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Summary

Toll roads have a long history in the United States going back to the early days of the republic. During the 18th century, most were local roads or bridges that could not be built or improved with local appropriations alone. During the tolling boom of the late 1940s and early 1950s, the prospect of toll revenues allowed states to build thousands of miles of limited-access highways much sooner than would have been the case with traditional funding. The imposition of tolls on existing federal-aid highways is restricted under federal law, and while new toll facilities have opened in several states, some of those projects have struggled financially.

The failure of federal highway user taxes and fees to provide sufficient revenues to fund the surface transportation program authorized by Congress beginning in FY2008 renewed interest in expanded toll financing. The recently passed five-year surface transportation act, the Fixing America's Surface Transportation Act (FAST Act; P.L. 114-94), made few changes in tolling policy. Nonetheless, the Congressional Budget Office (CBO) projects that annual highway revenues, mostly from motor fuels taxes, will fall an average of $20 billion short of the amount needed to sustain the current federal surface transportation program between FY2021 and FY2025. This impending shortfall could again revive congressional interest in tolling.

Congress could achieve an expansion of tolling in several ways. At one extreme, it could simply encourage tolling pilot projects on federal-aid highways, of which relatively few have been implemented to date. At the other extreme, Congress might authorize states to toll federal-aid highways as they see fit, or even require that Interstate Highway segments be converted to toll roads as they undergo reconstruction in the future, eventually turning all Interstates into toll roads.

Whatever policies Congress adopts, tolls are likely to play only a limited role in funding surface transportation projects. The costs of toll collection on many existing toll roads exceed 10% of revenues even if all tolls are collected electronically, not including the cost of toll collection infrastructure. This compares unfavorably to the cost of collecting the existing federal motor fuels taxes, estimated to be about 1% of revenues. Many roads may not have sufficient traffic willing to pay a high enough toll to cover construction, maintenance, and toll collection costs. The availability of competing non-tolled routes may allow motorists to evade tolls. In addition, political concerns often limit the ability of operators to raise toll rates.

Beyond a requirement that bridge tolls "shall be just and reasonable" and a provision limiting tolls on over-the-road buses, current federal law provides no role for the federal government in regulating toll rates or practices. A number of states offer preferential tolls for in-state residents or residents of particular localities. Some states have attempted to collect tolls at borders rather than at internal locations where more residents would be affected, and in a number of places trucking interests have complained that truck tolls are excessive compared to auto tolls. More widespread use of tolls is likely to raise questions about the extent to which tolling should be subject to federal oversight.

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Introduction

Since FY2008, federal highway user taxes and fees have been inadequate to fund the surface transportation program authorized by Congress. Although the 2015 surface transportation act addressed the revenue shortfall through FY2020 by authorizing the use of general funds for transportation purposes, the Congressional Budget Office (CBO) projects that after FY2020 the gap between dedicated surface transportation revenues and spending will average $20 billion annually.[1] The search for revenue to fill this gap may revive congressional interest in tolling as a means of financing transportation projects without federal expenditures.

Although states are free to impose tolls on roads, bridges, and tunnels that have been built and maintained without federal assistance, federal law limits the imposition of tolls on existing federal-aid highways, especially on the Interstate Highways. This report explains current federal policies governing tolling and discusses issues related to increasing the use of tolls as a source of revenue for surface transportation projects.

A Brief History of Tolling on Federal Roads

In some states, mostly in the Northeast and the mid-Atlantic region, many of today's highways were originally toll roads, often built and operated by private investors. While tolling often made it possible to build or improve roads at minimal cost to taxpayers, many of these roads failed due to overly optimistic revenue expectations, inability to attract sufficient investment to pay for improvements, competing capacity, and toll avoidance and the related cost of enforcement.[2] Over time, toll roads came to be regarded as obstacles to the free flow of commerce. When it established the forerunner of today's federal-aid highway program in 1916, Congress emphasized the principle that roads should be free. Section 1 of the Federal Aid Road Act (39 Stat. 355) provided that "all roads constructed under the provision of this Act be free from tolls of all kinds."[3]

The Oldfield Act of 1927 (44 Stat. 1398) opened the door to tolls by permitting the use of federal funds to build toll bridges as long as they were operated by the states or their political subdivisions.[4] However, the federal Bureau of Public Roads continued to oppose the use of federal funds on toll roads. Consequently, when states, mainly in the Northeast, undertook expressway construction in the decade after World War II, they built toll roads without federal aid. By January 1, 1955, there were 1,239 miles of completed "arterial toll roads" in the United States, another 1,382 miles were under construction, and 3,314 miles were being planned or

[1] Congressional Budget Office, *Projections of Highway Trust Fund Accounts Under CBO's March 2016 Baseline*, March 2016, https://www.cbo.gov/sites/default/files/51300-2016-03-HighwayTrustFund.pdf. The $20 billion figure represents the average annual gap between projected receipts from the motor fuels and other excise taxes that flow into the Highway Trust Fund (HTF) and the anticipated cost of maintaining the surface transportation program at its current "baseline" level.

[2] Joseph Austin Durrenberger, *Turnpikes: A Study of the Toll Road Movement in the Middle Atlantic States and Maryland* (Valdosta, GA: Southern Stationery and Printing Co., 1931), pp. 156-158. See also George Rodgers Taylor, *Transportation Revolution* (New York: Rinehart and Co., 1951), pp. 3-31.

[3] The provision was added without opposition. See House debate, *Congressional Record*, vol. 53, part 2 (January 19, 1916), p. 1284. Also, Senate debate, *Congressional Record*, vol. 53, part 2 (January 25, 1916), p. 1518.

[4] The authors of the legislation were concerned about private bridge monopolies. For a detailed legislative history of federal toll road policy, see Congressional Budget Office, *Toll Roads: a Review of Recent Experience; Appendix*, 1997, pp. 22-28.

studied.[5] Many of these roads were on routes of the planned Interstate system. Although the Bureau of Public Roads supported the building of new Interstate Highways as free roads, it did recommend that existing toll roads that met its engineering standards and followed the routes of proposed Interstate Highways be incorporated into the new network.[6]

The tolling prohibition was reiterated in the Federal-Aid Highway Act and Highway Revenue Act of 1956 (P.L. 84-621; 70 Stat. 374), which authorized 13 years of funding for construction of the Interstate Highway system, created the Highway Trust Fund (HTF) as the source of federal funds for state road construction, and raised tax rates on motor fuels to help fund it. The fuel and other highway taxes that were now dedicated to the HTF were seen as a close proxy for a user-payer system of financing federal-aid roads.[7] The increased flow of federal funds, heavily weighted toward the Interstate Highways, effectively stopped the development of new toll roads by the states.[8]

Thirty-five years later, the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA; P.L. 102-240) opened non-Interstate federal-aid highways to tolling, but allowed existing roads or bridges to be tolled only after being reconstructed. This effectively linked tolling to capacity additions or road improvements. Both the 1998 Transportation Equity Act for the 21st Century (TEA-21; P.L. 105-178, as amended by P.L. 105-206) and the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (P.L. 109-59; SAFETEA) allowed tolling on high-occupancy vehicle (HOV) lanes, established pilot projects for tolling of a limited number of Interstate system routes, and allowed limited use of tolls that vary according to the level of traffic, known as congestion pricing.

The Moving Ahead for Progress in the 21st Century Act (MAP-21; P.L. 112-141), enacted in 2012, reinforced the encouragement of tolls on HOV lanes and congestion pricing. It allowed new Interstate system routes or route extensions to be built as toll roads, but continued to block tolling of most existing Interstate Highway lane capacity. MAP-21 retained two pilot programs, one encouraging the use of pricing to control congestion and another allowing Interstate route segments in three states to be converted to tolling as part of their reconstruction.

The Fixing America's Surface Transportation Act (FAST Act; P.L. 114-94), enacted in December 2015, clarified that public authorities generally, as opposed to solely state agencies, may impose tolls on single-occupant vehicles using HOV lanes. It modified the TEA-21 pilot program allowing existing Interstate Highway segments in three states to be subject to tolls to finance reconstruction by providing that federal approval lapses if the selected states have not started construction within three years of approval. The law also included two provisions related to the setting of rates. One mandates that intercity buses that serve the public have the same access to toll roads and pay the same rates as public transportation buses. The other requires public authorities operating high-occupancy toll lanes (HOT lanes) on the Interstate system to consult with the metropolitan planning organizations concerning the placement and amount of tolls on the

[5] Federal Highway Administration, *America's Highways* (Washington: GPO, 1977), pp. 166-170.

[6] Bureau of Public Roads, "*Toll Roads Included in Interstate System*," press release, August 21, 1957.

[7] President Franklin D. Roosevelt envisioned building a network of interstate toll roads, in part as a jobs program, in the late 1930s. President Dwight D. Eisenhower supported the findings of the President's Advisory Committee on a National Highway Program, chaired by former General Lucius C. Clay, which recommended creation of a Federal Highway Corporation that would issue bonds to be paid off by existing gas taxes. This financing method was not well received by the chairs of the Senate Finance and House Ways and Means Committees, primarily because of the long-term dedication of the gas tax to service the bonds. Eventually, Congress settled on a gas tax increase and the pay-as-you-go funding of the 1956 act. See Federal Highway Administration, *America's Highways*, pp. 172-173.

[8] Some planned toll roads already under development in 1956 were completed.

facility. Other than these changes, the FAST Act continued the general federal government policy of not regulating toll rates.

Current Law

Table 1, below, briefly describes active federal tolling programs.

Table 1. Active Federal Tolling Programs in Title 23, *U.S. Code*

Program	Intent
Section 129 Exceptions to the Freedom from Tolls Provision (non-Interstate Highway system)	Authorizes federal participation in initial construction of a new toll road (or its extension), bridge, or tunnel; initial construction of capacity-increasing improvements and conversion of the facility to a toll facility if the ultimate number of toll-free lanes is not less than the number before the construction; reconstruction of an existing toll facility; reconstruction of a toll-free federal-aid highway and conversion to a toll facility; and preliminary studies to determine toll facility feasibility. Facility must be publicly owned or, if privately owned, under contract to a public authority.
Section 129 Exceptions to the Freedom from Tolls Provision (Interstate Highway system)	Authorizes federal participation in construction of a new toll highway, bridge, or tunnel on the Interstate system; initial construction of tolled lanes to increase the capacity of an Interstate system highway, bridge, or tunnel so long as at least the number of previously toll-free lanes on the facility remains toll-free; reconstruction, restoration, or rehabilitation of a highway on the Interstate system if the number of toll-free non-HOV lanes after construction remains not less than the number before construction; and reconstruction of a toll-free bridge or tunnel and its conversion to a toll facility.
Section 166 requirements for high-occupancy vehicle (HOV) facilities	Allows states and other public authorities to charge tolls on vehicles that do not meet the occupancy requirements for HOV use (including HOV lanes on the Interstate system). Includes speed-based performance standards that must be met for non-HOV use and sets forth waiver requirements. Metropolitan Planning Organizations for the area must be consulted on placement and amount of tolls. Over-the-road buses that serve the public must have the same access and pay the same tolls as public transportation buses.
Interstate System Reconstruction and Rehabilitation Toll Pilot Program	Allows three pilot projects in three different states for the reconstruction and conversion to a toll facility of an existing Interstate system highway. States with provisionally approved applications have three years to fully complete the application requirements and execute a toll agreement with the Federal Highway Administration (FHWA). Otherwise, the applicant must give up its reserved place in the program.
Value Pricing Pilot Program	Provides funds for local transportation programs to use pricing, including variable tolling, to manage congestion. The FAST Act authorized no funding for the program.

Source: 23 U.S.C. §§129, 166, and 301.

An important attribute of federal tolling policy is that all conversions of existing federal-aid highways, bridges, or tunnels to toll facilities require that the facility be reconstructed, restored, rehabilitated, or replaced (unless the conversion occurs under the Value Pricing Pilot Program). The decision to convert a free facility to a tolled facility must be made prior to completion of the qualifying reconstruction project. According to the Federal Highway Administration (FHWA), once physical construction is completed it is too late to make the decision to toll, unless an additional qualifying reconstruction or rehabilitation project is undertaken.

Financial Realities of Toll Roads

Whether it is built or operated by a government agency or by private investors, a toll road must have sufficient traffic willing to pay a high enough toll to cover construction, maintenance, and toll collection costs if it is to be financially successful. Most roads on the federal-aid system are not likely to pass that test. In rural areas, highways often do not have enough traffic to cover the cost of building toll-collection infrastructure and collecting tolls. While urban roads typically have more traffic, they may not be able to generate sufficient toll revenue to make the facilities self-sustaining.

Some publicly owned toll roads have been financially successful, generating sufficient revenue to pay for capital improvements and operations, and, in some cases, to contribute to the cost of other highway activities and even to public transportation activities.[9] Other public toll facilities, however, have struggled. One recent example is the 8 miles of express toll lanes built by the Maryland Transportation Authority on I-95 north of Baltimore. In the seven months following their opening in December 2014, the toll lanes produced $6 million in revenue before operating expenses, far from enough to cover the cost of financing the $1.1 billion project.[10] The state government has had to use other funds to make up the difference.

Recent federal policy has encouraged the use of tolling to attract private investment into highway and bridge construction, but a number of private toll roads have proven to be financial failures. The Pocahontas Parkway, an 8.8-mile-long toll road near Richmond, VA, that opened in 2002, has persistently been unable to service debt due to low traffic volumes; in June 2012, its private operator wrote off the entire value of its investment in a 99-year concession, and eventually transferred the lease to a new operator.[11] SH-130, a 90-mile, four-lane toll road near Austin, TX, has had much lower traffic volumes than forecast when it opened in 2012, and the Texas Department of Transportation ended up subsidizing truck tolls in an effort to help make the privately owned project viable. Despite the subsidy, in March 2016 the toll road operator, SH 130 Concession Co., and two affiliates filed for Chapter 11 bankruptcy protection.[12] Other toll roads

[9] If the public authority certifies annually that the facility is being adequately maintained, revenues may be used for any activity allowed in Title 23 U.S.C. (Highways), assuming that such use would not violate covenants on the authority's bonds. If the toll facility is subject to a public-private partnership agreement, payments required under the agreement may include payments for public transportation purposes within the corridor (23 U.S.C. (a)(3)(A)(iv)).

[10] Maryland Transportation Authority, *Comprehensive Annual Financial Report for the Fiscal Year Ended June 30, 2015*, pp. 9, 85.

[11] Transurban, "Transurban Distribution for the Six Months Ending 30 June 2012 and Pocahontas Impairment Charge," http://www.transurban.com/3A374702.pdf. The leased road remains under the ownership of the Virginia Department of Transportation.

[12] Tom Corrigan, "Texas Toll-Road Operator Files for Bankruptcy," *Wall Street Journal*, March 2, 2016, http://www.wsj.com/articles/texas-toll-road-operator-files-for-bankruptcy-1456958991. The concession is majority-owned by Spanish infrastructure firm Ferrovial's Cintra unit and minority-owned by Zachry Construction Corporation. The concession operated under a leasing agreement. The state of Texas is the owner. SH130 Concession Company, (continued...)

that have sought bankruptcy protection include the South Bay Expressway in San Diego, CA, and the Indiana Toll Road.

All of these financial failures were public-private partnerships (P3s) that were formed based, at least in part, on overly optimistic forecasts of the revenue that would be provided by tolls. Their widely publicized difficulties have made investors more cautious about projects reliant on toll revenue. In some cases, private-sector investors have conditioned their participation in P3s on "availability payments," regular payments from the sponsoring government entity to the private entity. This reduces the risk to the private entity, but leaves the public entity at risk if toll revenue falls short of expectations.[13]

Billing and Operating Costs

Using tolls to support transportation expenditures may be a comparatively inefficient form of funding because of high administrative costs. Collecting federal motor fuels taxes is estimated to cost about 1% of the amount collected.[14] The process is administratively simple, because nearly all the federal fuels taxes are collected at the terminal "rack" from only 850 registered taxpayers nationwide, rather than at a large number of retail gasoline stations. The small number of collection points also facilitates enforcement.

The administrative costs of toll collection appear to be significantly higher than the cost of fuel-tax collection. Determining the true cost of toll collection is difficult because, as noted in a 2007 report for the Transportation Research Board, some costs are not readily identified in agencies' financial reports, such as a portion of general administrative costs and pension expenses attributable to tolling. Published figures thus likely understate true collection costs. Even so, at the seven agencies examined, the study estimated that toll collection cost from 16.5% to 92.6% of the amount collected.[15]

Most toll facilities now collect a majority of their tolls from customer accounts that are debited when an electronic sensor detects a transponder in a vehicle passing beneath a gantry. In principle, the cost of operating an electronic tolling system should be much lower than the cost of manual collection, due to obvious personnel savings. However, many toll facilities continue to employ collectors to receive cash tolls. Those with no provision for collecting cash tolls normally bill drivers without transponders by mail at the address associated with the license plate on the vehicle, often at a higher rate to cover the cost of mailing the bill.

Recent financial reports from public agencies indicate that even with extensive use of electronic tolling, collecting highway tolls costs between 8% and 11% of the amount collected (see **Table 2**). The annual report of the New Hampshire turnpike system breaks out some of the costs of

(...continued)

LLC, and its affiliated debtors filed their Chapter 11 Plan of Reorganization on August 12, 2016.

[13] CRS Report R43410, *Highway and Public Transportation Infrastructure Provision Using Public-Private Partnerships (P3s)*, by (name redacted) , p. 8.

[14] National Surface Transportation Infrastructure Financing Commission, *Paying Our Way; a New Framework for Transportation Finance*, Final Report, Washington, DC, February 2009, p. 150, http://financecommission.dot.gov/. This 1% cost of collection figure has been challenged; see Daryl S. Fleming, *Dispelling the Myths: Toll and Fuel Tax Collection Costs in the 21st Century*, Reason Foundation, Culver City, CA, November 2012, http://reason.org/files/dispelling_toll_and_gas_tax_collection_myths.pdf.

[15] Transportation Research Board, National Cooperative Highway Research Program, *Costs of Alternative Revenue-generation Systems*, NCHRP Report 689, Washington, DC, 2011, pp. 70-74, http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_689.pdf.

electronic tolling in detail, including bank and credit card fees (2.7% of revenue collected from the electronic system), fees paid to process electronic transactions (7.3%), and the in-vehicle transponders furnished to drivers (0.7%). The agency's total operating costs for electronic tolling in FY2015, not including enforcement costs and depreciation of the electronic tolling infrastructure, were 10.6% of revenues collected electronically.[16]

Table 2. Toll Collection Revenues and Costs

Facility	Costs	Revenues	Cost as % of Toll Revenues
407 International, Inc. Toronto (all electronic) C$=Canadian dollars	C$108,000,000	C$982,300,000	10.9%
New Hampshire Turnpike (electronic collection/costs only)	$9,310,000	$87,236,000	10.6%
New Jersey Turnpike Authority (81.2% E-ZPass usage rate, 2014)	$168,080,000	$1,445,748,000	11.2%
Kansas Turnpike Authority	$9,993,839	$100,324,558	10.0%
Oklahoma Turnpike Authority[a]	$18,201,278	$256,050,594	7.1%
Maine Turnpike Authority	$12,295,755	$128,199,732	9.6%

Source: *407 International, Inc. Consolidated Financial Statements,* December 31, 2015; New Hampshire Turnpike System, *Annual Report*, *fiscal year ending June 30, 2015*, p. 19; *New Jersey Turnpike Authority Financial Statements*, December 31, 2014, pp. 11-12; Kansas Turnpike Authority, *Annual Report 2015*, p. 6; Oklahoma Turnpike Authority, *Comprehensive Annual Financial Report, December 31, 2015*, pp. 16, 29; Maine Turnpike Authority, *Maine Turnpike Authority Financial Report*, December 2015, p. 2.

Notes: New Hampshire Turnpike revenue figure includes E-ZPass and transponder revenues only, and cost figure includes only bank and credit card fees, E-ZPass processing fees, and transponder expense. The electronic tolling share of personnel benefits (such as pension contributions), enforcement, and equipment and repair costs is not separated in the accounting and has not been counted as toll collection costs.

a. Oklahoma Turnpike Authority also incurred $14,444,832 in PIKEPASS customer service costs that are not reflected in **Table 2**. If these costs are included, collection costs are 12.7% of toll revenues.

Tolling and Highway Funding

Highway toll revenue nationwide came to $14.35 billion in FY2014, according to FHWA. While the amount of toll revenue has grown significantly in recent years, toll revenue as a share of total spending on highways has been relatively steady for more than half a century, in the range of roughly 5% to 6%.[17] On average, facility owners collected $2.36 million per mile of toll road or bridge in FY2014, but revenue per mile varies greatly among toll facilities.[18] All revenue from tolls flows to the state or local agencies or private entities that operate tolled facilities; the federal

[16] State of New Hampshire Department of Transportation Turnpike System, *Annual Financial Report For the Fiscal Year Ended June 30, 2015*, pp. 19, 36, https://www.nh.gov/dot/org/operations/turnpikes/documents/DOTTPKESAnnualReport20160113FinalSigned.pdf.

[17] Federal Highway Administration, *Highway Statistics: Summary to 1975*, Table HF-211, 1977, pp. 107-136. Also *Highway Statistics: Summary to 1995*, Table SF-210, and *Highway Statistics*, various years, Tables SF-21, HF-10, and HF-10a. Also "Figure 6-6: Toll Facility Revenue: 1993-2008," *Our Nation's Highways: 2010*, http://www.fhwa.dot.gov/policyinformation/pubs/pl10023/fig6_6.cfm.

[18] Federal Highway Administration, *Funding for Highways and Disposition of Highway-User Revenues, All Units of Government, 2014*, Table HF-10, March 2016.

government does not collect any revenue from tolls. However, a major expansion of tolling might reduce the need for federal expenditures on roads.

There are three possible means of increasing revenue from tolling:

- **Increase the extent of toll roads.** FHWA statistics identify 6,088 tolled miles of roads, bridges, and tunnels as of January 1, 2015,[19] a net increase of 1,367 miles, or 29%, over 1990.[20] These figures indicate that the extent of toll roads has been growing by 54.7 miles per year, on average, adjusting for the fact that some previously tolled roads have become toll-free. Toll-road mileage comprises only 0.6% of the 1,016,964 miles of public roads eligible for federal highway aid.[21] While there may be many existing roads on which tolling would be financially feasible, proposals to place tolls on existing roads have encountered strong opposition in several states, including Missouri, North Carolina, Texas, and Virginia. The vast majority of mileage on the federal-aid system probably has too little traffic to make toll collection economically viable.
- **Increase toll-road usage.** In the aftermath of the recession that began in 2007, the number of vehicle miles traveled in the United States fell below pre-recession levels until 2014. In 2015, vehicle miles traveled increased by 3.5% over 2014.[22] Despite this recent growth in travel, demographic trends and social changes, such as the increased popularity of center-city living among young people, suggest that personal motor vehicle use may grow more slowly in future years than it did in 2015. If that proves to be the case, higher traffic volume may contribute little to increased toll revenues in the long run.
- **Increase the average toll per mile.** Toll rates are often significant political issues at the state and local levels, especially when toll revenue is used for purposes other than building and maintaining the toll facility. Trucking interests frequently raise opposition to rate changes that increase truck tolls relative to automobile tolls. On publicly owned facilities, political concerns may lead to toll reductions, as occurred on bridges operated by the Delaware River Port Authority and the Maryland Transportation Authority in 2015. Where roads are operated by private concessionaires, the operators' contracts with state governments typically specify the maximum rate at which tolls can rise. Additionally, large increases can encourage motorists to use competing non-tolled routes.

These factors suggest that imposing tolls on individual transportation facilities is likely to be of only limited use in helping states overcome reductions in federal grants should Congress deal with the shortfall in motor fuels tax revenue by reducing the size of the federal surface

[19] Federal Highway Administration, *Toll Facilities of the United States: Toll Mileage Trends 2003-2013*, "FHWA-PL-11-032," July 2013, http://www.fhwa.dot.gov/policyinformation/tollpage/miletrends.cfm. The 6,088 miles of toll roads, bridges, and tunnels compare with the total federal-aid highway eligible road length of 1,001,874 miles (0.6%) and total National Highway System mileage of 222,946 or (2.7%).

[20] Federal Highway Administration, *Toll Facilities in the United States: Bridges-Roads-Tunnels-Ferries*, "Publication No: FHWA-PL-91-009," 1991, p. v.

[21] Federal Highway Administration, *Public Road Length-2014: Miles by functional System and Federal-Aid Highways, National Summary*, Table HM-18, Washington, DC, October 2015, https://www.fhwa.dot.gov/policyinformation/statistics/2014/hm18.cfm.

[22] Federal Highway Administration data obtained from Federal Reserve Bank of St. Louis, https://research.stlouisfed.org/fred2/series/TRFVOLUSM227NFWA. See also http://www.fhwa.dot.gov/policyinformation/travel_monitoring/15dectvt/page2.cfm.

transportation program. Further, some states, particularly those with low population densities, may have few or no facilities suitable for tolling. Tolls may be an effective way of financing specific facilities, especially major roads, bridges, or tunnels that are likely to be used heavily and are located such that the tolls are difficult to evade, but they seem likely to be less effective in providing broad financial support for surface transportation programs.

Tolling the Interstate Highway System

One way of estimating the revenue that could be raised by tolling the Interstate Highways is to assume that the public would pay the same average annual amount per mile, $2.35 million, as is raised on existing U.S. toll roads and bridges. In this case, tolling all Interstate Highways would be expected to raise roughly $112 billion per year.[23] Of this, approximately $8 billion is already captured by existing toll facilities, leaving around $104 billion of new revenue. This would be more than enough to maintain and operate the proposed toll network. However, it is doubtful that this average could be supported over the entire length of the Interstate system. This is because a large proportion of current toll revenue is collected on heavily traveled roads and bridges in urban areas. The rural Interstates that account for a majority of Interstate Highway mileage carry far less traffic, and may be unable to produce so much revenue per mile. In addition, excessively high tolls could lead users to seek alternative routes. In cases where an Interstate carries little traffic, the costs of building and maintaining the toll collection system might be large relative to the revenue that could be realized.

One option for expanding tolling on the Interstates would be for Congress to require tolling only as Interstate system roads and bridges are rebuilt with federal assistance. As many of these roads are not in need of near-term reconstruction, the evolving Interstate system toll network would expand over time. The corresponding reduction in federal-aid highway program spending would also be gradual. To accelerate the conversion, bonds might be issued to fund construction costs up-front, with toll revenues from the newly rebuilt facilities then used to pay for the interest and bond retirement costs.

A less ambitious alternative would be to convert only the urban Interstates. Approximately 8.4% of the roughly 18,500 miles of urban Interstate Highways are tolled already, leaving over 17,000 miles of road available for conversion to toll roads. Assuming tolls would be imposed at rates that generate the current average of $2.35 million per mile, tolling the currently free urban Interstates might produce nearly $40 billion in annual revenue, nearly as much as the highway account of the HTF now receives from motor fuels taxes. However, it is doubtful that such a large sum could be realized once operating and collection costs are covered. Also, it is likely that some urban Interstate Highways will not generate sufficient revenues to pay for all their costs. There could, again, be concerns about cross-subsidization if tolls paid on urban roads were used to build and maintain toll-free roads elsewhere.

In recent years, federal funds obligated for projects on the 47,662-mile-long Interstate system have accounted for 27% to 32% of total annual federal-aid highway obligations, or about $11 billion to $12 billion annually (in 2014 dollars).[24] Hypothetically, if all Interstate Highways could be instantly converted to a self-sustaining toll network and received no further federal funding,

[23] Federal Highway Administration, Table HF-10 toll revenues from all units of government and "Toll Mileage Trends: 2005-2015," in *Toll Facilities of the United States.* In 2015, 3,419 miles of Interstate Highways and bridges were tolled.

[24] Federal Highway Administration, *Highway Statistics: Table FA-4c*, Washington, DC, various years, http://www.fhwa.dot.gov/policyinformation/statistics.cfm. The FY2010 figure included some stimulus funding.

expenditures under the remaining federal-aid highway program would fall from an average of about $42 billion per year to around $30 billion. This would bring federal highway program spending more in line with motor fuels tax revenues.[25] This assumes, however, that tolls could be set high enough to support all the physical infrastructure and operating costs of such a massive toll network, and also that drivers continued to pay federal motor fuels taxes for fuel used while driving on toll roads that do not receive federal funds.

Costs of establishing tolling across the Interstate system are likely to be great. States would need to construct gantries above roads and entrance and exit ramps at thousands of locations to hold toll-collection equipment and cameras to identify toll violators, in addition to building communications infrastructure. If tolling were introduced in conjunction with reconstruction of Interstate Highway segments, estimates of the road building costs involved range from $1 trillion to $3 trillion.[26] The use of bond financing would add interest expense.

However Congress chooses to proceed, the conversion of a significant portion of the Interstate Highway system from free roads to toll roads would take a number of years. Studies would need to be conducted to identify the best locations to collect tolls, equipment would have to be ordered, and physical infrastructure such as road-spanning gantries and communications structures would need to be designed and constructed. Increased use of tolling would therefore be unlikely to have a significant impact on the need for taxpayer funding over a 5- or 10-year time frame.

Increased Use of Tolling to Encourage Innovative Finance

The revenue stream provided by tolling can be used to support highway projects that rely on debt finance and private equity investment, both of which have long histories in toll road construction. In recent years, Congress has encouraged the use of innovative financing mechanisms such as public-private partnerships (P3s), which may use toll revenues in several ways.

- Toll revenues can be used to service municipal bonds that state and local agencies have issued to pay for highway projects. The federal government supports this spending by providing a tax exclusion of the interest paid on the bonds. The tax exclusion results in a loss of revenue to the federal government. Private activity bonds, in which a state or local government acts as a financial conduit for a business or individual (such as a P3), can also be serviced with toll revenues.
- The Transportation Infrastructure Finance and Innovation Act (TIFIA) provides federal credit assistance, including loans, to leverage nonfederal funding, which may include investment from the private sector. Under the FAST Act, TIFIA is authorized to spend $1.44 billion over five years to cover the federal government's cost of providing the subsidized credit. Each $1 of budget authority can support approximately $10 in loans. TIFIA requires that each proposed project have a dedicated revenue stream to repay the loan. For highway projects, toll revenues are the most commonly proposed revenue source.

[25] Congressional Budget Office, *Projections of Highway Trust Fund Accounts Under CBO's March 2016 Baseline.*

[26] Alan E. Pisarski and Kevin E. Heanue, *Future Options for the National System of Interstate and Defense Highways: Task 10 Final Report*, Transportation Research Board (Washington, DC), NCHRP Project 20-24 (52), p. 13, 21. http://onlinepubs.trb.org/onlinepubs/trbnet/acl/NCHRP_20-24_52task10_NCHRPFinal.pdf; Edward Regan and Steven Brown, "Building the case for Tolling the Interstates," *Tollways*, spring 2011, http://ibtta.org/sites/default/files/documents/Advocacy/Key%20Studies/Regan—ase%20for%20Interstate%20Tolling.pdf.

- Toll revenues could also support loans for highways and bridges provided from a National Infrastructure Bank, should one be established. The creation of a well-funded National Infrastructure Bank could thus lead to an expansion of toll roads.[27]

Any expansion of tolling due to increased use of innovative financing for highway construction, maintenance, and operation would occur over an extended period of time. In any event, toll-supported innovative financing is likely to provide only a small proportion of highway spending needs unless Congress requires its use in large-scale reconstruction of Interstate Highways.[28]

Tolling Policy Issues

How Could an Interstate System Conversion Be Accomplished?

The current federal-aid highway program is essentially a state-run federal grant program, and states have ownership of the federal-aid highways within their borders. Any immediate conversion of highways to toll roads would necessarily be at individual states' discretion, with federal participation limited to technical assistance and a suggested conversion schedule. This would likely lead to a piecemeal outcome, as some states might convert quickly, some slowly, and some not at all.[29]

Congress could insist on a much stronger federal role by making the provision of federal highway grants to a state contingent on the state implementing a program of converting Interstate Highways to toll roads. FHWA might then take the lead in determining the sequence of reconstruction and conversion of Interstate Highways. This paradigm would have the advantage of assuring that all states would begin imposing tolls at roughly the same time, and federal leadership would likely not allow the outbreak of "toll wars" among the states, whereby states attempt to impose toll rates in a way that shifts the burden of the toll to their neighbors or interstate travelers generally. Under federal oversight, the operation of the converted highways might still be under the auspices of the states, which could operate them directly, through a toll authority, or perhaps under contract to a private operator.

Whether or not implementation of tolls were linked to reconstruction of existing roads, creation of tolling systems would require up-front investments in gantries, equipment to read transponders in vehicles, communications infrastructure, software to process toll payments, and enforcement. This would have to be done before the tolls are collected.

How Would Tolls Be Regulated?

Under current law, FHWA approval is needed for initial implementation of tolls on roads and bridges that have received federal aid, but the federal government has no jurisdiction over toll

[27] CRS Report R43308, *Infrastructure Banks and Debt Finance to Support Surface Transportation Investment*, by (name redacted) and (name redacted) .

[28] CRS Report R43410, *Highway and Public Transportation Infrastructure Provision Using Public-Private Partnerships (P3s)*, by (name redacted) , p. 15.

[29] Although one could argue that legislation requiring the conversion of Interstate Highways to toll facilities could be justified as an exercise of Congress's interstate commerce power, such legislation may give rise to other legal concerns. Analysis of these concerns may change greatly based upon a proposal's specific text and is outside the scope of this report.

rates. The Surface Transportation and Uniform Relocation Assistance Act of 1987 (P.L. 100-17; H.Rept. 100-27) requires only that bridge tolls "shall be just and reasonable."

More widespread use of tolls is likely to raise significant questions about equity. These might arise in a variety of contexts. Motorists from states with comparatively low tolls might find it unfair that other states charge comparatively high tolls. Some existing facilities offer preferential toll rates to residents of particular jurisdictions; if that practice were to become widespread, it could burden interstate travel and commerce. States may be tempted to collect tolls at state borders rather than at internal locations where more residents would be affected, effectively taxing interstate travel at higher rates than in-state travel and in some cases putting out-of-state companies at a competitive disadvantage against local companies.

Truck tolls are invariably higher than auto tolls, sometimes much higher: crossing the George Washington Bridge from New Jersey to New York at an off-peak hour costs $10.50 for a car with an electronic transponder, but $68.00 for a standard tractor-trailer rig. Trucking interests generally oppose additional tolling, largely out of concern that political considerations will make it easier to raise tolls on trucks than on cars; they generally prefer higher fuel taxes whose revenues are dedicated to highway improvement.[30] One reason for the preference for fuel taxes is that studies have concluded that funding highways with motor fuels taxes provides trucks a cross-subsidy from automobile users' gas tax payments.[31]

Proposals for a major expansion of tolling of federal-aid highways are likely to lead to discussion of a federal role in rate-setting. The FAST Act involved the federal government in toll rates for the first time, mandating that intercity buses serving the public have the same access to and pay the same rates as public transportation buses, and requiring public authorities operating high-occupancy toll lanes on the Interstate system to consult with affected metropolitan planning organizations on the placement and amount of tolls. Deeper federal involvement might include a federal framework of regulatory standards or a more precise definition of the requirement in current law that tolls be "just and reasonable," along with provision for the enforcement of that requirement. In such a case, Congress would need to clarify which federal agency would be responsible for enforcing tolling regulations and overseeing toll rates.

Will Tolling Increase Transportation Spending?

Proponents often advocate tolling as a means of increasing total spending on surface transportation infrastructure. It is possible, however, that any increase in toll revenue could be offset by declining spending on surface transportation at the local, state, and federal levels. Congress has at times sought to condition federal support for states' highway spending on "maintenance of effort" by state governments. Imposing similar requirements in conjunction with a large increase in the use of tolling would require increased federal monitoring of state and local transportation expenditures.

[30] Owner-Operator Independent Drivers Association, "Truckers urge rejection of Ohio House Bill 533 on tolling," May 8, 2014, http://www.ooida.com/MediaCenter/PressReleases/pressrelease.asp?prid=348.

[31] For the relative costs to the road network of use by different classes of vehicles, see Federal Highway Administration, Addendum to the 1997 Federal Highway Cost Allocation Study: Final Report, May 2000 (Washington, 2000), http://www.fhwa.dot.gov/policy/hcas/addendum.htm.

Toll Credits

An existing federal program, the toll credit program, has for many years allowed states to count expenditures of toll revenues on capital investments serving interstate travel as part of a state's required match for federal highway grants.[32] Although the statute states that the credit "shall not reduce nor replace State funds required to match Federal funds for any program under this title," some states have come to rely heavily on toll credits to meet their matching share requirements. A major expansion of Interstate Highway tolling could also expand the use of toll credits nationwide. This raises the possibility that states could provide less taxpayer funding for their matching shares of federal formula grants, unless other changes are made in the law.

Mileage-Based Road User Charges as an Alternative to Tolls

A mileage-based road user charge would be a toll-like charge on each mile driven. It has been advanced as an alternative to the federal and state motor fuels taxes that now support highway spending. As generally proposed, a mileage-based charge would be imposed for the use of any road within a state or nationwide, whereas tolls are imposed only on specific highway segments.

Most existing highway tolls are based on weight and distance traveled, and road user charges could be structured in a similar manner. Both electronic tolls and mileage-based road user charges could be used to implement congestion pricing, in which drivers are charged more for using a road at a busy time. However, a number of widely criticized aspects of mileage-based charges, such as the difficulty of accommodating drivers who lack credit card accounts to which the charges could be billed and concerns that the vehicle tracking system would invade drivers' privacy, have generally been less prominent in discussions of tolling.[33]

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[32] See 23 U.S.C. §120 (A). In general, states must pay 20% of the cost of highway projects built with federal funds distributed by formula, except that the required match is 10% for Interstate Highway projects. There are certain types of projects that do not require a state match.

[33] CRS Report R44540, *Mileage-Based Road User Charges*, by (name redacted) and (name redacted)