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Funding Important Transportation Infrastructure in a Fiscally Constrained Environment

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Overview

Transportation infrastructure is too important to the economy to be subject to across-the-board cuts in federal funding without first ensuring that alternate revenue streams are available. Ideally, each transportation mode should be made as self-supporting as possible via direct user fees. This would also make it feasible to use revenue-bond financing to do more reconstruction and new construction than would occur under the current policy of funding capital investment from operating cash flow. This approach would also tend to weed out projects whose benefits don't significantly exceed their costs.

One inspiration for this policy brief is the report of the National Commission on Fiscal Responsibility and Reform (Simpson-Bowles Commission) in 2010. While its recommendations were not implemented, its proposals for transportation infrastructure reflected the above approach, including utilizing highway user tax revenues to make the Highway Trust Fund once again self-supporting, removing large and medium hub airports from the federal airport grants program to allow them to support themselves via passenger fees, and making inland waterway systems fully user-funded. This policy brief seeks to apply these users-pay/users-benefit principles more thoroughly to transportation infrastructure.

Problems with Current Federal Transportation Funding

The federal government assists the major modes of transportation via several systems of user taxes and trust funds:

- Highway users pay several federal user taxes (mostly on gasoline and diesel fuel) that support the Highway Trust Fund, from which grants are made for highway and transit programs.
- Air travelers pay a tax on airline tickets, and aircraft operators pay fuel taxes, with the proceeds of these and other user taxes feeding the Aviation Trust Fund, which pays for airport grants and for the capital costs and some of the operating costs of the air traffic control system.

- Ships unloading cargo at U.S. seaports pay a harbor maintenance tax, which streams into the Harbor Maintenance Trust Fund, from which funds are allocated for harbor dredging projects overseen by the Army Corps of Engineers.
- And users of U.S. inland waterways pay a diesel fuel tax for the Inland Waterways Trust Fund, which pays for a portion of the cost of maintaining and improving waterways, locks and dams.

While this approach sounds somewhat market-oriented, it fails to direct resources to their most productive use, for the following reasons:

- First, user taxes are still legally taxes. Seen as such, Congress is often reluctant to increase their levels, even though in many cases transportation infrastructure urgently requires additional investment.
- Second, each of the above programs builds in significant redistribution from some parts of the country to others, from some categories of users to others, and from general taxpayers to specific transportation modes, with political factors far outweighing any rigorous assessment of whether the economic benefits exceed the costs of the projects being funded.
- Third, federal involvement significantly increases the cost of building projects with federal money, via such policies as the Davis-Bacon Act, Buy America Act, the Jones Act, and other regulations and requirements.
- Fourth, since many of the federal grant programs focus on new capacity, decisions made by infrastructure owners tend to be biased in favor of more capital-intensive projects (e.g., light rail rather than bus rapid transit) than would be the case were they spending mostly their own money. This same focus on capital programs tends to encourage the ever-present temptation of state and local policymakers to under-invest in proper levels of maintenance in favor of creating more-politically desirable ribbon-cutting opportunities.

Another underlying problem is that the current federal grant funding approach has encouraged state and local infrastructure owners to fund most capital projects out of annual cash flow, rather than *financing* them. A basic principle of public finance is that long-lived infrastructure can and should be financed (i.e., capital should be raised up-front from the capital markets) and paid for over time, as the users of that infrastructure derive benefits from it. This is analogous to the way most people acquire their homes: not by saving until they can afford to pay cash, or building the home a room at a time as cash flow permits, but by taking out a long-term mortgage and paying it off over time, so as to obtain the benefits of home-ownership much sooner. Non-transportation infrastructure entities—electric and gas utilities, pipelines, telecommunications and water utilities—generally finance their major projects via revenue bonds, paid for by their users over many years. Railroads and toll roads do likewise, as do airports (to some extent) and air traffic control providers overseas. The United States is one of the few advanced developed countries that makes relatively little use of revenue-based financing for its transportation infrastructure.

Thus, the emerging and ongoing fiscal crisis of the federal government offers an opportunity to rethink how this country pays for and manages its critically important transportation infrastructure.

Airport Investment

While airports are hardly “crumbling,” many of the most important large and medium hub airports face significant capacity expansion challenges in coming decades. In 2007, the Federal Aviation Administration released a report by the MITRE Corporation analyzing the airport capacity needs of 56 leading airports from 2007 to 2026.¹ While that report did not estimate the cost of these improvements, a survey conducted by the Airports Council International-North America estimated that U.S. airports have annual capital investment needs of \$16 billion for the period 2011–2015, about 60% higher than what is likely to be available.² Some \$6.7 billion per year of that would be for runways and taxiways, and another \$6.4 billion per year for terminals.

U.S. passenger airports are not heavily dependent on federal Airport Improvement Program (AIP) grants. Figures compiled for the Airports Council International by consultant Leigh Fisher shows that AIP accounted for only 22% of those airports’ capital funding sources. Bonds provided the largest component, at 54%; these are mostly revenue bonds, backed by various airport operating revenues, including local passenger facility charges (PFCs).³ PFC revenues directly accounted for another 3.4%, with other sources covering the balance of 20%.

However, AIP provides significant cross-subsidization among airports, as Table 1 illustrates. Large hub airports handle 70% of the passengers (and generate a comparable share of the ticket tax revenue), but receive just 17% of AIP grants. Small hubs, with only 8% of passengers, receive 15% of the grant funds, and non-hubs (3% of passengers) get 22% of AIP monies. And general aviation/reliever airports (0% of ticket tax-paying passengers) receive 22% of AIP grant money.

Table 1: AIP Grants versus Enplaned Passengers, FY 2011

Category	Annual Passengers	AIP Awarded
Large hub	70%	17%
Medium hub	18%	11%
Small hub	8%	15%
Non hub	3%	22%
Commercial service	0%	3%
Reliever/GA	0%	22%
State block grants	n.a.	9%
System planning	n.a.	1%

Source: Airports Council International-North America, 2012

In a recent policy paper, Brookings Institution analysts highlighted the importance of major hub airports as international gateways and urged that AIP’s priorities be altered to devote a greater share of resources to large hubs.⁴ They also urged that Congress increase the federal “cap” that currently limits local airport PFCs to a maximum of \$4.50 per enplaned passenger. (Airport organizations have been calling for such an increase in recent years, without success.) Airports Council International-North America, using the ENR construction cost index, estimates that to maintain its purchasing power for airport construction, the current \$4.50 PFC would have to reach \$9.25 by 2016.

Rather than battling with general aviation interests over how to split up the AIP pie, a better solution would be to liberate passenger airports from AIP altogether, allowing them to self-fund via PFCs and all their other user-derived revenue sources without a federal limit. In late 2011, a group of large hub airport operators responsible for 19 commercial airports sent a letter to the congressional Super Committee offering to give up AIP formula-driven “entitlement” grants in exchange for an increase in the PFC cap to at least \$7.50. In a position paper accompanying the letter, the group estimated that if all large and medium hubs did that, the 10-year savings in AIP would be \$3.4 billion. As of late 2012, a larger group of large-hub airports is willing to forego *all* AIP grants in exchange for eliminating the statutory PFC cap. And if all 65 large *and medium* hubs did that, the 10-year savings would be around \$11 billion.⁵

The possibility of using PFCs to replace all AIP grants for all four categories of passenger airports was the subject of a report from the Office of the Secretary of Transportation in 1987.⁶ Using dollar figures from 1985, the report calculated the average-size PFC that would be needed to replace AIP funding in that year as follows:

- Large hubs \$0.98 per enplanement [\$2.11 in 2012 \$]
- Medium hubs \$2.15 per enplanement [\$4.62 in 2012 \$]
- Small hubs \$4.94 per enplanement [\$10.62 in 2012 \$]
- Non-hubs \$8.33 per enplanement [\$17.91 in 2012 \$]⁷

As can be seen by the figures in brackets, those numbers would be considerably higher today, based on more than 25 years’ CPI inflation since 1985 (and even larger increases in construction cost indices). But the principle remains valid. Passenger airports could be self-supporting without AIP grants, via increased reliance on the proven tool of PFCs.

Those four airport categories account for 65% of the spending from AIP. At the current budget level of \$3.37 billion per year, eliminating 65% would save \$2.19 billion per year, without reducing the extent of airport investment. On the contrary, since the bond market has grown comfortable with PFC revenues to support airport revenue bonds, a larger annual flow of PFC revenues could support increased airport bonding. That would shift airports toward *financing* a larger fraction of their capital program than the current 49%. And capital projects at those airports would cost less, because without federal funds involved, they would not be encumbered by cost-inducing federal regulations such as Davis-Bacon and Buy America.

One other policy change that would let airports finance more infrastructure per available dollar would be to remove tax-exempt private activity bonds (PABs) from coverage by the alternative minimum tax (AMT). The same change should be made for PABs for all modes of transportation, including highway and seaport projects. The case for this change has recently been made by the Brookings Institution.⁸

Air Traffic Control Investment

The Federal Aviation Administration is embarking on a huge project to replace the 20th century way in which air traffic is controlled (radar and other ground-based navigation aids, voice radio, labor-intensive direction by controllers in hundreds of facilities) with a 21st century approach called NextGen. This would shift keeping track of planes' locations to largely space-based GPS signals, change routine communications to digital form, and automate many aspects of separation of aircraft, while consolidating air traffic control staff into a much smaller number of high-tech facilities. The technology improvements alone are estimated to cost over \$20 billion, while the facility replacements could approach another \$30 billion based on current FAA plans.

One major problem is funding. The only current funding for NextGen comes from the FAA's Facilities and Equipment account, currently at \$2.75 billion per year (with about \$1 billion of that allocated to NextGen). The largest FAA account—Operations—includes nearly all the agency's workforce, including over 16,000 controllers and managers. To cope with the sequester without having to shut down a portion of ATC operations, it is widely expected that the Facilities and Equipment account will take the bulk of FAA's budget cuts. But even without the sequester, at \$1 billion per year for NextGen, the \$50 billion modernization would take 50 years to accomplish, and much of the new equipment would be obsolete long before the program was fully implemented.

The FAA also has low credibility with Congress and its aviation customers for implementing new technology and consolidating facilities. Numerous major programs end up being completed years late and well over budget. Basic business decisions such as consolidating facilities become political decisions under the current governance structure. The FAA also has numerous overseers, including the DOT Secretary, OMB, the GAO and the DOT Inspector General's Office, as well as various congressional committees. Airspace users perceive FAA management as being so focused on responding to questions, critiques and directives from these overseers that they have far less focus on being responsive to the needs of their aviation customers.

The ATC system is another case where a shift to direct charging of users by the ATC provider would dramatically change the way the whole system works. If aircraft operators paid the provider directly for ATC services, the provider could issue long-term revenue bonds for the technology and facility investments needed for NextGen. The bond markets would insist on a sound business case for each element of the plan, to ensure that the revenue stream would be sufficient to service the debt. That would require the ATC provider to work with its aviation customers to refine those business cases, discarding those with a low ratio of benefits to costs and prioritizing those with high B/C ratios. It would also mean that large investments could be made much sooner, thanks to bonding.⁹

This model may sound like just a fantasy, but over the past 20 years more than 50 countries have reformed their ATC systems along these lines—including Australia, Canada, Germany and the U.K. The revenue bonds issued by these self-supporting air navigation service providers (ANSPs) typically carry investment-grade bond ratings. Many of these ANSPs have carried out significant

facility consolidations. Decisions like these are *business* decisions in those countries, not political decisions as they tend to become in the United States.

In its 2007 budget, the FAA proposed a revamping of its operations that would fund its Air Traffic Organization (ATO) out of new ATC fees, fund the Airport Improvement Program via much-reduced aviation user taxes, and fund the FAA's safety regulation operations and miscellaneous headquarters operations from the general fund. At that time, the general fund covered about 19% of FAA's total budget, approximately the share needed to pay for the regulatory and headquarters functions. In more recent years, the general-fund share has grown to about 30%, which is not sustainable.

With that 2007 proposal as a starting point, this plan would shift the ATO out of FAA, making it a stand-alone federal entity paid for directly by fees charged for its services. This would be directly analogous to the ANSPs of Australia, Canada, Germany, the U.K. and nearly 50 other countries. The independent ATO would be regulated, at arm's length, for safety by the FAA, which would also continue to administer the AIP grant program for airports. Since the capital and operating costs of the ATO are currently about \$10.5 billion per year, this change would reduce both the FAA's aviation user tax revenues and its ATC expenditures by that amount, with no net impact on the federal budget. But this reform of ATC governance and funding would protect NextGen from damaging budget cuts that would otherwise be inevitable.

The idea of making the U.S. ATC system a separate self-supporting system goes back to at least 1985, when the Air Transport Association produced a concept paper urging such a change.¹⁰ The idea was picked up by Vice President Gore's National Performance Review office, which commended the idea to the Office of the Secretary of Transportation. OST then produced a two-volume study advocating the shift of ATC from FAA to a self-supporting government corporation called USATS.¹¹ Enabling legislation was introduced in 1994, but not enacted. In 1997 the Mineta Commission recommended governance and funding reform of the ATC system, making it a self-supporting entity within DOT.¹² Congress in 2000 authorized the creation of the ATO, but within FAA and without its own revenue stream.

An updated version of USATS could take advantage of lessons learned from leading ANSPs in other developed countries, such as Airservices Australia, Germany's DFS, Nav Canada, and NATS in the U.K. Congress would need to enact enabling legislation providing for a transition period, including the transition from user taxes to direct ATC charges. The legislation would also need to spell out what kind of a governing body would set policy and guide the new entity as it implemented NextGen, perhaps adapting the Nav Canada model of a stakeholder board.

Highway and Bridge Investment

Numerous reports and countless political speeches have claimed that U.S. highways and bridges are “crumbling.” But a careful look at trends over the past 20 years by David Hartgen and colleagues finds that the average condition of highways and bridges over the years has improved,¹³ a conclusion supported by the most recent biennial “conditions and performance” report from the U.S. Department of Transportation.¹⁴ Using data from the Federal Highway Administration (FHWA), Hartgen’s team documented the following trends, comparing 2008 with 1989:

- Rural Interstate highways in poor condition decreased two-thirds, from 6.6% to 1.93%.
- Urban Interstates in poor condition decreased 6.6% to 5.4%.
- Rural primary highways in poor conditions decreased from 2.6% to 0.5%.
- Congested urban Interstates declined slightly, from 52.6% to 48.6%.
- Deficient bridges (either structurally deficient or functionally obsolete) decreased from 37.8% to 23.7%.
- Fatality rates on highways decreased by 42% over these two decades, from 2.16 per hundred million miles of travel to 1.25 per hundred million.

These significant improvements derive from substantial increases in annual highway and bridge investment, which increased in real (inflation-adjusted) terms by 60% over this 20-year period.

Nevertheless, these figures don’t call for complacency. There are still huge congestion costs being borne by highway users, especially in large urban areas. There is still a large backlog of deficient bridges. And since U.S. highways are designed to have a useful life of about 50 years (if well-maintained), much of the most important highway infrastructure in this country must be reconstructed and modernized. The Interstate highway system’s 46,876 miles represent just 1% of total route-miles but carry 25% of all vehicle-miles of travel. The initial segments of this system opened to traffic in the late 1950s, and many others in the early 1960s, so some have already exceeded their design life. Most of the rest of the system will reach that point during this decade or the next.

The latest DOT report on highway conditions and performance calculates total current annual highway capital investment and compares this with the amount of annual investment needed to either (a) sustain current conditions and performance (e.g., congestion levels), or (b) improve conditions and performance via projects whose benefits exceed their costs.¹⁵ For the Interstate highway system alone, the “sustain” calculation estimates that annual investment should be \$24.3 billion, compared with the actual figure of \$20.3 billion. The “improve” figure, which includes significant reconstruction and modernization, is \$43.0 billion per year, more than double the current level. Other large investment needs were estimated for the remainder of the nation’s highways and bridges.

The principal funding source for highways and bridges is highway user taxes, levied by individual states and also the federal government. The large majority of user tax revenue comes from per-gallon taxes on gasoline and diesel fuel. Thanks in part to increasingly stringent federal miles-per-gallon requirements, fuel tax revenues have stagnated in recent years (a trend exacerbated by the Great Recession). But with the latest Corporate Average Fuel Economy (CAFE) regulations requiring new-vehicle mpg to double again (to 54.5) by 2025, fuel tax revenues are expected to plateau and decline in coming decades. In real (inflation-adjusted) terms, the decline will be even greater.

Ever since the start of federal fuel taxes dedicated to a federal Highway Trust Fund (HTF) in 1956, those revenues increased every year, helped along by occasional increases in fuel tax rates (the most recent of which went into effect in 1993). But during the recession years of 2008–2012, when high fuel prices and job losses reduced both driving and fuel purchases, the federal fuel tax produced only enough revenue to fund about 70% of the 2007 spending level. To avoid reducing highway and transit grants, Congress transferred more than \$50 billion of general-fund monies into the HTF during those years. And in 2012, when Congress enacted the two-year MAP-21 reauthorization bill, it transferred an additional \$18.8 billion in general fund money (plus another \$2.4 billion from the Leaking Underground Storage Tank Trust Fund), thereby maintaining then-current spending levels despite insufficient fuel tax revenue.

A responsible path forward cannot depend on further general fund transfers, since all such transfers directly add to the annual budget deficit and hence to the \$16 trillion national debt. Yet the nation is faced with the need to increase, not decrease, investment in critically important projects such as reconstructing and modernizing the Interstates and replacing structurally deficient bridges. How can these conflicting imperatives be reconciled?

In a 2010 Reason Foundation study, Adrian Moore and Robert Poole laid out an agenda to address this problem.¹⁶ It called for rethinking the federal role in surface transportation to refocus it on interstate commerce, plus modest sums for safety and research. That would mean a primary focus on modernizing the Interstate highway system, including upgrading some portions of the larger National Highway System to Interstate standards. Responsibility for all other highways, plus the numerous non-highway programs that have been added to the HTF over the decades (urban transit, recreational trails, sidewalks, bikeways, etc.) would shift to state and urban-area governments, since these are state and/or urban systems. This refocusing would add \$9–10 billion per year to the highway programs that remained in the HTF. That would provide a way to keep the HTF “solvent” based solely on the revenues from highway user taxes.

States and urban areas would, of course, face major challenges in taking on the added responsibilities entailed by this shift. Some might be able to make a persuasive case to their voters to increase state or local/regional taxes dedicated to transportation, as Washington State DOT did during the 2000s (two fuel tax increases) and as Los Angeles County Metro did in 2008 (transportation sales tax increase). But the magnitude of this shift is large enough that state adoption of the following principles would do a great deal to help:

1. Make serious use of benefit/cost analysis, to direct investment to projects that produce the most bang for the buck. Transportation analyst Richard Mudge estimates that use of a B/C ratio of at least 2.0 (benefits at least twice the cost) would reduce current highway “needs” by 40%.¹⁷
2. Make much greater use of tolling and pricing, as both a source of highway revenue and as a powerful means of reducing traffic congestion.
3. Shift from *funding* highway and bridge capital investments out of annual cash flow to *financing* such investments via revenue bonds, backed by highway user revenues.
4. Repeal state “prevailing wage” laws that apply to highway and bridge construction; such laws are estimated to increase construction costs by about 10%.¹⁸
5. Take advantage of states no longer being subject to other cost-increasing federal regulations (such as the Buy America Act) on the increased fraction of what become *state-funded* projects.
6. Ensure longer-lived pavements either by requiring long-term pavement warranties in construction contracts or by doing large projects as long-term design-build-operate-maintain concessions (public-private partnerships—PPPs) to create built-in incentives for more durable pavements.

Note: transit is addressed in a subsequent section of this report.

If Congress refocuses the HTF on interstate commerce, as recommended above, it could help states do more with less by adopting the following federal measures:

- Relax the current ban on tolling Interstates by no longer counting toll-financed *reconstructed* lanes as “tolling existing capacity.”
- Enable increased use of long-term toll concessions (PPPs) by removing the current \$15 billion cap on tax-exempt private activity bonds (PABs) and continuing the TIFIA loan program at the \$1 billion per year level set by MAP-21.
- Facilitate true nationwide interoperability for all-electronic toll collection (AET).
- Repeal the Davis-Bacon Act.

These measures would give states powerful tools for increased investment and reduced costs.

Ports Investment

The Panama Canal is being expanded to permit passage of much larger ships, especially giant container ships that are too large for most east coast ports. Nearly all the large east coast ports are therefore seeking federal funding to deepen their channels to the 50-ft. depth required by the new generation of container ships in hopes of (a) gaining market share from west coast ports, and (b) gaining a competitive advantage over other east coast ports.

Federal funding comes from the Harbor Maintenance Trust Fund (HMTF), the source of funding for which is the Harbor Maintenance Tax (HMT), which is levied on the value of incoming cargo at all U.S. coastal ports and generates about \$1.5 billion per year. As with the other federal transportation trust funds, Congress decides how to allocate the money. Rather than doing this by formula, as is the case with most highway and airport grants, for ports Congress first relies on the Army Corps of Engineers to do benefit/cost analysis on capital projects proposed by individual ports. There is a long history of critical assessments of the objectivity of these analyses. In a 2006 study, the Government Accountability Office found that “the Corps’ analyses often understated costs and overstated benefits” and that the analyses supporting many projects were “fraught with errors, mistakes and miscalculations, and used invalid assumptions and invalid data.”¹⁹

Even if the Corps’ studies were fully objective, Congress traditionally has decided which port dredging projects to fund, resulting in each such bill being 100% earmarked. The Congressional Research Service found that HMT funds are often “directed towards harbors which handle little or no cargo.” It concluded that “Given the amount of HMT collections not spent on harbors, and the amount spend on harbors with little or no cargo, a rough estimate is that less than half and as little as a third of every HMT dollar collected is being spent to maintain harbors that shippers frequently use.”²⁰

Thus, a major problem with the current ports tax-and-grant system is that the most economically productive projects are often not being selected for federal funding. A second problem, much bemoaned by the ports industry, is that in recent years Congress has tended to appropriate only about half as much money per year as the Harbor Maintenance Tax brings in, resulting in a continued build-up of money in the HMTF (which has the political benefit of reducing the amount of the federal budget deficit).

Some critics of the status quo, such as Sen. Lindsay Graham (R, SC) have proposed legislation to establish a national assessment of which ports should be deepened. This idea reflects the underlying reality that ports inherently *compete with one another*, and port experts correctly note that if all large east coast ports were dredged to 50-ft. depths, there would be even more excess capacity than already exists.²¹ But it’s not at all clear that a central-planning approach would identify the optimal set of investments—or avoid the likely politicization that was evident in the U.S. DOT’s recent TIGER grants program.²²

There is yet another basic flaw with the current tax-and-grant model: unfairness. The harbor maintenance tax is levied on cargo unloaded at all coastal ports, yet many of the most important ports are inherently deep-water and do not need dredging for channel-deepening, only (at some) a modest amount of maintenance dredging. Such ports include Long Beach, Los Angeles, Oakland, Tacoma and Seattle on the west coast and Norfolk on the east coast. Those ports have an inherent competitive advantage that reduces the cost of goods movement—but imposing the Harbor Maintenance Tax on them artificially increases their cost to shippers and distorts the flow of goods movement. The HMT system provides large cross-subsidies from naturally competitive ports to less-competitive ports, thereby artificially increasing the cost of shipping without necessarily benefiting by more goods being received, but rather shifting the same amount of goods among different U.S. ports.

Hence, rather than reforming the HMTF by requiring Congress to spend as much as it takes in from the HMT or speeding up Corps' benefit/cost studies, the market-based alternative is to abolish both the HMT and the HMTF, allowing ports themselves to decide whether dredging and other investments are worthwhile. This approach was recommended in 2011 by Asaf Ashar, co-director of the National Ports and Waterways Institute at the University of New Orleans.²³ Without the current federal involvement, ports could make their own decisions much sooner, based on return-on-investment calculations. In most cases, they would then have to take their planned funding model to the bond market, where it would be assessed for its potential to generate enough new revenue to pay the debt service on the bonds needed to finance the project.

Some states, to be sure, have programs in place to put some state money into port expansion, hoping to enable a port in their state to gain a competitive advantage over ports in other states. Those state policies may or may not be wise, but that is not a problem the federal government should be concerned with. States, too, would be well-advised to let the capital markets decide which port investments make economic sense. The Port of Miami did this in 2012, issuing revenue bonds to finance its channel deepening, in case federal funding either does not materialize or does not do so until many years in the future.²⁴

These ideas have surfaced in recent studies about the Corps of Engineers' many missions. A report by its Institute for Water Resources outlined financing options “to initiate discussion of possible paths to meet [the] challenge” of port and waterway modernization.²⁵ One of the four options for ports is “Encourage individual port initiatives by phasing out the HMTF, expecting individual ports to collect their own fees and make their own investment and maintenance decisions.” Such options were also cited in a recent report by the National Academies of Science.²⁶

Finally, the cost of port dredging is higher than it would be under free-market conditions, because all port and waterway dredging must, by federal law, be performed via U.S.-built and U.S.-crewed vessels under the Jones Act. This applies regardless of whether federal funding is involved. So a companion reform would be to exempt dredging vessels from coverage by the Jones Act.

Waterways Investment

There are many parallels between the problems involved with federal port investments and federal funding to maintain and improve the 12,000-mile inland waterways system. As with harbors, there is an Inland Waterways Trust Fund (IWTF), which receives the revenues generated by a fuel tax on barge operators. But this fund pays for less than half the cost of construction projects on the waterways (such as modernizing or replacing existing locks and dams) and none of the ongoing maintenance costs. According to the chairman of the House Transportation and Infrastructure Committee, the fuel tax “covers just eight percent of the total amount the Army Corps of Engineers spends on behalf of inland waterways users.”²⁷

Thanks to the Commerce Clause of the Constitution, the federal government has had jurisdiction over inland waterways since the 19th century, and the Army Corps of Engineers is in charge of waterways projects. The trade association for the barge industry, the Waterways Council, routinely calls for increased federal investment (meaning general taxpayers’ money), but as waterways expert Steve Ellis noted in recent congressional testimony, “Since users pay nothing for maintenance, they are constant cheerleaders for new construction.”²⁸ Ellis also cited problems with the Corps’ waterways benefit/cost analyses similar to those of its harbor studies, testifying that “None of the inland navigation projects the Corps has green-lighted in recent decades have met their economic predictions.”²⁹

This is not to deny the existence of problems with the aging system of locks and dams on inland waterways. A recent report released by the American Society of Civil Engineers identifies numerous projects desired by waterways users to replace existing locks with larger ones and to deepen channels on portions of the system, including the Mississippi River.³⁰ It cites a huge gap between the cost of this long list of projects and what the current funding system will yield over the next decade. But this report does not seriously assess the benefit/cost ratio for these numerous “needed” projects. The Waterways Council has proposed a 30 to 49% increase in the diesel fuel tax, but that would still cover less than 12% of the system’s current cost, let alone the cost of the doubled level of spending that waterways groups are advocating. And their most recent proposal is even worse. Under the proposed 2012 WAVE 4 legislation, “federal funding” (i.e., general taxpayers) would pay for “all [lock and] dam construction and major rehabilitation, along with smaller lock repair programs.”³¹ That goes well beyond the industry’s 2010 proposal, which would have had the user-tax-funded IWTF pay 50% of the cost only for projects larger than \$100 million, with everything else 100% funded by general taxpayers.³²

The problem with these conventional approaches is that they basically call for large subsidies for inland waterways from general taxpayers. Barge transportation competes with rail transportation (and to a limited extent with trucking). Railroads build and maintain their own infrastructure, and those costs are included in railroad rates paid by rail shippers. Trucks currently pay a much larger share of their highway infrastructure costs via user taxes than do barge operators, though federal cost allocation studies consistently find that there is some cross-subsidy from personal vehicle operators to commercial vehicle operators in the federal highway funding system. But with inland

waterways users paying for only 8% of the cost of that system, those who choose barge transportation are paying artificially low shipping rates in comparison to those of other modes. This distorts the economics of goods movement by misallocating a significant share of infrastructure investment to low-productivity uses in the waterways system.

The solution to this problem, as with ports investment, involves changing the way in which inland waterways investments are made. Simply increasing the barge diesel fuel tax to cover 100% instead of 8% of the costs of the system (as Simpson-Bowles proposed) would still leave in place a system that funds many unproductive projects whose costs are far greater than their benefits. A better solution would be to develop a new institutional structure to operate and manage either the entire waterways system or individual waterways corridors. Such a proposal was made nearly two decades ago by a Corps study, but nothing came of it.³³ But in the previously cited 2012 report by the Corps' Institute for Water Resources, the section on waterways financing options included the following as one of three alternatives:

Implement public-private partnerships with the responsibility for improving, operating, and maintaining the inland waterway navigation infrastructure along specified segments of the system. Financing for these actions would be secured in private capital markets with revenues to repay the financed activities earned from a combination of vessel user fees (segment fees or lockage fees) and appropriations.³⁴

Aside from the reference to using general tax money (appropriations) for part of the funding, this approach looks very promising. If user co-op-type organizations were created for each major inland waterways corridor, and required to be self-supporting from user revenues, then the key stakeholders themselves would have powerful incentives to do real benefit/cost analyses to select potential projects, and then subject those candidates to vetting by the bond market. Only those projects that were financeable would go forward.

The Jones Act affects not only waterways dredging vessels but also the barges and towboats themselves, which must be U.S.-built and U.S.-crewed. Exempting all inland waterways vessels from the Jones Act would reduce both channel-dredging costs and the cost of operating barges, thereby at least partially offsetting the impact of higher waterways user fees.

The Problem Cases: Transit and Passenger Rail

Urban transit and inter-city passenger rail are two federally subsidized transportation modes that pose greater difficulties than those discussed previously. Except in very limited cases, neither covers even its operating and maintenance costs from user payments (passenger fares). Capital costs—e.g., the cost of buses, rail cars, locomotives, track, maintenance facilities, etc.—come entirely from some form of subsidy. In the case of urban transit, one subsidy is a cross-subsidy from highway users, since a portion of federal highway fuel tax money is shifted to a transit account in the Highway Trust Fund; the other subsidy comes directly from the federal general fund

(all taxpayers). Amtrak and other federal passenger rail projects receive general-fund money derived from all taxpayers, for both capital costs and a portion of their operating costs.

The existence of federal capital subsidies for both inter-city rail and urban transit tends to bias operators toward capital-intensive choices. For the vast majority of U.S. cities, bus transit is far more cost-effective than rail, yet transit agencies in some 31 metro areas have opted for federal New Starts funds to develop streetcars, commuter rail, light rail or (in a few cases) heavy rail systems.³⁵ Because the usual practice is then to reconfigure the bus system to serve as a feeder to rail—rather than to function as a self-sufficient grid—the post-rail transit system may require more transfers to complete a trip, making the transit system less user-friendly for the large majority of its customers who are bus riders.

Similarly, the availability (at least from 2009 to 2010) of federal high-speed rail grants led many state DOTs to focus on costly projects to upgrade Amtrak corridors from 79 mph top speed to 110 mph top speed. Yet it is far from clear, to take a prominent example, that the \$6 billion planned for upgrading the 284-mile single-track line from Chicago to St. Louis, to reduce the trip time from 5.5 hours to 4.0 hours, would produce large enough ridership increases to be worth that large investment.³⁶

Alternatives for Inter-City Rail

Airline deregulation, beginning in 1978, democratized air travel, making trips by air affordable for the vast majority of the population. And for trips shorter than are practical by air, transportation planners studiously ignore the large and growing role played by unsubsidized inter-city bus lines. Inter-city bus serves more than 3,000 destinations, six times as many as Amtrak, and does so without federal subsidy (other than a lower federal fuel tax rate than paid by other motor vehicles of comparable size and weight).³⁷ In 2011, inter-city bus service grew by 7.1%, making it the fastest-growing mode of inter-city travel for the fourth year in a row.³⁸

The Northeast Corridor, from Boston to Washington, DC may well be the only U.S. route where passenger rail could be made self-supporting, and where modest investments to eliminate bottlenecks to permit somewhat higher speeds might be cost-effective (as defined by generating enough additional revenue to pay the costs of financing the improvements). However, during the past year or so, private-sector proposals have emerged for two other corridors, aiming to provide unsubsidized higher-speed passenger service in those specific markets. The first is All Aboard Florida, which plans service from Miami, Ft. Lauderdale and West Palm Beach to Orlando, using mostly existing right of way of its parent railroad, Florida East Coast Railway. The second, Texas Central High Speed Railway, plans express rail service between Houston and Dallas/Ft. Worth. The company is a joint venture of local investors and Central Japan Railway Company.

Were Congress to decide that inter-city passenger rail is too low a priority for increasingly limited federal general funds to support, Amtrak would have to drop its heavily subsidized long-distance routes and focus mostly on cost-effective improvements to the Northeast Corridor. States traversed

by Amtrak in that corridor would have the most to gain from a higher Amtrak mode share, and with reduced or zero federal funding, might be motivated to make their own investments to improve the infrastructure of the corridor. Amtrak might also be able to win increased state support for corridors where its current short-haul services are popular, such as Portland-Seattle, San Jose-Sacramento and San Diego-Los Angeles.

Congress could assist by exempting “post-Amtrak” passenger rail service from various federal labor regulations, enabling significant reductions in operating cost.³⁹ At the very least, new passenger rail employees should be exempted from the Railway Labor Act, the Federal Employers’ Liability Act, the Railroad Retirement Act and the Railroad Unemployment Insurance Act. Instead, these employees would be covered under mainstream laws such as Social Security and the National Labor Relations Act.

Transit Alternatives

If Congress were to reduce or eventually eliminate federal transit funding, transit agencies would have two primary avenues for coping with the decreased funding: increasing their revenues and reducing their costs.

The largest potential for increasing revenue would be in those metro areas with a large volume of middle-class rail passengers. This includes major cities with large traditional central business districts (such as Boston, Chicago, New York and Philadelphia), and a few cities with newer rail systems (such as San Francisco and Washington, DC). In these metro areas, commuter rail and heavy rail systems carry large volumes and cover 50 to 60% of their operating costs from farebox revenues. Large fractions of their current ridership could pay several times as much and still commute at a cost far less than driving plus parking. Lower-income riders would receive transit vouchers to enable them to continue paying something like current fare levels. The same principle of charging market-based fares but assisting low-income riders with transit vouchers could be applied to all transit systems, but would have a smaller impact in smaller urban areas where a much larger fraction of transit riders are lower-income.

A second, largely untapped source of transit funding is “value capture.” To the extent that proximity to transit stations significantly increases land values, the owners of those properties receive benefits for which they may not be fully paying. Here again, this potential funding source applies primarily to rail transit, so would be mostly applicable to the several dozen metro areas that have rail transit systems in place (or are seeking to fund extensions that would involve building new stations).⁴⁰

How much do transit agencies depend on federal funding? The Eno Foundation and the Bipartisan Policy Center produced a report that provides some perspective.⁴¹ While the figures vary considerably, the top 50 transit agencies (in terms of passenger trips) on average get 6.4% of their operating budgets and 39.6% of their capital budgets from the federal government. To be sure, there are outliers, with several large agencies depending on Washington for 15% to 21% of their

operating budgets. And despite the capital budget average being below 40%, four agencies actually depend on federal grants for 100% of their capital budgets: Southern Nevada, MTA Long Island, Pace Suburban Bus and Milwaukee County Transit. This very high level of dependence suggests a surprisingly low level of commitment to transit in those jurisdictions.

In addition to increasing revenue via the above-recommended changes regarding fares and value capture, a third potential source of additional funding is increased state and local support. In recent years, a number of states and many metro areas have put forth transit or transportation ballot measures, seeking increased support, usually by presenting a specific array of projects that will be developed if voters approve the measure (which is most often an additional sales tax dedicated to transportation improvements). Nationwide, 76% of such measures were approved by voters in 2004, 77% in 2006, 78% in 2008, 61% in 2010, and 68% in 2012.⁴² While there may be a different degree of support for a ballot measure aimed at preventing large cuts in transit services rather than one promising new services, the self-help potential of such measures has been demonstrated across the country.

There are also significant opportunities for reducing both operating and capital costs. One of the most dramatic opportunities for cost savings is to competitively contract the operation of the bus system. Only about 20% of transit systems outsource any of their vehicle operations, with most of them using this method only for minor services such as paratransit. But those few that have tried it on a large scale are achieving significant, sustainable cost savings. The former head of New Jersey Transit, Tom Downs, reports that by contracting out half its bus routes, Denver is saving 20%; San Diego is the other stand-out, also contracting out half its operations.⁴³ A report from the Center for Urban Transportation Research found that savings from contracting out regular bus operations average 25%.⁴⁴ That is far larger than the 6.4% average contribution to operating budgets from the federal government.

The largest savings in capital costs could be realized by rethinking planned rail transit projects, replacing them with some form of bus rapid transit instead. The most recent study of BRT by the Government Accountability Office compared recent rail and BRT projects, and concluded that “BRT projects generally have lower capital costs than rail transit,”⁴⁵ often by a factor of ten. GAO’s report explains these large differences as being due to many costly elements needed for rail projects that are not needed for BRT: “electrical power systems with overhead wires, and rails, ties, and switches.” In most cases, a rail maintenance facility would also have to be built. And in terms of performance, most of the BRT projects in GAO’s sample produced ridership increases between 15% and 80%, and nearly all provided significant travel time savings (despite only a handful operating on exclusive or semi-exclusive rights of way).

Thus, transit agencies have a number of realistic options for increasing revenue and reducing costs. They have had little motivation to pursue these changes, as long as federal funding was readily available. But if that funding is reduced or eliminated, they will not be left without options.

Summary and Conclusions

America has very real needs to upgrade and modernize transportation infrastructure, but the reality going forward is that federal general fund subsidies will no longer be available. Major changes in federal policy will be needed to empower states and the private sector to meet the needs for capital investments in transportation infrastructure in this new environment of a smaller federal role. In making these changes, Congress has an unusually good opportunity to increase the productivity of these capital investments via changes that reduce or eliminate cross-subsidies between users and among states. This brief's proposed federal policy changes fall into three broad categories: organizational changes, tax changes and regulatory changes.

Organizational Changes

- Separate the Air Traffic Organization (ATO) from the FAA, giving it the power to issue revenue bonds backed by the revenue from ATC fees and charges.
- Eliminate the Transit Account in the Highway Trust Fund, to permit all federal highway user tax revenues to be spent on highway and bridge projects.
- Eliminate the Harbor Maintenance Trust Fund and the Inland Waterways Trust Fund.
- Authorize waterway-specific public private partnerships (PPPs) to operate, maintain and improve waterways on a self-funded basis.

Tax Changes

- Reduce aviation excise taxes by an annual amount of \$12.7 billion, thanks to phasing out Airport Improvement Program grants for large, medium, small and non-hub commercial airports and making the ATO self-supporting from new ATC fees and charges.
- Remove the federal cap on local airport Passenger Facility Charges (PFCs).
- Remove the current \$15 billion cap on tax-exempt private activity bonds (PABs) for surface transportation infrastructure.
- Eliminate the alternative minimum tax (AMT) penalty for all PABs used for transportation infrastructure.
- Abolish the Harbor Maintenance Tax and the Waterways diesel tax, to be replaced by harbor and waterways user charges, paid to the operator of each facility.

Regulatory Changes

- Terminate AIP grants for large, medium, small and non-hub airports.
- Eliminate the federal ban on tolling Interstate highways for the purpose of financing reconstruction.
- Exempt highway and transit projects from the Davis-Bacon Act.

- Exempt from the Jones Act all vessels using inland waterways, including those involved in harbor dredging.
- Create the category of a “post-Amtrak passenger railroad employee” exempt from the Railway Labor Act, Federal Employers’ Liability Act, Railroad Retirement Act, and Railroad Unemployment Insurance Act.

A recent *Washington Post* article was headlined “Burden for Rebuilding Infrastructure May Fall to States.”⁴⁶ That is almost certainly true, but should be broadened to include the private sector (via PPPs) and the users of the infrastructure. But Congress should not simply cut back the size of federal infrastructure programs and dump the problem in states’ laps. Instead, it needs to remove federal organizational, tax and regulatory policies that have evolved in an era of ever-expanding federal largesse. Addressing those issues, as discussed in this report, is the responsible way forward.

About the Author

Robert W. Poole, Jr. is director of transportation policy and Searle Freedom Trust Transportation Fellow at Reason Foundation. Poole, an MIT-trained engineer, has advised the Ronald Reagan, the George H.W. Bush, the Clinton, and the George W. Bush administrations.

In the field of surface transportation, Poole has advised the Federal Highway Administration, the Federal Transit Administration, the White House Office of Policy Development, National Economic Council, Government Accountability Office, and state DOTs in numerous states.

Poole's 1988 policy paper proposing privately financed toll lanes to relieve congestion directly inspired California's landmark private tollway law (AB 680), which authorized four pilot toll projects including the successful 91 Express Lanes in Orange County. More than 20 other states and the federal government have since enacted similar public-private partnership legislation. In 1993, Poole oversaw a study that coined the term HOT (high-occupancy toll) Lanes, a term which has become widely accepted since.

California Gov. Pete Wilson appointed Poole to the California's Commission on Transportation Investment and he also served on the Caltrans Privatization Advisory Steering Committee, where he helped oversee the implementation of AB 680.

From 2003 to 2005, he was a member of the Transportation Research Board's special committee on the long-term viability of the fuel tax for highway finance. In 2008 he served as a member of the Texas Study Committee on Private Participation in Toll Roads, appointed by Gov. Rick Perry. In 2009, he was a member of an Expert Review Panel for Washington State DOT, advising on a \$1.5 billion toll mega-project. In 2010, he was a member of the transportation transition team for Florida’s Governor-elect Rick Scott. He is a member of two TRB standing committees: Congestion Pricing and Managed Lanes.

Endnotes

- ¹ MITRE Corporation Center for Advanced System Development, “Capacity Needs in the National Airspace System, 2007-2026,” Federal Aviation Administration, May 2007.
- ² Airports Council International-North America, “ACI-NA Airport Capital Development Needs Survey,” February 2011(www.aci-na.org/content/aci-na-capital-needs-study).
- ³ Leigh Fisher, “Airport Capital Needs and Funding Sources,” presentation on Removing Obstacles to Airport Capital Funding, Annual AAAE Conference, April 29, 2012.
- ⁴ Adie Tomer, Robert Puentes, and Zachary Neal, *Global Gateways: International Aviation in Metropolitan America* (Washington DC: Brookings Institution, October 2012).
- ⁵ Robert Poole, “Could PFCs Replace AIP Grants?” *Airport Policy News*, Issue No. 73, November 2011.
- ⁶ Office of the Secretary of Transportation, *The Effects of Airport Defederalization: Final Report*, DOT-P-36-87-4, February 1987.
- ⁷ 2012 values computed using Bureau of Labor Statistics CPI calculator.
- ⁸ Robert Puentes and Joseph Kane, *Exempt Private Activity Bonds (PABs) from the Alternative Minimum Tax (AMT)*, (Washington, DC: Brookings Institution, November 2012).
- ⁹ Robert W. Poole, Jr., *The Urgent Need to Reform the FAA’s Air Traffic Control System*, Policy Study No. 358 (Los Angeles: Reason Foundation, March 2007).
- ¹⁰ *Federal Corporation Approach to the Management and Funding of the Air Traffic Control System*, Air Transport Association, September 1985.
- ¹¹ Executive Oversight Committee, *Air Traffic Control Corporation Study*, Office of the Secretary, U.S. DOT, May 1994, Volumes 1 and 2.
- ¹² *Avoiding Aviation Gridlock & Reducing the Accident Rate: A Consensus for Change*, National Civil Aviation Review Commission, December 1997.
- ¹³ David T. Hartgen, M. Gregory Fields, and Elizabeth San Jose, *Are Highways Crumbling? State and U.S. Highway Performance Trends, 1989-2008*, Policy Study No. 407 (Los Angeles: Reason Foundation, December 2012).
- ¹⁴ U.S. Department of Transportation, *2010 Status of the Nation’s Highways, Bridges, and Transit: Conditions and Performance*, Report to Congress, March 2012.
- ¹⁵ Ibid.
- ¹⁶ Robert W. Poole, Jr. and Adrian T. Moore, *Restoring Trust in the Highway Trust Fund*, Policy Study No. 386 (Los Angeles: Reason Foundation, August 2010).
- ¹⁷ Richard Mudge, PhD., “Managing Traffic with No Money,” presentation at 2011 ITS World Congress, Orlando, FL, Oct. 18, 2011.
- ¹⁸ Sarah Glassman, Michael Head, David G. Tuerck and Paul Bachman, *The Federal Davis-Bacon Act.: The Prevailing Mismeasure of Wages* (Boston: Beacon Hill Institute, February 2008).
- ¹⁹ Government Accountability Office, “Corps of Engineers: Observations on Planning and Project Management Processes for Civil Works Projects,” GAO-02-529T, March 15, 2006.
- ²⁰ John Frittelli, “Harbor Maintenance Trust Fund Expenditures,” RS1042, Congressional Research Service, January 10, 2011.
- ²¹ Peter Tirschwell, “Ports’ Arms Race,” *The Journal of Commerce*, April 16, 2012.
- ²² Baruch Feigenbaum, *Evaluating and Improving TIGER Grants*, Policy Brief 99 (Los Angeles: Reason Foundation, April 2012).

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- 23 Asaf Ashar, “Paying for Benefits,” *Journal of Commerce*, Jan. 23, 2011.
- 24 Shelly Sigo, “Port Miami Set to Dredge Channel for Post-Panamax Ships, with Bonds on Tap,” *The Bond Buyer*, Oct. 18, 2012.
- 25 Institute for Water Resources, “U.S. Port and Waterways Modernization: Preparing for Post-Panamax Vessels,” U.S. Army Corps of Engineers, June 12, 2012.
- 26 “Corps of Engineers Water Resources Infrastructure: Deterioration, Investment, or Divestment?” National Academy of Sciences, 2012.
- 27 John L. Mica, Letter to Co-Chairs of the Joint Select Committee on Deficit Reduction, Oct. 14, 2011.
- 28 Steve Ellis, Testimony before the Subcommittee on Water Resources and Environment, House Committee on Transportation and Infrastructure, Sept. 21, 2011.
- 29 Ibid.
- 30 Economic Development Research Group, “Failure to Act: The Economic Impact of Current Investment Trends in Airports, Inland Waterways, and Marine Ports,” American Society of Civil Engineers, October 2012.
- 31 Mark Szakonyi, “Locking in a Waterways Plan,” *Journal of Commerce*, Oct. 8, 2012.
- 32 R. G. Edmondson, “Working on WRDA,” *Journal of Commerce*, June 14, 2010.
- 33 Cameron Gordon, “The Inland Waterways: Can They Be Corporatized?” Army Corps of Engineers, June 1995.
- 34 Institute for Water Resources, “U.S. Port and Waterways Modernization.”
- 35 Randal O’Toole, *Defining Success: The Case Against Rail Transit*, Policy Analysis No. 663 (Washington, DC: Cato Institute, March 2010) Table 1.
- 36 Jon Hilkevitch, “Amtrak Passenger Train Briefly Hits 111 mph in Test Run,” *Chicago Tribune*, Oct. 19, 2012.
- 37 Robert Damuth, “The Economic Impacts and Social Benefits of the U.S. Motorcoach Industry,” Nathan Associates, December 2008 (www.buses.org/files/report08.pdf)
- 38 Joseph Schwieterman, “The Intercity Bus Rolls to Record Expansion,” Chaddick Institute for Metropolitan Development, DePaul University, Dec. 21, 2011.
- 39 Joseph Vranich, *Derailed: What Went Wrong and What to Do about America’s Passenger Trains* (New York: St. Martin’s Press, 1997) pp. 224-232.
- 40 Center for Transportation Studies, “Value Capture for Transportation Finance, Final Report,” CTS-09-185, University of Minnesota, June 2009.
- 41 *The Consequences of Reduced Federal Transportation Investment* (Washington, DC: Eno Center for Transportation and Bipartisan Policy Center, September 2012).
- 42 “2012 Ballot Initiatives Report,” American Road & Transportation Builders Association, Nov. 12, 2012.
- 43 Tom Downs, “The Best of Both Worlds in Transit,” *Atlanta Journal-Constitution*, Nov. 12, 2012.
- 44 Stephen L. Reich and Janet L. Davis, “Analysis of Contracting for Fixed Route Bus Service,” Center for Urban Transportation Research, University of South Florida, June 2011.
- 45 “Bus Rapid Transit: Projects Improve Transit Service and Can Contribute to Economic Development,” GAO-12-811, Government Accountability Office, July 2012.
- 46 Ashley Halsey III, “Burden for Rebuilding Infrastructure May Fall to States,” *The Washington Post*, Oct. 27, 2012.