

An Evaluation of RouteMatch Software in the Billings MET Special Transit System

by

David Kack, Research Associate

and

Deepu Philip, Graduate Research Assistant

of

Western Transportation Institute

College of Engineering

Montana State University - Bozeman

Executive Summary

May 2, 2007

EXECUTIVE SUMMARY

In 2003, MET Transit in Billings, Montana was notified that the Mobility Master software it was using for its MET Special Transit (MST) service would no longer be supported, and wanted to research alternative software solutions. MET Transit contracted with the Western Transportation Institute to assist in an analysis of the technology currently used in MST, MET Transit's paratransit operations.

In addition to the software analysis, MST asked WTI to review the benefits of adding automatic vehicle location (AVL) and Mobile Data Communications (MDC). To review the benefits of these additional technologies, the Western Transportation Institute performed a literature review and incorporated those findings into a report for MET Transit [1].

Subsequently, the City of Billings developed a Request for Proposals, and ultimately selected RouteMatch Software. Both MET Transit and RouteMatch Software were interested in evaluating the effect the new software would have on the system. The Western Transportation Institute (WTI) performed an evaluation that looked at both quantitative factors (rides per mile, rides per hour, on-time performance) as well as qualitative factors (surveys of the drivers and dispatchers).

For the evaluation, researchers compared three months (July, August and September) in 2005 with the same three months in 2006, roughly six months after the RouteMatch software was installed. They believed that it was necessary to have comparison data that would show the impact of the software, and decided that after six months of using the new RouteMatch software, the dispatchers should be proficient with the system.

The results indicate that MET Special Transit operations were more efficient after the software was installed. This conclusion is based on data that the rides per mile and rides per hour were higher during the three-month evaluation period for 2006. However, researchers did not have enough data on cost parameters (fuel, insurance costs, etc.) to conduct a definitive analysis of whether or not the RouteMatch software had a positive benefit to cost ratio ("paid for itself").

A break-even analysis, however, did indicate that only a slight gain in efficiency could lead to a positive benefit/cost ratio. The data shows that if the cost of the hardware and software is amortized over a five-year period, and taking into account the annual maintenance fees, MET Special Transit (MST) would only need to decrease mileage and/or hours by approximately three percent for the software to have a positive cost savings for the organization. This is a relatively modest gain in efficiency. As indicated within this report, these appear to be achievable goals.

One item to note about the gains in efficiency is that during the time the RouteMatch software was being used, the MST dispatchers did not use the RouteMatch Scheduling Engine (RSE)

function of the software. The RouteMatch Scheduling Engine component is the function that can be utilized to maximize the efficiency of the transportation (transit) service. One hypothesis of why MET Special Transit did not use the RSE is that MST has many contracts with various agencies to provide rides, and was already very efficient at grouping these rides. Therefore, a transportation agency that schedules more individual rides may see a greater benefit from using RouteMatch software, than was experienced by MET Transit.

The analysis of pick up and drop off times indicated that slightly fewer pick ups were made within the 30 minute window established by MET Transit when the RouteMatch software was in use (84.5 percent in 2006, versus 87.5 percent in 2005). In 2006, slightly more drop offs were made within 15 minutes (plus or minus) of the scheduled time (84.5 percent in 2006 versus 79.8 percent in 2005) with the use of RouteMatch software.

One hypothesis on the differences in the pick up and drop off times is that the RouteMatch software is creating a more “normal” distribution of the times, whereas when the Mobility Master software was being used, and the rides were being scheduled manually, the dispatchers may have provided extra time between origins and destinations, leading to the drop off times being closer to scheduled times.

While a definitive benefit/costs analysis could not be conducted to determine if the RouteMatch Software paid for itself, as indicated by this review, it does appear that only a minor gain in efficiency is necessary for the RouteMatch software to pay for itself (reach the break-even point). The data herein, and previous national studies, indicated that these gains in efficiency are achievable.