

# Greenhouse Gas Emission Impacts of Tolling and Pricing Strategies

## Highlights of Tolling White Paper 1



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### Introduction

Climate change, which results from the release of various greenhouse gases into the atmosphere, is a growing concern locally, nationally and globally because of the changes that can result to sea levels, forests, farms and agriculture, and human and natural environments.

The transportation sector in general, and motor vehicles in particular, are large contributors of greenhouse gas emissions. Reducing these emissions is a key strategy to slowing and reversing the amount of greenhouse gases released into our atmosphere.

With advances in technology that eliminate toll booths and keep traffic moving, objectives of highway pricing/tolling have expanded beyond the traditional purpose of revenue collection to areas such as congestion management or economic sustainability. This paper considers whether reducing greenhouse gas emissions is an appropriate policy objective for tolling. Said differently, it asks if reducing greenhouse gas emissions should be the primary motivation for tolling highways in Oregon.

### Greenhouse gas emissions and transportation

Oregon state law says the growth of greenhouse gas emissions should be arrested by 2010, reduced to 10% below 1990 levels by 2020 and reduced to 75% below 1990 levels by 2050.

In Oregon, the major sources of greenhouse gas emissions are the transportation and electric utility sectors, at 34 and 32 percent of total greenhouse gas emissions respectively. Within the transportation sector, motor vehicles comprise 81 percent of total energy consumed,

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 1 about tolling and greenhouse gas emissions. Find all papers online and provide your comments: [www.oregon.gov/ODOT/TD/TP/Tolling\\_Background.shtml](http://www.oregon.gov/ODOT/TD/TP/Tolling_Background.shtml)

and carbon dioxide (CO<sub>2</sub>), is the biggest contributor to greenhouse gas emissions. It is emitted in direct proportion to fuel consumption, with variation by fuel type, vehicle type, model year, and operating conditions (speed and acceleration).

Reducing motor vehicle emissions is a key strategy in the battle against climate change.

## Conclusions

White Paper 1 reviewed a variety of methods to reduce transportation-related emissions. Most can be classified into the following categories:

- Reduce vehicle emissions – the stuff coming out of the tail pipe
- Improve fuel economy standards
- Change fuel type or composition to reduce carbon
- Manage congestion
- Improve transportation/highway system operations to keep traffic moving in a fuel efficient manner

The paper came to the following conclusions:

- Improving fuel economy standards and emission controls are more likely to result in major decreases in greenhouse gas emissions than changing the manner in which road usage is priced.
- To affect motorist behavior enough to reduce vehicle miles traveled, rates would be higher than current carbon tax proposals. Roadway pricing at these levels, therefore, should be based on objectives more comprehensive than reducing greenhouse gas emissions.

- Road pricing can be designed so that the greenhouse gas reduction impacts are heading in the right direction. For example, results from high occupancy toll or express toll lanes in other areas of the country show that fuel savings range between 1 and 2.5 percent when tolling a region or system.
- Achieving larger emission reductions would require an aggressive and comprehensive pricing program broader in scope than is typically associated with tolling and congestion-based road pricing.
- Road pricing by itself is not sufficient to achieve the desired reduction in transportation sector greenhouse gas emissions targeted in Oregon's climate change action plan. Additionally, broad application of congestion pricing may result in an array of economic, land use, and other impacts that should be considered.

## 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](http://www.oregon.gov/ODOT/TD/TP/Tolling_Background.shtml)
- Email: [Robert.A.Maestre@odot.state.or.us](mailto:Robert.A.Maestre@odot.state.or.us)