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

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Thesis submitted to the Faculty of the Virginia Polytechnic Institute and State University in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE
in
Civil Engineering

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June 11, 1999
Blacksburg, Virginia

Keywords: Automatic Vehicle Identification, Probes, San Antonio, MMDI, ATIS
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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 for their tremendous love and support. God bless you all.
I am most grateful for the guidance, support and encouragement of Dr. Michel W. Van Aerde and Dr. Hesham Rakha. Without their incredible patience and timely wisdom and counsel, my thesis work would have been a frustrating and overwhelming pursuit. Memories of their dedication and selflessness in their research efforts and in their care and concern for students will remain with me long after my days of academia are finished. In addition, I express my appreciation to Dr. Antoine Hobeika, Dr. John Collura and Dr. Wei Lin for having served on my committee. Their thoughtful questions and comments were valued greatly.

I would also like to thank Dr. Jesus M. de la Garza for his help and suggestions as I was first considering pursuit of graduate work, and Dr. Antonio Trani for assisting me in choosing coursework in the Civil Infrastructure Engineering program.

Thanks to the many Texans who filled in all the gaps in my data. I extend my sincerest gratitude to Mr. Joey Baumgartner of Southwest Research Institute in San Antonio, TX, for his constant help and support in answering my frequent questions as I gathered research data. Additionally, thanks go to Mr. Russell Henk and his supporting staff and students at Texas Transportation Institute for their assistance both during and after the data collection phase of my research. Thanks also to Laura Tavitas of TxDOT and Barbara Lorenz and Shawn Turner at Texas A&M. Although we’ve never met face to face, your help in my research is very much appreciated.
To all the fellow graduate students in transportation, it’s been a wonderful ride. Thanks for your advice, care, concern and many laughs along the way. I couldn’t have picked a better group with which to work.

I gratefully acknowledge the funding provided by the Virginia Tech Center for Transportation Research as well as the Via Civil Engineering endowment which has been such a blessing to me during both my undergraduate and graduate years at Virginia Tech.

I would be remiss to not thank Greg Durgin, Eric Anderson and Isaac Farr for their encouragement and help as fellow graduate students. My occasional interaction with each of them spurred me on to finish my thesis work more than they could know. When in graduate thesis misery, find good graduate thesis company.

I am so very thankful for my friend and roommate Tim Withers and my friend Whit Roberts for their prayers and fellowship during my graduate school days. Additionally, thank you Kristen Blix for the frequent long-distance encouragement from Richmond.

Mom and Dad, thanks for believing in me from Day 1, and for being my biggest fans. I love you both very deeply. Finally, I would like to acknowledge my Lord and Savior Jesus Christ for His incredible strength, power and love. In Him alone have I found abundant life.

“I can do everything through him who gives me strength.” Philippians 4:13
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