

## **Toll Roads and Congestion Pricing**

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Congestion pricing has become one of the hottest ideas in urban transportation over the last several years. The basic idea is that the demand for mobility is affected by the price charged to use a roadway facility. Hence, at times and places where demand exceeds supply (capacity), the use of pricing should be an effective tool for reducing peak demands and thereby reducing congestion. The well-known examples of Singapore and, more recently, central London and Stockholm, provide evidence in support of the theory of congestion pricing.

In the United States, the only form of congestion pricing that's been implemented to date is HOT lanes—either the conversion of existing HOV lanes to high occupancy/toll lanes (under which one can gain access either by meeting an occupancy requirement or by paying the market price) or the construction and operation of brand new express lanes, generally also operated on the HOT principle. A number of studies have modeled the congestion-reduction possibilities of pricing an entire urban freeway system, but the perception of huge political resistance to charging for something long viewed as “free” has deterred any serious attempt to price a freeway system.

The U.S. Department of Transportation's 2006 Urban Partnership Agreement competition selected the five best proposals (from among about two dozen submitted) from transportation agencies in large metro areas willing to implement some form of congestion pricing within a two-year time-frame. The idea was to entice public officials, with extra federal cash, to pursue bolder approaches than plain-vanilla HOV to HOT conversions. Unfortunately, the only two of the five that proposed charging for currently “free” road space—Mayor Bloomberg's plan for congestion pricing in much of Manhattan and San Francisco's plan to charge for using a rebuilt Doyle Drive—fell victim to political opposition. (Two others involved innovative approaches to HOT lanes and the fifth will use variable tolls to help pay for a replacement bridge in Seattle.)

My conversations with people at the Federal Highway Administration suggest that they really hoped their Urban Partnership competition would provoke one or more urban areas to propose pricing its freeway system. And in point of fact, the United States has so decentralized jobs and housing that the vast majority of U.S. congestion occurs on urban/suburban freeways. That is an easier problem to address with pricing than congestion on the surface streets of a Manhattan or London, since by definition we are talking about a limited-access highway system. With a finite number of entry and exit points, freeway pricing can be implemented cost-effectively by means of transponders and video—simple, well-proven technologies.

Thus far, the U.S. toll road community has been largely absent from the congestion pricing debate, with the exception of the Harris County Toll Road Authority's innovative managed lanes recently opened as part of the Katy Freeway (I-10) reconstruction project. That project involves a public-public partnership between HCTRA and Houston Metro, which will jointly operate the managed lanes, using changes in both pricing and vehicle

occupancy to ensure uncongested operations on these new lanes serving paying customers, buses, and car- and van-pools. I have referred to this project as America's first "virtual exclusive busway," since it gives Metro the equivalent performance of an exclusive busway but spares them the capital costs of producing it, since those costs will be covered largely or entirely by those paying tolls.

But the main question I wish to address in this article is how the owner/operators of *existing urban toll roads* should approach congestion pricing. Toll road operators are in a different position than freeway operators when it comes to congestion pricing, since people are already paying to use their roadway. So if recurrent congestion develops on an urban toll road, what is the most cost-effective approach to deal with it? The traditional approach is to increase toll rates enough to support the capital costs of adding enough lane capacity to meet the increased demand.

Many advocates of congestion pricing would disagree, arguing that the congestion on a tollway reflects a failure to price tollway use appropriately. Their solution would be to shift from fixed to variable toll rates on the entire roadway, reducing demand to the level of existing capacity. Presumably that would mean some previous peak-period drivers would shift to off-peak times, some would shift to a different mode (car-pool, van-pool, bus, etc.), some would shift to a different route (parallel arterials), and some would simply not make some trips at all (perhaps via telecommuting or increased use of trip-chaining). To be sure, we have very modest peak/off-peak differentials on some of the toll facilities in the New York/New Jersey area, on the Transportation Corridor Agency toll roads in Orange County, California, and on a few other facilities such as the toll bridges in Lee County, Florida, but those price differentials are far smaller than on a truly market-priced facility like the 91 Express Lanes in Orange County.

But there is another way in which congestion pricing could be used on existing, congested urban toll roads. That alternative would be to create premium-priced, premium-service lanes on the toll road itself. The premium lanes would charge variable tolls high enough to provide a specified level of uncongested service during peak periods—perhaps Level of Service B or C. The operator could even offer a money-back guarantee of trip times on the premium lanes. Such guarantees would permit those choosing them to eliminate "buffer time" when estimating how long a trip would take using the toll road.

Depending on the magnitude of current and projected congestion (indicating the size of the gap between demand and capacity), these premium lanes could be created via some combination of adding new lanes and converting existing lanes. For example, a toll road with three lanes per direction and some room to expand at reasonable cost could add one lane in each direction and convert one of its existing lanes, thereby providing two "regular" toll lanes and two premium toll lanes in each direction. In cases of higher projected traffic growth and more room to expand, two new lanes—both premium—could be added to the existing three "regular" lanes, making a total of five in each direction. In either case, the higher rates charged on the premium lanes would be justified not only by the higher level of service offered but also on grounds of fairness. New urban

lanes created today cost a lot more to build and operate than the existing lanes, which may have been built 15, 20, or 25 years ago, so it makes sense that those demanding reduced congestion pay for the added capacity.

This approach takes into account the fact that congestion pricing can produce losers as well as winners. As far back as 1964, researchers Zettel and Carll described three broad categories of groups affected by a shift to freeway congestion pricing (assuming that pricing was applied uniformly to all lanes of a congested freeway):

- The Tolled—drivers who pay the toll, because their time savings are worth it.
- The Tolled-Off—drivers who no longer use the road, because it would not be worth the cost of the toll.
- The Un-Tolled—drivers on other roads whose trips are made worse by those tolled-off.

Two of the three groups are made worse off by congestion pricing, in the absence of either compensation or large-scale provision of alternative mobility (which, in the decentralized U.S. suburban landscape, is not easy). While the specifics would be somewhat different for a toll road shifting to real congestion pricing, the same three groups would exist.

How large each group might be depends on the specifics of each metro area, but in general, since most US metro areas practically stopped adding freeway capacity several decades ago, the market-clearing price for zero-congestion freeways would be high enough that the losers would likely outnumber the winners. And that's especially the case if most of the pricing revenues were spent on transit alternatives that would provide a poor substitute for the personal mobility offered by automobiles.

One of the most thoughtful researchers on congestion pricing is Prof. Kenneth Small of the University of California, Irvine. Small has spent more than a decade studying the two existing California HOT lanes projects, on I-15 in San Diego and the 91 Express Lanes on SR 91 in Orange County. Initially a supporter of the standard "congestion-price the freeways" approach, Small's empirical findings have documented the huge variation in how drivers value time and reliability of trip times. And that has led him to take a more nuanced view of pricing, on equity grounds. Small now favors two-tier pricing as a better approach to addressing congested freeways. One set of lanes would be premium-priced, with a no-congestion guarantee; this would be similar to express toll lanes such as those on SR 91. A larger set of lanes would have modest peak-period pricing, aimed at spreading out the peak and eliminating true stop-and-go (Level of Service F) conditions. Small's calculations suggest that with this approach winners would outnumber losers.

While Small has not directly addressed existing urban toll roads, I think his analysis supports my suggestion for two-tier pricing on congested urban tollways. This approach would recognize that both pricing and capacity expansion have important roles to play in reducing or eliminating the congestion that plagues our larger urban areas.

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