Status report on COG/TPB's travel demand modeling improvement efforts:

Overview and status of COG/TPB staff work

Ronald Milone, TPB Travel Forecasting Program Director

Metropolitan Washington Council of Governments
National Capital Region Transportation Planning Board

TPB Travel Forecasting Subcommittee

May 20, 2016

Strategic Plan Overview

Three phases over seven years:

1. Improvement of Trip-Based Model (FY 16-17)

2. Activity Based Model Development /Existing Survey Data (FY 18-20)

3. Activity Based Model Development /New Survey Data (FY 21-23)

FY 2016 Task Orders

T.O. #	Name	Responsibility	Date Authorized	Budget
16.1	Attend meetings/ad-hoc requests	CS	6/23/15	$50k
16.2	Advice and Testing	CS & TPB Staff	12/28/15	$60k
16.3	Managed Lanes	CS	2/10/16	$50k
16.4	Non-Motorized Model Enhancements	CS	2/10/16	$40k
16.5	Mode Choice Model Enhancements	CS	2/10/16	$85k
	Total:			$285k

T.O. 16.2 Advice & Testing: Tasks

1. Version Control and Bug-Tracking Software
2. Non-Resident Trips Update
3. Screenlines/Cutlines
4. Speed/Travel Time Validation Improvement
5. Migration of Transit Path-Building Software
6. Perform Transit Network Coding Enhancements
7. Include Transit Drive-Access Trips into Highway Assignment
8. Add External-to-Internal Transit Trips
9. Revise Bus Speed Linkage to Highway Speeds
10. Migration of Mode Choice Application Software
11. Walk-Access Script Enhancement
12. Develop Parcel-Level Development Database
13. Develop Census and Household Travel Survey Database
14. Prepare Non-Motorized GIS Database

Topics of Today's Discussion

- TPB staff progress on selected Task Order 16.2 activities

- CS will address progress on their assigned activities per T.O.s 16.2 -16.5

16.2 #2 Non-Resident Trip Update

- Current model addresses non-resident (NR) travel using exogenous auto driver trip tables that are "grown through time; supporting data is old

- Objective: an updated forecasting process that addresses auto and non-motorized NR travel

- Data source: Cellular O-D data obtained in FY 2014
  - Data allows NR O-Ds to be distinguished

  - NR trips account for 4.5% of all I-I cellular trips in the region

  - NR trip patterns reflect a spectrum of submarkets:
    - Airport travelers
    - Visitors, tourists
    - Business travelers, conventioneers
    - Military personnel
    - Temporary employees working in the region
   - University students/teaching staff
    - Hospitals
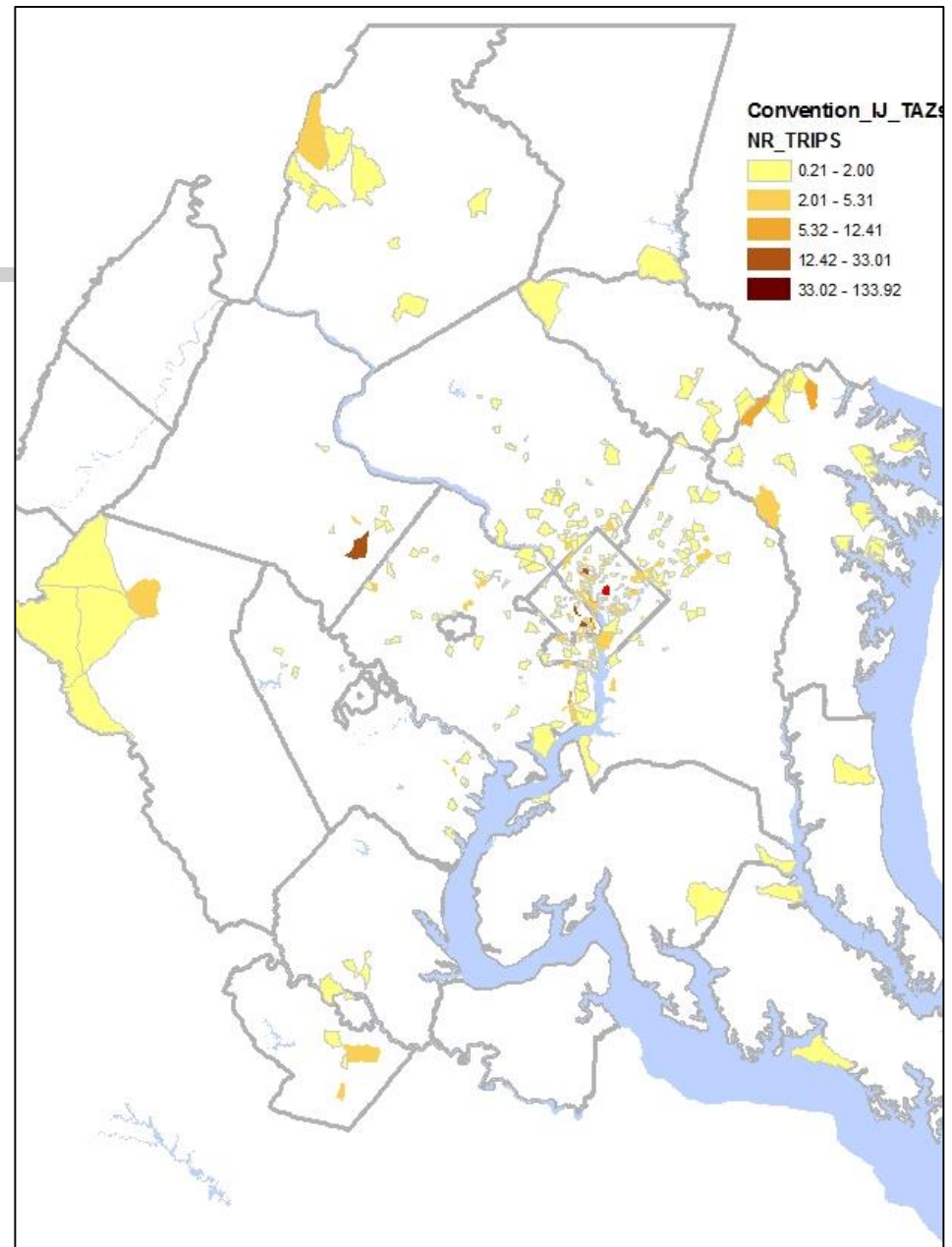
16.2 #2 Non-Resident Trip Update

- Approach used to understand cellular O-D patterns of non-residents
  - NR zonal trip-ends have been summarized
  - High-NR-generator TAZs have been identified
    (defined as >1,500 NR trip-ends per day)
  - High-NR-generators (and land use) have been visually evaluated
    - Airports, museums/monuments, federal facilities, universities, military installations
    - Vast majority high-NR generators are in the District of Columbia
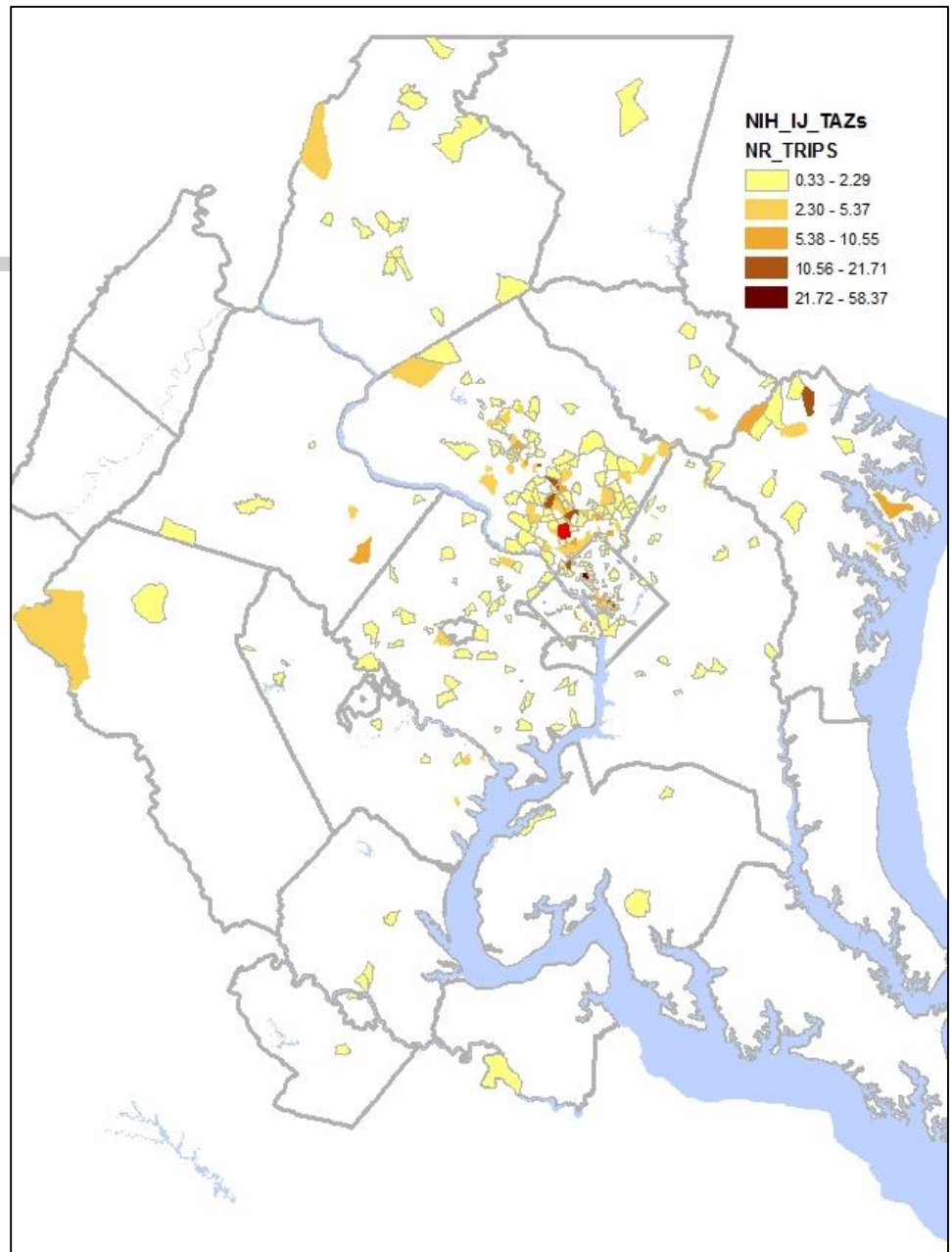 - Analysis is on-going

Non-Resident cellular trips from Andrews AFB

Andrews_IJ_TAZs
NR_TRIPS
- 0.21 - 4.95
- 4.96 - 16.17
- 16.18 - 44.41
- 44.42 - 105.26
- 105.27 - 342.31
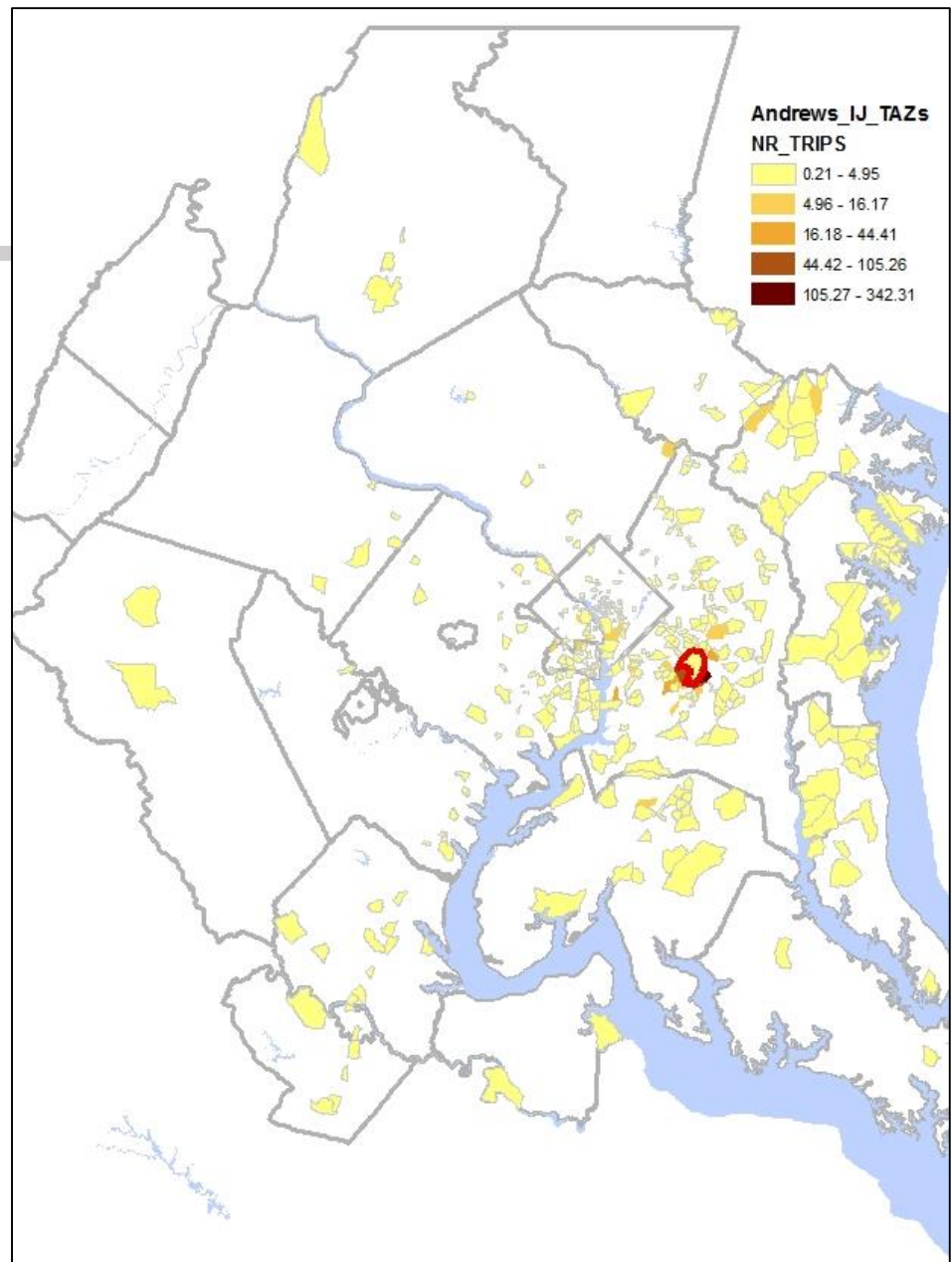
Non-Resident cellular trips from the Convention Center in downtown DC

Convention_IJ_TAZ
NR_TRIPS
- 0.21 - 2.00
- 2.01 - 5.31
- 5.32 - 12.41
- 12.42 - 33.01
- 33.02 - 133.92

Non-Resident cellular trips from NIH campus in Bethesda

NIH_IJ_TAZs
NR_TRIPS
- 0.33 - 2.29
- 2.30 - 5.37
- 5.38 - 10.55
- 10.56 - 21.71
- 21.72 - 58.37

16.2 #3 Screenlines/Cutlines

- 35 standard screenlines are currently used model evaluation purposes

- 23 additional screenlines have been added

- 1 existing screenline has been modified/extended
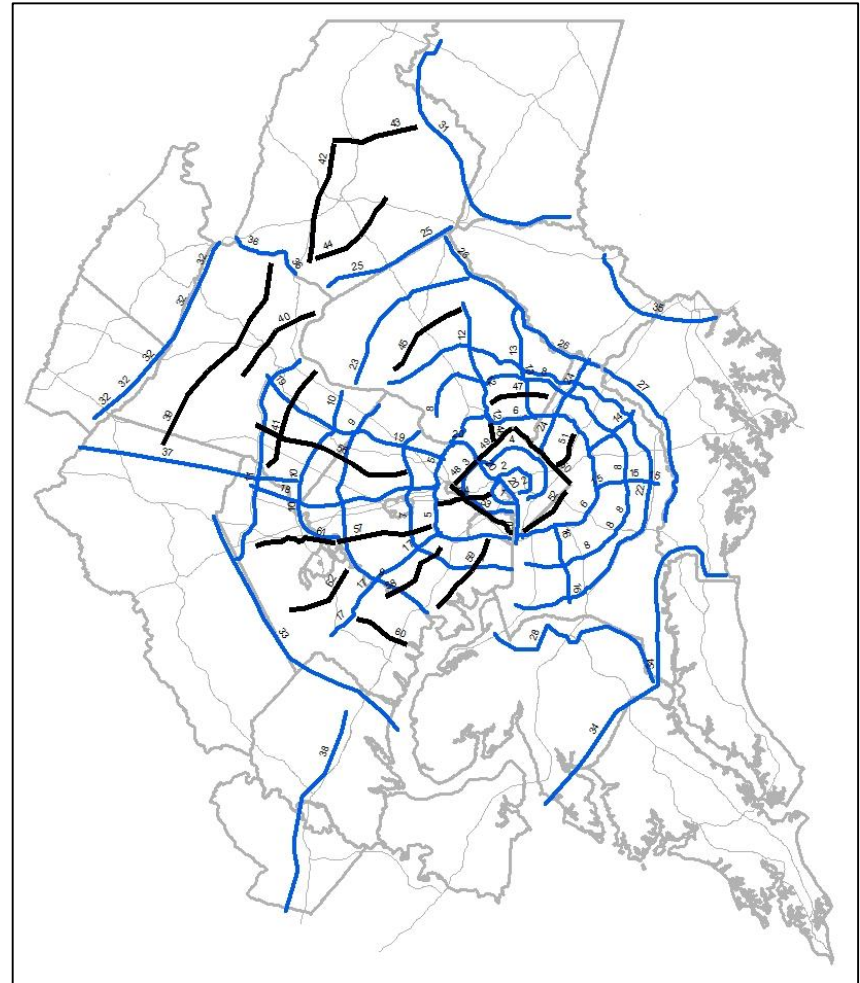
16.2 #8 Add NR Transit Trips

- Current model does not currently address this market

- Affects all transit modes; we'll start with Metrorail-related transit

- Includes a wide spectrum of travelers, for example:
  - Commuter rail riders from Baltimore transferring at Union Station
  - Business/leisure airport travelers using National Airport Station
  - Tourists using Metrorail to see the sights

- NR travelers comprise about 5% of Metrorail trips system-wide, but a substantial portion of Metrorail trips at certain stations:
  - Arlington Cemetery (70%)
  - National Airport (27%)
  - Union Station (16%)
  - Smithsonian (16%)
  - Woodley Park Zoo (8%)
  - College Park (7%)
  - Navy Yard (7%)

  Source: 2007 Metrorail Survey

Approach

- Developed by W. Allen/Stump Hausman & AECOM

- Develop NR trip tables for 7 sub-markets:
    1. HBW   auto access
    2. HBnonW auto access
    3. HBW   non-auto access
    4. HBnon-W non-auto access
    5. NHB   visitor/tourist
    6. NHB   business-related
    7. Air Passenger

- Essentially zonal MR trip tables serve as "seeds" for a Fratar process

- Growth factors based on both traffic growth at external stations and employment growth at nearby Metrorail stations

Test Results of NR Transit Model

Non-Resident Market	Obs.2007	Est. 2040
HBW auto access	3,100	5,300
HBnonW auto access	1,600	3,300
HBW non-auto access	9,000	13,900
HBnonW non-auto access	2,900	5,200
NHB visitor/tourist	10,600	17,100
NHB business-related	4,000	7,100
Air Passenger	1,700	5,400
Total	32,900	57,300

16.2 #6: Transit Coding Enhancements

Staff is initiating several transit line coding enhancements:

1. Consolidating mode codes
   - Local Metrobus (M1) & Local Ride-On bus (M6) would be collapsed into one mode group, for example
2. Explicitly addressing ground-to-mezzanine elevator length as part of the walk access time (as a station attribute)
3. Coding express bus transit lines with explicit "board-only" and "alight-only" nodes
4. CS tasks (regarding bus speed and non-motorized modeling) will require additional coding changes

Concluding Comments

- TPB's Strategic Travel Models Improvement plan is set

- Now in Phase 1 of 3 (Trip-based model improvements)

- Developmental work is on-going

- We envision Phase 1 completion by end of FY 2017 (a new model release)

- The TFS will receive periodic updates on progress