Summary of Final Report, BC354-44
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TRANSPORTATION ISSUES: PEDESTRIAN SAFETY

PROBLEM STATEMENT

Pedestrian safety experts and advocates have long debated why Florida's pedestrian fatality rate consistently exceeds the nation's, often ranking highest among the states. There are two principal views. One is that Florida's high fatality rate results from a combination of urban sprawl and low investment in safety capital. Associated with sprawl is a reliance on high-speed arterial highways (e.g., the highway U.S. 19 in the Tampa Bay area). Along these highways, pedestrians are neither separated nor safeguarded adequately from vehicles traveling at high speeds—a deadly situation. The competing view is that the conventional measures of fatality rates inadequately control for exposure—the amount of time people walk near traffic. For Florida, exposure is high relative to resident population because the state is visited by millions of tourists each year and because the warm, sunny climate encourages walking.

In addition to examining these two standard hypotheses, we propose a third: the high fatality rate in Florida comes from a combination of climate and seasonal variation in length of day. This new hypothesis has two parts: (1) in the summer, people walk both in the South and in the North, but the nights, which are more dangerous, set in earlier in the South; and (2) winter nights are longer than summer nights across the country, but cold winter nights remain warm enough in the South to encourage walking, which increases pedestrians' exposure to traffic during dangerous dark hours.

The source of the hypothesis comes from observing how Florida's excess fatality rate, compared to the nation's, varies by time of day. Florida's pedestrian fatality rate exceeds the national average by 25% during the daylight hours (from 6 a.m. to 6 p.m.), a difference readily explained by the state's tourism and vulnerable elderly residents. Nevertheless, Florida's fatality rate during the night hours (6 p.m. to 6 a.m.) is more than *double* the nation's, far too great a difference to be explained by tourism and age alone.

OBJECTIVES

In order to assess the relative importance of these explanations, researchers set out to develop a model of pedestrian fatalities that posits a technology of investment in pedestrian safety that is non-rival (one pedestrian's use of a walk signal does not hinder another's use of the same signal) and displays diminishing returns (the most effective investments will be made first), both at a single location and across locations. The model would assume optimizing behavior by those responsible for allocating scarce funds to improve safety. The model would be applied

empirically to pedestrian fatality data for the years 1999 through 2001 for 276 U.S. metropolitan areas, including all twenty in Florida.

FINDINGS AND CONCLUSIONS

Empirical analysis confirmed the view that Florida's high fatality rate is largely attributable to the State's being the extreme instance of this interaction of climate and length of day; these two variables alone account for nearly 60% of the difference between the fatality rates of Florida's metropolitan areas and the nation's. Other factors include a combination of tourism, age, relative shortage of interstates serving as urban arterials (causing more intensive use of dangerous non-freeway arterials), and a slightly higher-than-average poverty rate. These other variables do not perform nearly as well as climate or length of day, although their individual effects can vary between metropolitan areas. Tourism, for instance, plays a small role in determining the excess fatality rate across the state (only 0.05% for the whole state), but it accounts for nearly 26% of Orlando's excess rate. The final report provides a summary of such results (Table 7, page 19) by allocating, among six causes and an unexplained residual, the difference between the pedestrian fatality rate of each of Florida's twenty metropolitan areas and the nation's. Researchers found, for example, that Miami and Orlando differ little from what would be expected, whereas Tampa-St. Petersburg and Jacksonville are more dangerous than expected, and Punta Gorda is much safer than predicted.

BENEFITS

Quite apart from being able to explain over half of the variation in the excess fatality rate of Florida's twenty metropolitan areas, our model is innovative and novel, breaking from the usual regulation-based economic studies of safety. Being new, it required further testing. Since it explains higher pedestrian fatality rates in the South as a whole, not just Florida, such further testing should be funded by a national agency.

This research was conducted by James F. Dewey, Ph.D., and David Denslow, Ph.D., of the Bureau of Economic and Business Research at the University of Florida. For more information, contact Monica Zhong, at (850) 414-4808, monica.zhong@dot.state.fl.us.