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Income-Based Work Trip Stratification within the Puget Sound Regional Council Travel Model Framework

Title of the paper

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BIOGRAPHICAL SUMMARY FOR MAIN AUTHOR (100 words mini-CV)

Chris Johnson has approximately 13 years of travel modeling experience. He is currently a senior planner with the Puget Sound Regional Council in Seattle, Washington. Prior to coming to Seattle, he spent approximately 11 years working in the public and private sectors in Madison, Wisconsin. Chris' project experience has varied widely in terms of scale, complexity, and geography – he estimates that he has worked on travel modeling projects in at least 10 different states and numerous cities.

AUDIOVISUAL SUPPORT NEEDED

(A PC with Office XP, a projector, and a microphone will be provided. Please mention any other needs.)

ABSTRACT (500 words)

Procedures to stratify work trips (home-based work trips) by income range and carry those income ranges as separate purposes/classes through the extent of the four-step process were formally incorporated into the Puget Sound Regional Council's (PSRC) travel model framework in early 2006. Income-based work trip stratification allows for capturing the relationships between household income and other household characteristics such as the number of work trips generated, household location, occupation type, and occupation location, thereby strengthening the distributional match between households and jobs. Income-based stratification within mode choice and generalized-cost assignment also provides for the consideration of differing values-of-time in the evaluation of tolling and pricing policies.

As currently implemented within the PSRC model framework, income stratification of work trips begins with trip generation and continues through the generalized-cost assignment. The trip generation model calculates work trip productions and attractions for five distinct income ranges: less than \$15K; \$15K-\$25K; \$25K-\$45K; \$45K-\$75K; and greater than \$75K. In addition to income classification, work trip production rates are cross-classified by household size and the number of workers per household. Work trip attraction rates have been calculated by income range for six different employment classifications. Following trip generation, the two lowest income ranges are combined and four distinct work trip purposes are carried forward to distribution: less than \$25K; \$25K-\$45K; \$45K-\$75K; and greater than \$75K. Individual gravity models, using logsums for impedance measures, have been developed to geographically distribute the work trips within each income category. Individual mode choice models have also been developed for each income classification to split the work trips into seven different modes. For the generalized-cost assignment, the single-occupancy vehicle (SOV) work trips within each income category are kept separate and assigned as four distinct vehicle classes, while non-SOV trips are grouped according to mode.

The primary theme of the presentation will be an examination of the income-based work trip generation and distribution methods implemented within the PSRC travel model framework. As such, the presentation will provide a detailed description of the work trip generation and distribution models, overviews of the mode choice and generalized-cost assignment models and their income-based elements, analysis (and findings) of the household travel survey database used to develop, calibrate and validate the income-based models, and a discussion of the structural implementation of the income-based models within the PSRC model framework. The final sections of the presentation will offer a comparison of the results of the income-based methods trip generation and distribution methods with prior methods, measure and determine the improvement of the income-based methods over prior methods, and offer lessons learned from the process or ideas for future model enhancements.

Please send the completed form to the attention of:

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