investment in, the nation's transportation infrastructure. A management system includes: identification of performance measures; data collection and analysis; determination of needs; evaluation and selection of appropriate strategies/actions to address the needs; and evaluation of the effectiveness of the implemented strategies/actions."

The Proposed Rule for the management systems (Federal Register, March 2, 1993) includes minimum requirements for each system with an emphasis on an "end result" philosophy, as distinct from detailed specifications of the content of each management system. By January 1, 1995 all states must certify that each of the management systems is being implemented. Additional requirements for phasing in elements and for full operational capability are specified for each management system.

With regard to motor carriers and freight movement, the most important systems are the the Congestion Management System (CMS) and the Intermodal Management System (IMS). These systems affect how information will be gathered and used to develop strategies for improving goods movement by reducing traffic congestion and improving the efficiency of intermodal freight transportation facilities and systems. In addition, private sector participation is critical to the development of a successful IMS, particularly in identifying intermodal facilities, identifying efficiency measures and performance standards, and evaluating system and facility performance. Brief descriptions are provided below of these two systems.

Congestion Management System (CMS)

A congestion management system (CMS) is "...a systematic process that provides information on transportation system performance to decision makers for selecting and implementing cost-effective strategies to manage new and existing facilities so that traffic congestion is alleviated and the mobility of persons and goods is enhanced."

The objective of the CMS is "to identify areas where congestion occurs or may occur, identify the causes of the congestion, evaluate strategies for managing congestion and enhancing mobility, and develop a plan for implementation of the most effective strategies." Each CMS covers an entire state, but may include sub-systems that cover metropolitan and other areas. The CMS must consider a wide variety of strategies for reducing congestion and enhancing mobility. These strategies include the following:

- Transportation demand management measures;
- Traffic operations improvements;
- Measures to encourage use of high-occupancy vehicles;
- Congestion pricing;
- Land use management;
- Access management techniques;
- Incident management strategies; and
- Applications of intelligent vehicle-highway system technology.

The proposed regulations also recognize that expansion of capacity through the addition of general purpose lanes may be an appropriate strategy, but that priority must be given to strategies that reduce single-occupant vehicle travel and improve the existing transportation system.

Some key features of the CMS:

- Each state, in cooperation with local authorities and transportation operators, will establish its own standards for acceptable congestion levels, data requirements and collection techniques, and appropriate performance measures.
- The need for cooperation and coordination with the other management systems, particularly the IMS, is explicitly recognized.

Intermodal Management System (IMS)

An intermodal facilities and systems management system (IMS) "identifies intermodal facilities, efficiency measures, and performance standards or goals; encourages data collection at the project and systems levels; and evaluates and implements intermodal strategies and actions."

The goal of the IMS is to ensure better coordination, planning, and integration of all transportation facilities and systems.

A fully implemented IMS would result in:

- A continuing inventory of intermodal facilities and systems;
- Incorporation of IMS strategies and actions into transportation planning processes; and
- An implementation plan for integrating results of an IMS into the state-wide and metropolitan transportation plans and programs.

Some key features of the IMS:

- Performance standards and goals should be established at the state or local level with private sector coordination. Suggested parameters for freight facilities include: time, cost, delay, system reliability, system flexibility, ease of access, modal commodity changes, turnaround rates, contingency operations, information flows, level of service, air quality and energy consumption impacts, and facilities and equipment capacity.
- The IMS must be coordinated with the statewide and MPO transportation planning processes.
- IMS requirements will vary based on the complexity of the transportation issues of individual states and metropolitan areas.
- Private sector involvement is critical, but how to obtain this input is left to the individual state and local parties.

Recognizing the flexibility needed by the states to develop their systems, the Proposed Rule does not specify the types of data to be collected or the level of precision required.

■ 2.5 Related Matters

The ISTEA must be viewed in the context of two other major pieces of national legislation that also contain important provisions affecting the motor carrier industry. These are the Clean Air Act Amendments of 1990 (CAAA) and the National Energy Policy Act of 1992 (EPACT). In many ways, the key provisions of these three acts build upon and reinforce one other. A brief discussion of these acts may be found in Appendix A.

* * * *

More than any previous national transportation program, the ISTEA's ultimate impact in achieving all of its stated objectives depends very much on who participates in implementing the new requirements, and how effective they are. Section 3.0 presents an action plan for trucking industry's participation in decision making under the ISTEA.

3.0 Participation Matters

■ 3.1 Why Does Motor Carrier Industry Participation Matter?

The trucking industry, as well as the other parts of the transportation industry concerned with freight movement, can no longer take for granted that its needs will be met in the post ISTEA world.

Now, state and local authorities, rather than the federal government, wield the power to make resource allocation decisions; programs are no longer segregated along modal lines; and project categories are flexible rather than rigid.

To ensure that the transportation investment choices reflect their constituents' priorities, the ISTEA mandates early, broad-based, and ongoing public participation in the state and MPO resource allocation and decision-making process. This sets the stage for debate among the various stakeholders in the transportation system, including those with interests in automobiles, bicycle and pedestrian transportation, environmental protection, historic preservation, and economic and community development, as well as the freight community.

Under these circumstances, participation by the trucking industry is not optional. If the industry wants its priorities to influence the expenditure of state and local funds, it must work to ensure that its voice is heard.

The ISTEA opens the door; it is up to the states, metropolitan areas, and the transportation industry to work as partners in defining and programming transportation investments. Both state DOTs and MPOs are required to develop structured procedures for defining and programming their investments. They are explicitly required to assess the impact of projects on freight transportation and intermodal goods movement. In addition, they must provide opportunities for the transportation industry and the public to review projects and comment on selection and programming.

Active participation by the trucking industry is critical because motor carriers generally have not participated in state DOT and MPO planning and programming processes. Most state motor trucking associations have established effective lobbying efforts with state legislatures, and some work with state DOTs through committees patterned after the federal Motor Carrier Advisory Committee, but only a few participate regularly in MPO activities.

To most outside of the industry, it is the trucks themselves that are visible, not the business of trucking. Consequently, neither MPOs nor state DOTs really understand the trucking industry or the business of motor carrier operations. States understand motor carriers from an engineering and regulatory perspective, but seldom see trucking operations as a tightly integrated part of industrial and retail logistics operations. Few state DOT staff members have seen their roads from the cab of a commercial truck or from a motor carrier manager's office.

MPOs were created to coordinate transportation programs across the multiple jurisdictions that constitute metropolitan areas, but their primary focus has been on automobile and transit programs. MPOs tend to view trucks as vehicles that contribute to congestion and air pollution. It is the rare MPO that has staff who are trained or experienced in freight or motor carrier operations and, like state DOTs, they rarely have an opportunity to see motor carriers as part of larger business operations.

The ISTEA envisions state DOTs and MPOs as taking a major role in economic and environmental development; however, with their traditional focus on building roads and transit systems, these organizations have become somewhat insulated from development-related activities carried out by other agencies. Carriers may have a unique role to play in bridging the gap between transportation and economic development issues by virtue of their understanding of how truck access, traffic flow, and shipping costs affect the operation and competitiveness of local business and industry.

■ 3.2 Get Involved: The ISTEAM Approach

Given that the motor carrier industry wants to influence transportation policy and programs – and it must – the industry must create a role for itself and shape the process to ensure that the NHS and STP programs in each state and metropolitan area address the industry's needs. The trucking industry must develop a strategy and an action plan to ensure that its voice is heard. The key elements of the trucking industry's approach (as summarized in Exhibit 2) should include:

Establish a Policy of Active Involvement

Achieving success with local policymakers requires active involvement in the community. You must earn the respect of the people involved, build your credibility with the decision makers, know and understand the positions of the critical players, and commit to working with all factions to find solutions to mutual problems and concerns. **This cannot be done from the sidelines – you must commit your time and efforts to getting heard.** Show interest, attend meetings, maintain frequent telephone contact with key officials and staff, and offer your assistance.

Organize and Commit to Continuing Activities

State motor trucking associations, both individually and on the national level, must organize to carry on a continuing dialogue with state DOTs and MPOs. This must be a part of the standard mission of a state motor trucking association. Because they are primarily responsible for capital programs, state DOTs and MPOs are geared to work on projects and issues that take years, not weeks or months to accomplish. To have an impact on this business culture, motor carriers must think in terms of one-, two-, and five-year program planning, funding, and construction cycles. **To be a player and have a significant impact will require the long-term commitment of staff and resources. Intermittent or last-minute intervention will have limited effect, if any.**

In all planning processes, early input drives the direction and priorities of the resulting plans. **Active early involvement gives you the opportunity to provide meaningful input and help to guide the planning process.** Getting support for including a freight project in a TIP is a lot easier than trying to amend a TIP once projects and their funding are already established.

The mechanisms for participation in the planning processes are likely to differ from state to state and area to area, but might include establishing an

Exhibit 2. The "ISTEAM" Approach

Establish a policy of active involvement
Organize and commit to continuing activities
Pick your spots: Use a phase-in strategy to build capabilities
Understand the responsibilities of the key players: the MPOs and the State DOTs
Know your players and the rules of their game
Define needs, identify bottlenecks, develop solutions
Create support for solutions
Advocate effectively for funding and implementation
Develop technical assistance capabilities

industry advisory committee – an "ISTEAM" – for the new planning processes. Members of the ISTEAM could include shippers, receivers, motor carriers, and various others with a special interest in freight transportation. This committee's activities might include:

- Working with state DOT and MPO planners to assist in organizing forums for actively involving industry in strategic activities, such as defining goals, objectives, and policies; planning work programs; conducting surveys of business' interests in freight transportation issues, and reviewing draft freight transportation plan reports;
- Helping to organize and plan the activities of advisory committees set up for the development of congestion management systems and inter-modal management systems; and
- Getting industry representatives to participate in all public meetings and hearings related to the new planning processes.

Pick Your Spots – Use a Phase-in Strategy to Build Capabilities

Having successfully developed the skills needed to deal with transportation tax and regulatory issues at the legislative level, **the associations must now build similar capabilities for dealing with transportation infrastructure and operations. This work is best done in stages, focusing first on a few regions and key metropolitan areas.** This pattern will parallel the trend among states, which are increasingly treating freight and interstate transportation as regional and corridor issues involving coordinated action at a multi-state or regional level.

Know Your Players and the Rules of Their Game

Understand the responsibilities of the key players: the MPOs and the state DOTs.

MPOs

MPOs are responsible for long-range planning, setting shorter-term project priorities, and allocating funds for transit and highways. MPOs have significant power in determining how funds are allocated among the various modes, and which projects will be completed. The ISTEA requires MPOs to develop two types of plans:

- Transportation Improvement Program (TIP): Each MPO must prepare a TIP which includes a three-year priority list of projects and a financial

plan demonstrating how the program will be financed. The TIP must be updated at least once every two years.

- Long-Range Plan (LRP): MPOs must prepare a financially constrained LRP to serve as the basis for TIP project selection, based on factors specified in the legislation.

State DOTs

The state DOTs have the overall responsibility for managing the major programs of the ISTEA. In addition to establishing a statewide transportation planning process that considers the 20 factors specified in the legislation, these responsibilities include:

- Developing a Long-Range Plan: The state DOTs must develop a multimodal, financially constrained long-range transportation plan in cooperation with the MPOs;
- Developing a Statewide Transportation Improvement Program: This plan must be consistent with anticipated funding and the long-range plan;
- Developing and implementing the six management systems specified by the ISTEA; and
- Managing obligation authority for all ISTEA program funds in the state (including the STP, CMAQ, NHS, Interstate System, and the Bridge Program).

Get to know the key officials at both the DOTs and the MPOs, as well as their supporting staff. (Detailed background information on MPOs and state DOTs may be found in Appendix B and C, respectively.) The more that can be learned about these players and their positions, the easier it will be to identify potential supporters. Suggested activities in this area include:

- Identify the local officials who belong to the MPO, especially those on the technical committees related to freight transportation. Attend their open meetings to become familiar with the local agenda and the roles each member plays. Meet with the MPO's technical staff to offer input and assistance.
- Appreciate local characteristics and know the history – avoid the pitfalls of old feuds, and know where the natural alliances are.
- Show interest – attend meetings, call for updates, offer assistance.

- Form an advisory committee – find out if a Citizens Advisory Committee exists – if so, when, where, and how often they meet, and how to get appointed.
- Develop good tracking systems – keep track of both public and private meetings that are held, who attends, what is discussed, what follow-up actions were indicated and who is responsible for them.

Define Needs/Identify Bottlenecks/Develop Solutions

Motor carriers are in the best position to define the industry's needs, identify and rank freight movement bottlenecks and other "hot spots," and suggest reasonable solutions to these problems. **Carriers should not wait to react to proposed state and metropolitan plans – the industry should play an active role in proposing projects for inclusion in those plans.** This is not to say that the industry must be solely responsible for developing solutions to the problems it identifies. The industry must, however, participate in the development of solutions.

The initial focus should be on identifying those bottlenecks and solutions that can be addressed by state DOTs and MPOs and for which there is a reasonable expectation of funding and success. Typically, these will be problems that can be remedied through construction, traffic engineering, and local regulation. Projects that require massive capital investment, major legislative initiatives, or fundamental restructuring of state or local government can be addressed, but more tractable issues should be considered as initial building blocks of the process.

Although the trucking industry can propose solutions, they should not necessarily expect state DOTs, MPOs, or other transportation groups to see the same solutions as motor carriers. States and MPOs have mandated agendas, now heavily weighted toward infrastructure replacement, and personal mobility. They will not, and in some cases cannot, frame solutions in exactly the same way as would a motor carrier manager.

In devising solutions, it is important to think boldly and creatively, keeping in mind the long-range impact of transportation investment decisions. For many carriers, "long-term" may mean "until the end of the week" – it is especially important to go beyond this constraint when trying to solve infrastructure-related problems. Where appropriate, emphasize public/private partnerships when developing solutions.

Create Support for Solutions

Standing alone, motor carriers are just another special interest group with concerns about their own operational efficiency. **By building alliances with its shippers and customers, as well as with other groups who may share the trucking perspective on a particular issue, the industry's positions will carry much more weight. A broad spectrum of local businesses and interests cannot easily be brushed aside by state or local officials.**

One important way to show the industry's strength is to enlist the participation of shippers and receivers in both public and private meetings. The livelihood of shippers and receivers, and the well-being of their stockholders and employees, depends on companies being able to move their goods and services efficiently. Shippers and receivers create the demand for motor carrier and other transportation services; ultimately, innovation and productivity gains in motor carrier transportation benefit not only business and industry itself, but also their customers. It is therefore in their best interest to support reasoned proposals developed by the trucking industry for improving the freight movement system. Customers who are known and respected by local decision makers would be especially valuable in showing the industry's stature.

The motor carrier industry has limited resources to devote to the new planning processes and management systems and has limited influence in shaping the process compared to the influence of other, frequently competing interests who represent much larger constituencies, such as automobile users, transit advocates, environmental protectionists, and local governments. Thus, it is important for motor carriers to join forces with other interest groups who may have similar perspectives, if only for selected issues; in some cases, there will be a need to look well beyond traditional boundaries to identify mutual interests.

Examples of potentially important ad hoc alliances include:

- **Major industries of the state**, who have a broad interest in freight transportation improvements;
- **Shippers and receivers with strong logistics management programs**, who may have specialized technical knowledge, data, and interest in congestion management;
- **Automobile clubs**, who have interest in congestion management and in increasing investment to overcome congestion problems;
- **Construction industries and their suppliers**, who have interest in improving the quality of transportation plans and in expanding transportation investment programs;

- **Local governments**, who may have a variety of interests ranging from improving the quality of transportation plans to expanding transportation investment programs to reducing single occupant automobile travel;
- **Environmentalists**, who are interested in reducing single occupant automobile travel and in improving the quality of the planning process and management systems;
- **Economists and "free marketeers,"** who are interested in reducing congestion through pricing of peak period travel on the most heavily used urban freeways, in having peak period auto users pay the full marginal social costs associated with their travel, and in eliminating various forms of employer subsidies of auto commuters;
- **The automobile industry**, which has an interest in incident management that reduces traffic congestion and improves safety for all highway users;
- **The transit industry**, which has a common interest with the trucking industry in reducing automobile congestion. The trucking industry should consider supporting cost-effective transit programs that will shift automobile drivers to transit; this will increase ridership and revenues for transit; and reduce congestion on the roads for carriers.
- **State and metropolitan traffic engineers**, who are interested in IVHS programs to enhance traffic flows and improve truck dispatching and routing;
- **Ports and railroads**, for whom improved access means retaining freight and economic development that might divert to other ports and railroads; this is feasible because of intense competition among ports and railroads, and growing dependence of rail and trucking industry on TOFC and COFC for cost-effective long-haul movement;
- **Private fleets, utility company fleets, and government fleets**, who also are affected by factors such as posted bridges, inadequate clearance, deteriorating road services, noise restrictions, access and pricing policies, and safety enforcement practices. Private and governmental fleets typically are not well represented in public transportation planning and could benefit from an alliance with state motor trucking associations on an issue-by-issue basis; and
- **Local land use planners**, who are interested in redeveloping terminals, warehouses and industrial areas, both to preserve jobs and reduce the environmental impacts of urban sprawl.

These and other groups may not always have the same interest in issues as motor carriers, but the commonality of interests should be emphasized wherever the opportunity occurs.

Advocate Effectively for Funding and Implementation

The best proposals will go unfunded without careful and vigilant attention to how they are presented to the DOTs and the MPOs. Some suggestions to enhance the prospects of getting proposals enacted:

- Ensure that the ideas in your plans and proposals are easily accessible – use clear, easy to understand visual presentations at public meetings and in private meetings with MPO staff.
- Articulate not only the problem but also the public benefit of the proposed solution – both must be clear, because without "public" benefits there will be no public funds expended. Public benefits, such as enhancing economic growth, creating jobs, improving safety, reducing congestion and vehicle operating costs, enhancing quality of life, and improving air quality, should outweigh the negative impacts for a project to receive funding consideration.
- Educate, listen, respond, and compromise where necessary – do whatever it takes, but be sure your positions are put on the table.
- At public hearings, seek the chance to testify. Emphasize the regional benefits of your proposals.
- Use the power of the press – talk with them when the opportunity presents itself, keeping communication clear, direct, and on point.

Develop Technical Assistance Capabilities

The trucking industry should develop technical assistance capabilities for freight planning at the national, regional, and local levels. On the national level, efforts should focus on developing skills relating to tools and procedures that would be useful to planning activities anywhere in the nation. For example, the industry should work with the FHWA and other modal agencies to develop a technical guidebook that would provide information to state and local planners on areas such as the following:

- Logistics patterns by industry.
- Commodity forecasts and forecasting techniques.
- Truck route standards (i.e., minimum tolerable conditions for different types of freight routes).
- Model procedures ("best practices") for conducting cost/benefit analyses.

On the regional level, efforts should be directed toward developing freight planning specialists who understand the national planning rules, regulations, and procedures and can apply them effectively to the regions. These specialists also should become familiar with the best practices for freight planning and with the development of alternative solutions to trucking problems. In addition, the regions should develop information on regional trucking patterns.

Efforts at the local level should focus on increasing awareness of trucking issues among transportation planners. Skills to be emphasized at this level include the following:

- Conducting surveys of local industry to identify local trucking issues and needs.
- Identifying sources of trucking industry data that will be useful to state DOTs and to MPOs.
- Presenting issues, proposed solutions, and their benefits to MPOs and to state departments of transportation.

* * * *

A final note: The transportation planning process may appear cumbersome, time-consuming, and complex. Projects now underway may have been on the drawing boards a decade ago. Don't get frustrated or discouraged – the opportunity is there to establish credibility and to shape the direction of the new planning process, because the MPOs and state planning organizations need your help. The more active the motor carrier industry is in participating in the planning processes, the stronger will be the freight transportation components of all plans and programs that result from the new ISTEA planning processes and management systems. Make the long-term commitment to make your voices heard.

4.0 Planning Matters

■ 4.1 Why Does Planning Matter to the Trucking Industry?

State DOTs and MPOs are changing the way they do business. Where once state and metropolitan transportation agencies were told to focus on only one mode of transportation – typically, highways or transit – they are now being told to direct attention to the total transportation system. Where they once were told to specialize, typically in construction, they are now being told to diversify into operations and management.

These changes necessitate new business planning procedures, especially for freight planning. State DOTs and MPOs are building those procedures today. The procedures are important to the trucking industry because they will determine where the public sector will invest in freight transportation. If motor carriers work with state DOTs and MPOs to understand the freight transportation system and focus planning on critical needs, then the public sector investments will benefit the trucking industry, the businesses they serve, and their communities.

This section suggests how motor carriers, state DOTs, and MPOs might think about the freight transportation system for planning purposes, and provides general guidance for motor carriers on what they should expect when they work with state DOTs and MPOs on freight issues.

■ 4.2 Building a Freight Planning Process

The trucking industry has an opportunity to help shape the freight planning process. The ISTEA mandates an overhaul and expansion of the transportation planning process – the procedures that determine which transportation needs will get attention, how much money will be spent on them, and when it will be spent. Although state DOTs and MPOs have relatively sophisticated passenger transportation planning procedures, most agencies will be building their freight planning capabilities from scratch.

A recent survey¹ of all 50 states found that 33 of the 36 states responding had little or no experience in developing forecasts of freight transportation movements. Only seven of the 36 states had completed or were working on a statewide freight transportation plan.

Interviews with 12 major MPOs for this guidebook found that only one MPO had conducted major freight planning studies prior to the enactment of the ISTEA. Six of the MPOs reported limited or sporadic efforts to deal with trucking and freight issues; the remaining five MPOs reported no significant involvement in freight transportation issues.

All of the state DOTs and MPOs surveyed reported that they were taking steps to collect data and grapple with the freight planning requirements imposed by the ISTEA. Both surveys found that these agencies are interested in building a freight transportation planning capability and were looking to the trucking industry for advice and assistance.

■ 4.3 Defining the Freight Transportation System

The first step in building a freight planning process is to see the system as a whole – to understand freight movements as a system of supply chains and distribution networks. The trucking industry is in a unique position to help state DOTs and MPOs build a picture of the freight system as a whole, and the importance of trucking to that system, because at one point or another in the freight shipment, almost all goods and services are moved by truck.

¹/ Cambridge Systematics, Inc., Survey of State Officials Responsible for Freight Planning and Forecasting, National Cooperative Highway Research Program Project 8-30: "Characteristics and Changes in Freight Transportation Demand," Interim Report to the Transportation Research Board of the National Research Council, August 1993.

As an illustration, consider the movement of retail merchandise from an overseas manufacturer to a consumer: Merchandise is shipped from Asia or Europe by intermodal container on a steamship. At the port, the container is landed and transferred to a railcar. From there it is carried cross-country to an inland city. At the railroad's intermodal terminal, the container is again transferred, this time onto a trailer chassis, which is hauled by truck to a distribution warehouse. At the warehouse the merchandise is unpacked, sorted, and combined with other goods for distribution. Those shipments are then picked up by a truckload carrier or a less-than-truckload carrier for delivery to retail stores. The final leg of the trip, from the retail store to the consumer, may be made by the store's delivery truck or by a parcel-delivery service truck.

The shipment could take other paths, as illustrated in Figure 3. Some of those paths may be shorter and use fewer modes; however, the typical freight "trip" usually involves three to six moves within the freight system – many of them by truck.

Any given state or metropolitan area may see only a part of that trip. One city will see the port transfer; several states may see the rail portion of the trip; and another city will see only the drayage movement from the intermodal terminal to the warehouse. Similarly, the distribution trips may be limited to a single metropolitan area or utilize highways and local roads crossing dozens of states and communities. In this respect, freight transportation is significantly different from passenger transportation, where the vast majority of trips occur within a metropolitan area and within the jurisdiction of a single MPO.

■ 4.4 Understanding the Freight System

Freight Transportation System Elements

The second step in building a freight planning process is to break the freight system into its component elements or subsystems. Each part can then be analyzed, and changes in one part can be traced to see how they will affect the overall performance of the freight system. For planning, it is useful to think of the freight transportation system as made up of five major components (see Figure 4).

- **Economic Structure.** The economic structure of a state or metropolitan area – that is, **the types of business and industry in an area and the number and type of jobs and households they support** – is the key determinant of the type and volume of freight and goods that will move through a region. As a region's economy grows, shifts, or shrinks, so will the demand for truck service. Freight planning starts with the

Exhibit 3. Intermodal Freight System Paths

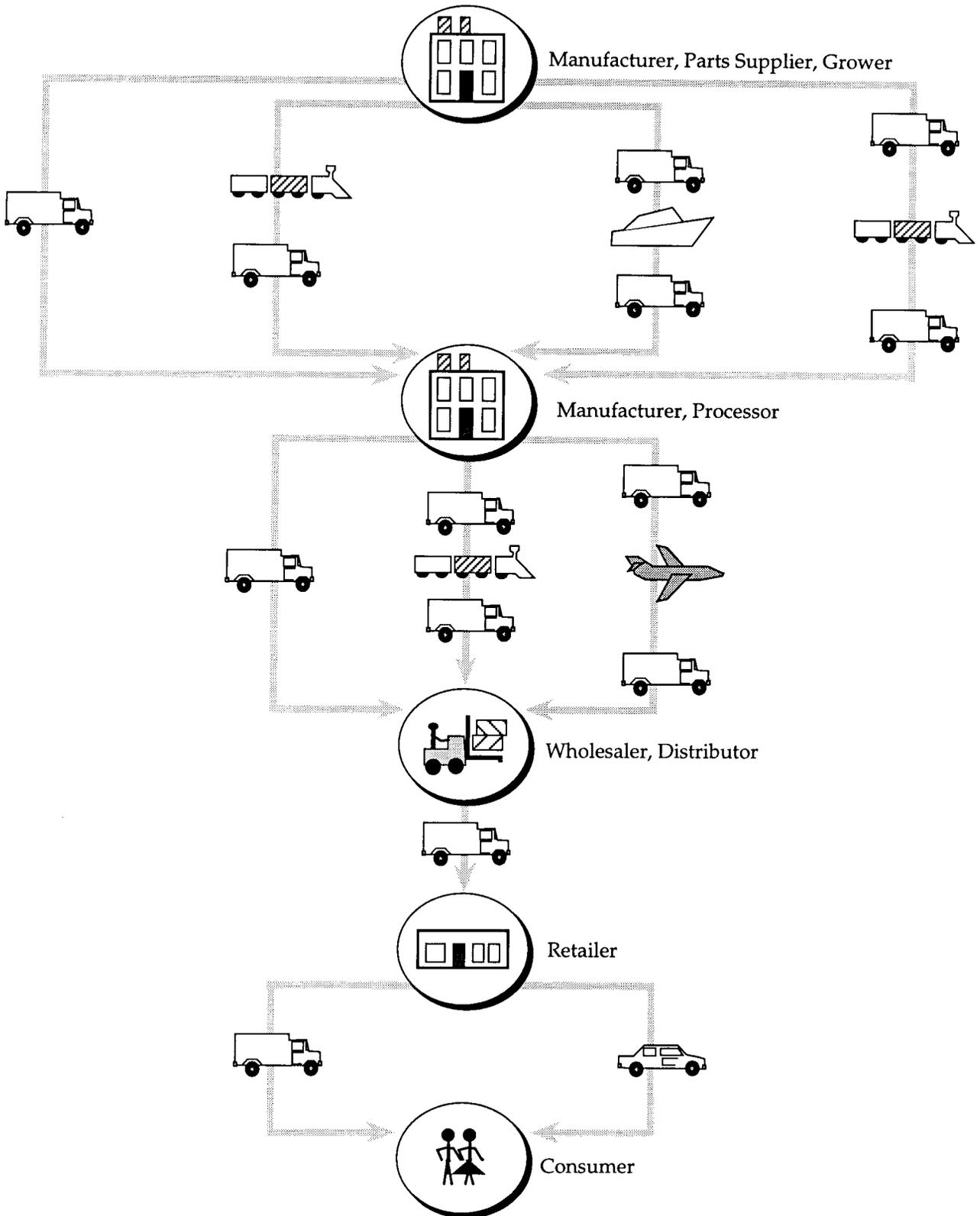
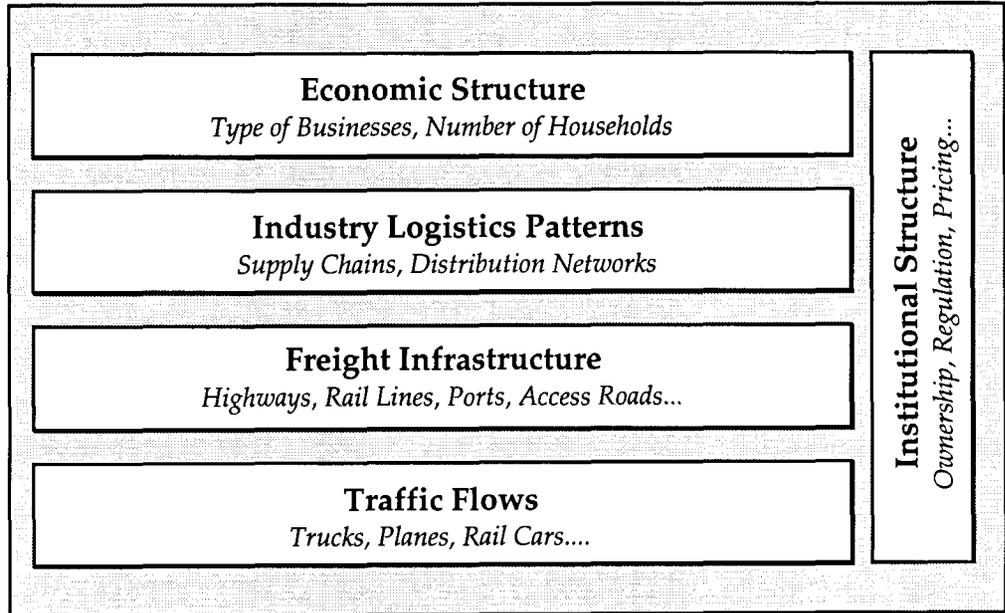


Exhibit 4. Elements of the Freight Transportation System



development of a good economic profile of the industries in the region; an understanding of which industries generate freight; and a sense of how those industries and the economic structure of a region are likely to change over time. Detailed, long-range economic forecasts are not necessary for most state and metropolitan freight projects, but a basic understanding of the economy and current trends is mandatory.

- **Industry Logistics Patterns.** The logistics strategies of business and industry – very generally, **the decisions about where to buy goods and where to sell them** – determine freight flows. Each industry has a unique logistics strategy that is determined by a number of factors such as the location of suppliers and markets, transportation costs, and economic and safety regulations. The pattern of truck movements can change radically when logistics strategies change – for example, when companies enter new markets or introduce just-in-time delivery systems to reduce inventory carrying costs. Currently, the logistics strategies of business and industry are not well understood by state DOTs and MPOs, especially those moves and transfers that go beyond metropolitan and state boundaries. The trucking industry can be a valuable source of information about logistics patterns for state DOTs and MPOs and be a liaison between government and industry.
- **Infrastructure.** The freight system infrastructure includes **highways, rail lines, steamship lanes, freight terminals, ports, warehouses, and airports** – **the physical facilities over which goods and commodities flow**. State DOTs and MPOs have good descriptions of the highways, bridges, and ports that the public sector operates, but often have limited information on the rail networks, terminals, and warehouses operated by the private sector. Equally important for today's logistics systems is the information infrastructure – the network of satellites, computers, and telephone and data communications lines that tie together shippers, carriers, and receivers. Most of this system is operated by the private sector, but the public sector is now building IVHS systems (intelligent vehicle-highway systems), which apply similar information technologies to traffic management and which will have a major impact on freight transportation. Both of these information infrastructures need to be accounted for in building a freight planning process.
- **Traffic Flows.** The economic structure of a region, the logistics strategies of its industries, and the available infrastructure determine the flow of trucks, rail cars, and planes. With an understanding of commodity flows and a good map of the freight transportation network, it is possible to trace vehicle movement patterns through the freight transportation system. When sufficient data are available, these traffic flows can be analyzed to determine where bottlenecks are created by congestion, cost, or regulation. The effect of these bottlenecks can then be traced back to see how they affect the overall performance of the

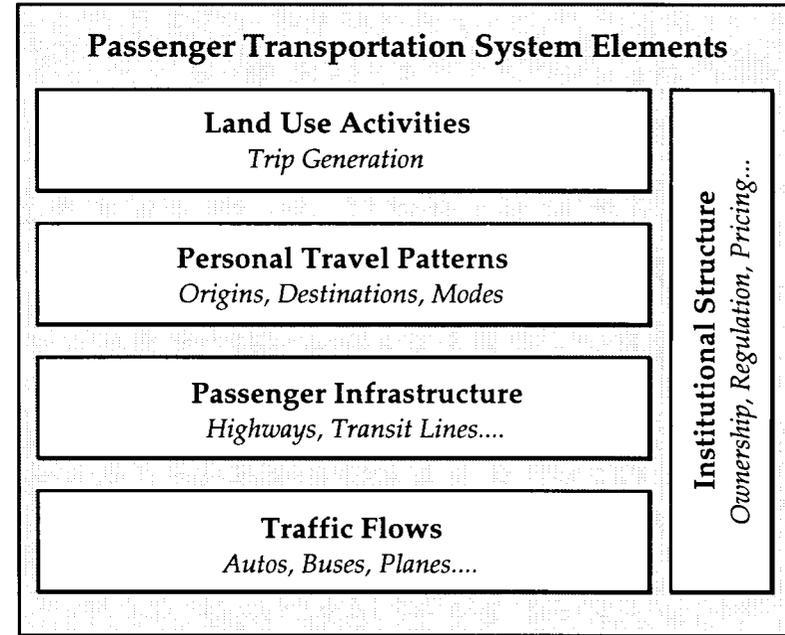
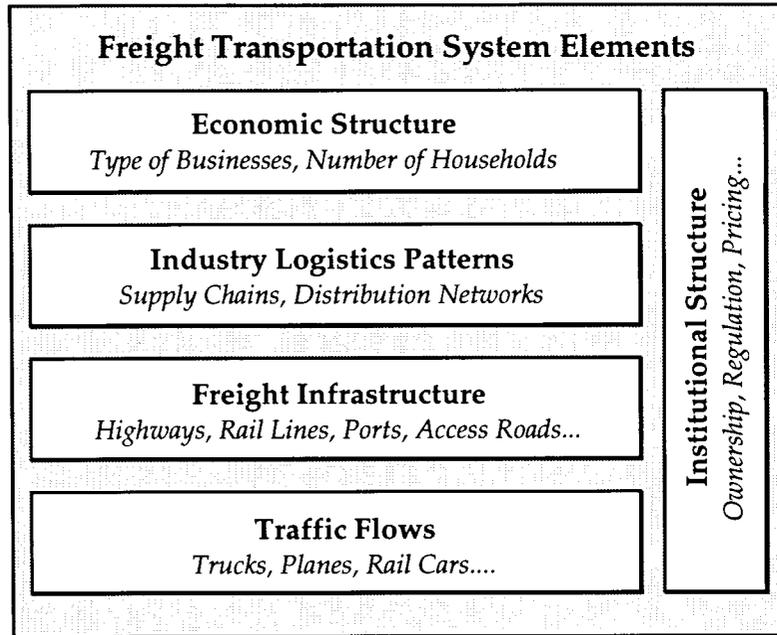
freight system. For example, congestion and deteriorating roads may slow truck travel and make delivery times less reliable; this may force companies to maintain larger inventories, increasing their cost of doing business, and eventually making them less competitive. Posted bridges, which cannot carry heavy trucks, may result in lengthy detours, especially in rural and suburban areas; this may increase the cost of shipping and receiving for companies that depend on good truck service and may contribute to a decision to relocate, with a subsequent loss of jobs and tax revenue to the community.

- **Institutional Arrangements.** The final element of the freight transportation system is its institutional structure – the pattern of ownership, regulation, and pricing that shapes logistics strategies, determines who uses freight transportation facilities, and controls the flow of vehicles. The regulatory system that governs the motor carrier industry was developed 50 years ago when most truck movements were local and regulations were tailored to the needs of the local economy. Today, when the trucking industry and the businesses they serve operate at a national and global scale, this regulatory system is increasingly inefficient because of its complexity and administrative cost to both states and carriers. Federal economic deregulation of trucking in 1980 precipitated major changes in ownership and operation within the trucking industry; these changes have led to significant shifts in industry logistics strategies and more efficient truck flows. State DOTs, MPOs, and the motor carrier industry can further improve the efficiency of the freight transportation system through state and local regulatory reform.

Corresponding Elements of the Passenger Transportation System

The five freight transportation system elements correspond generally to the established urban passenger transportation planning elements (see Figure 5). There are, however, some significant differences between these systems. First, the freight transportation system is inherently more complex to analyze than the passenger transportation system; the five elements do not fully describe the logic or complexity of the freight transportation system. Second, the analytical methodologies being deployed today for freight planning are far simpler than those that have evolved over the last 30 years for passenger planning. Governments at the state, regional, and local levels are operating under tight budgets; few have yet devoted the resources to freight planning that have been invested in passenger transportation planning. Nonetheless, it is still useful to think of the freight system as using the same basic framework that has evolved for passenger transportation planning. This approach maintains a structure with which state DOTs and MPOs are familiar, and provides a common language that motor carriers can use in working with different public agencies.

Exhibit 5. Corresponding Elements of the Freight and Passenger Transportation Systems



■ 4.5 Establishing Planning Procedures

The third step in building a freight transportation planning process is to establish procedures for identifying and solving freight transportation problems. The ISTEA requires state DOTs and MPOs to set up procedures – designated as "management systems" – that cover, generally, each of the freight system components (see Figure 6). Together with statewide and metropolitan plans, these management systems provide a framework for freight transportation planning. (See Section 2.4 for more detail.)

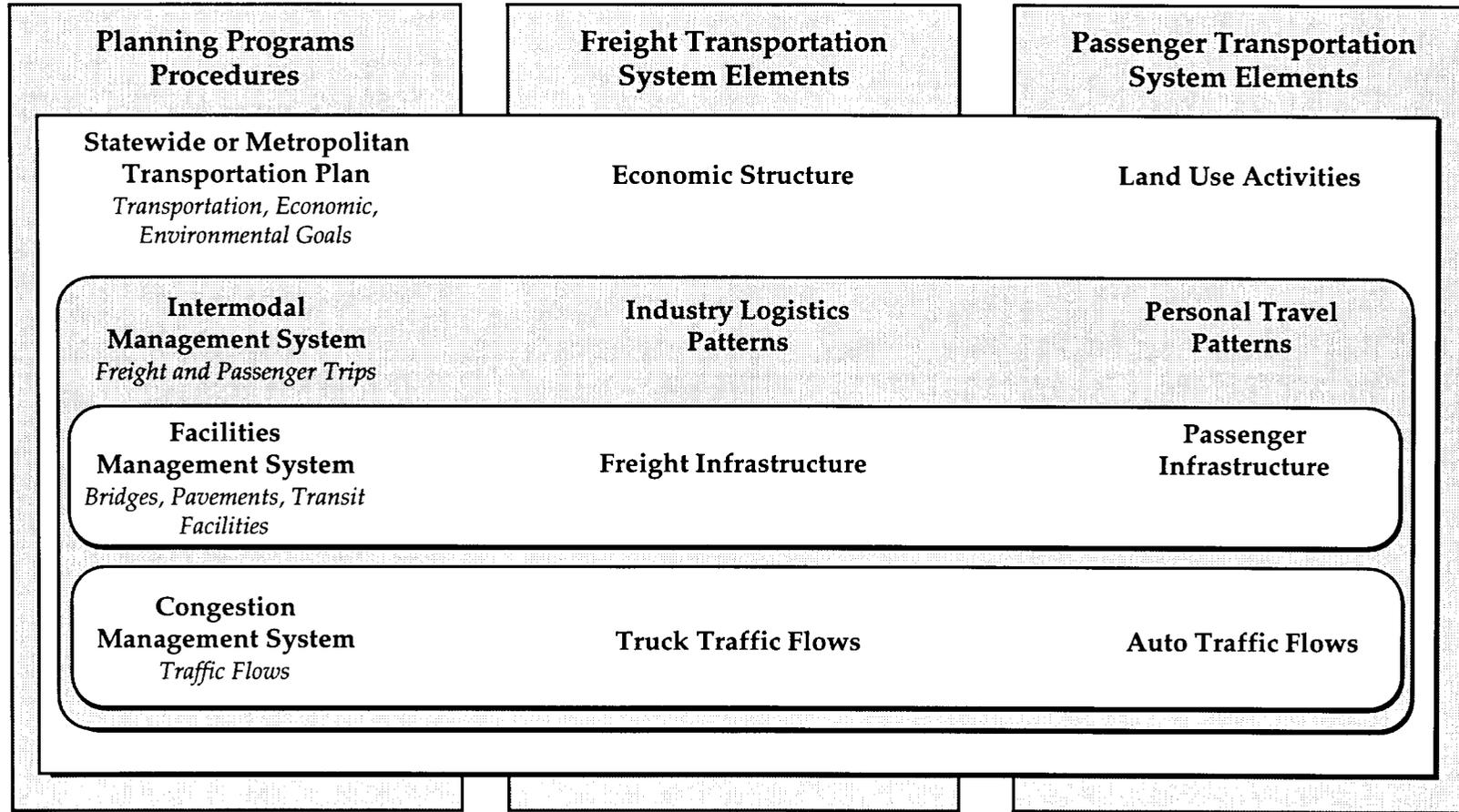
- **Congestion Management Systems.** Congestion management systems will deal with traffic flows. The primary focus of congestion management will be on peak hour congestion in urban areas. The objectives are to reduce delays and air pollution, and improve highway traffic safety. Congestion management systems will do this by stabilizing traffic flows through traffic control systems and allocating space and time on congested roadways.

The basic tools for congestion management – traffic monitoring, traffic engineering, traffic flow modeling, traffic information, and toll pricing – are reasonably well developed; however, previous thinking about congestion management has been oriented almost exclusively to the movement of people rather than freight. For example, urban transportation models can assign vehicle trips to a highway network and estimate travel time and congestion levels, but this is seldom done for trucks because information on truck trip patterns is inadequate. The trucking industry must work with state DOTs and MPOs to help them understand the impact of congestion on freight movements and develop tools that address the special needs of trucks. They also must be encouraged to collect data on truck trip patterns.

- **Facilities Management Systems.** Facilities management systems will deal with the maintenance of bridges, pavements, and public transit facilities. The objective is to maximize the economic life of highways and bridges. Maintenance systems do this by tracking the physical deterioration of pavements and bridges and then optimizing the allocation of funds for repair, replacement, and rehabilitation. Good pavement and bridge management programs are generally available to state DOTs and MPOs. Although considerable data collection is required to set up facilities management systems, the procedures are well established. The railroads have developed similar programs for rail maintenance-of-way, and many trucking firms have sophisticated vehicle maintenance programs.

The challenge posed by the ISTEA is to see and treat the maintenance of the freight infrastructure the way the infrastructure operates – as an integrated network. Since many freight transportation facilities are outside the physical and legal jurisdiction of state or metropolitan

Exhibit 6. Relationship of ISTEA Management Systems to Elements of Freight and Passenger Transportation Systems



agencies, considerable cooperation between the public and private sectors will be required to determine when facilities are inadequate and where new investment is needed to leverage freight services and economic development.

- **Intermodal Management Systems.** Intermodal management systems will deal with trips – both passenger and freight – and with intermodal facilities. The systems will build upon the information provided by the congestion management and facilities management systems. The objective is to maximize the productivity of the transportation system – to ensure that the whole trip, from origin to destination, is cost effective. Intermodal management systems will do this by allocating resources among trip paths and, where appropriate, ensuring that shippers and receivers have a choice of paths. While state DOTs and MPOs may develop a single intermodal management system that addresses both freight and passenger trips, it is generally anticipated that there will be two related management systems – one focusing on freight movements, and the other on passengers.

Intermodal management systems are the least well defined and developed of the transportation management systems mandated by the ISTEA. However, these systems will become very important because they will force state DOTs, MPOs, carriers, and shippers and receivers to look at the whole trip – both single-mode moves and intermodal transfers – to see if they add up to a safe and cost-effective freight system.

- **Statewide or Metropolitan Transportation Plan.** Statewide and metropolitan transportation plans deal with the role of transportation in the state or metropolitan area. Their objective is to define the transportation system and the overall level of investment needed. Statewide and metropolitan transportation plans do this by balancing transportation needs and investments against the social, economic, and environmental goals of the state or metropolitan area. The ISTEA requires explicit consideration of the freight transportation system and its linkage to economic development in these plans.

Most MPOs and some states already have long-range transportation plans that encompass economic, land use, and environmental goals. What is new in the ISTEA is the requirement that these long-range plans cover all modes, including freight transportation. In addition to this, the plans must be financially constrained – that is, they must present transportation plans that can be financed. This will be a significant departure from the past practice of many state DOTs and MPOs, whose transportation plans presented a vision of what might be achieved rather than a plan of what could reasonably be achieved with foreseeable revenues. It is important for the motor carrier industry to make sure that the new visions that emerge give adequate attention to freight transportation.

■ 4.6 Delivering Freight Planning Using Today's Tools

It will take state DOTs and MPOs some years to fully develop these management systems and refine a freight planning process. Agency staff have limited experience with freight operations; available procedures and traffic forecasting models are not well adapted to complex freight movements; and intermodal freight data are spotty, especially at the state and local level. Faced with these hurdles, some state DOTs and MPOs, although interested, will be hesitant to address freight issues, preferring to wait until they build a foundation of data and analytical techniques. But many freight problems and opportunities can be solved with available techniques by pooling the expertise of state engineers, MPO planners and economists, carrier managers, and shippers and receivers.

Planning studies are typically conducted in four phases:

- **Inventory:** Analysis of current conditions and system performance;
- **Needs:** Development of forecasts and requirements;
- **Alternatives:** Design of policy, management, construction, operations, or regulatory options; and
- **Evaluation:** Assessment of the impacts, costs, benefits, and risks of alternatives.

The next sections provide general guidance for motor carriers on what they should expect when they work with state DOTs and MPOs on freight planning projects. Three types of projects are discussed as examples:

- Reducing congestion;
- Improving intermodal access; and
- Designating and maintaining major truck routes.

Each section provides a thumbnail sketch of current practices and identifies the freight system elements that deserve the most attention from motor carriers, state DOTs, and MPOs.

Reducing Congestion

Congestion causes billions of vehicle-hours of delay every year and imposes a huge cost on state and metropolitan economies. Motor carriers have an immediate interest in reducing congestion because it affects the cost and reliability of their service and the safety of their drivers and other motorists. Figure 7 shows where motor carriers, state DOTs, and MPOs should focus their attention to ensure that trucking issues are adequately addressed. The elements of the transportation system that should receive the most attention are designated "high;" those that should receive moderate attention are designated "moderate;" and those that can receive relatively less attention for this issue are designated "low." These are general guidelines; specific situations may warrant different approaches.

Inventory

State DOTs and MPOs have adequate data – road maps, traffic counts, accident records, traffic engineering studies, etc. – to identify congestion bottlenecks and analyze their cause. What is usually missing for freight planning purposes is information about the number of trucks and the type of commodities caught up in traffic congestion.

Motor carriers should encourage agencies to take truck counts as part of the inventory phase of congestion management projects. Field observations and video tapes of traffic on congested highway sections can be used to estimate the number of trucks affected; by identifying the types of trucks and the names of the carriers, the types of commodities can be inferred. Both traffic congestion and truck flows can vary significantly from day to day and week to week, so motor carriers should work with local traffic engineers to pick survey days and weeks that accurately represent typical truck flows and congestion conditions.

A sample of carriers should then be interviewed to determine how congestion is affecting their operations. In turn, a sample of their shippers and receivers should be interviewed to determine how congestion is affecting supply chains and distribution networks. This latter task should receive attention early in a congestion management study because state DOTs and MPOs will not have a reservoir of knowledge about industry logistics patterns – it must be built from scratch.

Needs/Forecasts

Congestion projects have limited need for traffic forecasts. Current traffic flows, annual traffic growth rates, and identification of congestion problems usually form a good bias for assessing the severity of congestion over the next three to five years. If forecasts are available, motor carriers should inquire whether the traffic models make separate forecasts for trucks. Most state DOTs and MPOs have transportation network models

Exhibit 7. Reducing Congestion

Planning Procedures	Freight Transportation System Elements	Planning Phases			
		Inventory	Needs	Alternatives	Evaluation
Statewide	Economy				<input type="checkbox"/>
Intermodal	Logistics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Facilities	Infrastructure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Congestion	Traffic Flows	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Exhibit 8. Improving Intermodal Access

Planning Procedures	Freight Transportation System Elements	Planning Phases			
		Inventory	Needs	Alternatives	Evaluation
Statewide	Economy		<input type="checkbox"/>		<input type="checkbox"/>
Intermodal	Logistics	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Facilities	Infrastructure	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Congestion	Traffic Flows	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Exhibit 9. Designating and Maintaining Major Truck Routes

Planning Procedures	Freight Transportation System Elements	Planning Phases			
		Inventory	Needs	Alternatives	Evaluation
Statewide	Economy	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Intermodal	Logistics	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Facilities	Infrastructure	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Congestion	Traffic Flows	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>

Priority: High Moderate Low

that can assign vehicle trips to a highway network and estimate travel time and approximate congestion levels; however, many of the models do not distinguish between automobiles and trucks. Forecasts are made in terms of vehicles or passenger car equivalents; trucks are then estimated as a percentage of total vehicles or passenger car equivalents.

Where state DOTs and MPOs have transportation models that distinguish trucks from automobiles, carriers may be told that truck trip data are inadequate to produce reliable forecasts. This is a common problem because state DOTs and MPOs generally have not been asked nor given sufficient funds to survey truck trip patterns. Carriers should urge MPOs and state DOTs to develop truck trip tables (i.e., truck origin and destination patterns) and truck networks (i.e., computer models of the roads open to trucks) as the agencies upgrade metropolitan and statewide transportation models. This information can be used for air quality planning and economic development planning as well as for congestion management and freight planning. Until better data and models are developed, most of the basic information needed to make informed judgments about truck traffic patterns and trends can be gleaned from interviews with motor carriers, state police, and district and city highway engineers.

Alternatives

State DOTs and MPOs are developing a range of tools to manage congestion including incident management programs, traffic operations improvements, HOV lanes, parking and delivery zone management, IVHS congestion pricing, road widening, and computerized traffic control operations. All can be used to facilitate freight movement as well as passenger movement, but most have been designed with automobiles and passenger trips in mind. Motor carriers should examine congestion management strategies with state and metropolitan planners and engineers to determine how they will impact trucking operations. For example:

- **Incident management programs.** Do the programs provide heavy tow trucks and operators with adequate training to handle disabled trucks?
- **Traffic operations improvements.** Are traffic signals timed to compensate for the slower acceleration and deceleration of heavy trucks? Are left-turn bays sized to accommodate trucks?
- **HOV (high occupancy vehicle) lanes.** Will the addition of HOV lanes on freeways increase congestion in the remaining general traffic lanes? If so, will trucks – which cannot use carpool lanes or shift their cargo to transit – face increased congestion or shift to alternate truck routes?

- **Computerized traffic control systems.** Will sensors be placed on the through lanes of major routes to provide the basis for optimizing major through movements when the heaviest truck flows occur?
- **Parking and delivery zone management.** Will loading zones be policed only during peak or daytime hours? As more companies shift to nighttime deliveries, protection of loading zones in the early evening may be almost as important to motor carriers as daytime management of delivery zones.
- **IVHS.** Will information on construction, congestion, and incidents be available to dispatchers and be compatible with carriers' computer-aided dispatching systems? Will alternate route recommendations take into account the special needs of heavy trucks and hazardous material carriers?
- **Road widening and new construction.** Is the road engineered for safe and economical truck movement?

Evaluation

It is standard planning practice to measure the impact of congestion reduction programs in terms of travel-time savings and reduced vehicle-miles-of-travel. Benefits are calculated by applying a dollar value to the hours saved. The hourly rate or value of time that is used in these calculations is often quite low, but it must distinguish between cars and trucks. Average driver wage and benefits rates or overtime rates should be used to calculate a more accurate value of time for truck drivers.

Secondary impacts of congestion are seldom estimated, but are very important for motor carriers. Motor carriers, state DOTs, and MPOs must determine if congestion measures will have a significant impact on industry logistics patterns, making it more or less difficult to do business in the state or metropolitan area. Exposure to congestion varies tremendously from industry to industry depending on factors including their operating hours, the value of their shipments, and their dependence on just-in-time operations.

For most projects, interviews with motor carriers and a sample of industries affected by the congestion measures will provide adequate indication of any significant economic impacts. For complex studies, regional economic models, which are maintained by some metropolitan MPOs and states, can be used to trace the impact of changes in the cost of doing business to changes in state or metropolitan employment, business activity, and tax revenues. This level of analysis is warranted only when congestion management projects are expected to have a major impact on carriers and industries.

Improving Intermodal Access

Poor connections between highways and intermodal transfer facilities – ports, intermodal rail terminals, airports, and warehouses – delay trucks and increase freight transportation costs. These costs eventually are passed through to shippers and, in the worst case, may result in industries shifting their through shipments to other less congested facilities. For motor carriers and intermodal facility operators, this means a direct loss of business; for state and metropolitan areas, it means a loss of economic activity, jobs, and revenue. The motor carrier industry can help state DOTs and MPOs identify intermodal access problems and assemble the data necessary to justify improvements.

Figure 8 shows where motor carriers, state DOTs, MPOs should focus their attention to ensure that intermodal access issues are adequately addressed. The elements of the transportation system that should receive the most attention are designated as "high" priority; those that should receive moderate attention are designated as "moderate" priority; and those that can receive relatively less attention for this issue are designated as "low" priority. As with the other examples, these are general guidelines; specific situations may warrant different approaches.

Inventory

The planning process should start with a simple inventory of intermodal facilities and meetings with the intermodal facility operators and the motor carriers that serve them. This inventory process is the first step in answering system efficiency questions such as: Where are the bottlenecks? How much of the problem is caused by congestion – how much by inadequate roads and bridges? Direct mapping of access routes and bottlenecks on maps and aerial photographs is very effective.

If the problem is primarily congestion, state DOTs and MPOs can tackle the problems with the techniques described in the previous section. Planners should pay special attention to truck movements during midday and at night; truck flows into and out of ports and airports often peak at these times (or on weekends) because of rail, steamship, and airline schedules.

The problem more often will be inadequate roads, especially in older metropolitan areas where ports, rail terminals, and their access roads were built well before freeway systems. Typical problems include narrow surface streets with deteriorating pavements; intersections and exit ramps with turning radii that are too small for today's larger trucks; low bridges or posted bridges that force trucks to make long detours; and noise and safety problems when trucks must travel through neighborhoods. State DOTs and MPOs usually will have the in-house engineering expertise to evaluate the roadways, pavements, and bridges. Motor carriers can contribute information on truck-specific problems such as turning radii.

The most attention should be focused on understanding the role of the port or terminal in the freight system. What is the role and value of that link in the overall freight trip? Is it a distribution terminal serving moves from linehaul to delivery vehicles; a consolidation terminal serving moves from pickup to line-haul? Does it support a foreign trade zone with import and export moves? How does restricted access affect the competitiveness and profitability of the facility and its carriers? State DOTs and MPOs should be encouraged to interview facility operators and motor carriers and to assemble summary data on the type and volume of freight and commodities moving through each terminal. With this information, a general profile of the industries that depend on the facility can be constructed.

Needs/Forecasts

Reconstruction of access roads can be a major capital investment requiring at least three to five years to design, contract, and construct. Since access roads should have a useful economic life of 15 to 20 years or more, state DOTs and MPOs must anticipate changes in the structure of the intermodal facility as well as its use. Are there plans for expansion? Will changes in the structure of the state and metropolitan economy change the demand for freight movement through the port or terminal? What intermodal services will be needed by area shippers? Will changes in logistics or freight technology make the facility outmoded in five years?

State DOTs and MPOs have economic forecasts that provide adequate information on general trends in the local economy. Forecasts for specific commodities are available at a national level and for major ports, but these may not be adequate for many local projects. Truck commodity surveys, customs data, railroad waybill samples, airline cargo reports, and industry-specific forecasts must be sifted for useful data on commodity flows and trends. Carriers can contribute to this effort by helping public sector planners and economists meet with industry logistics managers. A half-day workshop that brings together knowledgeable shippers and carriers can generate practical assumptions about changes in logistics and freight technology.

For major projects, traffic flows should be modeled at least at the corridor level using simplified truck trip tables and truck networks. Most state and MPO planners have the tools to do this or can retain local traffic engineering consultants to do the work. The objective should be to determine whether new bottlenecks emerge as truck and general traffic grow over time. Motor carriers should carefully review assumptions about truck travel patterns and route choices with state and MPO engineers so that the models accurately reflect how trucks operate. Major new access roads and bridges may warrant special surveys and studies of truck movements.

Alternatives

As access problems are identified, state DOTs and MPOs should determine what actions they can take, if any. The ISTEA mandates attention to intermodal facilities and systems, but many intermodal facilities will be owned and operated by the private sector. State DOTs and MPOs may be limited to setting the stage for actions and investments by others.

Where new access roads are required, motor carriers should ensure that they are engineered for trucks. This means ensuring that pavements will withstand frequent heavy container loads; intersections will accommodate large trucks; and geometrics will minimize accidents. State DOT and MPO planners should be encouraged to consider a full range of actions that might improve access including roadway improvements; traffic engineering and congestion management; regulatory changes; and modifications to port and terminal operations, such as receiving and dispatching of vehicles.

Evaluation

The benefits of improving intermodal access can be measured as increased throughput and travel-time savings to carriers and cost savings to shippers and receivers. Case studies of freight flows for specific shippers or receivers and their carriers are the most direct means of estimating the benefits of improved access to intermodal terminals. Carriers should work with state DOTs and MPOs to select a representative sample of truck trips and industries for analysis, including out-of-state freight flows.

State trucking associations and industry associations can help overcome concerns about releasing confidential business information by screening and merging sensitive data into profiles for "typical" trips and costs. Some shippers will have logistics cost models that can be run to determine if there are measurable benefits to their operations. Regional economic models usually are not sensitive to local or corridor-level transportation improvements, but could be used for projects that are expected to trigger major savings in travel time and cost for a large number of carriers and industries.

Designating and Maintaining Major Truck Routes

Government invests over \$70 billion each year in the nation's roads. The vast majority of projects involve repaving roads, rebuilding bridges, creating new interchanges, and extending or widening existing local roads. Decisions about which roads to improve and how much to invest in them are based on the state DOTs' and MPOs' understanding of the importance of the roads and the types of traffic they will be carrying. The cumulative effect of these decisions determines the overall capacity and performance

of the road system. Motor carriers have a long-term interest in seeing that major truck routes are identified and that projects on these routes are given priority and adequate funding.

Figure 9 shows where motor carriers, state DOTs, MPOs should focus their attention to ensure that major truck routes are designated and maintained to acceptable standards. The elements of the transportation system that should receive the most attention are designated as "high" priority; those that should receive moderate attention are designated as "moderate" priority; and those that can receive relatively less attention for this issue are designated as "low" priority. As with the other examples, these are general guidelines; specific situations may warrant different approaches.

Inventory

The first building block for a truck freight system programming and prioritization process is the identification of the mainline and access routes important to truck freight movements. Where are the important truck lanes for industries in the metropolitan areas and state?

State DOTs, MPOs, and motor carriers can approach the problem directly by mapping major truck routes and access roads against major freight generators and transfers points – key shippers, receivers, ports, intermodal rail terminals, airports, and distribution centers. Some states have already identified truck networks; a few states have divided these into industry-specific networks such as an agricultural highway network or a commercial highway network. All states and MPOs are now designating highways for the National Highway System, to be submitted to the Congress by the FHWA in December, 1993. The NHS designation process requires states to identify the network of roads that form the economic backbone of states and metropolitan areas, and requires explicit consideration of truck freight movements.

Both the NHS designations and the standard functional classifications of highways – interstate, principal or minor arterial, collector and local – take truck traffic into account either directly in terms of truck volumes or indirectly in terms of economic activity centers. However, state DOTs and MPOs typically have very incomplete data on truck volumes and patterns. Motor carriers should work with state DOT and MPO planners to carefully review the route designations and estimated truck volumes. Many agencies now have geographic information systems (GIS) software that can quickly generate truck route maps and overlay them with information on truck volumes and the location of major terminals (if the data are available). These maps are easier to understand than standard traffic volume tables; where available, information on traffic congestion from congestion management systems and information on pavement and bridge conditions from facilities maintenance management systems may be added.

Freight generators and transfer points include factories, distribution warehouses, mines and quarries, grain elevators, processing plants, refineries, ports, intermodal rail terminals, airports, and pipeline terminals. Most of these facilities are already mapped; state DOTs and MPOs must collate this information into a working inventory for intermodal freight management. Planners can obtain the information from sources such as land use maps, county business patterns reports, metropolitan and regional development plans, and economic development agencies. Major facilities should be pinpointed; warehouse districts can be treated as areas. State trucking associations and motor carriers can accelerate this work by identifying major terminals, shippers, receivers, and distribution districts.

The second building block for a truck freight system programming and prioritization process is the definition of standards and criteria governing the structural and operational characteristics of these roadways: Which roads should be maintained as high-speed intercity routes? Which as heavy-haul routes for local industry?

The key to making these decisions is to develop a picture of the industries using the roads, the commodities they ship, and the importance of the roads to their logistics strategies and competitive position. With the exception of a few specialized port agencies, however, state DOTs and MPOs have little knowledge of industry supply chains and distribution networks. Data on commodity flows are inadequate, especially at the metropolitan and state level, and few, if any, state and metropolitan agencies have the ability to model national or international commodity flows. This is especially true for out-of-state freight moves; once freight leaves the borders of a state, it is often invisible to the state DOT. As a result, state DOTs and MPOs may have little sense of the freight trip as a whole – its origin, modes of travel, routes, transfer points, destination, costs, reliability, and risks. Even less information is available on the value and time-sensitivity of commodities.

State DOTs, MPOs, and motor carriers can build a more sophisticated picture of freight patterns by pooling the knowledge of carriers, industry associations, local economic planners, chambers of commerce, and district highway engineers familiar with local truck traffic. The initial focus should be on industries that are key to the economic well-being of a state or region and that are especially sensitive to changes in the quality of truck freight service.

Needs/Forecasts

As truck freight routes, freight generators, and service levels are defined, state DOTs, MPOs, and motor carriers can screen the networks for problems and opportunities: Do major freight generators have access to the highway network? What routes do they use? How circuitous are they?

(A simple measure is to compare over-the-road and point-to-point distances.) Will the roadways and bridges accommodate the size and weight of trucks that the shippers and receivers need? Where will improvements cut costs for carriers and make local industries more cost competitive? A simple survey of motor carrier managers and dispatchers by state trucking associations can develop a first-cut of a truck network needs inventory.

These questions should be projected as far forward as possible: Which industries are expected to grow over the next decade? What will their logistics needs be? Will they require just-in-time truck services? Will they generate heavy loads? High-value shipments? A state may not have an economic development business plan that adequately translates broad economic development goals into a viable, comprehensive set of transportation improvements, but by asking the questions, motor carriers can encourage states and metropolitan areas to bring freight planning and economic development planning closer together.

Alternatives

State DOTs and MPOs generate their roadway investment programs by working with three elements:

- **Extent of the network.** The network can be very general, limited to major truck routes that serve general freight trips or it may be more detailed, defining industry-specific networks such as agricultural networks and industrial networks. Networks may identify only major corridors or include important local access roads.
- **Level of performance standards.** The standards can define the minimum pavement strengths, geometrics, bridge carrying capacity, and levels of service for general purpose truck routes; alternatively, standards may be tailored to the needs of specific industries and carriers.
- **Assignment of priority.** The state DOTs and MPOs can attach different priorities to projects on truck freight networks so that if five bridges come up for repair, the two bridges on major truck network routes will be given priority in funding and implementation. Priorities can also reflect seasonal factors where spring freeze-thaw conditions may create temporary, but important, restriction for some truck movements.

The state DOT and the MPOs are developing computerized systems that can map proposed pavement, bridge, and safety projects against truck network priorities. Motor carriers should encourage them to make this exercise an explicit part of their annual programming and prioritization procedures.

Evaluation

At this time, most state DOTs and MPOs lack sufficient truck trip data to model the comparative costs of different truck freight networks and investment levels. A quick assessment can be made by evaluating a sample of truck trips against alternative networks and performance standards: Do the networks provide comparable coverage of major businesses and industries? Are there significant differences in access, circuitry, reliability, cost, and safety? Some local industries may have logistics models that will analyze shipping costs and indicate the potential benefits. The state DOTs and MPOs can arrange to review network plans with motor carrier and economic advisory councils, industry associations, and local development groups.

* * * *

In summary, the trucking industry must take a leadership role in educating the planners and programmers on the nature of freight shipment patterns and the importance of intermodal connectivity in achieving an on-time, cost-effective freight delivery system. By playing an active role in shaping the planning process, as well as in building the new management systems, the trucking industry can ensure that freight will matter when it comes to making transportation investment decisions.

Related Environmental and Energy Legislation

The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) dramatically restructures this nation's transportation programs, placing increased emphasis on freight considerations, intermodal transportation facilities, and freight movements by commercial motor carriers. It is important, though, that ISTEA be viewed in the perspective of two other major pieces of national legislation that also contain important provisions affecting the motor carrier industry. These are the Clean Air Act of 1990 (CAA) and the National Energy Policy Act of 1992 (EPACT). In many ways, these three acts build upon one other, reinforcing and helping to implement key provisions.

Mobile sources are a prominent part of the Clean Air Act. Light and heavy duty trucks are of consideration because of higher per vehicle emission rates, especially emissions of Nitrogen Oxides from heavy duty diesel vehicles. While vehicle emission standards and cleaner fuels are expected to produce large reductions in motor vehicle emissions, there is concern that overall vehicle use is increasing at such a rate that the benefits of these "technology fixes" will be overtaken by the effects of growth within a period of 20 years. Consequently, the CAA also emphasizes the efficient "management" of transportation systems. In addition, transportation fuel utilization is a major contributor to global warming. Where fuel usage is projected to remain relatively stable in most sectors of the economy in coming years, transportation energy consumption is expected to increase.

With the ISTEA legislation being passed one year after the CAA, many ISTEA provisions were explicitly designed to re-enforce and help implement transportation provisions of the Clean Air Act. The Congestion Mitigation and Air Quality Improvement Program (CMAQ) is but one example.

The National Energy Policy Act of 1992 completes this triad of legislative initiatives having important implications for the motor carrier industry. Where the Clean Air Act emphasizes "clean" fuels for purposes of reducing emissions, EPACT emphasizes "alternative" fuels for purposes of improved energy security.

■ A.1 The Clean Air Act of 1990

The Clean Air Act of 1990 builds upon the 20-year history of clean air legislation in this country, and dramatically restructures the manner in which air pollution control decisions are made. Motor vehicle emission standards, including those for particulate matter, are strengthened for all categories of trucks, including heavy duty clean fueled vehicles. For 1998 and later model years, a NO_x standard of four grams per brake horsepower hour is defined for gasoline and diesel fueled heavy duty vehicles. The act contains numerous additional provisions having both general and specific interest to the motor carrier industry.

Non-attainment areas are classified by severity of non-attainment, with different attainment schedules for different levels of non-attainment. Five classifications for ozone and two categories of carbon monoxide non-attainment are defined, with attainment dates varying from three to twenty years depending on the severity of the problem. The CAA incorporates the use of performance standards throughout, with attainment schedules as well as an attainment deadlines being defined. For example, ozone non-attainment areas must demonstrate a 15 percent reduction in emissions by 1996, and an additional three percent per year reduction thereafter until attainment is achieved. In addition, an "offsets" provision exists which prevents motor vehicle emissions from growing from one year to the next. In other words, measures must be implemented within an urban area that will offset any increase in emissions that would otherwise result from the growth in travel. Employee commute option programs are required in severe and extreme ozone non-attainment areas for employers having more than 100 employees at any one worksite. These require a 25 percent increase in vehicle occupancy above the areawide average. This provision does not directly apply to trucks but could apply to trucking firms and related businesses.

Of most direct interest to motor carriers is the Clean Fueled Fleets Program defined by Section 246 of the Clean Air Act. This program applies to fleets

of 10 or more vehicles capable of being centrally fueled that are located in 21 urbanized areas throughout the country. These are areas that are greater than 250,000 in population, and determined to be in either serious, severe, or extreme violation of the ozone standard or to have a carbon monoxide design value of 16 ppm or above (compared to an attainment standard of nine ppm). Beginning in 1998, 30 percent of light duty vehicles and 50 percent of heavy duty vehicles (between 8,500 and 26,000 GVWR) that are purchased for these fleets must qualify as a clean fueled vehicle. The purchase requirement increases to 70 percent in the year 2000 for light duty vehicles, but remains at 50 percent for heavy duty vehicles. A clean fuel is defined as any fuel that meets EPA specified performance standards and will include methanol, ethanol, natural gas, propane, electricity, reformulated gasoline, and clean diesel fuels. For example, it is expected that diesel fuel in combination with an advanced technology engine and emissions control system would qualify as a clean fueled vehicle. For regulation and enforcement purposes, vehicle conversions are defined as being equivalent to purchase of a clean fueled vehicle.

There are two additional aspects of the CAA's Clean Fueled Fleet Program that are important to motor carriers. Fleet operators can receive emissions credits if (1) more than the required number of clean fueled vehicles are purchased, (2) vehicles are purchased (e.g., ultra low-emission vehicles (ULEV) and zero-emission vehicles (ZEV)) that meet more stringent emission standards than those established by EPA, or (3) otherwise exempted vehicles are replaced by clean fueled vehicles. Emission credits are weighted according to the degree of additional emission reduction and may be traded, sold, held, or banked. Clean fueled fleet vehicles also are exempt from certain temporally-based transportation control measures; for example, those that are based primarily on a time-of-day or day-of-week restriction.

■ A.2 The National Energy Policy Act of 1992

The National Energy Policy Act of 1992 also contains requirements for centrally fueled vehicle fleets. While these provisions are similar in concept to those in the Clean Air Act, they differ in three important ways: (1) the use of alternative fuels rather than clean fuels, (2) applicability to a different class of vehicle fleet, and (3) a more ambitious time schedule for implementation.

Given the energy security objectives of EPACT, the applicable fuels are limited to alternative non-petroleum fuels such as methanol, ethanol, natural gas, propane, and electricity. Reformulated gasoline and clean diesel are not included under the EPACT definition of alternative fuels. The objective is clearly defined as a conversion to alternative fuels rather than to clean emissions fuels.

Like the Clean Air Act, EPACT's centrally fueled vehicle fleet program is applicable to certain ozone and carbon monoxide non-attainment areas with populations of 250,000 or more. The applicable vehicle fleets in these areas, though, are those operated by the federal and state governments and by energy providers. Municipal and private fleets are not initially covered, but can be included under an opt-in provision by the Department of Energy if it is determined that certain vehicle purchase targets are not being achieved.

Only vehicles up to 8,500 GVWR are covered. Applicable fleets are those containing 50 or more vehicles nationwide, with 20 or more centrally garaged at any one location. As with the Clean Air Act, certain vehicles are exempt from EPACT, including emergency and law enforcement vehicles and rental vehicles.

The phase-in schedule for purchase of alternatively fueled vehicles varies by the type of entity covered. For the federal government, mandatory purchases begin in 1993. By 1996, at least 25 percent of applicable vehicles purchased by the federal government must be alternatively fueled, with this percentage rising to 75 percent by the 1999 fiscal year and continuing at that level thereafter.

For providers of alternative fuels, 30 percent of the vehicles purchased for their fleets must be alternatively fueled beginning in 1996. This purchase requirement increases to 90 percent by model year 1999. The phase-in for state fleets begins in 1996 with a 10 percent purchase requirement, rising annually to 75 percent by model year 2000.

For private and municipal fleets, EPACT establishes a schedule of purchase targets. This starts at 20 percent for the 1999 model year, and increases to 70 percent for model year 2006 and thereafter. If it is determined that these voluntary targets are not being achieved, the Secretary of Energy is authorized to implement purchase requirements that are similar in nature to those existing for other covered vehicle fleets.

The conversion to an alternative fuel will require important management decisions to be made by a fleet operator, beginning with the choice of alternative fuel to be used. Different fuels will be applicable for different vehicle performance requirements, and a vehicle operator may want to undertake a feasibility study to examine appropriate technical and cost considerations. Related important management considerations include financing, training, and the development of the necessary supporting infrastructure for service and refueling (or battery charging).

Metropolitan Planning Organizations

■ Metropolitan Planning Organizations (MPOs)

Background

Major decisions affecting the flow of both goods and people are being made by the country's more than 400 MPOs, which are responsible for long-range planning, setting shorter-term project priorities, and allocating regional funds for transit and highways. MPOs have significant power in determining how funds are allocated among the various modes, and which projects will be completed. Carrier participation in the MPO process is essential to the future movement of freight on the highways.

MPOs are designated planning organizations in areas with urban populations of at least 50,000 people. They represent local governments and transportation agencies in the metropolitan area. MPOs may have various names including Council of Governments, Planning Association, Planning Authority, Regional or Area Planning Council, or Regional or Area Planning Commission.

The governor of each state is responsible for designating MPOs in urbanized areas in cooperation with local representatives. In addition to the current population requirement, the MPO must include areas expected to become urbanized in a 20-year population forecast. Redesignation to

replace an existing MPO requires agreement between the governor and local officials representing 75 percent of the population, including the central city.

Each MPO has an executive board, often known as a Board of Directors, which is made up primarily of elected officials chosen by the member jurisdictions. This board is supported by a professional staff with expertise in various modes of transportation, and by formalized advisory committees composed of appointed citizens and representatives of special interest groups.

Generally, the decision-making process at an MPO is as follows:

- The MPO's Board directs its staff to develop or update its comprehensive regional transportation plan. This begins the planning process, which defines the issues and determines the direction of MPO policy.
- Committees are formed and community input is gathered; meetings are held.
- The MPO staff drafts a plan or report and makes recommendations.
- The Board holds hearings and votes on the recommendations.

ISTEA Responsibilities

MPOs are required to carry out a continuing, coordinated, and comprehensive transportation planning process. Under the ISTEA, they are responsible for developing two types of plans:

- **Transportation Improvement Program (TIP):** Each MPO must prepare a TIP which includes a three-year priority list of projects and a financial plan demonstrating how the program will be financed. The TIPs must be approved by the governor.
- **Long-Range Plan (LRP):** MPOs must prepare a financially constrained LRP to serve as basis for TIP project selection, based on factors specified in the legislation.

MPOs also must cooperate with the state in the state's development of the ISTEA's six management systems.

In areas where the urban population is greater than 200,000, MPOs are designated as Transportation Management Areas (TMAs). Like regular MPOs, TMAs are responsible for developing financially constrained LRPs. (i.e., only projects for which there is a reasonable expectation of available

financing may be included in the LRP). Unlike regular MPOs, TMAs have additional responsibilities which include:

- Coordinating a regional process to develop the TIP, which must include efforts to ensure compliance with clean air goals in nonattainment areas;
- Developing their own congestion management systems and collaborating in the implementation of other statewide management systems; and
- Performing project selection for the STP and CMAQ programs.

MPO Issues

Lack of Weight Given to Freight Transportation Concerns

MPOs traditionally have lacked understanding and concern for freight movements. The reason can be simply stated: "People vote, containers don't." In theory, all projects and modes should be treated equally, but in fact projects benefitting local communities and neighborhoods may carry more weight with decision makers than more industrially-oriented plans, despite those projects' significant long-term economic benefits.

Inconsistency of Project Eligibility Across MPOs

MPOs are making individual interpretations of project eligibility under the ISTEA. When essentially similar projects are proposed to two MPOs, one may be funded and the other ruled ineligible; this inconsistency creates frustration. Some even argue that the ISTEA was never meant to fund freight projects. For example, many MPOs are ruling that no federal funds may be spent on projects for building intermodal yards or improving trackage, despite acknowledgement that rails provide essential links between ports and highways. Concerns have been raised that by relying on the details of the ISTEA, which may prohibit funding for certain freight-related projects, the intent of ISTEA to support movement of goods via all modes will be subverted.

Boundaries

Establishing the boundaries of a planning area can be problematic. Every 10 years, after the population census, new urbanized areas (UZAs) are recognized. It is not necessarily true that there is an MPO created for every UZA. It is more common for one MPO to provide planning for multiple UZAs, but some UZAs have multiple MPOs. Special coordination is required when there are multiple MPOs within a single UZA, particularly

when the area crosses state lines so multiple governors and state Departments of Transportation get involved. Coordination and boundary drawing become particularly difficult with regard to air quality nonattainment areas, which tend to cross state, UZA, and MPO lines.

Membership

The ability of an organization to gain voting membership in an MPO is critical to its ability to secure funding for its projects in the new ISTEA environment. This is particularly true for the freight transportation community, which may already be facing an uphill fight in setting project priorities. The situation of port authorities illustrates the battle that freight interests must wage. Many ports want to be voting MPO members, and their view is supported by a variety of local legal opinions. However, many ports are excluded from MPOs by those who argue that the intent of their state's legislation establishing MPOs was to include only local government officials as members. The failure of ports to be represented on MPOs, despite their significant role in transportation, congestion, and air pollution, is a serious problem.

Resources and Planning Capacity

Under ISTEA, all MPOs are not created equal. The most clout, and the most dedicated planning and program resources, go to the larger MPOs (those with populations of over 200,000) and to small MPOs in air quality nonattainment areas. Strict compliance with the ISTEA's planning requirements is therefore more likely expected from the 123 MPOs serving populations of over 200,000. The smaller MPOs may be able to employ a simplified process which considers all of the required factors but at a lower level of detail and with less thorough analysis.

A key concern is the ability of MPOs to meet the requirements imposed upon them by the ISTEA. MPO experience with planning and forecasting for freight transportation was never substantial to begin with, and many MPOs have experienced a decline in their planning capacity and capabilities over the last decade. The ability of many MPOs to do the sophisticated transportation, clean air, and congestion modelling and analysis required by the ISTEA is in serious question. One manifestation of the squeeze on MPO capabilities is to slow down the process through which federal funds get appropriated. For example, the lack of appropriate technical staff to support ISTEA-related decision making contributed to over \$16 billion in fiscal 1992 contracts for road and bridge work not being let until two months into fiscal 1993.

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State DOTs: Background and Planning Contacts

■ State Departments of Transportation: Background

ISTEA Responsibilities

The changes imposed by the ISTEA affect all modes and all the key decision-making groups in a state DOT, including programming, planning, finance, construction, and operations. The breadth of the changes is forcing DOTs to change the way they do business, particularly with local governments. The agencies will require time and assistance from interested private parties to adapt and respond to this new environment.

Under the ISTEA, the overall responsibility for managing the major programs of ISTEA belongs to the state DOTs. Their responsibilities include:

- Establishing a statewide transportation planning process that considers the 20 factors specified in the legislation;
- Developing a multimodal, financially constrained long-range transportation plan in cooperation with MPOs;
- Preparing a STIP that is consistent with anticipated funding and the long-range plan;

- Developing and implementing the six management systems specified by the ISTEA; and
- Managing obligation authority for all ISTEA program funds (including the STP, CMAQ, NHS, Interstate System, and the Bridge Program) in the state.

State DOT Issues

Coping with Multiple Requirements in Developing a Planning Process

The ISTEA imposes a host of new planning obligations on the states, but it is not the only legislation affecting how state DOTs operate. They may also be coping with state legislation regulating congestion and growth management, for example, as well as compliance with the National Ambient Air Quality Standards, congestion and growth management. In addition, governments at all levels are suffering from budget squeezes, as the demands on resources outstrip the supply of available revenues. The planning process developed by states to meet the ISTEA's requirements must consider these other constraints.

Because many state DOTs have not previously engaged in a statewide planning process, the need to create a state transportation improvement program (STIP) is among the more important new requirements. No longer can a state simply replace a cancelled project with one that had been put on hold; now, the new project must be specified in the STIP.

Programming

Because ISTEA emphasizes programming, planning, and management, many state DOTs may need to overhaul their programming processes to adapt to the funding changes instituted by ISTEA. In states where programming is regulated by statute, new legislation may be required.

Programming processes under ISTEA must encourage:

- Funding flexibility;
- Interjurisdictional coordination;
- Consideration of land use, transit, and intermodal issues;
- Assessments of tradeoffs between different transportation alternatives, both within a mode and between modes;
- Explicit recognition of financial constraints;

- Conformance of state and local transportation improvement programs with the state implementation plan for meeting clean air standards;
- Effective use of the management systems mandated by ISTEA; and
- Coordination with MPOs.

By greatly enhancing the influence of MPOs, increasing local autonomy, and mandating interjurisdictional planning, the ISTEA creates a need for a new dynamic between the state and local levels of government. The ISTEA stipulates that the TIPs prepared by the MPOs must be coordinated with the STIP. Hence, the state DOTs must maintain an ongoing working relationship with all the MPOs in its jurisdiction. Because ISTEA provides limited guidance for this interaction, state DOTs and MPOs may wrestle for some time to establish the boundaries of their authority and the nature of their cooperation.

In negotiating with MPOs, the state DOTs will need to demonstrate the value of freight transport. Breaking with the previous attention to vehicle movements, ISTEA focuses on the movement of freight and passengers. Previously, MPOs have focused primarily on passenger movements. The state DOTs, which have always had responsibility for freight, must press the MPOs to broaden their scope.

Development of Management Systems

The ISTEA mandates that state DOTs must create a wide range of transportation management systems. The experience of the various state DOTs with these systems varies widely. While many agencies already have experience with pavement management and bridge management systems, the ISTEA requires DOTs to develop additional systems for safety, congestion, transit, and intermodal transportation. Many states have not yet resolved how they will implement these systems or how they will be integrated into the programming and budgeting processes. Building these systems and then using them effectively will be a significant challenge for DOTs over the next few years.

* * * *

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ISTEA Glossary

CAA: Clean Air Act Amendments of 1990. Legislation that identifies "mobile sources" (vehicles) as primary sources of pollution and calls for stringent new requirements in metropolitan areas and states where attainment of National Ambient Air Quality Standards (NAAQS) is or could be a problem.

CMAQ: Congestion Mitigation and Air Quality Improvement Program. A categorical funding program contained in Title I of ISTEA that provides funds for projects and activities to reduce congestion and improve air quality. To be eligible for CMAQ, projects and activities must contribute to achieving National Ambient Air Quality Standards and must be included in a Transportation Improvement Program (TIP).

CMS: Congestion Management Systems. Management plans, required by ISTEA for large metropolitan areas (200,000 population or more) and for states, that make new and existing transportation facilities more effective through the use of travel demand management and operational management strategies. The CMS requirement strengthens the link between the Clean Air Act Amendments and ISTEA.

COG: Council of Governments. One of several possible names for a Metropolitan Planning Organization.

DOT: Department of Transportation. A federal or state agency responsible for transportation policies, projects, and facilities.

FHWA: Federal Highway Administration. The agency of U.S. DOT with jurisdiction over highways.

HOV: High-Occupancy Vehicle. A vehicle carrying sufficient passengers to meet high occupancy requirements, typically 2 or 3 persons for a passenger car. Some roads have specially designated lanes reserved exclusively for HOVs.

IMS: Intermodal Management System. One of six management systems required of the states by ISTEA.

ISTEA: Intermodal Surface Transportation Efficiency Act of 1991. A major piece of federal transportation legislation that implements broad changes in the way transportation decisions are made. ISTEA emphasizes a diversity and balance of modes and the preservation of existing systems over the construction of new facilities, especially for roads. It proposes a series of social, environmental, and energy factors that must be considered in transportation planning, programming, and project selection. Signed into law on December 18, 1991.

IVHS: Intelligent Vehicle-Highway System. A generic term for the advanced technology applications that automate highway and vehicle systems to enable the more efficient and safer use of existing highways.

LRP: Long-Range Plan. A 20-year forecast plan, now required at both the metropolitan and state levels, that must consider a wide range of social, environmental, energy, and economic factors in determining overall regional goals and how transportation can best meet these goals.

MPO: Metropolitan Planning Organization. The agency designated by the governor (or governors in multi-state areas) to administer the federally required transportation planning process in a metropolitan area. An MPO must be in place in every urbanized area with a population of over 50,000. The MPO is responsible for the 20-year long-range plan and the Transportation Improvement Program. The official name for an MPO may also be Council of Governments, Planning Association, Planning Authority, Regional or Area Planning Council, or Regional or Area Planning Commission. ISTEA provides procedures under which local governments and governor(s) may designate or redesignate an MPO.

NAAQS: National Ambient Air Quality Standards. Limits defined by the Environmental Protection Agency for six air pollutants – carbon monoxide, ozone, particulate matter, lead, sulfur dioxide, and nitrous oxide – intended to reduce their threat to health.

NHS: National Highway System. A highway system to be designated by Congress in 1995. It will contain all interstate routes, a large percentage of urban and rural principal arterials, and strategic highways and connectors. ISTEA funding will be available for NHS.

Nonattainment Area: An area that does not meet NAAQS.

SIP: State Implementation Plan. A plan for achieving compliance with the National Ambient Air Quality Standards (NAAQS).

SOV: Single-Occupancy Vehicle. A car containing only its driver.

STIP: Statewide Transportation Improvement Program. A three-year transportation investment strategy, required at the state level, that addresses the goals of the state long-range plan and lists priority projects and activities throughout the state.

STP: Surface Transportation Program. One of the key capital programs in Title I of ISTEA. It provides flexibility in expenditure of "road" funds for the pedestrian, bicycle, and transit modes and for a category of activities known as transportation enhancements, which includes pedestrian and bicycle facilities and improvements to community and environmental quality.

TIP: Transportation Improvement Program. A three-year transportation investment strategy, required at the metropolitan level, and a two-year program at the state level, that addresses the goals on the long-range plans and lists priority projects and activities for the region. (At the state level, the TIP is also known as a STIP.)

TMA: Transportation Management Area. A region whose MPO has enhanced authority in selecting local transportation projects. Any urban area with a population over 200,000 is automatically a Transportation Management Area. Additional areas may be designated TMAs if the governor and the MPO or affected local officials request designation. Designation as TMA entitles the area to funds reserved for large urbanized areas under the Surface Transportation Program, but also obligates it to prepare Congestion Management System.

UZA: Urbanized Area is a Census classification for areas having populations of 50,000 or more and that meet certain population density requirements. The 1990 Census identified 35 UZAs that newly qualified to be designated MPOs.