

GAO

Report to the Senate Committee on
Commerce, Science, and Transportation
and the House Committee on
Transportation and Infrastructure

July 2005

FREIGHT TRANSPORTATION

Short Sea Shipping Option Shows Importance of Systematic Approach to Public Investment Decisions



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Highlights

Highlights of [GAO-05-768](#), a report to the Senate Committee on Commerce, Science, and Transportation and the House Committee on Transportation and Infrastructure

Why GAO Did This Study

A dramatic increase in freight moving on the nation's highways and rail lines, coupled with growing congestion and infrastructure limitations, has prompted DOT to explore new mobility-enhancing options like short sea shipping (SSS)—transporting freight by water between domestic ports, either along the coast or on inland waterways. This report describes (1) why SSS is being considered and factors affecting its viability, (2) the department's role in the development of this option, and (3) issues that should be considered by public transportation decision makers when making investment decisions about this option or other types of projects for addressing freight mobility challenges. This report is based on a review of pertinent studies, federal activities, and an examination of two new SSS operations.

What GAO Recommends

GAO recommends that the Secretary of DOT and the Administrator of the Maritime Administration: (1) develop a more thorough understanding of SSS issues before defining a federal role involving substantial federal investment and (2) use current mechanisms to encourage other public decision makers to use a systematic approach for making investment decisions on freight mobility projects.

DOT officials generally agreed with the contents and agreed with the recommendations in this report.

www.gao.gov/cgi-bin/getrpt?GAO-05-768.

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

FREIGHT TRANSPORTATION

Short Sea Shipping Option Shows Importance of Systematic Approach to Public Investment Decisions

What GAO Found

Transportation experts have cited numerous benefits, such as congestion mitigation, for developing short sea shipping, but they have also noted numerous obstacles, such as shippers' reluctance to try a different mode for transporting their cargo, that impede its development. Absent in-depth information on the benefits and obstacles, opinions vary on how to proceed. Some stakeholders favor extensive public involvement, including federal funding for projects while others see a more limited public role, such as addressing regulatory provisions that may interfere with its development. The two new services GAO examined provide insights—but no clear answers—about the viability of this approach.

The Department of Transportation (DOT) has made short sea shipping a high-priority option to enhance freight mobility and has drafted a policy proposal to provide potential federal funding. So far, the department's efforts have been too narrowly focused. Before determining that federal funding should be applied to its development, a thorough understanding of key issues is required, such as the potential effect of federal involvement on the competitive balance among all transportation modes, lessons to be learned from recent start-up services, and actions that could mitigate identified obstacles, particularly with respect to reluctance to use this option.

Public transportation decision makers are also actively considering short sea shipping in the context of a range of other options to address freight mobility challenges in their jurisdictions. Improving freight mobility, however, is a particularly complex challenge because the freight transportation system encompasses many modes on systems owned, funded, and operated by both the public and private sectors. In light of growing budget deficits, public decision makers must guard against waste of limited public resources when making investment decisions. This report contains a four-step approach for helping public decision makers define the rationale for public involvement, assess the merits of projects, determine the appropriate level and type of public support, and evaluate project results.

Self-propelled Short Sea Shipping Vessel



Source: Osprey Line, LLC.

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Abbreviations

CMAQ	Congestion Mitigation and Air Quality
DOT	Department of Transportation
FAST	Freight Action Strategy
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
ISTEA	Intermodal Surface Transportation Equity Act
MARAD	Maritime Administration
MPO	metropolitan planning organization
NYMTC	New York Metropolitan Transportation Council
PIDN	Port Inland Distribution Network
SEA-21	Sea Transportation Efficiency Act of the 21 st Century
SSS	short sea shipping
TEA-21	Transportation Equity Act for the 21 st Century
TIFIA	Transportation Infrastructure Finance and Innovation Act

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United States Government Accountability Office
Washington, D.C. 20548

July 29, 2005

The Honorable Ted Stevens
Chairman
The Honorable Daniel K. Inouye
Co-Chairman
Committee on Commerce, Science, and Transportation
United States Senate

The Honorable Don Young
Chairman
The Honorable James Oberstar
Ranking Democratic Member
Committee on Transportation and Infrastructure
House of Representatives

A robust U.S. economy depends on the efficient movement of freight to fuel domestic production and satisfy consumer demand. In 2002, 16 billion tons of freight, valued at about \$11 trillion in year 2000 dollars, moved through the U.S. transportation system. The efficient movement of these goods across roadways, rail lines, and inland waterways, helps ensure that factories remain efficient, packages are delivered on time, and retail and grocery store shelves are stocked. Efficient freight movement also tends to lower total shipping costs, helping keep production costs and consumer prices lower, and these savings to households and businesses help ensure that American products remain competitive in global markets.

Increases in freight volume coupled with current rail, roadway, and port capacity problems, however, are stressing the capacity of the U.S. transportation system and interfering with the efficient movement of these goods. Estimates made in 2003 suggest that growing international trade and domestic production will increase overall freight traffic by 70 percent by 2020. Adding this much freight to the transportation system is particularly worrisome since the system is currently showing signs of strain. For example, roadway congestion, which affects 60 percent of the freeway mileage in urban areas, is causing significant delays for truck traffic in certain cities. Driver shortages further impact the efficient movement of goods and make it difficult for trucking companies to expand capacity—a factor that is particularly relevant since trucks carry 78 percent of the nation's goods (measured in terms of freight tonnage). Freight movement by rail is also encountering serious capacity problems in many areas. In July 2004, for example, Union Pacific took measures to limit service

because increasing freight volumes were affecting service levels.¹ The 2002 Mid-Atlantic Rail Operations Study,² which analyzed rail traffic in five states in the Northeast, noted that there was a lack of capacity on critical rail lines in at least 25 different locations. Congestion at freight gateways—container ports and land border crossings—is also expected to worsen as containerized imports from our international trading partners are estimated to double in the next 15 years.

There are no quick and easy remedies for these capacity problems. Addressing these problems is a particularly complex challenge because the surface transportation system encompasses many modes—water, highway, transit, and rail—on systems owned, funded, and operated by the public and private sectors, or both. State and local governments, for example, have primary responsibility for selecting projects within their jurisdictions, while private sector companies conduct most of the actual transportation of cargo. Public transportation decision makers who attempt to expand infrastructure capacity face a myriad of funding, planning, and regulatory constraints. Highway projects costing from \$100 million to several billion dollars, for example, are becoming commonplace and can take as much as two decades to complete. In the New York City area, transportation officials estimate that transportation projects will cost an estimated \$147.1 billion (in 2005 dollars) by 2030, and most of this money is needed just to maintain the current infrastructure.³ Freight railroad expansion efforts, which are largely a private-sector endeavor, are also costly. The Mid-Atlantic Rail study estimated that it would cost \$6.2 billion to address freight rail capacity needs in that region.⁴ These problems are only exacerbated by difficulties in accessing federal, state, and local funding sources for freight projects. Public officials have noted that inadequate

¹Union Pacific Railroad Press Release (July 8, 2004).

²The Mid-Atlantic Rail Operations Study was a joint product of five states (Delaware, Maryland, New Jersey, Pennsylvania, and Virginia); the I-95 Corridor Coalition, which represents 13 states in the Northeast; and three railroads (Amtrak, CSX, and Norfolk Southern).

³Estimates are from the New York Metropolitan Transportation Council (NYMTC). NYMTC is an association of governments and transportation providers that serves as the metropolitan planning organization for New York City, Long Island, and the lower Hudson Valley.

⁴This estimate is not expressed in dollars of one particular year because components of the cost were estimated in different years, but it roughly represents the estimated cost in 2000 or 2001 dollars.

funds for freight projects also hinder expansion efforts. Finally, in many larger urban areas, a lack of available land to build new roads or rail lines adds to the constraints imposed by the costs to expand capacity.

The continued growth in freight volume has led the U.S. Department of Transportation to explore alternatives to improve freight mobility. One of the options the agency is exploring involves the use of waterborne freight, known as short sea shipping. Broadly defined, short sea shipping encompasses waterborne transportation of commercial freight between domestic ports through the use of inland and coastal waterways.⁵ The department is exploring whether moving more freight in this manner could provide an economically viable option to relieve some highway and rail congestion while increasing freight mobility. We conducted this study to provide information to the Congress about this effort as it considers various ways to enhance freight mobility. Our report addresses (1) why short sea shipping is being considered as an option for addressing freight mobility concerns and the factors that affect its viability as an approach, (2) the Department of Transportation's role in the development of short sea shipping, and (3) issues that should be considered by public transportation decision makers when making public investment decisions about short sea shipping or other types of projects for addressing freight mobility challenges.

To determine why short sea shipping is being considered as an option for addressing freight mobility concerns and the factors that affect its viability as an approach in the United States, we conducted a literature review of public- and private-sector reports and studies related to freight mobility issues and the waterborne transport of goods, and interviewed known short sea shipping experts in the public and private sectors. To determine whether the issues identified through the literature review and interviews were evident in practice, we visited two short sea shipping operations and interviewed a wide range of public and private transportation officials involved with or knowledgeable about the services. In identifying existing services, we relied on information gleaned from the literature review and interviews, and selected a private-sector operation that ships cargo along the Gulf of Mexico and a publicly funded operation that ships cargo between the Port Authority of New York and New Jersey and the Port of

⁵The U.S. waterway system consists of approximately 25,000 miles of inland, intracoastal, and coastal waterways and channels, of which about 12,000 miles are capable of handling commercial traffic.

Albany. We also interviewed officials at the federal level, including at the Department of Transportation and the Department of Homeland Security's Customs and Border Protection agency, to supplement information obtained through the literature review and interviews. To determine the Department of Transportation's role in the development of short sea shipping, we interviewed officials at the department and its agencies, including the Maritime Administration and the Federal Highway Administration. We also collected and analyzed documents supplied by the department and its agencies. To determine issues that should be considered when making public investment decisions, we analyzed the results of this review of short sea shipping and built on the perspectives gained from our past work in transportation systems and federal investment strategies.⁶ We performed our work from July 2004 through June 2005 in accordance with generally accepted government auditing standards.

Results in Brief

Transportation stakeholders representing both the public and private sectors believe that incorporating short sea shipping into the surface transportation system can produce numerous public benefits, but stakeholders also note that numerous factors may limit the development of short sea shipping services in the United States. Potential benefits of new applications of short sea shipping, according to these transportation stakeholders, include improved freight mobility, improved air quality, and reduced public expenditures on large infrastructure projects. For example, some transportation officials in the Northeast believe that a short sea shipping service operating out of the Port Authority of New York and New Jersey could relieve congestion in and around New York City because cargo could move by ship rather than by truck. Transportation officials note, however, that numerous legal, operational, and acceptance-related factors, such as laws that increase start-up costs, necessary modifications to port facilities, and a general reluctance among shippers to try new modes, may present obstacles to a wider development of short sea shipping services. For example, ports may be mainly set up to lift containers from large cargo ships using cranes, but short sea shipping operations may

⁶Transportation Research Board, *Special Report 252: Policy Options for Intermodal Freight Transportation* (Washington, D.C., 1998); Transportation Research Board, *Special Report 271: Freight Capacity for the 21st Century* (Washington, D.C., 2002); GAO, *Highway and Transit Investments: Options for Improving Information on Projects' Benefits and Costs and Increasing Accountability for Result*, [GAO-05-172](#) (Washington, D.C.: Jan. 24, 2005); and GAO, *Freight Transportation: Strategies Needed to Address Planning and Financing Limitations*, [GAO-04-165](#) (Washington, D.C.: Dec. 19, 2003).

instead use trucks to roll containers on and off barges or small ships—an approach requiring new truck ramps and holding areas. The effect of such factors, however, remains somewhat unclear, given that few new applications of short sea shipping have been developed. For the two operations we examined, many of these factors were apparently not insurmountable, although there were indications that some factors may interfere with further development. For example, operators of a service between several ports in the Gulf of Mexico said the federal requirement to use a U.S.-built ship for domestic shipping was limiting their ability to expand capacity, because there are a limited number of U.S.-built ships available on the market. Sponsors of a service between the Port Authority of New York and New Jersey and the Port of Albany said that shipper reluctance to use the service was limiting their ability to attract more business, even though the subsidized service is being offered at a lower cost than trucking.

The Department of Transportation has established short sea shipping as a high priority component of the federal freight transportation strategy and has drafted a policy proposal to provide targeted incentives for short sea shipping projects. The department has been exploring the potential of the option to reduce congestion and expand capacity of the freight transportation system, but its efforts to date have been narrowly focused—that is, they have been focused on the option itself and not on the impact of this option on other transportation modes or of federal involvement in its development. Nonetheless, the Department of Transportation is already contemplating a potential role for the federal government; it has developed policy proposals that would include short sea shipping as a central component of increased federal investment in the maritime sector. Before determining that federal involvement is appropriate, a more comprehensive understanding of key issues should be explored. If a federal role does exist, key issues that are pertinent to this role are (1) how to go about providing federal support to privately owned and operated infrastructure and (2) whether and how to increase funding levels for freight improvement projects. Considering the implications of these broader issues can help guide the agency in defining the federal role and ensure that the federal approach for short sea shipping development is part of an integrated federal approach to addressing the nation's congestion and capacity problems.

As the federal role is being defined and clarified, public transportation decision makers at the state and local levels are also actively considering short sea shipping and other options to address the freight mobility

challenges affecting their jurisdictions. Increased funding constraints and compartmentalized funding programs, however, create challenges for public decision makers in setting transportation priorities and linking resources to results to ensure that limited public dollars are wisely and effectively spent. A systematic investment approach to guide public investment decisions at all levels—federal, state, and local—could help public decision makers in making those difficult choices. Building on the perspectives gained from our past work in federal investment strategies and the work of transportation experts, we developed a four-step approach that may be helpful. The first step of the approach involves determining whether public support for a proposed project is warranted by considering whether it is expected to produce public benefits, such as reduced congestion, improved air quality, and economic development opportunities. If a rationale for public involvement can be established, the second step involves a closer scrutiny of the proposed project through an analysis of the costs and expected benefits of the proposed project to determine if the project is the most cost-effective option among alternatives. The third step of the approach involves determining the level and type of public support to be provided. This step involves recognizing that public support does not necessarily mean financial support, but when financial support is provided, it should be structured in such a way to minimize distortion of any competition. The final step involves the evaluation of ongoing and completed projects to determine if intended benefits have been achieved and to hold decision makers accountable for their public investment decisions.

We recommend that the Secretary of Transportation and the Administrator, Maritime Administration, (1) ensure that a comprehensive understanding of key issues is developed before defining a federal role that would involve any substantial federal investment in short sea shipping projects and (2) use current mechanisms to encourage decision makers at all levels to take a more systematic approach to making decisions about freight mobility projects. In commenting on a draft of this report, the Department of Transportation generally agreed with its contents and agreed with the recommendations. The department also provided technical comments that we incorporated, as appropriate.

Background

Transporting freight by water has been part of the freight network for many years in the United States, but most operations have traditionally been used for the movement of bulk commodities, such as coal, petroleum, grain, and lumber. Waterborne modes, sometimes referred to as short sea shipping

(SSS) operations, currently operate along the Mississippi River system, across the Great Lakes, through the St. Lawrence Seaway, and along some coastal routes. Together, these operations moved about 6 percent of the nation's freight tonnage in 2000. SSS is one of the most cost-effective ways to move heavy, lower-value, and non-time-sensitive goods, but since it is slower and less reliable than trucking or air, shippers tend to move higher-value and time-sensitive freight by faster and more reliable modes, such as trucking or air.

Recent years have brought an increasing focus on developing new SSS options that are better suited for moving cargo that normally travels by truck and tends to include higher-value and time-sensitive goods. (See table 1 for examples of traditional and newer waterborne services.) Some of these proposals rely on traditional waterborne methods, such as tug-and-barges, that are adapted to move containerized cargo instead of the traditional bulk commodities. For example, one operation we examined uses a tug-and-barge to move containers between two cities in the Northeast. Other proposals, however, look much different from the traditional waterborne modes. For example, one operation has proposed using two self-propelled ships to move containerized cargo along coastal waterways at faster speeds than tug-and-barges. Another proposal calls for building a dozen "next-generation" vessels that could move trucks and passenger cars along an extensive waterway network at more than four times the speed of tug-and-barges.

Table 1: Characteristics of Traditional and Newer Waterborne Services

Characteristics	Traditional services	Newer services
Cargo	Mostly lower-value non-time-sensitive cargoes, including bulk commodities, such as grain, coal, and lumber	Many different types, but many are targeted at the higher-value time-sensitive containerized freight that normally moves by truck
Vessel speed/type	Mostly slower-moving tug-and-barge operations	Higher-speed self-propelled vessels; many propose using ships that can allow trucks to roll on and roll off, instead of the traditional methods in which cargo is lifted on and off by large cranes
Areas served	Along inland waterways and the Great Lakes	Proposals include the Great Lakes and inland waterways, but many are focused on coastal routes that parallel high-traffic interstates
Purpose	To provide the most economical way to move low-value and non-time-sensitive freight	To remove cargo from busy truck cargo routes and port areas

Source: GAO analysis of information from studies, interviews, and other sources.

To develop these newer types of SSS operations, some transportation stakeholders have called for extensive public-sector involvement, while others have advocated for a more limited government role. For example, some transportation stakeholders believe that the federal government should provide money for SSS demonstration projects or heavily subsidize start-up operations to prove to shippers that this is a viable mode of transportation. Others, however, see a more limited government role and argue that government officials should focus their efforts on addressing regulatory provisions that may interfere with the development of SSS operations.

The waterborne transportation of freight has a strong presence in Europe, where European Union policies have encouraged its use. In Europe, SSS grew steadily between 1970 and 1998.⁷ Shipping in Europe, however, is not directly analogous to shipping higher-value freight in the United States. For example, Europe’s rail system is less efficient for moving freight than the U.S. rail system, and because of Europe’s geography, many of Europe’s main industrial centers are close to waterways. Thus, in many cases, SSS routes in Europe may provide the fastest and most reliable service between

⁷Data on the percentage of freight moved by short sea shipping in Europe is only available through 1998.

destinations. In addition, legal provisions—such as road taxation and driving restrictions—increase the cost of road transport in Europe and play a role in the greater use of SSS.

Federal funding that could potentially be used to assist with the development of SSS in the United States is currently limited. Under certain circumstances, however, current federal laws could provide some financing for waterborne options because these laws allow states more flexibility to expend federal aid on certain nonhighway freight projects. The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) and its successor, the Transportation Equity Act for the 21st Century (TEA-21), broadened the reach of programs established under title 23 of the United States Code⁸ to fund and finance surface transportation projects with user tax receipts⁹ credited to the Highway Trust Fund and distributed to states through annual apportionments according to statutory formula.¹⁰ While funds apportioned to the states are most often used to build and maintain roads, innovations in ISTEA and TEA-21 allow transportation decision makers some flexibility in using funds for freight improvement projects. For example, funds can be used to make improvements to rail lines and port facilities. The current federal framework also allows for greater use of public-private partnerships through programs such as the Transportation Infrastructure Finance and Innovation Act of 1998,¹¹ a program that provides federal loans or loan guarantees to be used in concert with funding from other sources, including the private sector.

Transportation planning occurs at the federal, state, and local levels. Although the last two surface transportation reauthorizations provided enhanced project-specific decision authority for the use of formula funds to the state level, the U.S. Department of Transportation (DOT) has responsibility for nationwide transportation planning, as well as program-

⁸Several programs were expanded under title 23 of the United States Code to allow funds to be used for nonhighway projects, including the Surface Transportation Program (23 U.S.C. § 133) and the Congestion Mitigation and Air Quality Improvement Program (23 U.S.C. § 149).

⁹The user taxes include excise taxes on motor fuels and truck-related taxes on truck tires and sales of trucks and trailers. Formulas consider a variety of factors, including vehicle miles traveled on the interstate system and motor fuel usage by each state's highway users.

¹⁰Other programs have been established at the federal level to build, maintain, and operate inland waterways and enhance and maintain harbors.

¹¹P.L. 105-178, 112 Stat. 241 (1998). Seaport projects are ineligible for funding under the Transportation Infrastructure Finance and Innovation Act (TIFIA).

level oversight. DOT has recently become involved in exploring the potential of SSS to expand the capacity of the freight transportation system to improve freight mobility and reduce congestion. In its strategic plan, DOT states that the U.S. coastal and inland waterway system is underutilized and could provide a practical, safe, and efficient means of transporting freight.¹² Through its National Freight Action Agenda, DOT has specifically identified SSS for accelerated development.¹³ As the primary operating agency within DOT responsible for promoting SSS, the Maritime Administration (MARAD) has also made SSS a high-visibility component of its strategic plan.¹⁴ MARAD's Strategic Plan proposes that greater use of the maritime transportation system, through elements like SSS, offers the potential to reduce passenger and freight congestion, as well as facilitate increased U.S. military reliance on commercial marine transportation systems.¹⁵

Transportation Stakeholders See Short Sea Shipping As Having Multiple Benefits, but Also Cite Obstacles That May Impede Development

Stakeholders, including transportation officials and maritime stakeholders representing both the public and private sectors, see SSS as a potential option for improving freight mobility and creating other benefits, especially in high-demand transportation corridors, but they also note that certain obstacles may limit its development. Benefits cited include improved freight mobility, reduced infrastructure spending, and improved air quality. Potential obstacles to being an effective competitor include laws that increase start-up and operating costs, port facilities that are not readily adaptable to SSS operations, and a general reluctance among shippers to try new modes. For the two operations we examined, the effect of these potential obstacles varied. Some affected the viability of the operations, but others appeared to have little effect or were overcome by the operators.

¹²DOT, *Department of Transportation Strategic Plan, 2003-2008: Safer, Simpler, Smarter Transportation Solutions* (Washington, D.C., September 2003).

¹³DOT has also recently developed the National Freight Action Agenda, in conjunction with its operating agencies, in an effort to guide DOT and its partners in making the nation's transportation system better serve its citizens. The Action Agenda identifies six high-priority freight initiatives, one of which is to accelerate the development of short sea shipping.

¹⁴Maritime Administration, *Strategic Plan for Fiscal Years 2003-2008* (Washington, D.C., September 2003).

¹⁵MARAD's Strategic Objective Commercial Mobility aims to address congestion reduction by promoting the exploration of technology development and infrastructure that will improve the use of the maritime system.

**Benefits Cited Include
Improved Freight Mobility,
Improved Air Quality, and
Reduced Infrastructure
Spending**

According to stakeholders, the development of SSS operations may produce a number of public benefits.¹⁶ (See table 2.) By providing an additional option for transporting freight, stakeholders contend that such services would increase the capacity of certain freight routes, thus alleviating many of the capacity stresses that currently affect the surface transportation system. For example, an SSS service that moved cargo from New York to Miami might reduce the number of trucks on Interstate 95, the major highway between the two cities, thereby reducing overall roadway congestion. Similarly, SSS services that move containerized cargo out of busy ports to less congested ports could help alleviate dock congestion and reduce the number of trucks and trains traveling on crowded port access routes, thus alleviating capacity constraints affecting many ports. Stakeholders also contend that since SSS services are more fuel efficient than trucks, SSS operations can help improve air quality in certain locations by reducing pollution. Finally, stakeholders contend that SSS services could provide a more cost-effective alternative to building new roadways and rail lines, thus reducing the amount of money spent on infrastructure projects.

¹⁶We did not determine, through our own independent analysis, whether SSS can produce these public benefits, and we were unable to locate studies that determined, through rigorous analysis, the potential public benefits of SSS.

Table 2: Benefits of Short Sea Shipping Cited by Stakeholders

Benefit	Explanation
Improved freight mobility (increased freight capacity)	At a basic level, incorporating SSS into the surface transportation system may add capacity to certain cargo routes because it increases modal alternatives. SSS operations may also help increase capacity in other ways, such as helping remove containers from busy ports, thus freeing up needed dock space for incoming cargo.
Improved freight mobility (less congestion)	By taking trucks off the road, SSS may help alleviate congestion along key corridors.
Improved air quality	Barging services may be more fuel efficient than trucking, and one barge may be able to carry as much freight as 58 trucks. Removing these trucks from the road and using a more fuel-efficient option may reduce emissions and improve air quality.
Reduced need to build roadways and rail lines	By reducing the pressure on existing transportation infrastructure, SSS can reduce the need to build new infrastructure. Large infrastructure projects, such as new roadways and rail lines, are expensive, time consuming, and in some cases may be limited because of population density or land costs.

Source: GAO analysis of studies, reports, interviews, and position papers.

Potential Obstacles Cited Include Legal, Operational, and Acceptance Issues

While stakeholders contend that such SSS operations can produce a number of public benefits, they also note that various obstacles could make it difficult for operators to start and sustain an SSS service that competes effectively with other modes. Since few SSS services have actually been created, there is no consensus about the effect, if any, these obstacles would present to SSS development. The potential obstacles cited involve legal, operational, and acceptance-related challenges. Legal requirements could present a barrier to SSS development by increasing the start-up or operating costs of operations. Operational challenges involve incompatible infrastructure and potential strains on port capacity. Finally, a general unwillingness among the shipping community to switch from well-established modes, such as trucking and rail—even if SSS can be shown to be a competitive option—can present a barrier to SSS development.

Legal Requirements

Paying the Harbor Maintenance Tax. Some proponents contend that the Harbor Maintenance Tax, a general levy on the value of cargo moved through a port,¹⁷ would make SSS less competitive with other modes, such as truck or rail, because it places an additional tax burden on shipping by water. The fee, which pays for such activities as harbor dredging, is levied on the value of cargo (0.125 percent) as it is loaded or unloaded from a

¹⁷26 U.S.C. § 4461 and 19 C.F.R. § 24.24. In the case of imports, the importer pays the tax. In all other cases, the shipper pays the tax.

commercial vessel in a U.S. port.¹⁸ Stakeholders argue that since shippers may avoid the tax by utilizing other modes, such as trucking or railroads, few would choose to use SSS services. For example, a shipper moving cargo from New York to Miami using SSS would be subject to the tax, but the same shipper can avoid the tax if the shipment travels by rail or truck. Trucking associations note, however, that they, too, are subject to user taxes, such as tolls and federal taxes.

Potentially higher vessel costs because of Jones Act requirements. Some SSS stakeholders contend that certain provisions in the Jones Act,¹⁹ which requires that any vessel (including barges) operating between two U.S. ports be U.S.-built, owned, and operated, may increase the start-up costs of SSS operations because ships built in U.S. shipyards tend to be more expensive than vessels that can be acquired from the global market.²⁰ These higher costs, in their view, could increase start-up costs and make it difficult for operators to create SSS services or sustain profitability. Another stakeholder argued that SSS operators are overstating the cost differences between U.S. and foreign-built ships and note that even if U.S.-built ships are more expensive, these additional capital expenditures, given the long operating life of a ship, would add little to the cost of each trip.

Operational Issues

Potential need to alter port facilities. Current port infrastructure is often designed to accommodate large and deep-draft oceangoing vessels and may not be compatible with ships designed for SSS operations. For many oceangoing ships, large cranes are generally used to load and unload containers. This approach, referred to as “lift-on/lift-off,” may be compatible with some SSS operations, but others may use different loading and unloading techniques. For example, some SSS operations may use a different approach, such as “roll-on/roll-off,” in which trucks drive off and

¹⁸Cargo entering some ports is exempt, such as those in Alaska, Hawaii, Puerto Rico, and possessions of the United States. For domestic shipments, the fee is levied at one port—either the port of departure or the port of entry, but not both—and it does not normally apply to movements along inland waterways as long as the ship moving the goods is subject to the Inland Waterways Fuel Tax (19 C.F.R. § 24.24 (C) (5) and 26 U.S.C. § 4042).

¹⁹Section 27 of the Merchant Marine Act of 1920 (46 U.S.C. App. § 883).

²⁰We asked one SSS operator about whether the Jones Act requirement to use U.S. crews was a potential obstacle to expanding SSS services since U.S. crews may be more expensive than foreign labor. The operator said the requirement was not a particularly important issue, but that Coast Guard crewing requirements, which he believes mandate unnecessarily large crews for his SSS operations, increase the costs of SSS operations.

on the ship. Therefore, starting an SSS service might require ports to build ramps that allow trucks to move on or off the ship or additional dock-side space where truck trailers wait to be loaded and unloaded from the ramp. SSS vessels are also smaller than oceangoing ships, and this size difference has raised concerns that SSS ships will not be compatible with docks designed for larger oceangoing vessels.

Added handling costs. Shipping operators must pay dockworkers to lift cargo on or off ships, and some stakeholders have argued that the cost of these “lifts” will make SSS services less cost competitive with other modes. A shipper moving a container by SSS from New Orleans to Houston, for example, would need to pay for at least two “lifts”—one at the port of departure and one at the port of arrival. This could add hundreds of dollars to the total shipping costs, according to some proponents. A shipper choosing to move the goods by truck avoids the costs of the “lifts.” An SSS service using a roll-on/roll-off approach rather than cranes to load its vessels, however, might encounter cost savings.

Potential strains on port capacity. While some SSS services may improve port efficiency, thus reducing strains on port capacity, other types of SSS services might have the opposite effect, according to some stakeholders. For example, a service that attracted additional containers to a port for shipment by SSS rather than by truck would add to the number of containers entering and leaving the port. Because of these concerns, some proponents have advocated basing SSS services at ports that handle less cargo than the nation’s major freight gateways, but these are often further away from the major market areas that demand the cargo.

Acceptance-Related Challenges

A viable economic advantage. Some stakeholders note that short sea shipping must offer economic advantages before shippers would be willing to use such services. Stakeholders note that for shippers to be willing to try this new approach, SSS operations would need to provide service that is cost-competitive with other modes and is as consistent and reliable. In addition, shippers would need to identify some advantages to shifting to SSS services, such as faster, more reliable, or cheaper service than other transportation modes.

General reluctance to try new modes. A general reluctance among shippers, freight forwarders, and others involved in moving freight to try new shipping modes, regardless of the potential benefits, poses an additional challenge, according to many stakeholders. One transportation stakeholder told us that since shippers have operated under negotiated

contracts with trucking companies for many years, they may be unwilling to shift business to SSS operations regardless of perceived benefits.

SSS Services Examined Were Operationally Different, but Both Attempted to Address Similar Freight Capacity Concerns

While the two SSS services we examined—one in the Gulf Coast and one in the Northeast—differed in many ways,²¹ both of the services were designed to address capacity concerns. The two operations differed in such ways as the types of vessels used, operating schedules, types of cargo moved, and structure of funding (public or private). (See table 3.) Both services, however, were designed to provide a modal alternative that could help improve freight mobility around ports and along congested cargo routes.

Table 3: Summary of Operating Characteristics of SSS Services GAO Studied

Characteristic	Gulf Coast service	Northeast service
Operator/sponsor	Osprey Line, LLC (private operator)	Port of Albany, Port Authority of New York and New Jersey (primary project sponsors), and private barge operator (vessel operator)
Funding source	Private funding only: Operator charges shippers for the service	Private funding: Operator charges shippers for the service Public funding: Shipping rates are subsidized with money from a federal grant (Congestion Mitigation and Air Quality program) and funds from the Port of Albany and the Port Authority of New York and New Jersey
Type of cargo	International and domestic containerized cargo, mostly bulk commodities but also finished manufactured goods	International containers (no domestic) carrying mostly bulk commodities
Vessel type	Self-propelled ship (lift-on/lift-off)	Tug-and-barge operation (lift-on/lift-off)
Service frequency	Once every 7 days	Once every 7 days

Source: GAO analysis of information provided by SSS operators.

Gulf Coast Service

The Gulf Coast service, which began in 2000, is a private-sector initiative designed to attract shippers concerned about several freight capacity issues at ports and along key transportation routes. Operating on a 7-day

²¹Some of the transportation stakeholders we spoke with noted that SSS operations may be less successful on the West Coast because of labor issues, port density along the West Coast, and a lack of freight movement along the north-south cargo routes (most freight in the western United States tends to move west to east).

cycle²² around the Gulf of Mexico, the Gulf Coast service uses a self-propelled U.S. flagship vessel (named *Sea Trader*) to move international and domestic containerized cargo, such as building supplies, finished manufactured goods, and chemicals, to and from ports in Houston, New Orleans, Tampa, and other cities as needed. (See fig. 1 for picture of the *Sea Trader*.) For example, the service moves finished manufactured products from Houston to Tampa and empty containers from Florida to Gulf Coast ports. The self-propelled vessel completes these types of trips in about half the time of a tug-and-barge service, according to the operators of the service. Speed is important, they said, because it allows them to compete with trucking along these cargo routes.

²²This means that the vessel returns to its port of origin every 7 days. A shipper moving goods from Houston to Tampa, for example, could make one shipment every 7 days on this SSS service.

Figure 1: The Sea Trader



Source: Osprey Line, LLC.

The service has provided a successful solution to several of the freight mobility concerns in the area, according to operators. (See fig. 2 for a map of the Gulf Coast service.) Two concerns, in particular, attracted customers to the service, according to officials we spoke with. One was the difficulty of finding truck drivers for several routes covered by the service. These routes, such as Houston to Tampa, are reportedly undesirable to many truck drivers because they involve a long-distance trip that may take multiple days, and the drivers often receive compensation for only one leg of the trip. One logistics provider²³ told us that a company in the region began using the SSS service because it was unable to find drivers willing to move cargo from Houston to destinations in Florida. Operators of the

²³Logistics providers, such as third- and fourth-party logistics providers, work with clients to arrange for the transportation of products. One task of a logistics provider is to help clients determine which mode of transportation to use, such as truck, rail, or SSS.

Freight Movement and the Gulf Coast Service

According to the Gulf Coast operators, the Gulf Coast service was created in response to many of the freight capacity problems affecting the Gulf region. Transportation officials said that the most significant problems are at major urban areas-such as Houston and Dallas-and major freight gateways-such as the Port of Houston and the Port of Laredo. Private stakeholders and public-sector officials in the region identified the following problems:

- Large influxes of cargo from international trading partners have severely constrained capacity at the Port of Houston, resulting in extended "dwell times" that now average 7 days. (Dwell time refers to the amount of time that cargo remains in the port before it is removed by truck, rail, or another mode.)
- Roadway congestion around major urban areas and along the primary access routes to the ports has made it difficult to move cargo in and out of the port and to the final destination.
- Growing rail inefficiency and a truck driver shortage has contributed to freight mobility problems. A logistics company spokesperson said that it was difficult to find drivers to complete "long-haul" trips and that railroad service is increasingly inefficient.

service maintain that the service provides shippers with an alternative means of moving cargo along these routes. The second concern was declining rail service, which has become increasingly unreliable, according to the operators and the logistics provider we spoke with.

According to the operators, the service has also been able to help relieve port congestion and provide other public benefits, including the following:

- Because containers can be transferred directly from other ships to the SSS vessel at the Port of Houston, fewer trucks will need to travel along port access routes, thus reducing congestion on roadways leading to and from the port.
- This ability to pick up cargo from the port also increases the amount of cargo that can be removed from the docks during a 24-hour period, increasing overall port capacity and reducing the amount of time that cargo normally sits on the docks²⁴ before it is loaded onto another mode for delivery to its final destination.
- Finally, to the degree that containers are transported to their destination on the SSS vessel instead of on the highway, the service reduces the number of trucks traveling along congested roadways.

²⁴According to officials at the Port of Houston, cargo normally sits on the dock for an average of 7 days before a truck removes it.

Figure 2: Map of the Gulf Coast Service



Source: Osprey Line, LLC.

The Gulf Coast service has been able to attract enough business that the service is currently covering most of its operating expenses. The logistics provider we spoke with said the cost of the service was competitive with trucking rates. Although the service has been able to move enough cargo to sustain operations, the operators said that they are still operating below full capacity and have had a difficult time attracting more business from shippers in the area. Nonetheless, the operators said they plan to add an additional self-propelled vessel to the Gulf Coast route within the next 12 months. They expect future customers to be attracted because of (1) problems that trucking companies are having with finding drivers for certain long-distance routes and (2) continued concerns on the part of shippers about rail service in the region.

Northeast Service

The Northeast service, which began in April 2003, is a public-sector initiative designed to help alleviate many of the port capacity problems at the Port Authority of New York and New Jersey as well as relieve congestion on crowded roadways in the New York City area. The Port Authority of New York and New Jersey, the Port of Albany, and regional and state planners spearheaded an SSS service for moving containerized cargo up and down the Hudson River between the Port Authority of New York and New Jersey in the south and the Port of Albany in the north. This

Freight Movement and the Northeast Service

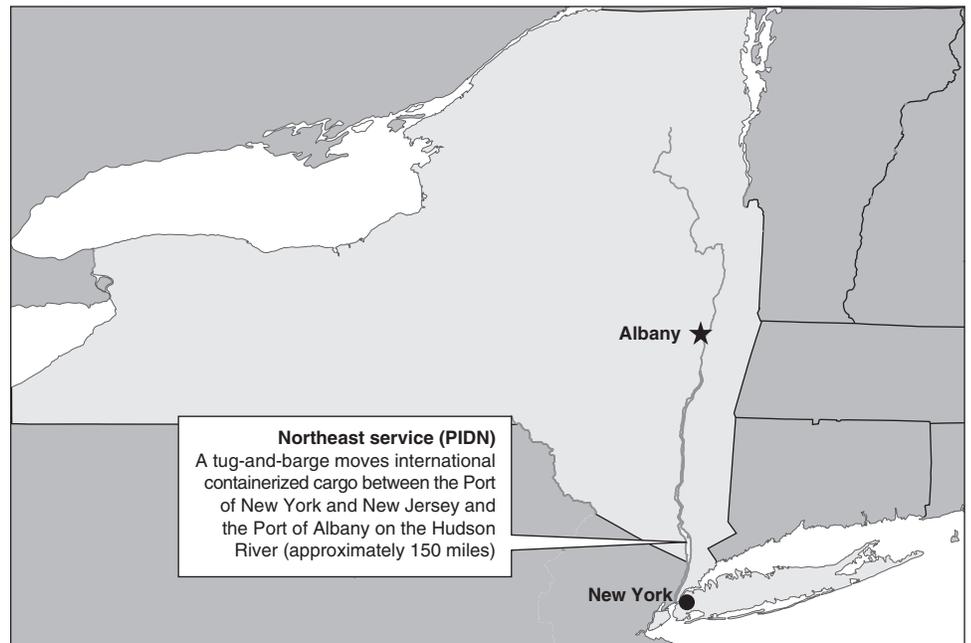
Transportation officials at the Port of Albany, the Port Authority of New York and New Jersey, and planners at the state and local level created the Northeast service in response to freight capacity problems affecting the region. They noted the following regional concerns, adding that these problems are expected to worsen as local and international cargo levels rise dramatically in the next few years:

- Port congestion has increased the “dwell time” of containers to an average of 6 to 8 days and access routes to and from the port are severely congested.
- Traffic congestion around New York City, especially at “choke points” such as the bridges and tunnels leading to the city, is interfering with the efficient movement of freight.
- New hours of service regulations are limiting the amount of cargo that one driver can ship, reducing the overall capacity of trucking. For example, they noted that drivers who are stuck in heavy traffic are unable to finish their trip before their “operating window” expires.
- Officials said the large volume of passenger trains in New York limited the number of “operating windows” in which cargo trains are allowed to enter the city, and officials noted that many bridges and tunnels offer limited height clearances, affecting the ability to double-stack containers.
- The high cost of land and the increasing population densities have made it difficult to expand roadways and rail lines to deal with these capacity problems.

service is part of a proposed inland distribution network that planners hope will include multiple rail and SSS services.

This service, called the Albany Express Barge, uses a privately owned and operated tug-and-barge to transport the containers, which are primarily loaded with bulk commodities, such as logs and silicon. (See fig. 3 for a map of the Northeast service.) Shipping containers between these ports by barge is slower than shipping them by truck, so the two ports decided to use a public subsidy to make the shipping rate more attractive to potential shippers. With the help of the public subsidy, the ports were able to set a shipping rate 10 percent below the rate for shipping by truck. Officials at the Port Authority of New York and New Jersey, faced with space limitations and expecting a dramatic influx of international cargo in future years, believed that within 15 years, such operations would be able to transfer more than 18 percent of all containerized cargo moving into and out of the Port Authority of New York and New Jersey.

Figure 3: Map of the Northeast Service



Source: Port Authority of New York and New Jersey.

To set a shipping price that was lower than trucking rates, the ports have used public funding from several sources as a way to supplement the amount the operator is receiving. The main sources for this subsidy are two federal grants secured by the Port of Albany through the Congestion Mitigation and Air Quality Improvement (CMAQ) program.²⁵ The first grant was for \$3.3 million for 2003 to 2004; the second, an extension of the first grant, was for \$2 million for 2005. Under the rules of the CMAQ grant, Port of Albany officials are required to provide a 20 percent match to receive the funds. The Port of Albany has been providing much of this amount from its budget, although Port Authority of New York and New Jersey officials have recently provided \$500,000 to help meet the requirement.²⁶ Operators of the service also collect a fee from users of the service for each container shipped, which, according to port officials is about 10 percent less than what it costs to move the same goods by truck.

This service is not meeting officials' expectations.²⁷ Port officials said that during the first 2 years, it has moved significantly less cargo than originally projected and will likely remain dependent on public subsidies for the next 10 years. The operation initially began as a twice-weekly service, but shortly after its launch, officials cut service to once a week because the volume of freight was not sufficient to sustain two trips a week. During the first 12 months of service, the operation moved an average of 105 containers per month. Usage rose to an average of 383 containers per month in the next 11 months (April 2004 through February 2005), but this higher level is still far less than originally projected. In addition, port officials said that about half of the containers that travel on the service are empty and, thus, do not generate revenue for the service.²⁸ Because usage is lower than expected, the ports have had to use more grant moneys than expected to meet the operator's costs. According to port officials, without

²⁵The CMAQ program was designed to assist nonattainment and maintenance areas under the Clean Air Act in attaining the national ambient air quality standards by funding transportation projects and programs that will improve air quality.

²⁶This is an advance on a \$25 per container payment that the Port Authority of New York and New Jersey makes to the Port of Albany to help keep shipping rates on the Northeast service lower than trucking rates.

²⁷Officials from the Port Inland Distribution Network generated expectations based on the volume of containers actually shipped.

²⁸Empty containers must be repositioned for use when there is a lack of two-way trade; that is, the containers must be returned to the steamship companies after the freight has been transported to its final destination.

the 1-year \$2 million extension of the CMAQ grant, the operation would likely have been discontinued. Plans for the service after grant moneys are exhausted are uncertain.

Effect of Potential Obstacles Varied for the Two Services

Some of the factors that stakeholders identified as potential obstacles appeared to affect the development and continued operations of the Gulf Coast and Northeast services, but others had little effect or were overcome by the operators.²⁹ For example, neither the Northeast nor the Gulf Coast operators cited inadequate port infrastructure as a major obstacle to development, but both said that shipper reluctance was affecting the viability of their services. Some factors, such as handling costs, affected the two services in different ways. Below, we describe how each identified obstacle affected the two SSS operations we examined.

Harbor Maintenance Tax. The Harbor Maintenance Tax did not appear to be a significant obstacle to the development or operation of either SSS service, but in both cases, the operators of the services still expressed concern about its potential effect. While users of the Northeast or Gulf Coast service are required to pay the Harbor Maintenance Tax, the operators said they were not sure whether the shippers using these services were submitting their payments. Operators of both services nonetheless said they were concerned that if the tax is ever explicitly levied on these domestic movements, shippers may be unwilling to use the services because they can avoid the cost by using land-based options.

Jones Act requirements. The Gulf Coast operators said that, in general, the high capital costs of U.S.-flag vessels are affecting their ability to expand operations and keep shipping prices competitive with trucking, while the Northeast operators said that this requirement was not affecting them. The difference, however, may lie primarily with the type of vessel each service uses. According to the Gulf Coast operators, this obstacle did not prevent them from starting their service because they were able to buy a used U.S.-flag ship—a cheaper alternative than buying a new U.S.-flag vessel. For expansion, however, the Gulf Coast operators said the limited

²⁹While these findings suggest that many of these obstacles may be surmountable, it is important to note that because we evaluated only two existing operations, these lessons may not be transferable to other operations. It is also important to note that because our case-study approach focused on existing services, it provides no indication of whether other operators may have considered a service but not followed through out of concern for any of these obstacles.

number of used U.S.-flag ships available on the market poses a greater difficulty. Operators of the Northeast service, by contrast, said the requirement was not a significant concern because they use a tug-and-barge option in which the U.S. and foreign-built versions, compared with self-propelled vessels, are more similarly priced.³⁰

Handling costs. The Gulf Coast operators said that handling costs were not a significant concern because they were able to negotiate special rates with dockworkers. In contrast, the Northeast operators said that handling costs are affecting the sustainability of their service. In both instances, the operators were able to negotiate special contracts with dockworkers that reduced the cost of each “lift,” thus helping decrease overall shipping costs. The Northeast operators, however, said even their negotiated rates are still high enough to affect viability.

Port infrastructure. Neither service cited port infrastructure as a problem. Gulf Coast operators said they worked with transportation officials in various locations to provide needed infrastructure additions or upgrades at ports, such as roadway access routes. However, both operators used lift-on/lift-off equipment (such as cranes), and it is unclear whether SSS operators who attempted to use roll-on/roll-off technology would encounter port infrastructure problems.

Adverse impact on port capacity. According to port officials in the Northeast and the Gulf Coast, the SSS operations have not had a significant impact on port capacity. For the Gulf Coast operation, officials at the Port of Houston said that the SSS service was moving a small amount of freight; thus, it did not add to capacity problems at the port. In the Northeast, officials from the Port of Albany and the Port Authority of New York and New Jersey said that the operation was also not adding to capacity concerns.

Shipper acceptance. The Gulf Coast and Northeast operators both said that a general unwillingness among the shipping community to try new and untested modes, such as SSS, was affecting the viability of their SSS services. The Northeast operators said that even though they are offering a service that is cheaper than trucking, they have been unable to convince

³⁰While some stakeholders have cited potentially higher costs associated with the Jones Act provision that requires the use of U.S. crews, which can add to the cost of each trip, neither of the SSS operations we visited had such concerns.

shippers to switch. The Gulf Coast operators also said that they have had a difficult time convincing many shippers to switch from trucking to SSS, even though they believe they offer a service that is comparable in price and speed to trucking. Our discussions with logistics providers produced two main explanations for this lack of acceptance. One concerns speed. For example, one logistics official in the Northeast told us that SSS services in general are too slow for shippers' needs, and thus many shippers are unwilling to use them. The other concerns frequency of service. Logistics providers in the Northeast and the operators of the Gulf Coast service said that the SSS services are at a disadvantage to trucking because they cannot currently offer more-frequent service, while trucking companies can move goods daily. This frequency of service, according to logistics providers, is an important factor for many shippers.

Operators of the Gulf Coast service echoed these concerns in their own comments about potential obstacles to keeping or expanding a viable SSS service. They said the ability to provide service that is comparable with trucking is critical, especially if the goal is to remove trucks from major roadways and port access routes. In this regard, they said, tug-and-barge operations are too slow to compete with trucking along certain cargo routes, and even self-propelled vessels are still slower than trucks along many cargo routes. Likewise, frequency of service was a concern because more-frequent service allows shippers to integrate SSS services into their supply chains. The Gulf Coast operators also said that Coast Guard crewing requirements were an impediment to SSS operations that use self-propelled vessels because the Coast Guard requires a larger crew for self-propelled vessels that carry containers. Because the operators of the service must pay for a larger crew, these requirements decrease the cost competitiveness of the SSS operation, according to the operators of the Gulf Coast service. Finally, the most important factor, according to the Gulf Coast operators, is that SSS services must be cost-competitive with trucking if such operations are going to attract business from shippers.

Stakeholders involved with the Northeast service said that a lack of commitments from ocean carriers—those responsible for exporting and importing international shipments—is also affecting the viability of their SSS service. According to officials at the Port Authority of New York and New Jersey, ocean carriers often decide how international cargo entering the United States will reach its final destination, and, therefore, having their commitment to move goods on the Northeast service might make it more successful. This is a factor that could affect other SSS operations in other regions of the country.

The Department of Transportation's Role in the Development of SSS and Freight Transportation Improvements Needs More Careful Study

While SSS appears to have merits worth considering, it is unclear why DOT has already identified SSS as a high-priority component of the national freight transportation strategy and chosen to promote and accelerate its development. Such an endorsement appears premature given the limited experience in the United States in using this approach, the preliminary nature of the information generated so far through the agency's exploratory efforts, and the absence of a comprehensive understanding of key issues necessary to define the appropriate federal role needed, if any. Before moving ahead, more work is necessary to establish whether federal intervention in the development of SSS in this country is appropriate. Then, if an appropriate federal role exists, a necessary next step is to consider what changes, if any, might be needed to carry out that role. Two questions appear central to such a discussion: (1) Should federal support be provided for privately owned and operated infrastructure? (2) Should funding levels be increased and existing funding sources expanded?

DOT Has Identified SSS Development as a National Freight Priority before Determining Why the Federal Government Should Be Involved

DOT has identified the acceleration of SSS development in the United States as one of six high-priority freight initiatives through its National Freight Action Agenda and has taken steps to explore the viability of the approach.³¹ According to agency officials, SSS is an important concept for the agency to explore because of the potential of the approach to produce public benefits, such as reducing traffic congestion in areas experiencing heavy freight movement and expanding the capacity of the freight transportation system to support continued economic growth. At this stage, however, agency officials acknowledge that all of the public benefits of SSS and factors that may affect its development in this country have not been fully considered. DOT has undertaken a number of exploratory activities, most of which were undertaken to promote and accelerate the approach in the United States. For example, MARAD—the primary agency within DOT responsible for the SSS initiative—has funded studies of the concept, created a public/private partnership of stakeholders to share

³¹The National Freight Action Agenda was developed to guide the agency and its partners in agency efforts to make the transportation system better serve its citizens. Within this plan, DOT has identified the following six high-priority freight initiatives: (1) facilitate the development and planning of major freight projects, (2) promote intelligent transportation technologies to improve freight transportation, (3) improve intermodal connectivity by improving coordination of planning and financing across DOT programs, (4) enhance DOT's Freight Capacity Building Program, (5) improve the timeliness and quality of freight data, and (6) accelerate development of SSS.

resources and in-kind services for accelerating SSS development in the United States, and sponsored conferences to exchange industry knowledge of SSS and its potential contribution to the nation's transportation system. Agency officials emphasize that MARAD's exploration of these issues spans only a few years and results to date can be characterized as preliminary.

DOT does not yet appear to have a sound basis for identifying SSS as a high-priority component of the national freight transportation strategy. Thus far, federal efforts have focused on studying and exchanging industry knowledge on the concept, and not on whether federal involvement in its development is necessary. This information may be useful in understanding the potential of the approach to reduce congestion and expand system capacity, but it will not help policymakers determine whether federal involvement in its development is warranted, and it does not begin to broach issues involving the effects of federal involvement on the freight transportation system as a whole. For example, DOT has not thoroughly assessed key issues, such as

- the potential impact of federal involvement in developing SSS on the competitive balance among all transportation modes;
- lessons learned from new SSS services, such as the Gulf Coast and Northeast services that we examined; and
- obstacles and mitigating actions necessary to developing SSS, particularly with respect to the reluctance by shippers and logistics providers to using this option.

In-depth insight into these and other issues is an important prerequisite in order to establish the extent of federal involvement needed, if any, in the development of SSS in this country. However, it is unclear at this time whether DOT and, in particular, MARAD are planning to address these issues. DOT's Office of Freight and Logistics and MARAD's Directorate of Port, Intermodal, and Environmental Activities, which together account for the bulk of federal SSS activities undertaken to date, have recently reorganized and are rethinking where next to focus their SSS efforts. Both are developing plans for future SSS activities in which they plan to engage, and these plans were not yet finalized and were not available for our review during the course of our work.

Before asserting a federal role in the development of a domestic SSS system, DOT should consider whether federal involvement is even

appropriate. As part of the agency's information-gathering efforts, it would be important for DOT to consider the potential of the private sector to develop SSS without any involvement from the federal government. Many transportation experts maintain that government involvement in freight projects should be limited to circumstances in which market-based solutions would produce less than efficient results.³² Government-imposed solutions to freight problems have the potential of superseding solutions that the private market would reach on its own. Determining whether SSS development could occur solely in response to market forces is an important issue to explore, in part, because the federal involvement may be spurred by considerations other than freight efficiency. For example, the federal government is interested in maintaining the safety and condition of the transportation system in addition to improving the efficiency of the system. Therefore, without fully exploring the implications of federal involvement, policymakers may adopt an approach that unintentionally causes market distortions and reduces efficiency. In the extreme, providing federal support for a project has the potential of producing overcapacity and distorting shippers' choices about which transportation mode to use.

Part of determining the advisability of a federal role involves assessing the risks associated with providing federal support for SSS projects. While lessons learned from the two SSS operations we reviewed are not necessarily transferable to other operations, they serve as examples of how government intervention might produce the risk of resources being used inefficiently. One of these services (the Gulf Coast service) had little or no federal involvement and demonstrates the willingness of users to pay for a project; the second (the Northeast service) involved a federal subsidy and demonstrates the risk associated with providing a subsidy when demand is not completely understood. The unsubsidized Gulf Coast service depends on private-sector demand and has been able to attract enough business that the service has been able to cover most of its operating expenses. In contrast, the subsidized Northeast service is not meeting the expectations established for it, even though the ports were able to set a shipping rate 10 percent below the rate for shipping by truck with the help of the federal subsidy. Additionally, an extension of federal funds had to be secured, without which the operation would have been discontinued, according to project sponsors.

³²For example, less than efficient results would include solutions driven by the private sector that may not recognize certain costs imposed on others by users of the transportation system, such as congestion, environmental costs, and accident costs.

At the very least, the lessons learned from the two operations we reviewed suggest that more information should be developed to help policymakers weigh the risks associated with federal involvement in SSS. However, the available evidence indicates that DOT is already proposing a role for the federal government in SSS and is considering federal financing mechanisms that will, in part, provide support for SSS projects. DOT has recently developed federal policies intended to benefit the maritime sector and packaged these policies within a proposal referred to as the SEA-21 initiative. According to DOT officials, the purpose of the SEA-21 initiative would be to create a federal maritime program similar to the surface transportation program governed by ISTEA and TEA-21. This proposal has not been formally introduced, but, according to the prepared remarks of the Under Secretary of Transportation for Policy, DOT has endorsed SEA-21 and appears to be committed to its eventual enactment.³³ DOT officials have stated that the proposal includes SSS as a central component and involves increased investment in the maritime system by leveraging federal, local, and private sector funds. It would thus appear that DOT has determined that the federal role would involve the provision of targeted incentives for SSS projects. These decisions seem premature by establishing that federal involvement is warranted before determining how SEA-21 will impact the competitive balance among all transportation modes, such as rail and trucking.

If a Federal Role Exists, Key Policy Issues Merit Close Consideration

If DOT determines that federal involvement in the development of SSS is appropriate, changes may be needed at the federal level to realize the concept's potential. These changes potentially affect the federal surface transportation program established under Title 23 of the United States Code because the vast majority of freight moves across the nation's roadways, and this program provides most of the federal support for roadways.³⁴ This program is also important in any discussion of providing federal support to advance freight improvements in that freight

³³Remarks of Jeffrey N. Shane, Under Secretary of Transportation for Policy, at the September 25, 2003, annual National Waterways Conference and the May 20, 2004, National Maritime Day Luncheon held in Washington, D.C.

³⁴Other programs build, maintain, and operate the inland waterways; provide aid to airports; maintain the air traffic control system; and maintain harbors. The federal surface transportation program, however, is the largest of those programs and the most important for freight.

transportation is typically intermodal and through these acts the Congress established intermodalism in federal policy.

If a federal role exists for SSS, the potential change involved appears to center on two broad policy questions: (1) Should federal support be provided for privately owned and operated infrastructure? (2) Should funding levels be increased and existing funding sources expanded? Understanding the implications of these broader policy issues can help guide DOT as it wrestles with defining the federal role for SSS development and ensuring that the approach adopted will be part of an integrated approach to addressing the nation's congestion and capacity problems.

Determining How Federal Aid Could Be Applied to Projects That Provide Benefits to the Private Sector

Accommodating freight projects under federal aid programs involves considering the implications of providing public support to projects both that provide substantial private benefits and that individuals and firms would be willing to pay for on their own. The high level of private sector involvement in freight transportation is a major factor distinguishing freight improvements from other transportation projects. For example, most freight carriers are private companies, and they own and operate significant components of the nation's freight transportation infrastructure, such as port terminals, trucking companies, and rail lines. Therefore, any freight improvement, including SSS projects, would likely involve privately owned or operated infrastructure. Funding such types of projects might thus provide a significant benefit to the SSS operator that owns and operates the service.

The rationale for considering whether federal aid programs should be broadened to include freight improvements is that these types of projects also have the potential of producing a public benefit. Broadly stated, a freight improvement project may produce benefits that are not captured in market transactions. For example, an SSS project might alleviate congestion over a wide area by removing some freight from highway and rail, thereby increasing the capacity of the surface transportation system. These types of benefits provide benefits to society but do not in themselves generate incentives to the private sector to invest because the benefits do not accrue to the projects' users and, therefore, would not be reflected in the prices they would be willing to pay.

Although freight improvement projects may have potential to produce public benefits, current decision-making processes and federal funding requirements can limit the consideration they receive. Transportation decision making has been established primarily as the responsibility of

state departments of transportation and local metropolitan planning organizations,³⁵ based on the premise that these levels of government would know best how to identify transportation priorities and dedicate funding to them. As we have reported in the past, however, consideration of freight improvement projects within this state and local process is limited because the process is oriented to projects that clearly produce public benefits, such as passenger-oriented projects.³⁶ Because of eligibility requirements, many federal-aid programs also limit the use of federal support for privately owned or operated projects. The exceptions to such restrictions include the Congestion Mitigation and Air Quality (CMAQ) program, which requires a correlation between the use of funds and improved air quality, and loan or loan guarantee programs, such as the Transportation Infrastructure Finance and Innovation Act (TIFIA) program, that require that the projects being supported have the ability to take on debt.

When public subsidization is being considered for freight infrastructure projects—which to a large degree would likely benefit the private sector—the appropriate scope of government involvement must be considered carefully. Apportioning the cost burden of freight projects among participants equitably³⁷ is important not only to guard against the waste of limited public resources but also to enhance the efficiency of the transportation system by supporting only the most worthy projects. Federal subsidies should not be assumed for all projects, since this increases the risk of resources being used inefficiently. Encouraging or requiring state and local decision makers to establish cost-sharing frameworks between the public and private sectors would better ensure

³⁵Federal law requires the creation of metropolitan planning organizations (MPO) for any urbanized area with a population greater than 50,000. Composed of representatives from local governments and transportation authorities, MPOs are regional policy boards charged with developing a comprehensive metropolitan long-range transportation plan and transportation improvement program that considers a wide array of interests and factors through cooperative partnerships with stakeholders.

³⁶GAO-04-165.

³⁷The use of the term “equitable” in this regard refers to the principle that beneficiaries should pay for project costs commensurate with the benefits they receive from projects.

that federal funds or support are being applied in the most effective way.³⁸ Cost-sharing involves two important factors:

- First, the degree of public involvement, whether local, state, or federal, should be limited to the public benefits the project is expected to produce—for example, those related to congestion reduction, pollution reduction, accident avoidance, and other public benefits. In other words, the cost-sharing framework should ensure that the private sector is assessed the costs of projects commensurate with the benefits it receives from them.
- Second, care should be taken to adequately consider the capabilities and resources of the private, state, and local entities to fund freight improvement projects. These stakeholders may seek to use federal funds to reduce the levels of commitment they would have provided otherwise. Federal assistance, when deemed appropriate, should promote or supplement expenditures that would not otherwise occur and should not supplant private or other public investors.

Encouraging or requiring the quantification of project costs and identifying all parties who will bear the costs can help ensure that costs are apportioned among all stakeholders equitably. When federal support through a loan or loan guarantee is used to advance a project, rather than using federal funds, DOT could consider encouraging or requiring that project sponsors plan the project to be self-supporting by targeting user fees to retire debts. Relying on revenue from users and encouraging public/private partnerships to provide efficient solutions to freight transportation needs should increase the likelihood that the most worthwhile improvements will be implemented and that projects will be operated and maintained efficiently.

There are precedents in which cost-sharing frameworks have been devised for freight improvement projects that stress reliance on federal, state, local, and private partnerships to share in the costs of freight projects. One such example involves a rail project in the Los Angeles area—the Alameda Corridor Project—which created a 20-mile railroad express line connecting the ports of Los Angeles and Long Beach to the transcontinental rail

³⁸We discuss the value of conducting benefit-cost analyses in [GAO-04-165](#), [GAO-05-172](#), and GAO, *Surface Transportation: Many Factors Affect Investment Decisions*, [GAO-04-744](#) (Washington, D.C.: June 30, 2004).

network east of downtown Los Angeles. Project sponsors secured a federal loan to cover a relatively small portion of the project cost and planned the project in such a way that revenues from fees assessed on the users of this service were targeted to retire debts. Also, the Freight Action Strategy (FAST) project in Washington state, involving a series of freight improvement projects in the Everett-Seattle-Tacoma region, received funding from a variety of public sources and private railroads. These projects illustrate how a cost-sharing framework—not largely dependent on federal funding—can be devised in such a way that all stakeholders share in the cost of freight projects.

By requiring or encouraging state and local decision makers to develop equitable cost-sharing frameworks as a condition for public support, the federal government would help ensure that costs are borne by all relevant stakeholders and that public resources are used as effectively and efficiently as possible. This approach would likely involve the least intrusive change at the federal level because it would retain the basic structure of transportation decision making by leaving the identification of transportation objectives and solutions to address those objectives in the hands of state and local decision makers. This change, however, might not change the perspectives of state and local transportation decision makers, who tend to give freight improvements limited consideration in the transportation-planning process. Left in the hands of state and local decision makers, freight improvement projects may continue to receive secondary consideration even if the eligibility requirements of existing federal-aid programs have been broadened to include freight improvements.

Determining Whether Funding Levels Should Be Increased and Sources of Funding Expanded

After deciding if federal financial support should be provided for SSS development, a follow-on consideration is whether additional resources beyond what is currently available should be provided. The primary source of federal support for freight improvements is the federal surface transportation program. The revenues collected and disbursed through this program involve excise taxes on highway users, which are credited to the Highway Trust Fund and apportioned to states by formula. States are given some flexibility in selecting projects on which federal-aid funds are expended, making possible the expenditure of federal aid on nonhighway freight projects in certain limited circumstances. Limited availability of federal funds, coupled with the hesitancy of state and local decision makers to devote public resources to projects that produce direct benefits in readily identifiable forms to the private sector, has resulted in freight

improvement projects typically not receiving the level of federal support that perhaps some in the freight industry believe is necessary.

Considering whether Highway Trust Fund revenues should be expanded to nonhighway freight projects is a controversial issue. The argument against increasing flexibility in the use of federal-aid funds is related to the way revenues are collected. However imperfectly it may be implemented, the method by which revenues are collected and credited to the Highway Trust Fund is based on the user-pays principle, which contributes to efficiency.³⁹ In this instance, the user-pays principle ensures that users value the facility at least as much as the cost of providing it. However, the opposing view holds that highway users do not pay for the effects of air pollution and the congestion delays they cause for others, and user-fee payments are not well matched to highway agency costs attributable to individual highway users. For example, the Transportation Research Board has reported that the heaviest combination trucks pay a smaller share of the expenditures highway agencies incur to serve them. Therefore, an argument in favor of increased flexibility in the use of these funds is that nonhighway uses of trust fund revenues may be defended as offsetting the effects of imperfect pricing of highways.⁴⁰ Another argument for increased flexibility is that states should manage their transportation infrastructure programs by defining their transportation objectives and then identifying the optimal means to obtain those objectives. Limiting consideration of nonhighway solutions is an arbitrary constraint that will lead to suboptimal investment solutions.

In the face of controversy over use of the Highway Trust Fund for nonhighway projects, DOT has proposed a separate funding source to address improvements involving the maritime system. According to DOT officials, the SEA-21 proposal—a maritime version of the federal surface transportation program—is intended to benefit the maritime sector. Creating a new system of providing federal funds for freight projects based on one mode, however, addresses neither the problems of the overall system nor the source of the federal aid that will be necessary to implement the SEA-21 initiative. An integrated approach to addressing the impediments to freight mobility involves evaluating investment decisions

³⁹Transportation Research Board, *Special Report 252: Policy Options for Intermodal Freight Transportation* (Washington, D.C., 1998).

⁴⁰Transportation Research Board, *Special Report 252*.

across modes and making modal trade-offs. For example, a nonhighway project, such as SSS, may have the potential to relieve highway congestion and is, therefore, not a project that should be viewed in isolation of other modes.

Adopting an approach that involves new funding sources and federal-aid programs would require substantial changes at the federal level. Therefore, careful consideration should be given to the implications of implementing such changes. More work needs to be done to determine whether new sources of funding are actually required for SSS development or whether existing funding levels and sources could accommodate these types of projects. While the freight transportation industry and transportation agencies might agree that improving freight mobility is an essential factor for maintaining the nation's economic health and competitiveness and that adequate funding must be made available for freight projects, reaching agreement on where the money should come from or how federal aid should be administered will be much more difficult.

While we have enumerated various factors that federal policymakers should consider in determining an appropriate role in the development and implementation of SSS in the United States, state and local transportation decision makers will also be faced with making difficult choices regarding SSS and other freight-related projects. In the next section, we describe an approach that state and local planners could use to guide investment decisions.

A Sound Investment Approach Is Needed to Guide Current and Future State and Local Public Investments in Freight Improvements

While DOT considers the federal role in the development of SSS activities, transportation decision makers at the state and local levels also face the need to consider alternatives for improving freight mobility. This is a challenge that goes far beyond SSS, because the transportation system involves many different modes and is funded by both the public and private sectors. Successfully addressing the needs of the system in the face of these complex, crosscutting challenges will require state and local decision makers to make tough choices in setting priorities and linking resources to results to ensure that public dollars are wisely and effectively spent. The public investment approach that we have developed, which grows out of our past work and our interaction with transportation experts, may be helpful in guiding public investment decisions.

The Complexities of the Transportation System and Growing Fiscal Constraints Present Challenges for State and Local Decision Makers

Improving the efficiency of the nation's surface transportation system is a particularly complex challenge because it encompasses many modes—water, highway, transit, and rail—on systems owned, funded, and operated by both the public and private sectors. As primary decision makers, state and local governments have significant and broad responsibilities. On the front lines of transportation decision making, state and local governments must address multiple and sometimes competing priorities, such as maintaining the safety and condition of the transportation system while, at the same time, improving the efficiency of the system.

Addressing these transportation challenges in light of federal and state budget constraints will require an understanding of existing transportation program constructs and financing mechanisms to ensure that limited public dollars are wisely and effectively spent.⁴¹ For example, the current method of dispersing federal transportation funds to the states does not necessarily encourage transportation decision makers to address the needs of the system in a systematic or rational manner. Much of the public funding for system maintenance and improvement for surface transportation projects comes from federal programs established under Title 23 of the United States Code, with funds from the Highway Trust Fund apportioned to the states by formula without regard to the needs or capacity of the recipients.⁴² Because decisions are primarily made by state and local governments, there is little assurance that the projects selected and funded best meet the nation's mobility needs. Improving freight mobility in particular is hampered by the highly compartmentalized structure and funding of federal transportation programs. The structure and funding of these programs give state and local transportation agencies little incentive to systematically compare the trade-offs between investing in different transportation alternatives to meet mobility needs because funding can be tied to certain programs or types of projects. For example, while passenger and freight travel occurs on all modes, federal funding and planning requirements focus largely on highway and transit. This framework makes it difficult for freight projects to be integrated into the transportation system.

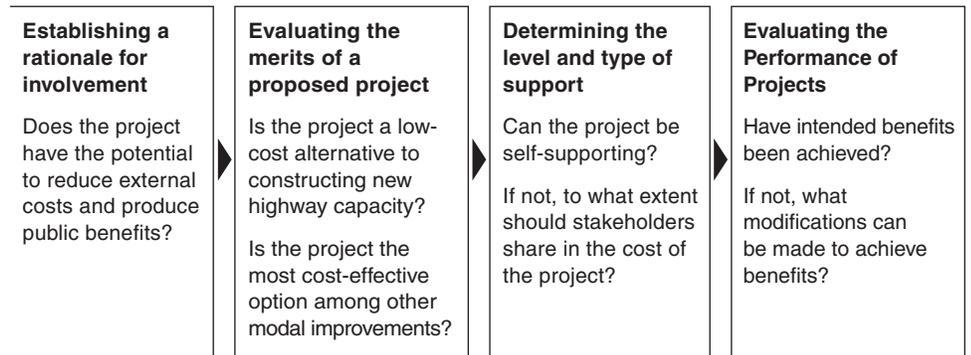
⁴¹GAO, *21st Century Challenges: Reexamining the Base of the Federal Government*, GAO-05-325SP (Washington, D.C.: February 2005).

⁴²Other programs have been established at the federal level to build, maintain, and operate inland waterways and enhance and maintain harbors.

A Public Investment Approach Can Help Public Decision Makers Guard against an Inefficient Use of Public Resources

As calls for increased transportation investments come amid growing concerns about the size of federal and state budget deficits, state and local decision makers must guard against any waste of limited public resources when making transportation investment decisions. At the same time, intermodal approaches and coordinated solutions involving the public and private sectors should be considered. Using the work of transportation experts and our own experience in evaluating freight mobility projects, we have developed a public investment approach to guide public decisions about freight improvement projects.⁴³ This approach incorporates but also expands upon the points discussed earlier in describing the actions we think DOT needs to take in assessing potential federal involvement. As can be seen in figure 4, this approach encourages public decision makers to consider four steps: (1) establish a rationale for public involvement in a project, (2) develop a systematic framework to evaluate the merits of projects, (3) determine the level and type of public support to be provided, and (4) evaluate projects to ensure that intended benefits have been achieved.

Figure 4: Investment Approach to Guide Public Investment Decisions



Source: GAO.

⁴³Transportation Research Board, *Special Report 252* and *Special Report 271*; [GAO-05-172](#); and [GAO-04-165](#).

Step One: Determining Whether
Public Support in a Freight
Project Is Warranted by
Establishing a Rationale for
Involvement

Public transportation decision makers attempting to advance freight improvement projects must work within a system that is often designed to favor projects that appear to clearly produce public benefits, such as passenger-oriented projects. Public transportation-planning decision makers are hesitant to give consideration to freight improvements because many freight improvements are undertaken by and directly benefit the private sector. Generally, freight improvements undertaken by the private sector usually arise in response to market forces (e.g., profit) and, as a result, are most likely to produce efficient results. Care should be taken not to artificially stimulate the market by publicly subsidizing an operation inappropriately, especially if the private sector is unwilling to undertake the project in the first place. Otherwise, this would likely be a waste of public resources. Although freight improvement projects may also produce public benefits, 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 projects only when there is considerable public benefit as well.

There are, however, freight improvement projects that are unattractive to the private sector but have the potential of producing benefits to the public; one such benefit is reducing the external costs of transportation, such as reducing fuel emissions and roadway congestion. Considering whether the project has the potential to reduce the external costs of transportation provides an indication of a project's potential for yielding a good return. For example, improving freight mobility through the implementation of an SSS service may have the effect of shifting some freight from truck to water and, as a result, reduce external costs such as pollution and congestion. These benefits can, in turn, produce indirect benefits, such as economic development and employment, that affect the regional or local economy. Lowering transportation costs for users and improving access to goods and services enable new and increased economic and social activity. Over time, indirect impacts, such as changes in land use and development, changes in decisions to locate homes and businesses in areas where housing and land are more desirable, and changes in warehousing and delivery procedures for businesses in order to take advantage of improved speed and reliability in the transportation system may occur. These impacts can lead to increased property values, increased productivity, employment, and economic growth. These indirect impacts, however, may constitute transfers of economic activity from one area to another or are a result of the direct benefits filtering through the economy. Although these indirect benefits represent real benefits for the jurisdiction making the

transportation improvement, they represent transfers and not real economic benefits, from a national perspective.

The SSS service sponsored by the Port Authority of New York and New Jersey serves as an example of how public involvement in a proposed project appears to be justified. SSS was being explored by the port authority as a way to transport a portion of the international containers entering the congested and capacity-constrained Port Authority of New York and New Jersey to the less congested and capacity constrained Port of Albany. Public officials believe that an SSS service between these two ports has the potential of diverting international containers from trucks to barge and by doing so, truck emissions, fuel consumption, roadway wear and tear, and roadway congestion (i.e., external costs) would be reduced. Public officials also believe that the service will create new economic development opportunities at public facilities, if successfully implemented. Potential private benefits identified include increased efficiency for terminal operators, reduced highway congestion for truck drivers, and stable and reliable scheduling and defacto free warehousing of inventory for shippers.⁴⁴ Project sponsors also believe that both sectors would gain service insurance and security benefits due to the redundancy aspect of the new service and its safety advantages in transporting hazardous materials outside of populous urban highway and rail corridors.⁴⁵ However, establishing a rationale for public involvement is not enough to justify financial support for a project. Rather, it merely supports closer public scrutiny of a proposed project through benefit-cost and other analyses to determine if the project is worthwhile.

Step Two: Developing a Framework to Evaluate the Merits of the Proposed Project

Once public interest in a project appears to be justified, investment decisions based on a systematic benefit-cost analysis could provide a structure for rational analysis and a factual basis for public discussion of public decisions. Benefit-cost analysis enables decision makers to more closely scrutinize the justification for a project by quantitatively considering whether the proposed project is a low-cost alternative to

⁴⁴According to project sponsors, the warehousing benefit is becoming more important to shippers and ocean carriers as terminal operators, in an effort to handle more cargo within their facilities, continue to put pressure on the shippers and carriers to move containers off their piers as quickly as possible.

⁴⁵According to project sponsors, the lack of freight system redundancy is particularly troublesome in corridors such as Interstate 95 where the loss of any individual segment could have an impact.

constructing new highway capacity and whether it is the most cost-effective option among other modal improvements. By including a comparison of other modal improvements, the public planner gains an understanding of the trade-offs and relationships among alternative solutions involving different transportation modes.

A carefully considered list of public and private benefits and costs should be developed and the costs and expected payoffs should be quantified. For freight improvement projects, the costs and expected benefits largely mirror those of highway and transit projects. In recently published work on highway and transit investments, we provided information on the types of costs and benefits decision makers typically consider when evaluating highway and transit projects.⁴⁶ We reported that these types of projects have the potential of producing direct benefits, such as travel-time savings, and collateral benefits, such as a reduction in the adverse environmental impacts of transportation. These direct benefits can produce indirect benefits, such as economic development opportunities that affect the region or local economy. Freight improvement projects seek to produce the same benefits. Highway and transit projects also produce costs, including the direct costs to construct, operate, and maintain the project as well as other potential social costs resulting from the construction and use of the facility, such as unmitigated environmental effects. Any freight improvement project under consideration would include similar categories of costs.

Although public decision makers may view freight projects as being somewhat different from highway and transit projects, state and local decision makers can use similar categories of costs and benefits. The SSS service operating in the Northeast illustrates this point. Project sponsors considered the proposed SSS project as an option that had the potential to reduce congestion in and around the Port Authority of New York and New Jersey. The project was considered to be an environmentally sound method for moving international containers from the congested port, via a biweekly barge service, to a less-congested port area. In this example, project sponsors quantified potential project benefits such as congestion reduction, improved air quality, and economic development opportunities for the feeder port. Costs considered included the capital and operating costs of the barge service.

⁴⁶[GAO-05-172](#).

In conducting benefit-cost analyses, accurate and relevant data are essential to the evaluation of freight improvement proposals because such data are needed to evaluate forecasts of transportation demand and the effect a project would have on diverting traffic to and from other transportation modes. However, in past reports, we have found that state and local decision makers do not have data to sufficiently evaluate freight projects.⁴⁷ Without such forecasting, the analyses will not expose the true costs and expected payoffs of a project. The SSS service operating in the Northeast provides insights into what might occur if sufficient data are not available to forecast demand. While this service appeared to be a project in which public involvement was justified, acceptance-related issues with the potential users of the service were apparently not adequately considered to accurately predict outcomes. For example, project sponsors did analyze data indicating that there were sufficient cargo flows to support the new service, but they had difficulty estimating the level of acceptance of the new service by stakeholders within those markets. They acknowledged, however, that shipper acceptance is perhaps the most critical factor that has held back the project so far. After starting the service, they realized that factors beyond market size, level of service, and service cost must be taken into account. Consequently, once the service began operating, service had to be cut back from twice a week to once a week, and the federal grant being used to subsidize the operation was expended more quickly than anticipated. Juxtaposing this example with another illustrates the significance of this point. The SSS service operating in the Gulf of Mexico performed a market survey before implementation to determine that a market existed for the service. In this case, the service was advanced by the private-sector and not surprisingly, depends on private-sector demand.

While benefit-cost analysis ensures that decision makers closely scrutinize proposed projects objectively, we recognize that other factors work against using this kind of analysis. These factors may involve the way federal programs are structured and funded, federal requirements that place demands on analytical resources to other areas, and the high cost of such analyses. In addition, factors other than those considered in analyses of projects' benefits and costs can play a greater role in shaping state and local public investment choices. Some of the factors considered reflect local or regional priorities and needs; others are required to be considered in the decision-making process by federal legislation. These factors may

⁴⁷[GAO-04-165](#) and [GAO-05-172](#).

not be easily considered in traditional benefit-cost analysis.⁴⁸ Nevertheless, as we have recommended in an earlier report, the increased use of benefit-cost analysis can provide important information that can be used to inform discussions on transportation investments.⁴⁹

Step Three: Determining the Level and Type of Public Support to Be Provided

If evaluation supports the merits of public involvement in a freight project, the public decision maker must determine the level of public support to be provided. While in most cases, public involvement is often assumed to mean subsidization of a project, such involvement need not necessarily imply the need for or appropriateness of subsidization. A subsidy is any cost imposed on taxpayers as a whole to pay for benefits that are received by users of the service. Therefore, if a public decision maker plans a project to be entirely self-supporting from user fees and private-sector contributions, no public subsidy is involved. Relying on revenue from users increases the likelihood that the most worthwhile improvements will be implemented, operated, and maintained efficiently. Fees assessed on the mode in question should be accurately aligned with the costs other modes or vehicles impose on the transportation system. Otherwise, one mode may enjoy an advantage over another in competing to transport goods. For example, according to the Transportation Research Board, the heaviest trucks pay a smaller share of the expenditures that highway agencies incur to serve them.⁵⁰ From an economic standpoint, this level of taxation distorts the competitive environment with other modes by making it appear that the heavier trucks are a less-expensive means for shippers to transport goods. Ultimately, an accurate alignment of fees to costs could provide incentives for shippers to make modal choices and transportation options based on true costs.

A rail project designed to improve freight mobility illustrates how a project can be planned with relatively little federal subsidy. The Alameda Corridor Project in the Los Angeles area created a 20-mile, \$2.4 billion railroad express line connecting the ports of Los Angeles and Long Beach to the transcontinental rail network east of downtown LA. The express line eliminated approximately 200 street-level railroad crossings, relieving congestion and improving freight mobility for cargo. The project was

⁴⁸GAO-05-172.

⁴⁹GAO-05-172.

⁵⁰Transportation Research Board, *Special Report 252* and *Special Report 271*.

funded through a blend of public and private sources. While the federal government contributed to the funding, its share was about 20 percent of the total, of which 80 percent was in the form of a loan. Revenues from user fees paid by the railroads have been targeted to retire debts. Decision makers have planned the project so that fees would be charged to the direct users of the system, which, in this case, are the railroads. The railroads are paying \$15 for each loaded container, \$4 for each empty container, and \$8 for other types of loaded railcars, such as tankers and coal carriers. Over a 30-year period, fees will be increased between 1.5 percent and 3 percent per year, depending on inflation.

The planning of this rail project contrasts with the manner in which the SSS operation in the Northeast was planned. Project sponsors involved with the Northeast service planned to subsidize the capital and operating costs of the service from the outset rather than through fees charged to the direct users of the service. Project sponsors acknowledged that they knew the service would experience an operating deficit during the first several years of the operation due to the need to achieve a sufficient level of demand to be economically viable.

When public involvement does mean direct financial support for a project, benefit-cost analysis allows a public decision maker to determine the level of public support to be provided on the basis of the public benefit the project is expected to accrue. Therefore, there should not be an expectation that public dollars should automatically fund the entire or even majority of the project. Rather, costs should be apportioned among all relevant stakeholders. This apportionment involves identifying the relevant stakeholders, determining the level of benefits they are likely to derive from the project, and apportioning costs on that basis. Beneficiaries should pay the costs of projects commensurate with the cost of providing the service to the users. For example, when users are the direct beneficiaries of a project, user fees are the preferred method that should be considered for projects that directly benefit the users. When external benefits, such as the reduction of pollution or congestion, result from a project, the direct users should pay the net cost of the use of the service after deducting the public benefit. In the case of the SSS service operating in the Northeast, the true costs of the service were not apportioned among all of the relevant stakeholders because the service was being completely subsidized with public funds—that is, 80 percent with CMAQ funds and 20 percent with port funds. However, project sponsors believe that as demand for the service increases, the service will eventually meet expectations and rise to the level necessary for self-sustainability, which means that operating costs

will eventually be paid from the fees charged to the direct users of the service.

Step Four: Evaluating the Performance of Ongoing and Completed Projects

The final component of our public investment approach involves evaluating results and incorporating lessons learned into the decision-making process. Evaluating the effectiveness of ongoing and completed projects could provide public planners with valuable information for determining whether intended benefits have been achieved and whether the service should be modified. With thorough evaluation of projects, the public sector can learn from experience, improve the performance of its infrastructure investments, and hold planners accountable for their decisions.

Comparing the actual results of a project with the project's projections tests the economic rationale for a project, provides a self-correcting mechanism, and holds public decision makers accountable for decisions made. A federal transit program provides an apt example of how a federal program can be designed to require such evaluations. The New Starts program provides funds to transit providers for constructing or extending certain types of transit systems and is the primary source of funds for new transit capacity. The Federal Transit Administration (FTA) has recently adopted a requirement for project sponsors to complete before and after studies of New Starts projects. Project sponsors seeking federal funding for their New Starts project must submit to FTA a plan for the collection and analysis of information that addresses how the project's estimated costs, scope, ridership, and operating plans proposed during planning and project development compared with what actually occurred. This requirement is intended to hold transit agencies accountable for results and identify lessons learned for future projects. In another example, federal program requirements led to both a prospective evaluation of a proposed project and an evaluation of the ongoing project to secure federal funds. Project sponsors of the Northeast SSS service evaluated the ongoing performance of the service to update estimates of future performance in their bid for an extension of CMAQ funds. By monitoring the performance of the service, project sponsors have been able to identify problems and devise strategies to address those problems. For example, project sponsors are developing strategies to reduce some of the operational costs of the service and increase demand. Ongoing evaluations of the service also revealed that within the first few years of operation, the feeder port was providing a disproportionate amount of funding for the service through the local CMAQ match, and as a result, the primary port agreed to provide the local match for the third year of service operation. Monitoring the performance of the

service allowed project sponsors to seek ways to improve the service, thereby guarding against a waste of public resources.

Opportunities Exist for Encouraging the Use of a More Systematic Public Investment Approach

The application of a decision tool such as the one we developed could be useful in making more fully informed decisions about transportation projects. However, there is no federal or other mechanism that would require its use or even ensure that it is considered in evaluating transportation investment decisions. This is the case even for projects that receive a substantial amount of funding from the federal government. For example, for federally assisted highway projects, federal requirements specify a wide range of factors (such as safety or environmental impacts) that must be considered when selecting a project from alternatives, but they generally do not specify what analytical tools should be used to evaluate these factors. Federal requirements also do not mandate that in making these decisions, cost-benefit analysis be performed and the results of such analysis considered. Instead, officials have the flexibility to select projects based on their own determination of the community's priorities and needs. In general, decisions about what transportation projects to adopt are generally made at the local, regional, or state level. In examining how various locations made decisions for highway projects, for example, we found that officials used a variety of approaches and often based their decisions on different criteria.⁵¹ For example, decisions were often based on whether to proceed primarily on the project's perceived indirect benefits, such as desirable changes in land use or economic development, which are difficult to forecast and were generally not quantified or systematically analyzed.

While federal policy gives transportation planning authorities considerable latitude in deciding how to make decisions about which projects to fund, there are mechanisms available at the federal level for disseminating information about decision-making approaches and encouraging the use of approaches that can make the best use of limited public funds. DOT, for example, issues guidance and information on a variety of matters for which it has responsibility. One such mechanism for doing so is DOT's Transportation Planning Capacity Building Program, which is designed to equip decision makers, transportation officials, and staff with tools for resolving the issues they face when addressing transportation needs in

⁵¹GAO-05-172.

their communities. This program is a collaborative effort of DOT agencies as well as various public and private organizations. Among other things, it provides communities with background information, examples of effective transportation-planning practices from across the nation, and technical assistance. Our approach, which represents a set of “best practices” stemming from our previous work and our discussions with transportation officials, might be useful as part of DOT’s guidance and information.

DOT has a variety of ways to disseminate such information. One way is through its Web site, which incorporates a variety of program resources, including detailed information related to the Transportation Planning Capacity Building Program. Another way is through its network of seminars, training opportunities, and technical assistance. The scope of training and assistance includes conferences held over the Internet, classroom training, and Internet-based short courses. For example, the Federal Highway Administration developed and implemented a Web-based “Talking Freight” seminar series on many diverse topics, such as freight data and modeling, SSS, and linking freight to economic development.

Conclusions

Expanding the SSS option may be a way to enhance freight mobility by supplementing roadways and rail lines, alleviating congestion in metropolitan areas and freight corridors, and mitigating the need for more highways or rail corridors. However, despite the potential importance of SSS to enhance the nation’s freight mobility, its viability as a cost-effective approach is uncertain, given the legal and operational issues cited by proponents of this option. Also, there is reluctance among shippers to use this option, a factor that affects its acceptance and further development.

DOT deserves credit for thinking “outside the box” in looking for ways to alleviate congestion in the nation’s growing transportation bottlenecks, but the direction it is taking—increasing federal involvement in SSS—needs to be more carefully examined. DOT has made the development and implementation of SSS a national priority for enhancing freight mobility and has undertaken numerous activities but has not articulated a clear rationale for what the federal role, if any, should be. Also, the department’s draft proposal for greater involvement in maritime transportation (SEA-21) calls for financial assistance to further the SSS option. Actions such as those in the draft proposal are premature, in our opinion, until a broader understanding of the federal role with respect to SSS is defined and the potential applications and impacts of such an option on other modes are better understood. Otherwise, DOT runs the risk of “putting the cart before

the horse” and is at greater risk for creating inefficiencies within the transportation system and missing opportunities to best apply and leverage federal resources.

State and local public transportation officials are the primary decision makers for planning and financing projects, such as SSS, to enhance freight mobility, and they will largely determine the extent of public involvement in SSS projects and the amounts and types of public subsidies for that purpose. Ideally, a sound investment approach—one based on recognized economic and management principles—is needed to make this determination. But many public transportation entities lack a consistent and comprehensive investment approach to identify, evaluate, and implement competing projects, including potential SSS projects. Having a sound investment approach is critical to better ensure that available resources are used cost effectively to address the most pressing freight mobility needs. The approach we developed based on our past work and extensive literature research will be helpful, we believe, in guiding public investment decisions. DOT can play a role in promoting this approach by interacting with public entities using established communication channels and other mechanisms.

Recommendations for Executive Action

We recommend that the Secretary of Transportation and the Administrator of the Maritime Administration undertake the following two actions with regard to further federal involvement with SSS and greater use of systematic approaches to making public investment decisions:

1. Before expending substantial federal resources on SSS activities or developing a formal program for federal involvement in helping to fund this approach, establish a comprehensive understanding of key issues to determine whether there is a genuine need for federal involvement and what the role of the federal government should be, if any. Such a determination could, for example, involve consideration of the following issues.
 - To determine whether the private sector would likely undertake SSS projects on its own, policymakers could explore several areas in depth. For example, gaining a better understanding of the conditions and circumstances under which existing SSS started and are being sustained and the potential impact of the regulatory, administrative, and operational barriers to the development and implementation of

SSS are both important in determining whether federal involvement is necessary.

- To better define an appropriate federal role, if deemed necessary, a number of areas could be explored, including (1) an assessment of the state, local, and private resources that may be likely available for SSS projects; (2) quantitative and qualitative analyses of nonmarket or external factors with respect to SSS, such as reduction in the costs of congestion, pollution, and accidents, that the private sector will likely not be willing to fund; and (3) an evaluation of potential financing mechanisms and incentives to best leverage federal resources, develop an equitable cost-sharing framework among public and private entities, and ensure that users and beneficiaries of SSS services pay for these services commensurate with the costs of providing them.
2. To foster greater use of systematic approaches, use existing mechanisms and communications channels to encourage public transportation decision makers to evaluate SSS and other freight projects using an investment decision tool—such as the one we developed—that incorporates recognized economic and management principles.

Agency Comments and Our Evaluation

We provided a draft of this report to DOT and MARAD for review and comment and met with a number of officials, including the Assistant Secretary for Transportation Policy, the Deputy Assistant Secretary for Transportation Policy, and MARAD's Associate Administrator for Ports, Intermodal, and Environmental Activities. DOT and MARAD agreed with our recommendations and assured us that efforts within the department to gain a more detailed understanding of key issues surrounding the SSS approach will be undertaken before requesting federal funds for it. The department also provided clarifying comments and technical corrections, which we incorporated, as appropriate. These officials reiterated that while the freight demands placed on the nation's highways and rail systems continue to grow, the marine transportation system remains underutilized. They said there is a need to explore innovative, potentially viable options to increase the capacity of the nation's transportation system in order to expedite the flow of goods and support economic growth. These officials stressed that the maritime freight capacity option has received scant attention (with the exception of two small demonstration projects using CMAQ funds to support barge moves of cargo), because ISTEA, TEA-21,

and the proposed TEA-3 are essentially surface transportation bills. According to these officials, the department is using a range of actions and discussions, including a thorough vetting of maritime capacity options, to “press the envelope” on freight capacity deliberations as the country continues to experience serious and growing freight congestion issues on key highway and rail corridors.

The DOT officials told us the department has begun to explore SSS as one means to accommodate growth in freight shipments, given the capacity constraints of the national transportation system and the high cost of increasing surface transportation capacity. DOT has also been working to raise awareness of this option among potential industry participants and throughout the government. Further, these officials explained that DOT is now conducting detailed and rigorous studies of the potential for SSS and has been drafting possible policy options as a means to stimulate discourse on the topic within the administration. They maintain it is not premature to conduct these activities since it is necessary to act with an understanding of the considerable lead times involved. They assured us that any request to the Congress for funding related to the SSS initiative will be made only after the option and its implications are fully and rigorously explored and well understood.

The efforts taken to date by DOT and MARAD to begin exploring the SSS option provide a good first step to gain a better understanding of key issues with respect to developing this approach. As DOT and MARAD proceed, we think it is critical that they do so thoughtfully, taking the time to thoroughly consider the implications on other modes and on current SSS operations. Until a thorough assessment is completed in this regard, proceeding with federal intervention such as providing regulatory relief or financial assistance to SSS projects is premature.

We are sending copies of this report to congressional committees with responsibilities for transportation issues; the Secretary of Transportation; and the Administrator, Maritime Administration. We will also make copies available to others upon request. In addition, this report will be available at no charge on the GAO Web site at <http://www.gao.gov>.

If you or your staff have any questions about this report, please contact me at heckerj@gao.gov or (202) 512-2834. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix II.

A handwritten signature in black ink that reads "JayEtta Z. Hecker". The signature is fluid and cursive, with a long horizontal stroke at the end.

JayEtta Z. Hecker
Director, Physical Infrastructure Issues

Objectives, Scope, and Methodology

To determine why short sea shipping (SSS) is being considered as an alternative method for transporting freight and factors that may affect its viability as an approach, we conducted a literature review of reports and studies related to freight transportation issues; interviewed freight transportation stakeholders representing all levels of government; interviewed private-sector stakeholders involved in various aspects of the freight transportation system; and examined two existing SSS operations. Our literature review included reports and studies issued by public- and private-sector organizations, nonprofit organizations, and academia; articles from relevant trade journals; and position papers reflecting the views of freight stakeholders. To supplement the information obtained through the literature review, we interviewed transportation officials representing ports on the East and West Coasts and the Gulf of Mexico; officials involved in transportation planning at the local and state levels; and federal officials from the Department of Homeland Security's Customs and Border Protection agency. We also interviewed private-sector officials from the trucking and rail industries and other private officials involved with the movement of freight, such as third-party logistics providers. To supplement the information obtained through our literature review and interviews, we examined two existing operations. We selected one publicly subsidized operation in the Northeast and one private operation in the gulf region from information we received from our interviews as well as information we obtained through our literature review. The services were also selected because they were operating in regions of the country that handle a significant portion of the nation's freight. Because we evaluated only two existing operations, however, lessons learned from the operations may not be transferable to other operations. It is also important to note that because our review focused on existing services, it provides no indication of whether other operators may have considered a service but not followed through because of perceived obstacles to SSS implementation.

To determine the federal role in the development of SSS, we conducted in-person interviews with U.S. Department of Transportation (DOT) officials, as well as officials at its operating agencies; analyzed documents supplied by DOT and its operating agencies; reviewed GAO reports on transportation systems and infrastructure projects; and reviewed studies and reports issued by transportation experts. At the department level, we interviewed officials from the Office of Freight and Logistics, Office of Environmental Activities, and Office of the Secretary. At the agency level, we interviewed officials from the Maritime Administration and the Federal Highway Administration. Our work also included an analysis of documents

supplied by DOT and its agencies, including strategic plans, budget documents, and studies and reports on freight transportation issues.

To identify issues that should be considered when making public investment decisions, we analyzed the results of our review of SSS and built on the perspectives gained from our past work in transportation systems and federal investment strategies. We also analyzed reports and studies completed by various federal agencies and other independent experts on public investment strategies.

We conducted our work from July 2004 through June 2005 in accordance with generally accepted government auditing standards.

GAO Contact and Staff Acknowledgments

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