



Florida Department of Transportation Research Review and Update of Road Ranger Cost Benefit Analysis BDK84 977-15

Several states and municipalities have freeway service programs, in which service vehicles roam a beat on a public highway responding to driver needs, such as minor crashes, flat tires, and out-of-fuel vehicles. Lead time created by patrolling highways means that incidents are cleared more quickly, saving time, fuel, and emissions, improving traffic flow, and reducing secondary incidents. In Florida, this service is called the Road Rangers, and it is regarded as one of the most effective components of the Florida Department of Transportation's (FDOT) Traffic Incident Management (TIM) program. Road Rangers have responded to over three million incidents in ten years of operation. Nevertheless, because the Road Rangers is government-funded, it is reviewed periodically to determine its benefit to Florida's travelers and if program costs are well-justified.

In this project, researchers from the University of South Florida reviewed the Road Rangers program. Data for Road Rangers operations were collected from SunGuide™, advanced traffic management software that collects a wide variety of information about activity on Florida's highways. Data collected included mean spent time per incident type, mean response time without Road Ranger service, traffic profile, highway geometry, and average travel speed. Incidents were grouped into nine categories, the product of three incident types – accident, breakdown, and debris – and three types of lane blockage – one-lane blockage, left shoulder, and right shoulder.

The Freeway Service Patrol Evaluation (FSPE) model was used to analyze incident data and balance savings from reductions in delay, fuel, and emissions against costs of program administration and operation. FSPE calculates benefits by considering average daily traffic and distributing incidents on the selected beat segment according to vehicle miles traveled (VMT). Input parameters for FSPE include service description, road design and traffic characteristics, and incident data.



A Road Ranger assists a motorist with a tire change along a busy segment of a South Florida highway.

Road Ranger service coverage data were compiled for FDOT districts where this program operates and for Florida's Turnpike Enterprise (FTE). Service coverage is divided into zones, and Road Ranger trucks operate on assigned shifts. A total of 1,321 centerline miles are covered for on interstates and toll roads in Florida. To effectively generate the models, the research team developed the FSPE model generator, scenario generator, and software which can run the FSPE model. A total of 204 scenarios were modeled.

Breakdowns were produced of the lateral distribution of incidents for each district, the turnpike, and Florida as a whole. Based on these breakdowns, cost-benefit analyses were performed to determine delay savings, fuel savings, and total benefits. All benefits were converted to dollar equivalents. Weekend and weekday incidents were treated separately.

Benefits exceeded costs in all districts, though the ratio of benefit to cost varied. Overall, the average benefit to cost was 6.78 to 1, demonstrating the effectiveness and value of the program on Florida's heavily traveled highways.