

Assessing the Economic Effects of Congestion Pricing

Highlights of Tolling White Paper 5



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Congestion pricing is an overarching term used to describe measures that reduce congestion by charging drivers tolls that vary by time of day or traffic volumes. The intent is to improve the economic efficiency of the highway system by more correctly pricing the use of congested highways. Advances in technology have made it possible to keep traffic moving by eliminating toll booths and using 100 percent electronic toll collection systems.

Congestion pricing issues

The primary purpose of the congestion pricing white paper is to emphasize that there are benefits and costs to congestion pricing. This, in turn, raises a number of analytical challenges in evaluating the economic and social effects resulting from the introduction of congestion pricing to an urban highway system. The paper discusses tools needed to evaluate a successful proposal to better understand if the project is worthwhile. The paper also briefly addresses additional issues such as equity, environmental justice, privacy and administrative costs. It summarizes recent findingsⁱ about public acceptance of pricing programs, noting that the public:

- Wants value; that is, they want to see a benefit for the price that they pay
- Learns from experience; as tolling and pricing options are actually implemented, the fear of the unknown recedes and approval increases
- Cares about the use of revenues and wants tangible projects
- Believes in equity and wants fairness
- Wants simplicity and prefers tolls to taxes

Seven technical tolling and pricing white papers were prepared for ODOT in February 2009 as a way to consider concerns and issues for Oregon to address prior to developing a tolling/pricing policy in the future.

1. Is tolling an effective means of reducing greenhouse gas emissions?
2. Where, geographically, could tolling and pricing work and under what circumstances?
3. Forecasting change – how do we incorporate tolling into our regional transportation models?
4. What are the economics of transportation system reliability?
5. How should the economic and social effects of broad applications of congestion pricing be assessed?
6. How do you determine if tolling a project is a better alternative than other non-tolled options and how would you choose between a number of tolled alternatives?
7. Are truck-only toll lanes a viable option for Oregon?

This document highlights White Paper 5 about congestion pricing. Find all papers online and provide your comments: www.oregon.gov/ODOT/TD/TP/Tolling_Background.shtml

Substantive changes in the cost of using an urban area's highway system can have broad effects on the regional economy. Therefore, congestion pricing needs to be approached with caution, using comprehensive and methodologically correct analyses. The novelty of pricing to any urban area implies the need for analysts to be open about assumptions, methods and levels of uncertainty. Extensive public involvement and discussion should be anticipated.

Pricing approaches considered

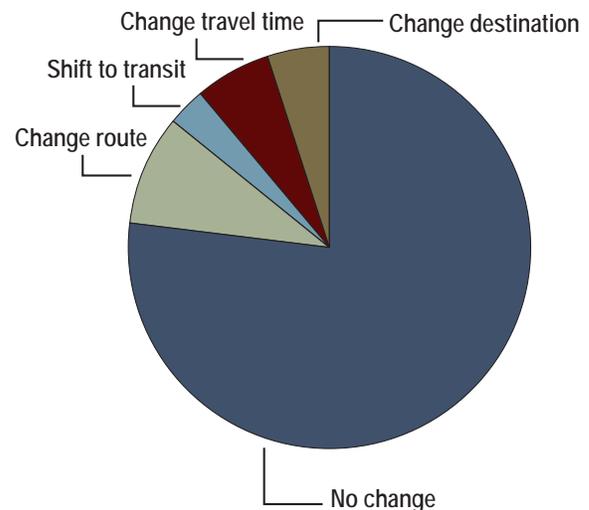
The white paper focuses on several ways that congestion pricing could be applied.

- **Area/cordon pricing:** Vehicles are charged to travel into or within a high activity center, such as a downtown or business district. Prices may vary by time of day to encourage motorists to enter the zone during less busy times or to use transit.
- **Tolling all highways in a metropolitan area,** also known as system tolling, which can also include major arterials.
- **Using pricing as an alternative to adding lanes.** This is often called “managed toll lanes” to maintain less congested travel conditions. In the United States, high occupancy toll (HOT) lanes are always located adjacent to a free lane.
- **Mileage-based pricing:** Tolling all roads in a given area to reduce congestion.

Potential effects of congestion pricing

Congestion pricing adjusts the cost of using the highway system reflective of the level of demand. Charging a higher cost in congested conditions reduces the use of facilities, allowing those that pay the toll a faster, more reliable trip. The introduction of tolls to a previously “free” system, however, introduces some negative effects. First, some people may prefer retaining the money for the tolls to the faster travel

Tolling/pricing projects and potential behavior changes



This chart is for illustrative purposes only. It is meant to demonstrate the types of changes people make when congestion pricing is implemented. Actual changes on any given project are site-specific and should not be expected to match these proportions.

times. Second, some might be “priced off” the system and the economic benefits associated with those trips would be lost. Third, traffic diversion is likely unless all roads are tolled, which can have a variety of negative environmental and social effects. Further, some of these factors may lead to long-term effects such as changes in land values and accessibility to particular locales, which may not become apparent for years.

Also, there are likely to be equity concerns given that lower income groups may have greater difficulty accommodating the cost of tolls. However, some research shows that members of low-income groups are willing to pay tolls if they know it means they won't be late for jobs, day care, or other time-sensitive priorities. All of these factors suggest that improved traffic flow is unlikely to be the sole determinant of the utility or political feasibility of a congestion pricing proposal.

How should revenue be used?

Though congestion pricing is advocated as a means to better manage the transportation system, when implemented on a larger scale (through cordon pricing, system pricing, or managed lanes), significant revenues can be raised. How those revenues are spent is critical to addressing the fairness issue and building public support and acceptance for a project or proposal. It is impossible to understand how attempts to balance fairness will be achieved until the revenue use is determined. Examples of how revenue could be spent include:

- Investing in transit improvements in the affected area
- Improving the highway system (e.g., parallel arterials)
- Improving the tolled facilityⁱⁱ
- Rebating motor fuel taxes
- Reducing general taxes such as income or property
- Awarding unspecified grants to the affected communities
- Devising a system whereby users pay a price during peak hours, and those who travel during off-peak hours get a credit. Credits might be used for travel on another day or for transit.

Conclusions

Determining whether a congestion pricing proposal makes sense requires detailed traffic and economic analyses. These include extensive and simultaneous knowledge about congestion levels on all parts of the transportation system as well as the ability to anticipate how each driver's trip-making decision would affect the overall system.

Aside from HOT lanes, there is very little real world experience with these forms of congestion pricing, making it difficult to reasonably predict the short and long term outcomes on issues such as traffic flow, land use, environmental effects, and others. It will be important to consider travel demand, economic effects and revenue forecasts to determine the effectiveness of a proposed project before it is approved or implemented. These issues are discussed in more detail in white papers 3 and 6.

Because these analytic methods are new, it is important that a deliberate, transparent and comprehensive process that is methodologically correct be employed for evaluating project assumptions and effects.

ⁱ National Cooperative Highway Research Program, Synthesis Compilation of Public Opinion Data on Tolls and Road Pricing, A Synthesis of Highway Practice, 2008.

ⁱⁱ Lessons learned from the FHWA's Value Pricing Pilot Program suggest that people support the use of tolls to benefit corridor-level improvements, including the transit system; or that toll revenue should only be spent for the benefit of those paying the toll, in particular, through investments in the highway being tolled. This is the traditional political justification for financing roads, bridges, and tunnels with tolls. These traditional public views of when tolling is justified run counter to the idea of recovering the marginal social cost of driving with tolls.

For More Information

- Visit the Web site to read the white papers and complete a comment form:
www.oregon.gov/ODOT/TD/TP/Tolling_Background.shtml
- Email: Robert.A.Maestre@odot.state.or.us