

December 2003

**FREIGHT
TRANSPORTATION**

**Strategies Needed to
Address Planning and
Financing Limitations**



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Highlights

Highlights of [GAO-04-165](#), a report to the Committee on Environment and Public Works, U.S. Senate

Why GAO Did This Study

The strong productivity gains in the U.S. economy have hinged in part on transportation networks working more efficiently. The nation's ports, which handle 95 percent of overseas freight tonnage, are a key link in this network, and efficient intermodal links between ship, rail, and highways are vital to continued productivity gains. GAO was asked to address (1) the challenges to freight mobility, (2) the limitations key stakeholders have encountered in addressing these challenges, and (3) strategies that may aid decision makers in enhancing freight mobility. GAO's work was based on a synthesis of previous studies and a review of conditions at 10 ports and surrounding areas that handle almost two-thirds of all containers moving in and out of the country.

What GAO Recommends

GAO recommends that the Secretary of Transportation take steps to facilitate state and local planners' use of better methods and tools to make freight transportation investment decisions. These methods and tools include better freight-related data, consistent and sound evaluation approaches, and greater consideration of alternatives to capital construction. The Department of Transportation reviewed the draft of this report and generally agreed with the facts presented, but did not take a formal position on the recommendations.

www.gao.gov/cgi-bin/getrpt?GAO-04-165.

To view the full product, including the scope and methodology, click on the link above. For more information, contact JayEtta Hecker at (202) 512-2834 or heckerj@gao.gov.

FREIGHT TRANSPORTATION

Strategies Needed to Address Planning and Financing Limitations

What GAO Found

The major challenges to freight mobility share a common theme—congestion. National studies point to such problems as overcrowded highways and freight-specific “chokepoints” that stifle effective intermodal transfer of cargoes. All 10 ports GAO studied faced similar congestion-related problems. For example, many of the ports are in dense urban areas, limiting the ability to expand rail yards, roadways, and other infrastructure. Increased port security measures may exacerbate congestion if new controls drastically slow the movement of goods.

Stakeholders encounter two main limitations in addressing freight mobility challenges. The first relates to the limited visibility that freight projects receive in the process for planning and prioritizing how transportation dollars should be spent. The planning process often lacks a comprehensive evaluation approach, such as a cost-benefit framework that might result in the implementation of freight improvements to better ensure that system-wide, multimodal solutions are considered and adopted where appropriate. The second relates to limitations of federal funding programs, which tend to dedicate funds to a single mode of transportation or a nonfreight purpose.

Two strategies may help address these limitations. One is to ensure that transportation planning cuts across modes and individual jurisdictions, includes coordination with freight stakeholders representing an intermodal perspective, and includes sound analytical approaches and meaningful data needed to compare the benefits of freight and passenger projects. The second is to develop a multifaceted funding approach that includes improved access of freight projects to existing funding sources and support for programs that emphasize better use of existing infrastructure. If integrated in these strategies, three principles could better assure that the freight infrastructure system provides the level of capacity and performance that makes the greatest contribution to the nation's economic well-being. These principles include promoting efficiency by embracing a “user pay” approach, establishing performance measures, and aligning incentives for planning agencies to adopt best practices.

Truck Congestion near the Port of New York/New Jersey



Source: Port Authority of New York and New Jersey.

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Abbreviations

CMAQ	Congestion Mitigation and Air Quality
CMS	Congestion Management System
DOT	Department of Transportation
FAF	Freight Analysis Framework
FAIR	Fast and Intertwined Regular Lanes
FAST	Freight Action Strategy
FHWA	Federal Highway Administration
FMSIB	Freight Mobility Strategic Investment Board
HOT	high-occupancy toll
HOV	high-occupancy vehicle
ISTEA	Intermodal Surface Transportation Equity Act
ITS	Intelligent Transportation System
MPO	metropolitan planning organization
NHS	National Highway System
RRIF	Rail Revitalization and Improvement Funding
STP	Surface Transportation Program
TEA-21	Transportation Equity Act for the 21 st Century
TIFIA	Transportation Infrastructure Finance and Innovation Act
TRB	Transportation Research Board

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United States General Accounting Office
Washington, D.C. 20548

December 19, 2003

The Honorable James M. Inhofe
Chairman
The Honorable James M. Jeffords
Ranking Minority Member
Committee on Environment and Public Works
United States Senate

Globalization has had a dramatic effect on the U.S. economy, resulting in a greater reliance on international trade and the efficient movement of goods within the United States. Continued development and efficient management of the vast transportation system of highways and rail lines that connect seaports, airports, and intermodal facilities are all important factors contributing to the nation's economic growth and productivity. Because more than 95 percent of our nation's overseas trade tonnage moves by water, container ports are key gateways for our nation's imports and exports and, therefore, play a particularly critical role in moving goods into and across the country. Increasing congestion at these seaports and the surrounding metropolitan areas is a growing national concern and represents a threat to the efficient flow of the nation's goods.

Planning and funding of projects to improve the efficiency of freight movement in the transportation system are becoming increasingly important. At the federal level, the Intermodal Surface Transportation Efficiency Act of 1991 and its successor legislation, the Transportation Equity Act for the 21st Century, establish much of the structure of federal assistance for surface transportation projects. Under this structure, planning and funding of federally assisted projects is carried out primarily by local metropolitan planning organizations and by state departments of transportation. Reauthorization of this legislation—an issue currently before Congress—presents an opportunity to reexamine ways to enhance planning and financing activities that improve freight movement at the local level and to consider whether adjustments should be made in current policies and programs.

This report responds to your request to provide information on issues related to moving freight through the nation's largest container ports and surrounding metropolitan areas and federal efforts to assist and enhance freight mobility efforts at these locations. As agreed with your offices, we identified (1) the national challenges to freight mobility and how these challenges were evident at selected container ports and surrounding

metropolitan areas, (2) the existing limitations to effectively addressing these challenges, and (3) strategies that may help public decision makers improve freight mobility, including a discussion of relevant provisions of selected proposals related to reauthorization of federal surface transportation programs.

To identify the challenges to freight mobility, the limitations to advancing freight improvements, and strategies to enhance freight mobility, we conducted an evaluation synthesis of public- and private-sector reports, studies, and proposals related to freight movement issues. To determine whether these challenges and limitations were evident at the nation's largest container ports and surrounding metropolitan areas, we conducted site visits and interviews of a wide range of public and private transportation officials in six metropolitan areas that collectively contain 10 ports that handle two-thirds of the containers moving in and out of the country each year.¹ To identify strategies that may aid decision makers in enhancing freight mobility, we analyzed the results of our review of the challenges and limitations and built on the perspectives gained from our past work in transportation and infrastructure systems and federal investment strategies.² We assessed various reauthorization proposals developed by key stakeholders, including the administration, within the context of these strategies. (See app. I for more information on the scope and methodology.) We conducted our work from October 2002 to November 2003 in accordance with generally accepted government auditing standards.

Results in Brief

Freight mobility is most affected by congestion-related challenges. Freight traffic on roadways has increased fourfold over the last two decades, and both rail and highway congestion are particularly severe in urban areas

¹The six metropolitan areas are Charleston, SC; Seattle/Tacoma, WA; Los Angeles/Long Beach, CA; San Francisco/Oakland, CA; Houston, TX; and New Jersey/New York. Except for Charleston and Houston, each of the areas has two ports. The percentage is based on the number of 20-foot equivalent container units (TEUs), a standard measurement of container volume.

²U.S. General Accounting Office, *Surface and Maritime Transportation: Developing Strategies for Enhancing Mobility: A National Challenge*, GAO-02-775 (Washington, D.C.: Aug. 30, 2002); U.S. General Accounting Office, *Marine Transportation: Federal Financing and a Framework for Infrastructure Investments*, GAO-02-1033 (Washington, D.C.: Sept. 9, 2002); and U.S. General Accounting Office, *U.S. Infrastructure: Agencies' Approaches to Developing Investment Estimates Vary*, GAO-01-835 (Washington, D.C.: July 20, 2001).

where container ports for international trade are located. Such congestion was evident at all six locations we visited. In Oakland, for example, truck traffic on key access highways to the port increased by 50 to 100 percent from 1996 to 2000. Congestion on rail lines is also an issue. In the Los Angeles area, two mainline freight railroads are already experiencing 30-minute delays per train; freight traffic is projected to more than double along these rail lines by 2025. Severe congestion also regularly occurs at freight-specific “chokepoints” or bottlenecks, which exist at entrances to port facilities, at-grade rail crossings where highways and rail lines intersect, and roads connecting interstate highways and rail lines to ports and intermodal facilities.³ The area around the Port of Seattle located in the heart of the downtown area, for example, has considerable congestion due to at-grade rail crossings, which slow freight trains and trucks moving in and out of the port. Old and inadequate infrastructure in and around gateway seaports—such as underpasses, tunnels, and bridges with insufficient clearance—is another source of congestion. The ability to expand or improve this infrastructure is often limited by geography or by surrounding development. For example, about 90 percent of the freight moved through the Port of New York/New Jersey is carried by truck. Dense commercial and residential development adjacent to key routes in the area limits highway expansion in most areas and makes upgrades to tunnels and overpasses very expensive. Moreover, existing rail lines in the area have high-density usage due to heavy use by freight, commuter, and intercity passenger trains. Another potential source of congestion—which has not yet materialized—centers on tighter security measures being adopted in and around gateway seaports. The impact of future security measures, such as stricter container inspections and port access controls, could have a major impact on the efficient flow of goods at seaports and surrounding metropolitan areas, depending how such measures are applied and implemented.

The fundamental limitation to overcoming freight mobility challenges is that the public-sector process at the state and local levels for planning and financing transportation improvements is not well suited to address freight projects. On the planning side, consideration of freight improvement projects as part of the local planning process is limited because the process is oriented to projects that clearly produce public benefits, such as

³For the purposes of this report, intermodal freight transportation refers to the transport of goods in containers that can be moved on land by rail or truck and on water by ship or barge.

passenger-oriented projects. While freight projects also may produce public benefits by reducing freight congestion, generally, public planners are wary of providing public support for projects that directly benefit the private sector. In addition, the planning process often does not consider the regional nature of freight mobility and is subject to long lead times to plan and implement projects, a factor which deters valuable private sector participation in the process. These limitations were evident at the locations we visited. For example, planning officials in Southern California indicated that improvements to a key freight interstate route from the ports of Los Angeles and Long Beach clearly would have benefits that extend beyond the jurisdiction of the planning body. Instead of funding this type of freight improvement, however, planning bodies tend to allocate funding to nonfreight projects, which clearly benefit the local constituents. In New York, state officials said that the long planning horizons associated with the public planning process and the perception by the freight industry that it was not benefiting from the process have limited participation by the freight sector. In addition, freight projects are disadvantaged in the planning process because many local planning bodies have not applied rigorous evaluation approaches, such as a cost-benefit framework, or do not have good data to evaluate freight projects relative to other projects and to better ensure that multimodal solutions to enhance freight mobility are considered. Financing limitations pose another difficulty in advancing freight improvements. Freight projects can often have difficulty securing public funding because they may generate substantial private-sector benefits and are intermodal in nature, while funding sources often restrict access to private firms and focus on a single mode. For example, gaining access to funding sources—even those federal programs specifically targeted for freight projects, such as the National Corridor Planning and Development Program and the Coordinated Border Infrastructure Program—has been limited because, according to the Federal Highway Administration (FHWA), these programs are oversubscribed and much of the funding for these programs has been allocated to congressionally designated projects. Also, because of private ownership and other issues, certain freight projects, most notably rail projects, are especially difficult to fund through federal programs because of restrictions in using public funds for infrastructure that is privately owned.

Based on our past work and the work of transportation experts, we have identified two key strategies that we believe are needed to effectively address the freight planning and financing limitations. The first strategy involves promoting a more systemwide perspective in planning transportation projects. Such a perspective involves several facets in

planning projects. For one, our case studies have demonstrated that successful intermodal projects—such as the Freight Action Strategy (FAST Corridor) project in Washington state⁴—are those that are coordinated across various transportation modes and planning jurisdictions and include close coordination among multiple sets of stakeholders. Also, active participation by the private sector in partnership with the public sector often helps to ensure a successful outcome. The private sector often can bring a more global view of freight needs to the planning process, can help identify and implement projects, and can provide new data for making more informed decisions. An integral part of this strategy is also ensuring that sound analytical approaches are being applied locally and meaningful data are available, not only to evaluate and prioritize infrastructure investments but also to determine whether public support is justified by considering a wider array of social and economic costs and benefits. The second strategy involves determining the appropriate federal role and providing a wider range of financing and related options to enhance freight mobility. Expanding the eligibility criteria for existing programs to cover a broader range of freight projects is one way to accomplish this. For example, one of the administration’s current proposals is to expand the eligibility of one relevant program to include public or private freight rail facilities and intermodal freight transfer facilities. Another way could involve expanded support for alternative financing mechanisms, such as federal loan programs, and new sources of revenue, such as truck toll lanes, to appropriately blend public and private funds to match public and private costs and benefits. Finally, promoting low cost alternatives to expand capacity through the more efficient use of existing transportation infrastructure may be a way to address congestion with limited funds. These alternatives include a diverse mix of measures, including corrective and preventive maintenance, operations and systems management, and new technology. The administration and freight stakeholders have developed a variety of reauthorization proposals to broaden eligibility criteria, expand alternative funding, and promote low cost alternatives that, taken together, could represent key components of the two strategies we identified. While one aspect of the administration’s reauthorization proposal encourages coordination and cooperation of planning agencies across jurisdictional boundaries and various transportation modes, more fundamental, bolder steps to change the way projects are planned and

⁴Through various partnerships, the FAST Corridor is a project that has identified solutions to problems where transportation systems meet along the freight corridor between Everett and Tacoma.

financed may be necessary to overcome widely recognized limitations with the process. Some transportation experts contend that more far-reaching solutions, such as establishing a federally administered program to identify and fund freight projects having national significance, are needed to overcome local disincentives currently impeding such cooperation.

We are making specific recommendations to the Secretary of Transportation to facilitate the use by state and local planners of better methods to make freight-related and other transportation investment decisions. These methods include increasing efforts to collect and maintain more complete and useful freight-related data and using consistent and sound analytical methods and evaluation approaches. The Department of Transportation reviewed a draft of this report, provided technical comments, and generally agreed with the facts presented in this report. We made changes, as appropriate, to ensure the accuracy of our report. The department did not take a formal position on GAO's recommendations.

Background

The economic significance of gateway ports is related both to consumer demand for imported products, which has fueled the United States' increasing dependence on international trade, and to significant shifts in business and logistics trends. Businesses, to remain globally competitive, have reduced costs by moving production facilities overseas and by developing improved practices that highlight reliability, efficiency, and quality of service. For example, more companies are practicing multinational production, which involves manufacturing or assembling goods or components overseas and importing them into the United States. Also, the time-dependent manufacturing practice, which minimizes inventories to reduce warehousing costs, has resulted in the need for smaller, more frequent shipments of goods.

Effective implementation of these new business practices is dependent on an integrated, intermodal transportation system to provide efficient and reliable freight movement. Within the ports, quick movement of imports and exports relies on ready transfer between ships and other transportation modes, particularly highway and rail. Outside the ports themselves, freight shares the transportation system with passenger traffic. However, the transportation system also includes some infrastructure that is more freight-specific, such as rail yards, intermodal connectors, and some exclusive rail rights-of-way that allow trains to move quickly without contributing to congestion.

Freight infrastructure projects are essentially a joint enterprise of both the private and public sectors and are typically intermodal in nature. Virtually all freight transportation carriers are private companies and conduct most of the actual transportation of cargo. Private sector players include shipping lines, terminal operators, trucking companies, railroads, airlines, and pipeline companies that often compete with each other for shipping business. These entities typically make key routing, operating, and equipment investment decisions. The public sector provides infrastructure such as highways, waterside and upland port/intermodal facilities, harbor development, channels, navigation aids, and locks and dams on inland waterways. For the most part, the supporting transportation infrastructure for freight transportation is publicly owned, with the exception of rail infrastructure.

The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) and its successor legislation, the Transportation Equity Act for the 21st Century (TEA-21), established federal funding and financing programs for surface transportation projects. Federal support for freight transportation infrastructure projects mainly occurs through the federal surface transportation programs, which include a number of programs targeted for specific modes and purposes. Other programs have been established at the federal level to build, maintain, and operate inland waterways and enhance and maintain harbors.

Revenues collected and disbursed through the surface transportation program are derived mainly from user tax receipts credited to the Highway Account of the Highway Trust Fund. The user taxes include excise taxes on motor fuels (gasoline, gasohol, diesel, and special fuels) and truck-related taxes on truck tires and sales of trucks and trailers. FHWA distributes highway program funds to the states through annual apportionments according to statutory formulas that consider a variety of factors, including vehicle miles traveled on the interstate system and motor fuel usage by each state's highway users. The federal share for project funding is usually 80 percent but can vary among programs, road types, and states. State and local governments then match federal funds from other sources, such as state and local revenues.

States have primary responsibility for selecting projects and for building and maintaining roads. Innovations in ISTEA and TEA-21 allowed states more flexibility to use federal funds for freight projects, established public-private partnerships, and allowed the expenditure of federal aid on nonhighway freight projects in certain circumstances. For example, with

the passage of ISTEA, it was possible through the Congestion Mitigation and Air Quality program (CMAQ) for states to fund intermodal freight projects that included improvements to rail lines and port facilities. With the passage of TEA-21, public-private partnerships were made possible through programs like the Transportation Infrastructure Finance and Innovation Act (TIFIA), a loan and loan guarantee program. However, because surface transportation infrastructure is mainly funded through highway user fees and is based on a user-pays principle, revenues generated from these fees generally are targeted for highway or transit projects.⁵

Challenges to Freight Mobility Center on Congestion

Congestion-related challenges are among the dominant constraints for freight mobility. Congestion on our nation's highways and at intermodal connectors to rail lines, terminals, and port facilities threaten the efficiency and reliability of the freight transportation system, both locally and nationally. Locally, the most acute impacts of congestion are traffic slowdowns, noise, and air pollution, which threaten freight and passenger mobility alike. Just as significant is the impact that an inefficient, congested transportation system has on the national economy and on international trade. For example, the ports of Los Angeles, Long Beach, and Oakland together account for over 40 percent of the container traffic coming into and going out of the United States; over half of the cargo coming into those three ports is destined for locations throughout the nation, including New York City and Atlanta.⁶

Several major sources of congestion can impede efficient freight flow. (See fig. 1.) One is the current high level of traffic on roadways and rail lines, which is particularly severe in metropolitan centers near gateway ports for international trade, and which shows no signs of abating. Moreover, freight-specific chokepoints exist at rail crossings and roads connecting intermodal terminals, seaports, and airports. In urban areas, limited expansion potential and infrastructure deficiencies, such as poorly

⁵A portion of highway user revenues is dedicated to mass transit.

⁶According to information provided by the Port of Los Angeles, slowdown of this cargo in the Los Angeles area can have an economic ripple effect for the nation as a whole. For example, the Los Angeles Economic Development Corporation released estimates as part of a study, placing the total trade disruption cost at \$6.28 billion. However, the Bureau of Transportation Statistics notes that costs of the shutdown have ranged from \$1.67 billion to \$19.4 billion, depending on the provider of the estimate.

designed access roads and insufficient rail and roadway clearances for bridges and tunnels, further contribute to congestion and impede the efficient flow of goods. Tighter security measures being adopted in and around large gateway seaports may also directly impact the efficient flow of goods. While security measures adopted thus far have not apparently disrupted the efficient flow of goods to and from seaports, the impact of future security measures on goods movement, such as stricter container inspections and tighter access controls to port facilities, is largely unknown and is a growing concern of freight industry stakeholders.

Figure 1: Congestion-related Challenges Are the Dominant Constraint to Freight Mobility



Source: GAO.

Current Levels of Congestion Are Already Significant and Will Likely Grow with Increasing Traffic Volumes

One major challenge to freight mobility is the existing high demand on the transportation infrastructure, which is increasing in large urban areas near international gateway ports. Overall, highway congestion for passenger and commercial vehicles traveling during peak driving periods doubled from 1982 through 2000. Freight traffic is adding to this congestion at a faster rate than passenger traffic. For example, from 1993 through 2001, truck traffic on urban highways increased more than twice as much as passenger traffic.⁷ This is particularly relevant for freight mobility, since trucks carried over 70 percent of all tonnage and must share the highways with other road users. (See fig. 2.)

Figure 2: Trucks and Cars on Congested I-710 near the Ports of Los Angeles and Long Beach



Source: Port of Long Beach, CA.

⁷Trucks include both single unit trucks (six tires or more) and combination trucks (trailers and semitrailers).

As a group, the six regions we studied had varying degrees of highway congestion. According to a study by the Texas Transportation Institute, driver delay times⁸ for the locations we visited ranged from 26 hours per year in Charleston, South Carolina, to nearly 140 hours per year in Los Angeles—the latter representing more than twice the average of 62 hours for the locations included in the study.⁹ Officials in the large gateway ports we visited cited numerous examples of how congestion affects the movement of freight in and around the ports and surrounding urban areas. (See fig. 3.)

⁸Delay times for passenger and freight are measured in average annual peak-person hours of delay. Annual person-hours of delay is equal to daily vehicle hours of incident plus recurring delay times 250 working days per year times 1.25 persons per vehicle.

⁹Texas Transportation Institute, *The 2002 Urban Mobility Study*, <http://mobility.tamu.edu>, Texas A&M University (June 2003).

Figure 3: Examples of Freight-related Congestion at Six Large Gateway Ports and the Surrounding Areas

Congestion at gateway ports and their surrounding areas

- Officials at the **Ports of Los Angeles and Long Beach** cited heavy congestion on major freeways as a primary challenge to the region's transportation system. Two interstate highways are major freight connectors to the Ports of Los Angeles and Long Beach and represent particularly congested routes. Long backups of trucks accessing these routes are common during peak travel periods. Officials estimate that truck traffic on these two freeways accounts for about 30 to 60 percent of the total traffic on these routes.
- In **New York**, a main freight connector for port traffic is a major source of congestion. State officials said that trucks make up 21 to 36 percent of the vehicles traversing this connector, and several interchanges along this route represent serious freight bottlenecks in the region.
- Port officials at the **Port of Oakland** cited growth rates of nearly 50 percent to more than 100 percent in truck traffic on key interstate highways between 1996 and 2000. Two highly traveled interstate highways are among the most congested roads in the Bay Area, especially during the morning and afternoon commuting periods. Port officials estimate that half of all trucks calling on the Port of Oakland travel these two congested routes.
- Officials at the **Port of Houston** cited a significant bottleneck at the exit ramp to a major intermodal terminal, where trucks seeking access to the terminal back up onto the highway especially during the morning peak traffic.
- The two major high-use highway corridors used by trucks in the region around the **Ports of Seattle and Tacoma** intersect in Seattle and give truck access to the Ports of Seattle and Tacoma. Between 1994 and 2002, truck traffic along the northbound corridor increased 77 percent; southbound truck traffic increased by 94 percent. For the same period, truck traffic along the eastbound corridor increased 75 percent, and westbound truck traffic increased 53 percent.
- **Charleston** officials cited passenger and truck traffic congestion on the port's two main access roads as the most visible challenge for freight mobility in the region. Traffic analysis performed in 2000 showed that these two roads had the highest traffic volume in the region. Both roads experience peak period congestion and have significant levels of port and nonport-related freight traffic.

Source: Information collected by GAO from metropolitan planning organizations, state departments of transportation, and port authorities.

While congestion affects roads, it was also present on other transport modes. In Southern California, for example, rail freight operations move along the main lines of two railroads; parts of these tracks are shared by both commuter and intercity passenger rail. Currently, freight trains are experiencing daily delays on the lines averaging about 30 minutes per train. In 2000, these lines handled up to 59 freight trains per day. Unless more tracks are added and key at-grade rail crossings are eliminated, the average delay per train will likely escalate because the number of freight trains is projected to increase to as many as 130 per day by 2025.

Specific Intermodal Chokepoints Exacerbate Congestion as Traffic Volumes Increase

While the freight industry shares many congestion problems with other users of the transportation system, some sources of congestion have a more severe impact on freight mobility. In large urban gateway areas, severe freight congestion regularly occurs at roads connecting main highway and port landside facilities¹⁰ and where rail lines and highways intersect. These bottlenecks or chokepoints are an important indicator of those locations where the transportation system has reached capacity.

Chokepoints on highway intermodal connectors and access roads are a major source of congestion and concern among freight stakeholders. Examples of such connectors include exit ramps from major highways, as well as local access roads that link highways to the port facilities and intermodal yards. Although these connectors represent less than 1 percent of total National Highway System¹¹ (NHS) mileage, they provide critical connectivity between highways and primary roadways, rail yards, airports, and seaports. According to FHWA officials, investment to improve intermodal connectors is expected to be a key component in reducing freight chokepoints.¹² Because these connectors were not originally designed to handle large volumes of freight traffic, they typically have higher rates of deterioration than other roads and highways. Further, the size of current equipment (e.g., trucks and trailers) has often surpassed what the connectors were designed to handle, with the result that roadways are too narrow, turning radii are tight, and turning lanes are lacking. (See fig 4.) All of these factors slow freight movement and cause

¹⁰These are port facilities located on land, such as terminals including warehouses, storage facilities, and intermodal connectors.

¹¹The NHS is approximately 160,000 miles of roadway including the Interstate Highway System, as well as other roads important to the nation's economy, defense, and mobility. The Department of Transportation (DOT), in cooperation with the states, local officials, and metropolitan planning organizations developed the NHS.

¹²U.S. Department of Transportation, Federal Highway Administration, *The Role of the National Highway System Connectors: Industry Context and Issues* (Washington, D.C.: February 1999).

safety and operational problems along these connectors. Improving the condition of many of these connectors is not being addressed by local transportation departments because other passenger-oriented roadways often have a higher priority.¹³

Another major chokepoint for freight mobility often occurs where the railroads meet highways. At-grade rail crossings, where rail lines intersect with roadways, can be especially problematic. (See fig. 6.) At-grade crossings have a double effect on both trucks and trains. At these locations, automobiles and trucks must often stop to allow a train to pass, but trains must often slow down as well.

¹³U.S. Department of Transportation, *NHS Intermodal Freight Connectors: A Report to Congress* (Washington, D.C.: July 2000).

**Figure 4: Connector to the Elizabeth New Jersey Port Authority Marine Terminal:
Intersection of North Fleet Street and Corbin Street**



Source: Port Authority of New York and New Jersey.

Officials at some of the locations we visited view at-grade rail crossings as a serious freight transportation problem and are putting forth considerable effort and resources to develop solutions. For example, around the ports of Seattle, Tacoma, and Everett, officials have targeted the elimination of key at-grade crossings as part of a large project to address freight mobility needs in the area. (See fig. 5.) Phase 1 of this project is implementing a total of 15 infrastructure improvements, 11 of which are rail/highway separations.

Figure 5: At-Grade Rail Crossing Near Ports of Seattle/Tacoma—before and after Construction of Overpass



Source: Puget Sound Regional Council, Fast Corridor project.

Other rail challenges identified at the gateway container ports we visited include a lack of alternative train routes to prevent train blockages on major roadways, substandard crossing warning devices, and the need for rail upgrades to handle heavier cars. For example, in some locations the rail industry has increased the load capacity of rail cars from 263,000 to 286,000 pounds on main rail lines. Officials in Charleston said that this has affected their dockside short rail—requiring upgrades so they can withstand the heavier cars.

Much Inadequate Infrastructure Has Limited Expansion Potential

Infrastructure that is old and inadequate—such as underpasses or tunnels with insufficient clearance—often carries limited expansion potential; thus, mitigating this source of congestion and enhancing the efficiency of goods movement by accommodating newer, longer, and heavier freight configurations becomes more difficult. According to the Transportation Research Board (TRB) and FHWA, insufficient and aged infrastructure is a major contributor to freight congestion and bottlenecks on U.S. freeways and highways and on the connectors to area ports. Even when expansion is possible, the growing costs of infrastructure projects, stagnant highway spending, and long delivery times (5 to 15 years) for completing infrastructure projects have slowed the development of infrastructure and prevented it from keeping up with demand.

Officials at the metropolitan area ports we visited pointed to many examples where there are few alternatives for expansion due to geographical constraints or surrounding development. (See fig. 6.) Port and rail terminals are often located in densely populated urban areas, where space is already at a premium and where commercial developers are competing for available space. Additional space for piers, container

storage, railroad tracks, and truck roads is being pursued and developed, but slowly and at a high cost.

Figure 6: Examples of Infrastructure with Limited Expansion Potential

Examples at selected locations

- The **Port of New York and New Jersey**, which is one of the largest international gateway ports, is located in a densely populated area where there is little land for the development of additional port facilities. Currently, approximately 90 percent of freight moved through the port is by truck. The port is examining opportunities to increase rail intermodal traffic (through upgrades and improvements to rail lines, tunnels, and bridges) to slow the growth of truck traffic. However, rail or highway expansion is limited because most of the adjacent land is already developed or occupied by other infrastructure. Further, existing rail lines in the area experience high-density operations, due to factors such as prior downsizing of the rail infrastructure and shared use with passenger operations.
- **Oakland** faces similar physical limitations to expansion. Eight of the 10 most congested freeways in the Bay Area are located near Oakland. One corridor, which already is eight lanes wide, is one of the main highways for commuter and freight traffic; it passes through a heavily developed area, and further widening would be very expensive and difficult. Port officials estimate that half of all trucks calling on the Port of Oakland travel this route north to another route. This section experienced a 51 percent increase in daily truck travel between 1996 and 2000. Given the lack of space, truck-only lanes are not a viable option.

Source: Information collected by GAO from metropolitan planning organizations, state departments of transportation, and port authorities.

Heightened Security Concerns Also Must Be Taken into Account

Security concerns are one additional matter that needs to be considered in addressing congestion challenges. Many of the studies included in our evaluation synthesis were conducted in 2001 or earlier and did not raise security as a major issue. However, since the terrorist events of September 11, 2001, security has become an important consideration, particularly to the transportation infrastructure in and around ports. The likely impact of disrupting this infrastructure—either to the economy generally or to military deployments—is substantial. For example, the Brookings Institution has reported that if a weapon of mass destruction were shipped into a port by container and successfully discharged, the immediate damage and the resulting disruption to the economy could cost as much as \$1 trillion.¹⁴

Security and freight mobility are not mutually exclusive goals, but they can potentially conflict, adding to congestion. Access in and out of ports

¹⁴Michael E. O'Hanlon et al., *Protecting the American Homeland: A Preliminary Analysis* (Washington, D.C.: Brookings Institution Press, 2002).

represents perhaps the highest potential for conflict between these two goals. Based on value, the Office of Intermodalism estimates that about 90 percent of world water commerce moves by intermodal cargo container. Ensuring that containers do not contain weapons of mass destruction or other dangerous materials requires comprehensive security inspections of these cargoes. Thus far, security measures taken to control port access and to evaluate containers have not materially slowed freight movement to and from seaports, according to officials at the locations we visited. However, developing and effectively implementing future solutions that can accomplish security goals while still allowing efficient movement of goods, particularly at ports, is a matter of substantial concern for many freight industry stakeholders we interviewed.

Protecting our nation's transportation network against attacks is a formidable challenge because our land and maritime transportation systems, in particular, are designed to be open and accessible. Unfortunately, these systems concentrate freight flows in ways that can make them vulnerable to terrorist attacks. Moreover, the sheer size of the network presents a daunting security challenge. Given the enormity and accessibility of this network, protecting it through traditional means, such as guards, guns, and gates, seems unlikely. Rather, transportation experts, such as TRB, believe that transportation security can best be achieved through well-designed security systems that are integrated with transportation operations.¹⁵ Opportunities for such integration can occur in many forms. For example, during the design of new facilities—such as bridges and intermodal facilities—or the remodeling of existing ones, cost-effective protective features can be incorporated. These features could include improved lighting, blast-resistant structures, emergency evacuation routes, and open spaces that provide broad fields of vision. Where free access is not required, such as at a rail yard, fences, police patrols, and other perimeter protections can be added. Also, the application of certain technologies, such as cameras and sensors that detect chemical and biological agents, can further strengthen overall security of transportation infrastructure. Taken together, elements such as these can provide a multitiered security system that not only deters and protects but also improves safety, thus potentially making the system more efficient. Such integration will require the concerted and coordinated efforts of federal, state, and local law enforcement authorities, the many public and private

¹⁵Transportation Research Board, *Special Report 270: Deterrence, Protection, and Preparation: The New Transportation Security Imperative* (Washington, D.C.: 2002).

entities that plan, develop, own, and operate transportation infrastructure and assets, and various federal agencies responsible for port and border security and freight movement.

We and others are involved in separate ongoing studies of numerous public and private efforts to develop and implement transportation security enhancements.¹⁶ Because of these ongoing studies and the enormity and complexity of evaluating the security issues involved in protecting the transportation system, in this report we did not address barriers that agencies and others face to implement sound security measures or evaluate options offered by others or efforts under way to strengthen transportation security. These issues will be more fully addressed as part of other ongoing and future studies.

Planning and Financing Limitations Pose Difficulties in Addressing Freight Mobility Challenges

Studies examining freight mobility point primarily to planning and funding issues as the main limitations in efforts to help address challenges to the system, and our work has confirmed their relevance at the ports and surrounding areas we visited. (See fig. 7.) On the planning side, the limitations center on two areas. First, consideration of freight improvement projects as part of the local planning process is limited because the process is oriented to projects that clearly produce public benefits, such as passenger-oriented projects. While freight projects also may produce public benefits by reducing freight congestion, generally, public planners are wary of providing public support for projects that directly benefit the private sector. In addition, the planning process often does not consider the regional nature of freight mobility and is subject to long lead times to plan and implement projects, factors that deter valuable private sector participation in the process. Second, the planning process often lacks a comprehensive evaluation approach, such as a cost-benefit framework, that might result in the selection and implementation of freight improvements and to better ensure that systemwide, multimodal solutions—as opposed to a focus on a single transportation mode—are considered and adopted where appropriate. On the funding side, even

¹⁶Previous GAO studies on this issue include U.S. General Accounting Office, *Transportation Security: Federal Action Needed to Enhance Security Efforts*, [GAO-03-1154T](#) (Washington, D.C.: Sept. 9, 2003); U.S. General Accounting Office, *Aviation Security: Progress Since September 11, 2001, and the Challenges Ahead*, [GAO-03-1150T](#) (Washington, D.C.: Sept. 9, 2003); and U.S. General Accounting Office, *Maritime Security: Progress Made in Implementing Maritime Security Act, but Concerns Remain*, [GAO-03-1155T](#) (Washington, D.C.: Sept. 9, 2003).

when freight projects rise to the level of warranting public-sector involvement, federal assistance can be hampered by difficulties in accessing funding sources because federal programs are often structured such that they dedicate funds on a modal basis. Freight projects have these difficulties because they are frequently intermodal, while most federal funding sources are focused on one mode, and because the projects may have private benefits, raising questions about whether and how to provide public support.

Figure 7: Focus of Planning and Funding Processes Limit Consideration of Freight Improvements



Source: GAO.

Freight Priorities Have Difficulty Competing in the Transportation Planning Process

According to several studies examining freight mobility, the transportation decision-making process does not lend itself well to regional freight mobility planning.¹⁷ Under ISTEA and TEA-21, much of this planning process takes place at the local level through metropolitan planning organizations (MPOs) and at the state level through state departments of transportation.¹⁸ These planning agencies focus on the needs and issues within their areas of jurisdiction. Although the transportation planning process is set up to address freight transportation improvements and include private-sector freight interests, in practice, freight projects have difficulty competing with other projects for a number of reasons. For one, the public planning process by its nature focuses largely on projects that clearly produce public benefits. Although reducing freight congestion may also produce a collateral public benefit, public planners are wary of providing public support for projects that would also yield direct private benefits. Within this focus, public-sector attention tends to be directed to freight-related projects only when there is considerable public benefit as well. For example, a project that adds lanes to a crowded freeway is likely to help both passengers and freight haulers, while a roadway enhancing freight access to a port facility would likely be perceived as having limited public benefit.

Another factor that can limit consideration of freight improvements is that local planning bodies may not sufficiently address key freight needs that extend beyond their local areas. Addressing freight infrastructure needs often involves projects along a freight corridor that cut across the jurisdictions of several transportation planning agencies and, in many cases, even states. Although state departments of transportation work to address freight mobility challenges on a statewide basis, many corridors cross state boundaries and, unless states are part of a multistate coalition, states do not usually address projects that involve multijurisdictional

¹⁷Federal Highway Administration, Office of Freight Management and Operations, *Freight Financing Options for National Freight Productivity* (Washington, D.C.: April 2001) and Federal Highway Administration, *Addressing Freight in the Transportation Planning Process* (Washington, D.C.: October 2001).

¹⁸Federal law requires the creation of MPOs for any urbanized area with a population greater than 50,000. Composed of representatives from local government and transportation authorities, MPOs are charged with developing a comprehensive metropolitan long-range transportation plan and transportation improvement program that consider other interests in the planning process through cooperative partnerships with stakeholders. MPOs receive federal funding in addition to other sources to conduct their operations.

corridors. According to reports issued by FHWA, getting the cooperation of and coordinating with multiple agencies and communities—each with its own priorities—to address freight projects within a relatively large area presents a challenge that makes the planning and implementation of this type of freight project difficult.¹⁹ Some MPOs and states, for example, may view a highway connector project for freight movement as benefiting only a small segment of their constituent population, with most of the benefits dispersed outside their jurisdiction. The New York and New Jersey region and the Southern California region serve as examples of the difficulties associated with addressing freight issues within a jurisdiction when the benefits extend beyond the jurisdiction. For example, officials representing the New York and New Jersey region are exploring the possibility of shifting some of the cargo from the highly congested roadways to railroads. However, the infrastructure limitations of rail tunnels in Baltimore, Maryland—outside of the jurisdiction of the states of New York and New Jersey—are a significant impediment to doing so. In Southern California, freight projects that would clearly have benefits beyond the jurisdiction of the MPO, such as addressing the congestion on the I-710 corridor, have more difficulty competing for funding against more localized projects that clearly benefit the constituents within the jurisdiction. At the locations we visited, we did find some examples in which officials found ways to deal effectively with projects that crossed jurisdictional boundaries. As we will discuss in more detail later, they formed multistate, multijurisdictional, and private- and public-sector coalitions outside the conventional public planning process to identify regionally significant freight transportation improvement projects. However, we found that few such coalitions exist.

Finally, certain aspects inherent in the local planning process can deter participation by the private sector stakeholders in the process. According to transportation studies, private sector participation can help local planners identify and address needed freight transportation improvements and provide expertise and data to make informed decisions. According to state and local officials, one reason for limited participation by the private sector stems from their perception that freight projects proposed through the transportation planning process do not offer sufficient benefits to

¹⁹Federal Highway Administration, *Addressing Freight in the Transportation Planning Process* (Washington, D.C.: October 2001) and Federal Highway Administration, Office of Freight Management and Operations, *Freight Financing Options for National Freight Productivity* (Washington, D.C.: April 2001).

warrant their involvement. This is not to say that private-sector freight interests were totally disengaged from the planning process. There were notable examples—discussed later in this report—in which the private sector became involved in planning for freight projects because the project held a clear, direct, and tangible benefit for the freight industry. However, public officials indicated that, even when freight-related projects were being considered by transportation planners, if the private sector did not perceive that the projects would meet their specific needs or the benefits were not clearly defined, private sector participation in the conventional transportation planning process was not as evident.

Another factor that can also limit participation by freight interests involves the differing planning horizons of the public and private sectors. According to FHWA, the public-sector process for planning and delivering freight improvements is slow and inflexible compared with private-sector needs and expectations.²⁰ According to these same studies, private firms operate in a faster-paced, competitive environment that is subject to fluctuations in demand for its services because of economic conditions. Similarly, ongoing business mergers sometimes make it difficult for private-sector officials to predict their company's infrastructure needs in 15 to 20 years because they are unsure whether their company will be active at that time in particular markets. Several MPO officials told us that their planning horizons extend over longer-term periods, sometimes as much as 20 years and that such a planning time frame is necessary to conduct impact studies or obtain funding. Several MPO and state department of transportation officials said that even when private-sector interests initially express a willingness to work with the public sector, they soon lose interest or become frustrated because of these long horizons.

The experience of ports and surrounding areas we reviewed generally mirrors the limited private-sector participation noted in studies of the larger transportation network. (See fig. 8.)

²⁰Federal Highway Administration, Office of Freight Management and Operations, *Freight Financing Options for National Freight Productivity* (Washington, D.C.: April 2001) and Federal Highway Administration, *Addressing Freight in the Transportation Planning Process* (Washington, D.C.: October 2001).

Figure 8: Reasons for Limited Private-Sector Participation in the Planning Process

Limited private-sector participation

- According to officials with the **Berkeley-Charleston-Dorchester Council of Governments** (MPO for Charleston-North Charleston metropolitan area), freight interests are included in planning activities and as members of committees, but their participation is often limited. According to these officials, the rail industry's participation has been limited because it could not see how participating in the planning process benefited it.
- Officials with the **New York Department of Transportation** told us that the biggest problems in getting private-sector participation are the long horizons of the public planning process and the belief of the private-sector participants that they are not benefiting from participation in the process.
- Officials with the **Metropolitan Transportation Commission** (the MPO for Oakland) commented that private-sector interest in participating on advisory councils waned because the MPO's time horizons were too distant and because tension existed between public agencies advancing public interests, which may exclude the needs and interests of the private-sector. As a result, public sector knowledge of private-sector needs suffered.
- Officials with the **California Department of Transportation** stated that private-sector involvement in the planning process has been limited. According to these officials, shippers, for example, have not participated because they are not interested in becoming involved with the planning process because of horizons averaging anywhere from 5 to 10 years.

Source: Information collected by GAO from metropolitan planning organizations, state departments of transportation, and port authorities.

Better Analytical Methods and Sufficient Data Needed for Transportation Planning at the Local Level

Transportation research recognizes the importance of using a sound evaluation approach, such as a cost-benefit framework, to take a more systemwide, multimodal approach to transportation planning.²¹ However, our review at the locations we visited showed that many state and local transportation planners were not consistently and systematically applying analytical methods as part of their investment decision-making process to evaluate freight-specific and other transportation projects. They also lacked sufficient data to identify and define current and future freight transportation problem areas and potential solutions to address them. Lack of data and sound evaluation techniques reduce the likelihood that the relative merits of freight transportation proposals can be adequately judged with passenger projects—a potentially serious consequence for freight projects, which already tend to receive low visibility. Also, without good cost-benefit studies, transportation planners may find it more difficult to determine the extent that public investment is required and to

²¹Transportation Research Board, *Special Report 271: Freight Capacity for the 21st Century* (Washington, D.C.: 2002); Transportation Research Board, *Special Report 252: Policy Options for Intermodal Freight Transportation* (Washington, D.C.: 1998); and [GAO-02-775](#).

understand trade-offs and relationships among alternative solutions involving different transportation modes. More focused federal direction and support for states and MPOs could better ensure that sound evaluation approaches are incorporated into the local investment decision-making process for freight projects and that meaningful data are collected and used.

State and Local Planners Are Not Consistently Applying Sound Analytical Methods and Evaluation Approaches

Our past work on best practices for capital decision-making²² found that establishing a decision-making framework that is supported by proper financial, technical, and risk analysis is a critical factor in making sound capital investment decisions. Transportation experts have echoed the need for such a framework. Key elements we and others have defined as being important for evaluations used in the public decision-making process are shown in table 1.²³

Table 1: Key Elements of Evaluations Used in a Public Decision-making Process

Type of evaluation	Key elements
Prospective evaluation	<ul style="list-style-type: none"> • Cost-benefit analyses should be used, especially for projects involving trade-offs among freight mobility benefits, passenger benefits, and environmental protection. Transportation benefits should be evaluated in terms of users' willingness to pay for the change. Estimating the demand response to changes in transportation cost is necessary. • Cross-modal and low cost noncapital alternatives, including traffic control improvements and congestion pricing, should be actively considered and analyzed in lieu of capital improvements. • External benefits and the value of avoiding external costs (like air pollution and congestion) should be quantified to the extent possible in the cost-benefit analysis. • An analysis of risks and sources of uncertainty, including uncertainty in traffic projections and strategies for reducing risk should be included.
Retrospective evaluation	<ul style="list-style-type: none"> • A retrospective evaluation of completed projects should be performed according to established guidelines. These evaluations allow public planners to learn from experience, provide incentives to achieve results, and hold planners accountable for their decisions.

Source: GAO summary of elements presented in TRB's *Policy Options for Intermodal Freight Transportation and Freight Capacity for the 21st Century*.

²²U.S. General Accounting Office, *Executive Guide: Leading Practices in Capital Decision-Making*, GAO/AIMD-99-32 (Washington, D.C.: December 1998).

²³Transportation Research Board, *Policy Options for Intermodal Freight Transportation* (Washington, D.C.: 1998) and Transportation Research Board, *Freight Capacity for the 21st Century* (Washington D.C.: 2002).

In recent studies, TRB and FHWA have noted that in making freight-related investment decisions, local MPOs and state DOTs are not applying many of these evaluation elements. For example, FHWA²⁴ said that planners lack the tools to evaluate freight projects with nonfreight projects. TRB studies²⁵ have shown, in general, that evaluation procedures for setting project priorities for state highway programs throughout the United States are often defined in terms of engineering criteria rather than economic criteria. According to TRB, an important change needed to improve intermodal freight efficiency involves conducting better evaluations of the direct benefits of transportation improvements. These evaluations—which are now largely absent at the local level—would entail applying proper methods of identifying needs for connectors to ports and other intermodal terminals. Also, government transportation agencies do not routinely consider facility management alternatives to physical expansion as a means to increase capacity, according to TRB.

Our case study work generally confirmed these findings and demonstrated unevenness in the application of sound methods and evaluation approaches across the country. Most locations we visited use some form of cost-benefit analysis, but the sophistication and elements used in the analysis differ significantly. For example, an MPO official in Charleston told us that they do not conduct formal cost-benefit analyses on transportation projects because they do not have access to those tools or resources. In contrast, the Houston MPO conducts a variety of cost-benefit analyses using economic criteria, travel delays, and vehicle miles traveled reductions. The Puget Sound Regional Council (the Seattle MPO) utilizes a cost-benefit approach for evaluating freight projects separate from passenger projects but is working on a more sophisticated approach.²⁶

²⁴Federal Highway Administration, *Addressing Freight in the Transportation Planning Process* (Washington, D.C.: October 2001).

²⁵Transportation Research Board, *Special Report 252: Policy Options for Intermodal Freight Transportation* (Washington, D.C.: 1998) and Transportation Research Board, *Special Report 271: Freight Capacity for the 21st Century* (Washington, D.C.: 2002).

²⁶This process involves solicitation of freight projects from potential public agency sponsors that are then screened, ranked, and then jointly advanced for state and federal funding partnerships (together with local, port, and railroad funds). Within this process, a project-level, weighted point system is used, in combination with a documented team review of all applications, that includes potential funding sources and a project narrative that includes looking at reduced delays, cost effectiveness, and cost alternatives. Once advanced to the state, the Freight Mobility Strategic Investment Board (FMSIB) reviews projects to be put forward as part of a statewide list to the legislature for project selection and funding.

Other locations often relied on a variety of methods to evaluate and prioritize freight and other passenger-related projects, such as weighted systems that assign additional points if the project benefited freight mobility. Weighted systems allow freight projects to better compete with passenger-oriented projects under consideration.

While many of the sites we visited performed cost-benefit studies to some degree, the specific elements of the analysis varied considerably. For example, some of the locations include low cost or cross-modal alternatives and external costs—two key best practice elements in our capital decision-making framework—during the decision-making process. However, while many locations considered these elements, MPO stakeholders typically did not apply these elements in a consistent and systematic manner. Instead, elements were considered in general through a process of negotiation among MPO stakeholders. Furthermore, none of the locations conducted retrospective evaluations. Some of the MPO officials stated they would like to conduct retrospective evaluations, and others said they did not have the data nor the resources to do so.

The use of cost-benefit analyses and the application of best practices evaluation elements at the state level mirrored the MPO experience for the most part. Most states we visited conduct some form of cost-benefit analysis, but in varied forms. For example, California conducts a number of cost-benefit analyses based on economic, safety, and highway maintenance information, while other states, such as New Jersey and Texas, mainly conduct cost-benefit analyses as a component of their environmental studies. Some states did not consistently look at cross-modal or low cost noncapital alternatives. For example, officials in Texas said they had not advanced to the point of evaluating management alternatives, although they were beginning to consider alternative financing mechanisms and user fees. Officials from New Jersey and New York said they have discussed user fees and tolls, but these discussions usually have occurred outside the planning process.

Transportation Planners Lack Sufficient Data to Evaluate Freight Investment Decisions

Transportation studies by us and by others have found that sufficient data and information systems are essential to make sound investment decisions. However, according to recent TRB and FHWA studies, state and local transportation planners do not have data to sufficiently evaluate freight infrastructure proposals. Some transportation companies may consider data on private freight movement to be proprietary. However, such data can often be used to identify heavily traveled highways and intersections and possible measures to mitigate intermodal freight bottlenecks. TRB

case studies of transportation projects show that planning agencies sometimes lack data and proper modeling techniques to compare the benefits of alternative solutions—such as operations and management alternatives—with proposals for physical expansion, such as adding new roadways or highway lanes. According to these studies, data are also needed that would allow state and local planners to evaluate forecasts of transportation demand, forecasts of the effect a project would have on diverting traffic to or from other transportation modes, or estimates of a project’s effect on congestion or pollution.

At the locations we visited, most state and local planners confirmed that they did not have sufficient data to accurately and effectively evaluate freight projects as part of the planning and investment decision-making process. Table 2 summarizes the types of data being collected by each location and additional data needed.

Table 2: Types of Data Collected and the Additional Data Needs for Freight Mobility Planning

Location	Examples of types of data used	Key limitations cited by planners
Charleston	Freight Analysis Framework (FAF) ^a , census data, commodity flow data, travel demand model	<ul style="list-style-type: none"> • Accessible data are generalized to state and national level; specific localized data is not available. • Some of the data from private companies are confidential and proprietary and, therefore, lack sufficient detail for accurate freight planning purposes.
Houston	A variety of national, state, and local data that includes freight flows, emissions, vehicle miles traveled, truck counts, purchased data from consultants	<ul style="list-style-type: none"> • The validity of some of the national, state, and local data are questionable, and it is difficult to get the data in detail at the local level. • Data purchased from consultants are expensive.
Los Angeles/Long Beach	A variety of national and state data including commodity flow data; demand model that incorporates heavy trucks included in regional transportation plan	<ul style="list-style-type: none"> • Useful freight data are generally unavailable. • Available commodity flow data are not detailed enough (i.e., county or by zip code) for accurate freight planning.

(Continued From Previous Page)

Location	Examples of types of data used	Key limitations cited by planners
New Jersey	National data such as the FAF, some state data, in-house modeling, purchased data from a consultant	<ul style="list-style-type: none"> Modeling data are available, but results are often unreliable because of questionable assumptions on routes for trucks. Reconciling similar data from different sources is also a problem; combining data and developing new data sets is time consuming and resource intensive.
New York	Commodity flows and volumes, origin and destination data, truck counts	<ul style="list-style-type: none"> Proprietary issues make it difficult to obtain detailed data that are useful. Often there is a time lag in the data received, and the data may not necessarily reflect the current environment.
Oakland	State and local data, travel demand models, roadway monitoring including car and truck counts	<ul style="list-style-type: none"> There is a need for more interstate import and export data and more freight-specific data.
Seattle/Tacoma	FAF and Bureau of Transportation Statistics data, marine cargo forecasting, modeling data, state-level data, trucking data	<ul style="list-style-type: none"> There is a need for better information on trip reliability or predictability. Metropolitan traffic models do a poor job of reflecting “real world” traffic delays.

Sources: Highlights of information collected by GAO from the metropolitan planning organizations for these locations.

^aFHWA has created the FAF. This framework was developed from various government and private-sector databases including the commodity flow database and the highway capacity dataset.

While many MPOs struggle to obtain sufficient data to make freight mobility planning decisions, some state and local planners are working toward collecting and maintaining databases to better evaluate freight projects. The New Jersey Transportation Planning Authority (an MPO in New Jersey), for example, in cooperation with the International Intermodal Transportation Center (IITC) at the New Jersey Institute of Technology (NJIT) has undertaken a comprehensive data gathering and research initiative designed to strengthen the evaluation process for freight planning and decisionmaking.²⁷ As part of this initiative, IITC developed goods movement indicators and a freight planning framework and modeling program to forecast the impact of selected freight mobility strategies for

²⁷Freight Planning Support System, *Final Summary Report* (New Jersey Institute of Technology, July 2003).

Federal Efforts to Encourage
Sound Evaluation Procedures
Have Been Limited

northern New Jersey region. For example, the model can be used to forecast the decrease in truck delay resulting from a strategy that considers adding truck-only lanes to selected highway segments. Also, IITC has summarized data collection practices used by selected MPOs throughout the United States.

The variation in local planning evaluation approaches and data gathering among MPOs is not surprising given the wide latitude that planning jurisdictions have under the law and the limited guidance provided at the federal level by DOT and its various transportation agencies. Under TEA-21 and existing regulations, MPOs and state departments of transportation have a great deal of latitude in how they evaluate projects and make investment decisions. DOT officials told us they viewed their role in this regard as facilitators rather than being prescriptive in dictating an evaluation process. For example, FHWA officials said they try to enhance consideration of freight issues through such efforts as the Freight Professional Development Program, which includes seminars by industry experts; technical assistance through peer exchanges and an online list of experts; and the FAF database program, which can be used to estimate trade flows and identify areas of potential improvement. DOT officials said their limited oversight efforts are directed at ensuring that states and MPOs keep broad goals in mind in designing their process, such as choosing projects that support economic vitality, increase safety and accessibility, promote efficiency, protect the environment, and promote energy conservation.

Although DOT's approach is consistent with giving planning bodies wide latitude in how to operate, there are strong signs from the planning bodies themselves that they would prefer more guidance and support in this area. State and MPO officials with whom we talked said they would welcome more help in designing an evaluation approach for making transportation investment decisions for a variety of reasons. One official, for example, said more specific policies and procedures were needed to better ensure that they were in compliance with planning requirements.²⁸ Almost all of the officials said they wanted more help in obtaining sufficient data for

²⁸For example, ISTEA and TEA-21 require the Department of Transportation, through the FHWA and FTA, to review and certify that all metropolitan areas with a population of 200,000 or more meet certain transportation planning requirements, including developing a Congestion Management System (CMS). Some transportation officials said more detailed guidance was needed on how to implement a CMS that meets specific requirements.

evaluating transportation proposals. Much of the available freight data, they said, are usually at a macro level, privately held, cost-prohibitive to acquire, and of limited use because of proprietary and reliability concerns.

Other groups have also urged DOT to do more. Several transportation studies have noted the limited amount of guidance and oversight and the need for better evaluation approaches and have recommended that DOT take steps to provide better guidance and support in this area. The TRB, for example, has recommended that DOT actively promote states' use of economic evaluation methods in transportation programs that receive federal aid, particularly highway aid programs. TRB also recommended that, as a means of promoting more useful evaluation at the federal and state levels, Congress establish a clearinghouse within DOT devoted to evaluation methods, so that DOT program agencies and local and state governments could share and compare methods and examples of evaluations.

Intermodal Nature of Freight Projects and Access Limitations to Federal Programs Can Hamper Planners in Funding Freight Improvements

A variety of factors in the way federal transportation programs are structured and used as funding sources for infrastructure projects hamper MPOs and states in advancing freight improvement projects. For one, freight improvement projects are more complicated to fund than traditional, modally oriented projects, both because of the intermodal nature of most freight projects and the challenge in balancing public and private benefits. For example, a traditional, modally oriented project, such as a project to widen a highway, typically involves only one mode and yields public benefits. This makes the planning and development of traditional transportation projects fairly clear-cut—there is a single sponsor (e.g., an MPO) and a clearly defined funding source (e.g., one of several highway programs). In contrast, freight improvement projects tend to be more complicated because they are frequently intermodal, which means that a clear sponsor for the project may not exist, discussions among multiple sponsors are usually required, and it may require consideration of multiple sources of funding. Also, the project can result in private benefits, which raises questions about whether and how to provide public support for private infrastructure. For example, an intermodal connector linking a port to an intermodal rail yard has no clear sponsor. Such a project may be viewed as the responsibility of the port, the railroad, or even the MPO. When such a project becomes the responsibility of the MPO, the project must also overcome the limitations to advancing freight improvements in the planning process described earlier. Moreover, because federal programs are often structured such that they dedicate

funds on a modal basis, MPOs may make decisions based on the mode eligible for federal funding, which puts freight projects at a disadvantage.²⁹

Aside from the greater complexities associated with funding intermodal freight projects, gaining access to funding sources more specifically targeted for freight projects is often difficult as well. For example, two programs—the National Corridor Planning and Development Program and the Coordinated Border Infrastructure Program (hereafter referred to as the Borders and Corridors programs)—were created by TEA-21 to better address freight transportation needs. They are federal grant programs that share an annual funding allocation of up to \$140 million. Although considered a good source of funding for freight projects, the most significant limitation with these programs is that they are oversubscribed, and much of the funding for these programs is allocated to congressionally designated projects, according to FHWA. Two other credit programs established in TEA-21—TIFIA and the Rail Revitalization and Improvement Funding program (RRIF) provide loans, loan guarantees, and lines of credit for projects. The TIFIA program, for example, can leverage federal funds by attracting additional private investments in infrastructure projects. However, according to stakeholders, the eligibility criteria for the TIFIA program limit some freight projects, as the program does not allow assistance to privately owned facilities, such as privately owned rail infrastructure. Further, to qualify for assistance, TIFIA projects must be valued at over \$100 million, which, according to many stakeholders, may exclude many freight projects that are valued at less than this amount. In addition, stakeholders have indicated that shortcomings with the RRIF program include the up-front fee applicants must pay in order to receive the loan and the length of time applicants must wait before receiving a decision. These shortcomings have proven to be a disincentive to use the program, according to DOT.³⁰ Table 3 shows the federal programs established in ISTEA and TEA-21 that are available as funding sources for freight projects.

²⁹When MPOs make infrastructure decisions based on the mode eligible for federal funding, this can potentially result in greater funding for one mode over another.

³⁰U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, *Transportation Policy: Evolution of Federal Freight Transportation Policy* (Washington, D.C.: 2001).

Table 3: Federal Funding and Financing Sources Providing Eligibility for Some Freight Projects

Funding source	Applicability
Congestion Mitigation and Air Quality Program (CMAQ)	<ul style="list-style-type: none"> • Can be used to fund a wide range of freight improvement projects, including rail and other nonhighway transportation projects. • Project must reduce carbon monoxide or other specified air pollutants in a nonattainment or maintenance area as specified in the Clean Air Act. • Freight projects are required to show reduced air emissions.
Surface Transportation Program (STP)	<ul style="list-style-type: none"> • Can be used for highway-related freight projects, such as roadway improvements to facilitate truck-freight movement or accommodate other modes, raising bridges, at-grade rail separations, and improvements to intermodal connectors. • Project must be related to federal-aid highway system.
National Highway System (NHS)	<ul style="list-style-type: none"> • Can be used to improve intermodal connectors. • Project must be identified as a NHS priority highway or a connector linking the NHS to key intermodal facilities.
National Corridor Planning and Development Program and Coordinated Border Infrastructure Program (Corridors and Borders)	<ul style="list-style-type: none"> • Can be used to fund projects related to planning and construction on major corridors that have been identified. • These programs are oversubscribed, and much of the funding is allocated to congressionally designated projects.
Transportation Infrastructure Finance and Innovation Act (TIFIA)	<ul style="list-style-type: none"> • Can be used for publicly owned, intermodal, surface freight transportation facilities (other than seaports and airports) located adjacent to the NHS. • To qualify for assistance, projects must be valued at over \$100 million.
Rail Revitalization and Improvement Funding Program (RRIF)	<ul style="list-style-type: none"> • Targeted specifically at providing credit for rail infrastructure and equipment. • Applicants must pay an up-front fee in order to receive the loan, are subject to the lengthy application process, and must first be turned down by a bank or credit institution.

Source: FHWA.

Because of private ownership and other issues, certain freight transportation projects are especially difficult to fund or finance through federal programs, even when they are identified as priorities within the transportation planning process. For example, rail projects in particular are difficult to fund even when considered a priority in the public planning process largely because rail infrastructure is privately owned. According

to a report issued by FHWA, although public support under existing programs can be used to fund or finance rail, the projects are usually only eligible for purpose-oriented programs, such as CMAQ, or through financing programs such as RRIF.³¹ However, even with these programs, there are certain restrictions. For example, in the case of CMAQ, unless a project has a positive impact on air quality in a nonattainment³² or maintenance area, it would not be eligible for CMAQ funds. In the case of TIFIA, a project must be publicly owned, which excludes many rail infrastructure projects as rail infrastructure is often privately owned and in the case of RRIF, applicants must pay an up-front fee in order to qualify, creating a disincentive to use the program.

One example that typified the complexities associated with funding freight projects under existing programs occurred recently on a major project undertaken at the Port of Tacoma (Washington). This project, the D Street overpass, which involved widening a road and relocating rail tracks to better facilitate road and rail freight flow, was delayed because the project involved two different modes, and the funding for one was available but funding for the other was not. Highway funds were available for the road portion, but private-sector funding for the rail portion was not readily available. Financing limitations such as this can delay needed freight improvement projects or prevent them from occurring all together.

Two Key Strategies Could Help Address Freight Planning and Financing Limitations

The upcoming reauthorization of TEA-21 provides an opportunity to consider ways in which federal policies and programs might be adjusted to help address the planning and funding limitations described above. Using the work of transportation experts and our own experience in evaluating transportation mobility projects,³³ we identified two key strategies that hold promise for addressing the planning and financing limitations that surfaced from our work. The first strategy addresses planning limitations,

³¹U.S. Department of Transportation, Federal Highway Administration, *Freight Financing Options for National Freight Productivity* (Washington, D.C.: April 2001).

³²EPA uses six criteria pollutants as indicators of air quality. When an area does not meet the air quality standard for one of the criteria pollutants, it may be designated as a nonattainment area.

³³GAO-02-775, GAO-02-1033, Transportation Research Board, *Special Report 252: Policy Options for Intermodal Freight Transportation* (Washington, D.C.: 1998) and Transportation Research Board, *Special Report 271: Freight Capacity for the 21st Century* (Washington, D.C.: 2002).

and the second strategy addresses financing limitations. In addition, we identified certain overarching, economic and management principles for consideration as the Congress and other transportation decision makers develop and implement strategies to enhance freight mobility. (See fig. 9.)

Figure 9: Key Strategies and Principles to Address Planning and Financing Limitations



Source: GAO.

The administration and system stakeholders have developed a variety of reauthorization proposals to address the planning and financing limitations.³⁴ (See apps. II–IV for an overview of proposals made by different freight stakeholders.) For example, to address planning limitations, most of the proposals seek to improve coordination, encourage private sector involvement, and/or improve data and analysis tools to evaluate freight projects. In the area of financing, most of the proposals seek to either expand the eligibility of federal programs to include specific freight projects, encourage the use of alternative financing, or allow for the use of nonbuild tools to reduce congestion. While all of the proposals address planning and financing limitations—and involve at least some aspects of our two strategies—a balanced strategy that addresses the broad range of limitations we identified will likely be required to significantly advance freight mobility. (See app. V for a summary of how stakeholder proposals relate to our two broad strategies.) Optimum results could be furthered if three overarching principles are applied in the development and refinement of reauthorization provisions. These include promoting efficiency by embracing “user pay” principle, maximizing a performance-based program, and aligning the incentives for planning agencies and other decision makers to focus on efficiency and results.

First Strategy: Emphasizing a Systemwide Approach to Transportation Planning

Our past work has shown that planning should be viewed from a systemwide perspective.³⁵ Such a perspective includes taking multiple transportation modes and jurisdictions into account—rather than considering each one separately—to better ensure the involvement of freight stakeholders in the private sector. In addition, such a perspective includes developing meaningful data and sound analytical methods for making decisions about how best to apply available resources and to determine the extent of public involvement.

Coordination Across Transportation Modes and Jurisdictions

As one means to ensure that freight perspectives are included in public planning and programming decisions, coordination across the various transportation modes and planning jurisdictions is important. Intermodal

³⁴National stakeholders include the Freight Stakeholders Coalition, the American Association of State Highway and Transportation Officials, Local Officials for Transportation, Association of American Railroads, American Trucking Associations, Association of Metropolitan Planning Organizations, American Road and Transportation Builders Association, and U.S. Conference of Mayors.

³⁵[GAO-02-775](#).

freight movements involve such matters as moving goods from ships to trucks or railroad cars for distribution throughout the country. Freight improvement projects must address congestion at these transfer points as well as congestion on the roads and railroad tracks that carry freight throughout the country. At the same time, extensive coordination between multiple sets of stakeholders representing the various modes is needed because of the intermodal nature of projects. When such projects affect not only multiple transportation modes, but also areas that extend beyond the jurisdiction of a single local planning body, the amount of coordination becomes even more complex. Our case studies showed that successful intermodal projects involved a high degree of intermodal and cross-jurisdictional coordination. For example, the FAST project in Washington state, a series of related but independent projects intended to improve freight mobility in the Everett-Seattle-Tacoma region, crossed multiple jurisdictions and modes and involved multiple stakeholders. The program included port access improvements and railroad grade crossing improvements to improve safety and increase mobility. While funding for the project comes from various public sources and the private railroads, the FAST members selected and prioritized projects for funding. The coordination of projects and the cooperation of the multiple stakeholders have resulted in the elevation and acceleration of freight improvement projects along the corridor.

Such coordination is not automatically a part of the transportation planning process; in fact, our reviews of successful projects like the FAST Corridor program found that they typically occurred outside of the conventional transportation planning process for several reasons. First, it is easier to address freight improvements when they do not have to compete with nonfreight projects in the transportation planning process. Also, it is easier to build consensus among the multiple stakeholders when the focus is solely on issues of freight mobility. As our review revealed, attempts to advance freight improvements within the conventional process are often hindered by limited cross-modal communication and limited cross-jurisdictional coordination. Thus, ensuring that a freight strategy includes sufficient modal coordination and stakeholder participation, and cooperation continues to be a challenge for public-sector decision makers.

A number of proposals developed by stakeholders are directed at greater coordination across modes and jurisdictions. For example, the administration's 2003 surface transportation reauthorization proposal (hereafter referred to as the administration's proposal) encourages MPOs to coordinate their planning process with officials responsible for other

types of planning activities that are affected by transportation.³⁶ The administration's proposal also encourages states and other jurisdictions to work together to develop plans for multimodal and multijurisdictional transportation decision making through allocations for planning studies.³⁷ This approach, which encourages more cooperation, but does not specifically place requirements on the parties in the planning process, is consistent with the premise of ISTEA and TEA-21 that states and MPOs are best positioned to make decisions on transportation planning and project selection to best address local concerns. However, while ISTEA and TEA-21 have encouraged an emphasis on freight in the planning process for over a decade, our review highlighted the many disincentives for such a focus with the result that MPOs typically have not used their transportation resources on projects that benefit areas outside of their jurisdictions.

Ensuring That Private-sector Stakeholders Are Effectively Involved

Since a systemwide approach to transportation planning will require more focus on issues that cross jurisdictions, securing the participation of the private sector, which tends to have a more national and global view of the transportation system than public-sector planners, will be necessary. Greater participation by the private sector can also be helpful in supplying necessary data for making informed decisions and expertise to effectively identify and implement improvements across modes and jurisdictions. However, our work has shown that participation by the private sector in the public planning process is often limited.

Several of the projects we studied offer insights as to how the private sector might be effectively engaged in the planning process. For example, the Alameda Corridor project in Los Angeles serves as an example of a project that involved private sector participants in the planning and implementation phases of the program. Specifically, the project consolidated port traffic from four separate branch lines into a 20-mile railroad express line connecting the ports of Los Angeles and Long Beach to the transcontinental rail network east of downtown Los Angeles. The express line eliminated approximately 200 street-level railroad crossings, relieving congestion and improving freight mobility. This project succeeded because state and local stakeholders, the ports, and the railroads all had a financial incentive to relieve congestion and the commitment and ability to bring the necessary financial resources to bear.

³⁶Title VI, Section 6001, subsection 5203(e)(4).

³⁷Title I, Section 1806(f)(1).

Our review also showed that when the particular needs or interests of the private sector were not addressed, private-sector participation could be limited or absent altogether. As noted earlier, the FAST Corridor and the Alameda Corridor projects are examples of bringing diverse stakeholders together to forge a partnership to advance needed freight projects. Both projects yielded benefits for the stakeholders. The Alameda Corridor East project, however, serves as an example of what could happen when a project yields limited private benefits. This proposed project, extending east from Los Angeles through the San Gabriel Valley, focuses on safety improvements and congestion relief for the surrounding communities by providing grade separations at rail and highway crossings along the route. Unlike the original Alameda Corridor project, this project provides no new track capacity for the rail carriers and would not materially speed freight movement along the route. Therefore, according to MPO officials, the rail carriers see little benefit for them and currently are not actively involved in or committed to the project.

Several of the proposals made by freight stakeholders would address private-sector involvement. For example, the Freight Stakeholders Coalition has recommended the formation of a group composed of freight transportation providers from all modes, as well as shippers and state and local planning organizations, to provide industry input to DOT.³⁸ Providing a national perspective through such a group could provide information that would help to identify critical freight bottlenecks within the nation's transportation system and options to balance the state and local perspective. Further, the Freight Stakeholders Coalition has suggested that states and MPOs receive additional funds for expert staff positions dedicated to freight issues. Hiring and training professional freight planners could ultimately result in improved coordination of resources and better transportation investment decisions leading to improved freight mobility. The administration's proposal also addresses private-sector involvement through a program that would address freight transportation gateways and intermodal connections.³⁹ This program would require states to designate a freight transportation coordinator responsible for fostering

³⁸The Freight Stakeholders Coalition is composed of the American Association of Port Authorities, the American Trucking Associations, the Association of American Railroads, the Coalition for America's Gateways and Trade Corridors, the Intermodal Association of North America, the National Association of Manufacturers, the National Industrial Transportation League, the U.S. Chamber of Commerce, and the World Shipping Council.

³⁹Title I, section 1205.

Applying Sound Analytical Approaches and Collecting Sufficient Data

public and private sector collaboration needed to implement solutions to freight-related problems. However, unless states are able to overcome the limitations to private-sector participation, this type of provision may do little in garnering private-sector participation.

As part of a systemwide approach to planning, standard evaluation methods and sufficient data will also be needed to support public transportation investment decisions. Methodologically sound evaluations and basic freight-related data are both necessary to support public transportation investment decisions; to evaluate viable alternative solutions, including facility management alternatives; and to ensure that intermodal solutions to enhance freight mobility are considered and adopted where appropriate. Transportation experts with whom we collaborated on past mobility work cited the importance of considering all modes and travel types in addressing mobility challenges—as opposed to focusing on a single mode—to achieve desired results. Sound evaluation approaches, such as a comprehensive cost-benefit framework, are a necessary prerequisite for doing this.

Various proposals have been made for strengthening this part of the process. For example, the administration’s proposal includes a modification to the planning provisions that would require states to address data issues by targeting part of the state apportionments for state planning and research.⁴⁰ This set-aside is intended to be used for the collection and reporting of strategic surface transportation data to provide information about the extent, condition, use, performance, and financing of the nation’s highways for passenger and freight movement. This set-aside represents somewhat of a departure from current core transportation legislation, which leaves such decisions on the use of federal transportation funds to states and MPOs; however, it might increase freight data collection efforts and elevate freight issues in the planning process. The TRB proposed a different approach involving recommendations at both the national and MPO levels. At the national level, TRB recommended the creation of a clearinghouse devoted to evaluation methods, which DOT program agencies and local and state governments could use for sharing and comparing methods and examples of evaluations. At a more localized level, TRB recommended that programs in successor legislation should contain requirements for evaluating the performance of programs and that state and local governments should conduct evaluations to test the

⁴⁰Title I, Section 1503(i)(3)(A).

economic rationale for both existing projects and proposed projects requiring new government involvement in transportation investments.

Second Strategy: Providing a Wider Range of Funding and Related Options

The second strategy addresses the other main limitation identified by our own reviews and other researchers as a common obstacle to progress in resolving freight and overall congestion issues—financing and funding. In the current budgetary environment, along with long-range fiscal challenges confronting the country,⁴¹ substantial increases in current funding sources for all transportation projects will require a high level of justification. Yet, as our work has shown, intermodal freight projects that involve both public and private interests and may help foster both economic efficiency and growth have difficulty competing for limited transportation resources. Therefore, determining how federal policies and programs might be adjusted to address the limitations to funding freight projects raises the fundamental policy question of defining the appropriate scope of government involvement in freight improvements. When public subsidization of freight projects is determined to be appropriate through proper analysis, approaches such as expanding eligibility guidelines for existing federal programs, developing or expanding the range of funding and financing mechanisms that appropriately blend public and private funds to match public and private costs and benefits, and making maximum use of low-cost “nonbuild” approaches could be considered to address limitations in advancing freight improvements.

Determining the Appropriate Federal Role and Apportioning the Cost Burden among Beneficiaries

Transportation experts generally agree that determining the appropriate scope of government involvement and level of subsidization in freight-related and other projects is an important step in making transportation investment decisions. The underlying principle guiding the scope of government involvement is that such involvement should occur only to the degree that the private sector will not undertake a project needed to improve transportation mobility, and yet the project is deemed to be economically viable. There are a number of reasons why the private sector may not participate in such projects—for example, they may generate significant external or social benefits associated with reducing congestion and air pollution from which those in the private sector who would make the investment would receive no economic benefits.

⁴¹Speech made by the Comptroller General of the United States on September 17, 2003 entitled “Truth and Transparency: The Federal Government’s Financial Condition and Fiscal Outlook.”

Determining the scope of government involvement entails three basic steps: (1) determining that the project is worthwhile by applying a rigorous cost-benefit study; (2) justifying that government involvement is necessary based on known criteria; and (3) deciding on the level of subsidization required by the public sector reflecting the interests and benefits on a local, state, regional, or national level. As we have discussed previously, cost-benefit frameworks that transportation agencies currently use to evaluate various transportation projects could be more comprehensive in considering and quantifying a wider array of social and economic costs and benefits to determine whether public support is justified. Developing sound justifications and determining appropriate subsidy levels can be undermined by an absence of rigorous evaluation approaches, and there is broad consensus among transportation stakeholders that state and local planners need to improve their evaluation capabilities.

Justifying government involvement for freight transportation infrastructure projects involves having clear guidelines specifying the conditions under which public involvement is warranted. TRB has provided such guidelines in two recent reports.⁴² According to TRB, public support for freight infrastructure projects must be established on a project basis to determine if the project possesses certain characteristics, such as reducing the external costs of transportation, yields efficiencies in the transportation system beyond those recognized by the private sector, and/or meets some public safety need.⁴³ TRB contends that if government involvement cannot be justified on one of these grounds, the private sector should undertake the project.

Once the justification is established for public involvement in freight and other projects, the next critical decision involves deciding on the level of public subsidy. While in most cases, government involvement is often assumed to mean subsidization of a project, such involvement need not necessarily imply the need for, or appropriateness of federal subsidization. For example, a government agency might plan a project to be entirely self-

⁴²Transportation Research Board, *Special Report 252: Policy Options for Intermodal Freight Transportation* (Washington, D.C.: 1998) and Transportation Research Board, *Special Report 271: Freight Capacity for the 21st Century* (Washington, D.C.: 2002).

⁴³According to TRB, public support for freight infrastructure projects is appropriate if a project possesses certain characteristics, such as (1) reducing external costs of transportation, (2) producing external economic development benefits, (3) providing offsetting subsidies, (4) meeting a national defense need, and/or (5) is an established government responsibility.

supporting from user fees and private sector participant contributions; in this case, no government subsidy is involved. However, when public subsidization is being considered, particularly for freight infrastructure projects, the appropriate scope of government involvement must carefully be considered because of the public-private nature of these projects.

When public subsidization has been deemed appropriate, apportioning the cost burden among participants, or the beneficiaries of the project is the next critical step. This means identifying the beneficiaries and determining the level of benefits they are likely to derive from the project. According to TRB, “the candidates for paying for an intermodal freight transportation project are users (through tolls or other fees), other direct beneficiaries (e.g., owners of property adjacent to the development), the local public (through subsidies from local general tax revenues or tax concessions), the national public (through use of federal grants or tax-exempt bond finance), or indirect beneficiaries (e.g., application of road user fee revenues to rail transport on the grounds that rail use relieves road congestion).”⁴⁴ TRB further noted that, for some projects, these beneficiaries should pay the costs commensurate with the cost of providing the service to the user. For example, when users are the direct beneficiaries of the project, user fees, which involve each user paying a fee for the cost of the service provided, are the preferred method that should be considered for projects that directly benefit the users. On the other hand, when external benefits, such as the reduction of pollution or congestion, result from a project, a case can be made that public support be provided for the project, and the direct users should pay the net cost of the use of the service after deducting the public benefit. Further, if public beneficiaries are largely local (e.g., reducing suburban congestion), efficiency principles would call for the public subsidy to be at a local rather than federal level. Again, as in other aspects of the decision-making process, sound evaluations and the ability of local planners to quantify the benefits and their distribution are critically important to making good decisions.

Expanding Eligibility Guidelines for Existing Federal Programs

A concern voiced by national stakeholder groups and raised through our evaluation synthesis was that federal program eligibility requirements do not always lend themselves to certain types of freight improvement projects. For example, rail projects are eligible for federal aid funding or grants only if the project has a positive impact on air quality in a

⁴⁴Transportation Research Board, *Special Report 252: Policy Options for Intermodal Freight Transportation* (Washington, D.C.: 1998).

nonattainment area, involves modifying a rail line to accommodate a federal aid highway project, or results in specified improvements in safety. While carefully tailored eligibility assures only projects generating public benefits receive subsidies, these programs do not appear to be sufficiently fluid to allow support for the full range of freight projects, which might generate substantial public benefits. One way to address this concern might be to expand eligibility criteria to cover a broader range of freight projects—by adding specific types of freight projects to the guidelines of existing programs—to make it easier for states and MPOs to fund freight projects identified as priorities through the transportation planning process. However, unless a determination is made that the project meets the criteria or characteristics that justify government involvement, public support for freight projects may result in more significant needs going unmet.

A number of proposals have been made to expand eligibility criteria to include freight projects, including the following examples. (See table 4.)

Table 4: Examples of Stakeholder Proposals to Expand Eligibility Criteria to Include Freight Projects

Stakeholder	Proposal
Administration	<ul style="list-style-type: none"> • Allows the use of Surface Transportation Program funds for publicly owned intermodal freight transfer facilities and National Highway System funds for routes connecting to intermodal freight terminals. • Expands the types of private activities that can be financed with tax-exempt private activity bonds to include surface freight transfer facilities. • Expands the eligibility of the Transportation Infrastructure Finance and Innovation Act to include public or private freight rail facilities and intermodal freight transfer facilities.
Freight Stakeholders Coalition	<ul style="list-style-type: none"> • Expands eligibility guidelines by dedicating funds for National Highway System connectors and expanding the Corridors and Borders Program to include gateways.

Sources: The administration's surface transportation reauthorization proposal and the Freight Stakeholders Coalition proposal.

The provisions within the administration's proposal to expand eligibility generally leave decisions about whether to advance projects to the states and MPOs. The extent to which eligible freight projects actually received support would depend on the priority they received in these local funding decisions. While there are specific implications of each suggested modification, these options retain the basic funding flexibility framework

of ISTEA and TEA-21, which enables states and MPOs to determine their needs and identify the projects that are needed. This approach, however, may not go far enough in overcoming the difficulties in advancing freight improvements when their scope extends beyond the purview of individual states or MPOs. In such cases, many researchers and stakeholders have observed that public planners are wary about giving priority to freight projects when the costs are borne locally, but the benefits accrue nationally. Moreover, this approach does not recognize the intermodal nature of freight projects, since existing funding mechanisms tend to be modally focused. In addition, the administration's proposal contains one provision that would establish a mandatory set-aside of NHS funds to address intermodal connectors. Since this would provide a dedicated pool of funding for intermodal connectors, these projects would no longer have to compete with other nonfreight priorities. However, a set-aside runs counter to the flexibility that ISTEA and TEA-21 allow to MPOs and states and could result in other needs going unmet.

While expanding the eligibility of existing programs to cover a broader range of freight projects has benefits, it would not, in itself, provide a systemwide approach to addressing freight mobility improvements. Another option, however, would largely mitigate this planning limitation—establishing a federally administered program to address freight projects of national significance. A federal program to address freight projects of national significance offers another way to address freight corridors that are regional in nature and achieve a systemwide approach for planning freight improvements, taking multiple transportation modes and jurisdictions into account. This program could be structured either through a “top-down” approach, under which a federal agency actively identifies, develops, and evaluates freight projects, or a “bottom-up” approach, under which local governments and private parties develop proposals and compete for federal support. This approach would provide a dedicated pool of funding for freight projects and, thus, would reduce, although not totally eliminate, the competition at the local level for available funding with nonfreight projects.

In structuring such a program, suggestions have been made by various stakeholders. The Freight Stakeholders Coalition, for example, proposed a tenfold increase in funding for the Borders and Corridors programs. They also proposed expanding the eligibility guidelines of the Borders and Corridors programs to include gateways. Therefore, prioritizing projects based on a qualification threshold, such as volume and congestion, would be needed to focus funding on critical corridors, gateways, and intermodal

infrastructure. As noted above, to date, much of the funding for the Borders and Corridors programs has been allocated to congressionally designated projects, and the need has far surpassed the available funding for the programs, according to FHWA.

FHWA describes a federally administered program as one that could complement the decisions made at the state and local levels, not replace them. In other words, the program would not remove MPOs from considering and approving freight projects within their respective areas of jurisdiction; rather, it would augment the current process by addressing those freight projects of national significance that crossed the boundaries of local jurisdictions. In terms of the revenue sources for such a program, some have suggested a more indirect federal role in subsidizing the program's projects. For example, TRB has said that the government's most effective role in subsidizing freight projects of national significance would be as a provider of backup credit and as an absorber of risk rather than as a source of grants. This, according to TRB, would make the project accountable for its performance and would tend to improve project selection. Also, FHWA suggests that such a program would need to be a discretionary, as opposed to a formula-driven program, to allow greater flexibility for the federal government to identify and fund projects as the need arises.

Using Financing Mechanisms or Developing New Revenue Sources to Ensure a Blending of Public and Private Funds to Match Public and Private Costs and Benefits

Many stakeholders have argued that the level of transportation funding is insufficient to adequately address the challenges to freight mobility described earlier in this report. While more funding might appear to be an obvious solution, in the current budgetary environment, many stakeholders believe that other methods must be explored. One alternative would be to expand support for alternative financing mechanisms to access new sources of capital and stimulate additional investment in freight improvements. A closely related strategy involves raising new revenue through tolling and pricing strategies.

Alternative financing mechanisms include techniques such as loans and loan guarantees, providing credit assistance to state and local governments for capital projects, and using tax policy to provide incentives to the private sector for investing in freight improvements through, for example, bonds. When public transportation investment decisions are made based on sound evaluations, these mechanisms can lead to an appropriate blend of public and private funds to match public and private costs and benefits. Such mechanisms, however, currently provide only a small portion of the total

funding that is needed for capital investment and are not, by themselves, a major financing strategy for addressing freight mobility challenges.

The administration's proposal, for example, seeks to expand the eligibility of the TIFIA program, which provides loans, loan guarantees, and lines of credit. The proposal expands the eligibility of the program to include private freight rail facilities, access to intermodal freight transfer facilities, and allows for the grouping of projects. In addition, the loan threshold would be lowered from \$100 million to \$50 million. In addition, the administration's proposal would amend the Internal Revenue Code by expanding the eligibility of private activities that can be financed with tax-exempt private activity bonds to include freight-related projects.⁴⁵ Eligibility would be expanded to include all federal-aid eligible surface transportation projects and surface freight transfer facilities, such as intermodal rail yards.

Alternative financing mechanisms involve a careful evaluation of trade-offs involving their use. On one hand, expanding eligibility could encourage development of new funding sources for transportation projects by attracting private-sector participation in projects that serve both public and private ends. Also, they may be necessary tools for freight infrastructure; many freight operators are private entities, which currently makes it impossible or inappropriate to provide funding for them through direct federal grants. On the other hand, despite potential benefits, these mechanisms could result in higher costs to the U.S. taxpayer. For example, when we compared direct appropriations for transportation infrastructure projects with methods such as TIFIA loans or state and local tax-exempt or tax credit bonds, we concluded that a direct appropriation had the lowest combined cost to state, local, and federal governments for a given amount of transportation investment.⁴⁶ The U.S. Treasury has drawn similar conclusions. Further, because these approaches would allow public support for private infrastructure, it will be important that evaluations are conducted to prospectively test the economic rationale for government involvement in such projects and retrospectively evaluate whether intended benefits have been achieved.

⁴⁵Title IX, Section 9004.

⁴⁶[GAO-02-1126T](#).

A related feature of alternative financing approaches is the strategy for generating revenue from various tolling approaches, which can provide new sources of funding to address the increasing freight-related and other infrastructure needs. Tolling is often associated with alternative financing tools since nearly all require a dedicated revenue stream to repay borrowed funds. According to TRB, a greater reliance on tolls allows capacity to be more self-adjusting by rationing use, providing funds for expansion, and providing an indication of where expansion should occur in the long run. In concept, tolling on highways and major access roads is consistent with the premise that the users of the transportation facilities should pay the cost of those facilities. Also, to the extent that the private sector participates in building and maintaining toll roads or intermodal facilities, tolling can bring new funding sources into the financing mix, thus potentially reducing funding contributions of the public sector.

Tolling can take many forms, but two approaches are particularly relevant—tolling mainly to raise revenues and tolling instituted at peak driving times to reduce congestion.

- *Tolling as a revenue-generating source.* Tolling on some roads is done as a way of generating new revenues to pay for needed infrastructure rather than to reduce congestion. The Reason Foundation has suggested freight-specific tolling through self-financing toll truckways.⁴⁷ Toll truckways, solely for use by large trucks, could be custom-built and designed for use by longer and heavier trucks. Separating large trucks from other vehicles would improve safety along with transportation efficiency. In its study, the Reason Foundation concludes that trucking firms would be willing to pay a toll up to one-half of the cost saving that would be generated from the use of the truckways.
- *Tolling for congestion pricing.* Not only can pricing strategies generate revenue to help fund transportation investment, our past work has shown that this approach can potentially reduce congestion by providing incentives for drivers to shift trips to off-peak periods, use less congested routes, or use alternative modes, thereby spreading out demand for available transportation infrastructure.⁴⁸ A number of

⁴⁷Reason Foundation, *Toll Truckways: A New Path Toward Safer and More Efficient Freight Transportation* (Washington, D.C.: June 2002).

⁴⁸GAO-03-735T.

congestion pricing projects are in place in surface transportation, both here and abroad. For the most part, they demonstrate that congestion pricing can be successful. Congestion pricing also has the potential to generate sufficient revenue to help fund operations—and sometimes fund other transportation investment as well. For example, in San Diego, where users pay a toll to use a less crowded freeway lane, some of the revenues are used to operate a new express bus service, providing commuters with more travel options.

In one possible form of congestion pricing for public roads, tolls would be set on an entire roadway or road segment during periods of peak use. In another form, sometimes known as value pricing, peak-period tolls would be set on only some lanes of a roadway, allowing drivers to choose between faster tolled lanes and slower nontolled lanes. High-occupancy toll (HOT) lanes, under which drivers of single-occupancy vehicles are given the option of paying a toll to use lanes that are otherwise restricted to high-occupancy vehicles, are an example of value pricing. A more freight specific alternative, such as truck toll lanes, may also be a way to reduce congestion, expand capacity, and generate revenues.

Possible challenges to implementing congestion pricing include current statutory restrictions limiting the use of congestion pricing and concerns about equity and fairness across income groups. For example, tolls are prohibited on the Interstate Highway System, except for roads that already had tolls in place when they became part of the system or where exceptions have been made for pilot programs. Also, equity and fairness issues for low income and other groups have been raised, but there is evidence that these issues can be mitigated. Some projects have shown substantial usage by low-income groups, and other projects have used revenues generated to subsidize a low-income transportation option. In addition, some recent proposals for refining congestion pricing techniques have incorporated further strategies for overcoming equity concerns. For example, the Fast and Intertwined Regular (FAIR) lanes proposal in New York suggests crediting users of the nontolled lanes to partially pay for them to use public transportation, or to use the express lanes on other days.

The administration's proposal allows for the use of such alternatives in the form of variable toll pricing. The administration's proposal encourages the use of a variable toll pricing provision that would permit a state or public authority to toll any highway, bridge, or tunnel to manage existing high levels of congestion or reduce emissions. The administration's proposal

would also allow low-occupancy vehicles or solo drivers to pay a fee to use high-occupancy vehicle (HOV) lanes during peak travel periods.

Using Nonbuild Alternatives

Finally, a number of low cost alternatives can be used to expand the capacity and efficient use of existing infrastructure. These alternatives are a diverse mix, including corrective and preventative maintenance and rehabilitation, operations and system management, and new technology.⁴⁹ Keeping up with growth within the constraints that will be imposed on the transportation system in the future will not be possible through capital improvements alone; operators must also extract more service and capacity from existing facilities. Although many of these techniques are currently in use, public planners can more consistently consider a full range of techniques. Table 5 briefly describes the types of alternatives available with examples of stakeholder proposals that apply to each. While the administration’s proposal allows for the use of all of the nonbuild alternatives, many of the provisions do not require the consideration and analysis of these noncapital alternatives in evaluating capital projects.

Table 5: Description of Nonbuild Alternatives and Relevant Stakeholder Proposals

Type of alternative	Description	Examples of proposals
Increased maintenance and rehabilitation	This entails having a regular and a systematic corrective and preventive maintenance program at the state and local level to maintain the integrity of existing infrastructure and prevent or forestall major rehabilitation or replacement. Such a program can improve the speed and reliability of freight travel.	In the administration’s proposal, maintenance and rehabilitation is addressed through the establishment of a new program—the Infrastructure Performance and Maintenance Program—which focuses on projects that preserve existing highway facilities or alleviate traffic chokepoints.

⁴⁹Tolling for congestion pricing, discussed earlier as an alternative financing approach, is another nonbuild alternative. Congestion pricing can spread out demand on existing infrastructure, thereby reducing congestion and expanding system capacity.

(Continued From Previous Page)

Type of alternative	Description	Examples of proposals
Improving management and operations	This involves using existing infrastructure more efficiently, which adds capacity. Examples include installing modern traffic control systems and developing strategies to handle traffic accidents and breakdowns.	The administration's proposal requires transportation plans to contain operational and management strategies. It also encourages transportation agencies to collaborate and coordinate on a regional level for improved systems management and operations.
Developing and using new technology	This includes Intelligent Transportation Systems (ITS) that are designed to enhance the safety, efficiency, and effectiveness of the transportation network. ITS can serve as a way of increasing capacity and mobility without making major capital investments.	The administration's proposal addresses ITS through an Intelligent Transportation Systems Performance Incentive Program. The goal of the incentive program is to accelerate the integration and interoperability of ITS to improve the performance of the surface transportation system in metropolitan and rural areas. Funding would be directly tied to criteria that reflect each state's performance outcomes with respect to established criteria for enhanced safety, operations, and mobility.

Source: GAO and the administration's reauthorization proposal.

Building in Basic Economic and Management Principles into Reauthorization Strategies and Provisions Could Enhance Capacity and Performance of Freight Mobility

Congress will formulate a new national transportation policy when it reauthorizes TEA-21. Our past work and our review of numerous studies by a diverse group of transportation experts show that the planning and financing processes established by core transportation legislation make it difficult for freight mobility projects to compete with nonfreight projects. Our work has also led us to identify sound principles that, if integrated into the transportation planning and financing strategies and provisions of the new legislation, would better assure that the freight infrastructure system provides the level of capacity and performance that makes the greatest contribution to the nation's economic well-being.

While not an all-inclusive list, we have synthesized three main guiding principles, often mentioned by transportation experts, for use in structuring federal support.

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- *Promote efficiency by embracing “user pay” principle.* Public financial support to individual private entities or transportation modes is best structured so as to minimize distortion of any competition. Competition will be enhanced and efficiency will be promoted when capital and operating costs for infrastructure are paid from the revenues or fees charged to the direct users or beneficiaries of the facilities. Reliance on revenue from users will increase the likelihood that the most worthwhile improvements will be implemented and that facilities will be operated and maintained efficiently, according to transportation experts. Fees assessed on each mode (user) need to be accurately aligned with the costs each mode or vehicle imposes on the transportation system. Where user fees and costs are not aligned, a mode may enjoy an advantage over another in competing to transport goods. For example, according to TRB, the heaviest combination trucks pay a smaller share of the expenditures highway agencies incur to serve them.⁵⁰ From an economic standpoint, this level of taxation distorts the competitive environment with railroads and other modes that could also move the goods by making it appear that these heavier trucks are a less expensive means for shippers to transport their goods than they really are. Better matching of fees to costs could provide incentives for shippers to make modal choices and transportation options based on true costs. Transportation experts recommend that, to ensure market outcomes of competition between trucking and other modes are in the public interest, adjusting user fees is preferable to providing off-setting subsidies to competing modes, such as railroads.
 - *Establish performance measures and expectations and build in accountability.* Leading organizations have stressed the importance of developing performance measures and linking investment decisions and their expected outcomes to overall strategic goals and objectives. Doing so is valuable in evaluating the effectiveness of investment decisions, and it provides decision makers with valuable information for determining whether intended benefits were achieved and whether goals, responsibilities, and approaches should be modified. Establishing a framework for performance and accountability involves three key components—setting expectations for performance outcome, developing and maintaining an information system to capture critical

⁵⁰Transportation Research Board, *Special Report 271: Freight Capacity for the 21st Century* (Washington, D.C.: 2002); Transportation Research Board, *Special Report 252: Policy Options for Intermodal Freight Transportation* (Washington, D.C.: 1998); and [GAO-02-775](#).

performance-related data, and establishing a mechanism for evaluating and reporting results. Transportation experts have suggested that such a framework be built into legislation as a means of better ensuring effective use of transportation dollars. The Brookings Institution, for example, recently recommended that Congress should subject MPOs to enhanced accountability measures and require states and MPOs to maintain information systems on indicators of national significance, such as daily vehicle miles traveled, improving air quality, lowering transportation costs, and expanding transportation options. Brookings also recommended establishing annual performance objectives and holding decision makers accountable by establishing consequences for excellent and poor performance. TRB has suggested similar measures including the need for systematic and uniform retrospective evaluations after projects are completed to assess the financial and economic performance of completed projects and facilities in operation. As discussed above, none of the states or MPOs in the locations we visited currently perform retrospective evaluations. TRB also recommended developing benchmarks to evaluate existing or proposed transportation facilities. The benchmarks would be a systematic comparison of performance measures, such as physical efficiency, cost, and rate of return; such benchmarks would be used to evaluate a specific facility under construction with other similar facilities, including state-of-the-art facilities abroad.

- *Align incentives for planning agencies to adopt best practices and to achieve expectations.* Aligning incentives for existing and new programs or approaches to facilitate the use of better freight transportation project planning and financing options could improve the efficiency of federal transportation programs in enhancing freight mobility. Better aligning both intended and de facto incentives of federal programs could elevate freight consideration in transportation planning and investment decisions more effectively than rigid direction or mandatory programs and is consistent with the ISTEA and TEA-21 premise of providing state and local planners with broad flexibility to address the nation's transportation needs. To be effective, incentives should be tangible and significant enough to address the need and spur action. Incentive approaches can take many different forms, as evidenced by varied suggestions from transportation experts and stakeholders. FHWA has suggested, for example, that to promote a more system-wide approach to planning freight improvement projects, incentives could be offered to multistate or regional coalitions or organizations. One such incentive would provide funding to support

freight planning or financing for projects that meet certain criteria, such as involving multiple states or modes. TRB has noted, for example, that as an incentive for states to experiment with alternative financing and management methods, Congress could set aside a fund dedicated to projects on roads where the highway agency has implemented efficient maintenance, traffic control, and other management measures, according to specified definitions. TRB has also suggested that as part of the highway program reauthorization, Congress should consider measures to reduce obstacles and provide incentives to private participation in highway development. Others have suggested that to promote the use of low cost, noncapital alternatives to more efficiently use existing infrastructure, a system could be established in which federal support would reward those states and localities that apply federal money to gain efficiencies in their existing transportation system. Different matching criteria would be one way to provide these rewards. For example, to spur consideration of preservation of existing infrastructure, matching requirements could be changed to a 50 percent federal share for building new capacity and an 80 percent share for preservation. The Brookings Institution, for example, has recommended consideration of other types of incentives—for example, that Congress should allow DOT to maintain a small incentive pool to reward states and MPOs that consistently perform at the exceptional level.⁵¹ Ideally, an intentional alignment of the full range of existing programs and policies would emerge from a rigorous retrospective evaluation of both intended and de facto incentives provided by current programs and policies.

Conclusions

The current system for planning and financing transportation infrastructure projects is not well suited to advancing freight transportation improvement projects, and fundamental changes are needed that take a broader, systemwide approach to planning and financing freight projects and that foster active participation by the private sector in this process. Without such changes, growing congestion, coupled with a doubling of freight volume in the next two decades, could overwhelm the capacity of our nation's transportation infrastructure and

⁵¹The Brookings Institution, *Improving Metropolitan Decision Making in Transportation: Greater Funding and Devolution for Greater Accountability* (Washington, D.C.: October 2003).

thereby severely impede goods movement. This, in turn, would likely negatively impact the nation's economic well-being and productivity.

Reauthorization of TEA-21 represents an opportunity to examine current federal policies and programs and determine how best to address freight mobility issues. The range of freight-related options proposed by various freight stakeholders is broad and sometimes controversial, and selecting among these options and splicing them together into a cohesive package represents a significant challenge. A blend of measures offers promise in two broad strategies: first, to promote a systemwide approach to planning and transportation investment decision making, and, second, to provide an array of flexible financing approaches and funding sources for freight-related infrastructure improvements. Taken together, these strategies offer a balanced approach to enhancing freight mobility. Optimum results could be furthered if three overarching economic and management principles are applied in the development and refinement of reauthorization provisions. These include (1) promoting efficiency by enhancing "user pay" principle, (2) maximizing a performance-based program, and (3) aligning the incentives for planning agencies and investment decision makers to focus on efficiency and results.

One issue requires immediate attention because of its importance in the process for both planning and financing transportation infrastructure. State and local planners, in particular, need—but lack—sound, economically based methods and approaches and sufficient freight-related data to perform a variety of critical planning and financing functions. The absence of these analytical methods and data undermines local planners' abilities to develop evaluations essential to support public transportation decisions; to assess viable alternative solutions, including multimodal solutions; to justify government involvement in and subsidy levels for projects; and to retrospectively assess projects and hold planners accountable for their decisions. Because this issue is so critical to the entire process, it is important that state and local planners adopt sound, consistently applied methods and develop and enhance data collection efforts.

Recommendations for Executive Action

To encourage the use of sound evaluation and data collection efforts among state and local transportation planners, we recommend that the Secretary of Transportation:

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- Develop evaluation approaches for state and local planners to use in making freight-related and other transportation investment decisions and actively work with transportation planners to achieve implementation of these approaches. In developing these approaches, DOT should promote the incorporation of key elements of effective planning, including systematic cost-benefit analyses, evaluation of noncapital alternatives, inclusion of external benefits (e.g., congestion and pollution costs), and routine performance of retrospective evaluations.
 - Facilitate the collection of freight-relevant data that would allow state and local planners to develop and use a broad range of evaluation methods and techniques, such as demand forecasts, modal diversion forecasts, estimates of effects of proposed investments on congestion and pollution, and other factors, as they make transportation investment choices.

Agency Comments and Our Evaluation

We provided a draft of this report to the Department of Transportation for its review and comment. Generally, the department agreed with the facts presented in the report. Department officials provided a number of comments and clarifications, which we incorporated to ensure the accuracy of our report. The department did not take a formal position on GAO's recommendations. Department officials raised two points that were either outside the scope of our work or were not addressed by freight stakeholders at locations we visited or discussed in various reports included in our evaluation synthesis. First, department officials noted that expanding port business hours should be considered as a nonbuild option to relieve congestion. Although we do not disagree with the expansion of hours as a potential nonbuild option, it was not raised in either our evaluation synthesis or expressed as a major congestion issue during our case study work. Second, department officials indicated that intermodal freight movement is larger than depicted in the report and involves many transportation communities essential to productive freight movement. These include shippers, receivers, warehouses, and trucking companies. We recognize this point as well, but we were asked to focus on international gateways around major containerized ports, since this is where transportation congestion is often most acute and where intermodal solutions are critically needed. In addition, while we do not explicitly identify all of the various communities involved in freight movement, our discussion of the private and public sectors is intended to encompass all of the communities involved in freight movement. To this end, we have

described the key entities involved in freight movement in the background section.

As agreed with your offices, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the report date. At that time, we will send copies of the report to the Secretary of Transportation. We also will make copies available to others upon request. In addition, the report will be available at no charge on the GAO Web site at <http://www.gao.gov>.

If you have any questions about this report, please contact me at heckerj@gao.gov or (202)512-2834 or Randall Williamson at williamsonr@gao.gov or (206)287-4860. GAO contacts and acknowledgments are listed in appendix VI.



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Objectives, Scope, and Methodology

The objectives of this report were to identify (1) the national challenges to freight mobility and how these challenges were evident at selected container ports and surrounding areas, (2) the existing limitations to effectively addressing these challenges, and (3) strategies that may help public decision makers improve freight mobility, including a discussion of relevant provisions of selected proposals related to reauthorization of federal surface transportation programs. To address these objectives, we conducted an evaluation synthesis of national reports and studies, an analysis of proposals issued by numerous stakeholders addressing reauthorization of TEA-21, and case studies at six international gateway container ports.

We conducted an evaluation synthesis of research reports, analytical studies, and proposals issued by numerous stakeholders to gain a national perspective of freight mobility issues. This was done through an extensive literature review and analysis of key categorical findings. Findings were supplemented with interviews of key officials in federal agencies and national association representatives to include, at the Department of Transportation: the Office of Intermodalism, Office of Freight Operations, the Federal Highway Administration, Federal Railroad Administration, Maritime Administration, and stakeholders including the American Trucking Association, Association of Metropolitan Planning Organizations, American Association of Port Authorities, Association of American Railroads, and the American Association of State Highway and Transportation Officials.

To identify challenges to freight mobility and the efforts to address them, we also conducted case studies of international gateway ports and their surrounding areas. We adopted a case study methodology because, while the results cannot be projected to the universe of ports, case studies are useful in illustrating the range and complexity of challenges and projects implemented to address those challenges. Our efforts included in-person interviews along with follow-up questions via telephone and e-mail, visual observations of ports and their surrounding areas, and collection of pertinent documents for analysis. The ports selected were geographically representative and comprised more than 65 percent of U.S. container traffic by volume. We conducted case studies of six regions containing 10 container ports including Charleston, SC; Seattle/Tacoma, WA; Los Angeles/Long Beach, CA; San Francisco/Oakland, CA; New York/New Jersey; and Houston, TX. The information collected and analyzed may not be representative of other types of ports, such as smaller container ports and noncontainer ports. The information collected included information

regarding the planning process, both at the state and local level; the metropolitan organization's role, funding, and financing; private-sector participation; data and use of nonbuild tools; and security. In the area of security, we reviewed previous GAO studies on this issue, but because of ongoing studies and the enormity and complexity of evaluating the security issues involved in protecting the transportation system, we did not address, in this report, barriers that agencies and others face to implement sound security measures or evaluate options offered by others or efforts under way to strengthen transportation security. These issues will be more fully addressed as part of other ongoing and future studies.

To identify strategies that may aid decision makers in enhancing freight mobility, we relied extensively on perspectives gained from our past work in transportation and infrastructure systems and federal investment strategies and other perspectives gained through our evaluation synthesis. We assessed the reauthorization proposals developed by key stakeholders within the context of these strategies.

We conducted our work from October 2002 to November 2003 in accordance with generally accepted government auditing standards

Summary of the Administration's 2003 Surface Transportation Reauthorization Proposal

Freight-related Provisions and Observations

I. Planning

- 1. State planning and research (Title I, Section 1503(i)(1)(B)).** Two and one-half percent of the sums apportioned to a state for state planning and research to be made available for a number of activities, including freight planning.
- 2. Transportation planning (Title VI, Section 6001, subsection 5203(e)(4)).** Metropolitan planning organizations (MPOs) are encouraged to coordinate their planning processes with officials responsible for other types of planning activities that are affected by transportation, including freight.
- 3. Multistate corridor planning program (Title I, Section 1806(f)(1)).** States and other jurisdictions are encouraged to work together to develop plans for multimodal and multijurisdictional transportation decisionmaking and to prioritize multimodal planning studies.

Observation: Although these provisions are consistent with Intermodal Surface Transportation Efficiency Act (ISTEA) and Transportation Equity Act of the 21st Century (TEA-21) in that they emphasize the importance of freight transportation and continue the decentralized planning approach, states and MPOs are best positioned to make decisions on transportation planning and project selection; encouragement alone may not be enough to overcome planning challenges.

- 4. State planning and research (Title I, Section 1503(i)(3)(A)).** Not less than 20 percent of the dedicated state planning and research funds (2 ½ percent of the sums apportioned to a state for state planning and research) to improve the collection and reporting of strategic surface transportation data to provide critical information about the extent, condition, use, performance, and financing of the nation's highways (including intermodal connectors) for passenger and freight movement.

Observation: Requiring a set-aside may increase freight data collection efforts, which may lead to an elevation of freight issues in the planning process. Requiring a set-aside, however, may be viewed as an unwelcome mandate that negatively

affects the ability of states and MPOs to address their unique transportation needs.

II. Financing

- 1. Freight transportation gateways; freight intermodal connections (Title I, Section 1205, subsection 325).** Creates a new program that adds state responsibilities and allows the use of Surface Transportation Program (STP) and National Highway System (NHS) funds for freight-related projects. (1) State responsibilities include ensuring that intermodal freight transportation, trade facilitation, and economic development needs are adequately addressed and fully integrated into the project development process; designating a freight transportation coordinator responsible for fostering public- and private-sector collaboration needed to implement complex solutions to freight transportation and freight transportation gateway problems; and encouraging the adoption of innovative financing strategies for freight transportation gateway improvements. (2) Allows states to obligate STP funds for publicly owned intermodal freight transfer facilities, access to such facilities, and operational improvements for such facilities. (3) Requires a set-aside of NHS funds for NHS routes connecting to intermodal freight terminals.

Observation: Since the STP funds are part of the state apportionment and the provision is not requiring the use of the funds for freight-related projects, freight transportation projects would still have to compete with other projects in the planning process. While the mandatory set-aside of NHS funds for intermodal connectors would directly address the problems associated with NHS intermodal connectors, it runs counter to the funding flexibility established in ISTEA and TEA-21.

- 2. Transportation Infrastructure Finance and Innovation Act (TIFIA) amendments (Title I, Section 1304).** Modifies the TIFIA program by (1) expanding the eligibility to include a public or private freight rail facility, an intermodal freight transfer facility, access to such facilities, and service improvements for such facilities; or grouping of such projects with the common objective of improving the flow of goods; (2) reducing the threshold from \$100 million to \$50 million; and (3) revising the lines of credit clause

by removing the requirement that TIFIA lines of credit be drawn upon as a last resort.

Observation: (1) Adding “private freight rail facilities” would suggest that rail lines would be eligible for TIFIA assistance. In such a case, public funds could potentially be used for privately owned infrastructure. The expanded definition would also allow for the grouping of projects, which may enable smaller projects to be packaged together to meet the eligibility project cost threshold requirement. (2) Lowering the loan threshold would make many more projects eligible. (3) Expanded use of TIFIA loans as a result of these changes could heighten federal risks.

3. **Private activity bonds (Title IX, Section 9004).** Expands the eligibility of private activities that can be financed with tax-exempt private activity bonds to include surface freight transfer facilities, defined as facilities for the transfer of freight from truck to rail or rail to truck (including any temporary storage facilities directly related to such transfers). The total amount of the bonds issued for highway facilities and surface freight transfer facilities cannot exceed \$15 billion.

Observations: Expanding eligibility could encourage development of new funding sources for freight projects by attracting private-sector participation in such projects. However, expanded eligibility could potentially result in higher costs to the taxpayers. Bonds can be more expensive than grants because the governments have to compensate private investors for the risks that they assume.

III. Nonbuild Tools

1. **Infrastructure Performance and Maintenance Program (Title I, Section 1201).** Creates a new program intended for projects that would preserve, maintain, or extend the life of existing highway infrastructure elements or provide operational improvements, including traffic management and intelligent transportation system (ITS) strategies and limited capacity enhancements, at points of recurring highway congestion.

2. **Transportation planning (Title VI, Section 6001, Subsection 5203(g)(2)(C)).** A transportation plan will be required to contain, among other things, operational and management strategies to improve the performance of existing transportation facilities to relieve vehicular congestion and maximize the safety and mobility of people and goods.

3. **Transportation systems management and operations (Title I, Section 1701, subsection 165(b)(3)).** Allows the Secretary of Transportation to assist and cooperate with other departments and agencies to improve regional collaboration and real-time information sharing; issue, if necessary, new guidance or regulations for the procurement of transportation system management and operations facilities equipment, and services; and approve for federal financial assistance support for regional operations collaboration and coordination activities that are associated with regional improvements.

Observation: While these provisions allow for the use of these tools, there is no explicit requirement to evaluate the effectiveness of the tools to discern whether intended benefits have been achieved.

4. **Intelligent Transportation Systems Performance Incentive Program (Title I, Section 1703).** In the area of ITS, the provision would allow funds to be used for projects involving planning, deployment, integration, and operation of ITS. The funding formula would be based on the following criteria that reflect each state's (1) reductions in delay due to incidents, (2) improvements in the operation and safety of signalized intersections, (3) reductions in delay and improvements in safety of work zones on the NHS, (4) improvements in the efficiency and reliability of transit services, (5) overall improvement in integrated regional transportation operations, (6) improvements in the quality and availability of traveler information, (7) improved crash notification, and (8) improvements in the safety and productivity of commercial vehicle operations in the NHS.

Observation: Tying funding to performance outcomes increases the likelihood that agencies will endeavor to improve performance.

- 5. Toll programs (Title I, Section 1615).** The provision would allow a state or public authority to toll any highway, bridge, or tunnel, including facilities on the Interstate Highway System, to manage existing high levels of congestion or reduce emissions in a nonattainment area or maintenance area. The tolls must vary in price according to time of day to manage congestion or improve air quality. A state may also permit vehicles with fewer than two occupants to operate in high-occupancy vehicle (HOV) lanes as part of a variable toll pricing program.
- 6. Use of HOV lanes (Title I, Section 1610).** Responsible agencies may permit vehicles that do not satisfy the established occupancy requirements to use an HOV facility only if they charge such vehicles a toll. Any agency electing to toll such vehicles shall also (1) establish a program that addresses how motorists can enroll and participate; (2) develop, manage, and maintain a system that will automatically collect the tolls that vehicles must pay; (3) continuously monitor, evaluate, and report on performance; (4) establish the policies and procedures for varying the toll that is charged to manage the demand to use the subject facilities and enforce violations; and (5) establish procedures that will limit or restrict the use of such vehicles, as necessary, to ensure that the performance of individual facilities or the entire system does not become seriously degraded.

Observation: Pricing incentives such as these can enhance economic efficiency by making users take into account the external costs they impose on others.

Summary of Freight-related Recommendations Developed by the Transportation Research Board

I. Planning

- 1. Department of Transportation (DOT) data and analysis programs.** Continued support should be given to the development of DOT capabilities for economic analysis of the federal aid highway program and federal highway user fees and to the application of this analysis in support of decisions.
- 2. Evaluation methods.** As one means of promoting more useful evaluation at the federal and state levels, a clearinghouse devoted to evaluation methods within DOT should be created where DOT program agencies and local and state governments could share and compare methods and examples of evaluations.

II. Financing

- 1. Maintain and reinforce the principle of user financing by reforming the structure of fees so that they more closely relate to costs each highway user imposes.**
- 2. Provide funding adequate to ensure that the states have resources to maintain the overall performance of the highway system.**
- 3. Programs in successor legislation should meet certain criteria.** These programs should (1) sustain the “user pays” principle, which involves paying capital and operating costs from the revenues of fees charged to the direct users of the facilities; (2) sustain the support of the affected parties that the federal user fee financing system enjoys by funding projects that fee payers recognize as having value to them; (3) ensure that the market outcomes of competition between trucking and other modes are in the public interest, primary reliance should be placed on adjusting user fees rather than supply offsetting subsidies to the competing modes; and (4) establish requirements for ongoing and retrospective evaluation of the performance of the programs for federal multimodal credit assistance programs.
- 4. DOT should study the costs and market potential of exclusive truck facilities.**

**Appendix III
Summary of Freight-related
Recommendations Developed by the
Transportation Research Board**

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- 5. State and local governments should routinely conduct evaluations to quantitatively test the economic rationale for government involvement in their freight transportation infrastructure projects. Federal programs should require such evaluations of projects receiving federal assistance.**

Summary of the Freight-related Reauthorization Proposals Developed by Stakeholders

I. Proposals to Address Planning Barriers:

American Association of State Highway and Transportation Officials proposed (1) the development of a freight planning capacity building process jointly sponsored by Department of Transportation (DOT) and American Association of State Highway and Transportation Officials (AASHTO) wherein up to \$10 million annually would be provided to support an initiative through which DOT and the state DOTs would jointly develop and implement a training and capacity-building program to strengthen the ability of state and local transportation agencies to effectively address freight transportation issues, (2) enacting an increase in the Federal Highway Administration's (FHWA) research and technology program allowing a greater emphasis on freight transportation research and creating a Freight Transportation Cooperative Research Program, and (3) creating a Freight Advisory Group to communicate with one voice to DOT on freight transportation issues.

Local Officials for Transportation proposed (1) encouraging the development of a seamless transportation system by connecting all modal elements to ensure the efficient movement of people and goods and (2) developing new approaches to help localities combat increasing urban congestion.

Association of American Railroads proposed encouraging that freight issues be given additional consideration in state and local transportation planning.

American Trucking Associations proposed (1) producing a national Freight Transportation Improvement Program (FTIP) that focuses on transportation corridors with heavy freight usage relative to the national economy and relative to regional populations and economic activity;¹ (2) establishing a Freight Advisory Board to review and comment on the FTIP; (3) requiring that MPO governing boards include representatives from the freight community; (4) setting aside a portion of the MPO funds for the salaries and training of freight planning specialists; (5) establishing a Freight Cooperative Research Program; (6) establishing a discretionary

¹The American Trucking Associations proposed that the purpose of the FTIP is to identify corridors that are currently deficient or are likely to become deficient given projected freight transportation demands and specific local system bottlenecks, including deficient intermodal connectors.

program that provides research grants to states, MPOs, multijurisdictional transportation planning groups, and private-sector groups; and (7) funding and supporting multimodal research programs that benefit and improve the safety and productivity of the trucking industry, as well as fostering innovative partnerships with the private sector.

Association of Metropolitan Planning Organizations proposed continuing efforts in the area of goods movement data and setting regional priorities.

American Public Transportation Association proposed a pilot program that will identify the benefits of shared use of freight rail corridors by freight and light rail. Although shared use is common in Europe, Federal Railroad Association (FRA) has a number of regulatory requirements that restrict this practice. The proposals called for amending federal transit law to provide for this pilot program to be carried out jointly by Federal Transit Administration (FTA) and FRA. It would draw on European experience with shared use of freight rail corridors to demonstrate that operations can be safe, effective, and smooth. Separate funding would not be available for the program. Instead, applicants would use existing resources to support it. Conclusions drawn from the pilot program would be the basis for FRA to revise its current regulatory framework.

II. Proposals to Address the Limitations with Existing Funding/Financing Programs

American Association of State Highway and Transportation Officials proposed (1) the use of existing innovative finance tools and new financing mechanisms for investments in freight transportation infrastructure such as lowering the Transportation Infrastructure Financing and Innovation Act (TIFIA) project dollar threshold, expanding the eligibility of freight projects and relaxing repayment requirements, allowing pooling of modal funds, expanding the state infrastructure bank (SIB) program to all states, creating tax incentives for freight rail and intermodal infrastructure investment, and exploring the utility of a Transportation Finance Corporation as a financing mechanism for freight projects; (2) tailoring existing and proposed innovative financing techniques to make increased investment in intermodal connectors possible in combination with increases in core Transportation Equity Act for the 21st Century (TEA-21) programs; (3) focusing the National Corridor Planning and Development Program and the Coordinated Border Infrastructure Program more tightly on freight corridors and augmenting

funding from the Highway Trust Fund with innovative financing; (4) clarifying the eligibility of freight projects for Congestion Mitigation and Air Quality (CMAQ) funding; (5) increasing the funding for the highway rail grade crossing program (section 130)² proportionate to the increase in the overall highway program; and (6) expanding and reforming the Rail Revitalization and Improvement Funding Program (RRIF).

Association of American Railroads proposed (1) providing tax incentives and tax-exempt financing to companies making investments in intermodal freight infrastructure; (2) allowing funding of rail infrastructure through the issuance of tax-exempt indebtedness, increasing the amount of low-interest loans and loan guarantees available through the RRIF program, and removing overly restrictive regulatory requirements that have hindered program implementation; (3) increasing funding for the section 130 grade crossing program and allowing funds to be spent on maintenance activities; (4) increasing funding and clarifying freight project eligibility for the CMAQ program; and (5) increasing funding for the Corridors and Borders program and liberalizing project eligibility criteria.

American Road and Transportation Builders Association proposed increasing the amount of funding available nationally under TIFIA and reducing the overly restrictive qualifications and criteria that discourage expanded use of the tool.

American Trucking Associations proposed (1) ensuring that revenues are dedicated to projects and programs that serve national economic, safety, and research interests; (2) preventing further diversion of highway user revenues to nonhighway projects; (3) creating new innovative financing programs that allow states to fund extremely high-cost highway projects designed to expedite the movement of freight; (4) opposing the adoption of any new highway user fees on the trucking industry or increases in existing user fees; (5) preventing further diversion of highway user revenues to nonhighway freight projects; and (6) dedicating adequate resources to the development of infrastructure and human resources along the U.S. borders with Canada and Mexico in order to meet the challenges associated with rapidly increasing trade growth.

²Section 130 is a program to enhance safety at highway-rail grade crossings on public highways.

Association of Metropolitan Planning Organizations proposed (1) promoting the use of innovative financing arrangements, through providing more incentives, greater flexibility in regulations, and removal of barriers to public-private joint development;³ (2) giving additional assistance to metropolitan areas at major entry ports and intermodal hubs; (3) using Highway Trust Fund or other federal funding sources in excess of current authorizations to increase program capacity to support the safe and efficient movement of goods in corridors that are crucial to national economic security and vitality; and (4) broadening the eligibility of freight project funding, providing incentives to attract private investment, and allowing port access and gateways to be eligible for the Corridors and Borders programs.

III. Proposals That Would Allow for the Use of Nonbuild Tools

American Road and Transportation Builders Association proposed exploring new technologies to help meet system and mobility needs.

American Trucking Associations proposed elevating highway operations to a level comparable to highway construction and maintenance with comparable increases in funding for operations. As part of this increased focus on operations, the DOT should continue to support and fund research into improved highway operations.

Association of Metropolitan Planning Organizations proposed (1) managing existing capacity better through traditional congestion management techniques and ITS and (2) giving MPOs the responsibility for determining which institution in their region should lead the development of metropolitan-level management and operations plans.

Local Officials for Transportation proposed increasing funding for all existing research and technology programs that directly benefit local government.

U.S. Conference of Mayors proposed (1) suballocating surface transportation funds to metropolitan areas for repair and maintenance of

³The Association of Metropolitan Planning Organizations provides the following specific changes that should be considered: increasing direct federal capitalization of infrastructure banks, making changes to tax-exempt bond finance restrictions, removing barriers to public-private joint development, and broadening eligibility rules and relaxing thresholds on innovative financing tools already available.

**Appendix IV
Summary of the Freight-related
Reauthorization Proposals Developed by
Stakeholders**

existing urban highways while giving equal weight to other transportation needs and (2) dedicating resources to combat increasing metropolitan congestion through the expanded use of ITS technology.

Assessment of Stakeholder Proposals

Stakeholder proposals vary considerably in the degree to which they address the various elements of the strategies to address planning and financing limitations. Table 6 shows the most extensive proposals that have been made, together with our assessment of which elements of the two strategies are present in the proposal. (In the table, an “X” indicates whether the proposal addressed this element in some manner; it does not indicate the nature or extent of the action.) As the table shows, the broadest representation of these elements is contained in the administration’s surface transportation reauthorization proposal. Collectively, the proposals touch on all of the elements of these strategies, although no single proposal currently contains the breadth of elements that will be needed to address the multidimensional limitations inherent in the public planning process and in federal funding/financing programs.

Table 6: Coverage of Strategy Elements in the Most Extensive Reauthorization Proposals

Reauthorization proposal	Elements of planning strategy			Elements of financing strategy		
	Coordination	Private involvement	Data and tools	Expand eligibility	Alternative finance	Nonbuild tools
Administration’s 2003 surface transportation reauthorization proposal	X	X	X	X	X	X
Freight Stakeholders Coalition	X	X		X	X	
American Association of State Highway and Transportation Officials		X		X	X	
Association of American Railroads				X	X	
American Trucking Associations	X	X				X
Association of Metropolitan Planning Organizations			X	X	X	X
American Road and Transportation Builders Association					X	X

Source: GAO analysis of selected system stakeholder reauthorization proposals.

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