



Puget Sound Regional Council

Model Users Group 4k Refresh

June 2018



Today

- **Model Refresh from 2014 HH Survey**
 - Trip Generation
 - Trip Distribution
 - Mode Choice
- **Trucks, Externals and Network updates**
- **Input and Code Release**

Quick Reminder



- **SoundCast is the model that PSRC used for the Regional Transportation Plan and is being used for the Vision 2050 Update.**
- **4k has been updated for use by our members for analysis purposes and is a reasonable tool for a variety of modeling projects around the region and is still supported by PSRC staff.**
- **PSRC did not use 4k for the RTP and as such we do not have “official” 4k results for the RTP for distribution.**



Model Refresh based on 2014 Survey

Trip Generation



- Updated household trip generation rates using same cross-classification system from previous versions of the trip based model.
- Trip rates resulted in slightly fewer trips in 2014 due to slightly lower rates of trip making in 2014 survey.

| Trip Purpose | 2014 Daily Trips | |
|-------------------------------|------------------------------|------------------------------|
| | Using 2006 Trip Rates & QCEW | Using 2014 Trip Rates & LODS |
| Home Based College | 160,675 | 185,731 |
| Home Based Shopping | 1,353,695 | 1,702,579 |
| Home Based Other | 5,889,625 | 5,644,507 |
| Home Based School | 1,128,944 | 1,337,641 |
| Non-Home Based Work to Other | 1,684,921 | 1,623,536 |
| Non-Home Based Other to Other | 3,249,214 | 2,841,669 |
| Home Based Work Income #1 | 306,275 | 347,903 |
| Home Based Work Income #2 | 622,479 | 688,107 |
| Home Based Work Income #3 | 643,381 | 591,717 |
| Home Based Work Income #4 | 944,894 | 953,177 |
| Total Daily Trips | 15,984,102 | 15,916,567 |

Key Trip Generation Differences:



Trip Generation is run in python and is:

- **LODES based**
- **Runs from parcels (can be aggregated to any zone system)**
- **SeaTac Airport trips are generated by total population and jobs in a zone and are scaled to total enplanements**
- **JBLM worker trips are based on gate counts and employment and are distributed based on zip code and blue-tooth data from WSDOT study**

All trip generation inputs can be distributed to anyone and are available via PSRC's website.

Trip Distribution



- Updated trip lengths for HH trip purposes
- Trip lengths in 2014 survey were similar but shorter than the 2006 targets
- Trip lengths had to be slightly longer in the model to match VMT, screenlines and count volumes

| Trip Purpose | Trip Length (miles) | |
|-----------------------------|---------------------|----------------|
| | 2014 Base Model | 2014 HH Survey |
| Home Based College | 7.6 | 7.7 |
| Home Based Other + Shopping | 5.4 | 4.5 |
| Home Based School | 4.5 | 3.9 |
| Non-Home Other to Other | 4.8 | 4.2 |
| Non-Home Work to Other | 5.4 | 6.0 |
| Home Based Work Income #1 | 9.9 | 8.6 |
| Home Based Work Income #2 | 11.4 | 10.4 |
| Home Based Work Income #3 | 12.9 | 12.1 |
| Home Based Work Income #4 | 12.7 | 11.6 |
| All Trips | 6.3 | 5.7 |

Key Trip Distribution Differences:



Trip Distribution functions are similar but:

- Shopping and Other trips were combined
- Bridge crossing penalties were removed from the I-90, SR 520 and SR 16 bridges in this update
- SeaTac Airport trips are added to Non-Home based purposes after trip distribution so that mode choice for those trips is run but distribution is fixed.
- JBLM work trips are added to Work Income #1 & #2 purposes after trip distribution so that mode choice for those trips is run but distribution is fixed.
 - Nonwork trips are still generated for the remaining trips and total was scaled to match base year gate counts.

Mode Choice



- **Estimated models from 2014 survey**
- **New density variables were added to the logit models**
- **Still remain MNL – no nesting was done**
- **Transit share in model is lower compared to Survey but better reflects observed transit boardings (within 10%)**

| Trip Purpose | Trip Length (miles) | |
|--------------|---------------------|----------------|
| | 2014 Base Model | 2014 HH Survey |
| Drive Alone | 45% | 45% |
| HOV 2 | 23% | 22% |
| HOV 3+ | 16% | 16% |
| Transit | 3% | 5% |
| Walk | 12% | 11% |
| Bike | 1% | 1% |

Key Mode Choice Differences:



Same functional form but:

- New density variables were added to the models to capture urban form



Other Changes / Improvements

Truck Model:



Generation of Medium & Heavy Trucks:

- Heavy truck creation informed by ATRI truck data
- Updated truck counts from NW Seaport Alliance to update truck special generators
- Light trucks are now treated as “commercial vehicles” but similarly defined
- Updated truck network updates have been incorporated

Other Updates:



Other improvements include:

- Addition of PM and EV transit (now model transit 6am-10pm)
- Updated External Auto and Truck counts
 - LEHD data used to update “work” component of external trips
- Updated creation of model inputs from base year data
- Network cleanup from all the work on the Regional Transportation Plan



Input & Code Release

Release Dates:



- **Networks and Land Use Data** is already available (1 person has requested since June 1st)
- **Model Code and Documentation** will be made available officially on June 25th due to schedule conflicts this week.
 - The model code is always on GitHub (and has been for the last several years) if you really want it but use at your own risk until it is officially released!



Questions?

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