Tolling and Travel Demand Model Sufficiency

Highlights of Tolling White Paper 3

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Travel models

State, regional and local transportation planners rely on travel models to evaluate future traffic patterns. Models allow planners to see how people will behave if changes are made to the transportation system.

Existing models in Oregon are rated as excellent for the purposes they were designed, and some are internationally recognized. However, Oregon models have not been specifically designed to evaluate toll projects, so planners are not able to confidently forecast travel patterns for projects that are considering tolling/pricing. Existing models are not able to determine how travelers would change their mode, route, travel time, or destination in response to tolling/pricing.

Tolling, reliability and travel choices

Measuring and understanding how highway users value and respond to travel time savings and changes in reliability are key to updating travel demand models. (This issue is explored in more detail in White Paper 4.) Although there is general agreement that it's important to measure the value of reliability, the best way to quantify reliability is not known at this time. A handful of approaches have been identified through practice or research, though each has some short-comings in application. What is understood is that there are first and second-level choices that people make in response to the option of a tolled facility.

First order choices are immediate responses. These include whether to take the tolled route or the free route, whether transit is a better option, and what time to travel. The tolled route might be more reliable, but it has a fee. Traveling during rush hour might involve a higher toll than other hours.

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 work and under what circumstances?
3. Forecasting change – how do we incorporate tolling and pricing 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 3 about the sufficiency of travel demand models to accommodate tolling. Find all papers online and provide your comments: www.oregon.gov/ODOT/TD/TP/Tolling_Background.shtml

Second order responses depend on the tolling application. These responses could include deciding to change the trip destination, cancel the trip, or combine the trip with other purposes (in order to reduce the

cumulative effect of paying a toll for every trip). Second order choices are more difficult to measure and require more "feedback loops" in the model.

These responses are important in order to understand the effects tolling will have on traffic, but are also needed to meet certain thresholds regarding revenue estimates if a project is to be financed with bonds and paid back by toll revenues. Investors will need confidence that the model is accurate in order to provide the funds. The quality of the travel demand model is one consideration in assigning bond ratings.

Conclusions

White Paper 3 reviews characteristics of travel models in several of Oregon's major cities/geographic regions and assesses their current capabilities compared to the types of data most likely needed to estimate travel behaviors in a tolled environment. Although the models meet state-of-the-practice standards they were not developed to evaluate tolling applications.

White paper 3 recommends improvements to the existing models so that they can account for tolling:

- Improve the models to better account for first and second order responses to tolling/pricing conditions.
- Improve the ability to group motorists into categories based upon their value of travel time reliability. This would increase confidence in model results.
- Confirm that the model accurately estimates traffic and transit at the corridor level before evaluating tolling/pricing projects.
- Implement a data collection program to encourage model improvements across the state.
- Implement a process that would identify and systematically analyze risk factors. This would produce conservative estimates that planners and decision makers could rely on.

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**