

## **OKI's Travel Demand Model, an Activity-Based Model (ABM)**

The OKI ABM covers the combined planning areas of OKI and the Miami Valley Regional Planning Commission. The OKI ABM utilizes the Coordinated Travel – Regional Activity Based Modeling Platform (CT-RAMP) to simulate the travel pattern of all individual travelers in the region. The ABM estimates a schedule and itinerary of daily activities for members of every household in the region based on detailed information for individuals, households, trips, and highway and transit systems. Travel behavior modeling at fine spatial-temporal resolution improves the accuracy of travel pattern estimates and enables the model to evaluate conventional highway and transit projects as well as to test a variety of policies and scenarios. Travel analysis zones (TAZs) are the basic geographic unit for estimating travel in the OKI model. The region is subdivided into 2,299 TAZs to permit detail as well as manageability.

Truck trips are provided by the Ohio Department of Transportation (ODOT) from the statewide travel demand model and incorporated into the OKI TAZ structure. Trucks are not generated as part of the ABM but as part of the ODOT four-step modeling process. Trucks are generated based on Freight Analysis Framework (FAF) commodity flow data and disaggregated to ODOT zones. The truck freight is then used to estimate the number of trucks based on load factors and 'empties' estimates and distributed and assigned over the network. OKI is provided the truck trip tables (within ODOT zones) and then disaggregated to the OKI TAZ structure. These truck trips provide a good estimate, but truck analysis is not the primary purpose of OKI's regional travel demand modeling program. They are what is referred to as 'background traffic' and therefore should be considered across five transportation planning scenarios:

- 2020 Base scenario - Existing transportation infrastructure, travel patterns, and OKI socioeconomic characteristics.
- 2050 Base scenario - Existing transportation infrastructure and travel patterns, OKI 2050 socio-economic characteristics, and no OKI 2050 MTP projects.
- 2050 E+C - Existing (E) transportation infrastructure, Committed (C) OKI Transportation Improvement Program (TIP) Fiscal Year 2021-2026 projects, and projected 2050 socio-economic characteristics.
- 2050 Plan – Existing transportation infrastructure, TIP FY 2021-2024 projects, OKI 2050 MTP projects, projected OKI 2050 socio-economic characteristic, connected and autonomous vehicles (CAV) usage increases to 70%, vehicle occupancy increases by 30%, person trips generated declines by 15%.
- 2050 Vision – Existing transportation infrastructure, TIP FY 2021-2024 projects, OKI 2050 MTP projects, projected OKI 2050 socio-economic characteristic, CAV usage increases to 89%, vehicle occupancy increases by 40%, person trips generated declines by 20%.

Projects in the OKI 2050 Metropolitan Transportation Plan (2050 Plan) and 2050 Vision are forecasted to have a positive impact on congestion.