Travel Demand Modeling for the *Mt Juliet Comprehensive Transportation Plan*

presented by

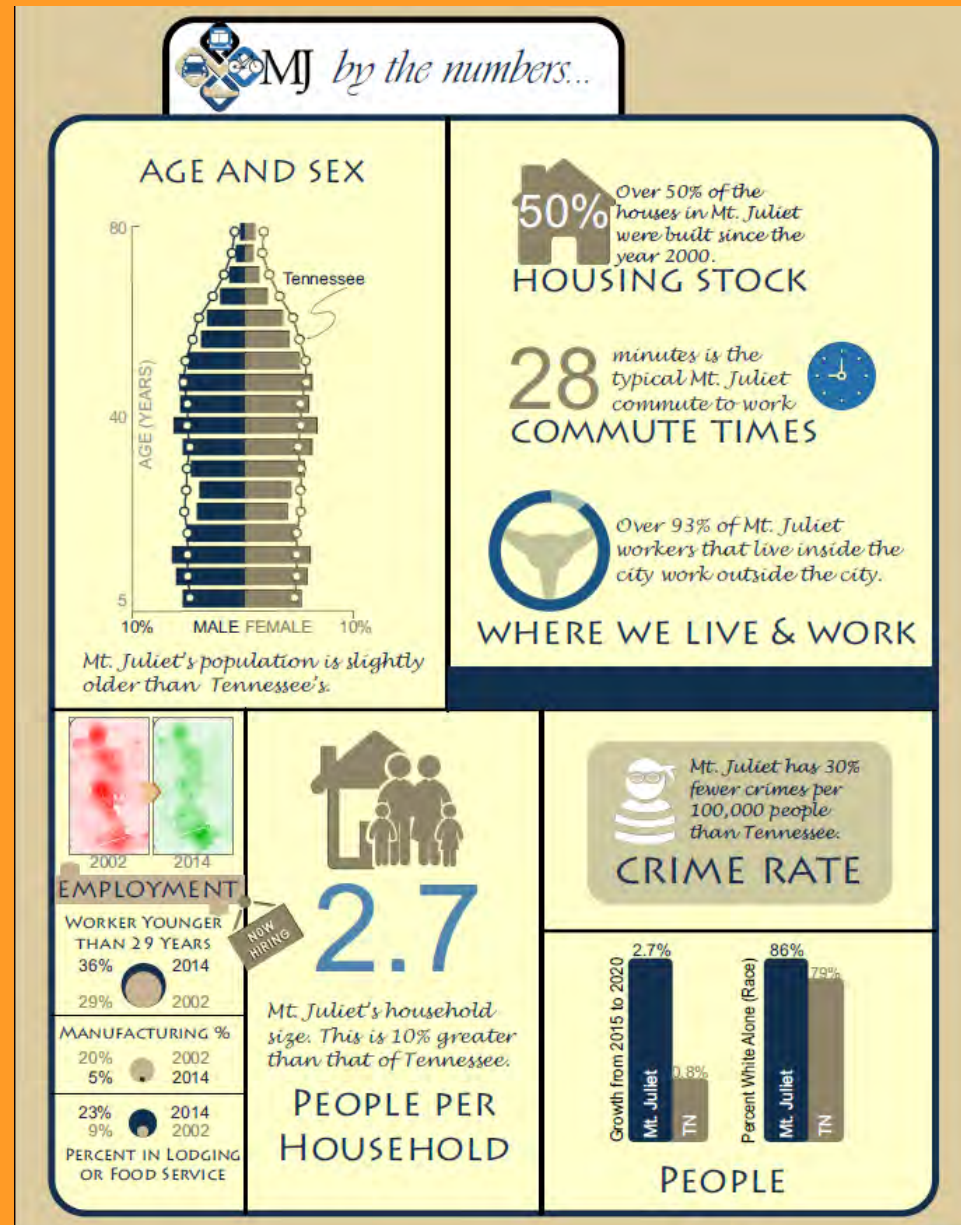**Robert G. Schiffer, AICP, Stantec Consulting Inc.**

Tennessee Model Users Group

October 19, 2016

Presentation Overview

- Study Background
- Nashville 2010/2040 Model
- Subarea Model Validation
- Preliminary Results
- Model Application Tips
- Next Steps

Study Background

- Task 1: Development of Vision, Goals, Objectives, and Investment Strategies
- Task 2: Stakeholder and Public Involvement Plan and Activities
- Task 3: Inventory of Existing Conditions
- Task 4: Assessment of Current and Future Needs
- Task 5: Transportation Recommendations
- Task 6: Best Practices Guidebook
- Task 7: Workbook, Adoption and Implementation

Mt. Juliet Multimodal Long Range Transportation Plan
Project Work Plan

Stantec

Stantec | 601 Grassmere Park Road Suite 22
Nashville, TN 37211
(615) 885-1144

May 2016

Stantec

Study Background (Cont'd)

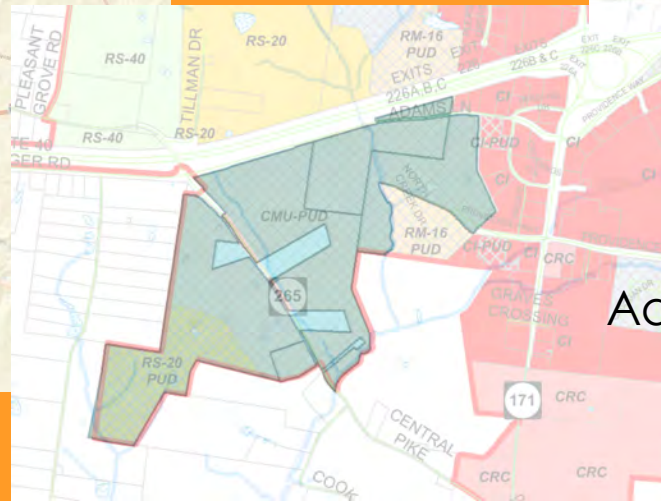- Outreach has included an interactive online map for folks to provide input
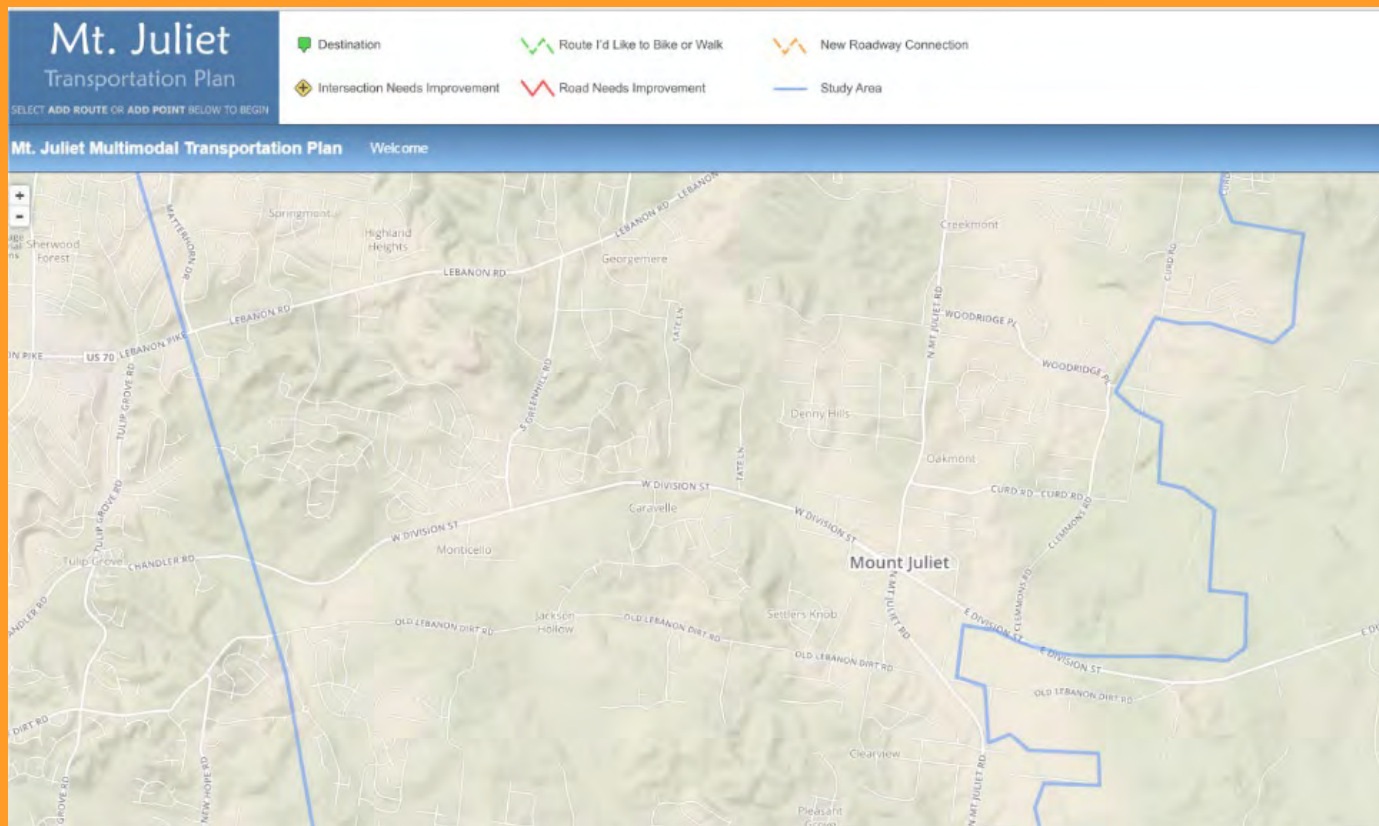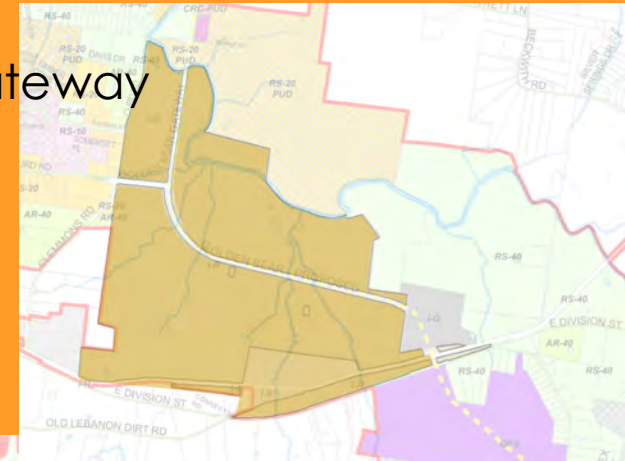
Study Background (Cont'd)

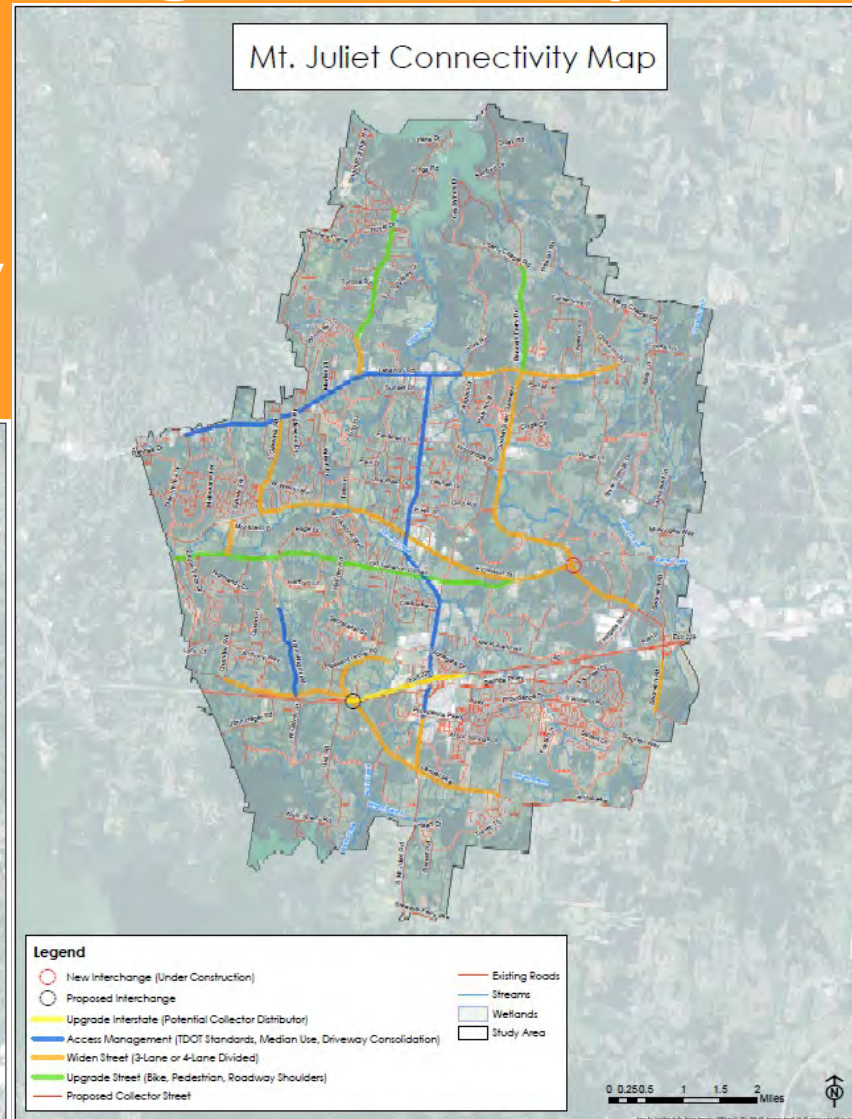- Catalyst Sites – 2 sites were chosen based on potential for rapid development
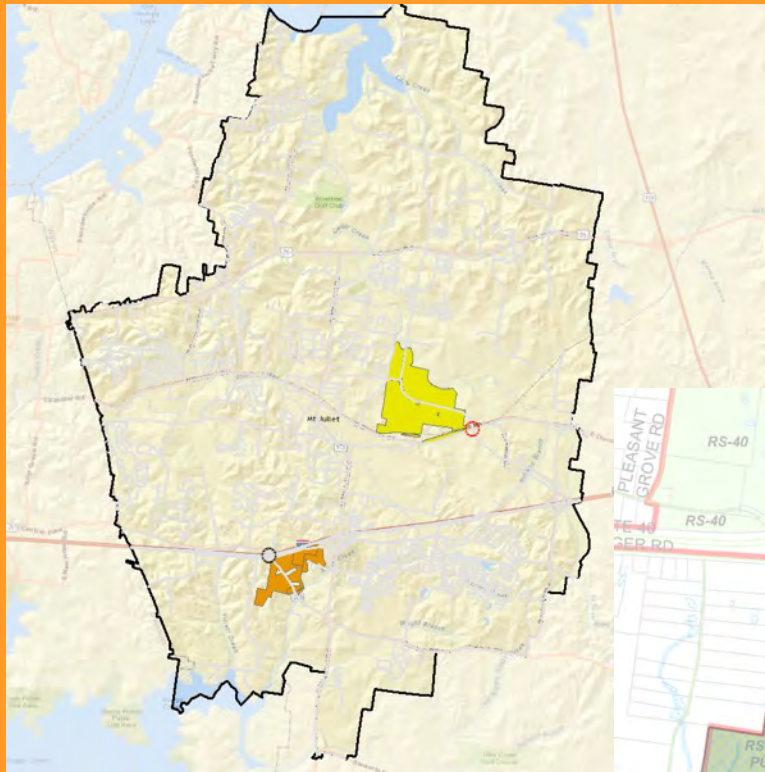
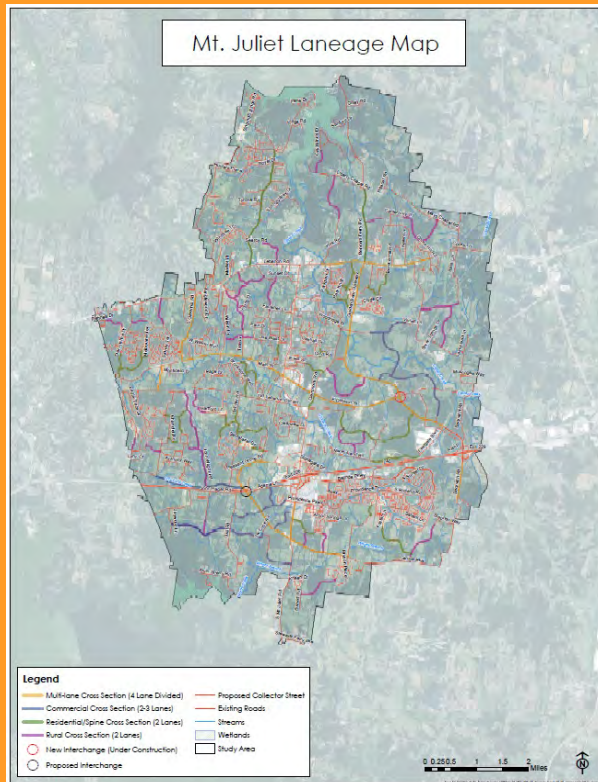
Golden Bear Gateway

Adams Parkway

Stantec

Study Background (Cont'd)

- Proposed Connectivity & Laneages

Mt. Juliet Laneage Map

Mt. Juliet Connectivity Map

Stantec

Nashville 2010/2040 Model

- Model recently updated to base year 2010 & future year 2040

- Request for model files includes filling out MPO's data sharing agreement & travel demand model data request form

- Model covers 7 counties:
  1. Davidson County (Metro-Nashville)
  2. Maury County
  3. Robertson County
  4. Rutherford County
  5. Sumner County
  6. Williamson County
  7. Wilson County (Mt. Juliet)

NASHVILLE AREA
Metropolitan Planning Organization

DATA SHARING AGREEMENT

Last Updated: March 23, 2016

APPENDIX A
Nashville Area MPO

TRAVEL DEMAND MODEL DATA REQUEST FORM

1. **Requestor Information:**

Firm/Organization:_____

Requested by:_____ Title _____

Address:_____ City _____ State ____ ZIP _____

Phone _____ E-Mail _____

Request is for work on behalf of ;   □ Public Agency   Contact   Organization
□ Private Agency   Phone   E-Mail

2. **Project/Study Information:**

Project/Study Title

Scope of Work

Data Usage Plan

New Model Run(s) by MPO?   □ Yes; Describe the nature of new Scenario(s) below
□ No

Nature of the New Scenario(s) & Model Usage

New Model Run(s) In-house?   □ Yes (□ includes alternative land use scenarios*; or □ No); Describe below
□ No

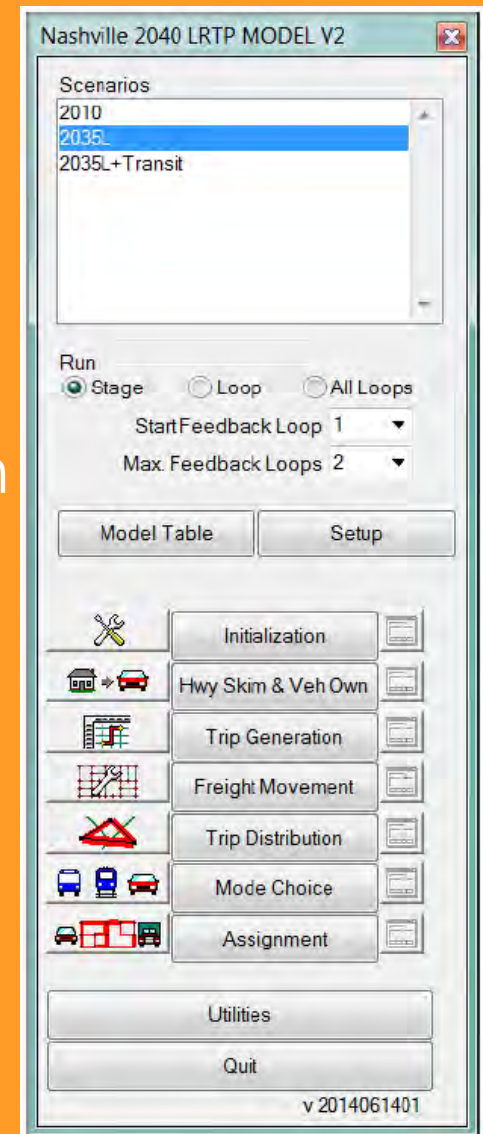Model set-up and Scenario build-up/Run Plan

*Model needs MPO-version 'PopSyn II' pre-processed in case of land use alternative runs

Page 1 of 2

Stantec

Nashville 2010/2040 Model (Cont'd)

- Major enhancements vs. the prior 2035 model include:
  - All-road network based on the Tennessee Roadway Information Management System (TRIMS)
  - Population synthesizer
  - Vehicle-ownership model
  - New trip purposes
  - Destination-choice model for passenger trips (gravity model still used for trucks and externals)
  - Integrated mode-choice model

Nashville 2040 LRTP MODEL V2

Scenarios
2010
2035L
2035L+Transit

Run
○ Stage   ○ Loop   ○ All Loops
Start Feedback Loop 1
Max. Feedback Loops 2

Model Table   Setup

Initialization
Hwy Skim & Veh Own
Trip Generation
Freight Movement
Trip Distribution
Mode Choice
Assignment

Utilities

Quit

v 2014061401

Stantec

Nashville 2010/2040 Model (Cont'd)

- New person trip purposes in model:
  - Home-Based Other (HBO)
  - Home-Based Work (HBW)
  - Home-Based Pickup/Delivery (HBPD)
  - Home-Based School (HBSCH)
  - Home-Based Shop (HBS)
  - Non Home-Based Work (NHBO)
  - Non Home-Based Other (NHBW)

- 3 airport trip purposes added: Air HBO, Air Visit, Air NHBW (from Raleigh model)

- Also Multi-Unit Trucks, Single-Unit Trucks, & Commercial Vehicle components
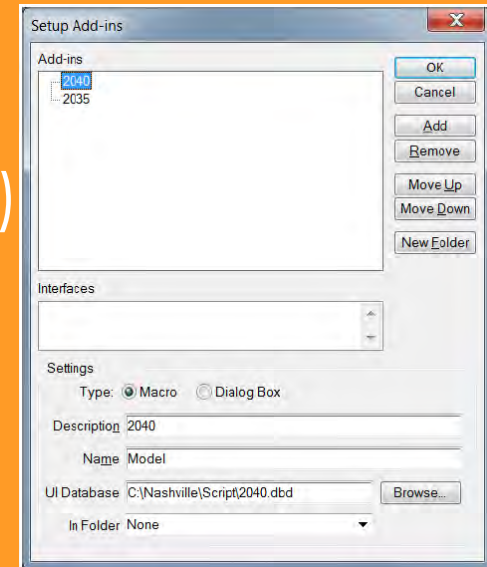
Subarea Model Validation

- Review regional validation statistics
- Review screenline volume-over-count ratios in Mt. Juliet/Western Wilson County

8.4.4 Screen Line and Cut Line Volumes

Table 8-7: Volume-to-Count Percent Difference of Screen Line / Cut Lines

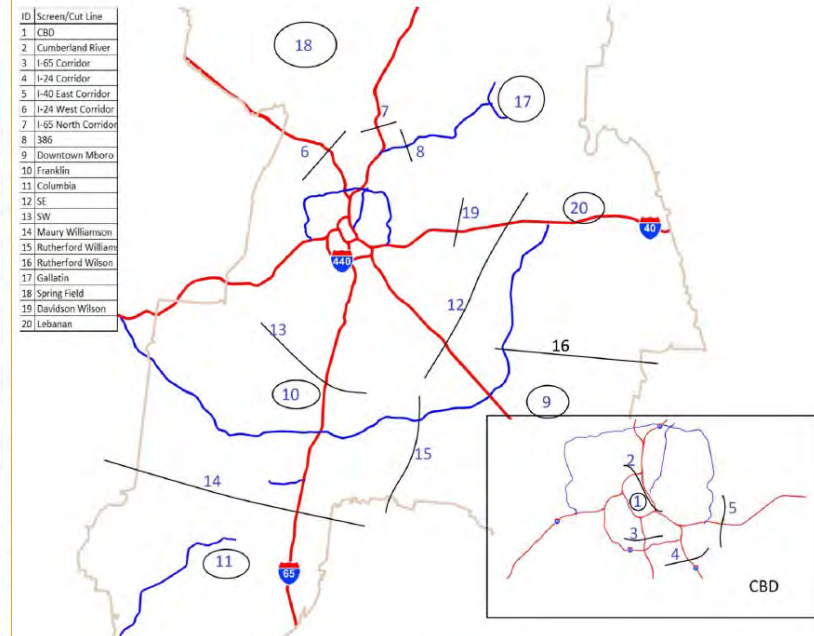| ID	Screen/Cut Line	Model	Counts	Number of Counts	% Error	FHWA standard
1	CBD	150,412	131,460	11	14%	21%
2	Cumberland River	302,839	299,800	8	1%	19%
3	I-65 Corridor	160,538	154,312	5	4%	20%
4	I-24 Corridor	180,593	187,281	5	-4%	19%
5	I-40 East Corridor	170,674	159,406	4	7%	20%
6	I-24 West Corridor	82,223	74,551	6	10%	29%
7	I-65 North Corridor	89,694	83,734	3	7%	21%
8	386	100,776	95,799	4	5%	21%
9	Downtown Mboro	134,265	157,571	11	-15%	20%
10	Franklin	138,123	157,824	9	-12%	20%
11	Columbia	66,457	75,316	9	-12%	21%
12	SE	91,409	99,157	6	-8%	21%
13	SW	126,629	127,790	6	-1%	21%
14	Maury Williamson	55,992	51,465	6	9%	21%
15	Rutherford Williamson	12,482	12,215	6	2%	25%
16	Rutherford Wilson	26,503	23,634	5	12%	25%
17	Gallatin	87,357	99,772	11	-12%	21%
18	Spring Field	28,692	25,966	7	10%	25%
19	Davidson Wilson	116,056	102,462	5	13%	21%
20	Lebanan	47,779	57,580	9	-17%	21%

ID	Screen/Cut Line
1	CBD
2	Cumberland River
3	I-65 Corridor
4	I-24 Corridor
5	I-40 East Corridor
6	I-24 West Corridor
7	I-65 North Corridor
8	386
9	Downtown Mboro
10	Franklin
11	Columbia
12	SE
13	SW
14	Maury Williamson
15	Rutherford William
16	Rutherford Wilson
17	Gallatin
18	Spring Field
19	Davidson Wilson
20	Lebanan

Figure 8-2: Screen Lin and Cut Line Locations

Stantec

Subarea Model Validation (Cont'd)

- Review volume-over-count ratios in Mt. Juliet/Western Wilson County by corridor

- Confirm completeness of traffic counts

- Verify base year 2010 laneages, assignment location codes, and functional classifications

 - Assignment LOC – Determines links used in traffic assignment

Stantec
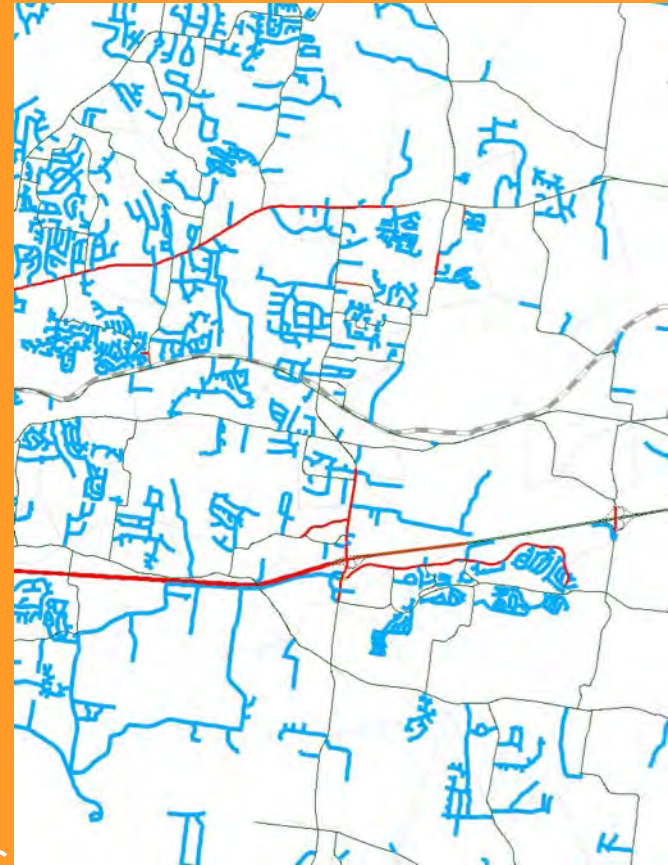
Subarea Model Validation (Cont'd)

- Adjust centroids and centroid connectors to better conform to local access patterns in Mt. Juliet
  - In some cases, this involved activating some links not previously used in assignment
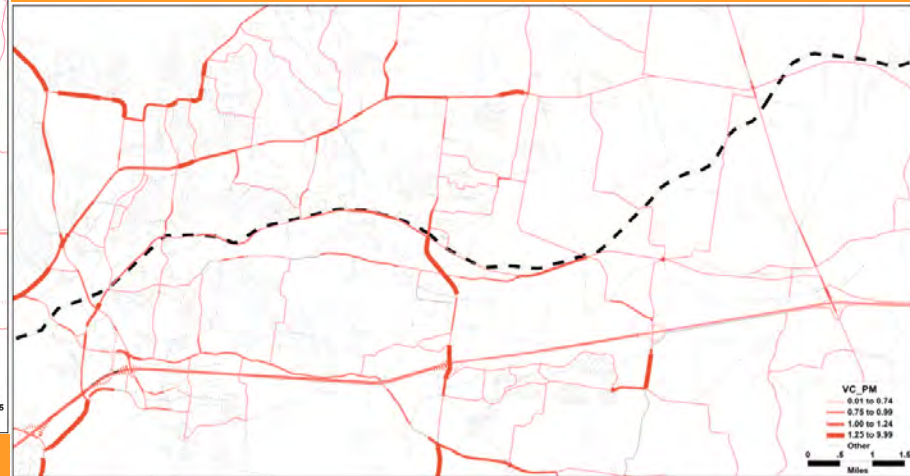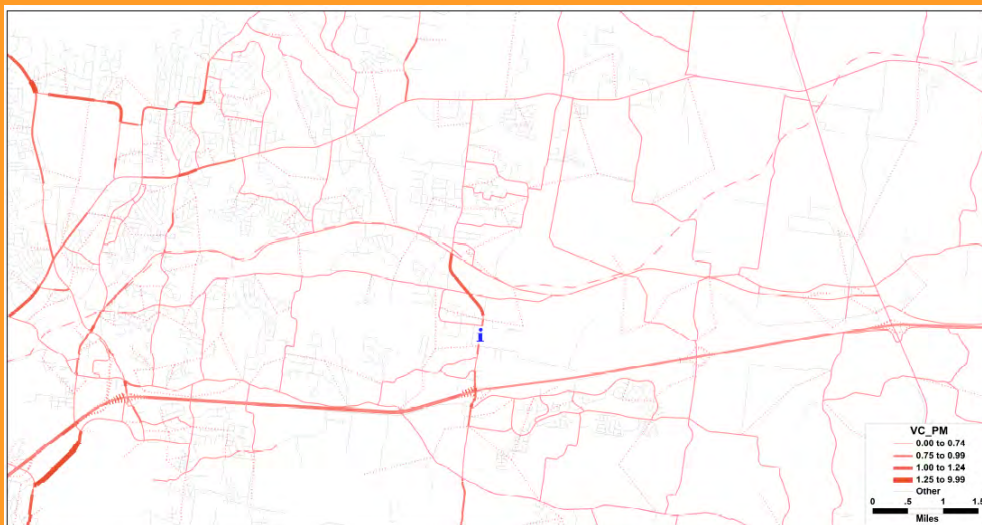- Make corrections to laneages where coded incorrectly

Stantec
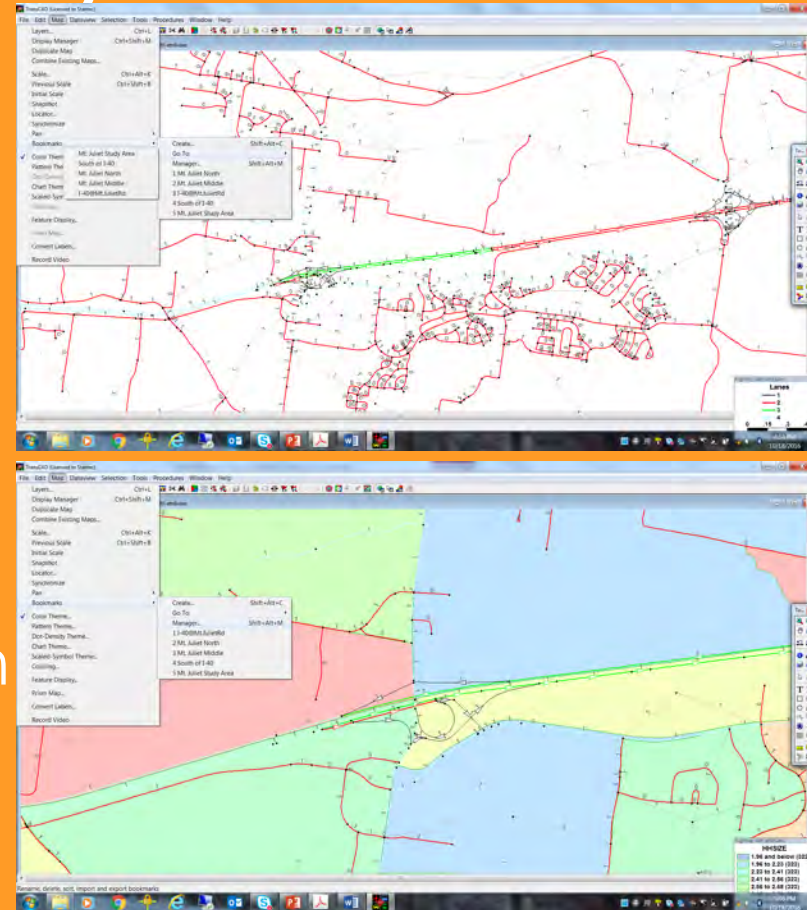
Subarea Model Validation (Cont'd)

- Link volume-over-count ratios (before & after)

Stantec
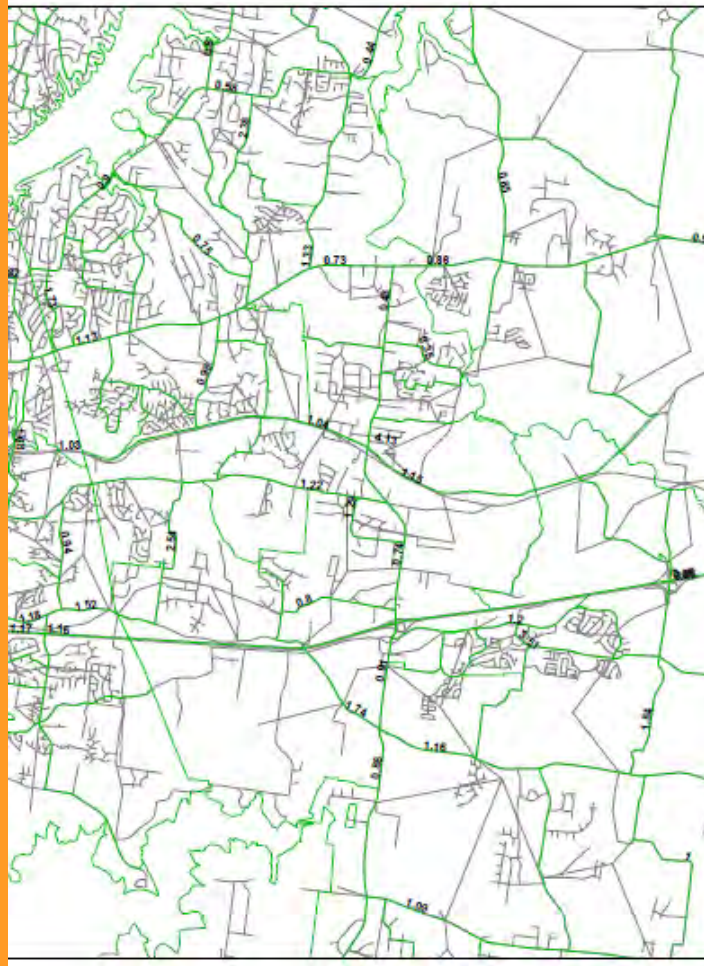
Preliminary Results

- For initial public meetings, prior to subarea validation and receipt of updated MPO files...
    - Mapped PM V/C Ratios for 2015 vs. 2040
   - As expected, V/C Ratios are generally worse in 2040

Stantec

Preliminary Results (Cont'd)

- For initial public meetings, prior to subarea validation and receipt of updated MPO files…
  - Mapped PM Travel Time Isochrones for 2015 vs. 2040
  - As expected, travel times are generally longer in 2040 *(note color spectrums are slightly different)*

Stantec
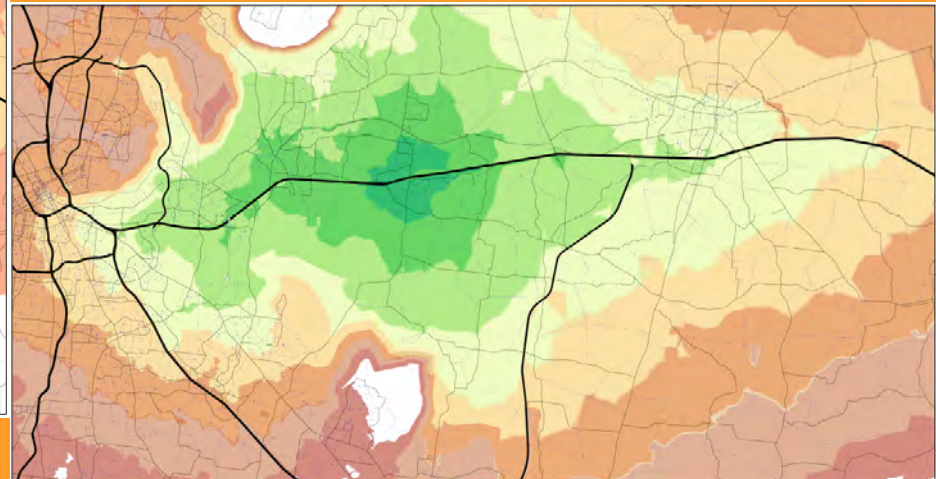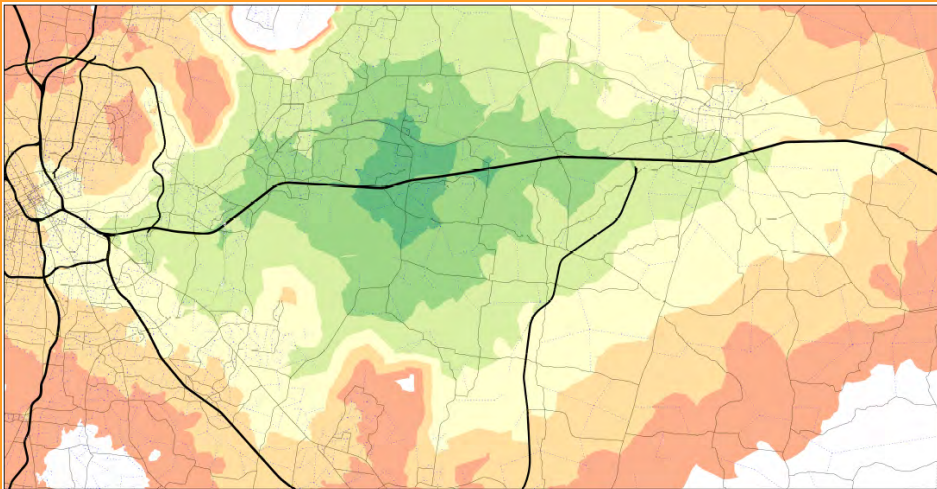
Model Application Tips

- Files MUST be located here: C:\Nashville

- Nashville Model System Requirements *(for real)*

  - Microsoft Windows 7 64bit

  - JAVA JRE 7 64bit or newer

  - JAVA JDK SE 7 64bit or newer

  - 12 GB Memory

  - TransCAD 6.0 6 4bit build 9065 or newer

- Don't mistakenly edit networks using TransCAD 7 and try to run in TransCAD 6… it won't work!

  - Likewise, .MAP files created in TransCAD 7 can not be opened using TransCAD 6

Stantec
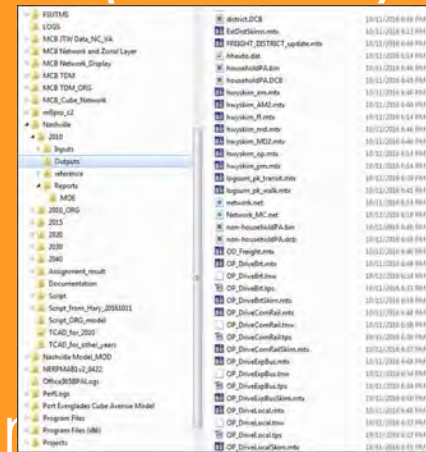
Model Application Tips (Cont'd)

- 32-bit TransCAD 6.0 doesn't seem to work so be sure to use 64-bit software version

- Different model scripts are required for 2010 vs. other years *(issue related to HOV lanes)*

- Best to have transit network open while editing highway network even if you're only editing links without transit routes on them

- Make sure you have the latest files from the MPO before proceeding… file updates might not work in conjunction with other older files

- Confirm replication of MPO's results

Stantec

Next/Future Steps

- Consider need for one more 2010 base year run with additional centroid modifications

- Make final 2010 network edits to 2040 network

- Update 2040 V/C ratios and travel time isochrones

- Consider adjustments to plan recommendations based on updated model

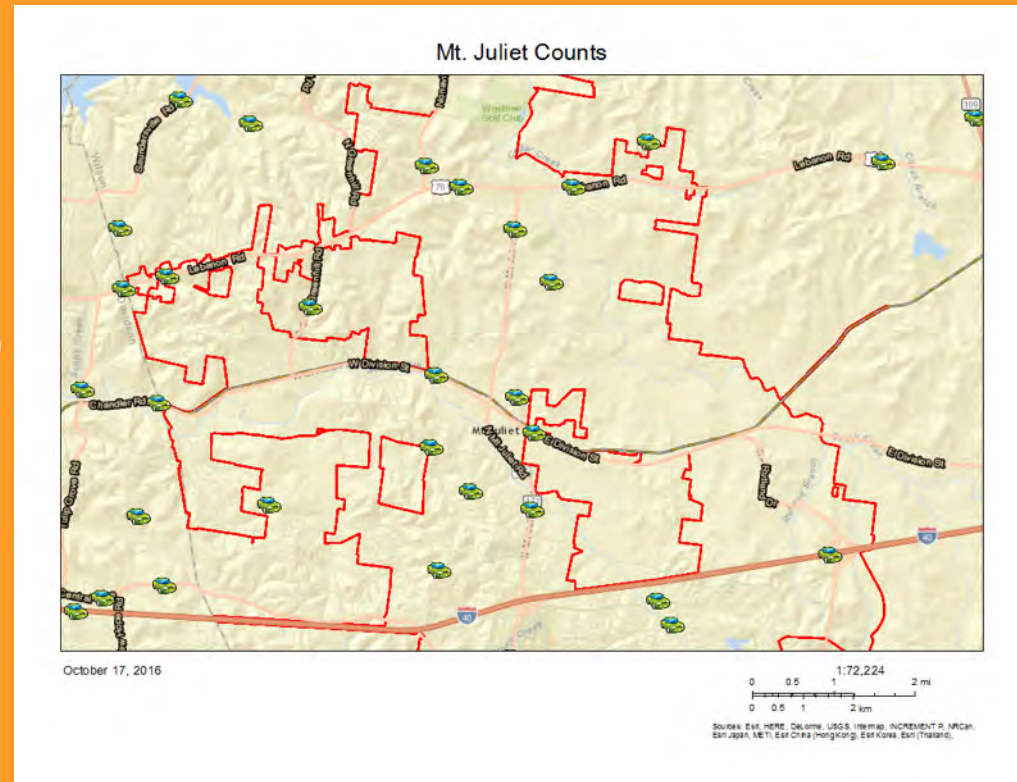- Possible final 2040 run with any plan changes

Stantec

Next/Future Steps (Cont'd)

- Not surprisingly, there are some very large TAZs in the model within the Mt. Juliet area

- Consider zone splits though likely beyond scope and budget for Mt. Juliet Plan…

- Certainly recommended for next MPO model update
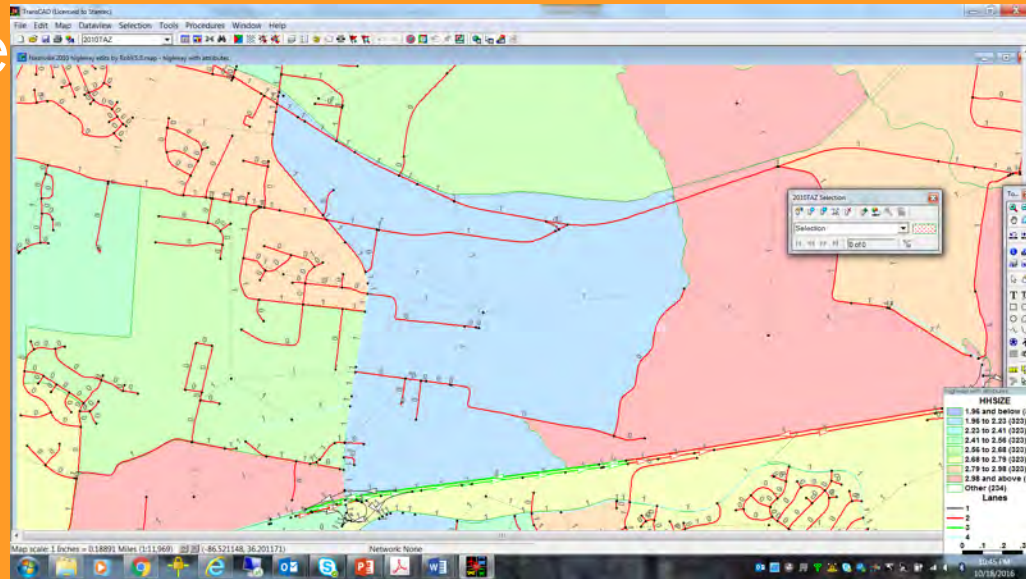
Stantec

Acknowledgements

- City of Mt. Juliet, *especially Andy Barlow, Assistant Public Works Director and Rob Ealy, GIS Technician*

- Nashville MPO, *especially Hary Prawiranata*

- Others on the Stantec team, *especially Mike Rutkowski, Project Manager*

Mt. Juliet Counts

October 17, 2016

1:72,224

Stantec

Questions?

Stantec