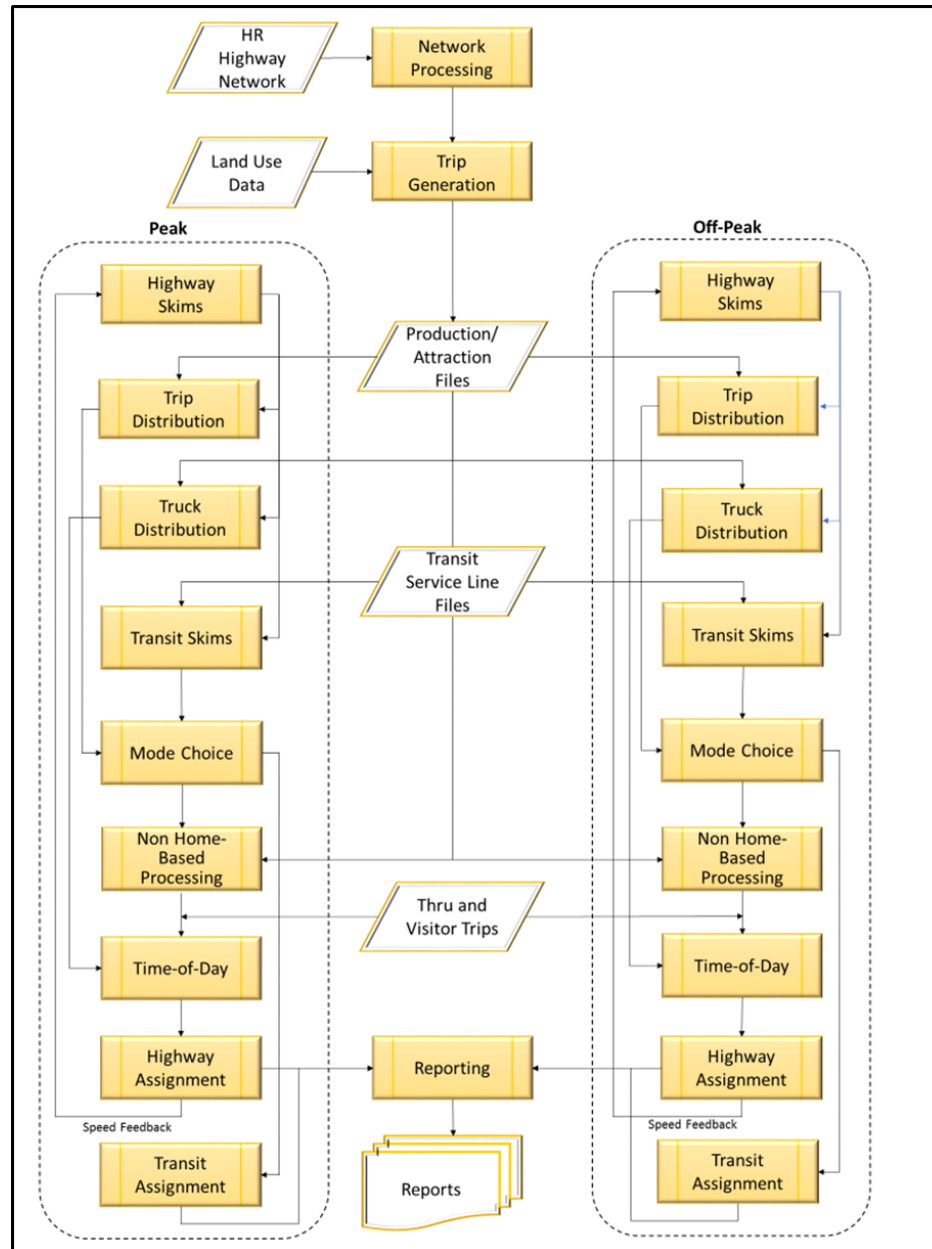


Summary of Version 5 Travel Demand Model Review

- Executed FAMPO version 5 model sets received from VDOT.
- Verified output of model sets received matches output generated by VDOT.
- Analysis of model set output indicates performance of the base year (2015) model is the same as described in model documentation received from VDOT.
- Completed *static validation* comparing version 5 model performance to VTM Policies and Procedures Manual and the version 3.1 model.
- Dynamic Validation comparing version 5 and version 3.1 models.
- Technical Memorandum and Recommended Actions

FAMPO version 5 Modeling Process



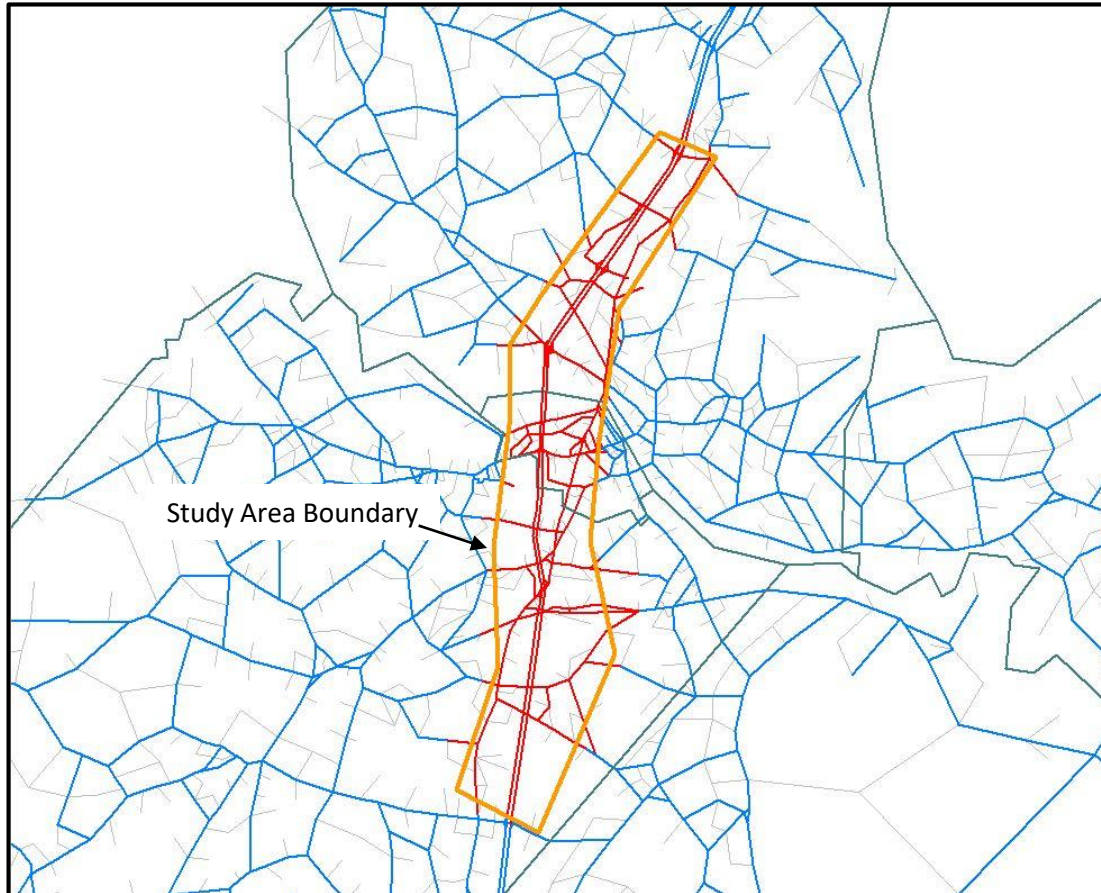
Static Validation

- Accuracy of the version 5 model over the entire FAMPO region in matching observed daily volumes is generally better than version 3.1.
 - Improved on roadways carrying greater than 40,000 vehicles per day.
 - Improved in dense/urban areas of the FAMPO region.
 - This improvement translates to greater accuracy in the I-95, US 1, and US 17 corridors.
 - Route 3 corridor accuracy is approximately the same for both of the models.
- The version 3.1 model tended to under-estimate travel on higher volume roadways and over-estimate travel in dense/urban areas. The version 5 model corrects this, but; at the expense of accuracy on lower volume facilities and roadways in suburban and rural areas.

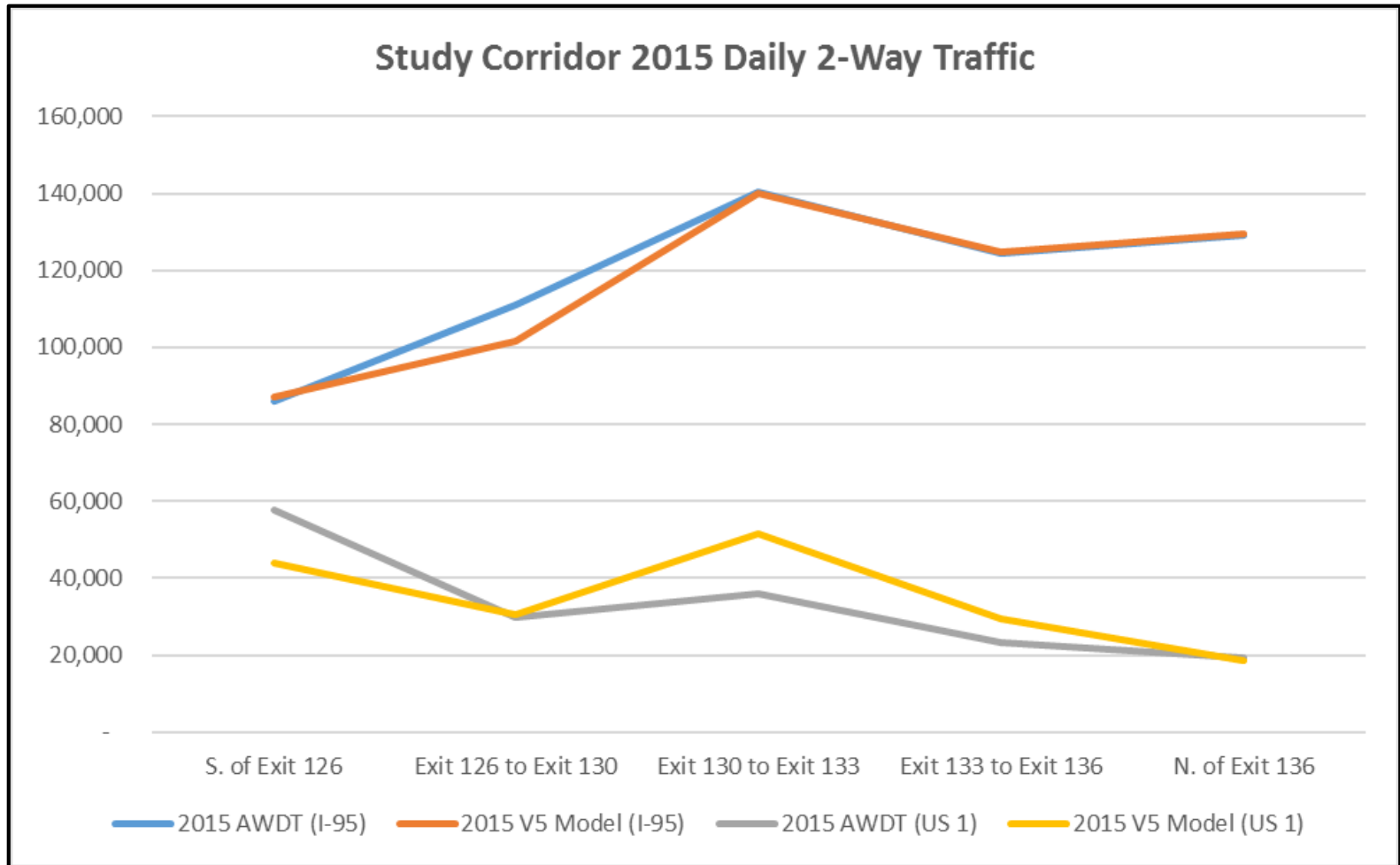
Static Validation

- At the location of the study area used in the previous I-95 Phase II Highway Study, accuracy of the version 5 model is better as compared with version 3.1.

I-95 Phase II Highway Study Area

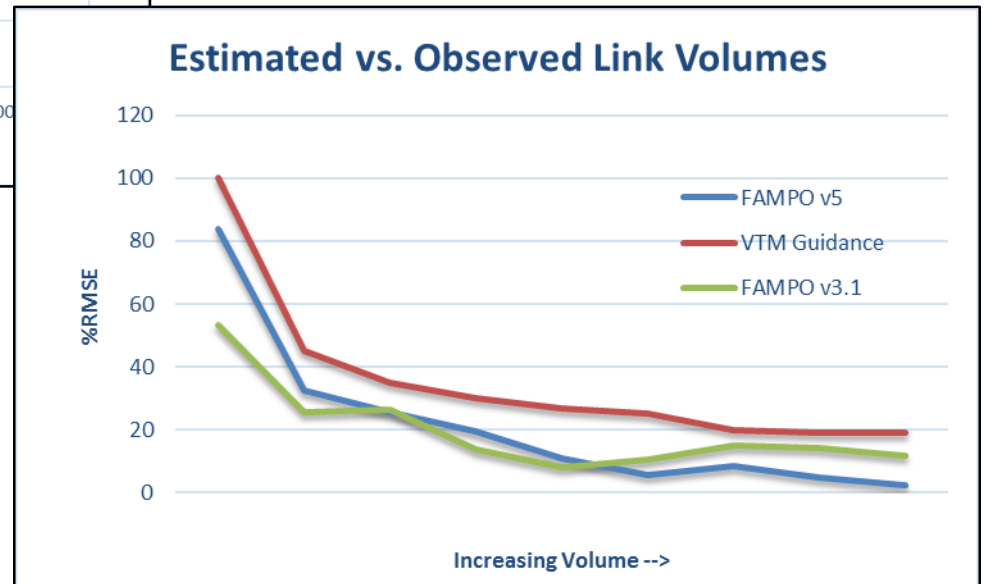
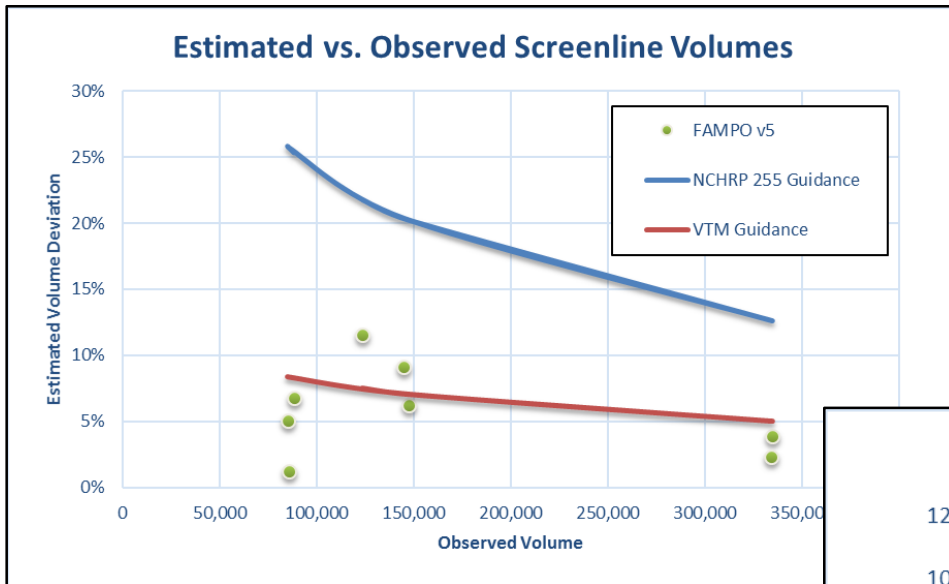


I-95 Corridor Performance



Static Validation vs. VTM Policy Guidance

- The version 5 model validation generally conforms to VTM guidance.



Dynamic Validation Summary

- Year 2045
- Case #1: Non-Toll I-95 Modification, Remove addition of 4th lane from mainline between Exit 126 to Exist 130.
- Case #2: Arterial Capacity Enhancement, Remove Gateway Boulevard LRP improvement from Route 3 to Fall Hill Avenue.
- Compare the reaction of the version 5 model to the version 3.1 model.
- Reaction to changes in the case studies by each individual model seem reasonable.
- Comparison between models challenging due to numerous inherent differences in the models and their input data:
 - 2045 network and land use assumptions.
 - Non Home-based trip generation and distribution
 - Trip production rates
 - Data sources used to estimate travel external to the FAMPO region.

Recommended Actions

Model Component	Description of Action
General	<ul style="list-style-type: none"> • Accommodate sensitivity to the presence of connected/autonomous vehicles. • Accommodate sensitivity to new modes enabled by technology (ride hailing...). • Account for induced demand due to added roadway capacity. • Comprehensive documentation.
Trip Generation	<ul style="list-style-type: none"> • Assess need for special generator representation using available surveys and cell phone/GPS data (“big data”). • Reconcile differences in land use inputs between current and previous version of the model.
Truck Trip Generation/ Distribution	<ul style="list-style-type: none"> • Assess need for special generator representation using available surveys and cell phone/GPS data (“big data”).
Auto/Truck Trip Assignment	<ul style="list-style-type: none"> • Validate model to time-of-day. • Develop/implement standardized assignment validation/performance summary reporting.