# **RTDM Consultant Task 4: Freight Analysis**

#### **RRTPO TECHNICAL ADVISORY COMMITTEE MEETING**

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Presentation by:

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## **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 El

## **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)**



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#### **District to District Flows (2)**

Total		RIC / Charles City	East End	Eastern Hanover - NK	Western Hanover	Glen Allen	I-95 North	Downtown	West End	Goochland	South James	Commerce Corridor	Route 10	Crater	Hopewell	Midlothian	Route 1/ 360	Study Area	Total
DIC / Charles City	1	1	2	3	4	5	145	7	225	9	242	11	12	217	295	254	16	17	F 009
Fast End	2	331	205	25	22	190	145	296	223	42	152	219	77	110	161	151	229	172	2 720
Fastern Hanover - NK	2	76	35	16	5	35	24	46	36	-12	23	36	16	110	35	21	36	40	505
Western Hanover	4	30	22	4	16	57	40	39	54	21	29	30	9	12	17	26	33	32	473
Glen Allen	5	275	189	35	57	578	182	348	528	124	250	281	91	131	181	231	312	258	4,053
I-95 North	6	142	100	22	41	193	246	175	178	46	109	139	43	58	85	98	141	161	1,978
Downtown	7	467	289	47	39	350	177	678	474	83	350	491	148	236	300	342	504	250	5,223
West End	8	335	221	36	53	523	171	478	808	147	378	385	122	185	237	338	441	235	5,095
Goochland	9	60	42	7	21	120	42	85	154	73	91	69	22	32	40	80	88	55	1,080
South James	10	248	154	24	29	252	106	337	385	91	427	310	96	149	182	380	403	147	3,719
Commerce Corridor	11	396	228	37	31	288	143	494	381	69	311	639	183	283	341	334	622	205	4,986
Route 10	12	169	77	16	9	91	44	149	119	22	95	184	131	150	241	107	225	71	1,900
Crater	13	220	112	19	12	131	60	233	178	30	147	283	153	594	506	169	367	96	3,308
Hopewell	14	395	162	35	18	180	88	299	232	40	182	345	238	496	876	201	410	150	4,346
Midlothian	15	249	155	22	26	230	99	341	340	79	379	332	108	171	201	464	493	137	3,828
Route 1/ 360	16	412	236	37	33	312	142	508	440	87	405	622	227	372	414	494	871	208	5,817
Study Area	17	256	171	39	33	254	165	252	237	56	148	200	71	95	147	138	207	252	2,720
Total		5,007	2,719	505	473	4,051	1,977	5,221	5,092	1,080	3,718	4,987	1,901	3,310	4,349	3,829	5,819	2,719	56,757

#### **Truck Corridor Study Selection**

el Grove

**Burnside Farms** 

Mechanicsville

Ellerson Mill

The objective 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.

ongdale

Biltmore

Rd Solomons Store

**Chamberlayne Farms** 

I-295 corridor between US-1 and US-360

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## **StreetLight Insight Data**

- VDOT has purchased the subscription of the 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



## Results (1)

#### 2017 AADT Validation





## Results (2)

#### 2040 Forecast Comparison



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#### **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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