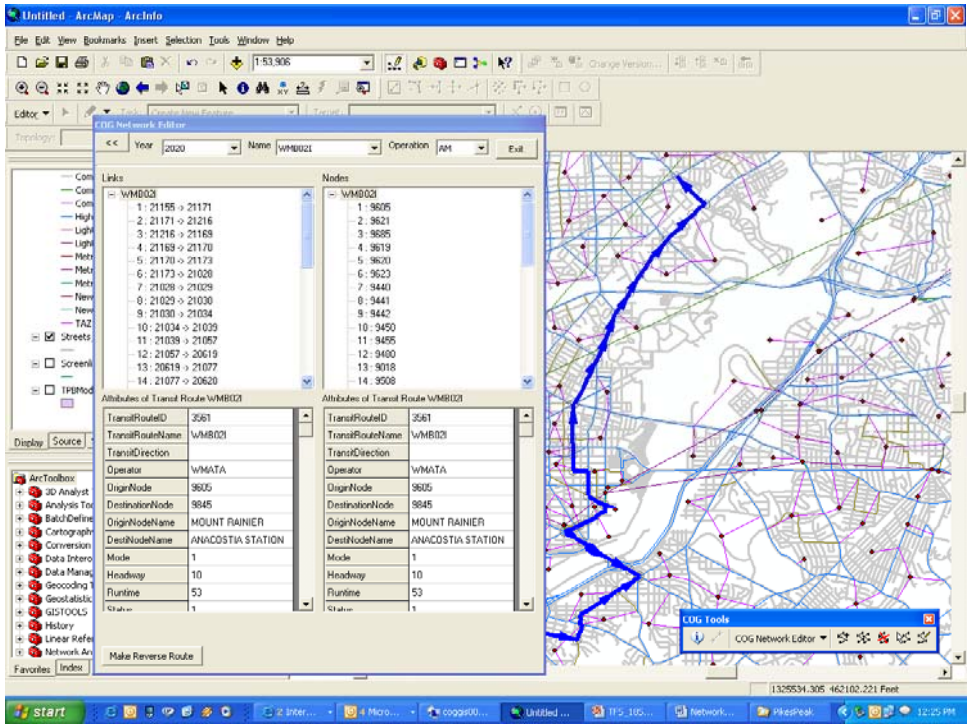
Network Development: Status Report



Robert Snead, COG/TPB
Meseret Seifu, COG/TPB

Presentation to the TPB Travel Forecasting Subcommittee
May 21, 2010

Background

- TPB staff completed adding new facilities (links) to ensure consistency with the new finer-grained TAZ system, created new TAZ centroids, and connected the TAZ centroids to the highway network.
- Network updates were made to the TPB multi-modal and multi-year master highway network geodatabase (TPBMAN) using GIS database application tools (COGTools) developed by DCI, Inc.
- The highway network inputs to the regional travel model, for year 2007, were exported from the network geodatabase.

Update: Network Development

- Developing a 2007 calibration year network has been the primary focus
  - 2007 network exported from TPBMAN and brought into Cube
  - Comparison between Cube built network & TPBMAN export network
  - During this time, corrections have been made to the Cube network and the TPBMAN database independently in an attempt to speed delivery of the final 2007 network

Update: Network Development (Continued)

- Addressing comments received from jurisdictions regarding centroid connectors
  - Feedback received from Prince George's, Frederick and Prince William Counties
  - Added additional connectors & removed connectors based on local knowledge of how/where TAZ loads to street network
  - Network features affected were altered as necessary to accommodate these changes (moved nodes, split, etc.)

Status of Network Development Process:

Step	Status
Finalize 3,722 TAZ system	Complete
Add new road links, since more TAZ means a more detailed road network	Complete
Create new centroids for each TAZ	Complete
Add centroid connectors	Complete
Add network detail that was omitted in the past due to software limits	Complete
Add network components representing transit infrastructure	Complete
Export highway and transit networks from GDB into Cube format for further review and modeling	Complete
Review transit route coding and make updates	complete
QC/QA: Highway network (tree tracing, etc.)	On going
QC/QA: Transit network (tree tracing, etc.)	On going

Exporting 2007 Highway Network Inputs

- There are two ways to export Cube highway network inputs from the TPBMAN geodatabase:
  - *TP+ Input File (Link.ASC and Node.ASC)*
  - *Personal Geodatabase (Link and Node Feature classes)*
- The personal geodatabase format is being used to export the 2007 highway network inputs from the TPBMAN geodatabase.
- The 2007 highway network was built in CUBE base, using geodatabase line and point feature classes.
- The following three attributes are now included in the highway network, in addition to existing link attributes:
  - EDGEID: geometry network link identifier
  - LINKID: highway network link identifier
  - Shape_Length : “True Shape” geometry length (in feet)- this attribute was used to compute distance in hundredths of miles

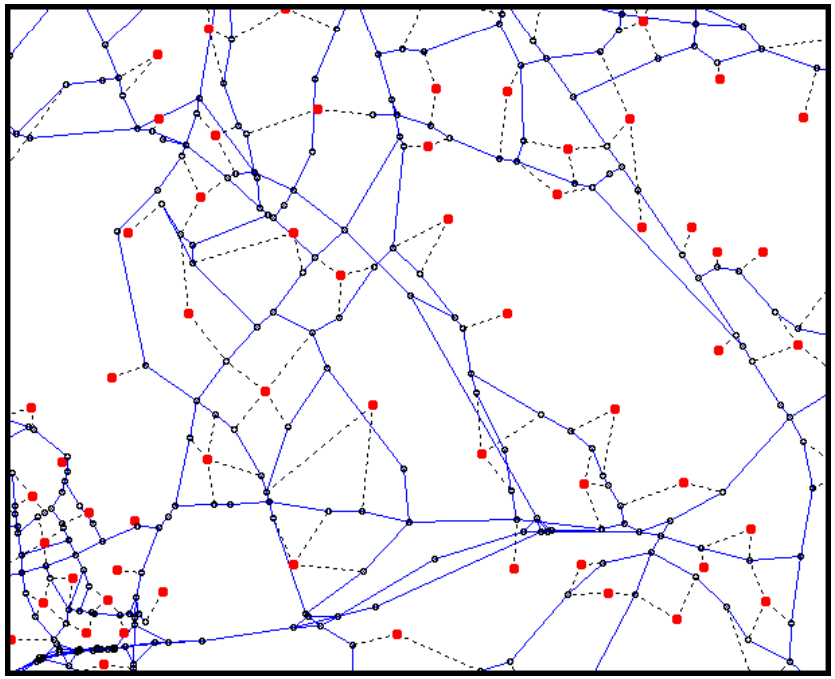
2007 Cube Base Network

- TP+/Voyager scripts were developed and used to extensively check the accuracy of network attributes and identify previous year network links that needed to be removed from the TPBMAN database.

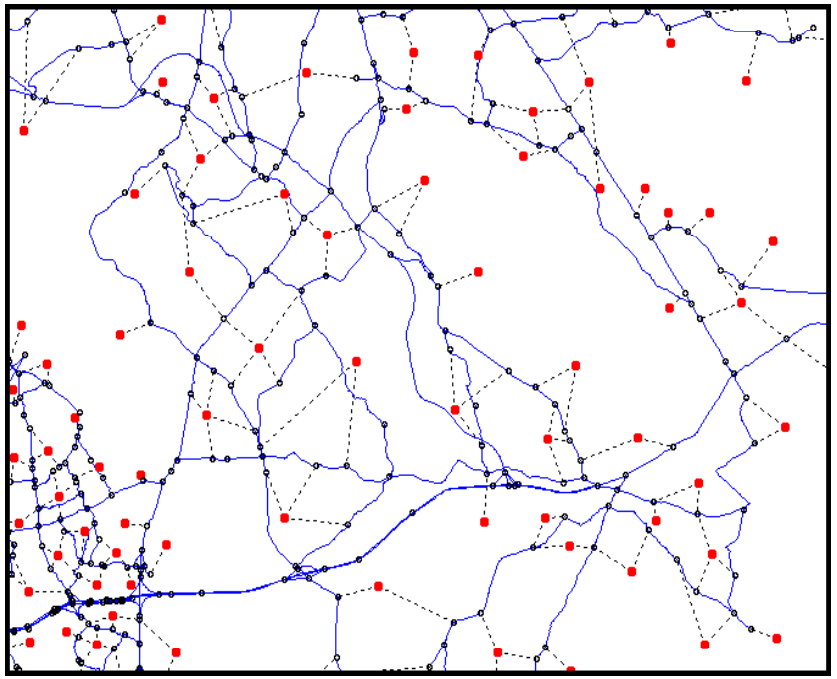
- Highway path building, to check the connectivity of the network continues.

2007 Highway Network

Without “True Shape”



With “True Shape”



Comparison of the 2007 and 2010 Highway Networks

- Comparison was made between the 2010 highway network as per the 2009 CLRP/FY 2010-2015 TIP Air Quality Conformity analysis and the new 2007 highway network:

	2010 Conformity Network	2007 Highway Network	Percent Increase
Internal/used TAZs	1,972	3,662	86%
Centroid Connectors and Highway Links	28,209	45,988	63%
Centroid Connectors	7,780	15,192	95%

Comparison of the 2007 and 2010 Highway Networks (continued)

Facility Type	Existing 2,191 Network (2010)	Updated 3,722 Network (2007)	Percent Change
Freeways	2,584	2,574	-0.4%
Major Arterials	6,764	9,467	40.0%
Minor Arterials	4,337	6,874	58.5%
Collectors	5,696	10,827	90.1%
Expressway	334	336	0.6%
Ramps	714	718	0.6%
Total	**20,429**	**30,796**	**50.7%**

- Number of freeway links is essentially unchanged
- Moderate increase in the number of arterial links is due to added links needed to maintain consistency with the greater number of TAZs
- Large increase in the number of collector links is due to:
  - added links due to finer zone grain
  - added transit station PNR centroid connectors are coded as collectors

Next Steps

- Review additional comments submitted by local and state agencies
- Incorporate comments and continue network updates resulting from reviews of highway network attributes and transit network lines and support files
- Complete the development of base year (2007) highway and transit networks and support files on the new zone system:
  - finalize highway and transit network building scripts
  - Validate paths
- Complete development of highway and transit networks and files for forecast year 2030, then for 2010, 2020, and 2040