PSRC Regional Truck Model

Seattle Freight Advisory Board Meeting

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Puget Sound Regional Council
April 21, 2015

Puget Sound Regional Council
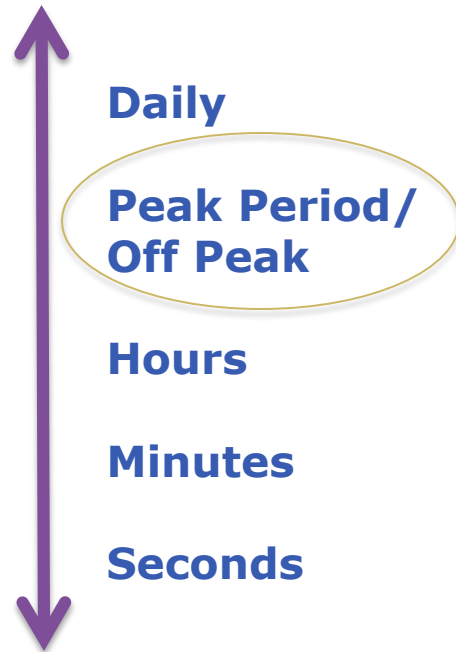PSRC

This presentation

What can/can't it do?
Inputs
How does it work?
Validation
Improvements

Levels of Transportation Modeling

Time
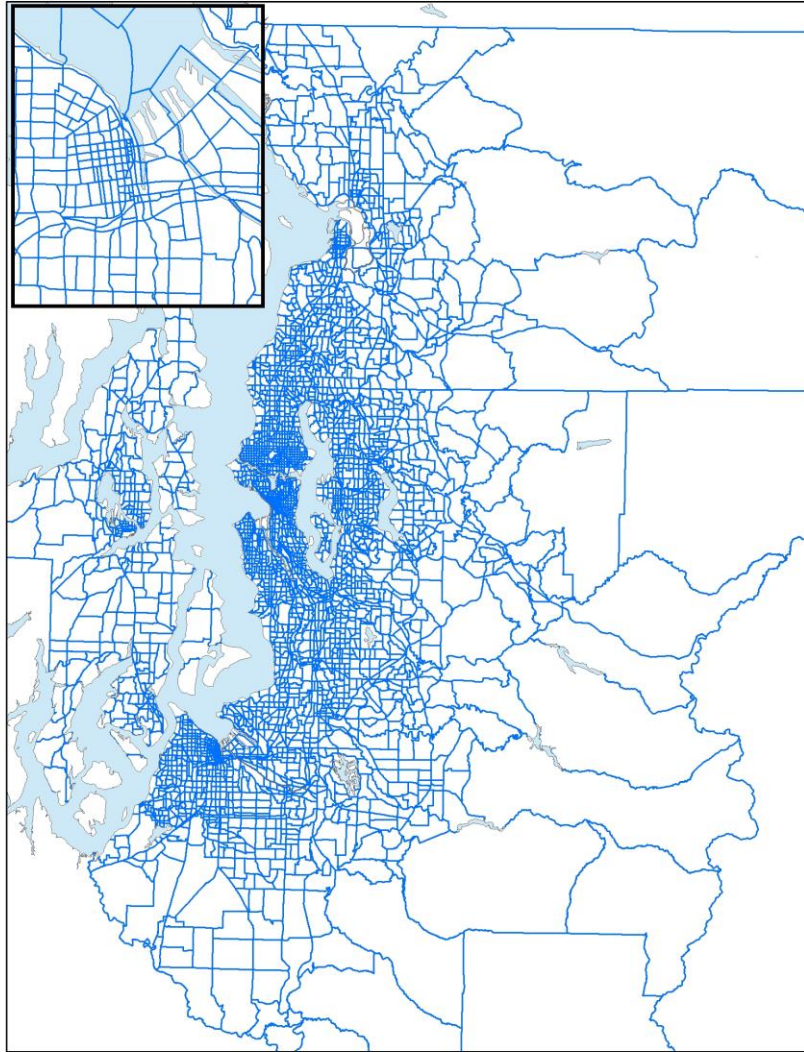
Daily

Peak Period/ Off Peak

Hours

Minutes

Seconds

Size

Statewide

Regional

City

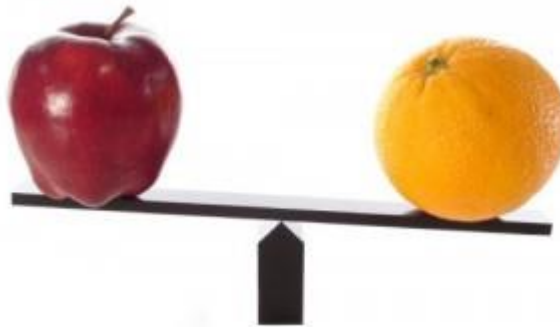Corridor / Neighborhood

Facility / Street
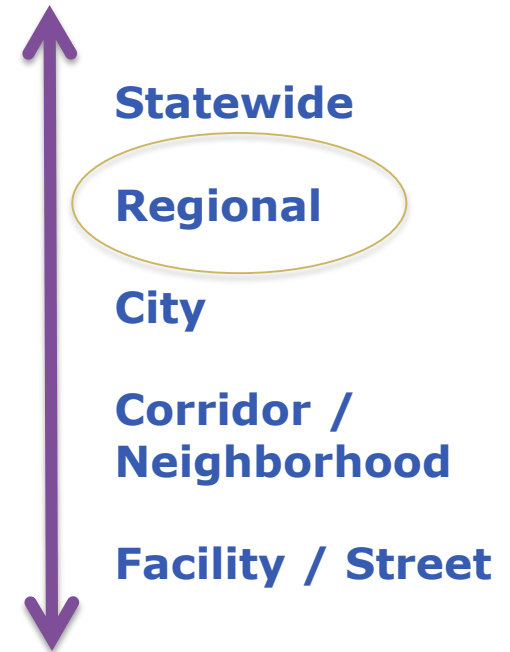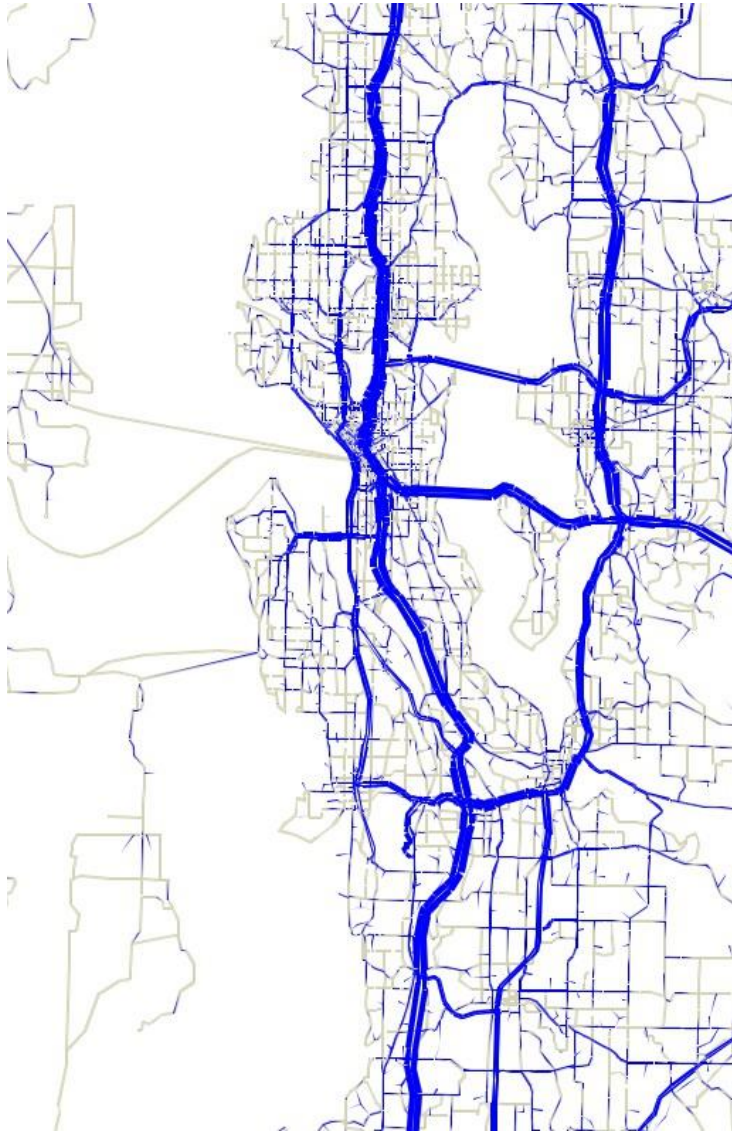
Transportation Analysis Zones
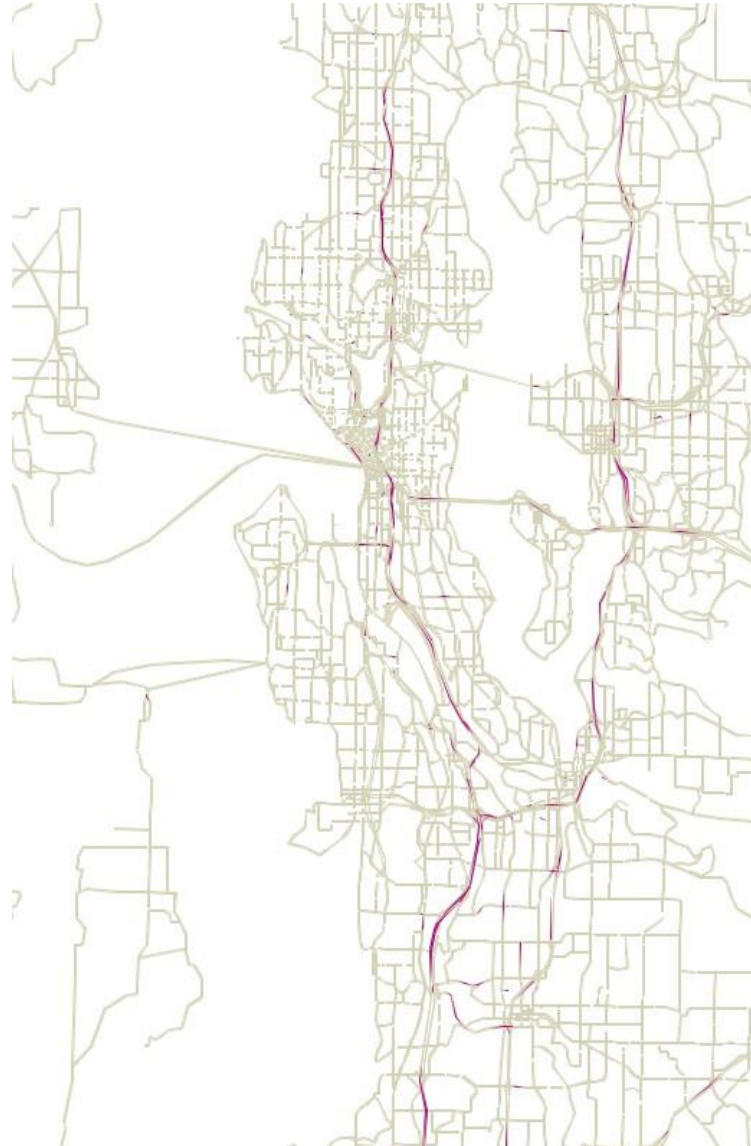
Regional Truck Model Purpose

- A component of our regional travel demand model
- Compare regional projects impacts on trucks
- Compare how policies impact aggregate measures average speeds and volumes on large facilities
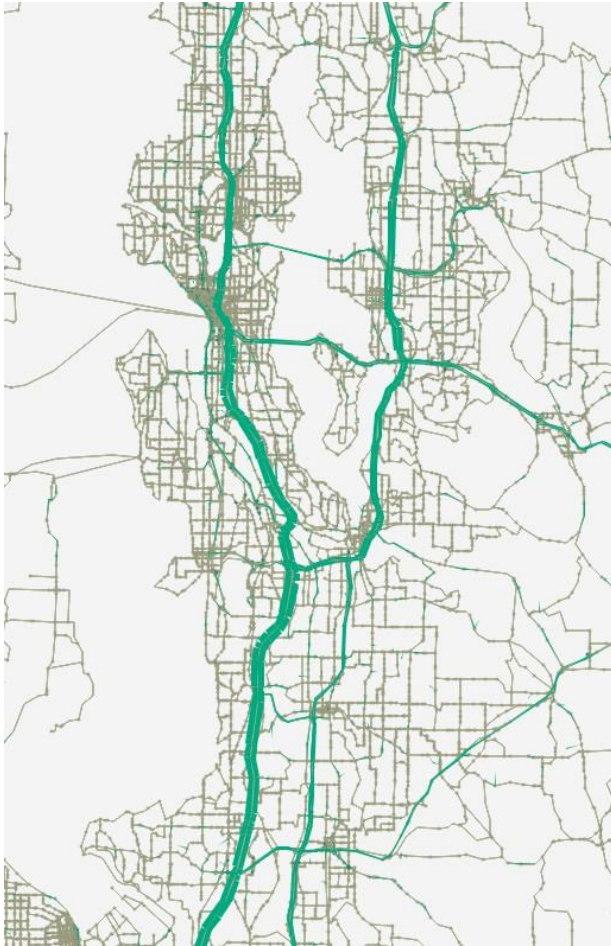- Forecast future volumes on large facilities
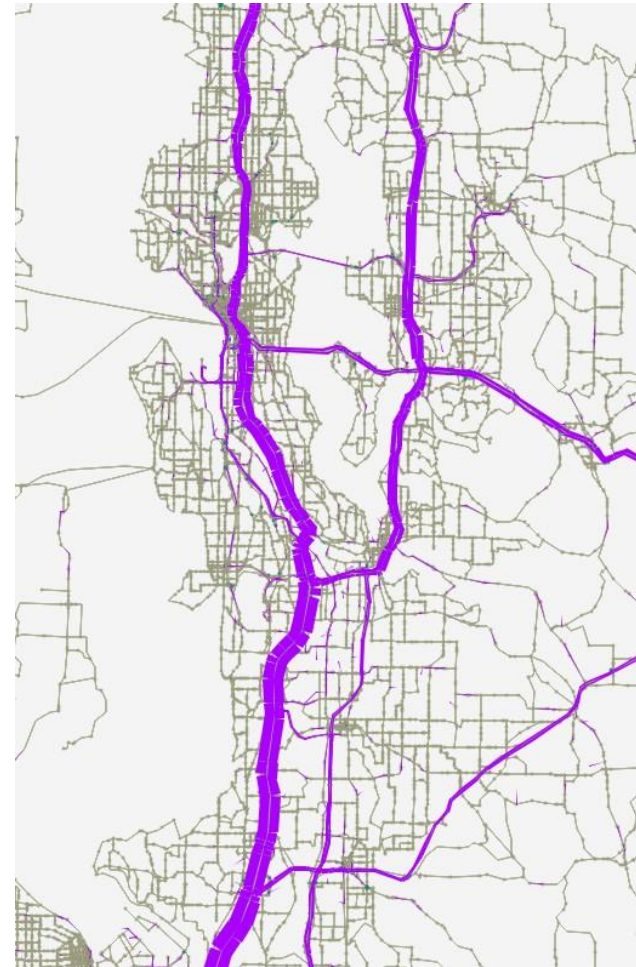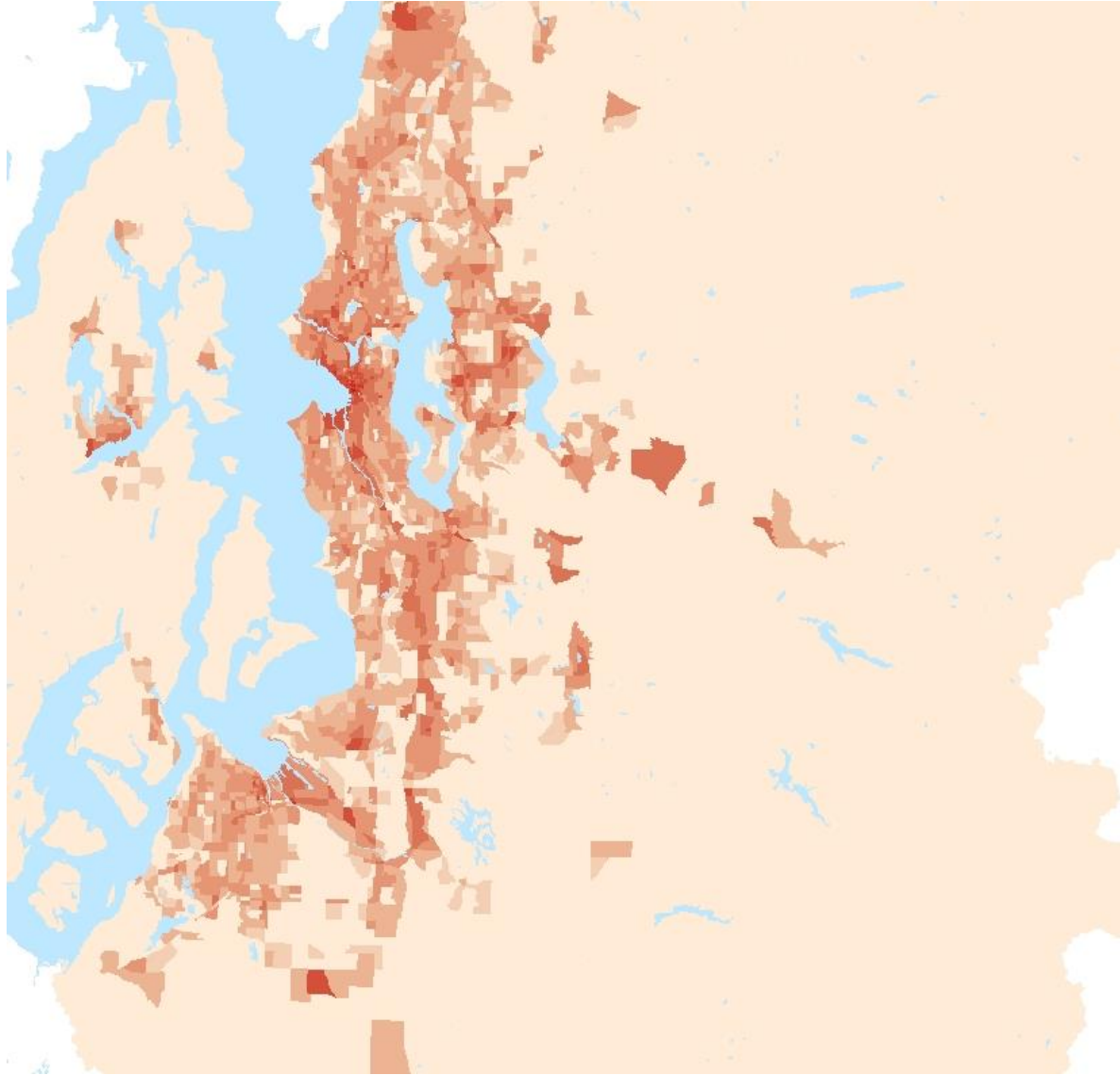
9 am – 3 pm All Volumes   Heavy Truck Volumes

Medium Truck Volumes

Heavy Truck Volumes

Truck Trip Activity Density

More Outputs

Time Savings of projects
Number of Truck Trips
Truck Travel Times
Truck Toll Costs
Truck Vehicle Miles

What can't it tell us?

Unique behaviors at specific freight distribution centers

How random road incidents impact truck times
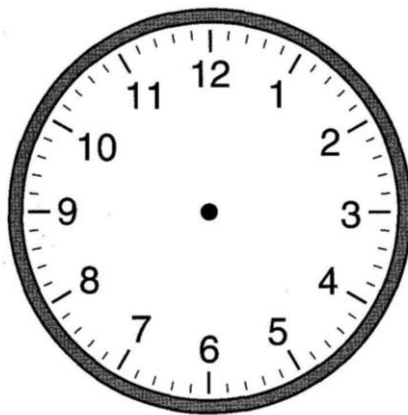
What kinds of goods are on the trucks

How the cost of delay depends on the types of goods

Inputs/Sensitivities

Highway network
Travel time
Amount and type of employment

How does it work?

Based on WSDOT's FASTruck model

Trip Generation
How many trips are there?

Trip Distribution
Where do they go?

Trip Time of Day
What time do they go?

Route Assignment
What paths do they use?

Truck Categories

Light commercial

small truck or car used for work purpose – 2 axles, <16k lbs
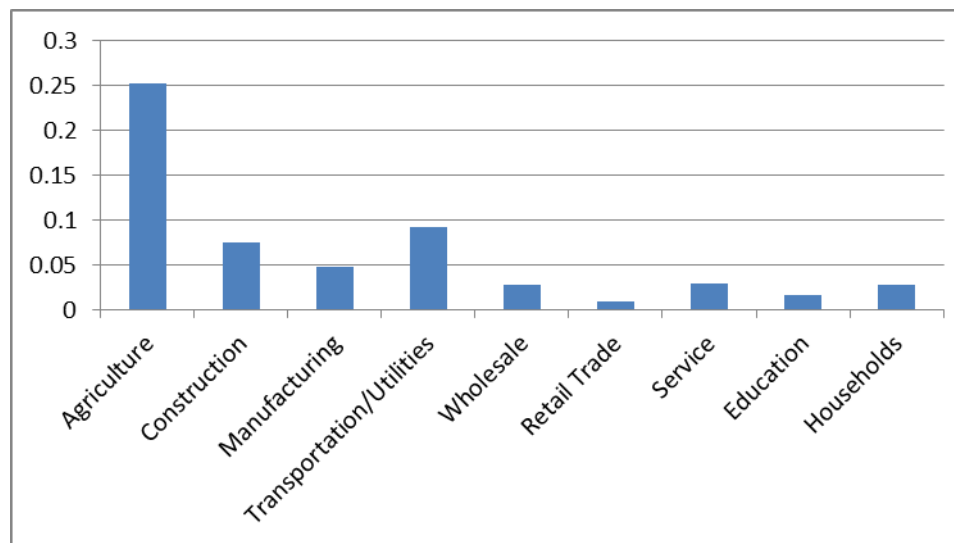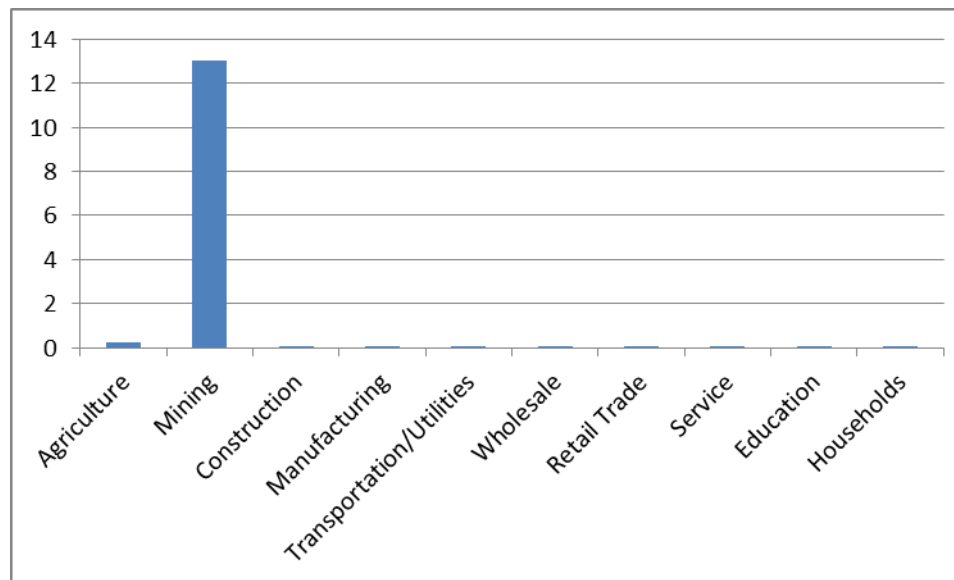
Medium trucks

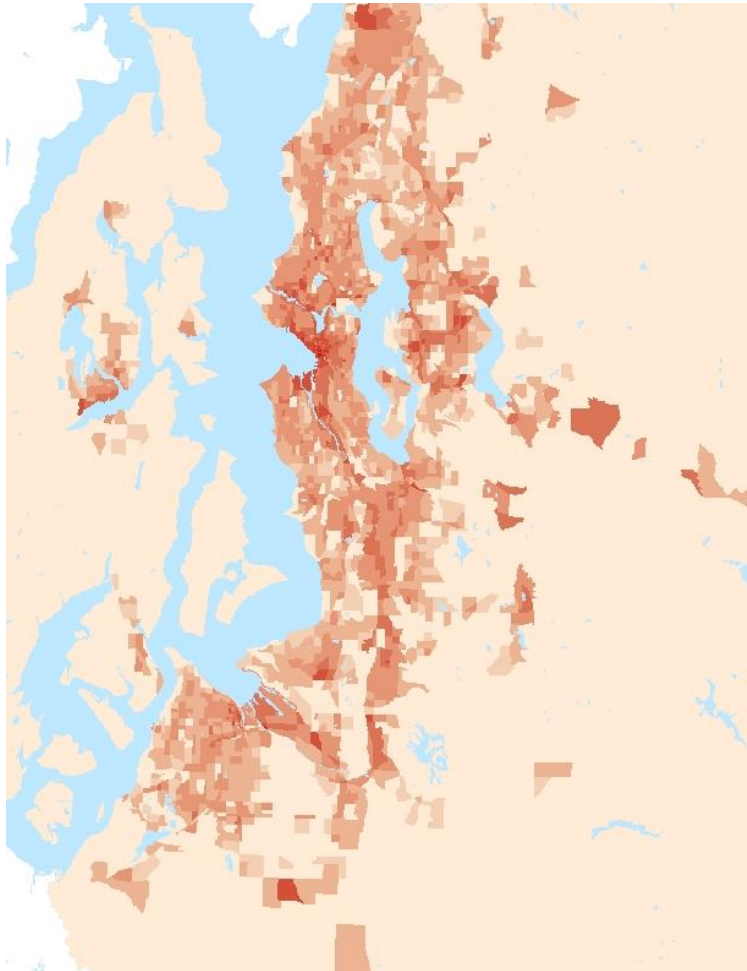single-unit semi – 2-4 axles, 16k-52k lbs

Heavy trucks

double/triple-unit semi – 5+ axles, >52k lbs

Trips Rates Differ by Employment Type

Truck Trips Attraction Density
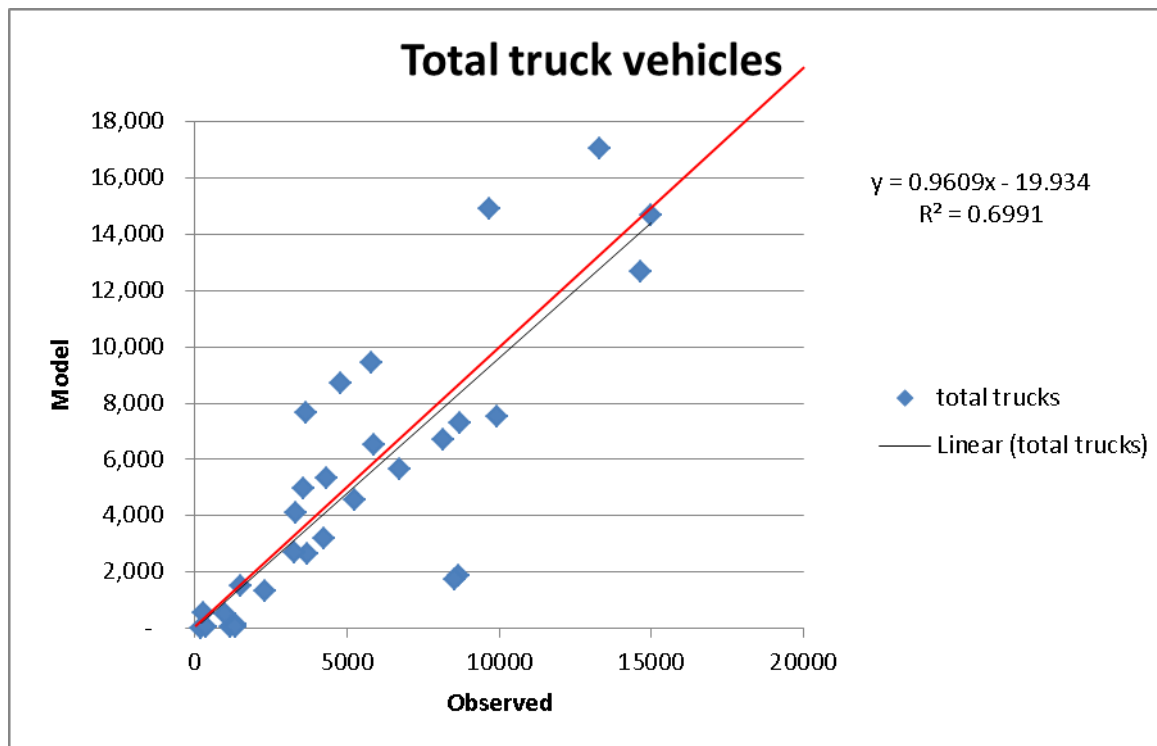
Employment Density

Special Generators and Externals
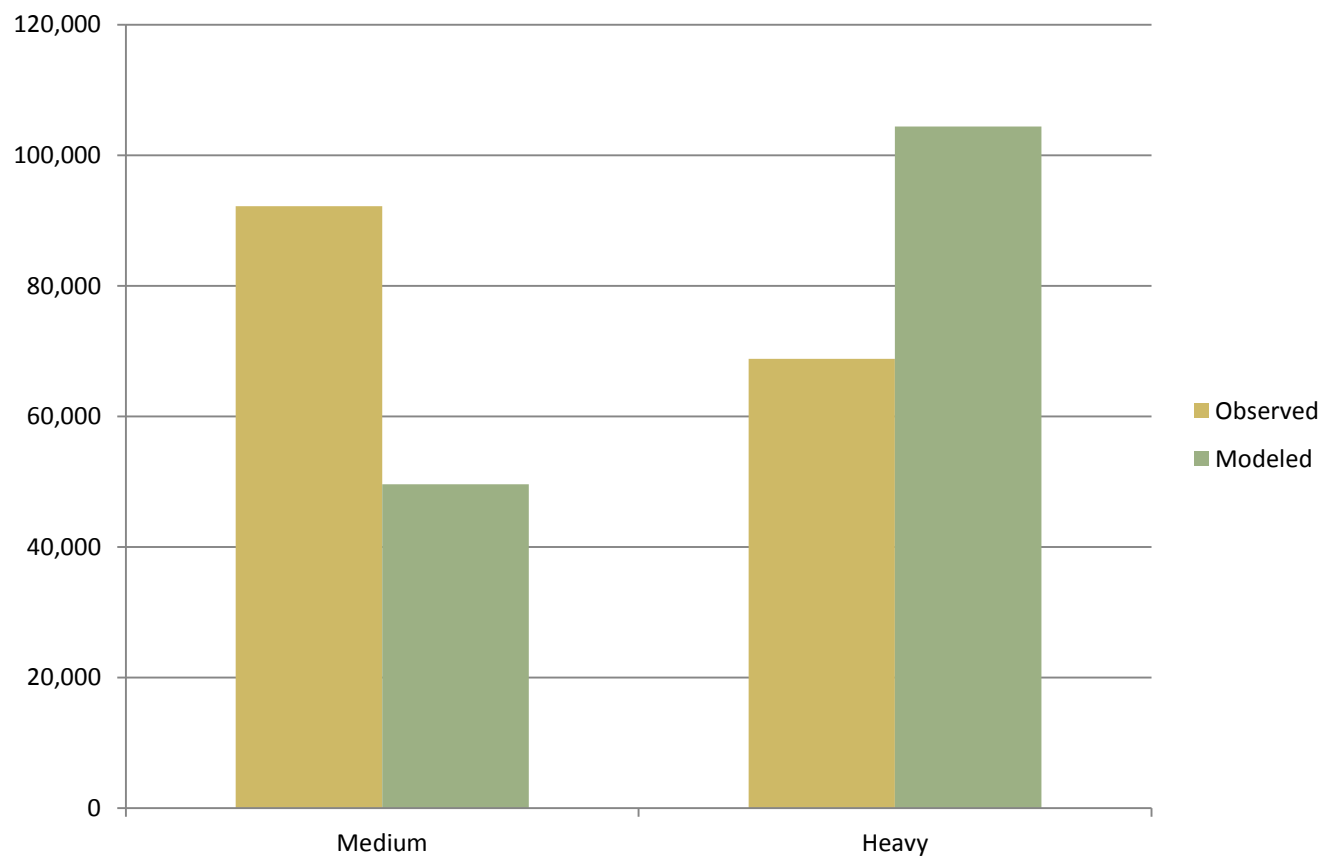
Port of Seattle
Port of Tacoma
Warehouse and Distribution
Center in SR167 corridor

Truck Volumes Validation

Total truck vehicles

$y = 0.9609x - 19.934$
$R^2 = 0.6991$

Model vs. Observed scatter plot with legend:
- ♦ total trucks
- — Linear (total trucks)

- 30 count locations – WSDOT Annual Traffic Report

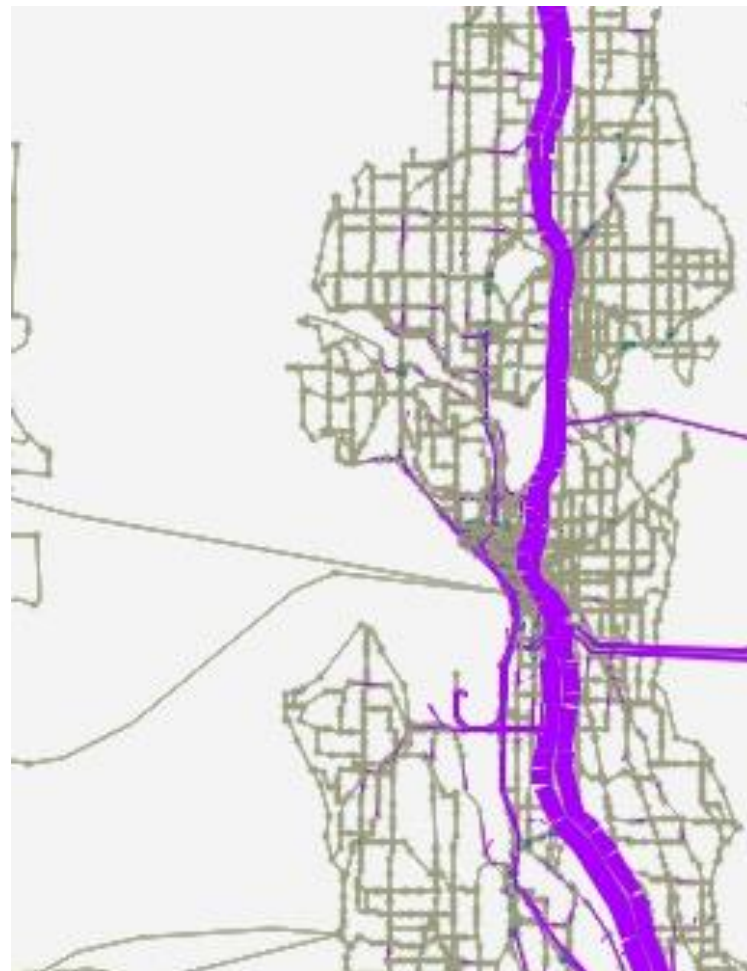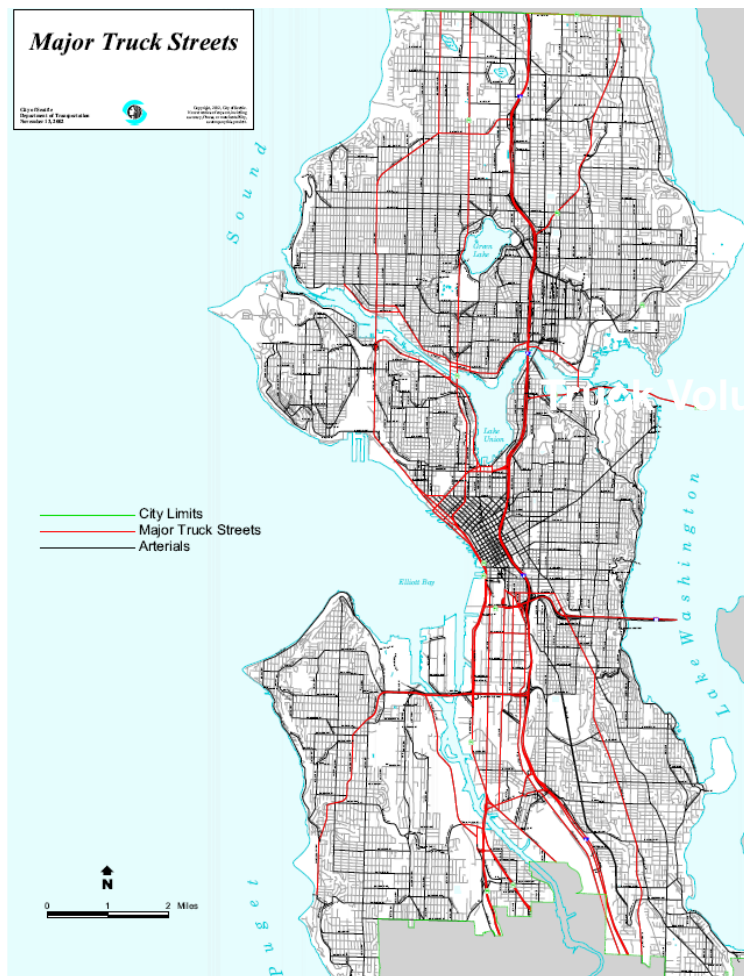- Low spots at State Road 2 and I-5; SR-512 and West Highway 7
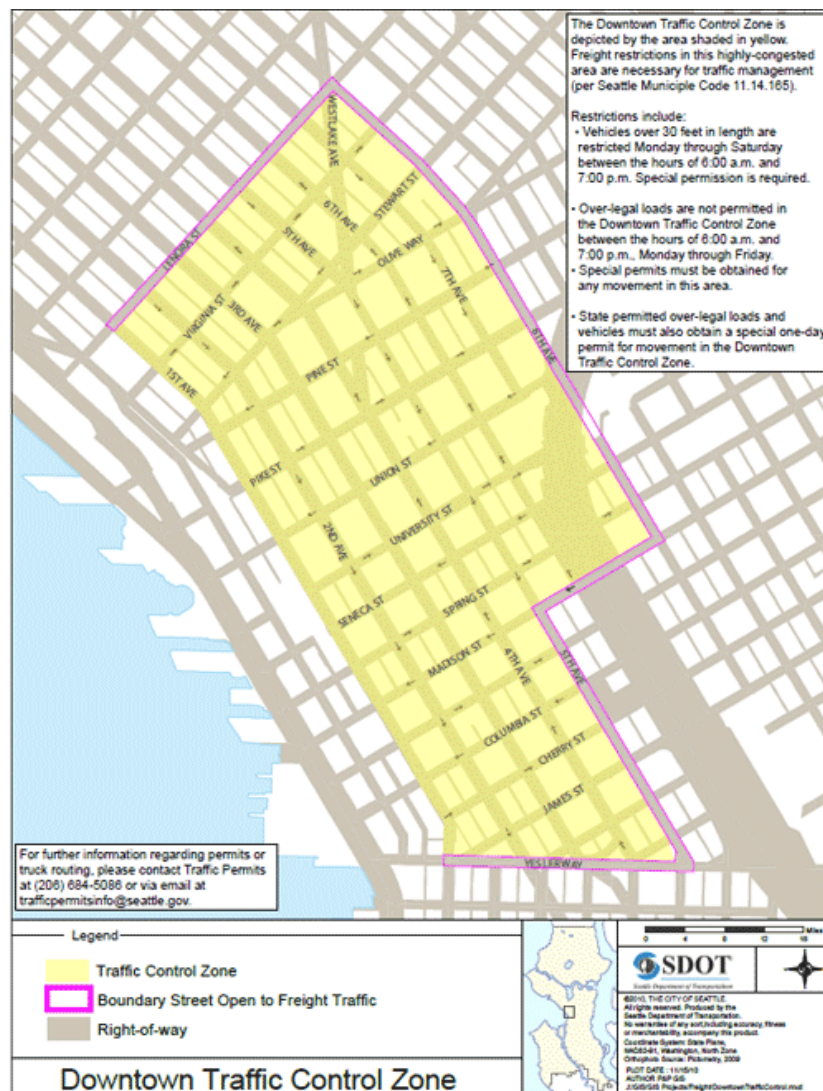
Truck Volume Validation

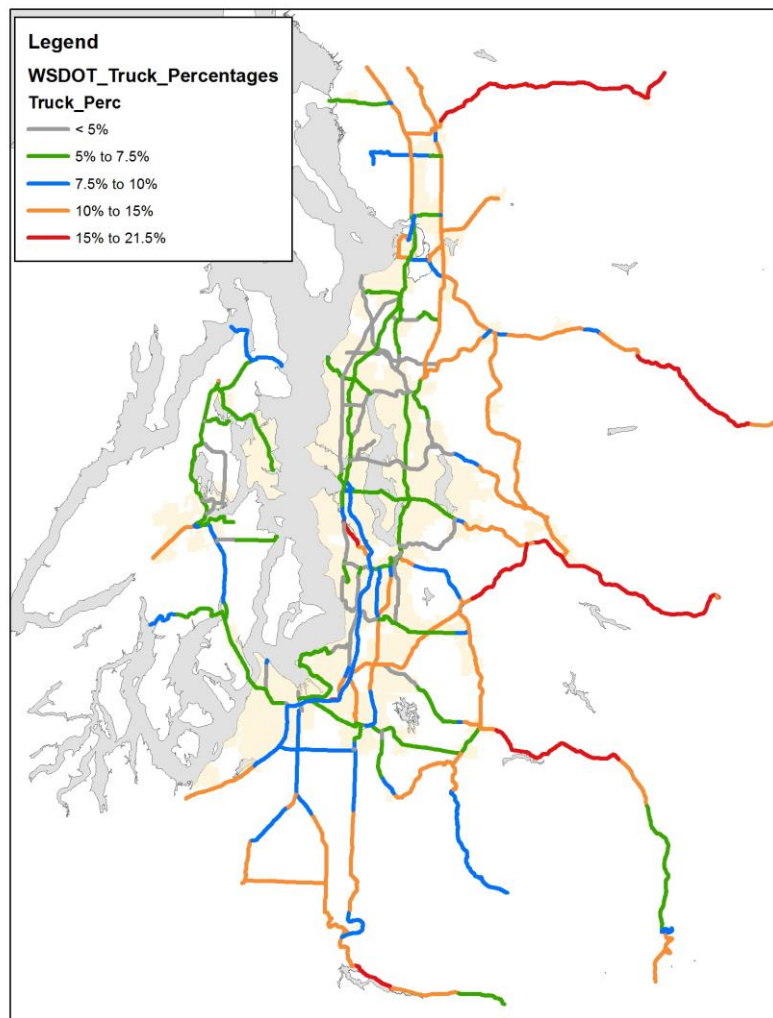# Ensure the model uses correct links

For attractive and unattractive truck routes

Include Freight Network Restrictions

Compare Model to Observed Truck Percentage

Near Term Improvements

- Add network restrictions and refinements to make links attractive or unattractive for trucks
- Calibrate the model to counts and splits by truck type
- Obtain more counts and calibrate
- Look into new GPS truck data sources like ATRI