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SJSU Research Center
210 N. Fourth St., 4th Fl.
San José, CA 95112

Tel // 408.924.7560
Fax // 408.924.7565

www.transweb.sjsu.edu

For immediate release
Contact: Donna Maurillo
831-234-4009
maurillo@mti.sjsu.edu

Mineta Transportation Institute Issues a Report on Using a Spatial Economic Model for Equity Analysis of Land Use and Transport Plans

Researchers use the PECAS Model to simulate two scenarios in Sacramento, Calif., to evaluate how these plans affect greenhouse gas emissions

San Jose, Calif., July 27, 2010 – The Mineta Transportation Institute (MTI) has just released *Equity Analysis of Land Use and Transport Plans Using an Integrated Spatial Model*, the results of a study about how a spatial economic model can be used to evaluate the equity effects of land use and transport policies intended to reduce greenhouse gas emissions. Principal investigators were Caroline Rodier, PhD, John E. Abraham, PhD, Brenda N. Dix, and John D Hunt, PhD.

The Activity Allocation Module of the PECAS (Production, Exchange, and Consumption Allocation) Model for the Sacramento, Calif., region is used to simulate two scenarios for 2035 arising from a recent planning process, "Business-As-Usual" and "Preferred Blueprint." Advanced aggregate travel models and activity based travel models have been applied to evaluate distributions of travel time and cost effects of transport and land use policies across different socio-economic groups. But the PECAS model system, with its representation of the interactions among the transport system and the rest of the spatial economic system, enables an evaluation of the distributions of a wider range of economic impacts, including wages, rents, productivity, and consumer surplus, for segments of households, labor, and industry.

"In this study, the PECAS model is applied to illustrate the distributional measures that can be obtained from this type of model and to provide insights into the equity effects of different transport and land development patterns," said Dr. Rodier. "The results show that a more compact urban form designed around transit stations may reduce travel costs, wages, and housing costs by increasing accessibility, which can lead to substantial net benefits for industry categories and lower income households."

Higher income households may be net losers, she said. Because their incomes depend more on reduced wages, they are less willing to switch to higher density dwellings, and they are more likely to own their homes.

The application of the Sacramento PECAS model in this study demonstrates the types of equity and economic measures that can be obtained from spatial economic models. These include change in transport costs as a share of wage income; change in rent and value of owned homes by income class; change in wage income by labor category; consumer surplus by income class; and producer surplus by industry sector. The results suggest equity effects possible given the built form and transport projects in each scenario and constant industry and household growth.

The full report includes charts, formulas, maps, and policy implications. It may be downloaded at no charge from http://www.transweb.sjsu.edu/MTIportal/research/publications/summary/0908new.html Or go to www.transweb.sjsu.edu, click "Research," then "Publications" and scroll down to the report.

ABOUT THE PRINCIPAL RESEARCHER

Caroline Rodier, PhD, is a senior researcher at the University of California, Berkeley. Her major areas of research include transportation and environmental planning and policy analysis. She has extensive experience applying land use and transportation demand models to evaluate the travel, economic, equity and air quality effects of a wide range of transportation and land use policies, including intelligent transportation systems technologies, high occupancy vehicle lanes, transit improvements, road pricing, and land use control measures.

ABOUT THE MINETA TRANSPORTATION INSTITUTE

The Mineta Transportation Institute (MTI) was established by Congress in 1991 as part of the Intermodal Surface Transportation Efficiency Act (ISTEA) and was reauthorized under TEA-21 and again under SAFETEA-LU. The institute is funded by Congress through the US Department of Transportation's (DOT) Research and Innovative Technology Administration, by the California Legislature through the Department of Transportation (Caltrans), and by other public and private grants and donations, including grants from the US Department of Homeland Security. DOT selected MTI as a National Center of Excellence following competitions in 2002 and 2006. The internationally respected members of the MTI Board of Trustees represent all major surface transportation modes. MTI's focus on policy and management resulted from the Board's assessment of the transportation industry's unmet needs. That led directly to choosing the San José State University College of Business as the Institute's home. MTI conducts research, education, and information and technology transfer, focusing on multimodal surface transportation policy and management issues. Visit www.transweb.sjsu.edu