



Florida Department of Transportation Research

Estimating Costs and Benefits of Emissions Reduction Strategies for Transit by Extending the TRIMMS Model

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Florida's remarkable transportation infrastructure is a key to its economic vitality, but transportation is also the single largest contributor to air pollution. Pollutants such as greenhouse gases (GHG) degrade air quality and contribute to climate change, while other pollutants have many environmental and health impacts. Urban areas, like Tampa or Miami, which are prone to traffic jams, generate high pollutant levels as vehicles inch along. By reducing vehicle use and highway density, public transportation can be a cost-effective and efficient means of reducing air pollutants. Therefore, how modes of transportation contribute to air pollution is an important topic of transportation planning.

The Florida Department of Transportation (FDOT) has been developing transit strategies for reducing GHGs. As a foundation for these efforts, FDOT is working to create a GHG baseline for each Florida transit agency, focusing on reducing ozone emissions. However, ozone is only one of many airborne pollutants, which also include particulate matter, hydrocarbons, nitrogen oxides, carbon monoxide, sulfur oxides, and air toxics.

This project engaged researchers from the University of South Florida (USF) to develop a low-cost method for assessing the full benefits and costs associated with the implementation of the mobile source ozone reduction strategies, while accounting for a broader spectrum of emission pollutants. They did this by extending the capabilities of software already used to model transportation strategies, the Trip Reduction Impacts of Mobility Management Strategies (TRIMMS) software, previously developed at USF.

Originally, TRIMMS evaluated strategies directly affecting the cost of travel, such as public transportation subsidies, parking pricing, pay-as-you-go pricing, and other financial incentives, and strategies which affect travel indirectly, such as alternative work schedules, telework and flexible work hours, and worksite amenities (e.g.,



Heavy traffic on Florida highways contributes significantly to air pollution.

childcare). With additional programming, the researchers enabled TRIMMS to evaluate a full suite of air pollution emissions based on a user-selected transportation strategy. Through a new interface, users compare selected strategies to understand their relative impacts on pollutant levels.

TRIMMS enables FDOT, transit agencies, planners, and communities to use a method similar to highway cost-benefit analyses to quickly estimate emissions and determine the societal benefits of changing travel behavior. Practitioners can assess costs and benefits for most strategies identified by the FDOT-sponsored Transit Ozone-Reduction Strategies Toolbox without the cost and expertise required by models that are more sophisticated.

Because TRIMMS uses the emission inventory of the Environmental Protection Agency (EPA) Motor Vehicle Emission Simulator (MOVES2010a), it is suitable to run official State Implementation Air Quality Plan (SIP) and regional emissions analyses for transportation conformity purposes.