

**EVALUATION OF TRAVEL TIME ESTIMATES DERIVED FROM
AUTOMATIC VEHICLE IDENTIFICATION TAGS
IN SAN ANTONIO, TX**

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(ABSTRACT)

The purpose of this research is to examine several aspects of the San Antonio automated vehicle identification (AVI) system, including the reliability and accuracy of the AVI system, travel tag level of market penetration (LMP) trends, and a comparison of aggregated travel time values with probe vehicle travel time values. This thesis serves as a first step toward the modeling of AVI systems in which the effects of travel tag LMP, AVI reader density and AVI reader location are analyzed.

GPS units were first tested as a suitable benchmark for validating AVI reliability and accuracy. A two-part system reliability study was then performed, consisting of overall system reliability and a controlled evaluation of selected AVI reader sites. The accuracy of AVI travel times was also assessed. A LMP analysis was then performed to serve as a reference parameter for the aggregate travel time study. Lastly, the level of aggregation analysis attempted to quantify differences between the individual test vehicle travel times and aggregated travel times of all observed, tag-equipped vehicles.

Overall system reliability was found to be greater than 90%. The controlled reliability study showed that freeway AVI readers slightly outperformed arterial readers for correct tag capture, while total tag capture exceeded the system design parameter of 80%. Tag capture rates were found to be independent of test vehicle speed. The LMP of travel tags at a selected reader site was found to be approximately 0.5% from the morning through the evening peak. Lastly, 5-

minute travel time aggregations provided a better estimate of individual test vehicle travel times than 2-minute or 15-minute aggregations.

This thesis is dedicated especially to
my parents, **Marriot and David Riley**
as well as to all my **friends and family**
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"I can do everything through him who gives me strength." Philippians 4:13

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