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Report for Congress

Intermodal Rail Freight: A Role for Federal Funding?

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John F. Frittelli
Transportation Analyst
Resources, Science, and Industry Division

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Summary

As Congress considers reauthorization of federal highway and transit programs and funding, currently provided by the Transportation Equity Act for the 21st Century (TEA-21, P.L. 105-178), one issue being discussed is the role of freight rail in the nation's transportation system. Economic and trade growth, along with growing congestion on certain parts of the nation's interstate highway system, has focused attention on the ability of the railroads to divert more truck traffic to rail. However, the railroads are currently operating at close to capacity. Many rail analysts question whether the railroads are making sufficient profit to add adequate capacity to their intermodal network. This raises the issue of whether the government could or should assist the railroads in expanding the capacity of their infrastructure. And if so, how a funding program could be arranged.

A number of concerns have been raised about federal contributions for the development of freight rail facilities. Some contend that an aid program is unnecessary, others object to providing public aid for privately owned infrastructure, and some warn that public aid will do more harm than good. Still others question the potential of intermodal rail to alleviate highway congestion.

On the other side of the issue, a number of public benefits can be associated with improving freight rail infrastructure. One view is that public aid should be directed to those rail or rail-related projects which improve passenger mobility. Projects that mitigate grade-crossing delays or upgrade passenger rail corridors are primary examples. Another popularly held assumption is that public aid should be provided because there are energy, safety, and environmental benefits to rail transportation. In this view, these external benefits are justifiably not likely reflected in the rail industry's investment decisions and thus warrant government involvement. There are also those who support public aid for rail projects for the purpose of enhancing freight mobility. This view holds that freight railroads are so critical to the national economy that upgrading and expanding their infrastructure is a national concern.

Freight railroads primarily finance projects themselves with almost no government assistance. The railroads have been investing heavily in their service capacity, particularly with respect to intermodal terminals. The question is if their pace of investment is sufficient to meet anticipated demand. Federal programs have funded some rail related projects, but relative to the other modes in modern times, funding is limited. There is a growing sense by some parties that public support for intermodal rail projects must become more common if growing congestion and inefficiencies in the nation's transportation system are to be corrected.

One proposal is to create a rail trust fund similar to the highway, inland waterway, and aviation trust funds to provide a regular funding stream. Others suggest that existing federal programs could be modified to make it easier for freight rail projects to qualify for federal monies. A related issue is how projects deserving public support could be identified. This report will be updated as warranted.

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Introduction

Congress is reevaluating the role of rail in the nation's freight transportation system as it considers reauthorization of federal surface transportation funding, currently provided by the Transportation Equity Act for the 21st Century, (TEA-21, P.L. 105-178), which expires at the end of September 2003. Railroads move approximately 40% of the nation's intercity freight as measured in ton-miles (the movement of one ton of freight one mile) and 6% as measured in value. Economic and trade growth, along with growing congestion on certain portions of the nation's interstate highway system, has focused interest in the capability of the railroads to divert more truck traffic to rail. However, according to observers the railroads are currently operating at or near full capacity. Diverting more truck traffic to rail will require substantial investment in intermodal rail facilities. Many rail industry observers question whether the railroads are making sufficient profit to add capacity to their intermodal network. This raises several complex and important policy issues for Congress.[1] Should federal rail policy remain relatively "hands-off" or does the current situation require a more activist policy? Should government assist the railroads in optimizing their intermodal network? If so, how should government funding be arranged? How would rail projects deserving government support be selected?

The first part of this report provides historical context and reviews some of the factors inspiring debate on these questions. The next section examines arguments for and against government involvement in financing rail infrastructure and discusses the types of rail projects being proposed for public funding. The following section describes current funding mechanisms and the last section reviews the pros and cons of some alternative mechanisms for funding and planning rail infrastructure.

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[1] For further information on this topic, see Jeremy F. Plant, "Railroad Policy and Intermodalism: Policy Choices After Deregulation," *The Review of Policy Research,* June 22, 2002, and John M. Scheib, "Government and Industry Partnership to Develop Rail Infrastructure in the United States," *Transportation Quarterly*, Summer 2002.

Background

What is Intermodal Rail?

Intermodal rail is the movement of cargo in combination with at least one other mode of transport but under a single bill of lading. Although intermodal rail could include many types of commodities, such as grain or coal, the rail industry limits the term to mean the carriage of truck-trailers (with wheels) or containers (without wheels) by rail. Trucking is critical to intermodal rail transport. Trucks are utilized for the pick up or delivery of the trailer or container to the shipper at either end of the rail segment.[2] Import and export moves through seaports involve water, in addition to rail and truck modes. Import and export containers may be transferred directly between ship and rail if the port has an "on-dock" rail facility. If the rail facility is located "off-dock," a truck will transfer the container between the port and railroad.[3] A truck may also transfer a container between two rail terminals if the transit involves two rail networks that do not share a common terminus.[4]

The most common forms of intermodal rail are trailer-on-flatcar (TOFC), container-on-flatcar (COFC), and double-stack container (DST). Railroads generally serve as wholesale operators for intermodal rail services, rather than dealing directly with shippers. Their intermodal customers are parcel carriers, trucking companies, ocean container lines, and intermodal marketing companies (IMCs).[5]

Historical Context

Although today the railroads may be operating close to their physical capacity, it was not very long ago that they were burdened with too much capacity. This dramatic change in circumstances over the past 20 to 30 years is largely due to technological innovations coinciding with deregulation and trade growth.

A significant development in the recent history of intermodal rail was the implementation of double-stack container cars in the early 1980s. In 1984, only one double-stack train per week originated from the West Coast and served only one inland market. Today over 241 double-stack trains per week originate on the West Coast and serve all the major U.S. long haul markets.[6] Double-stack cars allow railroads to potentially carry double the amount of containers for a given train length. This produces cost savings in terms of per unit crew costs and shortens the length of track needed in switching yards. However, double-stack trains also require higher clearances for overpasses and tunnels and require expensive lift-on and lift-off equipment in terminals.

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[2] Often referred to as "store-door" trucking or a "door" move.

[3] Often referred to as "bridge" trucking.

[4] Often referred to as "crosstown" trucking.

[5] United Parcel Service is the railroads' largest intermodal customer.

[6] AAR, AAR News, "Intermodal the 'Best Means' of Addressing the Dramatic Increase in Freight Demand," available at [www.aar.org].

Because intermodalism (and containerization) is a relatively recent phenomenon, the rail network was largely built before and is not specifically designed for this type of cargo. This creates some inherent inefficiencies in the network's connectivity. For instance, to move a container across the country requires carriage by more than one railroad. In many instances, depending on the destination, the western railroad's track does not directly connect to the eastern railroad's track, often requiring a truck to transfer the container "crosstown" between rail terminals. This most often occurs in Chicago where it is estimated that 3,500 containers a day are transferred by truck between rail terminals.[7] This truck traffic contributes significantly to the region's road congestion. Industry analysts note that while an imported container moving from the Port of Los Angeles to New York City may take three days' rail transit from Los Angeles to Chicago and three days' rail transit from Chicago to New York City, it may take two days' transit just to cross the city of Chicago from one rail yard to another. Kansas City, Memphis, New Orleans, and Dallas are other important interchange points between the eastern and western rail networks.

When double-stack trains first came into use in the early 1980s, the new intermodal traffic consumed under-utilized rail capacity. Today, however, due in large part to deregulation, supply and demand are closer to equilibrium. As a result of a series of de-regulatory acts, most notably the Staggers Rail Act of 1980 (P.L. 96-448), and culminating in the Interstate Commerce Commission Termination Act of 1995 (P.L. 104-88), railroads were given more freedom to abandon unprofitable lines and concentrate traffic on a limited number of routes. Deregulation also spurred industry concentration. Today there are six large freight railroads in North America: two in the West, two in the East, and two in Canada (with U.S. routes).

The disappearance of excess capacity was also partly a result of the decline of passenger trains. To support passenger train operations, multiple track, yard bypasses, and sophisticated signaling systems were installed. This infrastructure generated additional capacity. However, the Rail Passenger Service Act of 1970 created Amtrak, allowing the private railroads to focus on moving freight. The freight railroads "economized by strategies such as single tracking and lowering maintenance (track speed) standards."[8] If the railroads are to absorb additional traffic forecasted, or contribute to highway congestion relief by carrying additional truck traffic, they will need to make (and are making) substantial investments to expand their track and terminal network.

Factors Inspiring this Issue

Economic and Trade Growth. Concerns about the pace of investment in intermodal rail facilities is fueled by economic and trade growth. The DOT completed a freight forecasting study with DRI-WEFA (now known as Global Insight) which predicts that over the next 20 years, U.S. freight volumes, in tons, will

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[7] *Critical Cargo: A Regional Freight Action Agenda,* Business Leaders for Transportation, April 2002, p. 7.

[8] Robert E. Gallamore, "Perspectives and Prospects for American Railroad Infrastructure," *Infrastructure,* Summer 1998, p. 36.

increase by nearly 70%. International freight volumes are growing faster than domestic volumes and are forecasted to nearly double by 2020.[9] A major study on freight rail expects that rail traffic, measured in ton-miles, will increase 47% by 2020.[10] This forecast continues trends experienced in recent years. Intermodal has been the fastest growing segment of rail traffic in the last decade. In the last two decades, intermodal rail volume has almost tripled from 3.1 million trailers and containers in 1980 to 9.2 million units in 2000.[11] Intermodal now represents 18% of the revenue base for the Class I railroads[12], second only to coal at 21%.[13] By next year, intermodal may surpass coal as the top revenue source.[14] Much of the increase in intermodal volumes is the result of burgeoning trade volumes, particularly in marine containers. Approximately half of U.S. intermodal rail traffic is generated by imports or exports.

In addition to trade growth, port rationalization strategies by ocean carriers is also fueling the demand for intermodal rail services. In anticipation of rising container volumes, ocean lines are deploying larger container ships. Because there are economies of ship size at sea, but dis-economies of ship size at port, these larger container ships are calling at fewer U.S. ports. Fewer port calls will, in turn, place greater reliance on the railroads to disperse and gather container cargo to and from the hinterland.

Highway Congestion Relief. Many observers believe that intermodal rail, which is essentially trucks on trains, can provide at least a partial solution for relieving highway congestion. According to the Texas Transportation Institute's *Urban Mobility Study*, the cost of traffic congestion nationwide totals $78 billion in wasted time and fuel.[15] In the 1990s, truck traffic increased by 37%[16] and is expected to increase by more than one-third by 2010.[17]

Grade Crossing Conflicts. As rail traffic increases, at-grade rail-highway crossings increasingly delay automobile and truck traffic. A freight train can be over

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[9] U.S. DOT, Federal Highway Admin., Press Release FHWA 41-02, Oct. 3, 2002. For further information on DOT's freight forecast, see [http://www.ops.fhwa.dot.gov/freight].

[10] American Association of State Highway and Transportation Officials, *Freight-Rail Bottom Line Report,* n.d., p. 51.

[11] AAR, *Railroad Facts,* 2001 ed. p. 26.

[12] Class I railroads are railroads with operating revenues in 2000 of at least $261.9 million.

[13] AAR, "Intermodal Transport," available at [http://www.aar.org/ViewContent.asp?Content_ID=277].

[14] Thomas R. Brown and Anthony B. Hatch, *Rail Intermodal: On the Fast Track,* n.d., a study sponsored by North America's Freight Railroads.

[15] As quoted in "Hurry Up and Wait," *Logistics Management and Distribution Report,* June 2001, p.17.

[16] *Stuck in Traffic: How Increasing Traffic Congestion is Putting the Brakes on Economic Growth,* The Road Information Program, May 2001, [www.tripnet.org].

[17] According to the American Highway Users Alliance, as quoted in *Traffic World,* June 4, 2001, p.9.

a mile long, blocking several road crossings at a time. Most rail terminals are located in urban areas. If a freight train is moving slowly or not moving at all, which frequently occurs as it approaches a rail terminal, it is not uncommon in certain places for motorists to be delayed from 30 to 45 minutes, or even longer. Long, slow-moving trains can also delay emergency vehicles.

Replacing at-grade (ground-level) crossings by constructing overpasses, underpasses, rail trenches, or even relocating track or roads so that they do not intersect, are very expensive projects. In some cases, railroads have contributed to the cost of grade-crossing projects if they believe the project will improve train speed. In other cases, railroads may not be interested in the project because they are satisfied with train speed through the area and believe the project primarily benefits vehicular traffic. There are also some potential disincentives in law that may cause railroads not to seek a greater role in crossing elimination projects pursued by localities.[18] Because of the expensive nature of grade separation projects, and because it is a uniform problem occurring nationwide, many advocate that the federal government provide substantially more funds to mitigate this problem.

Railroad Revenue Shortfall. Many rail industry observers are concerned with the industry's ability to invest in added capacity to meet anticipated demand. Current investment levels appear to approach the level needed to maintain the system, but not to add capacity. A railway consultant has estimated that Class I railroads need to invest $8 billion per year just to maintain their network in its current condition.[19] However, in the decade of the 1990s, total Class I rail capital expenditures fell far short of this mark, ranging from $4.5 billion in 1990 to $6.6 billion in 1999.[20] The Surface Transportation Board (STB)[21] has found that most railroads are "revenue inadequate," meaning that the railroads can not earn enough revenues to meet the industry cost of capital. For instance, from 1990 to 1997, while the cost of capital remained between 11.4% and 12.2%, the railroads' return on investment ranged from 1.3% to 9.4%.[22]

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[18] Railroads are not required to contribute more than 5% of the cost of the project which may be limited to that portion of the project that crosses their right-of-way. See 23 CFR 646.210.

[19] Testimony of Dr. Allan Zarembski, Zeta-Tech Assocs. U.S. Senate, Committee on Commerce, Science, and Transportation, Subcommittee on Surface Transportation and Merchant Marine, *Oversight Hearing on the State of the Railroad Industry,* May 9, 2001.

[20] Testimony of William Rennicke, Mercer Management Consulting, Inc. U.S. Senate, Committee on Commerce, Science, and Transportation, Subcommittee on Surface Transportation and Merchant Marine, *Oversight Hearing on the State of the Railroad Industry*, May 9, 2001.

[21] The Surface Transportation Board is an independent adjudicatory body administratively housed in the Dept. of Transportation, responsible for the economic regulation of railroads. [http://www.stb.dot.gov].

[22] General Accounting Office, *Railroad Regulation*, April 1999, GAO/RCED-99-93, p. 45.

Concerns with Federal Aid

A number of concerns have been raised about federal contributions for the development of freight rail facilities. Some contend that an aid program is unnecessary, others object to public aid for private infrastructure, and some warn that public aid will do more harm than good. Still others question the potential of intermodal rail to alleviate highway congestion.

Revenue Shortfall Disputed

Some dispute the STB's determination of railroad revenue inadequacy. The STB's determination of revenue inadequacy is a long standing controversy that dates back to the Board's precursor, the Interstate Commerce Commission. Shipper groups question how railroads could be considered revenue inadequate at the same time they were able to attract substantial capital for recent mergers or acquisitions. In testimony before Congress, a transportation economist questioned the disparity between the individual railroad data presented in annual reports to shareholders and the industry-wide data that the STB used to determine revenue adequacy.[23] The witness argued that the STB should use the "real world" data in railroad annual reports as their basis for determining revenue adequacy.

Policymakers are likely to closely examine the financial health of the railroad industry in debating the issue of government aid. Opinions differ as to whether or not the railroads need an external source of capital to augment their reinvestment capacity. Economists might contend that private investors are not shortsighted and possess the most skill in supplying the right level of capital to the rail industry. They may argue that if the pace of commerce and growing truck congestion dictates greater demand for rail services, private capital, attracted by the prospect of good returns, will flow to the industry without special government encouragement.

Others contend that natural market forces keep supply of rail facilities in check. Commentators have suggested that investors "would rather see a rail system that is capacity-restricted so that railroads can better dictate the price of their service, leading to higher rates, higher revenues, and higher returns on invested capital."[24] Skeptics opposed to providing federal assistance to the railroads contend that the need for public funds is really "driven by disenchanted investors unhappy with railroad profits" rather than a need to increase rail capacity.[25] Another view is that a rail system at or near capacity is exactly where it should operate in a deregulated environment. As one rail executive stated, "neither customers nor stockholders like

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[23] Testimony of Harvey A. Levine, U.S. Senate, Committee on Commerce, Science, and Transportation, Subcommittee on Surface Transportation and Merchant Marine, *Oversight Hearing on the State of the Railroad Industry,* May 9, 2001.

[24] Testimony of Curt Warfel, National Industrial Transportation League, U.S. House of Representatives, Committee on Transportation and Infrastructure, Subcommittee on Railroads, *Hearing on Obstacles to Rail Infrastructure Improvements*, May 22, 2001.

[25] "Aluta Continua," *Traffic World,* May 21, 2001, p. 14.

paying for excess capacity. If you make a mistake in estimating need, it takes a long time to compensate."[26]

Private Infrastructure

Federal support for freight rail raises difficult issues because the freight railroads operate differently than other modes. An important difference is that, unlike highways, waterways, and airways, which all use public infrastructure, rail track is privately owned. This raises the difficult question of whether public funding should be used to support projects in private ownership and under private control.

Another important difference is that, unlike the other modes, railroads generally do not share their infrastructure with competing railroads. This raises the issue of open access. If competitive equity is the rationale for providing railroads with some form of regular public assistance, some would extend this argument further to include rail-to-rail competition. In other words, like the other modes, railroads could receive federal support for infrastructure, but in exchange railroads should compete with each other over the same track. As one industry analyst stated, "the cost of railroad access to federal funds will be some form of open access to railroad lines."[27] However, rail carriers argue vehemently that imposing open access ('forced access' from their point of view, 'competitive access' from the shippers' point of view) would be detrimental to the financial health of their industry. Railroads contend that the best way to raise capital for reinvestment in rail infrastructure is to allow them to continue to operate without "intrusive" government economic regulation.

Detrimental to Industry Efficiency

Policymakers are likely to debate whether federal aid to the railroad industry might do more harm than good to the industry. Topics of discussion include whether federal support would reduce the rail industry's efficiency, whether it would actually slow down the rate of construction in new facilities, and whether it would lead to investment in uneconomic facilities.

Some industry analysts are concerned that government support for rail projects could create less incentive for the railroads to continue their cost-cutting initiatives. Railroads have been improving profitability through mergers, increasing labor productivity, consolidating terminals, striving to capture more market share from trucks through service improvements, selling light density track to regional and shortline railroads, and investing in more fuel efficient locomotives and freight cars. Further application of technology could not only offer railroads additional cost saving opportunities but also increase the throughput capacity of existing infrastructure. Examples of technology deployment include further expansion of double-stack intermodal trains, computer-aided dispatching systems, and sensors for improving

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[26] James McClellan, Norfolk Southern Railroad, as quoted in "U.S. Military Preparedness, Jammed in the Traffic?" *Transportation Research News,* Nov.- Dec. 2000, p. 18.

[27] Anthony Kruglinski, "Open access: Not if, but when," *Railway Age,* Nov. 2001, p. 12.

shipment tracking. Some analysts fear that public aid could dampen the industry's pursuit of these cost saving strategies.

Other concerns include possible conflicts between public and private planning horizons and excessive politicization of the project selection process. Critics question if public involvement would have the opposite of the intended effect and actually slow the pace of facility improvements. The public sector generally operates under a longer term planning horizon and is motivated by broadly-defined needs. Railroads, on the other hand, are driven by specific customer needs and require faster return on investments. Some also question whether government can target the right projects to finance. They are concerned that political considerations will dominate the selection process.

If federal assistance were in the form of public funds, it could lead to overinvestment in rail capacity in some places. To the extent that public funds are available for construction of a new project, the project may have to pass a lower hurdle in terms of evaluating risk and return than if the project was financed by a railroad on a stand-alone basis. As is often said in this regard, "you never spend somebody else's money as carefully as you spend your own." Underestimating investment risk in new facilities could also lead to the development of uneconomic facilities. For example, due to a slowdown in global trade or changes in shipping routes as a result of rail mergers or terminal consolidation, the physical life of a facility could outlive its economic life.

Potential Congestion Relief

Growing congestion on the nation's highway system has raised the issue of the possible need to divert more truck traffic from road to rail. However, when evaluating the ability of the railroads to take trucks off the highways, it is important to recognize some of the limitations of intermodal rail in reducing truck traffic. Intermodal rail almost always relies on trucks for the pickup and delivery portion of the haul. This truck move frequently occurs in urban areas where the problem of congestion is most acute. Therefore, intermodal rail's contribution to congestion relief is probably most applicable to reducing the number of long-haul trucks on the interstates connecting cities, rather than reducing the number of short-haul trucks on urban streets and circumferential highways.

When assessing the potential of the railroads to take trucks off the highways, it is also important to recognize a distinction between international and domestic intermodal service. Railroads have demonstrated their ability to successfully capture the inland portion of international container shipments. However, international marine container shippers are generally less service sensitive and more price-elastic than domestic truckload shippers. A one or two day delay, in the context of a week to three week ocean transit, is not completely unexpected. Domestic shippers, on the other hand, demand more precise schedules. The time and cost of the truck pick up

or delivery at either end of a rail move must be considered. In the words of one rail analyst:[28]

> The trouble with intermodal transport is that complexity increases the risk of failure. In theory, any good 4x100-m relay team should beat the world champion 400-m sprinter, but the relay team has higher risk of a dropped baton, or even late arrival at the stadium. So, no matter how elegant the piece parts, if more complexity reduces reliability and margins for error are too slim, what ought to be possible just might not be.

An additional consideration in evaluating the potential of rail to alleviate highway congestion is the economics of short-haul intermodal traffic. Short-hauls generate the greatest amount of truck traffic. However, intermodal rail generally is not competitive with trucks for hauls less than about 500 miles, which is the point where double-stack trains also generally break even. Although the market potential for short-haul rail is large, it offers even thinner profit margins (or none at all) for the railroads than does long-haul intermodal. One of the difficulties for the railroads in capturing this market is that the highway system has dispersed manufacturing and distribution centers. Similar to passenger rail, successful freight rail requires high density. Trucks have less difficulty in finding a load for the backhaul portion of a move because they are not limited by track. Trucks can also offer shippers more flexible scheduling.

Public Benefits of an Aid Program

An important topic of discussion in the debate about aiding and assisting rail infrastructure development is clarifying under what conditions public aid might be provided. One view, which is well established, is that public aid should be directed to those rail or rail-related projects which improve passenger vehicle mobility. Projects that mitigate grade-crossing delays or upgrade passenger rail corridors are primary examples. Another popularly held assumption is that public aid should be provided because there are energy, safety, and environmental benefits to rail transportation. In this view, these external benefits are justifiably not likely reflected in the rail industry's investment decisions. The market's tendency to under-produce these public goods, it is argued, warrants a role for government. There are also those who support public aid for rail projects for the purpose of enhancing freight mobility. This view holds that freight railroads are so critical to the national economy that upgrading and expanding their infrastructure is a national concern. An argument could also be made that public assistance for rail infrastructure is advisable for national security reasons.

Passenger Mobility

Grade crossing separation and crossing signal upgrades are well established as rail-related projects with strong public interest. Grade crossing separation is

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[28] Robert E. Gallamore, "Perspectives and Prospects for American Railroad Infrastructure," *Infrastructure,* Summer 1998, p. 36.

traditionally viewed as a public good because it improves the safety and mobility of vehicular traffic. As a side benefit, it may also improve the flow of train traffic. The Rail-Highway Grade Crossing Program (23 U.S.C. 130) provides funds for improving grade crossings.

Public benefits are also traditionally associated with improving infrastructure on intercity passenger or commuter rail corridors. Passenger rail financing is inextricably linked with freight trains because most passenger trains run on track owned by the freight railroads. Investment in positive train control technologies and upgrading right of way for high-speed rail are projects that improve passenger mobility but may also have collateral benefits for freight train operations. The freight railroads are cautious of accepting public funding for track upgrades for passenger operations because they fear loss of control over future investment decisions. They are also skeptical of the long-term physical compatibility of freight and passenger trains sharing the same track.[29] One advantage of accepting public funding for passenger rail upgrades is that the freight railroads can access capital at lower interest rates from public than from private money markets.[30]

Another rationale for funding rail projects is that cities need intermodal options because of serious congestion problems on urban highways. Many argue that building additional highway lane miles will not improve highway mobility in the long run. Due to the expensive nature of highway construction and limited space for widening highways in many urban areas, many believe cities need to find more integrated transportation solutions. Proponents of intermodal rail assert that improving the rail links with ports and between rail terminals in metropolitan areas could significantly reduce the amount of "bridge" and "crosstown" truck traffic. This would not only expedite the flow of goods but also reduce the amount of truck traffic intermingling with highway commuter traffic. Mitigating highway congestion can also generate air quality improvements. Finally, it is argued that taking heavy trucks off highways can reduce highway maintenance costs.

Freight Mobility

Due to economic and trade growth, some policymakers believe a "bolder vision" of rail's place in the nation's transportation system is necessary. Freight advocates believe that the nation's intermodal infrastructure is failing to keep pace with international commerce. In the words of one industry representative:

> "The key aspect of our future is simply this. If the U.S. economy is going to continue its amazing growth, there needs to be a renaissance of the North American railroad industry. Renaissance does not come easily. I realize that many who call for dramatic change are branded as heretics, but the situation with the major railroads has to change - for everyone's sake.[31]

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[29] "Why One Problem at a Time Won't Work," *Railway Age,* Sept. 2001.

[30] Charles H. Banks, "Point of View, Freight Railroads Need Passenger Trains," *Railway Age*, Nov. 2001, p. 14.

[31] Ed Emmett, President of the National Industrial Transportation League, speech titled (continued...)

The National Center for Intermodal Transportation presents another view:[32]

> Just as the construction of the Interstate Highway System, which began a half century ago, served as a catalyst for a period of economic growth unrivaled in world history, the development of an integrated, efficient, and seamless intermodal transportation system will enable other economic sectors to enjoy enhanced productivity as well, thereby enhancing overall economic growth and securing a competitive position for the U.S. in the global economy.

Proponents of intermodalism, such as those cited above, contend that it increases the overall efficiency of the nation's freight transportation system because it optimizes the strengths of each mode. Rail transportation's fundamental advantage derives from steel wheels on steel track, reducing the friction of moving heavy loads. According to one study, rail transportation is three or more times more fuel efficient than trucks,[33] which could also translate into lower freight rates for shippers.

Intermodal rail could also benefit the trucking industry. Some trucking firms utilize rail service for the long-haul portion of a move, passing on the cost savings to their customers. Partnering with railroads can also reduce wear and tear on truck drivers. It is argued that if rail is used for the long-haul portion of a move while trucks are used for the short-haul pick up and delivery, truck drivers can work more conventional hours and stay closer to home. This can lessen the fatigue factor for drivers and help reduce driver turnover.

To enhance freight mobility, the railroads have identified where they need to increase intermodal capacity. Although price is always important, in a "just-in-time" delivery environment, reliability is paramount and service reliability demands quality infrastructure. Relieving capacity constraints at identified bottlenecks is especially critical. Rail and road connections with ports and inland terminals are often choke points in the intermodal network.

The main rail lines are experiencing high track utilization rates. Most of the main line system is single tracked. Double tracking and increasing the number of sidings in some regions would allow time sensitive intermodal trains to pass less service sensitive trains. Another capacity constraint occurs in urban areas where train speed has to be greatly reduced at present. Inadequate terminal capacity is a major cause of traffic buildup on tracks leading to terminals. Tunnels and bridges with clearances too low for double-stack trains are other physical constraints, especially in the East.

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[31] (...continued)
"Railroads' Renaissance - The Key to Economic Growth," March 3, 2001. Available at [http://www.nitl.org/railsp.htm].

[32] National Center for Intermodal Transportation, *A New Transportation Agenda for America,* Nov. 2001. Available at [http://www.ie.msstate.edu/ncit/].

[33] American Association of State Highway and Transportation Officials, *Freight-Rail Bottom Line Report*, n.d. p. 29.

Military Mobility

The rail network, particularly intermodal, is also viewed as important for military mobilization. Rail is used to move unit equipment and munitions to the Department of Defense's designated strategic seaports in the United States. DOD contracts with private commercial carriers, including railroads, to supply more than 85% of its transportation needs in both peacetime and wartime.[34] Many are concerned that adequate transportation infrastructure may not exist, particularly during peak commercial shipping seasons, to handle a rapid surge in case of a military crisis. As one columnist noted:[35]

> The concern is well founded. Continued traffic growth accompanied by asset rationalization has brought supply and demand into closer balance. The network no longer enjoys the luxury of overcapacity. As a nation, we reap the efficiencies brought about by transportation deregulation... Many people forget that, prior to deregulation, overcapacity was a specific public goal. Carriers had protected business segments in exchange for maintaining excess capacity, which would be called upon in times of national emergency.

Current Funding Mechanisms

Private Funds

Class I freight railroads primarily finance projects themselves with almost no public assistance. An intermodal transportation research group estimates that railroads contribute approximately 87% of the total cost of rail infrastructure projects. The remaining 13% is provided by federal funding (3%), and state and local governments (5% each).[36] Railroads raise money through bond and stock sales, bank loans, and revenues generated internally. A rail executive briefly outlined what could be described as a "market-driven" approach to investment decisions:[37]

- Market determines infrastructure needs
- Infrastructure needs dictate investment requirements
- Return on investment determines whether market is worth serving.

As industry trade journals frequently describe, railroads have been investing heavily in their service capacity, particularly with respect to intermodal terminals. The railroads have been consolidating intermodal terminals and in some cases

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[34] "U.S. Military Preparedness, Jammed in the Traffic?" *Transportation Research News*, Nov.-Dec. 2000, p. 22.

[35] Theodore Prince, "Warnings, war and the wall," *American Shipper*, Nov. 2001, p.76.

[36] Foundation for Intermodal Research and Education, "Intermodal Building Blocks: Blueprint for change." Third Freight Roundtable, Newport Beach, CA., July 24-25, 2001. Available at [http://intermodal.org/FIRE/thirdroundtable.html].

[37] Jim McClellan, Norfolk Southern, "Rail Freight Infrastructure: A Role for Public Financing?" St. Louis, MO. Apr. 30, 2001. Available at [www.fhwa.dot.gov/freight].

moving terminals from city centers to the outskirts. In 1999 and 2000, the rail industry spent about one-fifth of its revenue base on intermodal infrastructure.[38]

Federal Funding is Limited

In modern times, federal programs have funded some rail related projects but relative to other modes, funding is limited. Three programs in the Federal-aid highway program detailed in TEA-21 that have been used for rail or rail related projects are the Surface Transportation Program (STP), the Congestion Mitigation and Air Quality Improvement program (CMAQ), and the Corridors and Borders Program (CORBOR).

STP funds have been used primarily for safety improvements to existing rail grade crossings, such as installing warning devices or improving grade crossing surfaces. The Rail-Highway Grade Crossing Program (Section 130, Title 23 of the U.S. Code) provides funds for the separation of grade-crossings, including relocating roadways or rail lines to eliminate road and rail intersections. Current funding is approximately $155 million per year.

CMAQ funds have been used to improve rail links to ports or links between rail networks where truck traffic and their emissions are reduced in air quality non-attainment areas. Examples of rail related projects that were partly financed with CMAQ funds include the Columbia Slough Intermodal Expansion Bridge. This project expanded a rail bridge connecting the Port of Portland in Oregon with inland rail yards. The rail link eliminated the need for truck drayage between the port and the rail yards. CMAQ funds provided $1 million of the $6 million total cost of the project.[39] CMAQ funds also partially financed improvements to Canadian Pacific's Bensenville Rail Yard in Chicago. Improvements included reducing rail and traffic conflicts at grade crossings, new track, interlockings, and signals. CMAQ funds provided $2.1 million of the $35 million total cost of the project.[40]

The "Corridors and Borders"program (CORBOR, section 1118 and 1119 of TEA-21) was established to support planning studies and infrastructure development at the national border crossings and along major freight corridors. This program has helped finance the FAST (Freight Action Strategy for the Seattle-Tacoma region) project which will eliminate 12 grade crossings on access roads to the seaports in this region. CORBOR funds provided $10 million of the estimated $400 million total cost of this project.[41]

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[38] "Intermodal Set to Become Railroads' Biggest Source of Revenue Growth," *U.S. Rail News,* Oct. 9, 2002, p.162.

[39] U.S. DOT, Office of Operations, *Freight Finance Report,* n.d. [http://ops.fhwa.dot.gov/freight/freight_finance_report.htm].

[40] Ibid.

[41] U.S. DOT, FRA, *Intercity Freight and Passenger Rail: State and Local Project Reference Guide,* April 2001, p. 14.

A third TEA-21 program, the Railroad Rehabilitation and Improvement Financing program (RRIF), is intended to make funding available through low-interest loans and loan guarantees for railroad capital improvements. Improvements can include "acquiring or improving intermodal terminals, rail facilities, track, bridges, buildings and shops."[42] However, this program has been slow in getting underway. As of 2003, less than a handful of loans have been approved.

Railroads may find two provisions in the FRA eligibility requirements overly restrictive: (1) the requirement that an applicant show proof of at least one loan denial from a commercial lender that previously loaned the railroad money and (2) that the railroad provide collateral for recovery of 100% of principal and interest.[43] Railway financial observers assert that because revenue inadequacy is at least part of the problem, a loan or loan guarantee program such as RRIF, that relies heavily on rail revenue as a source of funds, is not a practical solution.

Although there are examples in which TEA-21 programs have funded intermodal rail projects, such as those cited above, they are few relative to other modes. There is a growing sense by some parties that intermodal freight projects must become more common if increased congestion and greater inefficiencies in the transportation system are to be corrected. Some parties suggest that a federal program be established to regularize funding for these types of projects. There is not a TEA-21 program designed specifically for freight or intermodal projects. Critics argue that the present approach significantly delays and complicates intermodal infrastructure funding.

State and Local Initiatives

State and local governments have also contributed funds for rail projects. The state of Pennsylvania assisted Conrail in making a number of its lines accessible to double-stack container trains.[44] The state of Delaware is funding the cost of rehabilitating a train bridge serving the Port of Wilmington. Norfolk Southern Railroad, which owns the bridge, will reimburse the state through a fee for each rail car crossing the bridge.

The Alameda Corridor

Another example of a "toll railway" is the Alameda Corridor. It connects the Ports of Los Angeles and Long Beach with a terminus for the transcontinental rail network located 20 miles north of the ports. The ports purchased the rail right of way from the railroads and eliminated 200 at grade road and rail intersections by lowering

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[42] Speech by FRA Administrator Allan Rutter at the American Shortline and Regional Railroad Conference, Orlando, FL, April 29, 2002.

[43] "Congressional Displeasure," *Traffic World,* May 7, 2001.

[44] For further examples of government assistance for rail projects, see FRA, *Intercity Freight and Passenger Rail: State and Local Project Reference Guide,* April 2001. And U.S. DOT, Office of Freight Management and Operations, *Funding and Institutional Options for Freight Infrastructure Improvements,* n.d.

the rail track in a ten mile trench and constructing overpasses and underpasses for the roadways. The railroads will reimburse part of the construction costs to the ports by paying a per container fee for use of the corridor. The idea for the corridor was proposed in 1984 by the Southern California Association of Governments (SCAG) which is the local Metropolitan Planning Organization (MPO). Construction began in April 1997 and was completed in April 2002.

A broad array of analysts have suggested that the Alameda Corridor is a model for improving the nation's freight transportation system that could be repeated at other major cargo hubs. The key to success for such a project is an alignment of stakeholder interests, with a strong willingness on the part of rail companies to participate. Unlike the Alameda Corridor, the Alameda Corridor East (ACE) project has not apparently had the active participation of the Union Pacific Railroad. ACE is a project to eliminate grade crossings on rail track extending east from the northern terminus of the Alameda Corridor.

Policy Options for Congress

Concern about the capability of the railroads to self-finance additional capacity as well as the financial and environmental constraints of building additional highway lanes raises several potential issues for Congress as it reevaluates surface transportation funding programs in TEA-21. The broad policy issue is finding the right balance between a "market-driven" versus a "policy-driven" approach to rail investment. Key questions under consideration are: should the federal government engage in a public-private partnership with the railroads to ensure capacity for industry growth? Are current funding levels and programs adequate or are new sources of funding needed? How should government funding be arranged? Should funding be rail specific or is this an opportunity for a multimodal funding program? How would projects deserving public aid be identified?

Modal Equity

Despite concerns about capital shortfalls, the North American freight railroads are arguably the most self-sufficient railroads in the world, freight or passenger. When considering how government could engage in a more cooperative relationship with the railroads, many suggest, the railroads first among them, that the government "first do no harm." The railroads and others contend that the most economically efficient policy the government could pursue to assist the pace of railway development is a mode-neutral transportation policy. If federal funding distorts modal choice, the nation as a whole, in this view, may pay a larger freight bill than is necessary. While a subsidized carrier may offer a lower rate, the real cost of transport may not be lower. The cost difference is merely transferred to others. The real total cost (the lower rate plus the amount of subsidy) may be greater than an un-aided competing mode may be willing to offer. While some economists agree that federal funding should not be biased in favor of or against any one mode, Congress has not previously adopted modal equity as a policy goal.

One controversial policy option is to refine current modal funding programs so that all surface freight modes pay the full cost of their infrastructure. According to a DOT study on highway cost allocation, the heaviest trucks pay only about 80% of their full cost of highway use.[45] According to a rail executive, barges pay only about 12% of the cost of their rights-of-way.[46] Proposals for how best to aid rail capacity are likely to renew debate on the long standing issue of modal equity.

Rail Trust Fund

The railroads are the only transportation mode in the United States that do not benefit from a federal trust fund. One proposal being discussed is to create a railway trust fund, analogous to the highway, waterway, and airway trust funds. These existing trust funds are financed with levies on the users of the transportation system provided. They vary in the type and combination of surcharges imposed but may include taxes on fuel, new equipment, cargo waybills, and passenger fares.

The rationale of transportation trust funds is to provide a dedicated pool of funds for infrastructure projects, thus ensuring a regular, systematic funding stream. A rail trust fund set up in the manner of the highway trust fund could provide a steady and predictable source of funds for rail infrastructure projects. A rail trust fund could also entice private sector and local government participation by leveraging federal dollars with contributions from local sources. Federal funds could serve as a catalyst for getting projects underway.

Critics of a rail trust fund argue that such a program puts the government in a position of "giving with one hand while taking away with the other." If the goal is to shift additional resources to rail improvement projects, some question how taxing the railroads and then handing it back, with directions on how to spend it, would accomplish this goal. Decision makers may also consider the impact of a rail trust fund on rail competitiveness. If rail surcharges increase the cost of rail vis-a-vis truck or barge, it may divert freight to these competing modes. An additional concern with a rail trust fund is that once established, it may prove difficult to terminate if changing economic circumstances invalidate the need for the fund.

Multimodal Trust Fund

Many observers believe that a major obstacle to achieving the goal of a national intermodal transportation network as envisioned in the Intermodal Surface Transportation and Efficiency Act (ISTEA, P.L. 102-240) is that the modes are separately managed and funded. Creating a separate trust fund for rail projects could reinforce what these observers describe as a stovepipe approach to transportation planning and finance. Intermodal supporters argue the focus should be on improving the connectivity and interoperability among modes. Public funding should be

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[45] For further information on truck cost allocation, see U.S. DOT, FHWA, *Federal Highway Cost Allocation Study*, 1997, with addendum in May 2000. Available at [http://www.fhwa.dot.gov/policy/hcas/addendum.htm].

[46] "Rail Update," *Railway Age*, February 2001, p. 18.

directed at improving the "intermodal connectors," that is, the roadways or railways that link to seaports, airports, and rail yards. A resource paper prepared for the Transportation Research Board noted:

> Every Federal reauthorization act for transportation has categorized funding into discrete programs for specific classes of projects, typically along modal lines. Because the old modal boundaries are becoming increasingly blurred at critical nodes and along key corridors, a compartmentalized approach presents clear challenges to DOT in advancing these important types of investments.[47]

This raises the matter of how a multimodal trust fund could be financed. Could funds be generated from an all mode freight surcharge? Could a pool of resources be generated from a portion of existing trust funds? These are complex policy questions with no easy answers or consensus among stakeholders.

Modify Existing Programs

Rather than creating additional trust funds, another option being debated is making it easier for rail projects to qualify for existing highway trust fund (HTF) financed programs. Federal assistance could, for example, be targeted to rail projects where the alternative highways are heavily congested. Use of highway trust fund monies for non-highway projects is a long standing debate. Although ISTEA's language encouraged an intermodal approach for solving transportation needs, it did not mandate it. State DOTs, consulting with Metropolitan Planning Organizations (MPOs), are given the power and flexibility to decide which projects get funded. Intermodal freight, particularly rail freight, has not received significant amounts of funding from ISTEA, nor TEA-21. Intermodalism has largely been a market-driven rather than a policy-driven development. The real focus of intermodalism in these laws is that it allowed the use of highway trust fund money more broadly for mass transit projects.

An advantage of allowing HTF funds to be used for non-highway projects is that it increases the options of state and local planners in solving their transportation needs. It should be noted that some state laws prohibit gas tax money being used for non-road projects. Nevertheless, more options could lead to more cost efficient systemwide solutions. For example, it could be less expensive to improve an existing rail line to handle more traffic than to build additional highway lane miles. Another advantage of this approach is that it maintains the basic program framework created by ISTEA and TEA-21.

A drawback of using the HTF for non-highway projects is the problem of "eligibility creep." Expanding eligibility may dilute the political support for the fund if the interests benefitting from it are too widely dispersed. Using the gas tax to support non-road projects could also reduce the "users-pay" principle - the principle that those who benefit must pay for the cost. The existing gas tax is an imperfect pricing system, however, because all users do not necessarily pay their full costs. For

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[47] Transportation Research Board, "Planes, Trains, and Automobiles: Multi-modal Reauthorization Opportunities," Scottsdale, AZ., Aug. 21, 2000, p. 8.

example, the fuel tax does not capture the costs of congestion delays and air pollution and cross-subsidizes certain classes of system users.

Expanding the eligibility of existing programs for rail does not guarantee that rail projects will be funded. State DOTs and local MPOs may favor highway and passenger related projects over freight rail concerns. Freight rail projects face stiff competition from highway and transit needs for limited resources in the HTF. Local governments may perceive the benefits of freight rail projects as flowing outside their geographic boundaries. Another downside of increasing availability of HTF dollars for rail projects is that it may make railroads dependent on public aid to get certain types of projects underway. Private carriers may then demand government aid on a routine basis for private infrastructure improvements.

Railway User Charges

Toll railways, such as the examples cited above in Delaware and southern California, are an alternative solution that some policymakers suggest could be repeated elsewhere. The advantage is that they overcome the economic hurdle railroads face with large initial capital outlays for new construction. The initial outlay is provided with public funds or by a regional transportation authority. The railroads repay some portion of the construction costs over a period of time. The rate of repayment is based on traffic volume with a per car user fee. The disadvantage of this proposal is that it probably can not be applied on a national basis. This option is more well suited to a geographically limited corridor.

Intermodal Freight Planning

The issue of how an aid program might be arranged raises a related issue of how projects deserving public support might be identified. A premise of ISTEA and TEA-21 is that states and MPOs are in the best position to identify and prioritize transportation projects needed in their area of jurisdiction. However, intermodal rail shipments are typically broader in scope geographically than the jurisdiction of a single MPO or state DOT. A significant portion of intermodal rail shipments move from one region of the country to another if not across the entire country. As mentioned earlier, half of all intermodal rail loadings are imports and exports.

At issue is how to select freight projects that could optimize the network nationally with a transportation planning process that is largely decentralized. To state the issue another way, how can national interests be weighed with local concerns? Freight stakeholders charge that the existing transportation planning process results in an incremental approach to solving bottlenecks. Expanding freight capacity at one node in the network can have adverse repercussions for the surrounding community of the next hub downstream if additional traffic overloads their facilities. From a freight stakeholder's point of view, simply moving the choke point to the next hub does little to enhance the overall flow of goods. As one observer noted, you can not fit an 18" pipe into a 9" pipe. On the other hand, if MPOs or states do not coordinate their activities, they could end up competing with one another for the same freight business. This could lead to overcapacity.

One option is for MPOs and state governments to work together to create a regional planning perspective. Some states are already participating in multi-state studies on corridors that cross state lines. In the reauthorization debate, policymakers may consider whether to formalize these multijurisdictional arrangements or allow them to continue informally. Another proposal is to create a "national rail map" similar to the national highway system identified under the National Highway System Designation Act of 1995 (P.L. 104-59) that would identify nationally significant rail corridors and target funding to projects on those corridors.[48] This proposal represents a "top-down" approach to transportation planning in which the federal government actively identifies and evaluates projects deserving federal support.

[48] Jeremy F. Plant, "Railroad Policy and Intermodalism: Policy Choices After Deregulation," *The Review of Policy Research,* June 22, 2002.