



Policy Brief

Stanford Institute for Economic Policy Research

Traffic Congestion, Congestion Pricing, and the Price of Using California's Freeways

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Introduction

Californians know traffic. California has some of the worst highway congestion conditions in the country and polls consistently show that traffic is a top concern for state residents. Traffic problems will probably get worse as the state's population grows. The current system of paying for transportation investments — be it for new highway capacity, public transit improvements, or bridge replacements — is underfunded, outdated, and confusing. Counties and municipalities have attempted to address the problem with Local Option Taxes, which, although popular for putting control over some expenditures into local hands, are insufficient and too decentralized to address the scale of the problem.

Unfortunately, there is no quick traffic fix. As unpopular as they are, higher gasoline taxes — ideally pegged to the consumer price index or to a construction costs index — will probably be part of the solution. Though imperfect, they generally conform to the concept of “the user pays” by taxing motorists in rough proportion to their use of California's road and highway system. But it is important to note that politically feasible increases in gasoline taxes — historically in the range of pennies on the gallon — will not ameliorate traffic congestion problems because, in comparison to the fixed costs of car ownership (such as car purchase, registration, and insurance), they are far too small to cause large changes in driving behavior. In other countries, however, where gasoline and diesel fuel taxes can be US\$3.00 or more per gallon, they are considered effective travel demand management tools. “The British government,” Martin Wachs explains, “defends its much higher rates of fuel taxation on the basis of its contribution to the reduction in traffic congestion, greenhouse gas emissions, and local air pollutants.”¹

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¹ Wachs, Martin. 2003. “A dozen reasons for raising gasoline taxes,” *Public Works Management & Policy*, 7(4): 235-242.

Other forms of funding transportation system improvements conform to the “user pays” concept as well. “Congestion pricing,” in particular, is one way to link the prices for using our transportation infrastructure to the total social costs of usage.

The most mature transportation congestion pricing initiatives are found outside the United States. Singapore implemented congestion pricing in 1975, first by charging a fee to enter the central business district during peak rush hours, then by extending the fees to non-peak hours, and finally by including expressways leading into the central business district in the program. London recently started charging a £5 congestion fee to enter the city center during work hours on weekdays. Norway, Hong Kong, the Netherlands, Italy, France, and other countries also have implemented area, facility, or distance-based congestion pricing programs.

Though the United States has not pursued congestion pricing programs as aggressively as other countries have, California has two congestion-priced facilities that are proving to address traffic congestion effectively. Orange County’s State Route 91 (SR-91) and an 8.5 mile segment of Interstate Highway 15 (I-15) in northern San Diego County each have been using congestion pricing for almost a decade to improve the flow of traffic. These initiatives should inspire further use of congestion pricing in the state for the benefit of motorists and non-motorists alike.

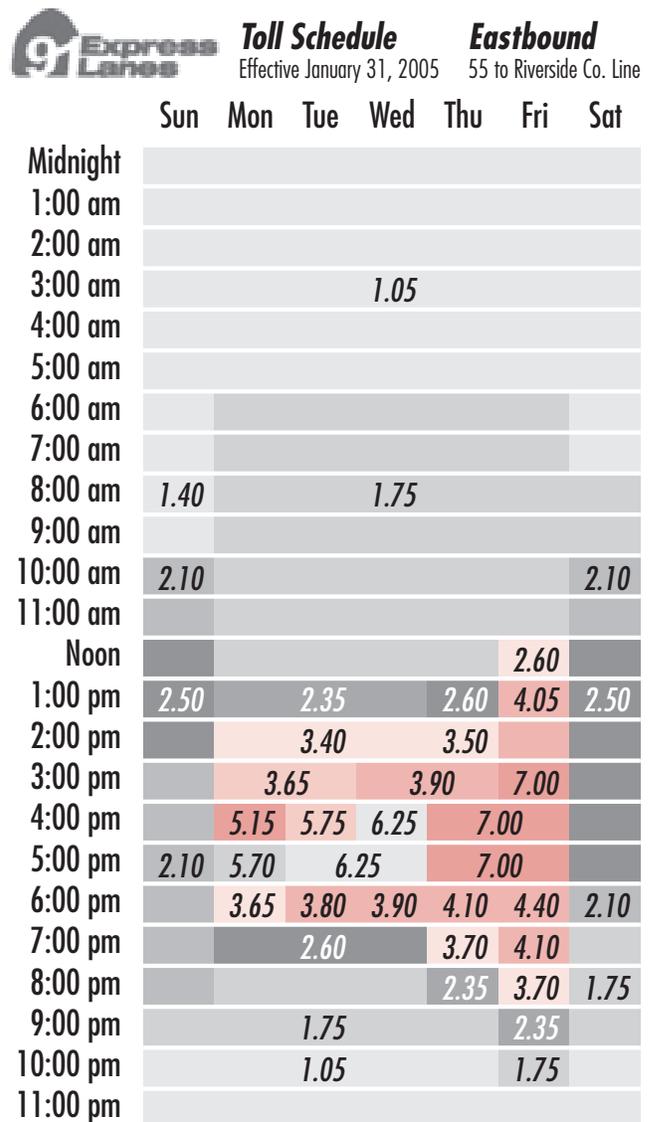
How Congestion Pricing Works

Congestion pricing is widely used in a variety of businesses. Movie theater matinees, early-bird dinners in popular restaurants, and free or bargain-rate phone calls on evenings and weekends are all forms of congestion pricing applied to different products. When demand is high and capacity limited, prices are higher than when demand is low. The marginal cost of a seat at a movie in the midweek afternoon, for example, is virtually zero, but in the evening the opportunity cost of that seat is substantially higher because other patrons would be willing to pay to occupy it. As a result, theater owners charge lower prices in the early afternoon than they do at night.

Congestion pricing on transportation facilities works in a similar way. When demand is high, tolls are charged and they are higher than when demand is low. The toll helps cover two costs of using a stretch of road or a bridge: the direct marginal cost of wear and tear plus the

externalities imposed on other users (increased driving times for other commuters) and non-users (higher emissions caused by stop-and-go driving). Congestion pricing helps drivers internalize these costs and, as a result, the price more closely reflects the marginal social costs of usage.

Figure 1



A congestion pricing system can be based on either a standardized schedule of hourly toll rates or on real-time price fluctuations pegged to traffic conditions. On SR-91 in Orange County, there are four free lanes and two toll lanes in each direction, with a predetermined toll schedule for each hour of the day (see Figure 1). In San Diego, on I-15, the toll schedule for two reversible lanes (southbound toward San Diego during morning commute hours and northbound in the afternoon) varies not with the time of day, but with the level of congestion

on the toll lanes. Tolls can change as often as every 6 minutes in order to maintain a consistent commute duration. Overhead signs inform drivers of the current toll before they have to make a decision about which lanes to choose.

SR-91 and I-15 are both voluntary congestion-priced facilities in that they are pay-to-use highway capacity directly adjacent to pre-existing lanes that remain free. In both cases, FasTrak electronic tolling eliminates tollbooth delays, reduces transaction costs, and simplifies the process. And both roads provide for free or reduced-price use of the toll lanes for carpoolers and other high-occupancy vehicles, earning them the name HOT (High Occupancy/Toll) lanes.

The Politics of Congestion Pricing

Until recently, the suggestion to implement congestion pricing on California's highways and bridges would have been a political non-starter. Variable tolls were seen as double taxation, since gasoline taxes are widely (though erroneously) believed to adequately cover road construction and maintenance; the administrative and time costs of variable tolls were high when manual toll collection was still necessary; and many argued that variable tolls would be a regressive burden on the poor.

But political opposition has softened in the past decade. This is in part due to technological advances that have made toll collection speedy and simple. And it is in part due to the recognition that continual increases in traffic and the costs of providing highway facilities cannot be solved without pursuing new strategies.

Perhaps most important to the acceptance of congestion pricing has been the growing recognition that demand for the use of a transportation facility — whether a bridge, a stretch of highway, or a commuter train — is not inelastic. Commuters can, and do, modify their use of a congestion-priced road or bridge to reflect the costs and benefits they perceive. Some drivers alter their commute schedule to avoid peak hours, or avoid paying the toll at all by taking public transit, carpooling, or finding another, less congested route to take. This is to their benefit and leads to reductions in traffic and delay for drivers still on the road, who get a faster, safer, more reliable commute in compensation for paying the toll.

The argument that the poor will be disadvantaged by congestion pricing—that upper-income people will speed away in the “Lexus lanes” and lower-income people will

be stuck in crowded free lanes—deserves special attention because of the social equity concerns it raises. Fortunately, low-income motorists can benefit from congestion pricing as much as upper-income motorists do. For example, studies of Orange County's SR-91 show that the variable-priced toll lanes are not used exclusively by the wealthy. The ability to save time and reduce uncertainty confers substantial benefits to all drivers, including service professionals who can make more service calls and parents of any income group rushing to avoid late charges for child care. For the lowest-income commuters, lifeline rates, patterned after similar programs for utility customers, could be established, but it will be important that all consumers face some costs for their usage.

Implementing variable-priced tolls will take time and planning, but the benefits merit the effort and experience has helped identify winning strategies. It is easiest to initiate congestion pricing when new capacity is being constructed, as was the case with SR-91, or when existing capacity is underutilized, as were high-occupancy-vehicle lanes on I-15 that were converted to HOT lanes. Setting congestion pricing rates at revenue-neutral levels can help convince the public and elected officials that the purpose is primarily to combat traffic. Or, if a higher level of revenue is one of the goals, dedicating it to facilities and services that motorists benefit from helps overcome doubts and opposition. And phasing congestion pricing in over time — for example, by converting highway lanes to HOT lanes one by one — also can help build support. In any case, ensuring that good options exist, in the forms of alternative routes and high-quality public transit, is critical.

Conclusion

Congestion pricing remains a politically complex and risky approach to taming traffic. But the appeal it has held for transportation economists and planners is now becoming clearer even to risk-averse politicians and traffic-beleaguered motorists. Congestion pricing can be congestion fighting, efficient, and equitable. The benefits accrue to highway users—both those paying peak tolls during peak hours and those opting to use the free lanes or tolled facility outside of peak hours—and to society as a whole. Though congestion pricing pushes the envelope of state transportation policy-making, it can show that sensible pricing policies work and have the potential to improve conditions on the state's overcrowded roadways.

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