

Travel Forecasting Methods Comparison

Evaluating the Future through Six Different Lenses



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Presentation Outline:

- Rationale for Evaluation of Travel Forecasting Methods
- Description of Travel Forecasting Methods Evaluated
- Evaluation Criteria
- Next Steps



Evaluation Rationale:

- Supports the update of the Montgomery County **Subdivision Staging Policy**
- Recognizes the evolution and **advancement of the “state-of-the-art”** in travel forecasting methods
- Responds to the need to find tools to produce **transportation system performance metrics** better supportive of County planning policies
- Supports the development of a **strategic plan** for the incorporation of new travel forecasting methods into the existing travel forecasting analysis framework

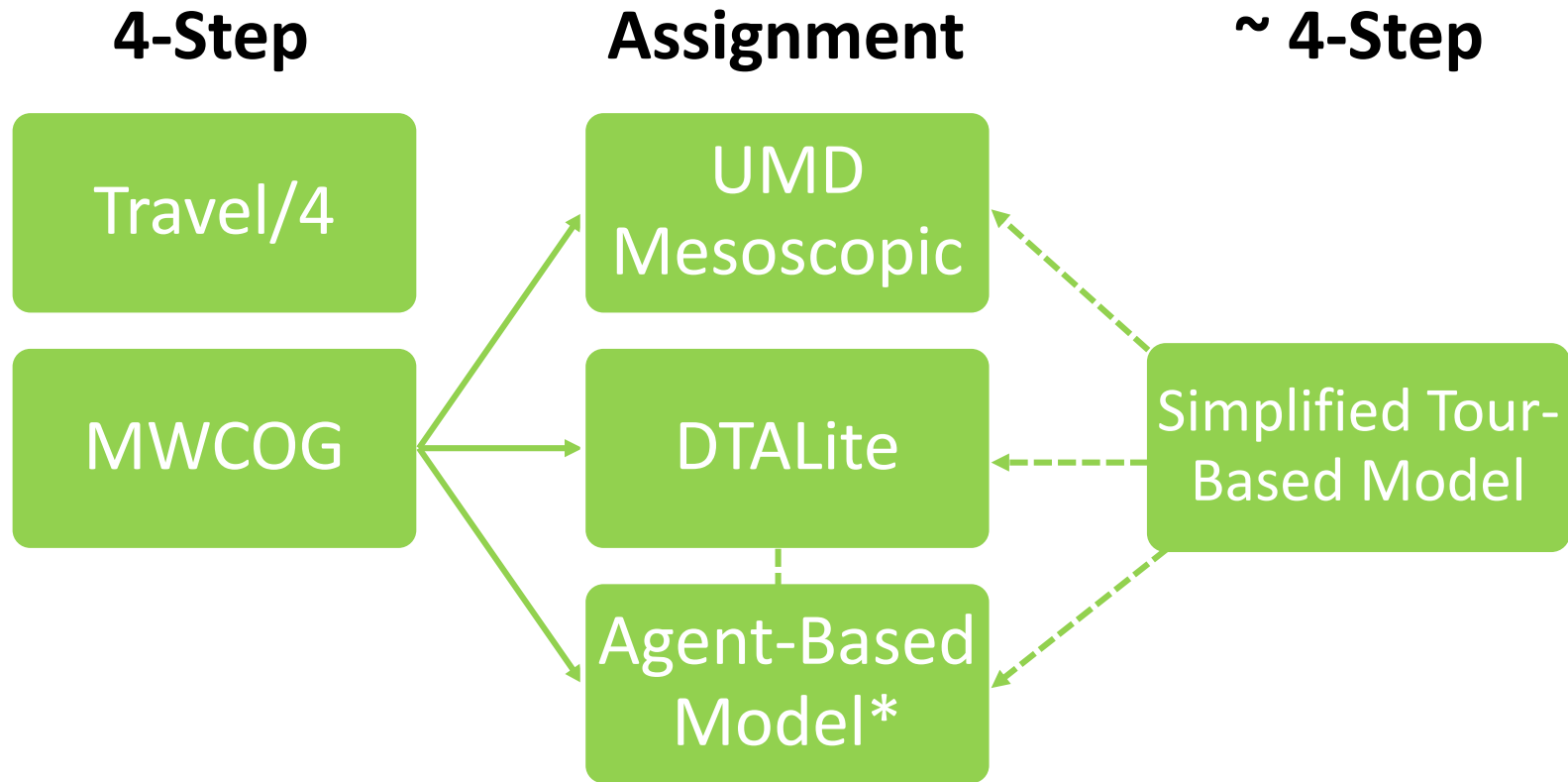


Methods Evaluated:

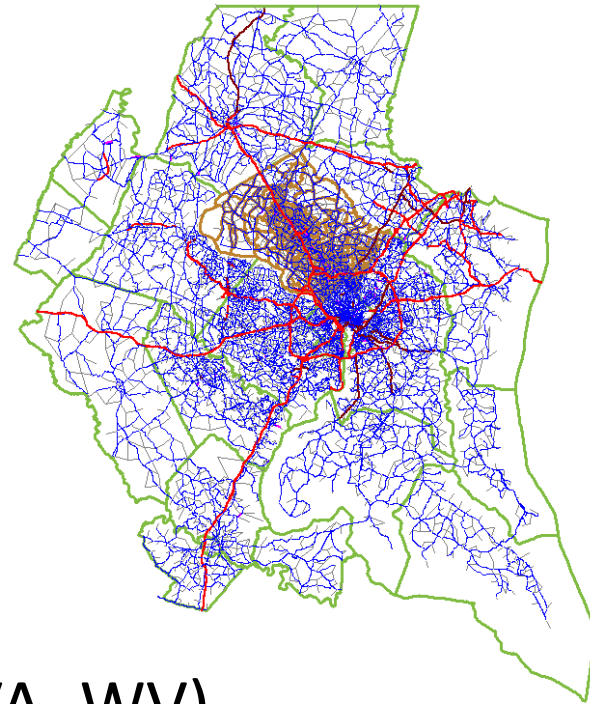
- MWCOG Version 2.3.57
- Travel/4
- UMD mesoscopic model
- Dynamic Traffic Assignment (DTA) Lite
- Agent Based Model
- Simplified Tour-based Model



Methods Evaluated:



*Some agent-based models provide feedback to activity choices



MWCOG Version 2.3.57

- 22 jurisdictions (DC, MD, VA, WV)
- 6,800 square miles
- 3,722 zones (376 in Montgomery County)

Application: land use changes, regional travel patterns, multimodal choices, arterial-level detail

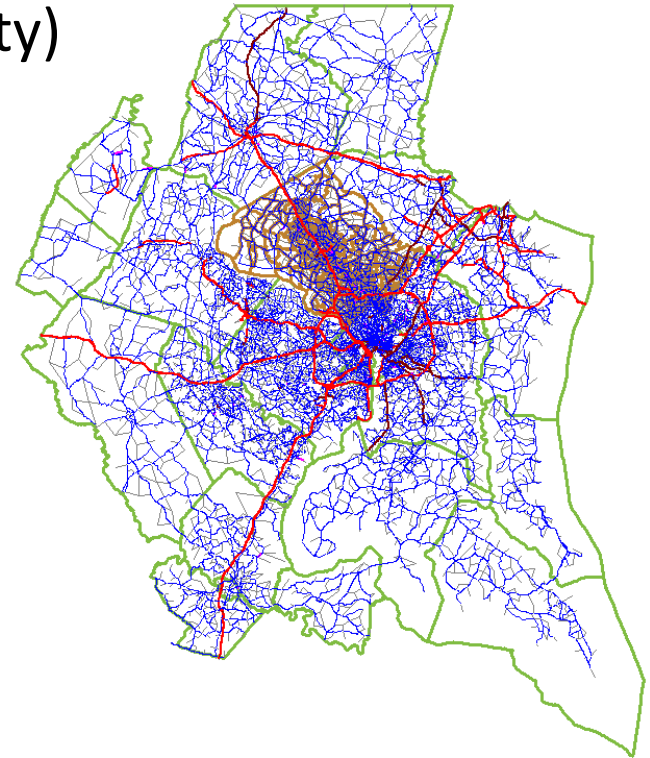


Travel/4

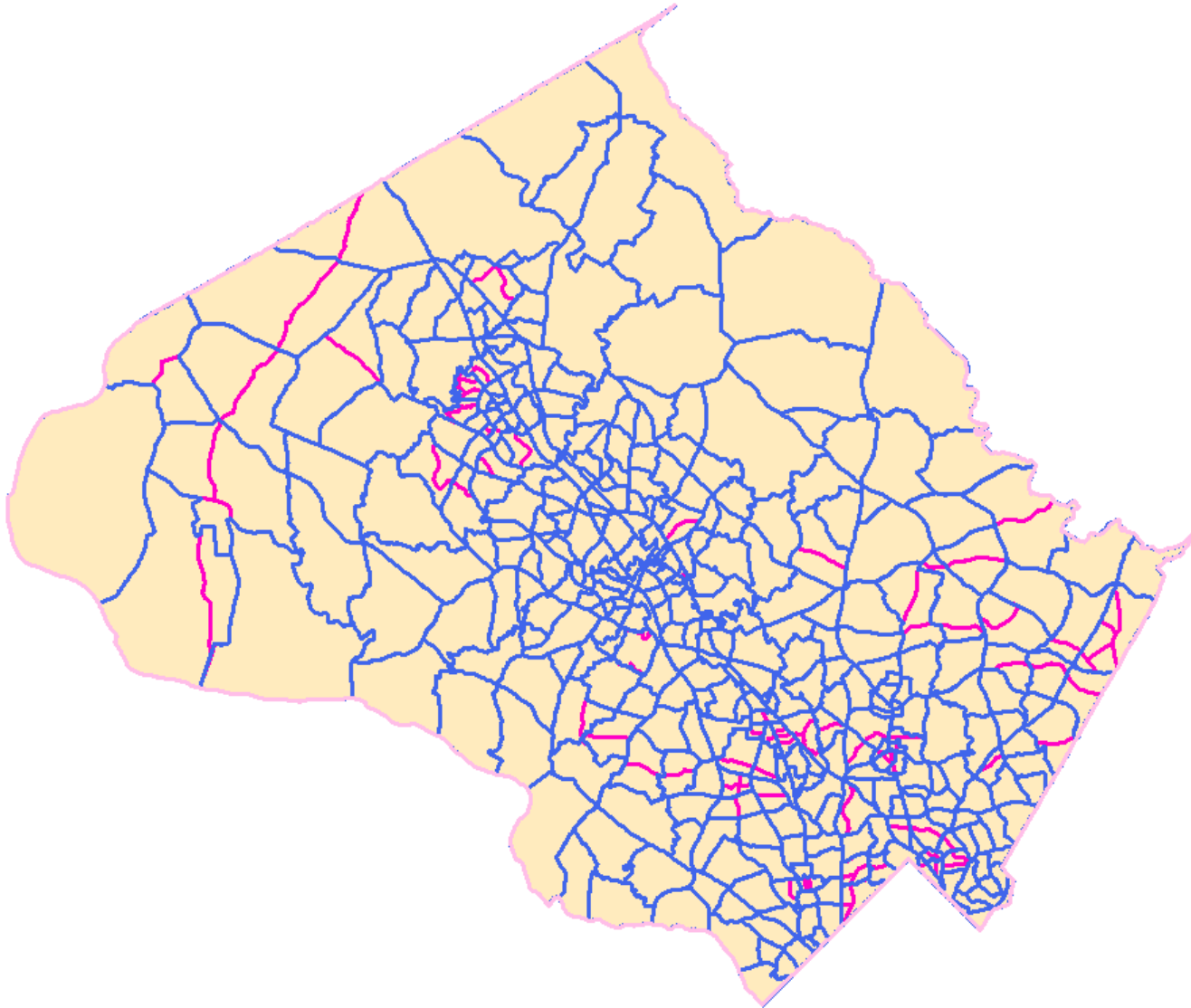
Montgomery County-focused adaptation of MWCOCG regional travel forecasting model tool:

- 90 additional zones in Montgomery County (+2.4% overall / +24% in Mont. County)
- 300 additional miles of highway links
- County-level validation

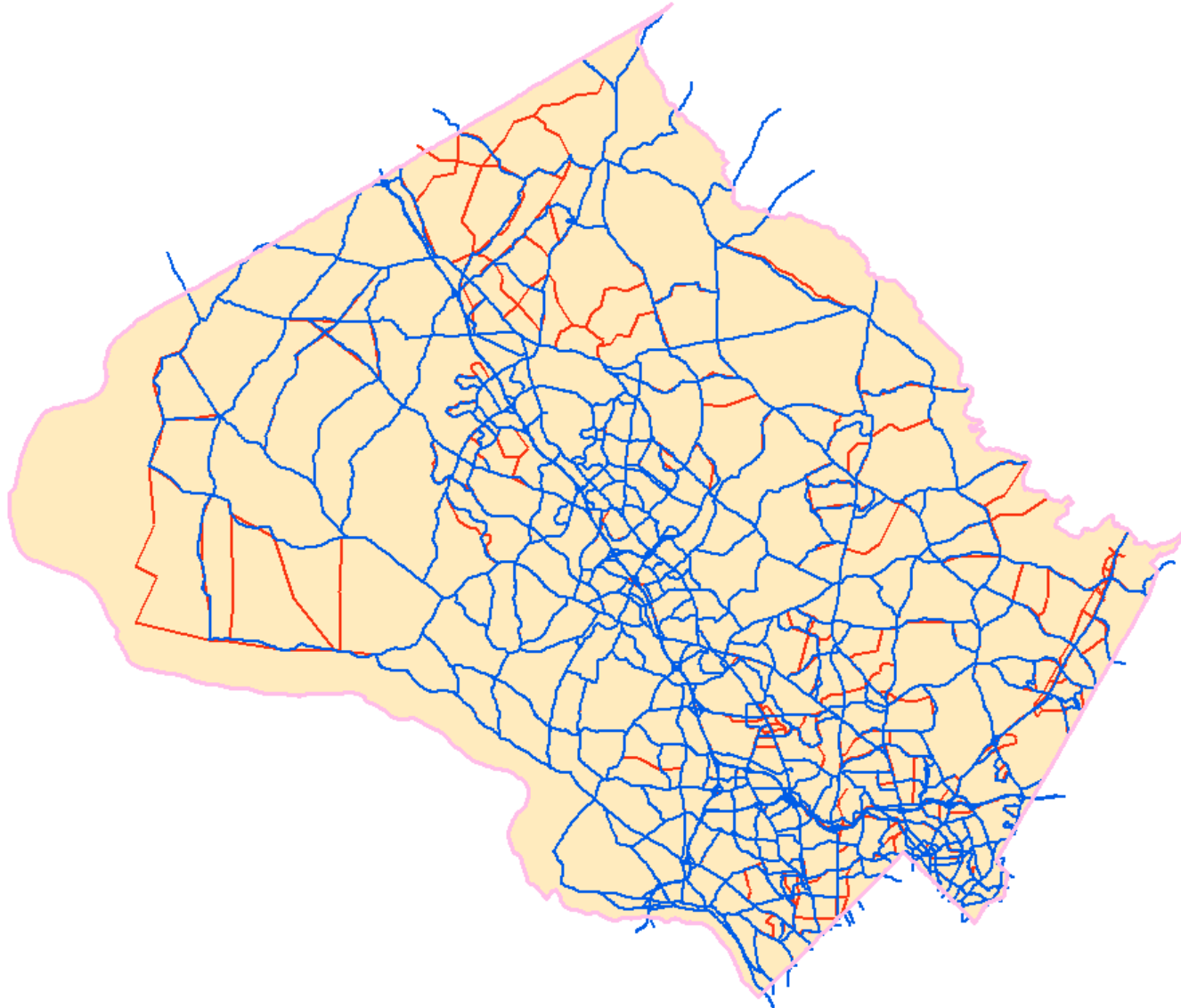
Application: land use changes, county travel patterns, multimodal choices
arterial-level detail



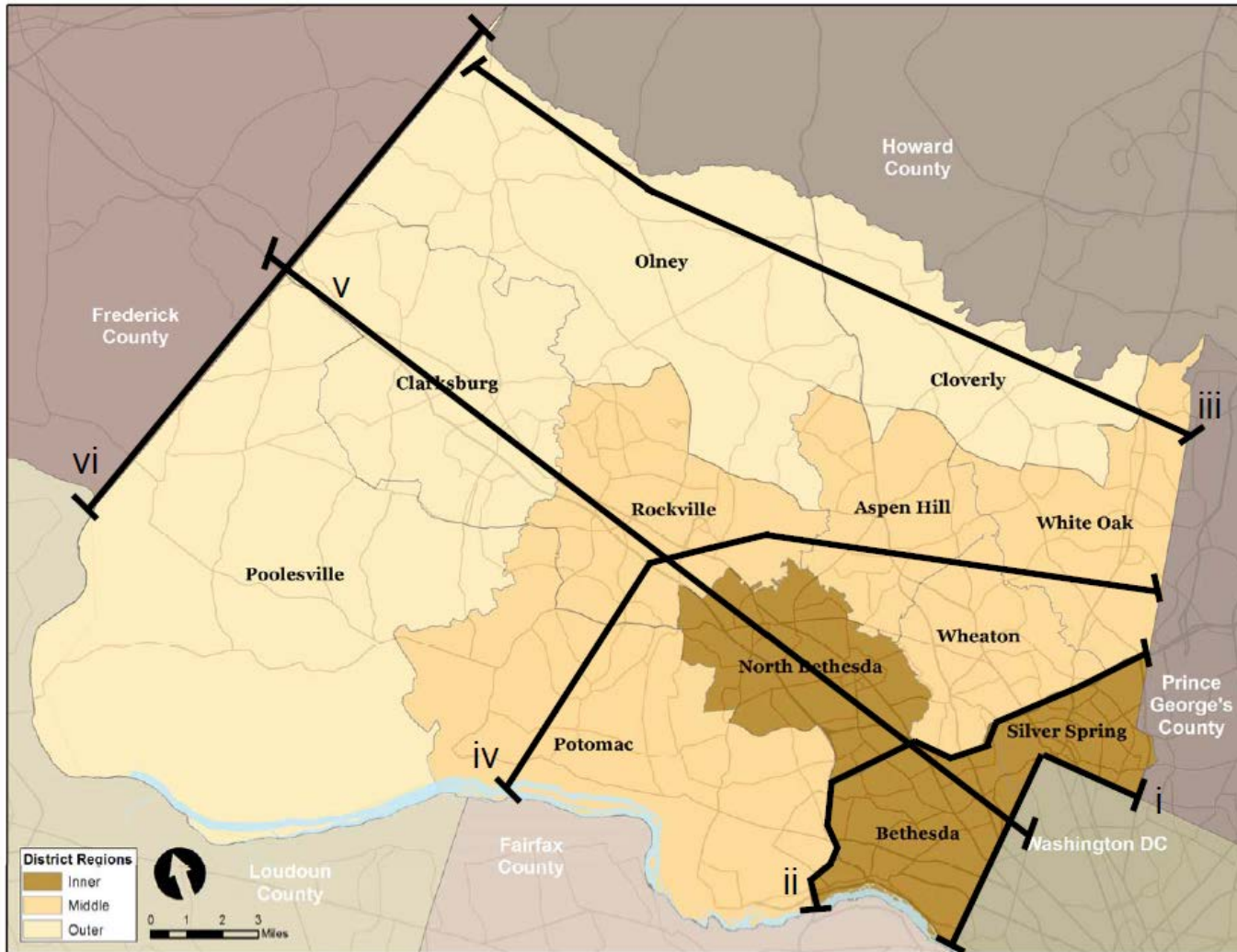
Travel/4 Montgomery County TAZ Modifications



Travel/4 Roadway Network Additions



Travel/4 County-Level Validation



Source: VHB. "Montgomery County Travel/4 Model Travel Demand Forecast Model Development – Validation Effort."

UMD Mesoscopic Model

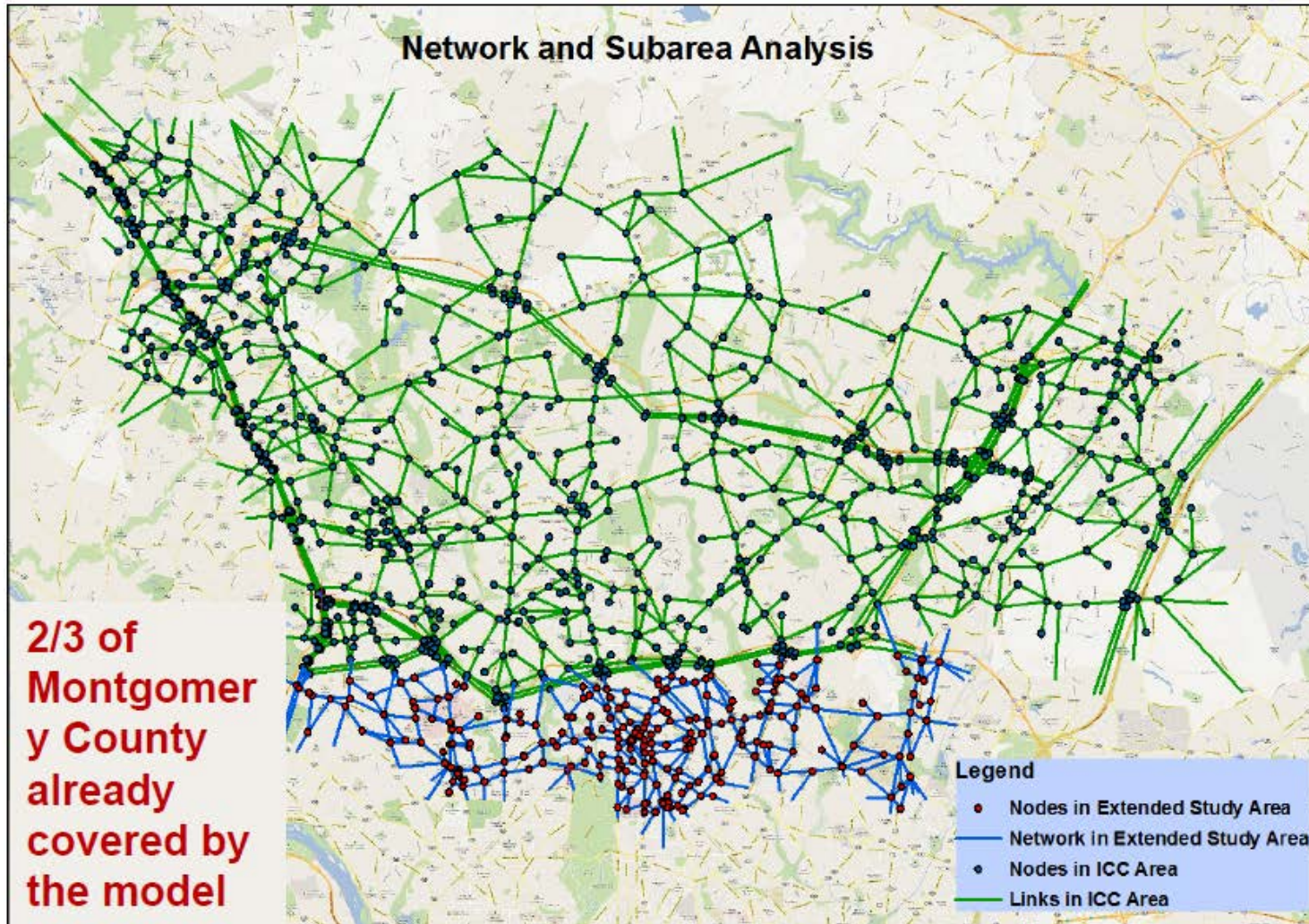
- Builds on foundation of regional model – assignment only, relies on network and OD outputs from regional model
- Bridges the gap between microsimulation and regional modeling
- Dynamic traffic assignment; sensitive to operational characteristics, so can provide more spatial and temporal detail (queues, dynamic pricing, travel demand management)
- Applicable to corridors or sub-areas
- Open source software

Application: auto routing at arterial or collector level

Source: Lei Zhang. University of Maryland. "Developing Mesoscopic Models for the Before and After Study of the Inter-County Connector: Phase-One;"



Traffic Model (network) (intersection) (multimodal)

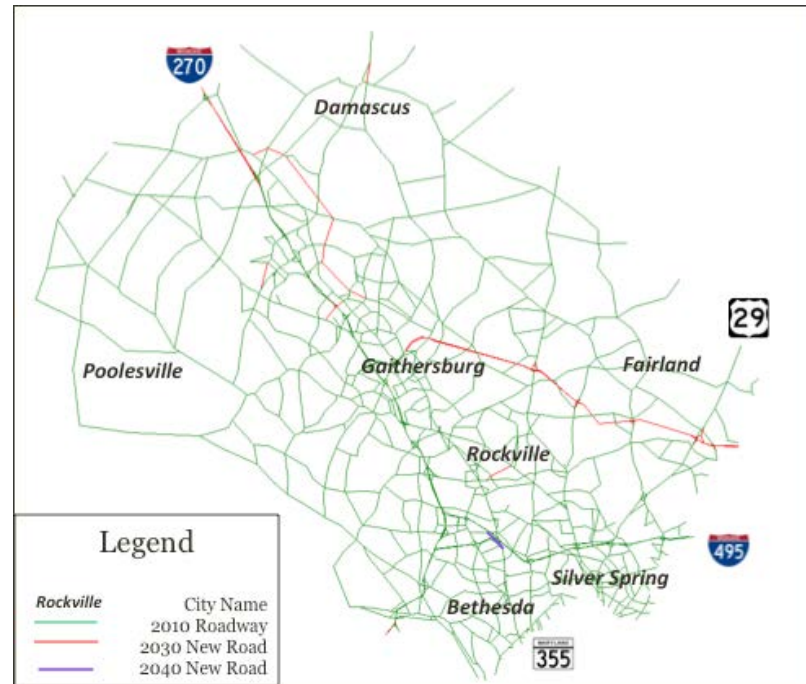


DTA Lite

- Assignment only – relies on network and OD outputs from regional model
- Re-estimates trip tables in finer time intervals
- Data-intensive; requires signal timing, queues, bottlenecks, departure timing
- Open source software

Application:

detailed auto assignment with response to queuing and signal controls



Source: "DTALite: A queue-based mesoscopic traffic simulator for fast model evaluation and calibration." Xuesong Zhou and Jeffrey Taylor. Cogent Engineering (2014), 1: 961345



Agent Based Model (ICC, I-270, US29)

- Individual is the unit of analysis
- Starts with OD output from regional model
- Re-estimation of refined OD time slices to match observed data
- Travelers iteratively adjust routes and departure times
- Open source software

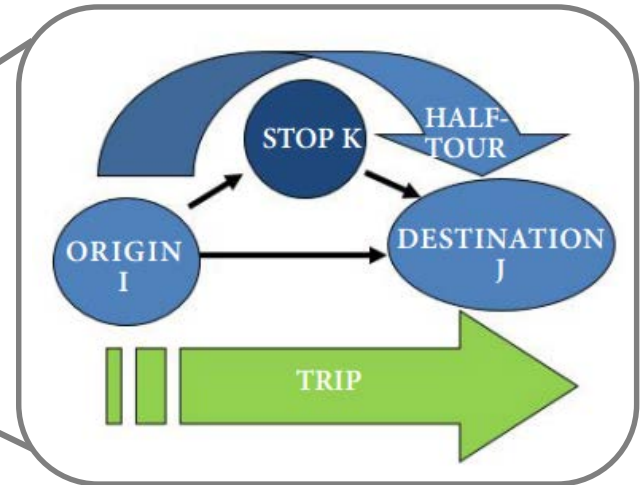
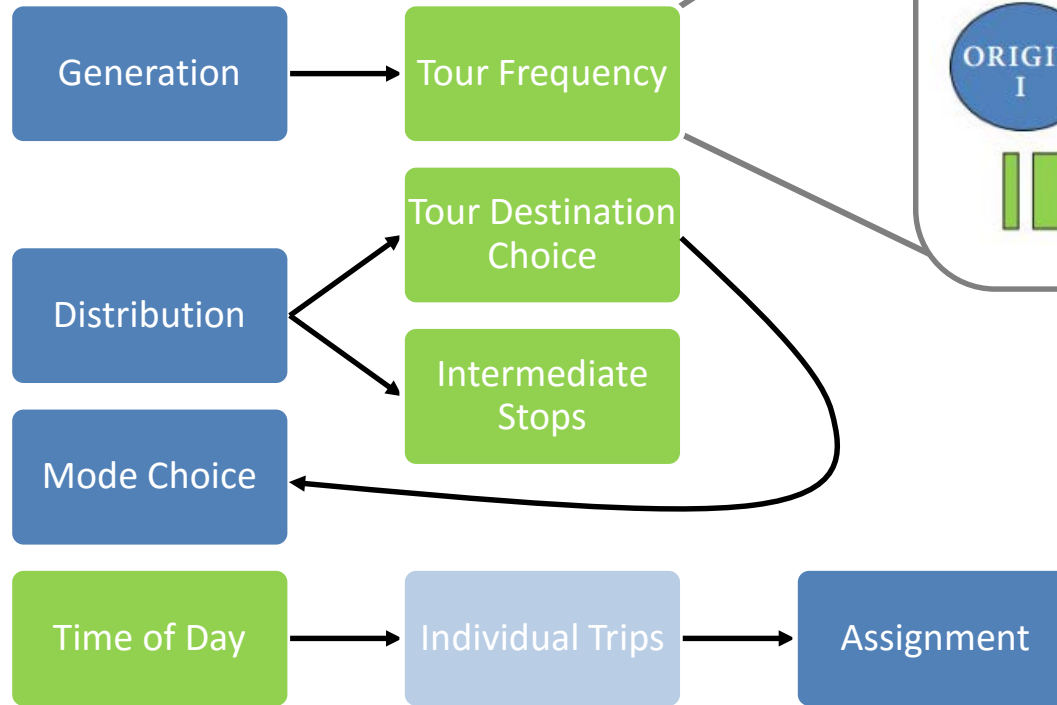
Application: detailed auto assignment with response to queuing and signal controls **and** individual departure times

Source: Lei Zhang. University of Maryland. "Developing Mesoscopic Models for the Before and After Study of the Inter-County Connector: Phase-One"



Simplified Tour Based Model

- Household is unit of analysis
- Twist on an old classic:



Source: CDM Smith. "Simplified Tour Modeling."

Application: analysis of linked trips for demand management or other policy analysis

Evaluation Criteria

Resources needed, categorized as:

- Tool development
- Tool maintenance
- Tool application
- Data needs
- Software/hardware needs



Next Steps

- Identification of “pros” and “cons”
 - Utility with respect to production of desired transportation performance metrics
 - Sustainability over time
 - Resource requirements (staffing, training, hardware, software, etc.)
- Development of a strategic plan
 - Consideration of MWCOG models development work program



Questions?

