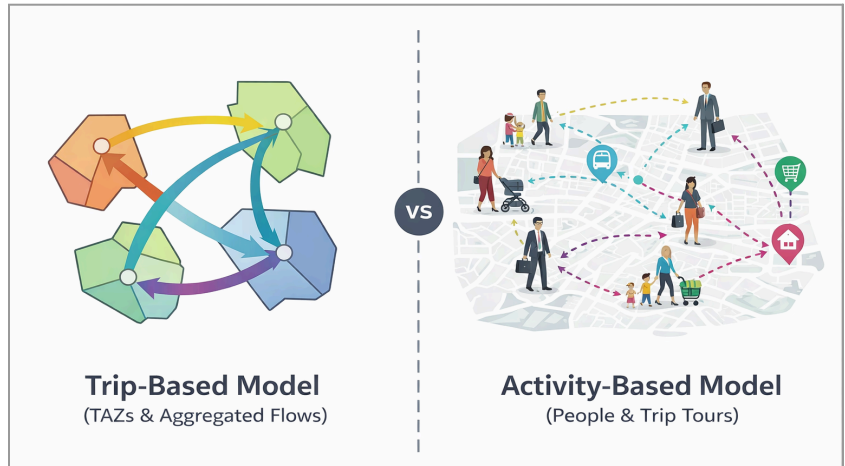


Moving to an Activity-Based Model (ABM): A Quick Guide

WFRC and MAG are upgrading our forecasting tools from our current trip-based travel demand model to a more advanced activity-based model (ABM) for resident daily travel. This change allows us to forecast travel behavior with greater detail and flexibility. This guide answers the most common questions about what this means and why we are doing it.

What is an ABM?

An ABM starts from the idea that people travel to do things like work, shop, or eat. Rather than modeling travel as a set of simple trips between zones, it simulates a person's whole day and uses their schedule to predict where they go, when they go, and how they get there.



How is it different from a Trip-Based Model?

Feature	Trip-Based Model	Activity-Based Model
Perspective	Simulates trip flows between geographic zones	Simulates complex traveler paths at a person level
Behavior	All trips are simple movements from 1 origin to 1 destination	Understands "trip chaining" (e.g., work→day care→groceries→home)
Timing	Uses broad time periods (e.g., "morning peak period")	Models travel throughout the day, hour by hour
Household	Minimal consideration of carpooling and shared trips	Simulates shared travel and scheduling of family members' trips

What questions will an ABM help us answer?

Because it represents individual people, their demographics, and their full daily schedules, the ABM can answer complex policy questions that trip-based models cannot. A few policy areas that ABMs provide deeper insight into include:

- **Access to Opportunities:** How changes in land use and transportation affect access to jobs, services, and specific daily needs within realistic schedules and time constraints.

- **Land Use & Development:** How mixed-use development shapes daily activity patterns and influences when, where, and how people travel.
- **Road Pricing Policies:** How pricing strategies influence travel demand, including distance, location, and timing of trips.
- **Remote Work:** How working from home changes commute patterns, shifts travel away from peak periods, and increases local, non-work trips throughout the day.
- **Equity:** How transportation policies and investments impact specific demographic and income groups, including the distribution of costs and mobility benefits.
- **Emerging Technology:** How new mobility options like ride-hailing and autonomous vehicles could change daily travel patterns and choices.

And many other applications, such as aging population, congestion pricing, parking policies, vehicle ownership, and school scheduling.

What will change within the Analytics team?

Transitioning to an ABM is a massive upgrade in our capabilities, and it brings some practical changes to how the model operates behind the scenes.

- **Detailed Data:** Uses detailed demographic and land use inputs, leveraging our current land use model and recent household travel survey as a strong foundation.
- **Resources:** Involves additional computing power and runtime to simulate individuals.
- **Variation in Results:** Produces slightly different model run results due to individual-level simulation, while overall patterns remain consistent.
- **Team Expertise:** Leverages our team's current expertise, with some additional training to support development and maintenance.
- **Collaboration:** Shifts toward broader team participation in model design and implementation decisions.
- **Shared Development:** Allows us to share costs, leverage peer agency experience, and stay aligned with best practices, as we join a national, multi-agency consortium.

What is the project timeline?

Building an ABM is a complex, multi-year effort. This is currently planned as a three-year project working with consultant WSP, and our goal is to have the new model fully calibrated, operational, and usable by the summer of 2029 in time for the next Regional Transportation Plan (RTP) cycle.