



Project Summary

Texas Department of Transportation

0-6044: Estimated and Actual Usage of Toll Facilities

Background

As toll road development increases to finance new or add capacity to existing road infrastructure, reliable traffic and revenue (T&R) forecasts informed by a robust understanding of who uses and who does not use toll roads becomes increasingly important to toll road developers, financiers, T&R consultants, and investors, among others. The objectives of this research study were to: a) expand upon the analysis conducted by the bond rating agencies that alluded to the existence of an optimism bias in T&R forecasts, and b) characterize the users and non-users of Texas toll roads.

What the Researchers Did

This extensive research effort involved the following:

- an extensive review of the literature that assessed the reliability of T&R forecasts,
- interviews with T&R consultants to document the approach used by the industry to forecast toll road usage,
- a detailed evaluation of the actual and forecasted toll road usage through the examination of five toll road case studies, including the Central Texas Turnpike, and four more mature toll projects,
- identification of variables and areas that require an improved understanding to ensure more reliable T&R forecasts,
- recommendations to address some of the concerns regarding the reliability of T&R forecasts,
- a comprehensive literature review and analysis of 1,507 telephone responses to gain insight into the demographic and trip characteristics of the auto users and non-users of Central Texas toll roads,
- a comprehensive literature review and survey of 108 trucking company respondents to characterize the truck users and non-users of Texas toll roads,
- analysis of actual transaction data for one week in November 2007 to gain insight into the day and time of the transaction, commercial and non-commercial use, axle distributions, and the billing zip code where the toll tag is registered, and
- analysis of actual transaction data obtained for the first two years of operation of the Central Texas Turnpike System to reveal trends in the overall use of the toll routes, time-of-day variability, day-of-week variability, and month-of-year variability by vehicle class and payment type.

Research Performed by:

Center for Transportation Research (CTR),
The University of Texas at Austin

Research Supervisor:

C. Michael Walton, CTR

Researchers:

Kate Flanagan, CTR
Lisa Loftus-Otway, CTR
Khali Persad, CTR
Beth Porterfield, CTR
Jolanda Prozzi, CTR
Jorge Prozzi, CTR
Chris Robertson, CTR
Beatriz Rutzen, CTR
Mengying Zhao, CTR

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What They Found

- The case studies revealed that revenue estimates exceeded actual collections on some projects, and were lower than actual collections on others. In one case study, revenue forecasts exceeded actual collections for the first 10 years of the road's operation, but subsequently collections exceeded forecasts.
- Although a detailed review of the case studies provided no evidence of a systematic optimism bias in toll T&R forecasts, the research was hampered by the lack of information and specificity included in the T&R reports. There is a general lack of transparency concerning the assumptions, estimated values, modeling methods, and data sources used by T&R consultants that prevent a clear understanding of the key variables impacting T&R forecasts.
- The study found that auto users of Central Texas toll roads tend to have higher household incomes, are younger, are mostly married with children, live in households of three or more members, have access to three or more vehicles, and are typically employed full time.
- This research study showed that the truck toll road users in Texas: a) are mostly private carriers, truck load carriers, and less-than-truck load carriers, b) believe that their operation is impacted by congestion, c) have a delivery window in which to deliver the major commodities transported by their company, and d) make most of their deliveries during the morning peak hours (i.e., between 7:00 and 9:00 a.m.).

What This Means

Without a better understanding of the modeling approach, when and how variables are considered in the T&R analysis, and the data sources used, little more can be achieved but to note the general effect (overestimation or underestimation) of the T&R forecast and to rely on the explanations of the T&R consultants as to the reasons for discrepancies between actual and forecasted values. It is recommended that the “black box” approach to T&R forecasting be mediated by a more detailed accounting of the variables, assumptions, estimation methods employed, and data sources used.

The study found that: a) a higher percentage of auto toll road users, regardless of the trip type, indicated a willingness to use a toll road if it were available, and b) that truck toll road users tended to rank toll roads more favorably than non-toll road users when presented with statements describing the benefits of toll roads. This suggests that marketing efforts should be targeted to commuters in areas with an existing toll customer base. Also, since almost half of the auto non-toll road users indicated a willingness to use a toll road if it saved travel time, marketing efforts should clearly demonstrate the potential travel time savings and the associated toll cost per minute of travel time saved. Regarding truck users, incentives that reduce the cost of using toll roads seem to be somewhat favorably viewed by truckers inherently opposed to toll roads. The effectiveness of incentives, such as a fuel tax refund and the allowance of Longer Combination Vehicles (LCVs), in encouraging toll road usage should thus be evaluated.

For More Information:

Research Engineer - Duncan Stewart, TxDOT, 512-465-7403
Project Director - Teresa Lemons, TxDOT, 512-463-9958
Research Supervisor - C. Michael Walton, CTR, 512-471-1414

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