



Toll Truckways: Suggested Locations for Pilot Projects

By Robert W. Poole, Jr. and Peter Samuel

INTRODUCTION

America's highly productive economy is critically dependent on efficient goods movement. Trucks deliver 90 percent of the value of U.S. freight every year. Today 75 percent of road freight ton-miles and more than half the value of truck shipping crosses state lines. This dominance of trucking is the result of the streamlining of the railroad system, the dispersal of industry to spread-out locations, and the revolution in logistics that minimizes inventory build-up and relies on just-in-time delivery.

But while trucking will remain the key player in 21st century goods movement, it suffers from four significant problems.

Inadequate Highway Infrastructure. Over the 20 years from 1980 to 2000, vehicle miles traveled (VMT) on the U.S. highway system grew by 80 percent,

while lane-miles increased by only 4 percent. Truck VMT has grown even faster than automobile VMT, and is projected to keep doing so through 2020.

Growing Congestion on Interstates. Federal highway data show that in 2001, some 3,084 route-miles of urban Interstate were "severely congested," as were 523 route-miles of rural Interstate. An additional 2,392 route-miles of urban Interstate and 1,299 miles of rural Interstate are likely to become severely congested over the next decade or two, without extensive and expensive lane additions.

Limited Productivity Gains. Both railroads and trucking were deregulated in the 1980s, but railroad productivity has increased much more than truck productivity. In long-haul trucking, for the most part one driver still hauls one trailer, even though technology permits hauling two or three trailers. Making trucking more

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efficient would benefit the whole economy. Freight costs get built into the cost of almost everything we buy, whether imported or made in the USA.

Continued Safety Problems. While large-truck fatality rates trended steadily downward between 1980 and 2000, the rate of decrease was significantly less than for total highway fatality rates. In the year 2000 there were nearly 5,000 deaths in highway crashes involving trucks. This large death toll spurs organized opposition to expanded use of double- and triple-trailer rigs—the very trucks that hold the potential for large productivity increases in trucking.

The federal government regulates truck sizes and weights on federally aided highways. The Intermodal Surface Transportation Efficiency Act (ISTEA) froze state regulations with respect to Longer Combination Vehicles (LCVs) as of June 1, 1991. It prohibited any modifications of truck size and weight limits and prohibited extension of the highways on which LCVs were permitted to operate. Therefore, highly productive LCVs such as long doubles and triple-trailer rigs are limited to a handful of western states and several eastern turnpikes.

Two major U.S. Department of Transportation reports in the past decade called for reform of truck sizes and weights to facilitate the large savings in shipping costs that could be realized, but no implementing legislation has emerged. Public policy discussion has been dominated by simplistic arguments. On the one hand, highway safety groups and their railroad industry allies have lobbied for further restrictions on LCV operations. On the other side, the trucking industry has argued for lifting the LCV freeze to make possible increased use of LCVs in general-purpose traffic lanes. The issue has been presented as a conflict between highway safety and trucking productivity.

THE TOLL TRUCKWAYS SOLUTION

In a 2002 policy study, a Reason Foundation research team proposed a new approach to resolving the safety versus productivity dilemma: add specialized heavy-duty truck lanes on Interstate routes where LCV operations would make sense. These “truckways” would be designed to take the heavier loads of long doubles and triples, so there would be no reason for state DOT concern about pavement damage. Double- or triple-trailer rigs would not be allowed

on regular state highways in these new states. They would be made up and broken down at staging areas directly adjacent to the toll truckways at major trans-shipment points.

The new truckways would be barrier-separated from general-purpose lanes, and would have their own on-ramps and off-ramps; hence, LCVs would not be mixing with regular traffic, thereby alleviating safety concerns. And because these truckways would provide trucking companies with large gains in productivity, our quantitative analysis showed that it would be worth the companies’ while to pay tolls to gain access to this new infrastructure. Hence, the truckways could be at least partially self-supporting from toll revenues. Consequently, the report recommended that the forthcoming reauthorization of TEA-21 include provisions to facilitate the introduction of toll truckways, as defined in the Reason study.

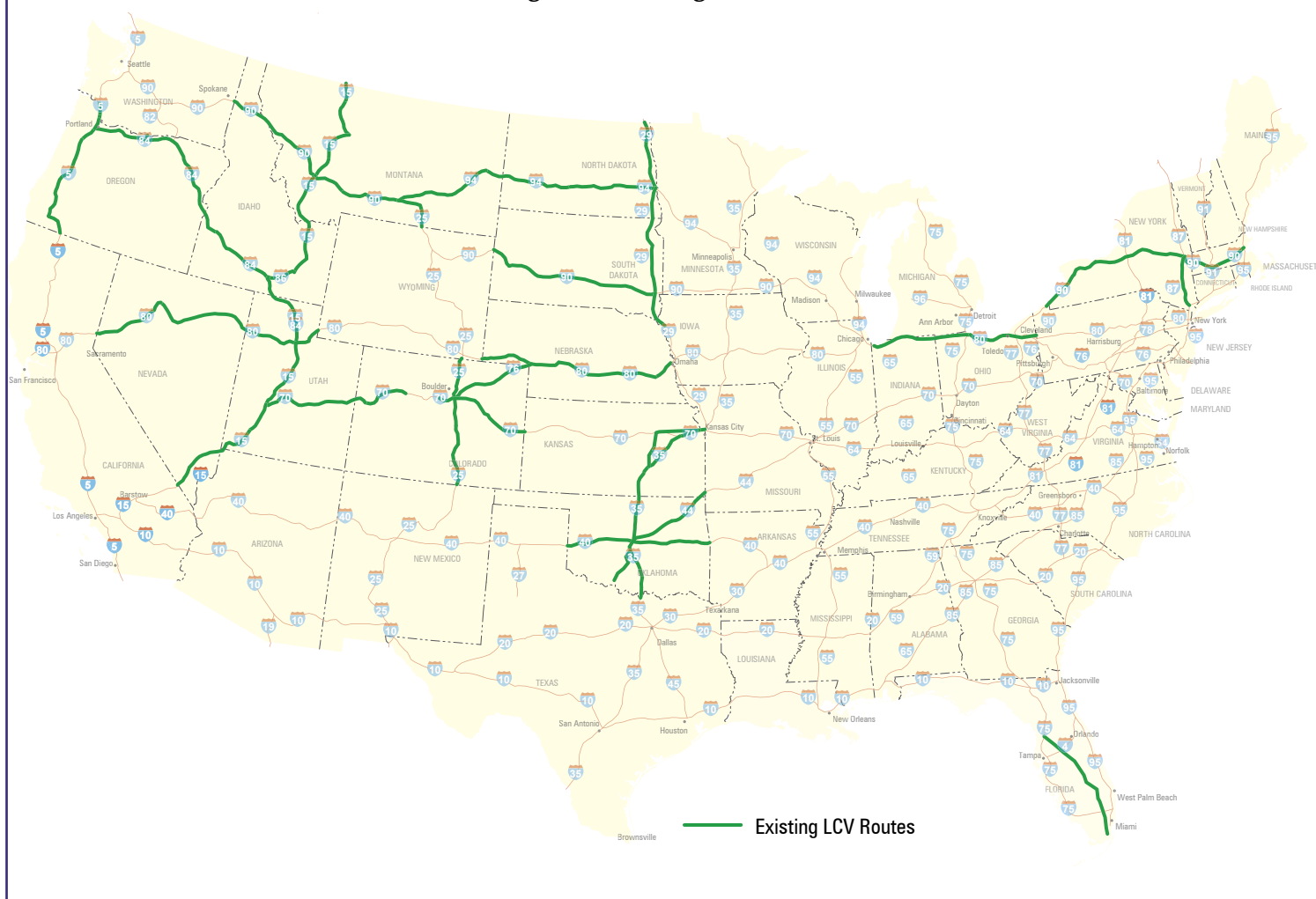
Reason’s toll truckways concept was endorsed by the National Safety Council and the American Trucking Associations, two organizations that historically have been on opposite sides on the LCV issue. It also caught the attention of Chairman Don Young of the House Transportation & Infrastructure Committee, who spoke at Reason’s news conference unveiling the study.

The first step toward realizing the potential of toll truckways would be to initiate pilot projects to test the predictions made in the Reason study. Assuming that the pilot projects were successful, the initial legislative authority could subsequently be mainstreamed, allowing for the further development of a national network of toll truckways wherever justified by current and future truck traffic. Thus, the purpose of the new report being summarized here was to identify the most promising Interstate corridors for such pilot toll truckways.

Obtaining Market Data. The most important value-driver for toll truckways is the productivity increase brought about when companies haul several times as much freight per truck. Because the 1991 freeze stopped the evolutionary development of trucking routes using long doubles and triples, what exists today is not a network of LCV routes but a set of fragments. Figure 1 shows the current Interstate routes where such rigs are allowed to operate.

To obtain information on potential demand, we contacted trucking companies that already operate long doubles and/or triples (in states where they are allowed) and asked them which new corridors would be of greatest importance

Figure 1: Existing LCV Routes



to their operations. We specifically told them that the new corridors would involve toll truckways as the means to bring about expanded LCV operations.

We contacted close to a dozen major national trucking companies and received responses from seven of them. Altogether, they suggested 17 corridors, most of which involve more than one state, and several involve more than one Interstate route. Next, the authors reviewed a map of the Interstate highway system, with the existing LCV routes of Figure 1 and the companies' proposed routes superimposed on it. Looking for remaining gaps and logical extensions to form a possible national network, we identified another 22 candidate corridors, all of which are listed in the larger report of which this is a summary. These 39 corridors formed the basis of the subsequent analysis.

SELECTION CRITERIA

Having selected a set of candidate routes, the next step was to attempt to quantify each one's suitability for a toll truckway. For purposes of this analysis, Wilbur Smith Associates provided us with a massive goods-movement database derived from the Federal Highway Administration's Freight Analysis Framework (FAF) and the longer-established Highway Performance Monitoring System (HPMS). Although the data reflect 1998 conditions, it was the only available source of consistent data for all Interstate corridors. This database was the primary source for our analysis, supplemented by data on terrain and right-of-way availability from state transportation departments.

What would make a toll truckway a successful project? In this context, success ultimately means that it would



attract enough trucking customers to pay for itself. That would mean both a high volume of truck traffic, especially LCV traffic, and relatively low construction costs. In other words, our selection criteria relate primarily to the financial feasibility of a toll truckway project. Would a proposed truckway corridor generate relatively more revenue than other corridors, and be buildable at relatively low cost compared with others? A corridor that meets these criteria is more likely to be financially feasible than one that does not.

REVENUE CRITERIA

Truck volume. The database provided several measures of truck volume, both “current” (actually 1998) and projected for the year 2020. We judged that the most useful of these was projected truck volume in 2020. It is gross truck volume that potentially generates toll revenues. To reduce the number of possible corridors to a more manageable number, we selected all those whose gross rural truck volume in 2020 was greater than or equal to 10,000 per day over most of its length. This gave us a set of 20 candidate corridors.

Long hauls. Gross truck volume is not the end of the story, however. Some of the corridors had high truck volume over nearly all of their length, while for others some relatively shorter stretches had higher than average volumes while other stretches had much lower volumes. But the latter type of corridor would produce much lower toll revenue than ones like the former. Therefore, we added a

second measure: the fraction of all miles in the corridor with 2020 truck volume greater than 10,000.

Congestion. Another factor that may lead trucking companies to use toll truckways is high congestion in the general-purpose lanes. We used the projected average 2020 volume/capacity ratio (VCR) for the (unexpanded) rural Interstate. A high value of VCR increases the attractiveness of adding a toll truckway, since it means that without capacity enhancement, the corridor in question will be heavily congested. High

VCR also means that the state DOT will be keen to provide additional capacity, in which case toll truckway lanes will be one way for them to do so.

Connectivity. Although we expect that some non-LCV trucks will choose to use toll truckways, especially where the regular lanes are congested, the most important selling point of these truckways is their ability to handle LCVs in states where these rigs would otherwise not be allowed to operate. Interstate routes connecting to existing LCV routes would appear to be especially good candidates for toll truckways. An isolated toll truckway may still make sense to trucking companies, if it goes from a sensible origin to a sensible destination, i.e., to and from major logistics distribution points. Furthermore, a new toll truckway that bridges a gap in the LCV network would appear to be more valuable than a spur, other things equal.

Industry Input. The LCV-oriented trucking companies we surveyed proposed 17 corridors as ones that at least one of them would be interested in using, if it offered toll truckways. Hence, we gave a higher ranking to a corridor with such expressions of possible customer demand than to one without such an indication.

COST CRITERIA

Right-of-Way Availability. Reason’s 2002 toll truckways study modeled the truckways as being added to

wide, unused medians of existing Interstates. Hence, land acquisition costs were assumed to be negligible. Since only rural, long-haul routes are being considered in this exercise, that condition should apply to some of the corridors on our list. But in those cases where sufficient right of way is not already owned by a state DOT, the capital cost of developing the truckway will be higher by the amount of land acquisition costs. For the 10 corridors with the greatest potential to generate revenue, we contacted the relevant state DOTs to obtain information about right of way.

Terrain Factors. The other factor that can significantly affect the cost of a toll truckway project is the type of terrain through which it must be built. The Federal Highway Administration, in considering capital improvement costs for lane additions, divides terrain into three categories: flat, rolling, and mountainous. For the candidate corridors involved in this exercise, we also obtained a judgment from each DOT as to which type of terrain best characterized the corridor in question.

Analysis of Candidate Corridors. Our quantification procedure for revenue potential used the data on each of the 20 corridors, weighted as follows:

- 35% for gross truck volume, because the single most important factor in revenue potential is how strong of a truck route the corridor is.
- 15% for truck traffic being high all along the corridor, because long trips are significantly more likely to benefit from the toll truckway than short trips.
- 15% for extent of congestion, which we expect to be only a modest factor in most cases, in determining whether a truck will use the truckway.
- 20% for connectivity to the LCV network, since the more LCV use, the higher the revenue.
- 15% for LCV-using trucking company interest, because that's the best real indication of actual market demand.

We selected the 10 corridors that scored highest on revenue potential for further analysis, to determine which of them would be likely to have unusually high costs, based on having inadequate existing right of way and difficult terrain.

The final step in the analysis was to compare the revenue potential scores and the high-cost factors to determine the most attractive corridors. We divided the index of revenue potential by the cost index, to provide a single measure of financial attractiveness. The results are shown in Table .

Table: Highest-Scoring Candidate Corridors				
Route	Affected States	Revenue Potential Score	High-Cost Score	Revenue/Cost Ratio
I-80	Iowa-Illinois	80	103	.78
I-90	Ohio-Penn.	74	102	.73
I-15	California	63	105	.60
I-75	Ohio-Michigan	66	111	.59
I-75	Ohio to Florida	68	118	.58
I-5	California	52	101	.51
I-94	Illinois-Minn.	55	107	.51
I-65	Tenn. to Indiana	57	112	.51
I-81	Tenn. to Penn.	59	116	.51
I-76	Penn. Turnpike	63	145	.45

The two most attractive pilot corridors stand out starkly from the others. They would each fill a gap in the existing LCV network.

(1) I-80 from Chicago west through Iowa would make a connection between the major logistical hub in Chicago and the western Great Plains and Rocky Mountain states where LCVs already operate. This route would enable the big rigs to operate all the way from Boston and New York to as far west as Denver.

(2) I-90 between the Cleveland area and the New York state line on Lake Erie would allow the two biggest existing LCV operations in the country to be linked. These are the Midwest LCV corridor on the Indiana Toll Road and the Ohio Turnpike in the Midwest and the operations on the New York State Thruway and the Massachusetts Turnpike in the northeast.

Three corridors form the next cluster by our ranking:

(1) I-15 in California would link the major intermodal logistics center in Barstow to the existing LCV operations of the High Plains and the Rocky Mountains. Moreover, the Southern California Association of Governments plans an urban-area toll truckway that would extend from the ports of Long Beach and Los Angeles up I-15 as far as Barstow, where it would link up with the I-15 route proposed here.

(2) I-75 Toledo to Detroit is a spur off the nation's largest existing LCV operation on the Indiana Toll Road and the Ohio Turnpike that would connect these to the major manufacturing areas of Detroit and Ontario, Canada.

(3) I-75 from the Ohio Turnpike near Toledo south through Cincinnati, central Kentucky and Tennessee, and Atlanta to the northern end of Florida's Turnpike and Tampa would provide a major north-south trucking route of



high efficiency and safety.

Next we have a grouping of four corridors that score equally on our revenue/cost ranking:

(1) I-5 in the Central Valley of California is the most truck-intensive portion of this major west coast north-south artery. An I-5 Valley toll truckway has the potential to interface with proposed urban toll truckways in greater Los Angeles, such as one being considered for I-5 over the Grapevine between Los Angeles and Bakersfield.

(2) Chicago to the Twin Cities via I-94 scores well since it links two major centers and is on a relatively flat route with a lot of central median to exploit. We also scored it as a spur, due to the potential to link it with the Indiana Toll Road at its southern end.

(3) I-65 from Tennessee to Chicago is obviously strong because it links the Midwest to the South. To some extent this route provides an alternative north-south route to the slightly higher scoring I-75 route.

(4) I-81 has become the major trucking route between the hub states and the mid-Atlantic. This route would link major logistics centers in Knoxville and Harrisburg, which is the portion of I-81 with by far the heaviest truck traffic.

Finally we have the Pennsylvania Turnpike. Already an important trucking route, it connects directly with the Ohio Turnpike, where LCVs already operate, and could bring these rigs to the major trucking logistics center of Harrisburg. Although its hilly terrain gave it a high score on relative cost, it has the additional advantage of already being a toll road, and one that has recently announced a 44 percent toll increase to facilitate reconstruction.

Figure 2 shows these 10 potential pilot corridors and their relationship with existing LCV routes and the remainder of the Interstate highway system.

CONCLUSIONS AND RECOMMENDATIONS

Over the next 20 years, large segments of many Interstate highways will experience significant increases beyond the already high volume of trucks they now carry. Many of these corridors will experience significant congestion without lane additions. Yet many state transportation budgets are hard-pressed just to keep up with proper levels of maintenance and repair to prevent existing highway infrastructure from deteriorating. They may have difficulty implementing desired lane additions, unless a new source of funding comes along (such as truck tolls).

Hence, the case for going forward with toll truckways appears to be strong. A federal pilot program, permitting states to move forward with corridors such as those identified here, would permit this promising concept to be tested during the next six years.

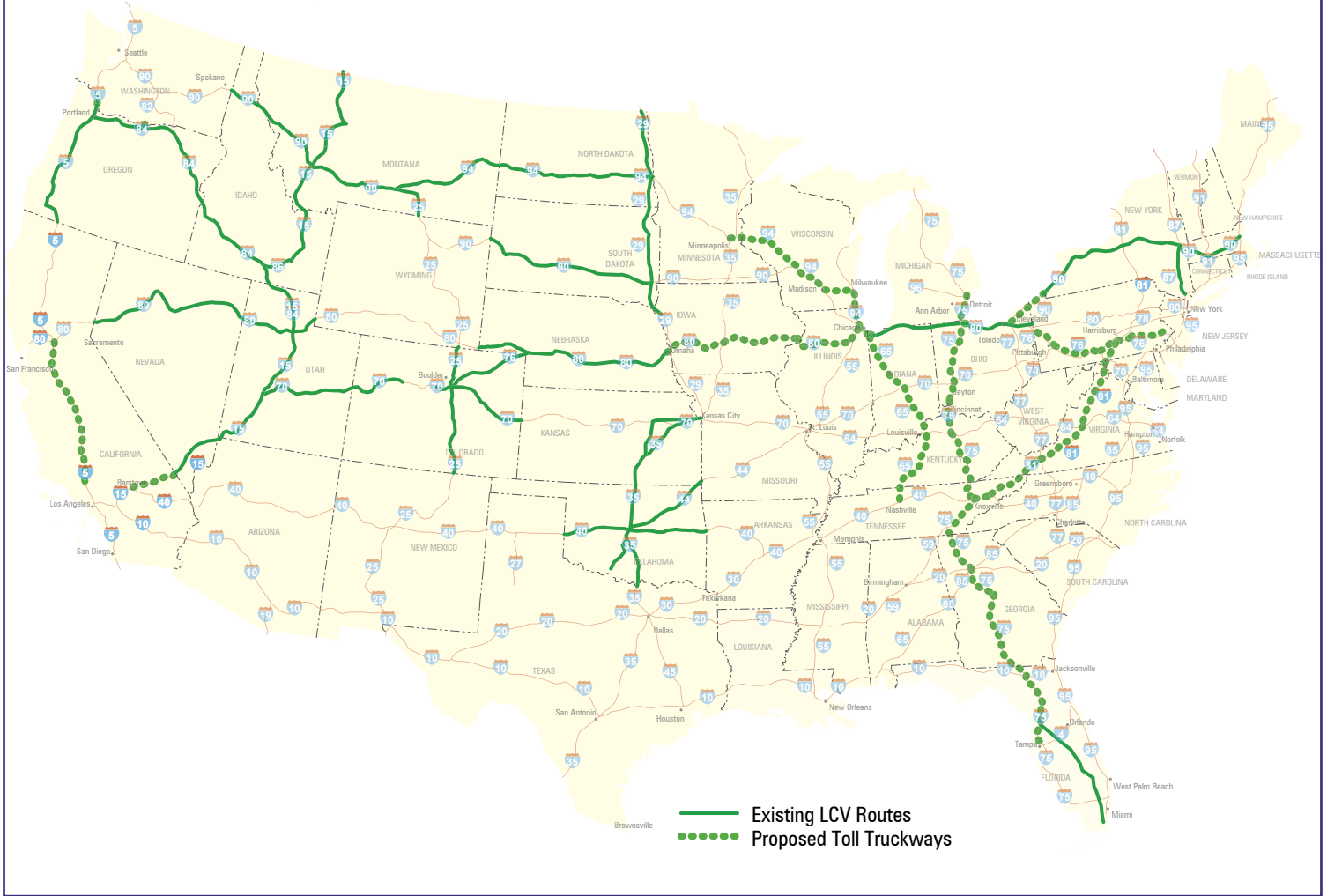
During the past year, the highway construction community has embraced the concept of tolled truck lanes, including the American Road & Transportation Builders Association and the coalition it chairs, the Transportation Construction Coalition. In addition, two existing corridor coalitions, the West Coast Corridor Coalition (I-5) and the I-10 Coalition, have seriously explored toll truck lanes in their efforts to expand freight capacity in their respective corridors.

We recommend that the pending legislation to reauthorize the federal surface transportation program include provisions to make toll truckways possible, at least on a pilot program basis. The single most important policy change needed is to permit trucks categorized as LCVs to operate on toll truckways built in states now covered by the LCV freeze. Allowing one big-rig to haul two or three trailers is what creates the economic value that makes it in the interest of trucking companies to pay tolls. Thus, the core policy change would be granting exemptions from the LCV freeze for LCVs operating solely on new toll truckways authorized by the pilot program.

Other key policy provisions include the following:

- Exemption from the current ban on the use of tolls on currently non-tolled portions of the Interstate system for the new toll truckways;
- Permission for states to use Interstate right of way for the construction of toll truckways;

Figure 2: Existing LCV Routes and Proposed Toll Truckways



- For those toll truckways projected to be fully self-supporting from tolls, an exemption from federal and state diesel fuel tax for miles driven (and electronically tolled) on toll truckways (to prevent “double taxation”).

Some other issues should clearly be left to state and local transportation policymakers. One such issue is competing uses for available right of way in the median of Interstates in or near urban areas. Some of the possible toll truckways in our analysis originate near, or bypass, large metro areas, using Interstate routes that also serve as local commuter routes. Thus, some of the “available” right of way in the median may be planned for use as high-occupancy vehicle (HOV) lanes. We take no position here on whether such right of way is better used for toll truckways, for a set of HOV lanes, or for a set of HOT lanes. That is a decision best made at the level of the state DOT and the relevant Metropolitan Planning Organization (MPO).

One other important *federal* issue is multi-state corridors. Nearly all the high-scoring corridors in our analysis involve two or more states. Planning large transportation projects in a single state is complex and time-consuming; doing so in multiple states is even more fraught with difficulties. Yet to make sense as a productivity increaser for goods movement, a toll truckway must connect a logical origin (typically a major freight logistics center) to a logical destination, irrespective of state borders. These projects cannot simply be built up to a state line (unless LCVs are already legal on the Interstates of such a neighboring state).

Thus, the pilot program legislation needs to include a mechanism to facilitate multi-state corridor planning and development mechanisms. One possible mechanism is the Intergovernmental Agreement (IGA), which many states authorize and which some (such as Texas) specifically authorize to be created with neighboring states. The Admin-



istration's SAFETEA bill includes a useful provision, Sec. 1806, Multi-State Corridor Planning Program, under which FHWA would encourage state DOTs and MPOs to plan and develop multi-state corridors, by making available planning grants for this purpose. The language suggests that priority be given to projects that increase freight productivity. It would be useful to amend this language to explicitly include planning grants for toll truckway multi-state corridors, formed as IGAs. Such IGAs would have the authority to initiate and serve as the lead agency for multi-state toll truckway pilot projects. They would provide a single point of contact for those who might compete for the authorization to finance, build, and operate such projects.

ABOUT THE AUTHORS

Robert W. Poole, Jr. is Director of Transportation Studies at the Reason Public Policy Institute. He received B.S. and M.S. degrees in engineering from MIT and worked in aerospace and for several consulting firms before launching Reason Foundation in 1978. He has advised the U.S., California, and Florida Departments of Transportation as well as the Reagan, Bush, Clinton, and Bush White Houses on transportation policy issues.

Peter Samuel received his B.Comm. (Honors) majoring in economics from the University of Melbourne, Australia, where he also studied city planning. He taught economics at Monash University, then moved into journalism with the *Canberra Times* and later with the news-weekly, *The Bulletin*. Based in the United States since 1980, he founded and edited *Toll Roads Newsletter*, now replaced by the comprehensive Web site, www.tollroadnews.com. ■



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