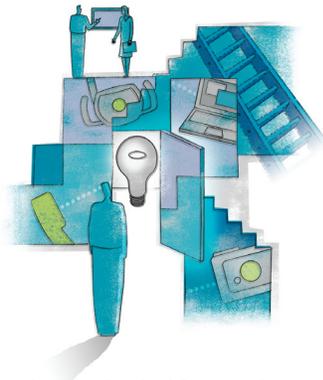


# America's Traffic Congestion Problem: A Proposal for Nationwide Reform



IN THE UNITED STATES, THE FIRST COUNTRY TO PRODUCE CARS FOR MASS CONSUMPTION, we have long valued the freedom to drive wherever we want, whenever we want. But we have reached the point where the traffic we generate is creating too many costs for society as a whole. In 2005, drivers lost an estimated 4.2 billion hours in delays on congested roads. The average peak-period driver nationwide was stuck in traffic for an aggravating thirty-eight hours—more than a day and a half over the course of one year. Beyond the personal cost, that lost time hurts individuals and society through decreased productivity.

In a new discussion paper for The Hamilton Project, David Lewis, chief economist of HDR Corporation, addresses the unsustainable increase in traffic congestion. Taking advantage of modern technology, Lewis would charge drivers to use the nation's most congested roadways at the most congested hours, leading to a reduction in traffic and improvements in safety and efficiency. A portion of the revenues from the tolls would fund a locally designed Progressive Refundable Mobility Tax Credit (PRMT) in order to compensate low- and middle-income individuals that are most burdened, economically, by congestion pricing. The rest of the revenue would be invested in improving the system of both roadways and mass transit. Because Lewis' proposal would put a value on roads, funds for investment would be better directed. High toll prices would signal which roadways are in greatest demand, promoting smarter investment in transportation by making it easier to determine where new or improved infrastructure should be built.

## THE CHALLENGE

Traffic congestion is a serious and worsening problem around the country. The number of urban areas where rush-hour drivers spent an average of more than twenty hours a year in traffic delays soared from five to sixty between 1982 and 2005. In Los Angeles, the congestion capital of the country, the average peak-period driver lost seventy-two hours—three full days—in 2005. If current trends persist, much of urban America could graduate to Los Angeles-style gridlock: as many as eleven cities could reach or exceed today's Los Angeles traffic levels before 2030.

Congestion is not limited to a small part of the expansive highway system. Traffic on more than half the miles of interstate highway exceeds 70 percent of capacity, and nearly one-quarter of the miles are strained at more than 95 percent of capacity. And congestion is not limited to highways: of all other urban roadways, 14 percent operate at more than 70 percent of capacity and 5 percent exceed the 95 percent threshold.

Much public attention has been focused on the strain that increased traffic puts on the nation's physical infrastructure and the lack of revenue to deal with those demands. The Highway Trust Fund that pays the federal share of highway construction and maintenance costs is funded by gasoline taxes. The gasoline tax (18.4 cents a gallon for the federal government and an average of an additional 21.4 cents for the states) has been increasingly unable to meet rising infrastructure investment costs as tax rates keep falling in real terms. Unless there is a sharp increase in gasoline tax rates, the Highway Trust Fund is projected to run out of money by the end of 2009.

Lewis, however, asserts that the discussion of gasoline tax rates and revenue shortages misses a fundamental issue. America needs not just more, but also smarter investment in transportation infrastructure—and more efficient use of that infrastructure. It needs the right amount of investment, allocated to either mass

transit or roadways, in the right locations: cities, suburbs, or rural areas.

Lewis argues that the current outcome is a result of our way of charging—or rather, not charging—for the use of the nation's roads and bridges. Less than 1 percent of all roadways charge variable tolls designed to discourage travel at peak periods. For most goods and services in our market economy, prices reflect what they cost to produce and what people are willing to pay for them. If washing machines are selling for a low price that leaves demand for them greater than the supply, the price will go up until equilibrium is achieved. If demand is weaker than supply, the price will go down. If the price drops below the cost of production, manufacturers will quickly shift resources to goods and services that they can sell at a profit.

Transportation does not work this way. The absence of tolls distorts travelers' perceptions of the cost of various ways of getting from Point A to Point B. Consider a rush-hour automobile trip. The private costs to the driver of gasoline, and wear and tear on their car might be about \$10. External costs—including delays and accident risk to other drivers caused by the presence of one more car on the roadway, as well as the pollution from combusting fuels—are substantial. External costs are up to 30 percent greater than private costs by some estimates; in the case of this example, they would be about \$13. The driver might find the trip well worth the \$10 in private costs, but society has no vote. It has to accept the extra \$13 in external congestion, accident, and pollution costs.

## A NEW APPROACH

Many experts, confronted by an increasingly inadequate transportation system, propose that the answer is for us to build more—more roads, more bridges, and more mass transit. Lewis focuses not on how many dollars we use for building more transportation infrastructure, but rather on how to make those dollars go further by charging the public for the external congestion costs

of their driving. He would charge tolls on congested roadways that would vary by the severity of the congestion. These tolls would raise money to address the inadequate funding of our transportation infrastructure. A portion of the funds should be used to compensate low-income drivers.

The plan would not mandate that all congested roads have tolls, but it would provide strong incentives to states and localities to encourage them to start pricing congestion. The incentive would function through the current matching grants the federal government provides to states and localities for construction and repair projects. Currently, the federal government matches 75 to 90 percent of the cost. Lewis' plan would call for lower match rates for states and localities that do not use congestion pricing.

### Federal Reform

To implement the financial incentive program for congestion pricing, Lewis argues that Congress should use the 2009 reauthorization of the "SAFETEA-LU" (the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users). Specifically, Congress should establish the following:

- By 2020, a federal congestion pricing incentive program should be established for a designated category of highway projects associated with both new and existing roads. This would provide incentives—not mandates—to states wishing to adapt their own versions of congestion pricing plans.
- By 2015, the Department of Transportation should have established regulations and guidelines enabling states and localities to begin planning for 2020 implementation.
- By 2015, the IRS and DOT should have developed a model template for a refundable tax credit (the

Drivers do not pay the full cost of getting from Point A to Point B; they see only their private costs, not social costs like pollution and congestion.

PRMT) in order to compensate low-income households for the increased costs of congestion pricing.

The deadline for the implementation of the federal incentive program is set for 2020 because it will take a number of years to establish the regulatory framework, both federally and in states, and to build the physical infrastructure (such as electronic toll collection booths and toll payment devices in cars) that are needed for nationwide congestion pricing.

Lewis proposes, as a starting point, to introduce congestion pricing on all roads with congestion above a 70 percent volume-to-capacity ratio. This would cover 15.3 percent of all road mileage and 41.1 percent of all miles driven. If tolls were calculated to reflect the time delay imposed on others by each driver's additional mileage, they would depend on the level of congestion at any given period and on estimated values of people's time. Lewis estimates that such tolls would range between 10 and 40 cents per vehicle mile.

### State Reform

Although an important share of the responsibility for setting the congestion pricing agenda rests at the federal level, important action is still needed at the state and local levels before the 2020 deadline.

## Key Highlights

### Challenge

Congestion continues to increase on America's roadways, harming both our economy and our quality of life.

- **If current trends persist**, eleven cities could reach or exceed today's traffic levels in Los Angeles before 2030.
- **The Highway Trust Fund**, which pays the federal share of highway construction and maintenance costs, is projected to run out of money by the end of 2009.
- **External costs are not reflected** in an individual's decision to drive. Individuals only pay for their private costs when deciding to drive, but society pays for costs such as pollution, increased accidents, and time lost by other drivers.

### A New Approach

In order to reduce congestion and its negative effects, David Lewis proposes an incentive system that would place tolls on congested roads. He also introduces a novel way to address the regressive nature of congestion pricing. His proposal would do the following:

- **Establish a federal congestion pricing incentive program** for highway projects by lowering the matching rate available for projects on highways that do not use congestion pricing.
- **Offer federal guidance to states and localities** on the creation of a Progressive Refundable Mobility Tax Credit (PRMT) in order to compensate low-income households for the increased costs of congestion pricing.
- **Allow state and local governments** to determine the allocation of toll revenues between a PRMT and infrastructure investment.

States with legislative prohibitions against the implementation of tolls would have to remove them in order to qualify for the federal incentive program. States and localities should begin evaluating alternative congestion-pricing mechanisms and engaging the general public and stakeholder groups to explain the rationale and importance of congestion pricing. Local governments must also begin to assess how best to address the negative effects of congestion pricing on disadvantaged groups; these solutions include possible designs for a PRMT.

## Impact of Congestion Pricing

A congestion toll will provide drivers with a clear incentive to drive less frequently, at less congested times, and on less congested secondary roads. Lewis estimates this incentive program would have a major effect if all roads with congestion above a 70 percent volume-to-capacity ratio were priced as he suggests. He calculates that highway driving would fall by 10 to 16 percent. Some drivers would shift to less congested roads, while others would find alternative means of transportation, including mass transit. This reduction in driving would decrease congestion, resulting in a 7 to 10 percent increase in speed for those that continue to drive on the tolled roads.

### Social Benefits

Lewis argues that congestion pricing will have two principal and immediate positive impacts. The first is the time saved by all drivers because roads will be less congested. In addition to a drop in the average time to reach a destination, the variability of travel time will be reduced, which will mean that drivers can build less buffer time into their schedules. Valuing the average individual's time at about \$20 per hour, Lewis calculates that time savings would amount to \$4.8 billion in the first year of congestion pricing.

The second positive impact is a reduction in accidents due to the drop in congestion. Lewis estimates the social benefit from accident reduction would be \$8.9 billion in the first year, which is an even larger social gain than the time savings. This number reflects the accident costs that are not internalized by drivers and includes, most significantly, the costs imposed on other drivers and their passengers who are more likely to get into accidents the more drivers there are on the road.

### Social Costs

At times, drivers will decide not to drive at all or to drive on less convenient secondary roads or at less congested (and thus less costly) times. In these cases, the drivers are worse off because they can no longer afford to travel as freely as before. Again basing his calculation on an estimated value of an individual's time, Lewis calculates the value of this loss at \$0.7 billion in the first year. Significantly, the \$4.8 billion in time savings to all drivers from less congested roads is seven times greater than the loss imposed on the drivers who sometimes change their behavior as a result of congestion tolls.

Administering the toll collection is also costly to society. Lewis estimates that it will cost \$6.2 billion to collect the \$62.9 billion in tolls the first year. Toll collection becomes less costly in proportion to the revenue raised as the system becomes more established.

The social costs sum to \$6.9 billion, social benefits rise to \$13.7 billion, and the net social benefit is almost \$7 billion. Lewis is careful to point out that several other studies of congestion pricing have found much larger social benefits, so these numbers should be seen as conservative estimates.

### Addressing Distributional Equity

While the social benefits from congestion pricing are clearly larger than the social costs, there are many drivers for whom travel time savings are worth less

This proposal would cause highway driving to fall 10 to 16 percent, resulting in a 7 to 10 percent increase in highway speed for those remaining on the road.

than the costs of tolls, and still others who cannot afford the tolls at all. As with any charge that does not vary across income groups, congestion tolling has the greatest proportionate impact on lower-income individuals. Without considering the value of time savings or time losses for people who change their driving behavior, Lewis calculates that those with incomes between \$10,000 and \$15,000 would pay 5 percent of their income in tolls, whereas those with incomes of more than \$100,000 would pay less than 2 percent of their income in tolls.

As a way to address the regressive impact of congestion pricing, Lewis' proposal requires that a portion of the revenues be used to compensate low-income households that would suffer from the increased tolls. He proposes that the federal government develop guidelines for a PRMT implemented at the local level. In addition to developing guidelines for the credit, the federal government would also lend technical assistance to help states and localities determine the effect of congestion pricing on local residents. After a local government estimates how much the average household with income below the poverty line will pay in tolls it can determine the size of the appropriate PRMT credit. Eligibility for the credit could depend either on income thresholds alone or on a combination of income and ability to travel without paying tolls. For example, those who

A portion of the revenues would be used to compensate low-income households that would be hit hardest by the increased tolls.

live and work near public transit might be ineligible for the credit.

Lewis notes that a PRMT is a better way to compensate individuals than exempting groups from the tolls. That option would subvert the purpose of the tolls by taking away the disincentive to drive during congested times. Discounted toll rates, however, could be offered. All the same, reimbursing a larger group than toll users, such as all low-income individuals, through a mechanism like the PRMT is probably a fairer and more effective way to take the sting out of the tolls. Less affluent people who decide to find alternative routes to avoid tolls are no less harmed than those who decide to pay the tolls and who then must cut back on other spending.

Funding a PRMT should not use up all the toll revenue. On a national level, fully compensating all households with incomes lower than \$40,000 would only cost \$41 billion. In the first year, toll revenues would be \$63 billion; they are projected to reach \$110 billion within twenty years. The remainder of the toll revenue should be spent on investment in transit and roadways. Lewis' proposal would allow local governments to determine the allocation of toll revenues between infrastructure investment and a PRMT.

## Questions and Concerns

There are a number of misconceptions about congestion pricing, some of which have contributed to resistance in implementing it. Here are the answers to several questions that are commonly raised:

### **Isn't congestion pricing the equivalent of double taxation since people already pay gasoline taxes?**

No. Gasoline taxes do not cover the external costs of driving, so people are currently underpaying for their use of roads and highways. Gasoline taxes do not even cover the full cost of current highway spending to maintain roads and build new ones to meet demand. Gasoline taxes are also not meant to account for the costs that one individual's driving imposes on all other drivers and members of society, including increased congestion, accidents, and pollution. Congestion charges make drivers pay for one of those social costs—the increased congestion—and by doing so align individuals' incentives with what is in the best interest of society. Tolls are technically a user fee that covers the costs associated with alleviating delays from overcrowded highways.

### **Is there technology available to implement congestion pricing?**

Congestion pricing has been made feasible by transponders—pocket-sized radio transmitters mounted on windshields that communicate with toll-receiving devices in the roads and allow fees to be subtracted from the drivers' accounts with no need to stop and pay at tollbooths. An example is the popular E-ZPass electronic toll collection system used in thirteen states in the northeastern United States. Southern California's Riverside Freeway (SR-91) also demonstrates the use of transponders. The SR-91 express lanes facility, opened in 1988, is a four-lane, ten-mile toll road in the freeway median from Riverside County's border with Orange County to the Costa Mesa Freeway. One-way tolls range from \$1.20 during off-peak periods to \$10 for peak periods.

## Are the political barriers to congestion pricing so formidable that they would not allow it to happen nationwide?

Not necessarily. Fourteen states—notably California, Texas, and Florida—already have overcome opposition and instituted various forms of congestion pricing in different localities. Other states are exploring the possibility. In Europe, London and Stockholm began citywide programs in the teeth of considerable resistance, which abated once traffic and air-quality improvements were apparent and significant shares of the toll revenue were used to upgrade mass transit.

## Is there enough known about the effects of congestion pricing to establish a nationwide program?

Yes. A great deal is known from the many pilot projects that have been conducted in the United States (such as variable toll lanes on I-15 and SR-91 in California, and bridge pricing in Lee County, Florida) and abroad (most notably in London).

### CONCLUSION

Without some sort of intervention, traffic delays will continue mounting and the economy will suffer from the loss of productive time. David Lewis's solution, congestion pricing, has demonstrated its efficacy in some states and localities, as well as in other countries where similar programs have been implemented.

Charging drivers more at certain times on certain roads necessitates a change in thinking in a country dependent on its cars, but the overall societal benefits would be large. Some would decide that the smoother travel was worth the price of the tolls. Those who decided to avoid the toll roads would benefit in other ways because some of the toll revenue would be used to upgrade mass transit and nontoll roads. A portion of the revenues would be used for a credit that would compensate low-income households. Less traffic, more money for highways and mass transit, and offsets for those most disadvantaged create what Lewis calls “truly a win-win situation.”

The views expressed in this policy brief are not necessarily those of The Hamilton Project Advisory Council or the trustees, officers or staff members of the Brookings Institution.

## Learn More About This Proposal

This policy brief is based on The Hamilton Project discussion paper, *America's Traffic Congestion Problem: A Proposal for Nationwide Reform*, which was authored by:

**DAVID LEWIS**

**Senior Vice President, HDR Corporation**

Lewis' professional interests include the economic analysis of human rights in relation to people with disabilities; the facilitation of public-private partnerships; and the extension of Cost-Benefit Analysis to accommodate the productivity effects of private investment in advanced logistics.

## Additional Hamilton Project Proposals

### An Economic Strategy for Investing in America's Infrastructure

This overview paper presents a comprehensive strategy for physical and telecommunications infrastructure policy in the United States. It emphasizes the need to use existing infrastructure more efficiently, improve the way in which infrastructure-related decisions are made, and promote infrastructure as a component of broadly shared growth.

### Physical Infrastructure

Several new papers from The Hamilton Project discuss ways to make better use of physical infrastructure. These policies would encourage users to consider the full costs of their infrastructure use through better pricing mechanisms, while compensating low- and middle-income households with the revenue generated by these mechanisms. These papers include:

- *America's Traffic Congestion Problem: A Proposal for Nationwide Reform* by David Lewis
- *Pay-As-You-Drive Auto Insurance: A Simple Way to Reduce Driving-Related Harms and Increase Equity* by Jason E. Bordoff and Pascal J. Noel
- *Creating a Safer and More Reliable Air Traffic Control System* by Dorothy Robyn

### Telecommunications Infrastructure

Two new Hamilton Project papers on telecommunications infrastructure aim to facilitate technological innovation and share the benefits of technology more broadly. Maximizing the value of telecommunications will require using wireless spectrum—the airwaves that allow devices to communicate—more efficiently and facilitating deployment of high-speed Internet access to rural areas. These papers include:

- *The Untapped Promise of Wireless Spectrum* by Philip J. Weiser
- *Bringing Broadband to Unserved Communities* by Jon M. Peha

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### THE BROOKINGS INSTITUTION

1775 Massachusetts Avenue NW, Washington, DC 20036  
[info@hamiltonproject.org](mailto:info@hamiltonproject.org) ■ 202.797.6279

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