



Model-Based Transportation Performance: A Comparative Framework and Literature Synthesis

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MTI Project 2805

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In a time of serious fiscal and environmental constraints, there has been a renewed call to identify transportation investments and related policy decisions that will optimize transportation, environmental, economic, and equity outcomes. Several influential reports have articulated how such outcomes may be measured (commonly known as performance measures) in the context of Global Warming legislation in California and the Federal Transportation Reauthorization Bill. These reports recommend numerous performance measures and metrics that correspond to roughly consistent goals. However, it is often unclear how the different performance measures relate and how they can be measured with existing modeling tools.

This study links these performance measures to data available from simulation tools, develops a common framework by which to compare many of the various measures, and synthesizes the types of measures and the results of these measures as implemented to date.

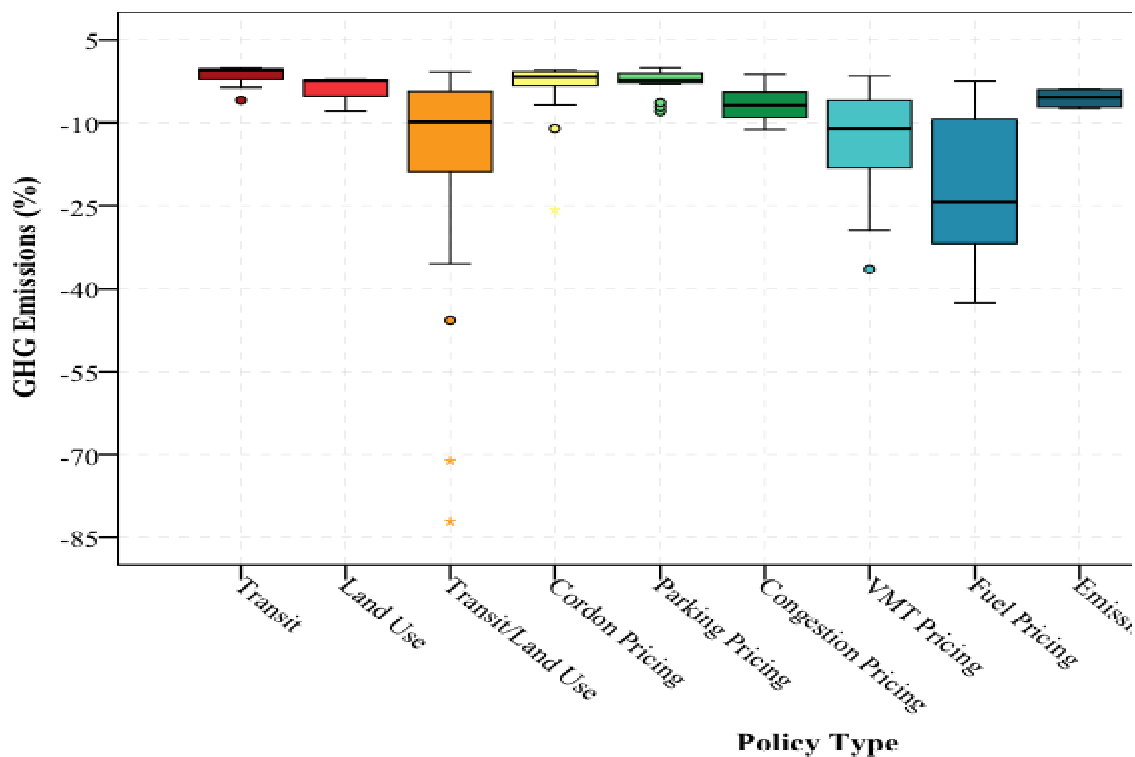
Study Methods

Performance measures were grouped into four broad categories (transportation, environmental, equity, and economic), and studies were grouped by region or modeling type (California Metropolitan Transportation Plans [MTPs], US regional visioning studies, and advanced studies), and by policy type (transit, land use, pricing, and so on). With these categories, performance measures were evaluated in terms of how often they were used by a certain study type and their values for a certain policy type.

Findings

This study found that a wide variety of performance measures have been used to quantify the impacts of various types of policies. Shown here is the reduction in greenhouse gas emissions for the various policy types, ranging from those that changed only transit or land use, to those that combined pricing, transit, and land use. As the graph shows, the value of the performance measure varies significantly by policy type.

Carefully designed transit, land-use, and automobile pricing policies may improve travel, economic, environmental, and equity conditions for communities.



Greenhouse Gas Emissions Reductions by Policy

Policy Recommendations

The performance measures used in a regional study can significantly affect the determination of total benefits for policy scenarios.

Soon a new generation of activity-based travel and land use models will be implemented statewide and regionally in California, enabling the development of high quality performance measures necessary to explore the critical dimensions of livable communities. The results of synthesizing performance measures in implemented policy studies show that consideration of the land use effects, travel time and costs for all modes of travel, and externality costs related to accidents, noise, air pollutants, and climate change, can significantly affect the determination of total benefits for policy scenarios.

About the Authors

Caroline Rodier is assistant director of the Urban Land Use and Transportation Center (ULTRANS) at the University of California, Davis. Her major areas of research include transportation and environmental planning and policy analysis. Margot Spiller is a junior specialist at the University of California, Davis and holds Master's Degrees in transportation engineering and city planning from the University of California, Berkeley.

To Learn More

For more details about the study, download the full report at transweb.sjsu.edu/project/2805.html