Automated Mobility Districts (AMDs)

- District-scale implementation of advanced vehicle (AV) technologies
- Full benefits of an AV-shared-mobility service (SAE Level 5) within a confined geographic region or district
- Everything somewhere vs. something everywhere
- AMD models serve as “special generators” in existing urban travel demand models (TDMs)—similar to how airports, university campuses, and central business districts (CBDs) are currently treated in TDMs
- AMD modeling and simulation toolkit informed by real-world deployments to quantify the mobility and energy impacts of an AMD.

Case Studies

A Hypothetical AMD Scenario

- Four AES vehicles operate “on-demand” inside the circuit.
- The simulation is carried out for a demand of 300 trips distributed across the 13 (O-D) pairs.
- Traffic demand is distributed as a bimodal distribution reflecting morning and afternoon peak hours during a typical day.
- The choice set of travel modes encompasses: 1) passenger car; 2) AES; and 3) walking.

Greenville AMDs

- On-demand fixed route automated shuttles (a-taxi shuttles) are operating inside Greenville field test region (AMD)
- Greenville AMD scenario toolkit is informed by the real-world traffic demand and network data (Figure 4(a)) from Greenville County
- A modeling and simulation scenario for the proposed Greenville AMD is developed for mobility and energy assessment
- Multi-modal traffic flow: 1) passenger car; 2) walking; 3) on-demand fixed-route shuttles; 4) on-demand door-to-door ride-sharing
- The Greenville AMD analysis is currently underway.

Results and Discussion

- An AMD is a district-scale implementation of connected and automated vehicle technologies to realize the full benefits of an on-demand shared automated mobility service within a confined geographic region.
- A hypothetical AMD along with real-world AMD implementations, e.g., Greenville AMD and the Kansas State University campus, are introduced.
- This study develops an AMD modeling and simulation toolkit and reports on the preliminary analysis results for hypothetical AMD deployment, exercising the toolkit with three scenarios.
- Future research will focus on enhancing the toolkit to integrate different mobility operations of AMDs and define and quantify various performance metrics for AMDs.
- The model will also be extended to account for parking-related issues (availability and access times).