To: Sorin Garber, HDR, Cross-Cascades Corridor Analysis Project Team
From: Keith Lawton, Deb Niemeier
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Subject: Cross-Cascades Corridor Peer Review

This memo documents our review of the Cross-Cascades modeling effort. We have organized the memo into two sections, beginning first with an overview, followed by specific "time-defined" comments related model improvements. Finally, we both enjoyed the peer review session and believe that the professional nature of the presentations provided an important backdrop for our review.

Overview

The structure of the proposed model is very sound, and should be suitable for Washington DOT modeling purposes probably for the next 10 to 15 years. The structure will allow, over time, the development of consistent sub-models with increasing complexity, finer granularity, and the ability to add policy analysis capability for policy areas not covered (or perhaps even thought of), in this stage of model development. Of particular importance is that the structure encompasses the inter-relationships between the transport infrastructure, land use development, economic impacts and internally consistent generation of freight flows.

It is our opinion that getting the structure "right" is the most important element in the model development effort. In the short-term, if compromises in initial calibration and goodness of fit are made in order to set the direction for long-term success, these are appropriate trade-offs to make. However, it is important to clearly specify the obvious limitations of this "16-week" 1st generation model.

The fact that this is a complex integrated model means that there are many targets to match in model calibration and it is unlikely there will be a solution where all targets can be matched equally well. It is clear that the weighting system for target matching will be study-specific to some extent (getting the best fit on the dimension of interest in a particular study). It is important that documentation of the weighting process be complete and clear, and that the weighting process for each study be explicated.

Finally, the current development effort clearly has data availability limitations, coarse zone granularity, and a modeling area focus that is too narrow (e.g., no consideration of the Columbia Corridor competition/complementarities, and interaction with north-west Oregon). These are compromises that can be overcome with time. However, a clear strategy for model development should be put in place; this strategy should outline important data needs as well as identifying the sequential development of improved sub-models. Data collection, in particular, takes time and resources and should be started as soon as feasible.

We have organized the remainder of our thoughts into categories of time-related considerations, rather than the four questions you initially posed to us. Our comments reflect our opinion about the priorities for model enhancements. In the short-term (i.e., prior to completion of this stage of

the modeling effort), we have focused our comments on items that modestly refine, and/or clearly delineate the limits of the current model. In the intermediate stage, we identify those model enhancements that we feel are critical to actual implementation of the model. Finally, our long-term enhancements reflect major steps in model development.

Short-Term (Immediate) Actions (Prior to 16 wks completion)

1. The consulting team should develop material to assist interested parties in better understanding the limitations of the current effort. For example, we suggest outlining the types of questions that can be answered using the current model – this approach should make clear the coarseness of the results associated with the current state of the model (or the final state at the end of the 16 weeks).
2. The consulting team should clearly identify stages for the further development of the model. These stages could be identified using, for example, a tree diagram where each progressive stage of refinement results in better resolution of modeling results, but requires a certain (estimated) resource allocation.
3. There may be a tendency on the part of policy-makers to assume that this model can be used in lieu of the regional models. The consulting team should prepare material that adequately explains differences (e.g., the resolution, types of questions addressed, etc.) between the new model and the regional models. It might also be useful to elaborate on how the models will work together. Although this might seem obvious, it was not clear that all the participants in the workshop had a clear sense of the partnership that would exist between the models.
4. Ensure that (in this prototype) residences cannot be assigned to constrained (or impossible) locations.
5. If this prototype model is actually to be used (even at a sketch plan level), the team needs to improve the model results so that trips (or trip lengths) are better estimated, perhaps by adding additional zones or combining trip purposes until the resolution of the full model is increased.
6. Develop a clear plan for calibrating the model and documentation that clearly describes the calibration steps (including, for example, the assignment of weights).

Important Next Steps in Model Enhancement

1. It is fairly clear that additional effort to improve the resolution of the north-south flows is required. We view this as the most important priority in further development of the model. This means that the Seattle-Portland Corridor will need to be more detailed, and that the Columbia corridor be included, with some detail in the modeling area (model boundary issues).
2. A land capacity function should be developed in the short-term. This will help to prevent over-assignment of residences to certain geographic locations.
3. Improved specification of external freight movements should also be considered.
4. Model testing should be completed that identifies the model significant parameters in the calibration process. Some of the factors are likely to be more important than others (e.g., for policy testing) – the sensitivity and uncertainty associated with these parameters should be identified. This will help to guide future data development.

5. A first cut at specifying the ways to reconcile the interface between the statewide model and the regional (MPO) models should be completed. Each system can inform the other.
6. Spatial granularity (zones) should be increased by a factor of at least 10, in order to get "intrazonal" problems under control. At present there is a lot of "unexplained" variability susbsumed into intrazonal factor assumptions.

Long-Term Enhancements

1. As the consulting team has rightly noted, use of the MEPLAN is premised on availability of land pricing. Over the long-term, land pricing should be added to the model framework.
2. A move to microsimulation on many fronts, from dealing with household transitions and location decisions to traffic flow microsimulation on the networks will need consideration. This could include microsimulation of developer actions and business formation and location. This will allow for a much richer mix of market considerations.
3. Consideration might also be needed of enlarging the model's area of influence. It is clear that the economic region that comprises the Northwest is larger than a state, a joint multi-state model, including the neighbor states could be the result of a cooperative effort.
4. A move to complete (or at least, a fine level of) spatial disaggregation will help remove the intrazonal modeling problem.