

An Evaluation of the Benefits of the Alabama Service and Assistance Patrol

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A.S.A.P. Program: Benefits Evaluation

Presentation Outline

- Background and Motivation for the Study
 - ▣ Program Overview
 - ▣ Study Objectives
- Analysis Approach and Study Methodology
- Benefits
 - ▣ Mobility
 - ▣ Safety
 - ▣ Environmental
 - ▣ Customer Service
- Conclusions and Recommendations

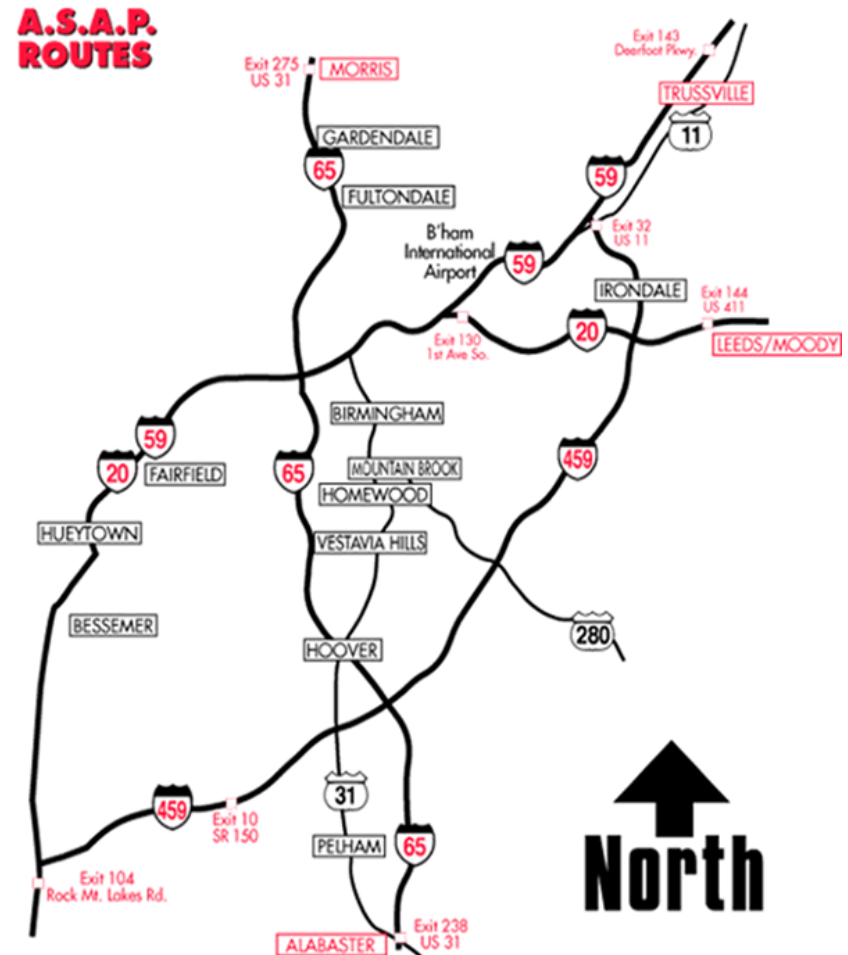


Background: Service Patrols

- Service patrols
 - ▣ Have existed since the late 1960s
 - Also called courtesy patrols, safety patrols, etc.
 - ▣ Purposes:
 - Respond to disabled vehicles; provide basic services
 - Manage and clear minor incidents
 - Facilitate/assist clearance of major incidents
 - ▣ Goals:
 - Reduce traveler delay
 - Reduce secondary crashes
 - Reduce emissions

A.S.A.P. Program Overview

- Alabama Service and Assistance Patrol
 - Created in 1997
 - Patrols approximately 100 miles of freeway in the Birmingham area
 - Operates 6 a.m. – 10 p.m., Monday - Friday

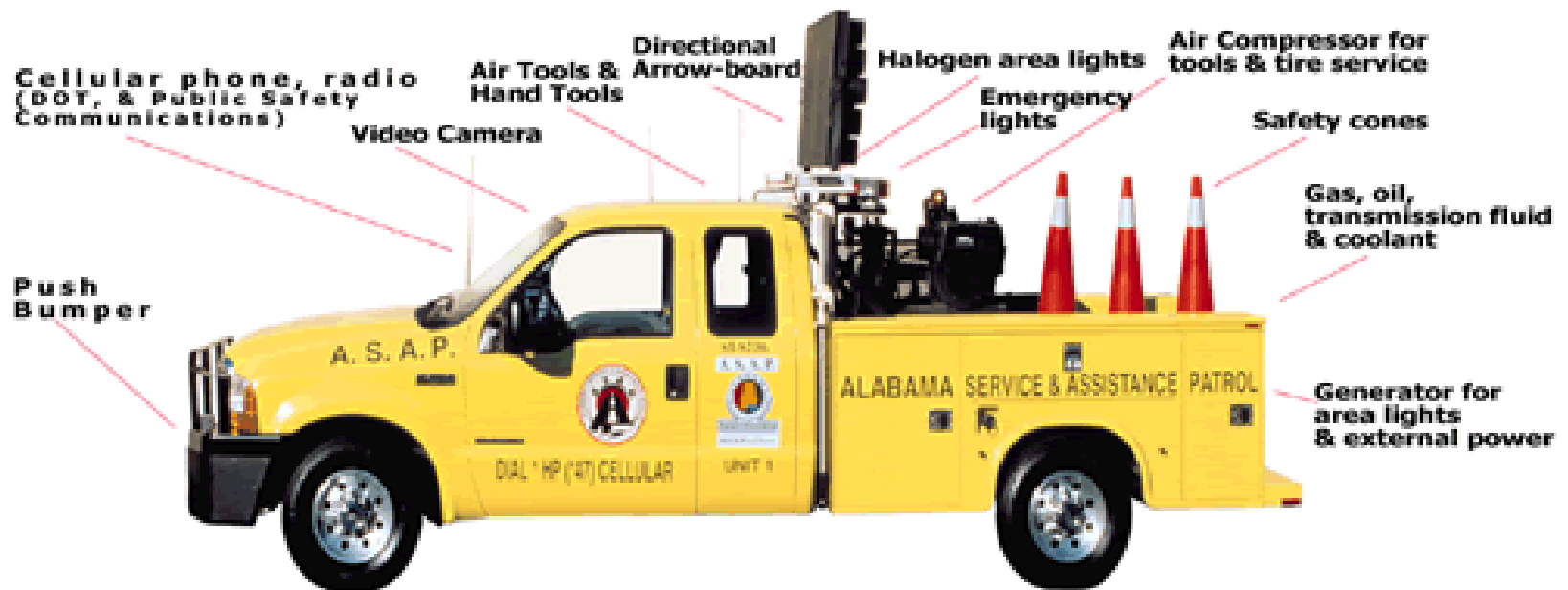


Study Motivation

- Originally supported with CMAQ funds
 - ▣ Expected to improve air quality
 - ▣ Other funding sources required after CMAQ funds ended
- Comprehensive evaluation of A.S.A.P.'s economic benefits had not been performed

Study Objectives

- Comprehensively evaluate benefits of the program
- Estimate benefit-cost ratio
- Develop guidelines for service expansion



Analysis Approach

- Review of prior studies on other service patrol programs
- Range-based approach to results
- Traffic simulation model to support analyses
- Categories of benefits
 - ▣ Mobility
 - ▣ Safety
 - ▣ Environmental
 - ▣ Customer Service

Past Studies of Other Programs

- Many service patrol programs have been studied since the 1970s...
 - ▣ Focus most typically on mobility benefits
 - ▣ Reported B/C ratios vary from 2:1 to 41:1
 - Several studies have used the “range” approach
 - ▣ Few studies have had a comprehensive focus
 - ▣ Range-based approach to evaluating benefits emerged as preferred philosophy

Methodology: Range-Based Approach

- Rather than presenting a single value for benefits, present a range of values...
 - ▣ Some of the inputs are difficult to quantify objectively
 - Examples: Dollar value of travel time, of assists rendered
 - ▣ Some of the inputs were simulated
 - ▣ Some of the input values were based on those in the literature
- This approach represents the variability in the inputs

Data Collection

- A.S.A.P. assist data for the July 2004 – June 2005 period
 - ▣ Number of assists, type of assists, duration, number of lanes blocked, etc.
- A.S.A.P. cost data for the same period
 - ▣ Operating costs (labor, materials, equipment) and new equipment purchases
- Traffic data to support simulation model

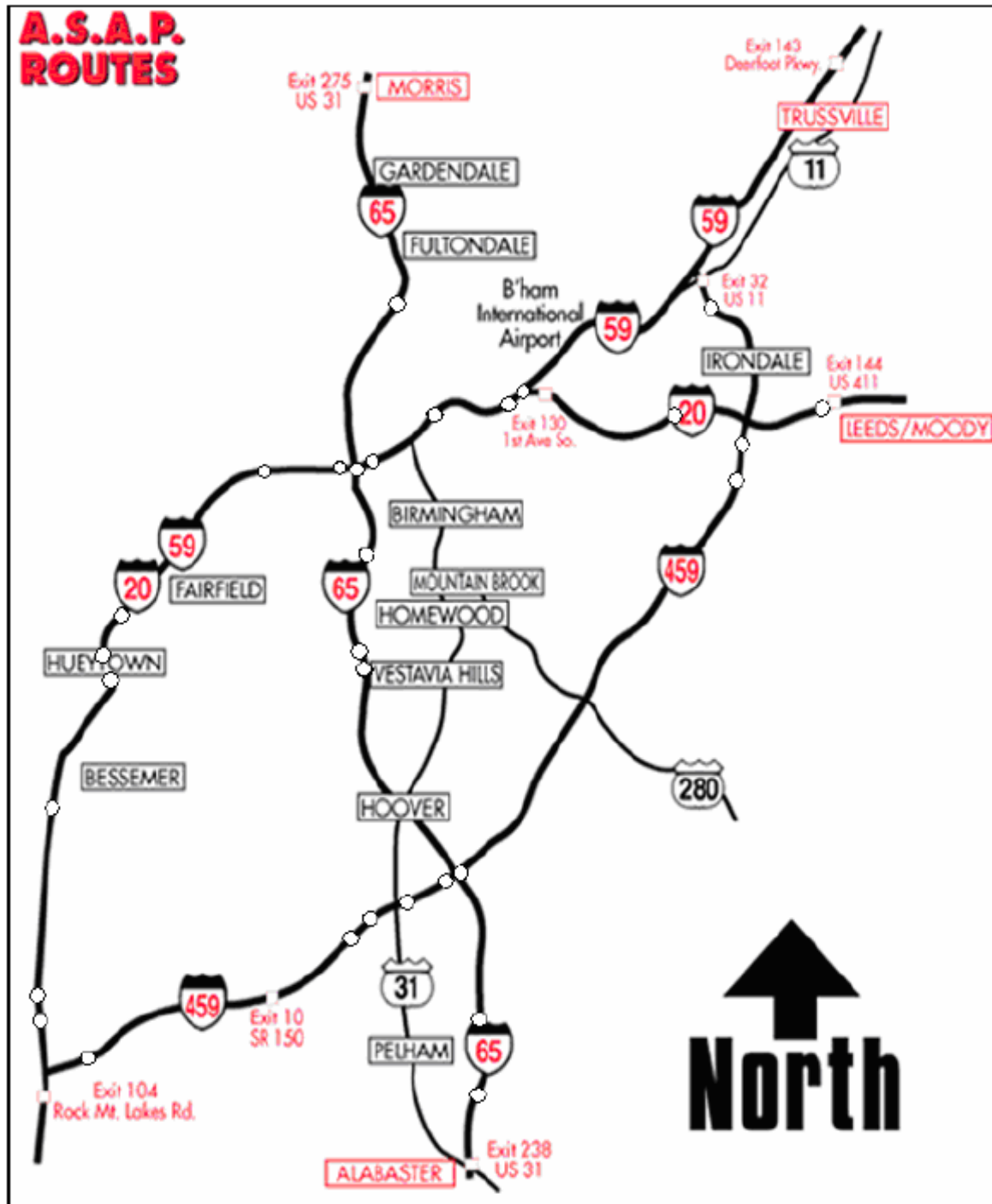
Traffic Simulation

- ❑ CORSIM used to model traffic and simulate incidents
 - ❑ 1,440 program runs!
- ❑ Necessary to quantify mobility benefits
 - ❑ Vehicle-hours of travel is a model output
- ❑ Thirty incidents were simulated
 - ❑ Based on data in incident log
 - ❑ Example: Distribution by number of lanes blocked

Incident Type	Distribution (%)	All incidents	Incidents with Dispatch Times
Shoulder	87.92	14850	805
1 lane blocked	8.02	1355	67
2 lanes blocked	2.80	472	29
≥ 3 lanes blocked	1.26	213	8

Traffic Simulation

- Example: Spatial distribution of the 30 simulated incidents



Mobility Benefits

- Quantified as value of personal travel time delay
- Inputs included:
 - ▣ Results of CORSIM modeling of incidents (veh-hr)
 - ▣ Average vehicle occupancy
 - ▣ Travel time values
- For the study period, range of benefits values:
\$986,000 to \$13,878,000
 - ▣ Most likely value: \$5,467,000

Safety Benefits

- Quantified as economic value of secondary crashes avoided
- Inputs included:
 - ▣ Secondary crash occurrence rates
 - ▣ Secondary crash change/reduction rates
- For the study period, range of benefits values:
\$580,000 to \$4,637,000
 - ▣ Most likely value: \$2,536,000

Environmental Benefits

- Quantified as economic value of emissions reduced/avoided
- Inputs included:
 - ▣ Results of CORSIM modeling (tons of emissions)
 - ▣ HC, CO, NO_x
- For the study period, most likely value: \$65,000

Customer Service Benefits

- Quantified as economic value of services rendered
 - ▣ Perhaps the most tangible facet of benefits
- Inputs included:
 - ▣ Estimated value of services
 - ▣ Incident log distribution of types of assists
- For the study period, range of benefits values:
\$512,700 to \$1,025,400
 - ▣ Most likely value: \$769,000

Conclusions

Total benefits values (for the 2004-2005 study period):

Benefits Category	High Estimate	Low Estimate	Most Likely
Mobility	\$ 13,878,400	\$ 985,900	\$ 5,467,600
Safety	\$ 4,636,600	\$ 579,600	\$ 2,535,700
Environmental	\$ 65,000	\$ 65,000	\$ 65,000
Customer Service	\$ 1,025,400	\$ 512,700	\$ 769,000
Total Benefits	\$ 19,540,400	\$ 2,078,200	\$ 8,837,300

Total costs: \$593,000

Conclusions

- Benefit-cost ratios:
 - Estimate range ... 3.5:1 to 33:1
 - Most likely ... 14.9:1
- These values appear to be in line with those found in other studies
- Support of A.S.A.P. is justified from an economic perspective
- Future expansion recommend for consideration where peak hour volumes exceed 1500 veh/h/ln

Acknowledgments

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Questions?????

