

I-95 Phase II Highway Study Modeling Assumptions

FAMPO Technical Committee

April 9, 2018

FAMPO Technical Study Approach

1. Data Driven Effort

2. Using latest Modeling and GIS Tools

3. Using latest available data

- Land Use (Census)
- Employment (Virginia Employment Commission-VEC)
- Traffic Counts (VDOT)
- Highway Network assumptions (Existing & Committed)
- Travel survey data (VDOT, VRE)

4. Objective look at Highway Needs

- Quantico to Thornburg
- Particular focus between Exit 136 and Exit 126

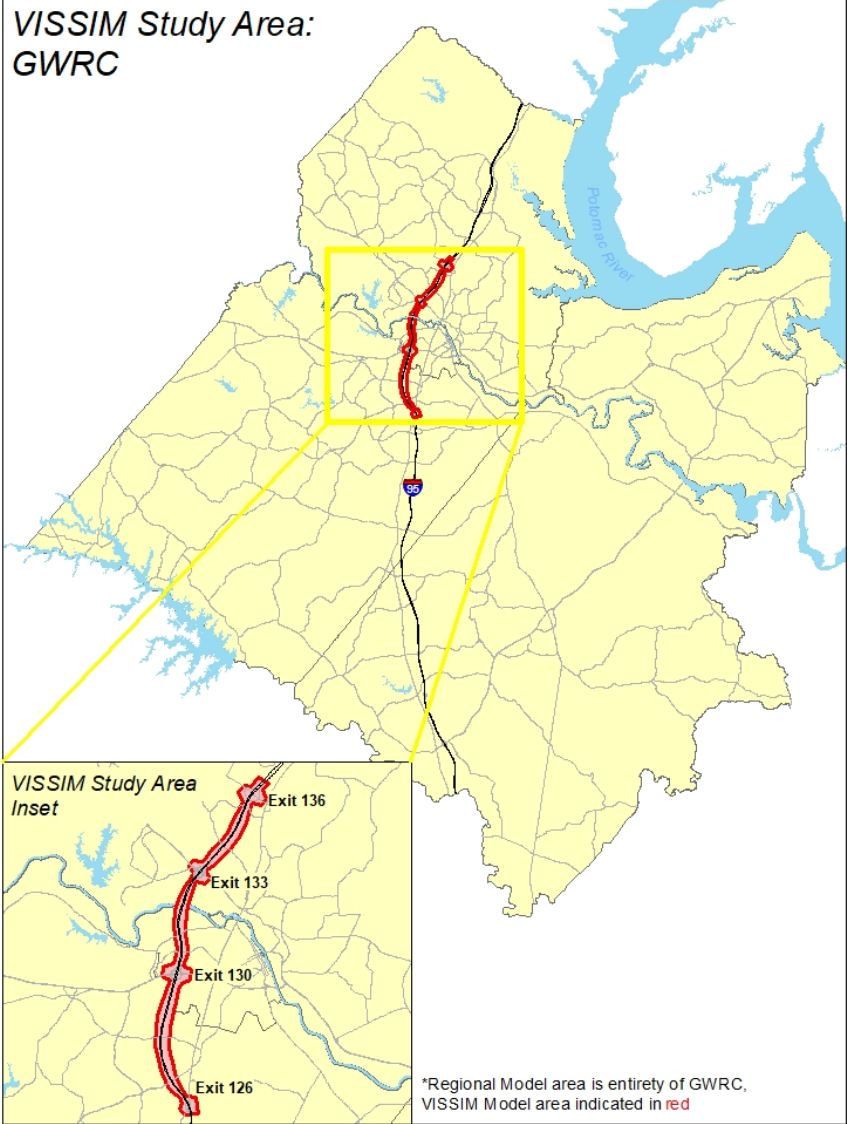
Two Types of Models used in I-95 Phase 2 Study

1. Regional Travel Forecasting model (Macroscopic) used to predict future travel demand based on land use and changes in transportation network.
2. Corridor-specific VISSIM traffic operations model (Microscopic) used to analyze performance of traffic flow based on a demand volume established by model #1 above.

The following slides present brief information about each model

Modeling Area: Regional vs. Corridor VISSIM Model

Regional Model = GWRC
VISSIM Model = In Red

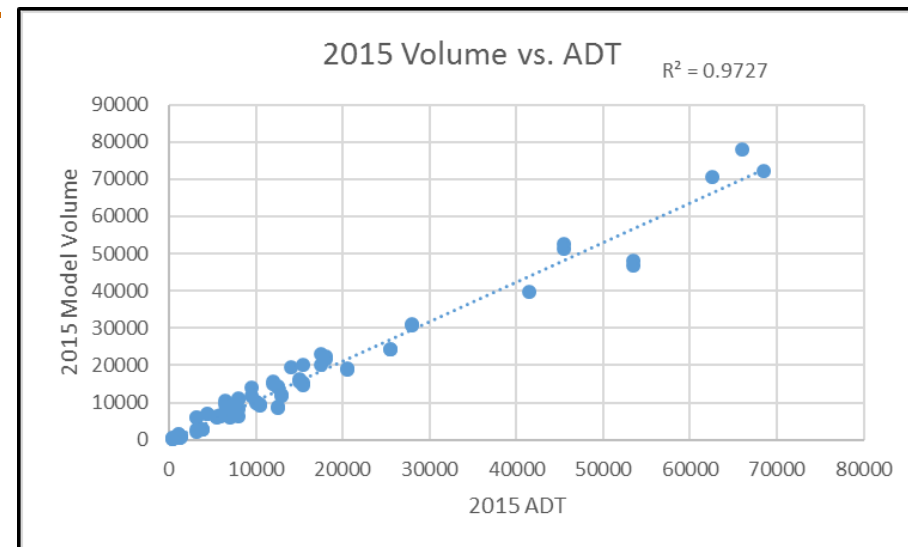


Regional Travel Forecasting Model Development and Applicability

1. Originated in the early 1990's and continually updated since then to reflect changing conditions such as highway improvements, HOT lanes, transit service & tolling.
2. Current rendition of model is Version 3.1
3. Main ingredients include:
 1. Agreed-upon socioeconomic (land use) data for base & future year
 2. Traffic Analysis Zone (TAZ) structure
 3. Trip-making propensity & tolerance to travel time based on household surveys
 4. Traffic counts entering, exiting and within study area to understand flow
 5. Available multimodal transportation network with details about capacity & speed
4. Used for development of the FAMPO Long Range Transportation Plan
5. Used for corridor studies conducted by FAMPO/GWRC and State

Regional Travel Forecasting Model Validation, Calibration & Performance

1. Base year model output compared to ground counts to determine performance in I-95 Phase 2 study area
2. It's customary to conduct these checks and make necessary adjustments to ensure a model is able to perform the tasks of a given corridor study in a given study area
3. Base year model was slightly overestimating traffic in I-95 study area when compared to counts. Small time penalties were applied to select corridors to improve results.
4. Adjusted model for I-95 Phase 2 study fell well within guidelines

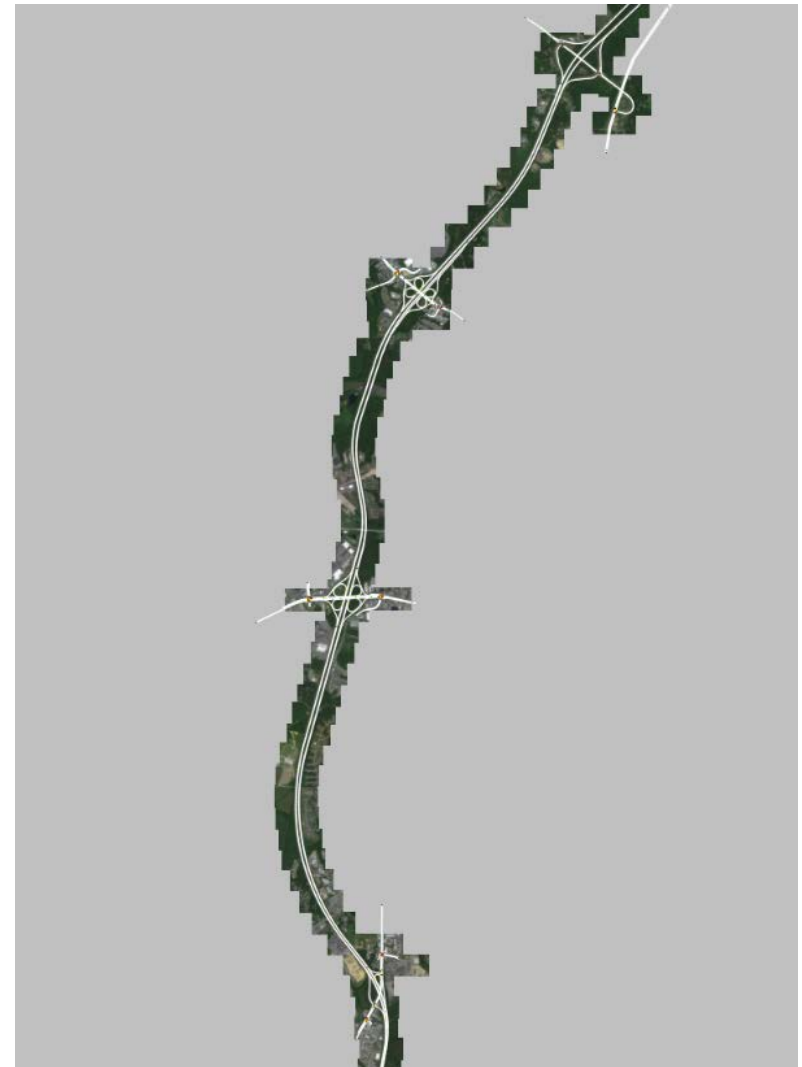
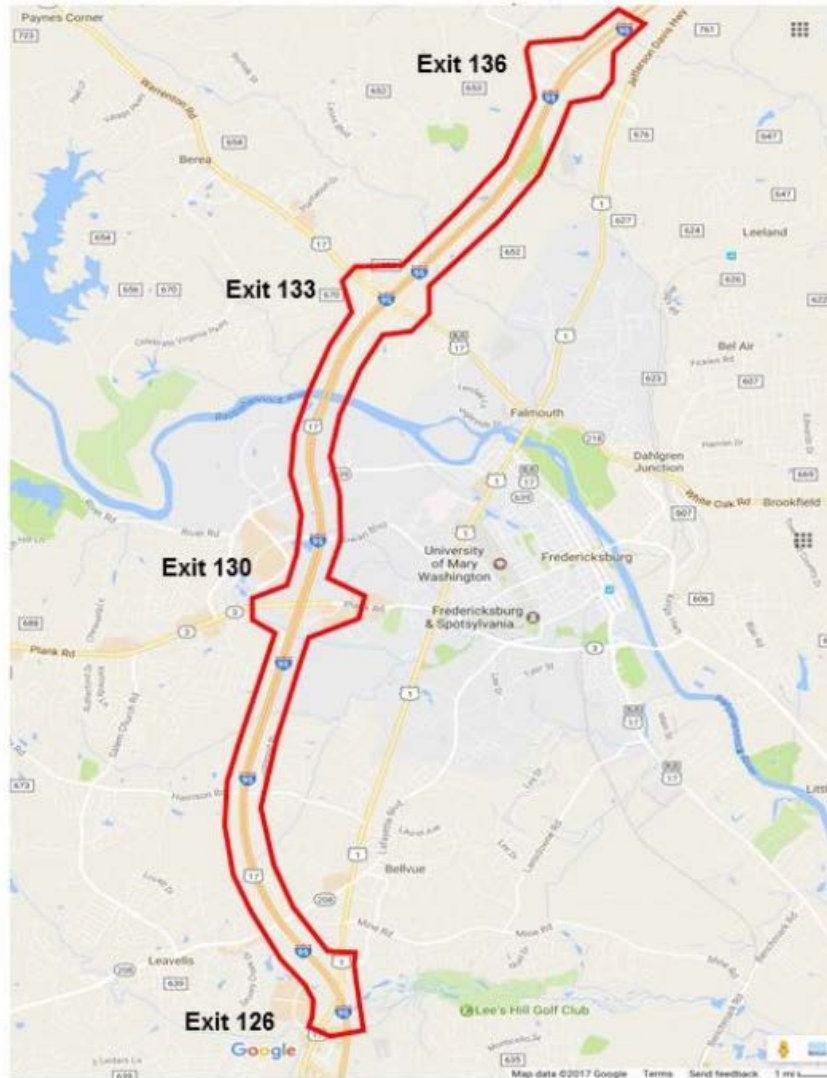


VISSIM Overview

- Microscopic Transportation Simulation Software approved by VDOT & FHWA for use on studies such as I-95 Phase 2
- Primarily used for detailed transportation operational analysis, alternative evaluations and performance measurement.
- For current study, VISSIM used in conjunction with the regional travel forecasting model



VISSIM Study area



VISSIM Simulation Effort Overview

1. Existing Conditions – AM Peak Hour, PM Peak Hour, Weekend Peak Hour
2. 2030 and 2045 No-Build Conditions
3. 2030 and 2045 Alternatives Analysis
4. Technical Documentation

VISSIM Simulation Effort Steps to Date

1. Calibrated and Validated Existing Conditions Model using Field Data and Observations.
2. Simulated 2030 and 2045 No-Build Conditions and observed traffic hotspots/bottlenecks.
3. Developed Low-Cost Interchange Improvements and Interstate Roadway Geometrical Improvements to improve/eliminate observed traffic hotspots/bottlenecks in No-Build Conditions.
4. Simulated Alternatives for forecasted 2045 traffic volumes and documented traffic performance and challenges.
5. Compiled Technical Documentation.