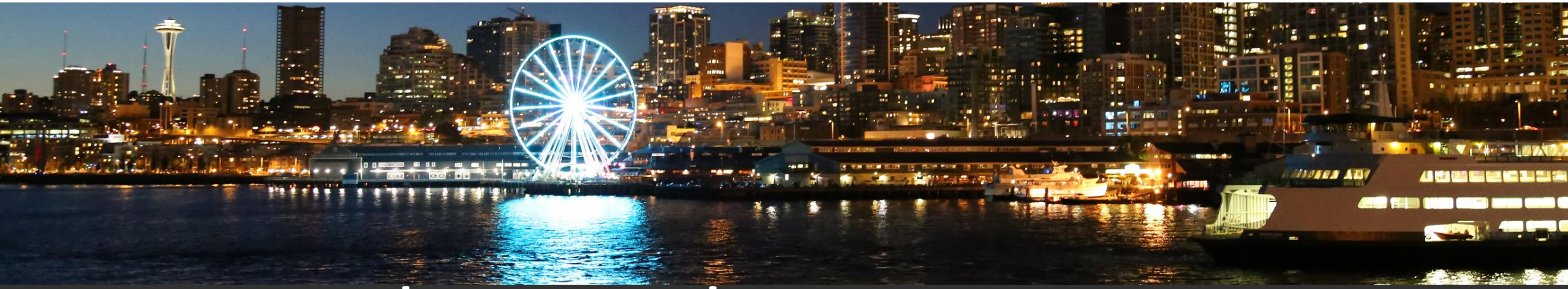


Soundcast Updates

Puget Sound Regional Council

Recent Updates

- Transit sub-modes implemented for Bus, Light Rail, Commuter Rail & Ferry.
- Work at home scenario- work flow and model calibration.
- 2018 Base Year Calibration.
- Incorporating 2017/2019 HH Survey for Soundcast.

Transit Sub-Modes

- Why?
  - Transit modes like Ferry, Commuter Rail and Light Rail different from regular bus service and from each other:
    - Frequency.
    - Comfort & amenities.
    - Availability & trade-offs between other transit modes.
    - Access-shed
    - Transfer Activity
  - Difficult for Mode Choice models to account for these differences.
    - Difficult to hit calibration targets.
    - Must often make assumptions about ‘perceived’ time.

Transit Sub-Modes Implementation

- Transit Assignments/Skim Creation:
  - Ferry- assigns demand that uses the Ferry sub-mode. Produces skims where each OD is traversed using a path that must include Ferry.
  - Commuter Rail- assigns demand that uses the CR sub-mode. Produces skims where each OD is traversed using a path that must include CR, but cannot include Ferry.
  - Light Rail- assigns demand that uses the LR sub-mode. Produces skims where each OD is traversed using a path that must include LR, but cannot include Ferry or CR.
  - Bus- assigns demand that uses the Bus sub-mode. Produces skims where each OD is traversed using a path that must include Bus, but cannot include Ferry, CR or LR.

- Mode Choice Models:
  - For the transit alternative, the sub-mode (or path-type) with the least impedance is used.

Transit Sub-Modes Calibration

- Calibration
  - Calibration Constant Example- If Ferry is the fastest transit option for a given OD, a positive Ferry path constant will make the transit alternative more attractive.
  - Assignment/Skims Example- make walk access slightly less onerous in the light rail assignment, which reduces impedance compared to other sub-types for certain ODs.

- Estimation
  - Possible to estimate the sub-mode constant if the survey has robust data about the types of transit people use for their transit trips.
  - Testing this has yielded positive coefficients for light rail, ferry and CR, but typically the coefficients must be increased to calibrate to boardings.

Work At Home

- COVID-19 quarantine/work from home has caused many to think about how things might be different in a post covid-19 world.
- Early into quarantine we discussed running work at home scenarios for the upcoming RTP.
- Outside interest in using Soundcast to run work at home scenarios.
- So we started looking into it….

Work At Home

- Soundcast was/is representing work at home and is calibrated to match the survey.
- The percentage of at home workers can be increased/decreased by adjusting a coefficient in the work locations scenario.
- However, we noticed that running scenarios with different amounts of at home workers did not result in significant differences in VMT.

Work At Home

- Digging into the outputs we discovered:
  - Most at-home workers were still making work tours.
  - Work tours were significantly longer than survey.
  - Other non-work tours were significantly longer than survey.

- Changes made:
  - Adjusted the work tour rate for people that work at home.
  - Adjusted tour rates for non-work purposes.
  - Added variables to address distance people travel for both work and non-work tours. These can be adjusted to match survey.

New 2018 Base Year

- Network updates
- Collecting data for calibration
- Adding network attributes
- Model estimation
- Calibration/Validation

Travel Survey for Estimation/Validation

- 2017 & 2019 combined travel survey data
- Soundcast estimation alternatives created by Daysim
- Survey records as input to create choice sets
  - chosen trip attributes compared to alternatives
- Estimation files generated in Alogit format

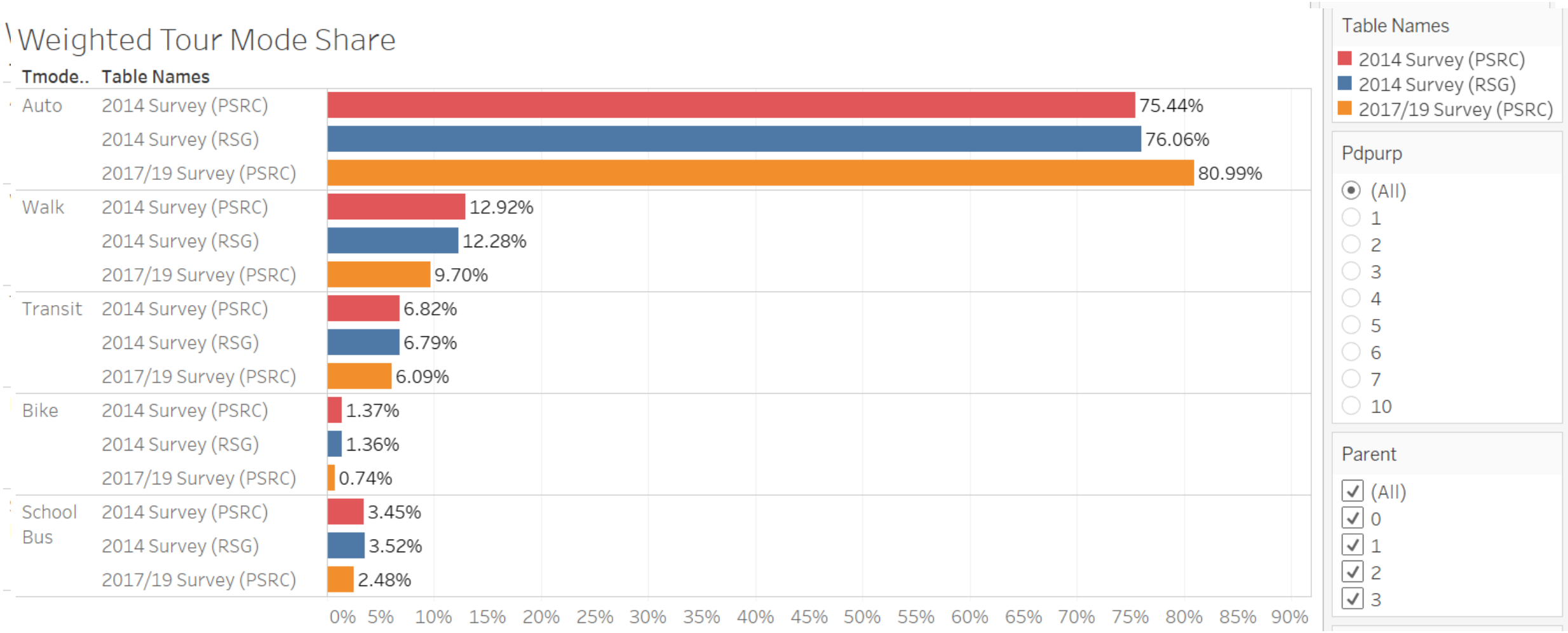
```
Work tour mode choice
Created by ALOGIT version 4                                    16:14:35
END
   1  costutil  F    1.42064055948       .123025698091
   2  timeutil  F    .453897999125       .314324656247E-01
  10  dt-const  F   -.980188286912       .544396764935
  11 dt-nocars  T    .000000000000       .000000000000
  13 dt-carsltw F   -.169625822845E-01   .414683814982
  20  wt-const  F    1.43737759676       .413610764722
  30  s3-const  F    .624372994810       .427755465740
  31  sr-hhcu5  T    .000000000000       .000000000000
  32  sr-hh515  F    .528253586488       .797150752149E-01
  35 sr-lndist  F   -.319185518863       .446024610820E-01
  38 s3-onephh  F   -1.57118918694       .193454567468
  39 s3-twophh  F   -1.39921510252       .128370926815
  40  s2-const  F    .846630415015       .422366093166
  41 sr-nocars  F   -2.49064659512       .303885492322
  42 sr-carsltd F   -.923078990516E-01   .104986952440
  48 s2-onephh  F   -.998944290131       .152147139705
  50  da-const  F    2.38368890000       .429673011624
  53 da-carsltw F   -1.31057476710       .137122622422
  54 da-incu25  F    .399204831543       .253907844185
  60  bi-const  F   -.376053802766       .494825187249
```

Converting Survey to Daysim Format

- Transposing variables for modes, purposes, household and person characteristics
- Creating tour and person-day files
  - Sub-tours
  - Relating trips to tour segments

```
purpose_map = {
    1: 0, # home
    6: 2, # school
    9: 3, # escort
    10: 1, # work
    11: 1, # work-related
    14: 1, # work-related
    30: 5, # grocery -> shop
    32: 5, # other shopping -> shop
    33: 4, # personal business
    34: 4, # medical is combined with personal business (4)
    50: 6, # restaurant -> meal
    51: 7, # recreational is combined with social (7)
    52: 7, # socail
    53: 7, # recreational is combined with social (7)
    54: 7, # religious/community/volunteer -> social
    56: 7, # family activity -> social
    60: 10, # change mode
    61: 4, # personal business
    62: 7, # other social
    97: 4 # other, setting as personal business for now (4) ?
}
```

Comparing Conversion Results



Parcel Geolocation