# A Message from the JTRF Co-General Editors

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The Fall 2012 issue of the *Journal of the Transportation Research Forum* contains the articles below:

- Assessment of Sustainable Infrastructure: The Case of Exurban Dallas
- Applying the Highway Safety Manual to Two-Lane Road Curves
- Predicting Block Time: An Application of Quantile Regression
- A Dynamic Programming Optimization Approach for Budget Allocation to Early Right-of-Way Acquisitions
- Pavement Pre- and Post-Treatment Performance Models Using LTPP Data
- Productivity Improvements in the U.S. Rail Freight Industry, 1980-2010
- Stopping Behavior of Drivers at Stop-Controlled Intersections: Compositional and Contextual Analysis.

Arvidson and co-authors write about sustainable infrastructure to answer two questions: "When is a particular infrastructure project sustainable and how are its impacts assessed?" In answering these questions they focus on two exurban communities and a control site outside of Dallas, Texas, and use a number of indicators to assess the impacts of sustainable infrastructure, where sustainable infrastructure includes street improvements such as sidewalks on both sides of the streets. The authors divide the impact area of each improvement site into three concentric rings whose distances apart vary by the site and are chosen to reflect typical walking distances. They then use economic, environmental, and social indicators drawn from the literature to assess the impacts of the sustainable infrastructure they study. The economic indicators include business density, employment density, property value, income and sales tax revenue, and vacancy rate. For environmental indicators, the authors used housing stock, land use mix, sidewalk density, and street density. The social indicators are average daily traffic, household density, population density, residential ethnicity, and walking and bicycling trips. The authors found consistency between their results and the expected and desired outcomes of dense development as well as diverse land use mix and compact circulation.

In the second paper, Findley et al. evaluate the Highway Safety Manual's (HSM) crash prediction model for horizontal curves with data on two-lane roads in North Carolina. The authors note that these models require more data than previous models and must be calibrated and validated for the state where they are to be applied. Further, they note that the model is credible, has been approved by a committee of experts, and its documentation provides instructions on how to apply it. By applying the model, the authors intend to inform decision-making by providing practical advice in how to use it to analyze horizontal curves to improve safety. They perform the application by preparing a field investigation form, which was distributed to North Carolina Department of Transportation (NCDOT) personnel to collect data on 21 variables for each of the 50 horizontal curves selected by NCDOT. The HSM model was then used to predict crash frequency, severity, and types of crashes. Among the findings are that there are not statistical differences between reported and predicted collisions; a large number of sites are needed for the calibration to meet the recommendations in the HSM; and annual average daily traffic (AADT), curve radius and curve length are the most important predictors of crashes in horizontal curves.

The third paper is by Tony Diana and it presents a quantile regression model to predict block time for airlines using data on the Seattle/Tacoma International Airport. As he argues, this method is most appropriate for skewed data; that is, it is more robust in handling outliers than do ordinary regression methods. Diana points out that predictability of block time can be affected by ground delays such as weather or congestion, delays propagated by a sequence of flights, and they can be stochastic, such as from crew and equipment problems. He argues that his approach allows predictability to be studied more accurately than previous studies have done. In particular, Diana's objectives are to assess the impacts of selected variables on block delays, derive predictable block times based on these variables, and test his model. Diana uses time series data for the years before and after September 11, 2001 for the Seattle/Tacoma International Airport to control for extreme variability in air travel. After estimating a number of equations, he concluded that quantile regressions can help airlines develop robust schedules.

The fourth paper is by Albitres et al. and its title is "A Dynamic Programming Optimization Approach for Budget Allocation to Early Right-of-Way Acquisitions." The objective of the paper is to identify candidate projects that have gone through preliminary environmental analysis and meet NEPA standards for early acquisition. Thus, "early acquisition of right-of-way is … the purchase of parcels before the approval of … environmental study." The rationale for doing this study is that property values may increase from such factors as change of use and speculation. Early acquisitions thus avoid the increases in costs that these changes could bring, as well as possible delays in project construction from protracted negotiations. The authors accomplish this objective using data for Texas and employing dynamic programming, which breaks down a problem into smaller ones, and are then solved recursively. Dynamic programming also allowed the authors to consider various right-of-way acquisition scenarios. Their study resulted in identification of parcels of land as candidates for early acquisition under different budget scenarios.

In the fifth paper, Lu and Tolliver write on "Pavement Pre- and Post-Treatment Performance Models using LTPP." They determine pavement roughness using the International Roughness Index (IRI) and associate it with exogenous variables, including pavement age, precipitation, freeze-thaw level and other maintenance strategies. To avoid endogeneity, they develop separate exponential models for pre- and post-treatment performance with the latter accounting for the effectiveness of various treatment strategies applied over time. A method of determining a post-treatment performance model using pre-treatment performance models and short-term performance effectiveness was presented. From the pre-treatment models, the authors conclude that minor preservation reduces a pavement's IRI deterioration rate; differences in deterioration in severe weather regions are greater than in less severe weather regions; deterioration increases with freeze-thaw cycles; and deterioration is higher in wet regions than in dry regions.

In "Productivity Improvements in the U.S. Rail Freight Industry, 1980-2010," Carl Martland documents the causes of the rail productivity gains during this period. Martland analyzes three sources of productivity improvement, which are (1) fewer service units per unit of output, (2) fewer resources per service unit, and (3) network rationalization. In connection with (1) he examines changes in traffic mix, length of haul, equipment, tons per load, and trip distances. He analyzes productivity gains from improvements in resource utilization (2) by examining changes in fuel efficiency, freight car utilization, labor productivity, improved track materials, and track maintenance technology. With regard to network rationalization, Martland discusses line abandonment, short line and regional railroads, mergers, and terminal consolidation and transformation. Martland concludes that productivity improvements were greatest for bulk traffic moving in unit trains, containers moving in double-stack trains, and high volume shipments moving long distances in specialized equipment.

The last paper, by Woldeamanuel, is on the stopping behaviors of drivers at stop-controlled intersections. The author's objective is to study how drivers conduct themselves at stop signs by considering their socio-demographic and physical attributes, which influence their stopping behaviors. It collects data for four intersections in St. Cloud, Minnesota, by observing drivers' stopping and other behaviors, including cell phone use as well as information on vehicle occupancy and the presence of a law enforcement officer. The observations were done at 12 different times for each intersection and resulted in 2,400 observations distributed equally among the intersections. Using these data, Woldeamanuel estimates a binary logit model with the dependent variable as the driver behavior of making a complete stop at a controlled intersection. The results from this model indicate that driver stopping behavior can be explained by contextual/ecological variables, including vehicle occupancy, the presence of law enforcement officers, and using headlights. Cell phone use was found to have a statistically insignificant effect on stopping behavior though its negative sign suggests to Woldeamanuel that it could prevent drivers from coming to complete stops at intersections.

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