Dynamic Traffic Assignment: Integrating DYNAMEQ into Long Range Planning Studies

Author: Richard E. Walker
Contributors: Peter Bosa, Scott Higgins

Organization: Metro, Portland, Oregon

Contact Information:
Metro
600 NE Grand Avenue
Portland, Oregon 97232
Phone 503-797-1765

Email: Richard.Walker@oregonmetro.gov

Author Bio:
Mr. Walker is the Modeling and Forecasting Manager for the Research Center at Portland Metro. His professional areas of interest include corridor studies, transit analysis, non-motorized travel, emission analysis, land use modeling, and surveys. In addition to his Metro duties, he provides service to the Transportation Research Board and the Oregon Modeling Steering Committee.

Abstract:

Portland, Oregon experiences extensive saturated roadway conditions. This situation will become more acute in the future. Given this environment, traditional static assignment methods will fail to meet the analytical needs required for project evaluation. Thus, Metro is embarking on an implementation plan to use DYNAMEQ as a planning tool with the use of a long term horizon year in the analysis.

Dynamic traffic assignment (DTA) methods have most frequently been applied as a tool to analyze traffic flow for impacts that could potentially emerge from construction or project implementation. However, the horizon year on this analysis has typically been a near term target date. Thus, the use of DTA methods in a planning study with a 30+ year horizon is considered unique.

Metro has found that the questions raised during project analysis are changing. Decision makers are no longer content to base their decisions on just volume-capacity ratios. They are now asking how many hours will the congestion on this facility last. They are interested in queue lengths at intersections. They want to know the impacts of corridor management measures (e.g., signal coordination). They need to be informed about corridor travel times. All of these questions lead to the implementation of a new analytical procedure. The dynamic traffic assignment tool can provide analysts with a means to quantify these (and other) issues.

DTA is also well suited to complement activity/tour-based models. Daily travel time data summarized in short time intervals is useful as a variable that informs the choice of activity patterns, activity locations, and modal selections throughout the day.

Emission analysis is very important in project analysis. The Environmental Protection Agency has developed the next generation of software (MOVES) to assist the analyst in air quality analysis. This

software is much more sensitive to acceleration, deceleration, and idling characteristics than its predecessor (Mobile6). The speed characteristics derived from DTA are well-suited to inform the MOVES software.

Given the above, DYNAMEQ is slated to become an important component in the Portland Metro modeling tool chest. To date, network data has been enhanced to make it "DTA ready". Trip tables have been refined to more accurately reflect the diurnal characteristics in the system. Both these items are being used to conduct a "prototype" focus area study. This work will serve to refine the expertise of the staff and to demonstrate the ability of the tool to address the unique issues identified above. Portland is "well down the path" in bringing DYNAMEQ into the long term planning arena.