
7.0 Test Plan for Benefit/Cost Analysis

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The benefit/cost analysis will extrapolate the focused findings from the analysis of the selected corridors and market research to produce estimates of regionwide impacts. A traditional spreadsheet benefit/cost model will be used to conduct the regional extrapolation of data and benefit/cost analysis.

This method involves the use of spreadsheet models to extrapolate data from the four selected corridors to the regional scale. All regional corridors will be classified similar to the selected corridors. Observed safety and traffic flow impacts from the selected corridors will then be applied to all ramp metered corridors according to their specific corridor type. Benefit values will be applied to the resulting impacts and will form the basis for the cost/benefit analysis. This method is advantageous in that the methodology is well accepted for conducting analysis of this type and can be applied in an expedient manner suitable to the schedule requirements. This method is limited in its ability to assess impacts on a location-by-location basis and would not completely capture some of the impacts on travel time reliability and other performance measures. This method is also limited in terms of presentation and data segmentation capabilities.

A second benefit-cost methodology may be used in the analysis of a broader set of ramp metering operating scenarios. After the “with/without” evaluation is completed, it is likely that there will be a need to investigate the role of ramp metering in optimizing system efficiency. Such an investigation is currently beyond the scope of the “with/without” evaluation which looks at an all-or-nothing comparison. An analysis of ramp metering operational strategies will require estimating the effect of these strategies onto multiple diversion routes for all Twin Cities corridors, queue lengths at freeways and ramps, and other details not analyzable in a spreadsheet format.

This further investigation would employ the ITS Deployment Analysis System (IDAS) software tool. IDAS was developed for the FHWA to provide planners with the ability to evaluate various traffic management strategies, including ramp metering. The IDAS software would use outputs from the Twin Cities’ regional travel demand model as inputs to the software. Field data, as well as traveler survey data, will be used to calibrate the IDAS model so that it replicates traffic conditions observed in the field. The IDAS model would then be used to investigate and analyze a broader set of ramp metering operating strategies. The IDAS methodology has the advantage of analyzing the ramp meter impacts specific to each deployment location and could also be used for analyzing additional operational scenarios following the completion of this study.

The result of this task will be a technical memorandum providing an evaluation of the regional benefits of ramp metering compared with the associated costs and negative

impacts. This memorandum will be supported by clear and useful graphical materials appropriate to a varying range of stakeholders and the public.