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Title (10 words limit): Comparing scenario responses between Perth DoT disaggregate and aggregate models

Theme: Integrated Travel Demand Modelling

Abstract (250 words limit):

The Department of Transport Western Australia maintains two travel demand models for the metropolitan area of Perth and Peel: a) the newly-developed Tour-Based Strategic Transport Evaluation Model (TB-STEM) and b) the traditional Strategic Transport Evaluation Model (STEM). In this work we provide a systematic comparison of the behavioral responses of each model to distinct planning scenarios.

TB-STEM is a disaggregate model which starts from a list of statistically-matched synthetic households for the region, and then microsimulates household-level choices for vehicle ownership, tour frequency, destination choice, remote activity participation (telecommuting, remote university and remote shopping), mode choice with park-and-ride, intermediate tour stop frequency and location, and time-of-day choice. The resulting trips are then aggregated prior to highway and public transport assignments.

In comparison, the STEM model is an expanded four-step model structure which includes zonal aggregate choices for trip generation, trip distribution, and mode choice including park-and-ride and parking choice. A zonal aggregate time-of-day segmentation is also applied to prepare for highway and public transport assignments.

The responses of the two models are tested against several planning scenarios including public transport expansions. We will provide comparison and interpretation of the results differences, along with explanations with reference to key differences related to trip-chaining and tour formation constraints.

The findings are generally transferable to other models, and we believe will help inform practitioners to better understand the impact of travel demand model structure in relation to planning needs.

Presentation draft outline:

- Introduction to the models' structures (TB-STEM vs STEM) and some implementation / calibration details
- Explanation of each tested scenario and key results' comparison between the two models
- Interpretations of the results with reference to the different structure of the models
- Conclusions / findings