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| **TO:** | SOABM Peer Review |
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| **FROM:** | Alex Bettinardi, ODOT |
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| **CC:** |  |
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| **DATE:** | March 25, 2019 |
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| **SUBJECT:** | Southern Oregon Activity-Based Model (SOABM) Calibration Peer Review Meeting Notes |
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A conference call was held on March 25th, 2019 via skype to discuss the results from the latest round of SOABM calibration. Below are the list of attendees and meeting notes. All other proceeds from this meeting which include a final documentation memo summarizing the work for the meeting, the round three calibration documentation and meeting notes, and five HTML files comparing the results from SOABM runs were shared on github - <https://github.com/RSGInc/SOABM/tree/master/documentation>.

Attendees

Sam Ayash, ODOT

Alex Bettinardi, ODOT

Brian Dunn, ODOT

Jin Ren, ODOT

Peter Schuytema, ODOT

Ray Jackson, Salem-Keizer Transportation Study

Chetan Joshi, PTV

Peter Bosa, Metro

Chris Johnson, Metro

Keith Lawton, Consultant

Rosella Picado, WSP

Agenda

5 min intro / background

20 min walk through of the changes made since August

20 min discussion on ways to address shadow pricing

20 min highlight of the key findings

20 min to walk through the issues we are still considering

5 min close out and discussion of next / follow-up steps

Meeting Notes

**Background and Changes Made Discussion**

**Alex**: Provided an overview of the background work so far and a walk through of the changes made since August (which are documented at the github link above). One change that was highlighted during the discussion was the visitor model. Rosella asked several clarifying questions for how it was applied. Alex attempted to answer the questions, but noted that ODOT did not have much information to use in the development and went through several iterations of testing to reach a method that seemed workable, but that the process lacked peer review, and ODOT should consider a peer review of the visitor representation approach specifically (further peer review beyond this discussion).

**Shadow Pricing Discussion**

**Alex**: Provided an overview that across the calibration scenario and the three sensitivity scenarios the ABM, without shadow pricing, seemed to do a good job (r-squared greater than 0.9, close to 1) placing workers in employment MAZs. However the scenarios that changed jobs (employment scenario) or workers (aged population scenario) created an imbalance in the relationship between workers and jobs that users of the ABM needed to be aware of. Alex asked of given this context if the peer review felt that it was best to keep shadow pricing on or turn shadow pricing back on.

**Rosella**: Discussed a handful of issues and considerations around using or not using shadow pricing, such as being aware that from scenario to scenario workers can pick different job locations which can make apples-to-apples comparisons difficult or misleading. Because of this Rosella suggested that with transit scenarios in particular, Oregon may need to consider a procedure where employment locations are set and held between transit alternative scenarios (for apples-to-apples comparison). This could be considered for other transportation system scenario comparisons as well, but it has come up as an issue most often in the past with transit scenarios.

**Alex notes**: In general, shadow pricing requires that the model user have a solid understanding of how shadow pricing works and how it is specifically being applied in the given model, and so this is an area where ODOT will need continued training and development to best apply the ABM for future applications.

**Sam**: Discussed that some of the internal jobs could be filled by external households under some scenarios, meaning that maybe a shift in the worker to jobs balance is okay. The group agreed but noted that the model users / operator must be aware that this imbalance is occurring and must be purposefully creating the imbalance if the scenario calls for it. The concern being that a model user might create a worker to jobs imbalance without intending to.

**Rosella**: Suggested adding a total regional jobs control to the synthetic population to control for this imbalance.

**Alex**: Replied that the synthetic population is controlled at the TAZ level by number of workers by household (0, 1, 2, and 3+) and regionally by the 6 occupation categories, which the model user must work to keep consistent. The group agreed that the jobs check is a second consistency check which must be made by the model user.

**Rosella:** Suggested that the shadow pricing results be reviewed for the 3 MAZs that had increased employment in the employment center scenario. The purpose being to see the worker to job ratio for those three zones under the reference and then after the ~5000 employees were added, to see how well the model allocated workers, and if it did so at a different ratio. Also to review MAZ worker allocation overall to the other MAZs, besides the specific three. Related, the group agreed that the ABM’s ability to match workers to jobs without shadow pricing used should continue to be reviewed for the 2017, 2045 and other model reference years (as well as ABM application scenarios in general).

**Findings and Potential Further Action Discussion**

**Alex**: Highlighted that ODOT was considering three options related to the current 2-8% under assignment ODOT has been seeing with the finalization of the highway assignment process. ODOT was considering three options related to achieving a daily slope of 1.0 of model assigned volumes versus daily counts:

1. Adjust the commercial vehicle model up
2. Add more visitors to the region (noting from above that the current visitor approach needs peer review)
3. Don’t complete any further refinement in this area and document the current under assignment as acceptable.

**Keith**: Voiced a recommendation to use the commercial vehicle model.

**Jin:** Voiced a recommendation to add further visitors.

**Sam:** Voiced a recommendation not to apply further work to this extent and document the current slight under assignment as acceptable.

**Chetan:** Noted that it looked as if ODOT custom VDF approach might be adding unnecessary complication to the ABM design and that PTV might be able to work with ODOT to deploy the same VDF treatment using the built in nodal delay functionality in Visum.

**Alex:** Highlighted to the group that ODOT had noticed late in the review that “progression factors” had been applied to several major state highways in the region to reduce intersection delay and help the state highways attract interstate volume. However, at the current time most of these highways were assigning too much volume (in comparison to counts) and there was a question to the group if it made sense to return the progression factors to 1.0.

**Chris**: Asked for clarification in how the progression factors were being applied. Alex showed some examples, showing how progression factors of 1.0 were assigned to all links in the network, except for links deemed to perform better (less delay, a factor less than 1.0, currently 0.6) or worse (more delay, a factor of greater than 1.0, currently no link is coded greater than 1.0).

**Rosella**: Suggested that before determining how to deal with the progression factors that observed data should be compared to the model travel speeds to see how different corridors are performing.

**Alex:** Noted that, while not ideal, ODOT does have TomTom data for the SOABM links from 2010, and that those 2010 weekday speed profiles could be compared to model travel times by link and corridor to get a sense of which areas might justify progression factors or not.

**Alex:** Discussed that similar to the under assignment issue above, that AM, MD, PM periods were not always a perfect slope of 1.0 when compared to counts, and that the commercial model could be altered to get a near perfect 1.0 slope in each period. The peer review quickly responded that would be over calibration and would not be advised.

**Alex:** Then discussed the issue of under assignment in the Ashland area. In previous work a special attraction district for the Ashland area was established, but for this latest calibration work that had been removed. ODOT was considering three choices:

1. Allow Ashland to have low assignment and just document the issue,
2. Re-apply the Ashland district factor from previous work, and adjust as needed, or
3. Apply a visitor methodology, however it’s not clear exactly how that visitor logic would be applied, and as documented above, the visitor component still would benefit from its own peer review.

**Keith:** Highlighted that Ashland is a special area with lot of attraction and visitors (noting difficulty finding space to stay in Ashland).

**Sam:** Recommended reviewing select links in the Ashland area to get more insight into trends in the model.

**Jin:** Voiced support for representing additional visitors in the Ashland area.

**Alex:**  Noted that the meeting time was almost up and asked for additional comment to be sent or communicated to ODOT as the peer review members desired.

In the final minutes Alex asked how the peer review would like to review any further work that ODOT completes towards this effort based on these comments. Keith and Rosella (along with the ODOT team silently), suggested just a follow-up memo addressing the specific elements in this discussion and final results.

**Summary of Recommendations and Next Steps:**

* ODOT should consider a peer review of the visitor approach taken in SOABM as a separate peer review process.
* ODOT will continue to review results related to employment to jobs assignment in the model; will pursue additional training related to shadow pricing and job treatment in the ABM; and will consider special treatment for holding work location constant between scenarios.
* ODOT will compare modeled link travel speeds to 2010 TomTom link speed weekday profiles to get a sense of what corridors might justify a “progression factor” treatment.
* There was no consensus on the best approach to deal with under assignment, ODOT will continue to take peer review comment on this post-discussion, and will pursue further understanding of options as needed.
* There was no consensus on the best approach to deal with the under assignment in Ashland, ODOT will continue to take peer review comment on this post-discussion, and will pursue further understanding of options as needed.
* ODOT will finalize the 2010 SOABM calibration and send the peer review a final memo covering the elements in these notes and the final results that are achieved.