

## A New Approach To Congestion Management: Area Pricing

Highway congestion is a problem in major cities in Oregon and across the United States. The direct cause is a combination of too much demand for highway capacity and too little supply (see Figure 1). It has long been noted that higher peak hour or “congestion” charges have the potential to reduce peak hour consumption of highway capacity, and provide a revenue source to increase the supply of transportation capacity. Congestion pricing accomplishes these feats without placing a burden on uncongested areas.

Conventional congestion pricing can take many forms. In the United States, these generally take the form of higher peak hour charges for use of a specific facility (e.g., a bridge or a freeway segment). In Europe, congestion pricing sometimes takes the form of cordon charges, where a sizeable charge is levied for crossing a line into a city center. Cordon charges do not vary with the amount of travel within the cordon.

While useful for reducing congestion on specific facilities, conventional congestion pricing applied to existing roads can cause several problems. First is traffic diversion. Given a choice between a “free” facility and a tolled (i.e., congestion priced) facility, many drivers will choose the free facility, even if its qualitative characteristics are not as good as those of the tolled facility. Non-tolled routes parallel to a route with a new toll may become very congested as a direct result of the toll.

Traffic diversion can create other problems. The location of development and urban form are heavily influenced by traffic and travel patterns. Potentially, years of land use planning could be undone by altered traffic routing and travel destinations. For example, if radial routes to/from a central business district are tolled, down-

town businesses may lose sales to suburban competitors. Ultimately, this could lead to downtown business closures and more suburban sprawl.

Third, while improved conditions on tolled routes will have a positive impact on air quality, in some circumstances congestion caused by diverted traffic traveling on other roads could actually result in worse air quality.

Another problem with adding conventional congestion tolls to existing routes is that they tend to occur on a piecemeal basis. Residents near the first highway to be tolled feel singled-out and penalized. Sub-regional fairness becomes a political issue.

Finally, as it is practiced today, electronic tolling means the highway owner (usually the government) knows when and where individual customers have used tolled highway segments and bridges. If these were to evolve into a network, vehicular movements could be tracked. Public outreach efforts have demonstrated that a large proportion of the public strongly opposes any system that could track their vehicles.

### A New Approach

Oregon’s Road User Fee Task Force has been searching for a replacement for the fuels tax as a revenue source. The primary candidate is a system of mileage-based fees.<sup>1</sup> As part of this process, the Task Force asked how congestion charges could be incorporated

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into such a system. With the assistance of university researchers, ODOT staff developed the concept of “area pricing.” Area pricing charges a fee for vehicle miles traveled (VMT) within a defined area during set peak hours. The fee applies to use of all highway facilities in that area without differentiation by jurisdiction or type of facility.

Compared to peak hour charges for use of a specific facility or set of facilities, area pricing would:

- a) Eliminate the problem of traffic diversion onto parallel facilities, as the cost of using parallel facilities would be virtually the same.
- b) Eliminate most of the negative land use impacts of adding conventional congestion pricing to existing facilities. Since traffic diversion onto parallel facilities would be eliminated and travel to alternative destinations would be priced, the land use impacts associated with traffic diversion would be quite small.
- c) Improve air quality due to less travel under congested conditions. Also, area pricing would eliminate the potential for negative air quality impacts resulting from diverted traffic.
- d) Eliminate sub-regional fairness concerns. All routes in the entire area would be affected the same way at the same time.
- e) Avoid the potential for vehicle tracking. Area pricing only requires the calculation of mileage during peak hours within large, congested areas. Neither the specific location nor date-of-travel are needed for pricing.

These benefits occur because area pricing charges are based on general location and general congestion level. The trade-off is that area pricing is not specific in terms of particular facility, exact location, or level of congestion.

A potential problem with area pricing is the public’s **perception** that it could result in vehicle tracking. A major component of the system needed to implement area pricing is Global Positioning System (GPS) technology. There have been many recent articles in the media about firms using GPS devices to track customers in their vehicles. However, a GPS-based system can be designed to avoid even the potential for vehicle tracking.

The system needed to implement area pricing would not use the GPS component as a tracking device. Instead, it would use the GPS component as a switch triggered by preprogrammed boundaries. This switch would tell an electronic odometer when to count miles and the charging category in which those miles belong. The only data that would be recorded (and subsequently transferred) is mileage data. Locations of mileage more specific than predetermined, large, congested areas would not be identified, recorded, or transmitted. A complicating factor is that it is difficult to explain the mileage recorded would be based on weekday peak hour times, but dates of travel would not be recorded. As the area pricing concept is further developed, methods of addressing the perception problem will need to be a major component of public outreach and communication efforts.

### Summary

Traditional concepts of congestion pricing, while useful, also present practical implementation problems. These include undesired effects on other facilities, urban form, air quality, fairness, and vehicle tracking. Area pricing shifts the focus of congestion pricing from specific facilities in specific locations to a focus on congestion in a general area, and is based on actual use (i.e., peak hour VMT) of highway capacity. This change in focus allows many of the implementation problems with conventional congestion pricing concepts to be minimized.

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<sup>1</sup> For further information on its approach, see <http://www.odot.state.or.us/rufft/>

FIGURE 1. STATE HIGHWAY MILES AND STATE HIGHWAY VMT

