U.S. Ports and the Funding of Intermodal Facilities: An Overview of Key Issues

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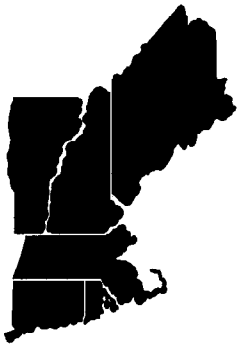

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16. Abstract

The growing use of containers to move freight has led carriers to use fewer but larger ports. In their efforts to attract and retain carriers, U.S. ports have made or are planning substantial investments in new berths, docks, and improved connections with the nation's rail and highway systems. However, the current port financing system - which generally relies on balance-sheet financing and, in most cases, direct public subsidies - could create several serious problems as ports move to carry out their investment plans because it makes it likely that public ports, not private shipping industries, will bear the risk of new investments and lead port officials to underestimate the risks involved with new investments. As an alternative, port officials might use true project-based financing strategies, which are appealing not only because they shift risk from public to private entities, but also because they seem likely to lead to improved decision-making.

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Summary

Due to economies of scale, the growing use of containers to move freight has led carriers to use fewer but larger ports. In their efforts to attract and retain carriers, U.S. ports have made or are planning substantial investments in new berths, docks, and improved connections with the nation's rail and highway systems.

However, the current port financing system – which generally relies on balance-sheet financing and, in most cases, direct public subsidies – could create several serious problems as ports move to carry out their investment plans. To begin with, balance-sheet financing makes it likely that public ports, not private shipping industries, will bear the risk of new investments. Moreover, subsidized balance-sheet financing means that port officials will tend to underestimate the risks involved with new investments. This suggests they will fail to choose the best investments and may even overinvest in new facilities. Such overinvestment not only could lead to less-than-optimal use of public resources, but also could force the general public – not carriers, railroads, or the ports – to subsidize both the debt-service and operating costs of uneconomic new facilities.

As an alternative, port officials and their political overseers might use true project-based financing, which is being used around the world in a variety of forms of infrastructure, to fund new facilities. Such funding strategies are appealing not only because they shift risk from public to private entities, but also because they seem likely to lead to improved decision-making about investments in intermodal facilities.

This paper, which represents the first phase of our research into this issue, explores these concepts by (1) providing an overview of the changes in the containerized shipping industry, (2) examining how these changes affect ports, (3) detailing how ports have responded to the changes, (4) explaining how the current port funding system might lead to less than optimal decision-making by port officials and (5) suggesting some alternative funding models that could produce better investment decisions. In a second phase of this research, we intend to closely examine new strategies being used to fund port improvements outside of the United States to see if those efforts offer important insights on how to restructure the U.S. port funding system.

The Container Revolution

In the past two decades, the means by which many goods move into and through the U.S. has changed in fundamental ways. The most significant change involves the rapid growth of shipping via containers, which are much easier to load and unload than breakbulk freight. Because of these efficiencies, containerized shipments, which began in the late 1950s, have gone from having a minimal market share in the early 1970s to carrying over 50 percent of all goods (when measured by value) now moving via ship. Industry experts, moreover, predict that by 2010 as much as 90 percent of all liner freight (as opposed to bulk commodities such as grain) will be moved via containers.[1]

The shift to containers and larger ships has created three profound changes in the flow of freight in the United States. First, the economics of containers make it more economical for shipping lines to rely on fewer, but larger ships that stop in relatively few hub ports. In 1996, for

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[1] U.S. Department of Transportation, Office of Intermodalism, *The Impact of Changes in Ship Design on Transportation Infrastructure and Operations*. Washington, DC: author, February 1998, p. 1. For a good overview of the containers and

example, post-Panamax ships – that is, container ships that are too wide to pass through the Panama Canal – made up only about six percent of the world's available cargo-ship capacity but almost 30 percent of the capacity of ships then on order. Even larger mega-ships – a new class of extremely large ships with such deep drafts that they often require dredging and new docks at many major ports – contained about one percent of the world's container shipping capacity, but made up more than eight percent of the capacity in ships on order.[2] At the same time that ships are growing larger, the shipping industry is shrinking both directly through mergers, and indirectly via the increased use of alliances in which carriers agree to share each other's vessels and equipment. Better vessel utilization, increased service frequencies, and more extensive port coverage are often mentioned as benefits of these shipping alliances.[3] Illustratively, the world's 20 largest carriers controlled 44 percent of all ship capacity in 1995, up from 38 percent in 1984. Global alliances, which did not exist in 1984, now control 29 percent of all slots.[4]

Second, the growth of rail freight spurred in large part by the 1980 deregulation of U.S. railroads (and the subsequent development of double-stack trains) has meant that railroads are extremely competitive with truckers for long-distance shipments (i.e. hauls longer than about 750

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the intermodal freight industry see Gerhardt Muller, Intermodal Freight Transportation, 4th Edition, Washington, DC: Eno Foundation, 1999.

[2] U.S. Department of Transportation, Office of Intermodalism, *The Impact of Changes in Ship Design on Transportation Infrastructure and Operations,* Washington, D.C.: author, February 1998, p. 3 and 4 and authors' calculations.

[3] See Brian Slack, Claude Comtois and Gunnar Sletmo, "Shipping Lines as Agents of Change in the Port Industry," *Maritime Policy and Management,* Vol. 23, No 3, 1996, and D.K. Ryoo and H.A. Thanopoulou, "Liner Alliances in the Globization Era: A Strategic Tool for Asian Container Carriers," *Maritime Policy and* Management, Vol. 26, No. 4, 1999. Both papers points out that the shipping industry has a long history of price control conferences, but that the current alliances involve a more general collaboration in operations than the more limited agreements that preceded them.

[4] Mercer Management & Containerization International, as cited in U.S. Department of Transportation, Office of Intermodalism, *The Impact of Changes in Ship Design on Transportation Infrastructure and Operations,* Washington, D.C.: author, February 1998, p. 23.

miles).[5] The purchase and breakup of Conrail by CSX and Norfolk Southern, for example, is expected to greatly improve intermodal connections in the New York region and, according to CSX, could remove as many as one million trucks a year from East Coast highways.[6] Thus intermodal freight shipments have become a major source of revenue for major U.S. and Canadian railroads in 1997 (See Table 1).[7] As with ships, moreover, the growth in such traffic (and a general growth in all freight carried by rail) has led to significant consolidation in the rail industry as rail lines have sought to create seamless systems that will better facilitate ship-to-rail services. Recent consolidations in the rail industry – such as the Conrail breakup, the Canadian National/Illinois Central, Union Pacific/Southern Pacific mergers and the proposed Canadian National/Burlington Northern/Santa Fe merger – are likely to further these trends.

Third, the growth of railroad and ship efficiency means that carriers have substantial discretion in deciding how to move goods bound for inland sites. For example, freight originating in Southeast Asia can come to United States (particularly the eastern and central U.S.) in one of two ways. Like much trade from northern Asia (i.e. Japan, China and Korea) goods from southeast Asia can travel across the Pacific Ocean to a West Coast port and then be transferred to rail for shipment to the Midwest and the East Coast. However, an alternative route would take ships through the Suez Canal and then across the Atlantic Ocean to an East Coast port, where goods can be moved by rail to the Midwest and by rail or truck to East Coast destinations. Indeed, some shipping industry experts believe that trade following the Suez based

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[5] For a good analysis of rail/trucking competition see Daniel Smith, *Double Stack Container Systems: Implications for U.S. Railroads and Ports*, a report prepared for the Federal Railroad Administration and the Maritime Commission, Springfield, VA: National Technical Information Service, FRA-RRP-90-2 or MA-PORT-830-90009, 1990, p. 183.

[6] Surface Transportation Board, Surface Transportation Board Issues Written Decision Approving "CSX-Norfolk Southern-Conrail" Railroad Merger, Washington, D.C.: author, July 23, 1998.

[7] Moody's Investor Services, *Moody's Port Ratings Outlook*, New York: author, June 1998, p. 12.

routes will be the fastest growing industry element in coming decades, because it allows carriers to stop at intermediate markets in Europe.[8]

Regardless of whether they travel across the Pacific or Atlantic Ocean, carriers handling goods bound for the Midwest (and to a lesser extent either of the coasts) can choose from multiple ports with excellent rail connections. Ships crossing the Pacific Ocean, for example, can (and do) enter North America at the ports of Los Angeles/Long Beach, Seattle/Tacoma, Vancouver, and, to a much lesser extent Oakland (which generally serves only the large local northern California market). Similarly, ships docking on the East Coast of North America can choose among Charleston, Hampton Roads (Virginia), Baltimore, New York, or Halifax.[9]

The rail connections, coupled with the regulatory freedoms in the 1984 shipping act, have allowed shipping lines much greater control over the routing of containers from origin to destination. As previously noted, in deciding which of these routes to use, carriers generally seek low overall costs, quick shipping times, and, increasingly, greater predictability and reliability in knowing when goods will arrive at their final destination. This means that unlike in the past, it is possible for ports that do not serve large local markets – such as Halifax, Seattle/Tacoma, Hampton Roads, or Vancouver – to be competitive. And even ports in major cities cannot be confident that goods produced locally will be loaded onto ships at their terminals.

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[8] For good overviews of this argument see Ricondo & Associates, Inc. and Booz-Allen & Hamilton Inc., "Port of Oakland, California, Revenue Bonds, 1997 Series G, H, I and J, Feasibility Study," in Port of Oakland, California, *Official Statement*, January 1, 1997, Oakland: author, pp. A79-A82.

[9] Carriers also seek to reduce costs by having goods to carry on return shipments. Two significant backhaul flows are the movement of manufactured goods from the industrial heartland to southern California. The southern California region, however, is not a significant export market. Consequently, some carriers are now taking empty containers to Seattle/Tacoma where they are dropped off to be filled with agricultural exports from the Pacific Northwest (such as lumber and produce). While such backhauls are important, they are not the driving factor for intermodal freight flows.

Illustratively, only about 25 percent of the goods entering the U.S. at Seattle and Tacoma stay within that region.[10] In contrast, about 85 percent of the imports moving through the port of New York and New Jersey stay within 260 miles of that port. (Such shipments, however, still represent only about 31 percent of all goods coming to the northeast and mid-Atlantic region, which receives about half its goods from West Coast ports.[11]) Thus, except for the ports of Los Angeles and Long Beach, which serve both a large local market and are major gateways to inland and East Coast markets, ports generally serve either a local or an inland market.[12]

Finally, to retain adequate frequency of service, the shift to large container ships has also led to increased concentration of containerized freight at a relatively few ports. In 1973, there were 30 ports on the Atlantic and Gulf coasts serving frequent international shipping lines. A decade later, the number of such ports had been reduced to 12.[13] By 1996, container traffic had been concentrated to such an extent that only three ports on the East Coast handled more than one million twenty-foot container equivalents (TEUs).[14] (See Table 2)

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[10] Moody's Investor Service, *Competition Among West Coast Ports Pressures Credit Outlook*, New York: author, January 1998, p. 9.

[11] Port Authority of New York and New Jersey, "Investment Options and Strategic Directions for the Future," a presentation made by Christopher Ward, director, port redevelopment, New York: author, May 4, 1998 and Port Authority of New York and New Jersey, "Future Plans for the Port of NY-NJ," Status Report," New York: author, undated.

[12] Moody's Investor Service, *Competition Among West Coast Ports Pressures Credit Outlook*, New York: author, January 1998, p. 5.

[13] Hayuth, Yehuda, *Intermodality: Concept and Practice*, London: Lloyd's of London Press Ltd., 1987, p. 57.

[14] These figures make Los Angeles the third busiest port complex in the world behind only Hong Kong's 12 million TEUs and Singapore's 11 million TEUs. Seattle/Tacoma is tenth, behind Kaohsiung, Tokyo/Yokahoma, Rotterdam, Busan, Hamburg, and Kobe/Osaka. New York is twelfth, behind Antwerp. See U.S. Department of Transportation, Office of Intermodalism, *the Impact of Changes in Ship Design on Transportation Infrastructure and Operations,* Washington, D.C.: author, February 1998, pp. 2, 33.

Pressure on Ports

Because containerization is linked to consolidation at a relatively small number of ports, it is putting intense pressure both on the ports that are attracting new business, and those ports seeking to reaffirm their historic roles as significant portals for trade. In general, such ports face three interrelated problems. First, they need adequate channels and berths for increasingly large ships. Second, the growth in ship sizes creates a need for larger and better-designed docks and other landside facilities. Third, the fact that ships are carrying increasingly large amounts of cargo often overwhelms existing connections between ports and the nation's road and rail systems (and areas where rail lines and highways directly intersect).

Because of these challenges, most of the major U.S. ports have launched extensive long-term capital investment programs. Annual capital investments by all U.S. ports more than doubled between 1993 and 1995, rising from $654 million to $1.4 billion, and projections indicate that over the next decades ports will maintain or even increase current levels of spending. (The nation's ten largest ports are responsible for about 65-to-75 percent of these expenditures).[15]

Illustratively, between 1996 and 2001 the ports of Los Angeles and Long Beach – the nation's two busiest container ports – will each spend more than $1 billion on new facilities (excluding their investments in the Alameda Corridor project, which is discussed below). Meanwhile the ports of Oakland and Tacoma will each spend more than $500 million on new

[15] U.S. Department of Transportation, Marine Administration, "U.S. Port Development Expenditure Report," Washington, D.C.: author, p. 4, 10, and 13.

facilities.[16] On the East Coast, the Port Authority of New York and New Jersey in early 1999 released a study calling for $1.7 billion in spending over the next 10 years to improve its shipping terminals, and as much as $7 billion over the next 40 years.[17] In addition, the Virginia Port Authority, which owns and operates several port facilities in and near Norfolk, has detailed a $377 million 10-year capital improvement plan.[18] Meanwhile, the port of Charleston has launched a more than $300 million improvement program (and is discussing a $1 billion for a totally new intermodal facility).[19] Voters in Harris County, Texas have approved a $387 million bond issue as part of the funding for a $1.2 billion container and cruise ship terminal in Houston[20] while officials in New Orleans are discussing a multibillion plan to move the city's entire port operation south to the mouth of the Mississippi River.[21]

These spending programs generally include new docks, land, terminals, and, increasingly, intermodal connections. In the mid-1980s, for example, the ports of Los Angeles and Long Beach joined with the Southern Pacific railroad to fund and build a specialized rail yard for the transfer of containers to and from trucks and railcars. More recently, the port of Long Beach has expanded its near-dock intermodal yard, and the port Los Angeles has built a major new one. The port of Oakland, meanwhile, has been trying to build an on-dock joint intermodal terminal, and the port of Tacoma has been expanding its on-dock rail facilities.

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[16] Moody's Investor Service, *Competition Among West Coast Ports Pressures Credit Outlook*, New York: author, January 1998, p. 3. For a general overview of port spending plans, see U.S. Department of Transportation, Maritime Administration, *United States Port Development Expenditure Report*, Washington, D.C.: author, October 1998.

[17] Thomas Lueck, "Port Authority Offers Its Vision of New York Harbor," *New York Times*, January 14, 1999, p. B5.

[18] VZM TransSystems Corp. "Consulting Engineers Report for the Virginia Port Authority," in Virginia Port Authority, *Official Statement*, June 11, 1997, p. G-2. See also Fitch IBCA, *Virginia Port Authority*, June 5, 1997.

[19] "Charleston Outpaces Savannah, Oakland" *Journal of Commerce*, October 2, 1998, p. 2B; Terry Brennan, "Moody's Gives A1 Rating to South Carolina Bond Issue, *Journal of Commerce,* May 27, 1998, p. 3B.

[20] Moreno, Jenalia, "Terminal Plan Sails to Victory," *Houston Chronicle*, November 2nd 1999.

The ports, moreover, are becoming increasingly active in improving nearby rail and road systems. Most notably, the ports of Los Angeles and Long Beach have been the prime sponsors of the Alameda Corridor project, a more than $2.4 billion, 22-mile long depressed, grade-separated rail corridor that will connect the ports' on-dock rail facilities with the rail yards of Union Pacific and Burlington Northern/Santa Fe. As is discussed later, funding for the project – which is governed by a board that includes the ports, city, and county officials – is coming from a variety of sources, including grants from the ports and all levels of government, revenue bonds backed by fees paid by the railroads (and, if those fall short, port revenues), and a loan from the federal government.[22]

In a similar vein, the ports of Tacoma and Seattle have been active members of a coalition that has put together the so-called FAST Corridor plan, an effort to improve both freight and passenger traffic flows in that region in large measure via grade separations between rail lines and highways. Funding for that program is coming from a variety of sources, including the ports, the railroads, and the federal and state governments.[23] Similarly, New Jersey Governor Christine Todd Whitman has suggested as part of plans the construction of a truck-only toll facility connecting port facilities in northern New Jersey, nearby railroad and truck yards, and the New Jersey Turnpike.[24]

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[21] *Journal of Commerce*, "Expansion Under Way at New Orleans," December 29, 1999, p. 1.

[22] For a good overview of the project see Diane Teece and Spencer Stevens, "Alameda Corridor Semi-Annual Update, Project Status and Credit Assessment", Washington: Federal Highway Administration, May 1998. See also, Office of the Inspector General, U.S. Department of Transportation, "Review of the Alameda Corridor Project," Washington, DC: author, October 22, 1999.

[23] See "Fast Corridor," an undated brochure produced by the Washington State Department of Transportation and the Puget Sound Regional Council.

[24] For information on the project, see www.state.nj.us/transportation/portway.

The Problem of Differing Goals

As ports, shipping lines and railroads undertake investment programs, they are faced by important differences of goals and institutional structure. Shipping lines and railroads are private firms that seek to maximize net revenue, taking into consideration the behavior of carriers and competition between rival shipping companies. In contrast, while most U.S. ports were privately owned in the nineteenth and early twentieth century, all major U.S. ports now are publicly owned entities. Public port authorities were established to overcome the disadvantages of railway domination of the freight industry, including the monopoly power that the railroads enjoyed as terminal owners.[25] Although the semi-autonomous governance structure was created to allow the ports to operate in a more business-like manner, in many case they have been treated more as economic development agencies than business enterprises. As such, the ports' primary goals are to maximize freight flows on the belief that more freight passing through the port will translate into more regional and local economic activity. In some situations, moreover, port advocates in cities that historically have been major ports contend that those cities would suffer a serious intangible but significant psychic losses, if they no longer house "working" ports. In Boston, for example, shipping advocates and city and state officials have been adamant that ailing port facilities in South Boston must continue to function even though the land occupied by those

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[25] Before 1900 there were only five public port authorities in the United States – in Galveston, San Francisco, New York City, Portland (Oregon), and New Orleans. In virtually every other city, private firms developed and operated port facilities (though they generally did so with public authorization and oversight). In Massachusetts, the state created the Port of Boston in 1911 as part of an effort to reverse declining trade that some thought was due to inefficiency and inflexibility created by the competing railroads and shipping lines. In contrast, progressive reformers in Seattle argued that James J. Hill's Great Northern Railroad, which had been deeded most waterfront land as part of the city's efforts to become a major commercial hub, was artificially raising costs and decreasing traffic by charging monopoly rents and discriminating against other carriers. After a nearly decade-long battle, in 1911 the city's voters approved the formation of the Seattle Port Authority, which was supposed to remedy these ills. (See David Olson, "Governance of U.S. Public Ports, A Preliminary Survey of Key Issues," an unpublished paper presented the National Research Board's Marine Board Governance Roundtable, November 1992, pp. 48-50 and Trevor D. Heavor, "The Implications of Increased Competition Among Ports for Port Policy and Management," *Maritime Policy and Management,* Vol. 22, No. 1, 1995)

facilities probably could be developed for potentially valuable commercial and residential uses and even though the goal of a working port makes it difficult to redevelop nearby waterfront land.[26]

Although most port authorities are structured as public enterprises with a "bottom-line orientation," most major ports receive significant state and local government subsidies. Every major port except Los Angeles and Long Beach, for example, receives direct, ongoing subsidies from state or local governments or is cross subsidized by other operations of the authority.[27] The ports of Seattle and Tacoma receive a dedicated portion of local property taxes, while the Virginia Port Authority, which oversees the ports of Hampton Roads and Newport News, receives a share of state gasoline and motor vehicle taxes. Similarly, the port of Charleston, South Carolina receives money from that state's general fund, and the Port Authority of New York and New Jersey cross-subsidizes its port facilities with revenues from the authority's three airports, five bridges and tunnels, and revenue from its World Trade Center.

A variety of subsidies supporting port development are available from the federal government as well. The most general federal subsidy arises through the issuance of tax-exempt debt by state and local governments and their political subdivisions (including port authorities). As a general rule, state and local governments may not issue tax-exempt bonds for the construction of facilities if the financing plan includes too much private participation in the operation or beneficial use of the facility. However, bonds issued to support the construction and

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[26] For a good account of these disputes see, Cosmo Macero, Jr., "Seaport District Debate Intensifies," *Boston Herald*, November 15, 1998, p. 31.

[27] Los Angeles/Long Beach arguably received historic subsidies because, unlike many other ports, they did not have to purchase their land; instead they received it directly from the state which had never deeded tidelands to private owners. In addition, like most ports, Los Angeles and Long Beach have received federal aid in the form of full or partial funding for dredging efforts and the construction of a major breakwater.

renovation of docks, wharves and related facilities are considered to be "exempt facility bonds" and may be financed on a tax-exempt basis even if the private participation exceeds the standard threshold.[28] Thus port facilities financed with tax-exempt debt have lower interest costs than they would if they were financed with otherwise equivalent taxable private debt.[29]

The federal government also subsidizes some speculative port activities, particularly dredging projects that are increasingly necessary for some ports – notably those on the East Coast – to handle the new mega-ships, which require 50-foot channels and berths.[30] (See Table 3) The federal government has also provided partial funding for some important port-related intermodal projects. Most notable are a subordinate-debt loan to aid in the construction of the Alameda Corridor project and grants in the 1998 surface transportation law that will help fund freight-related projects in the Seattle/Tacoma area.

Given the quest for government subsidy, it is important for the nation's port authorities to convince their political stakeholders of the benefits associated with the existence and expansion

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[28] Docks and wharves may only be financed with exempt facility bonds if they are municipally owned. The determination of municipal ownership is not straightforward, however. A port facility may be treated as municipally owned even if it is leased to or operated by a private entity. An argument that is often made to support the extension of tax-exempt financing to exempt facilities (including, but not limited to airports, docks and wharves, mass commuting facilities, sewage, solid waste and hazardous waste facilities) is that these investments create substantial benefits to non-residents of the issuing jurisdictions. Thus, in the absence of some form of federal subsidy, local governments might underinvest in the construction or operation of facilities. See Robert Amdursky and Clayton Gillette, *Municipal Debt Finance Law: Theory and Practice*, Boston: Little, Brown, 1992.

[29] Some analysts have argued that the importance of tax-exempt financing is overstated because interest payments on a private company's debt are deductible business expenses, which reduce the corporate income taxes the company pays. See Aaron Gurwitz, "Privatization in a New Key," *Monthly Market Perspectives*, NY: Goldman Sachs, 1989. See also Jose Gomez-Ibanez, John Meyer and David Luberoff, "The Prospects for Privatizing Infrastructure," in A. Munnell, ed., *Is There a Shortfall in Public Capital Investment*, Boston: Federal Reserve Bank of Boston, 1990, pp. 156-159.

[30] Before 1986 the federal government paid 65 percent of the cost of such dredging projects with funding from general tax revenues. Since 1986 the ports and the federal government have shared this cost with the federal share coming from a fee on shipping. In 1998 the U.S. Supreme Court overturned that fee system as an unconstitutional tax on exports. As of this writing, Congress and the Clinton administration have not devised a replacement funding system. For a good overview see Steven Thompson, "The Harbor Maintenance Tax and the 106th Congress," *Congressional Research Service Report for Congress*, January 19, 1999.

of their port facilities. The fact is that ports have an impact on the economy – of both the nation as a whole and of particular regions. The difficult question is the scale of that impact. For their part, port operators have made extensive use of economic impact studies that seek to estimate the impacts (in terms of jobs, income and sales) of existing and expanded port facilities. A study conducted for the three public ports in Indiana, for example, concluded that the ports are responsible for an annual output of $587 million, produced by workers in nearly 6,000 jobs throughout the state.[31]

Other experts, however, have contested the studies' merits, noting that measuring economic impacts at the local or regional level is intricate and imprecise. In a review essay on port policy, for example, economist Randall Eberts, contended that "the level of sophistication in data collection and in evaluation of the costs and benefits of projects, particularly with respect to externalities [such as regional economic development], is not sufficient to obtain precise answers."[32]

At a more immediate level, moreover, the modern container port bears little relation to the image of dockworkers loading breakbulk cargo into the hulls of ships. The irony of the containerization movement is that local economic activity may be declining even as the volume of freight passing through the port facility is increasing. A recent study of the impact of the port

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[31]The study was conducted by the Center for Urban Policy and the Environment at Indiana University. It was publicized on the website of the Indiana Ports Commission (http://www.portsofindiana.com/PortVitals/ipc_portvitals-fs.htm).

[32] Randall Eberts, "Policy Options for Intermodal Freight Transportation," in *Policy Options for Intermodal Freight Transportation,* Washington, DC: National Academy Press, 1998, p. 135. See also Robert C. Waters, "Port Economic Impact Studies: Practice and Assessment", Semoon Chang, "In Defense of Port Economic Impact Studies', H. Craig Davis, "Regional Port Impact Studies: A Critique and Suggested Methodology", and James E. Randall, "Fostering Economic Development: The Noncargo Alternatives" in Marc J. Hershman, ed. *Urban Ports and Harbor Management.* A similar point is often made about economic impact studies of sports teams and facilities. It has also been pointed out that ports such as Antwerp, Amsterdam and New York were pioneers of these techniques, possibly because these ports have needed assistance to persuade authorities to support their ports with money or favorable policies. See Patrick Alderton, *Port Management and Operations,* 1999.

on the local economy of Plymouth, England underscores the point that it is easy to exaggerate the role of ports in economic development. Ports are not big users of labor and are no longer the center of industrial complexes. The Plymouth study found that the port serves industry in distant areas and that the existence of the port was of little consequence in the location decisions of firms. Moreover, the benefits of the port development are likely "to leak" to consumers in inland locations. In sum, the study suggests that the development or expansion of port facilities is often not a good use of scarce economic development resources.[33]

Competition and Ports

Recognizing the availability of subsidies and the intense competition for discretionary freight business, most carriers can and do seek to create competition among ports for their discretionary business. Thus the language of recent urban political science, which focuses on how "fixed capital" – those businesses and institutions rooted in a particular place – are compelled to offer incentives to convince "mobile capital" to locate their activities in a particular region, is an apt description of the relationship between U.S. ports and private shipping lines and

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[33] Peter Gripaios and Rose Gripaios, "The Impact of a Port on its Local Economy: The Case of Plymouth," *Maritime Policy and Management,* Vol. 22, No. 1, 1995. A more recent study suggests that the widely used methods of economic impact analysis may fail to capture all of the impacts of certain transportation investments on business location (or relocation) decisions. The researched focused on air cargo hub facilities in four medium-sized Midwestern cities. These air cargo facilities share the intermodal characteristics of seaports, with a mix of air and surface transportation modes required. Using econometric techniques that differ from the input-output analysis that is more commonly employed, the authors concluded that air cargo hubs serving Federal Express in Memphis and Indianapolis changed the characteristics of each area sufficiently to alter both the location decisions of other businesses and the structure of the metropolitan region. That is, a manufacturing location near the air cargo facility may lengthen the "shipping day" enough to give the firm a locational advantage. The authors note, for example, that Laura Ashley, an apparel company, and Philips, a maker of high-tech medical equipment, have located in Memphis and are clients of Federal Express' Business Logistics Service. While this conclusion provides support for the government action to attract the FedEx hubs, the conclusion about economic impacts may not be transferable to seaport facilities where the length of the shipping day is less critical. (See Clinton V. Oster, Jr., Barry M. Rubin and John S. Strong, "Economic Impacts of Transportation Investments: The Case of Federal Express," *Transportation Journal*, winter 1997.)

railroads.[34] Other examples of this process include the competition to attract everything from professional sports teams to new offices and manufacturing plants. In the former case, the relative scarcity of sports teams forces cities to compete with public subsidies to attract new teams or maintain existing franchises. In the most extreme examples, state and local governments have constructed sports facilities at a cost of hundreds of millions of dollars in the *hope* that they would be able to attract a professional sports team after the facility is completed.[35]

Such competition has been, and remains, a constant theme in the U.S. history of port development. It goes back to the early nineteenth century debates about whether the federal government should fund "internal improvements" (which included harbor improvements) and continued throughout the nineteenth century as cities and states sought to facilitate the construction of docks, canals, and railroads that would make them more competitive.[36] Among ports, the competition has continued in recent decades as the shift to containerization and other factors have led to demise of many once-significant ports, such as Boston and San Francisco. However, it appears that this competition is growing in intensity as shipping companies and the shipping alliances continue their shift towards using larger ships that call at fewer and fewer regional load centers.

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[34] This is a common and hotly debated theme in the literature on urban politics – particularly whether such efforts benefit the locality as a whole. See, for example, Paul Peterson, *City Limits*, Chicago: The University of Chicago Press, 1981, Susan Fainstein and Norman Fainstein, eds., *Restructuring the City: The Political Economy of Urban Redevelopment,* New York: Longman, 1983, Stephen Elkin, *City and Regime in American Politics,* Chicago : University of Chicago Press, 1987, John Logan and Harvey Molotch, *Urban Fortunes*, Berkeley and Los Angeles: University of California Press, 1987, Clarence Stone, *Regime Politics: Governing Atlanta*, 1946-1988, Lawrence, KS: University Press of Kansas, 1989, and John Mollenkopf, *A Phoenix in the Ashes, Princeton, NJ: Princeton University Press, 1992.*

[35] See Rodney Fort, "Direct Democracy and the Stadium Mess," in R. Noll and A. Zimbalist, *Sports, Jobs & Taxes*, Washington, DC: Brookings Institution Press, p. 150.

[36] See, for example, Bruce Seely, "The Sage of American Infrastructure," *Wilson Quarterly*, Winter 1993, Carter Goodrich, Carter, Government Promotion Of American Canals And Railroads, 1800-1890, New York, Columbia University Press, 1960, and David Perry, "Building the Public City Through the Back Door: The Politics of Debt, Law, and Public Infrastructure," in D. Perry, *Building the Public City,* Thousand Oaks, CA: Sage Publications, pp. 169-201.

Most notably, in mid-1998 a consortium of the Sealand and Maersk shipping firms sought proposals from seven East Coast ports (Halifax, Boston, Quonset Point in Rhode Island, New York/New Jersey, Philadelphia, Baltimore, and Hampton Roads) for a long-term lease on docks and terminals to replace the firms' existing facilities in New Jersey. The new facilities, moreover, will have to be able to accommodate the new generation of deep-draft megaships. In responding to the bids, the ports offered a variety of inducements. Officials overseeing the state-owned port of Baltimore, Maryland, one of three finalists selected by Sealand and Maersk in late-1998 (the others were New Jersey and Halifax) reportedly offered extremely low lease payments. The state's ability to do so was made possible by the fact that an earlier state-funded port expansion program did not significantly increase port traffic and has left the port of Baltimore with significant unused land and facilities. In their effort to make that land attractive to Sealand and Maersk, Maryland officials reportedly were prepared to spend an amount roughly equal to the $280 million the state spent to build a new football stadium as part of its successful effort to convince the Cleveland Browns to move to Baltimore. According to Howard Rawlings, the Baltimore Democrat who chairs the Maryland House of Delegates' Appropriations Committee, such subsidies would have been appropriate because the proposed facility "would be a major economic entity that would be a real feather in the state's cap."[37] Despite these efforts, Sealand and Maersk, which subsequently merged, announced in mid-1999 that they would stay in New Jersey, attracted in part through inducements offered by both the Port Authority of New York and New Jersey and the state of New Jersey. As of this writing in early 2000, however, the

[37] Sun Staff, "A Super Port is Worth Cost in Md.'s View," *Baltimore Sun*, January 24, 1999, p. 1D

deal has not been finalized because of disputes between the states of New York and New Jersey over the general distribution of port authority subsidies between the two states.[38]

Funding Strategies

As previously noted, as part of their efforts to attract and retain business, most major U.S. ports have embarked on large capital improvement programs. (Most ports have also tried to loosen extremely restrictive work rules and to make better use of information technology). Funding for the capital improvements comes from a variety of sources, including state and local subsidies, operating revenues and bonds secured either by subsidies or net operating revenues. (See Table 4) The Virginia Port Authority, for example, used payments from an excise-backed trust fund to secure some bonds and the ports of Tacoma and Seattle use local property taxes directed to the port to secure some of their debt. In general, however, the share of port financing covered by general obligation bonds has fallen, while the share of projects financed by port revenues, revenue bonds, and other sources of funds (including earmarked state revenues) has risen.[39]

Though ports are relying less on general obligation bonds, they rarely use pure project-based funding, in which lease payments and project-based user fees are used to secure loans without a pledge of other operating revenues and government funds as additional security for those loans. More commonly, ports will use revenues from the projects to repay the bonds they issue. However, the security for those bonds is other port or government revenues, not the assets of the project tenants or users. In essence, the financing is secured by the balance sheets of the

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[38] See Ronald Smothers, "Feud Over How Port Authority Spends Money Creates an Impasse," *New York Times*, February 24, 2000, p. A1.

[39] See David Olson, "Governance of U.S. Public Ports: A Preliminary Survey of Key Issues," p., 7.

ports without claim to the assets of the facility users who may have initiated the project. (Los Angeles is an exception because it requires its tenants to sign guarantees for minimum lease and use payments for new facilities and has tenants' corporate parents pledge to honor those guarantees.[40])

The $2.4 billion Alameda Corridor project, for example, is being funded by a combination of revenue bonds, payments from the ports, a federal subordinate loan, and direct federal grants (both direct and those passed through to the project by other agencies such as the local transit agency). (See Table 5) The bonds are to be repaid with fees paid by the railroads for use of the corridor. However, the bonds are secured not by the railroads' assets but by the ports of Los Angeles and Long Beach. In fact, pro forma projections show that the fees paid by the railroads will not be sufficient to service debt until 2018. Until then, the ports will make "shortfall" advances to cover required payments on both the bonds and the federal loan.[41]

Allocating Risk

Though the current system for funding port improvements clearly has facilitated the construction of substantial new port and intermodal facilities, for two reasons, it may be exposing the public to significant levels of risk without providing the public with returns that are commensurate with that risk.

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[40] Los Angeles City Harbor Department, *Official Statement,* Revenue Bonds, Issue of 1996, p. 27.

[41] See Alameda Corridor Transportation Authority, *Official Statement*, January 29, 1999. See also "S&P Rates Alameda Corridor CA Sr. Bonds BBB+, Sub BBB," *Standard & Poor's CreditWire*, December 31, 1998, *Alameda Corridor Transportation Authority,* Fitch IBCA, January 19, 1999 (available on the World Wide Web at www.fitchibca.com), Diane Teece and Spencer Stevens, "Alameda Corridor Semi-Annual Update," Washington, DC: Federal Highway Administration, March 31, 1998, and Office of the Inspector General, U.S. Department of Transportation, "Review of the Alameda Corridor Project," Washington, DC: author, October 22, 1999.

First, to the extent that they are subsidized – ports seem likely to underestimate their true cost of capital. Similarly, to the extent that ports could use valuable waterfront land for other purposes, there is an opportunity cost for using the land for freight-related development.[42] Second, since ports, unlike private firms, do not finance new projects on a stand-alone basis, they lose market discipline and may underestimate the risks associated with those projects.

To the extent that the true costs of capital and/or risks are underestimated or ignored, investors (in this case the ports) are not likely to seek returns commensurate with risks. New projects, therefore, will have to pass lower "hurdle" rates to proceed, which means that over-investment is likely to occur.

This is clearly the danger when ports undertake speculative investments. A notable example is the state of Maryland which, in the early-1990s in an effort to increase business at the port of Baltimore built a new intermodal terminal with bonds that had been backed by toll revenues from the state's roads and bridges. The terminal, however, has been largely unused and did not stem the movement of carriers from Baltimore to Hampton Roads, which is located at the mouth of the Chesapeake Bay.[43]

Ports may also underestimate risk even when they have identified a tenant for a new facility. In this situation, the key to understanding the risk involved lies in the details of projects' financing package. As previously noted, in most cases, bonds may be *supported* by lease payments but they are *secured* not by the assets of the major shipping companies but by the

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[42]Similarly, to the extent that ports could use valuable waterfront land for other purposes, there is an opportunity cost for using the land for freight-related development The port of San Francisco is the most notable exception to this trend. That port has generally moved out of the freight business and is instead primarily involved with commercial redevelopment of valuable waterfront land. For more on pressures to develop valuable waterfront land for non-port uses see David Olson, "Governance of U.S. Public Ports: A Preliminary Survey of Key Issues," pp. 9-10.

ports' broader revenues, including the pledge of government subsidies. Thus, if payments from new facilities do not meet projections, it will be the ports, not the carriers, who bear the bulk of the projects' risks. Such risks might include a slowdown in the global economy that leads to slower-than-projected growth rates in shipping or a shift in the shipping industry away from larger ships toward smaller, but substantially faster ships. More narrowly, changing shipping patterns that might result from localized political conflicts, such as the closure of the Suez Canal, would lead carriers to re-deploy some mega-ships and post-Panamax ships from trans-Atlantic to trans-Pacific routes. In this latter case, the carriers are protected because their assets are mobile but the expense of dredging East Coast ports and the expense of expanded landside facilities could be largely wasted.

In contrast, consider how a port development project might be undertaken on a stand-alone basis by private investors. To secure financing, project developers would have to commit equity to the project. Because these investors seek to maximize their return they will be unwilling to invest in projects that they believe will be unprofitable. Lenders may also require financial guarantees beyond project cash flows and a lien on a project's hard assets. Equity investors, moreover, would be unwilling to provide such guarantees unless they believed the return they would receive was commensurate with the risks associated with particular projects. In a private funding model such guarantees are clearly defined and are explicitly linked to the flow of project revenues. That is, financial backers may agree to cover cash-flow problems during project construction and inception, and, after a project is operating, they may be required to cover debt-service payments if project revenues fail to meet specified projections. (In

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[43] See Suzanne Wootan, "Break bulk cargo is focus of MPA Plan," *Baltimore Sun*, July 7, 1996, p. 1E and Suzanne Wootan, "Showcase Terminal Starts Slow but Boosts Image of Once-Ailing Port," *Baltimore Sun*, June 5, 1994, p. 1D.

contrast, balance-sheet financing strategies generally do not distinguish between project revenues and subsidies provided from project sponsors' other resources.) In return for shouldering a project's financial risks, equity investors would seek higher returns than those that lenders would receive from the project. Equity investors would, however, receive that payoff only if the project generated a net profit after operating costs, debt service, required reserve deposits and taxes were paid. Thus equity investors can provide a market discipline that currently is missing from the current port funding system.

The Ports of Los Angeles and Long Beach used a financing plan along these lines for the development of an Intermodal Container Transfer Facility (ICTF) in the mid-1980s. The bulk of the money for the new facility was raised through Industrial Revenue Bonds that were guaranteed by the Southern Pacific Railroad. Under the terms of the agreement, the Port of Los Angeles retained ownership of the property and rented it to the Southern Pacific. The railroad, however, owned the capital improvements and qualified for an investment tax credit that was critical to the profitability of the project.[44] Currently, the Union Pacific Railroad Corp, which acquired the Southern Pacific in 1996, operates the facility under a 50-year sub-lease with the ICTF. Independent truckers transport containers from the ports to the facility, and the entry fees (currently $30 per container) are the sole source of project funds available to pay debt service. The financing transaction is structured with an underlying pledge from the railroad to meet any shortfalls in debt service and Standard & Poor's assigned its BBB rating to a recent $44 million refunding of outstanding bonds.[45]

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[44] Kagan, Robert A., *Patterns of Port Development,* page 138. The ports established a California joint powers authority (ICTF-JPA) to issue bonds for the project.

[45] In contrast, Standard & Poor's has assigned higher ratings to the port of Los Angeles (Los Angeles Harbor Department: AA/Stable) and the port of Long Beach (Long Beach Harbor Department: AA-/Stable) and a lower rating to the corporate

Similarly, had the Alameda Corridor project been structured as a privately financed project, equity investors – and those lending money with a subordinate security claim – would have demanded higher returns for the risk of undertaking that project. As currently structured, however, the federal government and the ports of Long Beach and Los Angeles are playing the role that an equity investor would play in a privately-financed project. The federal government has provided a subordinate loan to the project. The federal loan, however, does not reflect the risk the government is taking on. This is apparent from the fact that the interest rate on the federal loan, which is linked to the interest rate for 10 and 30-year treasury bills, is about 6.7 percent – a figure that is *below* the approximate 7 percent yield for the project's more senior taxable debt, which is guaranteed.[46]

The ports of Los Angeles and Long Beach, which are committed to paying project cost overruns, are taking a role akin to equity investors. Their share of the funding, however, is coming from balance-sheet financing so the ports seem likely to seek a smaller return than a private equity investor would seek for taking on the project risks. Railroads, on the other hand, have explicitly limited their exposure to project risks because they have capped the amount they will pay in fees for using the corridor.[47] Carriers, who will indirectly fund the project via fees they pay to the railroads and the ports of Long Beach and Los Angeles, are even more protected

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debt of the Union Pacific Railroad Corp (BBB/Stable/A-3). They noted that a rating change would depend on actual container volumes and any improvement or deterioration in Union Pacific's credit rating. See "Intermodal Container Transfer Facility," *Standard & Poor's Credit Profile*, September 1999.

[46] See "Alameda Corridor Complete Bond Sale," *Business Wire*, February 2, 1999 and Teece and Stevens, "Alameda Corridor: Semi-Annual Update." There is a second question, which is beyond the scope of this work, on why the federal government should assist one region in efforts that will explicitly make it better able to compete with other regions. Indeed, when officials from Seattle and Tacoma sought federal aid for their project, they asked for a grant equal in value to the loan given to Alameda Corridor. (Interview with Paul Chilcoate, director of planning, Port of Tacoma, January 6, 1999.)

from serious risk. Their assets are mobile, so carriers can move substantial portions of their discretionary operations to other ports to avoid dramatic fee increases. Under the best of circumstances, the project will succeed, the federal loan will be repaid and the ports will reap returns akin to those sought by equity investors – money they may well use to help fund the next generation of balance-sheet funded projects.[48]

Alameda Corridor is an extreme case only because of its magnitude and the complexity of its financing. Nevertheless, the general point remains. Public ports, not private project users, are taking on substantial amounts of new projects without market discipline to evaluate that risk or seek returns commensurate with it. Moreover, because of changes in the shipping industry (which make it possible to move goods to a region by a variety of means and routes) it is not clear that local ports – or at least local port facilities, such as terminals – are truly a monopoly that requires public ownership and operation. Rather, ports, like railroads, may be essential facilities that can be operated as private businesses with a modicum of public oversight, primarily to ensure that there is sufficient competition between port operators.

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[47] See "S&P Rates Alameda Corridor CA Sr. Bonds BBB+, Sub BBB," *Standard & Poor's CreditWire*, December 31, 1998, *Alameda Corridor Transportation Authority,* Fitch IBCA, January 19, 1999 (available on the World Wide Web at www.fitchibca.com),

[48] Traditionally, public authorities have used surpluses from existing projects to help fund new revenue-generating projects. Indeed, this is how the ports of Los Angeles and Long Beach have funded the Alameda project and how Robert Moses' Triborough Bridge and Tunnel Authority and the Port Authority of New York and New Jersey funded many of their projects in the middle of the century. In more recent times, however, public entities with generally positive cash flows have been pressured to help fund other public projects. The classic example of tapping surplus revenues was New York State's use of Triborough Bridge and Tunnel Authority revenues to subsidize transit, bus, and commuter rail service in the New York City region. In 1997, the TBTA recorded a surplus of $655 million that was used to support mass transit operations and capital investments. Similarly, the port of Long Beach, for example, has recently helped fund a new convention center while the port of Los Angeles has been asked to repay the city for services such as police and fire protection. Several other ports, including those in Oakland, San Diego, San Francisco, Seattle, and Tacoma, have also helped fund a variety of commercial real estate development projects. See David Perry, "Building the Public City Through the Back Door: The Politics of Debt, Law, and Public Infrastructure," in D. Perry, *Building the Public City,* Thousand Oaks, CA: Sage Publications, pp. 169-201, David Olson, "Governance of U.S. Public Ports: A Preliminary Survey of Key Issues," p., 7, Moody's Investor Services, "Competition Among West Coast Ports Pressures Credit Outlook," January 1998, pp. 7-8, and Metropolitan Transportation Authority, 1997 Annual Report, Combined Statement of Cash Flows.

Port officials, private port users, and other advocates of publicly subsidized ports are likely to criticize this conclusion on two grounds. First, they are likely to contend that the subsidies create jobs or provide other benefits – such as reducing traffic congestion (when ports help build grade separation projects such as the Alameda Corridor project), reducing air pollution (when port investments shift traffic from trucks to rail), or improving the quality of life in neighborhoods (as the Alameda Corridor project does by eliminating the use of existing rail lines through residential areas). However, because their primary missions are relatively narrow (i.e. to move freight) ports generally do not analyze whether there are cheaper ways to achieve larger societal goals such as reducing air pollution or spurring economic development. This makes it difficult to assess whether port investments are the best way to achieve the desired goals. We acknowledge that ports are not the proper venue for making such assessments. However, we believe that such projects should be part of a regional planning process that takes such questions into account. Indeed, we note that the initial proposal for the Alameda Corridor project was made not by the ports but by the Southern California Association of Governments (SCAG), which is the region's locus transportation and land use planning.

Second, defenders of the current funding system may contend that it is impossible to secure private-sector investment in desired facilities. Port advocates may further contend that because of intense competition among ports, it is impossible for a single port (or its political overseers) to use the funding mechanisms we have described in this paper because carriers would respond by moving their operations to ports that still were using funding strategies that have the public sector, not private firms, bearing the bulk of project risk. One solution to the problem would be for the federal government to mandate changes in the port funding system. Such an effort, however, not only would be difficult to put in place but would also go against the grain of

American federalism, which gives states and localities great freedom in pursuing their economic development strategies. More narrowly and perhaps more plausibly, federal policymakers might consider changing tax laws to end ports' exemption from restrictions that in many other areas limit the use of tax-exempt debt for projects that benefit only a few private firms.[49]

Recent history, in both the United States and other countries, moreover, suggests that even under the current funding system, it may be possible for individual ports to pursue project-based funding strategies. A notable effort in this regard came in Rhode Island where private investors received tentative state approval to develop a private port at a Quonset Point, a former naval base in Rhode Island using project-based financing based on throughput guarantees from shippers with additional funding (in the form of either subordinate debt to or equity investment) from contractors building the new facilities, carriers, or other terminal operators at the new facility.[50] (The developers, however, were unable to obtain an unambiguous throughput guarantee from the shipping lines and were unable to achieve political consensus with environmental groups over the projects' impacts on Narragansett Bay. Consequently, in mid-1999 the state rejected their plans and is looking at other options, including having a major stevedoring company build and operate a facility on the site.)[51] Similarly, the Port Authority of New York and New Jersey has been examining alternative financial models to finance its proposed port development plan and work around the constraints in its current funding system. The port, for example, could take responsibility for providing cleared land but not build facilities

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[49] See discussion in footnote 28.

[50] December 30, 1998 interview with Martin Grasso, Quonset Point Partners LLC and August 10 1998 letter from Richard King, Senior Vice-President of Lehman Brothers to Martin Grasso, included in Quonset Point Partners, LLC, *The Development of a Container Terminal at Quonset Point/Davisville Rhode Island,* October 1998.

[51] William Donovon, "Port Plan Rejected but New Try Eyed," *Providence Journal-Bulletin*, September 9, 1999, p. 1E.

on that land, instead relying on private equity investors using long-term leases to build those facilities.[52]

This approach has become increasingly common for port investments in many other countries, which generally do not rely on tax-exempt finance as a way to build desired infrastructure facilities. In the past decade, private sector participation in the improvement and expansion of port facilities in developing and transitional economies has expanded significantly. Between 1990 and 1998, for example, there were over 100 port projects in 28 developing countries having some form of private participation.[53] One such project had private firms winning the concession for the port of Rio Grande in Brazil. Those forms are planning to invest $70 million to expand capacity at the port and increase cargo handling by 150 percent. It is noteworthy that Wilson, Sons de Administraceo e Comercio Ltda., the largest port operator and ship towing company in Brazil, is the primary investor in the Rio Grande port project.[54] And in Singapore, the PSA Corporation, the recently privatized terminal operator, has entered into contracts to develop new facilities along the coasts of China, Italy, India, Portugal, South Korea, and the Middle East. PSA has entered into ten joint development agreements in less than three years and projects that it will handle at least 10 million TEUs outside of Singapore by 2007.[55]

Such financing arrangements, it bears mention, are also becoming increasingly common in other forms of infrastructure, particularly outside of the United States. With infrastructure

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[52] December 28, 1998 interview with John Ricklefs, a senior vice-president with Frederik R. Harris and a consultant to the Port Authority of New York and December 22, 1998 interview with Bill Ellis, Port Authority of New York and New Jersey.

[53] Dirk Sommer, "Private Participation in Port Facilities – Recent Trends," *Public Policy for the Private Sector*, a publication of The World Bank Group, Note No. 193, September 1999. See also, Marc H. Juhel, "Global Challenges for Ports and Terminals in the New Era," paper presented at the Singaport '98 Conference.

[54] Terry Brennan, "Rio Grande builds on IFC," *Journal of Commerce*, January 6, 1999, p. 1B

[55] PSA webpage, http://www.psa.com.sg

shortfalls that are far in excess of public capacity for new investment, many governments are seeking greater private provision of public infrastructure. Long-term concessions for private consortiums to build, operate, and maintain public infrastructure have been awarded through competitive processes. The winning bidder gets the opportunity to construct the project and collect fees for the duration of the concession, after which period the infrastructure is transferred to the government at no cost. Highway projects have been financed on the basis of forecasted toll collections, airports financed on the basis of landing fees, passenger charges and commercial revenues, and telecommunications infrastructure financed on the basis of user charges. In some cases, moreover, the public sector also provides limited direct or indirect subsidy for private operators if public officials believe that the facility is desirable but cannot be supported on a stand-alone basis by user fees.[56]

State and local governments in the United States that have traditionally relied on federal subsidies and tax-exempt bonds for the development of infrastructure have been relatively slow to adopt the concession model. However, some jurisdictions have turned over major public facilities to private operators with concession contracts. Indianapolis, for example, saved millions of dollars by turning operation of both its airport and its wastewater treatment system to private firms. (The city then used the money it saved to make other capital investments without having to raise taxes).[57]

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[56] See Ravi Ramamurti, *Privatizing Monopolies: Lessons from the Telecommunications and Transport Sectors in Latin America*, Baltimore: Johns Hopkins University Press, 1996 John Finnerty, *Project Financing: Asset-Based Financial Engineering*, New York: Wiley, 1996, Jay Walder, "The Melbourne City Link," Cambridge, MA: Kennedy School of Government Case Program, 1999, and World Bank, *Project Finance in Developing Countries,* Washington, DC: author, 1999.

[57] See Stephen Goldsmith, *The Twenty-First Century City: Resurrecting Urban America* Washington, D.C.: Regnery Publishing, 1997.

Some jurisdictions are also using this model to build new facilities. Two recent toll-road projects in South Carolina and Virginia, for example, followed this general practice and added an interesting twist. To preserve the federal subsidy on tax-exempt debt, a not-for-profit corporation was created as the financing entity for the construction bonds.[58] Net revenue from the operation of the road that will flow to the not-for-profit corporation serves as the primary security for bonds.[59] In contrast to the port development model, the offering documents for these financings explicitly state that the bonds do not constitute an indebtedness of the state or any department, agency or political subdivision. Reflecting this separation from government taxing authority, the senior bonds for each project received low investment grade ratings.[60] Moreover, the project size and scope was limited by the market's perception of risk and the financing cost was directly related to the perceived risk in the project.

U.S. policymakers could use several strategies if they wanted to extend these models to port and port-related intermodal projects. Ports could move toward true project-based financing mechanisms. Private equity investors might also undertake the construction and operation of those facilities. Finally, it may even be time to consider privatizing port operations in the United States.

All of these arrangements not only are increasingly common in other parts of the world; they also were the dominant modes of nineteenth-century port development in the United States.

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[58] The not-for-profit corporation can issue debt "on behalf of the government."

[59] See the Connector 2000 Association, Inc. *Official Statement for Toll Road Revenue Bonds (Southern Connector Project, Greenville, South Carolina),* February 3, 1998 and Pocahontas Parkway Association, *Official Statement for the Route 895 Connector,* June 24, 1998.

[60] The senior bonds for the Southern Connector project (approximately $154 million) were rated "BBB-" by Standard & Poor's and subordinate bonds (approximately $47 million) were unrated. The senior bonds for the Route 895 project (approximately $318 million) were rated "Baa3" by Moody's Investors Service and "BBB-" by Standard & Poor's and

Voters and policymakers once rejected that model on the grounds that private operators either exercised monopoly powers (when one owner controlled the port) or private operators made inefficient use of the facilities. Given that the current system may ultimately expose the public to substantial and largely ignored financial risks, it may be time to revisit those decisions.

Fitch. The subordinate bonds (approximately $36 million) were rated "Ba1" by Moody's, a level that is considered to be below investment grade.

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Table 1: Intermodal Revenue as a % of Total Revenues

Railroad	%
Burlington Northern Santa Fe	27
Canadian National	17
Union Pacific	17
Canadian Pacific	13
Norfolk Southern	12
CSX	5

Note: BNSF, Canadian Pacific, and Union Pacific figures are for 1997; Canadian National, CSX figures are for 1996)

Source: Moody's Investors Service, *Moody's Port Ratings, Outlook,* June 1998

Table 2: Canadian and U.S. Port Container Traffic ('000s of TEUs in 1996)

Long Beach	3.1
Los Angeles	2.9
NY/NJ	2.3
San Juan	1.6
Oakland	1.5
Seattle	1.5
Hampton Roads	1.1
Charleston	1.1
Tacoma	1.1
Montreal	.9
Houston	.8
Pt. Everglades	.7
Miami	.7
Savannah	.7
Vancouver	.6
Jacksonville	.6
Baltimore	.5
Honolulu	.5
Halifax	.4
Anchorage	.3

Source: American Association of Port Authorities

Table 3: Channel and Berth Depths at Major U.S. and Canadian Ports

Port (ranked by 1996 TEUs)	Channel (in feet)	Berth (in feet)
Long Beach	76	35-50
Los Angeles	45*	45
NY/NJ	40**	35-40
San Juan	35	35
Oakland	42	35-42
Seattle	175	40-50
Hampton Roads	50	32-45
Charleston	42**	40
Tacoma	40-50	40-50
Montreal	36	35
Houston	40	38-40
Pt. Everglades	47	37-44
Miami	42	42
Savannah	42	42
Vancouver	50	40-50
Jacksonville	38	38
Baltimore	50	36-42
Honolulu	45	40
Halifax	60	45-47
Anchorage	30-70	35

Notes
** 50-foot project underway*
*** 45 foot project underway*
Source: MARAD

Table 4: Port Financing Methods: 1970 to 1990

Financing Method	1970s	1980s	1990s
Port Revenues	27%	48%	38%
GO Bonds	31%	15%	10%
Revenue Bonds	29%	27%	32%
Other	14%	11%	19%

Source: MARAD

Table 5: Alameda Corridor Funding Plan

Source	**Amount (millions)**
Revenue Bonds	$1,229
Federal Loan	$ 428
Port Grants	$ 394
LA County Metropolitan Transportation Authority	$ 355
Railroads	$ 18
State grant	$ 7
Total	**$2,431.00 431**

Note: Figures for revenue bonds and federal loans includes interest earned on the bond proceeds and the federal funds. LA MTA funds include $71 million in federal grant funds and $284 in state grant funds.
Source: Alameda Corridor Transportation Authority