Briefing on the Version 2.3 travel demand model

A presentation to the TPB

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What is Version 2.3?

- A transportation forecasting model for the Washington D.C. region which is about to be released
- A replacement to the currently adopted Version 2.2 travel model
- A tool envisioned to support many upcoming transportation planning efforts, including:
  - Air Quality Conformity Determination
  - CLRP Update
  - Project planning studies
  - Special scenario studies
  - Local planning studies

What does the Vers. 2.3 model actually do?

- It produces travel-related forecasts based on our best estimate of land activity projections, the future highway and transit system, and planned policy assumptions.

  Examples:

  - The number of trips generated from a specific area
  - Trip flows between jurisdictions, by purpose and mode of travel
  - Traffic volumes on major highway segments
  - Transit ridership
  - Vehicle miles traveled

- The model provides insight to “what if” type of questions

Transportation goals articulated in recent TPB / COG documents

- To provide a broad range of public and private transportation choices
- To maximizing accessibility
- To minimizing reliance upon single-occupant automobiles
- To create dynamic mixed-use activity centers with walkable environments
- To encourage transit oriented developments
- To foster sustainability and minimize ecological harm

Version 2.3 was developed with these goals in mind

What is most notable about the Version 2.3 travel model?

- Developed with the latest travel survey data available
- Developed using a more detailed zone system
- Several technical refinements have also been made…
  - Greater specificity of travel markets by trip purpose and by time of day
  - More detailed treatment of travel with regard to transit and pedestrian (walking and bicycle) modes

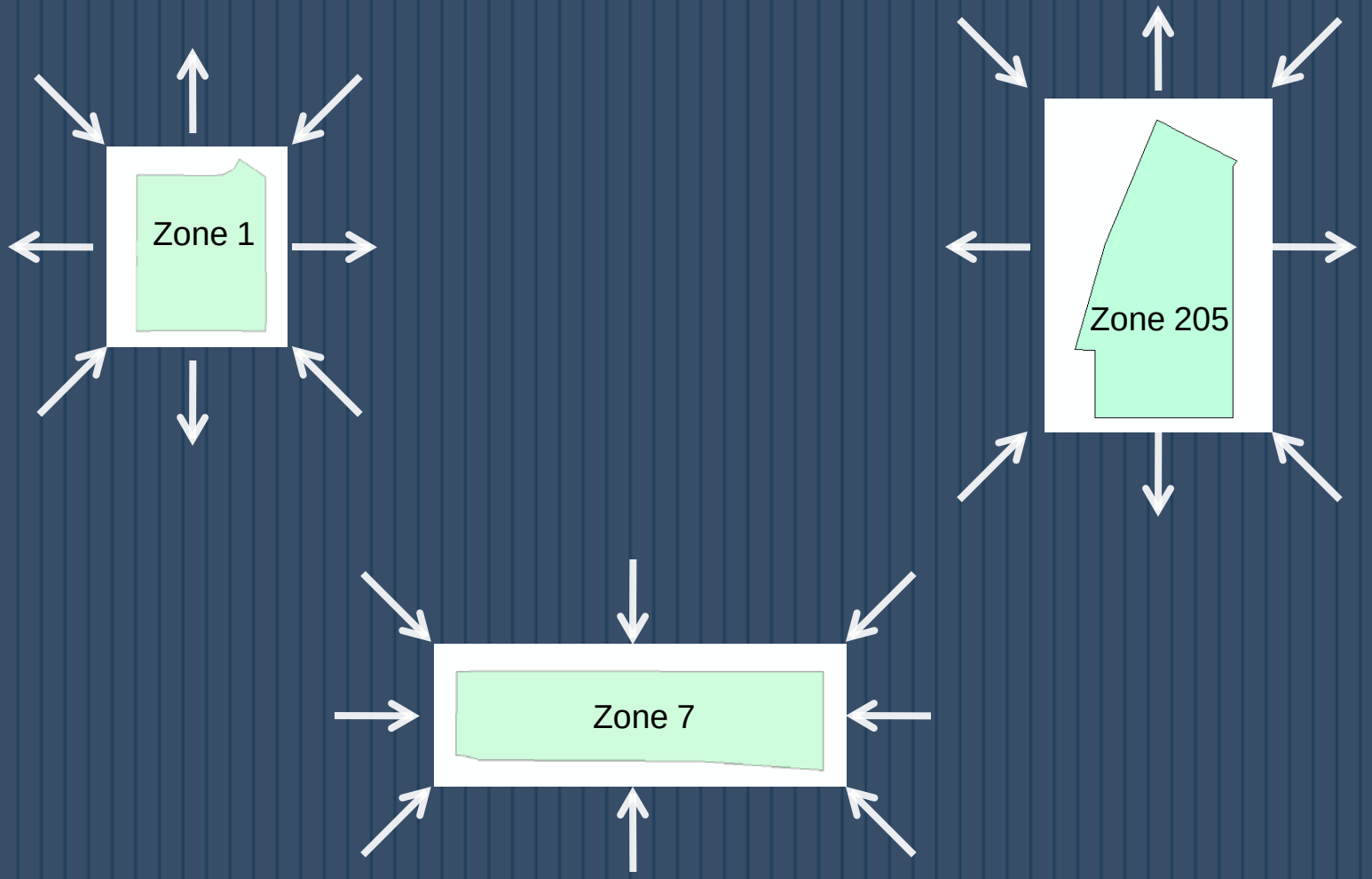
How does the transportation modeling process operate?

The model calculates *aggregate* zone-to-zone travel in four *sequential* steps:

1. Trip generation
2. Trip distribution
3. Mode choice
4. Network assignment

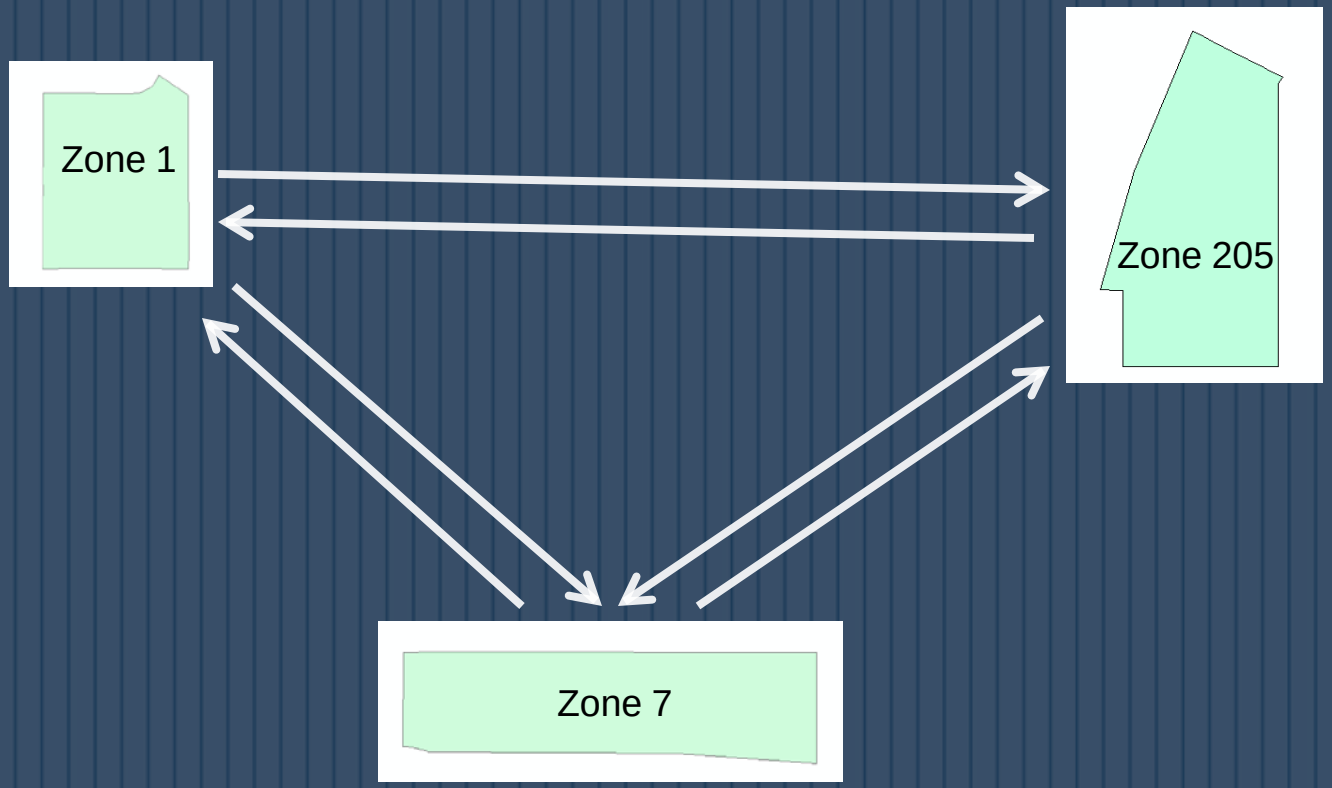
Step 1: Trip Generation

Person trips generated are calculated for each zone (or TAZ)



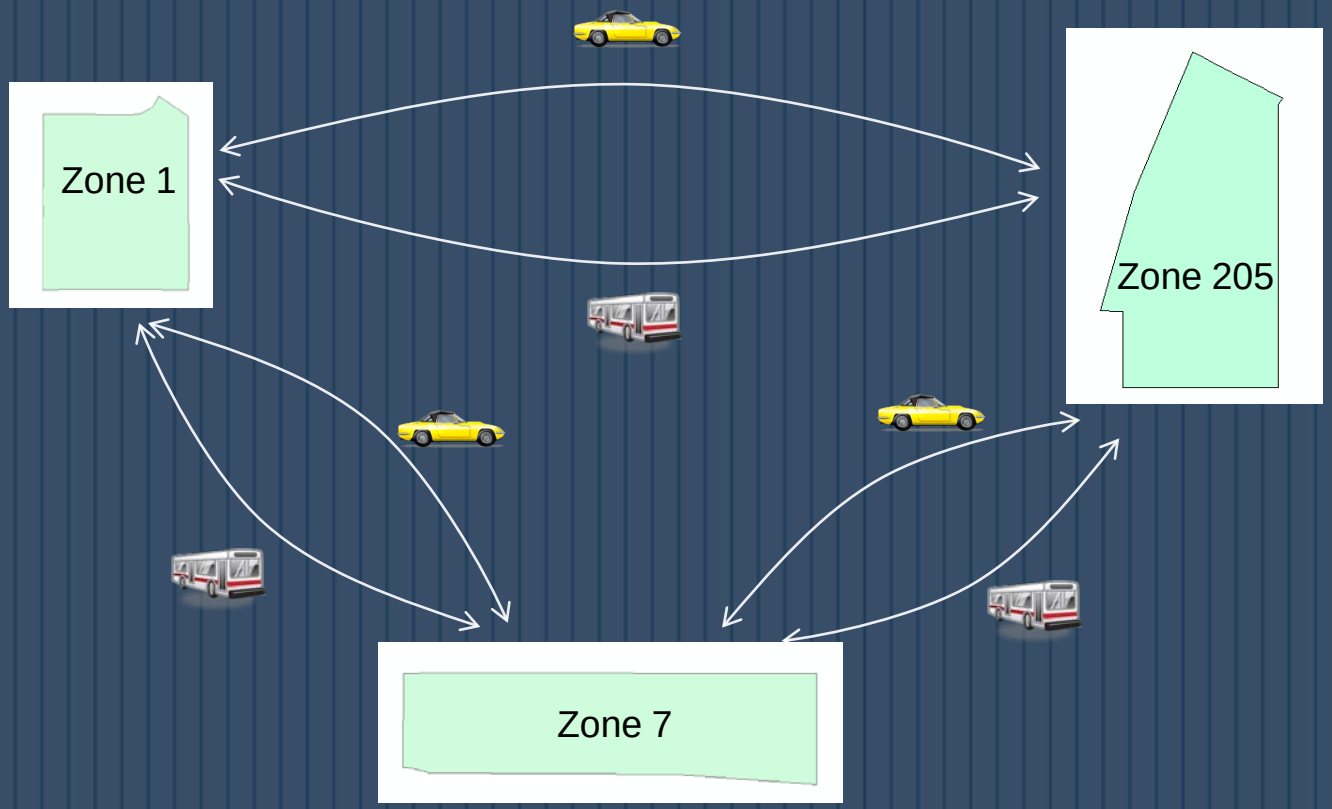
Step 2: Trip Distribution

The trips generated are next distributed among zonal destinations



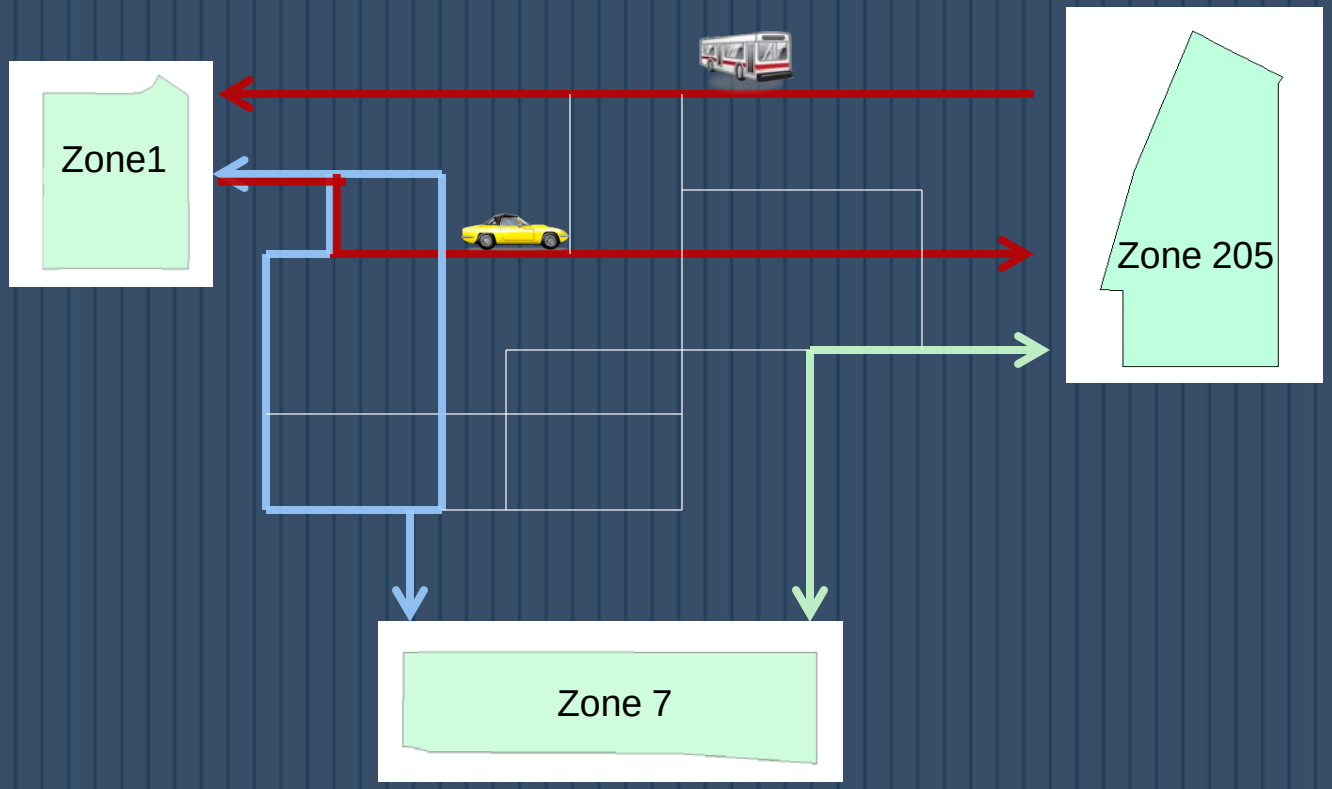
Step 3: Mode Choice

Person trips developed between zones are next apportioned by available travel modes



Step 4: Trip Assignment

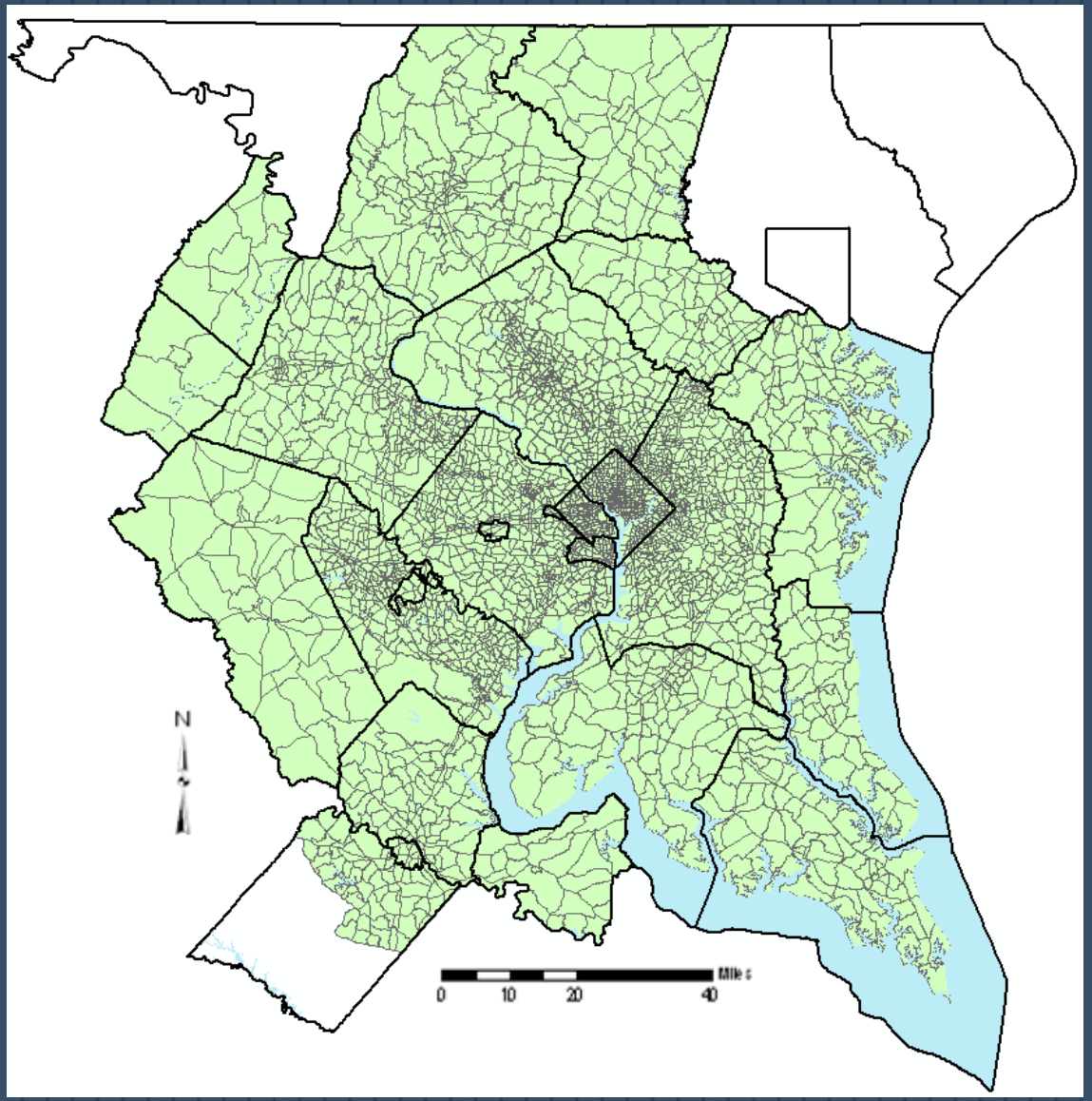
Finally, modal trip “flows” between zones are assigned to specific routes through the transportation network



Data supporting the Version 2.3 model

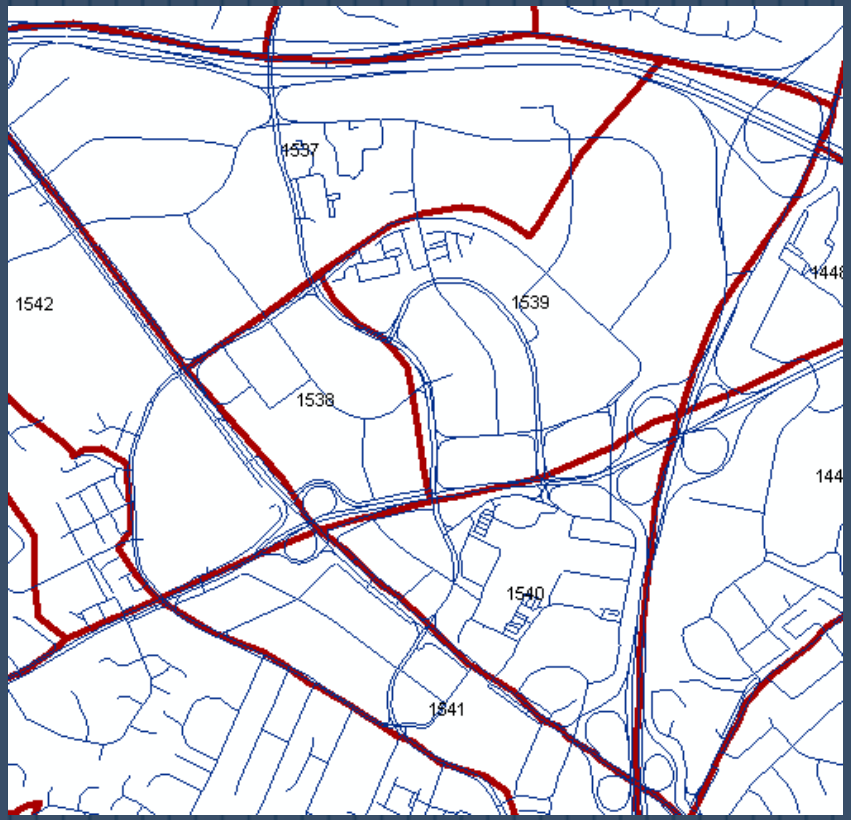
- The 2007/08 Household Travel Survey (HTS)
  - 11,400 household sample (over twice that of the 1994 HTS)
  - HTS survey area comprises entire modeled area (22 jurisdictions), in contrast to 13 jurisdictions surveyed in 1994
  - Designed to support both immediate trip-based model work as well as activity –based model work in the future
- Other information supporting the Version 2.3 calibration effort include traffic counts, transit on-board surveys, highway speed data, and the American Community Survey

Version 2.3 study area and 3,722 Transportation Analysis Zones (TAZs)

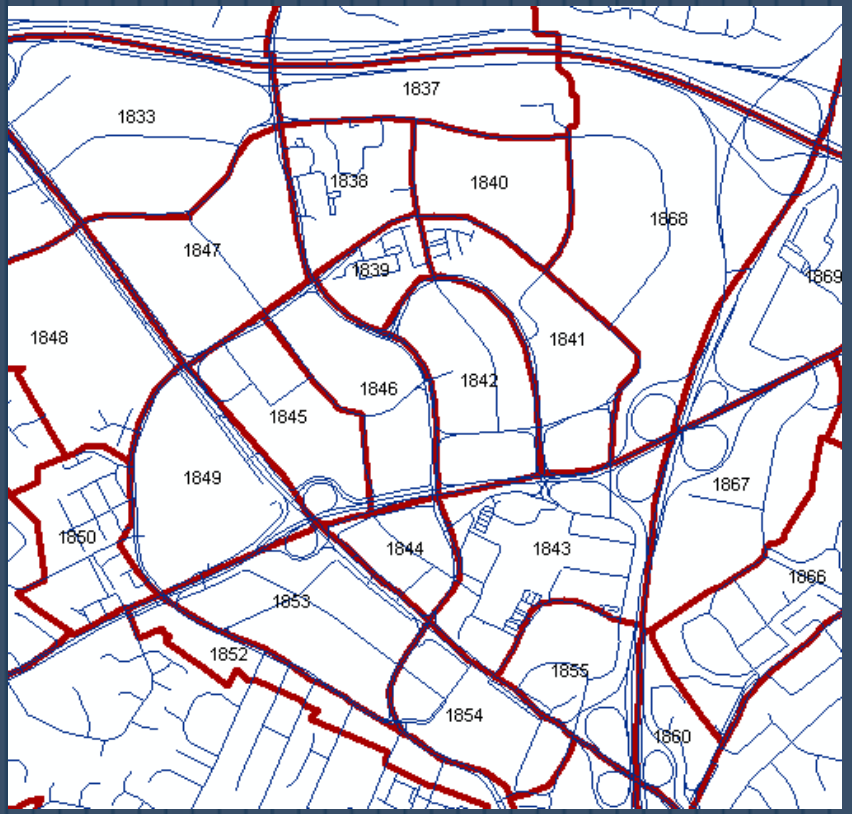


The current vs. new TAZ system: Tysons Corner Area

2,191 TAZ System

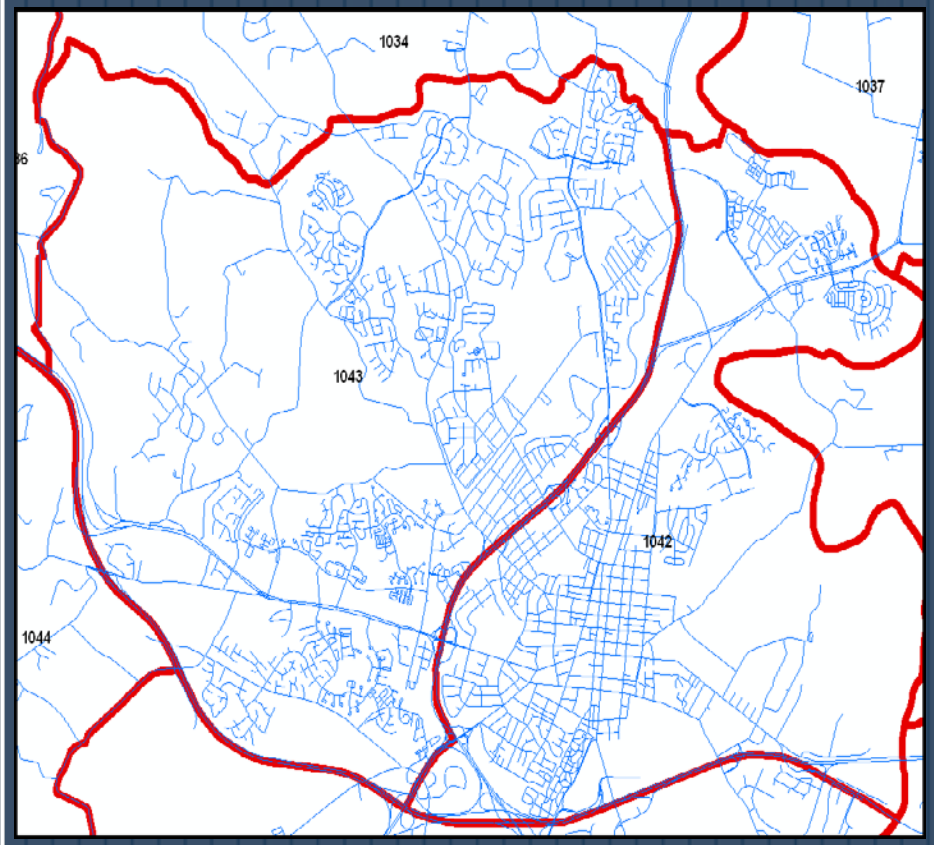


3,722 TAZ System

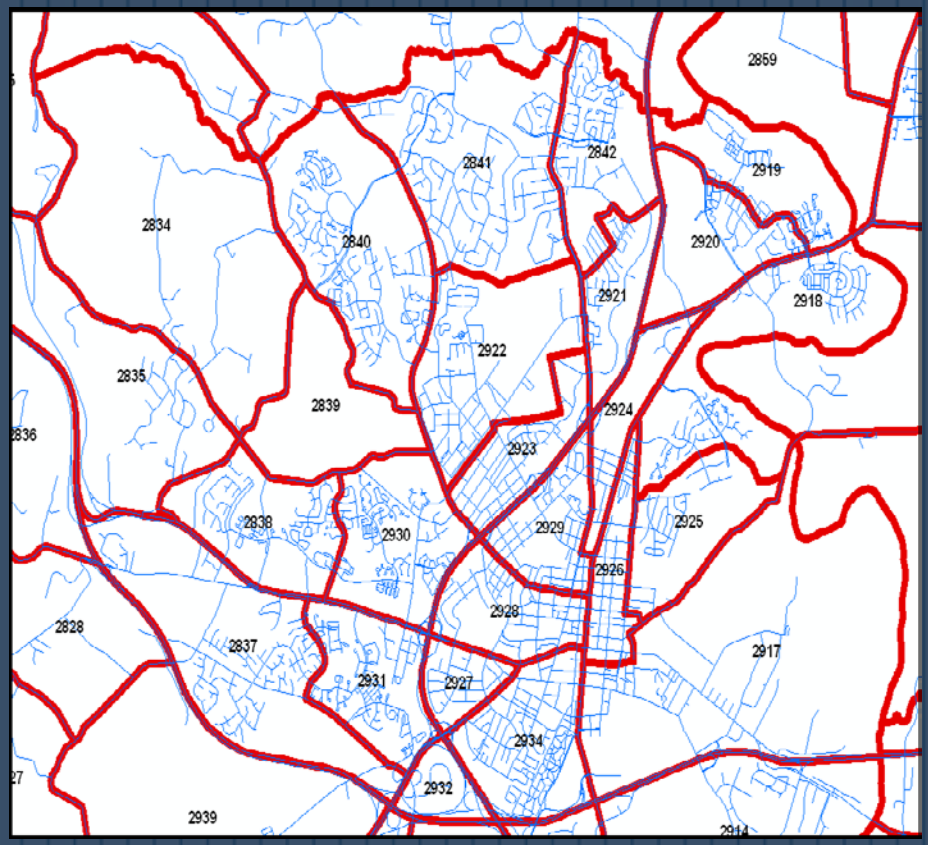


The current vs. new TAZ system: City of Frederick, Maryland

2,191 TAZ System



3,722 TAZ System



Version 2.3 Features: Trip generation -- Increased purposes and modes

Version 2.2 on 2,191 TAZ	
Purpose	Mode
Home-Based Work	Motorized
	Walk/Bike
Home-Based Shop	Motorized
Home-Based Other	Motorized
Non-Home-Based	Motorized

Version 2.3 on 3,722 TAZ	
Purpose	Mode
Home-Based Work	Motorized
	Walk/Bike
Home-Based Shop	Motorized
	Walk/Bike
Home-Based Other	Motorized
	Walk/Bike
Non-Home-Based Work	Motorized
	Walk/Bike
Non-Home-Based Other	Motorized
	Walk/Bike

Version 2.3 Features: A more detailed choice set & transit assignment capability

Version 2.2 Model Choice Set
Single Occupant Auto
2-Occupant Auto
3+Occupant Auto
Transit

Version 2.3 Model Choice Set
Single Occupant Auto
2-Occupant Auto
3+Occupant Auto
Commuter Rail
Bus Only
Bus-Metrorail
Metrorail Only

Version 2.3 Features: Time of day & traffic assignment- More time periods are addressed

Version 2.2 on 2,191 TAZ	
Time Period	Hours
AM Peak	6 AM- 9 AM
PM Peak	4 PM-7 PM
Other	12 AM- 6 AM 9 AM- 4 PM 7 PM- 12 AM

Version 2.3 on 3,722 TAZ	
Time Period	Hours
AM Peak	6 AM- 9 AM
PM Peak	3 PM- 7 PM
Midday	9 AM- 3 PM
Night and Wee Hours	12 AM- 6 AM 7 PM- 12 AM

Upcoming dates for the Version 2.3 model on 3,722-TAZ area system

- February 2011
  - Release of draft Version 2.3 model to TFS, along with documentation
  - Release of AQC draft scope of work to TPB Technical Committee, which identifies the selection of travel model
- March to October 2011
  - Testing of new travel model on AQC networks
  - Refinement to travel model, based on tests
- October 2011
  - Draft model results to Tech. Comm.
- November 2011
  - TPB approval of AQC determination
  - Ver. 2.3 travel model becomes **adopted model**

Conclusions

- Version 2.3 travel demand model is about to be released
- Includes several enhancements over the TPB's existing travel model capabilities
  - Informed by the latest survey data available
  - A substantially more detailed zone system
  - Larger set of purposes and modes are addressed
- Version 2.3 will be better equipped to answer questions being asked by decision makers