

## Technical Working Group

May 25, 2016 Notes

### **Suzanne Childress, PSRC, leading discussion and presentation**

In future meetings, we may be focused more on the day-to-day work instead of overall, broad discussions of the model. We want to start that conversation today of what we should discuss.

Suzanne presents recent progress for 2014 data. PSRC has completed updates to 2014 parcel land use, synthetic population, externals, networks (mostly transit), fares, special generator (especially the airport using a recent survey), tolls, parking costs, park and ride data.

The synthetic population is based on SynthPop, which is part of the UrbanSim model framework. The synthesizer tool calibrates synthetic population to ACS PUMS data targets for 2014. PSRC did some work to make results match across different categories by household size, number of workers, age, etc. Other control total values were the OFM population totals (Office of Financial Management). PSRC can present some of the results and validations in the future?

Gary asks if we accept more area in persons and household versus spatial mismatch? Mark S. answers that we control at the geography closely and the synthesizer is focused on getting the household distribution accurately. Overall the match-up is very close.

Progress made since last month include:

- All-day transit assignments
  - 5 am to 8 pm should cover most trips, modeling night trips is possible but PSRC probably won't do it. The setup is done but still needs some implementation
  - Should not add much runtime because transit assignment is already quite fast
- Discussion of model installation efforts
  - WSDOT says it would be nice to have a model manager to run on servers here or on the cloud to avoid install conflicts and input management issues
    - Possible to run this on internal servers within a year
    - On cloud more like 2 years
  - PSRC ran into install issues when transferring Soundcast code to WSDOT
  - PSRC installed Soundcast without major issues in Bellevue and Pierce County
  - How can we manage model run size? PSRC has plans to shrink and manage runs so they can be resurrected from inputs or partial outputs
- Random seed bug in Daysim code fixed
  - RSG has fixed the random seed issue, but the latest version of Daysim is still not debugged. PSRC is working with RSG to test and pull the latest version to take advantage of these and other changes. Problem is different branches of Daysim code for different agencies.

- WSDOT wonders if random seed fixes changed our calibration results? PSRC says they changed slightly but not major, not sure what might have changed the results for the latest clean build. There have been many changes since last update to code (50 code changes). PSRC will be doing a lot of this work anyway for 2014
- Implementation of Soundcast using BKR zone system and network built by Stefan at PSRC.
  - Only applies for skims and demand, doesn't include truck or supplementals, possible to change this in the future without huge effort
  - Validation is not great for PM peak, but mechanical parts are created
  - BKR network and zones match up with and cover PSRC zone area
  - Discussion of whether it would be better to abstract all PSRC zones as externals, and best way to set up a network for looking at a smaller subarea.
  - Gary is curious about if we could do something similar for 900-zone system – set base zone system as this and then build more detailed zones for whichever zone area we care about.
  - Future discussion point: creating a uniform zone system for everyone to use outside of each agency's subarea.
  - Run time for 4 global iterations on BKR zones is about 24 hours, vs. 36 hours for PSRC zone system. Could be useful for internal testing in PSRC because it runs much faster.
  - Craig suggest we could try Gary's zone system and network in Soundcast to see what happens. It could fail due to zone abstraction, but it's worth testing.
- Truck model re-improvements
  - 4k improvements to truck model were transferred to Soundcast, but it caused some errors that needed to be corrected.
    - Improvements included land use restriction for truck trip generation to keep heavy truck trips from improper locations like downtown Seattle. This also changed how we set our truck rates and factors.
    - PSRC is adding truck summaries
    - Future improvements will be moving to parcel inputs and not relying on 4k inputs. Keeping updates and inputs for 2 models simultaneously has been causing PSRC some issues. One impetus for updating 4k to a good point and not updating it all the time to match Soundcast.
- Household travel survey trip ends geo-coded
  - Stefan worked to make sure that trip purposes match the proper land-use for the survey, makes sure that model estimation is accurate.
  - Gary wonders how these changes affect expansion factors? Suzanne responds that we use parcel data for destination choice models often, and that we don't use expansion factors for this kind of measure, is usually used on aggregate measures.
  - PSRC is also cleaning GPS data for trip weight adjustment creation by RSG.
- Airport model improvements started
  - Generation based on employment and total population, ideas influenced by Bob Sicko's work.

- Originally the model used home-based other purposes for generation, and this caused many short trips from close by only.
- Using airport survey for validation
- Workers are still using the TAZ as a workplace zone
- Could apply similar approach to JBLM based on Gary's work in Pierce County or Boeing workers in Snohomish.
- Experimenting with INRO's CityPhi for visualization
  - Examples of outputs showing activities by purpose in 2010 vs 2040, 3D animations of stacked activities, arrival times by purpose
  - Still working on ways to use the tool
- Tasks before soundcast is ever used in practice:
  - Estimation of mode choice, day pattern, exact number of tours, school location with 2014 survey.
  - Calibration to match 2014 counts
- Other improvements
  - Implement mode choice for trucks, externals, and special generators.
    - Brant suggests that RSG was involved in Sound Transit fall 2015 on-board survey on Link, airport travel info might be useful. Stefan thinks PSRC may already have this data, but PSRC will follow up.
  - Bike assignment improvements, incorporating slope, link volumes, and bike facilities, could be used for mode choice and assignment, ideally needs more granular networks

#### **Hu Dong, City of Bellevue, presenting**

- Testing of soundcast in Bellevue
  - Run time 43 hours (!) on 32G RAM PC with 8 cores, 110 G disk space used.
- Test #1 of randomness test with different random seed
  - Use different random seed for baseline (seed=9) vs. alt (seed=19)
  - Same population, different daysim outputs and different assignment results.
  - % change is about 3-4% different between the two
- Test #2 of randomness with same random seed
  - Slight differences for daysim outputs (e.g., vmt/person 18.4 vs 18.6)
  - This should be fixed with RSG's most recent fixes, still not tested
  - Volumes differences smaller than in test #1, not a significant issue
- Test #3 increase/decreased network capacity by 30%
  - Mode share should slight decrease in SOV for decreased capacity, not highly sensitive, but in the right direction
  - Interest in seeing departure time by time of day
  - Transit ridership increase with decreased capacity
- Test #4 add tolling on SR520 vs no tolling
  - Reduction in AM peak hour trips on 520 and more trips on I-90, some very small increase in transit ridership along these routes, but almost insignificant

- Is it overly sensitive? 1000 vehicles less in an hour
- Good that changes are only locally on I-90 and 520.
- Slightly more transit passes owned with tolling
- Test #5 sensitivity test in land use
  - BKR downtown population up by 100%, BKR downtown employment up by 50%
  - Increased vehicle volume on many major roads in area, increased transit ridership
- Test #6 soundcast trip table summarized by BKR TAZ system and Test #7 BKRCast – Soundcast modified to fit BKR zone system
  - Comparing soundcast versus BKRCast shows similar results, slightly lower because trucks aren't included in BKRCast, likely issues with SCBKR aggregation
  - Overall screenlines look low for one-hour peak
    - Could be time-of-day distribution differences

#### Other Discussions

- Mark Simonson on administrative discussions, will follow up via email later
  - Delay next meeting until July?
  - Volunteer to check in for RSC, how often to do this?
- How far along is PSRC and RSG on estimation process?
  - PSRC is slightly behind schedule, not yet in estimation process, but not very far behind because T2040 model runs are later in the year (next year) than anticipated
  - Collecting 2014 data takes a long time to gather and format

Meeting adjourned