RTDM Consultant Task 4: Freight Analysis

RRTPPO TECHNICAL ADVISORY COMMITTEE MEETING

August 14, 2018

Presentation by:
Sulabh Aryal
Senior Planner
RRPDC
Objectives

• Review Freight sub-model of the Richmond/Tri-Cities Travel Demand Model (RTC Model)
• Perform Sensitivity Testing
• Understand District to District Truck Flows
• To perform truck and auto forecasts on a Freight Corridor in the Richmond Region
• Explore the use of Streetlight InSight Platform for corridor traffic forecasting
RTC Truck Model (1)

• The RTC Truck Model is a heavy truck model. Trucks are defined as those with three or more axles or pulling a trailer. Further distinction between types of trucks is not considered. The model generates and distributes truck trips in four groups
  • External to External – EE
  • Internal to Internal – II
  • Internal to External – IE
  • External to Internal – EI
RTC Truck Model (2)

• For EE Trips Counts on External Stations
• For IE, EI and II and uses land use data (SE Data) and External Counts.
• Household and employment data (broken by NAICS code) trip production rates for different employee type (Office, Retail, Industrial etc.)
• Further adjusted to Truck Intensive TAZs.
Truck Model (3)

Truck Trips in Truck Intensive TAZs is further multiplied by a factor of 2.5
Sensitivity Testing

• The purpose of sensitivity testing is to confirm that the model, or individual aspects of the model, generate results that might be expected. In other words, that the model, or model component, is sensitive to model parameters. Three Testing were performed:
  1. Truck trip generation rates
  2. The special truck zone trip factor, and
  3. Changes in zones identified as truck zones.

• Theses sensitivity tests showed that the model scripts perform as expected.
District to District Flows (1)
## District to District Flows (2)

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RICHMOND REGIONAL TRANSPORTATION PLANNING ORGANIZATION 8
The objective of the corridor study is to understand the freight flows on I-295 corridor and to forecast freight traffic on the links of I-295 corridor and the cross-street interchange ramps within the area of influence.
StreetLight Insight Data

- VDOT has purchased the subscription of the *StreetLight InSight Platform* and has shared its functionality with all Virginia PDCs and MPOs.

- It currently provides 1) Origin-Destination (OD) matrices of different vehicle types, trips purposes, time of day, and day of the week, 2) OD patterns for trips going through selected links (dubbed as Middle Filter by Streetlight), 3) Travel time between selected ODs.

**Location-Based Services (LBS)**

Best For: O-D to Zones, when you want large sample size, demographics, tourism, and heavy non-vehicular transportation areas.

**Navigation-GPS**

Best For: Separate commercial and personal analyses, vehicle analysis, detailed roadway analysis, and detailed travel time analysis.
Methodology

1. Extract RTC Model Subarea OD
   Subarea OD Growth = 2040 OD - 2017OD

2. 2017 Streetlight Subarea OD and Expansion

3. 2040 Adjusted OD:
   2017 Streetlight OD + Subarea OD Growth

4. Subarea Highway Assignment
Results (1)

2017 AADT Validation

![Graph showing 2017 AADT Validation results for various locations, including North I-295, West of I-95, I-95 Direct Connect, West of US 301, West of US 360, and South I-295. The validation compares Count 17, Regional Model, and Streetlight-based Subarea data.]

![Graph showing 2017 Truck AADT Validation results for the same locations, comparing Truck Count 17, Regional Model Truck, and Streetlight-based Subarea Truck data.]

RICHMOND REGIONAL TRANSPORTATION PLANNING ORGANIZATION
Results (2)

2040 Forecast Comparison

AADT Forecast

- Count 17
- Regional Model Volume 40
- Streetlight-based Subarea Volume 40

Truck AADT Forecast

- Truck Count 17
- Regional Model Volume 40
- Streetlight-based Subarea Volume 40
Conclusion/Lesson Learned

• Streetlight Data/ Big Data can be used to develop OD seed matrices for corridor studies.
• Streetlight-based data provides promising OD distribution for corridor studies.
• This procedure successfully adjusts for any errors in base year validation.
• One limitation is that it does not address the model’s future growth uncertainties.
Questions?

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