Program Update

Travel Efficiency Assessment Method

Key Takeaways from State and Local Case Studies to Reduce Transportation Emissions

Air quality in the United States has improved over the years, as emissions control technologies have reduced emissions from all pollution sectors. Yet the transportation sector continues to be a major source of criteria pollutants and greenhouse gas (GHG) emissions across the country. While emissions per mile traveled have decreased, growth in travel activity has partially offset those reductions, and presents a challenge to achieving and maintaining public health. For state and local planners, the ability to estimate the emission reduction potential of strategies aimed at reducing travel activity is critical to long range planning and programmatic investments.

In contrast to strategies that affect vehicle technology or fuel properties, travel efficiency (TE) strategies affect how often, how far, and by what mode people choose to travel. These strategies include travel demand management (e.g., telecommuting, transit subsidies, etc.), public transit fare changes and service improvements, road and parking pricing, and land use/smart growth. Some of these strategies can be implemented quickly, and some, especially land use changes, take time to be realized. Regardless, these types of strategies can be adopted by state or local entities, e.g., on a local or regional level, to reduce emissions and improve quality of life.

EPA developed the Travel Efficiency Assessment Method (TEAM) to quantify the potential emission reduction benefits of TE strategies. TEAM uses available travel data and a transportation "sketch model" – a spreadsheet based, easy-to-use model – to quantify the change in vehicles miles traveled (VMT) resulting from TE strategies.

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In TEAM, this data is combined with emission rates from EPA's MOVES emissions model to quantify the emissions benefits of the TE strategies when compared to a business-as-usual (BAU) case (i.e., estimated travel activity without the strategies in a future year).

Traditional four-step travel demand models are complex and require a high-level of expertise and input data to develop, calibrate, and maintain. A sketch model, like those used in TEAM, are a lower resource alternative that is far less data intensive, less costly, and less time-consuming to run.

Work to Date

In 2011, EPA conducted a national assessment using TEAM to estimate emissions reduced if all urban areas in the U.S. adopted TE strategies. Since then, EPA has completed 12 TEAM case studies in partnership with agencies from areas across the country, including:

- Austin, TX
- Atlanta, GA
- Pittsburgh, PA
- Orlando, FL
- Puget Sound, WA
- St. Louis, MO
- Champaign, IL
- Boston, MA
- Lake Charles, LA
- Kansas City, MO-KS
- State of Connecticut
- Tucson, AZ

These case studies allowed EPA to apply TEAM at various geographic scales, learn about the types of issues partner agencies face, and understand the strategies of most interest to transportation planning practitioners.

Applications of TEAM Analyses

TEAM analyses can be used to produce estimates of transportation and land use demand and impacts. TEAM analyses can inform different types of planning exercises, such as:

- General plans, such as regional or area-wide land use, circulation, and housing plans;
- Area-specific plans, such as neighborhood or corridor level plans that assess transportation infrastructure needs or local land use;
- Comprehensive Transportation and Public Transit Service Plans; and,
- Policy analyses to evaluate programs, identify policies, and augment decision-making.

TE Strategy Impacts

Case study agency partners explored many different TE strategies for TEAM analysis. Most often, strategies for analysis included transportation pricing, land use, and transit enhancements. The range of reductions predicted in the case studies was based on aggressiveness of policies/strategy proposed, as well as those already implemented in each area:

- **Transportation pricing strategies**, like VMT fees and parking pricing, showed the biggest potential impact on regional light-duty VMT. Hypothetical pricing strategies of $0.05 - $0.10/mi resulted in 3.83% - 9.56% decrease in VMT and emissions compared to the future BAU cases.

- **Land use and smart growth strategies**, such as increasing residential and jobs density, resulted in large impacts on VMT. For example, in Atlanta, a strategy that explored shifting population growth toward "travel efficient" neighborhood types resulted in a projected 6.43% decrease in regional VMT from BAU.

- **Transit improvements**, including increasing service frequency and service area, decreasing wait times, or providing subsidies, generally had the next highest impact on decreasing in VMT. In Puget Sound, for example, providing targeted transit subsidies to low income populations had an estimated effect of reducing regional VMT by 1.78% compared to the BAU case. In other cases, increasing transit frequency or reducing wait times resulted in a decrease of regional VMT by 0.30 - 0.55%.

- **Bicycle and pedestrian infrastructure** were examined in several case studies. These strategies resulted in a redistribution of drive-alone trips to increases in bicycle and walking trips. Bicycle and pedestrian infrastructure are important investments for multimodal accessibility and improved quality of life.

Benefits of the TEAM Approach

TEAM has proven to be an accessible, flexible, and scalable tool that can be used by a wide variety of organizations, for different types of analyses, and at different geographic scales.

TEAM is accessible to a wide variety of agencies with varying degrees of technical expertise, including:

- large metropolitan planning organizations (MPOs) with populations in the millions and significant experience with transportation planning;
- smaller MPOs and rural planning organizations with more limited technical expertise; and,
- state and local air agencies, non-governmental organizations, and other organizations interested in transportation and air quality issues.

TEAM is flexible and can be used for hypothetical "what-if" exercises early in the planning process, and strategic planning decision-making. It can also be used to analyze a range of strategy types with varying degrees of implementation.

TEAM is scalable and can be used to analyze strategies applied at a variety of scales (e.g., to a corridor/project, a city or metropolitan region, or an entire state). It can be applied to a region's entire population, or to a specific subset of that population, such as "commuters associated with a university," or "all state government employees."

More Information

For more information about TEAM, including the completed case studies, please visit:

www.epa.gov/state-and-local-transportation/estimating-emission-reductions-travel-efficiency-strategies