Americans lose 3.7 billion hours and 2.3 billion gallons of fuel every year sitting in traffic. In 2004, trucks idling in traffic are estimated to have cost the trucking industry some 243 million hours, the equivalent of 17,000 work years, with a cost of $8 billion.

To combat the country’s growing transportation congestion problem, the U.S. Department of Transportation launched the National Strategy to Reduce Congestion on America’s Transportation Network. One element of this initiative is to reduce incident-related congestion by promoting operational and technological improvements that increase incident response capabilities.

Traffic Incident Management

Traffic Incident Management (TIM) is a systematic, planned, and coordinated effort to detect, respond to, and remove traffic incidents and restore traffic capacity as safely and quickly as possible. TIM involves the application of institutional, mechanical, and technical resources, including Intelligent Transportation Systems (ITS), and offers a number of measurable benefits:

- Traffic incident management reduces fuel consumption by about 1.2 percent annually, saving 2,600-7,700 gallons per incident.
- Traffic incident management reduces incident duration by up to 65 percent and reduces secondary crashes by 30-50 percent.
- Service patrols’ benefit-cost ratios range from 2:1 to 36:1.

ITS technologies for traffic incident detection, verification, response, and communication are recognized as valuable tools by transportation professionals and are being used throughout the country:

- 32 percent of freeway miles are monitored by video to detect incidents, and 45 percent are served by service patrols.
- Traffic incident management on arterial streets is growing: 5 percent of arterial streets have video monitoring for detection, and 10 percent have service patrols.

BENEFITS

San Antonio Reduces Response Times by 20 Percent

As populations surge across the south and southwest, roads get busier and delays get longer. That’s why the Texas Department of Transportation, the City of San Antonio (police/fire/emergency medical services/traffic), and VIA, the region’s transit provider, teamed up to develop and implement the TransGuide “smart highway” system.

TransGuide is an Intelligent Transportation System that uses dynamic message signs, loop sensors, and cameras to detect and respond to traffic incidents.

continued on page 4
Service Patrols Promote Fuel Conservation and Public Safety

Service patrols are known to help decrease incident-related delay, which means faster travel and fewer vehicle-hours annually. But less congestion also means less fuel wasted as vehicles idle while waiting for traffic to clear. The following examples show how fuel consumption was reduced at regional and local levels by decreasing incident-related congestion through service patrols.

Maryland’s CHART Program

A 2000 study of Maryland’s Coordinated Highways Action Response Team (CHART) program showed how incident reduction benefits Marylanders:

- Estimated fuel savings: 4.1 million gallons annually.  

Florida’s Road Ranger Program

The Florida Road Ranger service patrol provides the residents of Florida with a significant reduction in wasted fuel due to congestion:

- Estimated fuel savings: 1.7 million gallons statewide monthly.  
- Estimated economic value of fuel savings: $3.4 million statewide monthly.  

According to the Florida Department of Transportation, this program not only cuts down on harmful emissions, it has an overall benefit-cost ratio of nearly 26:1.

Thoughts from the Public

Service patrols are highly visible and have a powerful impact on frightened motorists. The box to the right contains excerpts from letters of appreciation that travelers have written to the Tennessee Department of Transportation in praise of their program in Chattanooga.

“I truly felt my life was in danger as cars and trucks whizzed by…I felt my life was saved today due to this service…”

“He right off was thinking safety for everyone… me and my family, the traffic, and himself…”

“This is the best service the state provides. I was back on the road within 30 minutes…”

— Travelers in Chattanooga, TN
Traffic Incident Management

Traffic Incident Management

11 vehicles

Operating Costs

23:1

8:1

Hours of Operation

004 005

000

2 trucks

150 trucks

Fleet Size

15:1

ITS Benefits All Responders

Fire, rescue, and emergency medical services (EMS) have different priorities than transportation agencies when clearing an incident. Their first concern is the safety of the victims and motorists; getting traffic flowing again is secondary. Including these first responders in the planning and development of a traffic incident management program, and maintaining consistent communication, will help ensure effective management of the traffic incident scene and cultivate multiagency ties, with the traveling public reaping the benefits of increased efficiency — and safety.

This kind of information sharing occurred during the 1996 Olympic Games in Atlanta. The Atlanta Fire Department, as part of its joint response efforts with the Georgia Department of Transportation, the State patrol, and the city police, realized the benefit of closed circuit TV cameras. "Being able to view the scene of a freeway incident using the surveillance cameras helped us to better decide the type and number of units to send to the incident."

— Tony Davidson, Chief of Communications, Atlanta Fire Department

It’s important to keep all players in mind when deploying ITS. Better information to fire, rescue, and EMS means that they can arrive at the scene with the right equipment and resolve the incident more quickly.

<table>
<thead>
<tr>
<th>Location</th>
<th>Operating Costs (Millions Per Year)</th>
<th>Hours of Operation</th>
<th>Fleet Size</th>
<th>Benefit-Cost Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Los Angeles, CA</td>
<td>$20.5</td>
<td>6:00 a.m. to 7:00 p.m. Mon – Fri. 10:00 a.m. to 6:30 p.m. Sat – Sun</td>
<td>150 trucks</td>
<td>8:1</td>
</tr>
<tr>
<td>Detroit, MI</td>
<td>$2.5</td>
<td>6:00 a.m. to 11:00 p.m. plus special events</td>
<td>32 drivers 34 vehicles</td>
<td>15:1</td>
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<tr>
<td>Ft. Lauderdale, FL</td>
<td>$2.5</td>
<td>24 hours/day, 7 days/week</td>
<td>11 vehicles</td>
<td>21:1</td>
</tr>
<tr>
<td>Tennessee statewide</td>
<td>$5.6</td>
<td>variable hours, 7 days/week</td>
<td>85 operators 69 trucks</td>
<td>not available</td>
</tr>
<tr>
<td>Denver, CO</td>
<td>$1.5</td>
<td>6:30 a.m. to 9:00 a.m. 3:30 p.m. to 6:30 p.m. Mon – Fri</td>
<td>2 trucks</td>
<td>23:1</td>
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</tbody>
</table>

How Can You Save $8 Million Per Year?

Houston TranStar did it by co-locating 75 personnel from the Texas Department of Transportation, Harris County, Houston Metro, and the City of Houston. Then they added a variety of traffic management tools, including a freeway management system, a freeway and arterial street incident management program, Intelligent Transportation System programs, a service patrol, and several other programs to the mix.

This combination of traffic professionals and a variety of traffic management tools, all with the goal of improving traffic flow, has saved an estimated 572,095 vehicle-hours annually. For Houston, a metropolis covering more than 600 square miles and home to the Port of Houston, through which more than 200 million tons of cargo pass every year, that translates into an estimated economic value of $8.4 million saved annually. Other summary data show additional benefits:

- In 1996, high-occupancy vehicle lane restrictions were lifted seven times due to incidents on the mainline that blocked all lanes. The Texas Transportation Institute estimated that, due to that action, 12,910 vehicles were able to avoid delay and save 13.5 to 27 minutes. Vehicle delay savings were estimated at between $42,500 and $85,100 for those seven incidents.
- The service patrol, in place since 1989, has a benefit-cost ratio exceeding 23:1.

ITS Benefits All Responders

Since 1997, more than 40 percent of freeway miles utilized dedicated call numbers for travelers to report incidents via cell phones. In fact, detection times can occur in as little as 1 minute in most metropolitan areas due to the proliferation of cellular phones. But, as the graph below shows, the number of cell phone calls to a dedicated number has remained flat; the fastest growing incident detection and verification method from 1997 to 2005 has been closed circuit TV (CCTV), which was deployed on 43 percent of freeways in 2005, a 35 percent increase since 1997.

But no single method will detect everything, and transportation management professionals rely on several methods to detect and verify incidents, including CCTV cameras, cellular telephone calls, automated incident detection, and service patrols, among others.

- CCTV, deployed in some 73 metropolitan areas as of 2004, is one of the most cost-effective and efficient methods for incident verification.
- The number of freeway miles covered by service patrols, which have a benefit-cost ratio of up to 36:1, has grown by 21 percent since 1997. This incident detection method was utilized in 74 metropolitan areas in 2004 and now covers 41 percent of freeway miles and 10 percent of arterial miles.
- Freeway coverage by automated incident detection, currently used in 31 metropolitan areas, has increased by 19 percent since 1997 and was in use on some 16 percent of freeways in the United States in 2005.

BENEFITS

How Can You Save $8 Million Per Year?

For these and other sample costs, visit: www.itscosts.its.dot.gov
Managing Traffic Incidents — Lessons from Experience

The following are lessons learned on how to plan, design, operate, and maintain traffic incident management programs.

Traffic Incident Management Program Development

- Develop a combined strategy and implementation plan for coordinated arterial signal control during incidents. In Minnesota, the During Incidents Vehicles Exit to Reduce Time system provides demand-responsive signal timing along the arterials to accommodate additional demand, and monitors the freeway and arterial system with detection and video surveillance.

- Cultivate relationships among transportation, law enforcement, fire, and rescue agencies when developing a coordinated, multiagency, traffic incident management program. At the TransGuide Operations Center in San Antonio, the staff and representatives from the Texas Department of Transportation, the San Antonio Police Department, VIA (the regional transit provider), the San Antonio Public Works Department, the Alamo Dome, the Bexar County Sheriff’s Department, emergency services, and towing service providers formed the Corridor Management Team. The members meet regularly but informally to discuss traffic operations.

- Consider co-locating multiple agencies in a transportation management center (TMC) to foster personal relationships among key staff. The Houston TranStar TMC houses 75 co-located personnel from the Texas Department of Transportation, Harris County, Houston Metro, and the City of Houston (see related article on page 3). The streamlined management structure at TranStar maximizes public benefit by coordinating emergency response, increasing mobility, managing congestion, and enhancing safety.

Incident Detection, Verification, and Response

- Provide a combination of detection methods to detect incidents effectively and rapidly. While cellular phone calls continue to be the most widely used means of early detection, no single method will catch everything. Transportation management professionals rely on several methods to detect and verify incidents, including closed circuit TV cameras, cellular telephone calls, vehicle probes, call boxes, automated incident detection, and service patrols. Using a mix of detection methods enables more accurate and timely response.

- Establish common incident location identifiers. An agreement was developed between the Washington State Department of Transportation and the Washington State Police on a method of describing locations among the parties involved. As a result, both agencies were better able to pinpoint incident locations and decrease response times.

- Provide training to dispatchers to elicit useful information about the incident from motorists. Motorists calling in on cell phones often provide incorrect or inadequate information to dispatchers. It is important to train dispatchers to ask the right kinds of questions to obtain the most accurate information possible. The more accurate the information, the better traffic managers and emergency services are able to respond efficiently and effectively to an incident.

- Provide joint training among incident response agencies to improve response times and site management. In San Antonio, at the TransGuide Center, staff participate in three variations of training activities: mock incidents, tabletop exercises, and classroom workshops.

Incident Clearance and Evaluation

- Consider a service patrol to reduce incident clearance times. In the State of Washington, Incident Response Team personnel clear about 80 percent of incidents in less than 10 minutes each.

- Provide consistent, high-quality information about incidents to influence traveler behavior. TransGuide’s survey of motorist reaction to the information in San Antonio demonstrated a high level of acceptance of the system (80 percent followed its instructions, and 71 percent believed they saved time).

- Conduct post-incident debriefings. In Chattanooga, Tennessee, the Incident Commander coordinates debriefing sessions after major incidents and a lessons learned memorandum is produced and distributed to all participating agencies.

For these and other lessons, visit: www.itslessons.its.dot.gov

San Antonio continued from page 1

detectors, video surveillance cameras, and a communication network to respond rapidly to accidents and emergencies.

The system provided a number of dramatic incident response improvements in a very short time as demonstrated in a comparison of sample crash statistics from the 3 years prior to deployment with sample statistics collected during the first year post deployment.

- Incident response times were reduced by 20 percent.
- Average delay savings reached up to 700 vehicle-hours per incident.
- Fuel consumption decreased by up to 2,600 gallons per incident.
- All these numbers translate into annual savings of $1.65 million in 1995 dollars.

Survey results also indicate improvements in driver confidence due to the improved quality of traveler information available. Surveys taken after implementation indicated that driver response to posted instructions improved from 33 percent just after implementation to 80 percent at the time of the report.
Source Information

Page 1. Introduction

2. National Traffic Incident Management Coalition Website, timcoalition.org/?siteid=41&pageid=591

Page 1. Traffic Incident Management

4. The summary fact “Traffic incident management reduces fuel consumption by about 1.2 percent annually” is based on one article from the ITS Benefits Database:

<table>
<thead>
<tr>
<th>Document Referenced</th>
<th>Simulated v. Measured Data</th>
<th>Location</th>
<th>Date of Study</th>
<th>Percent Decrease in Annual Fuel Consumption</th>
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</table>

5. The summary fact “Traffic incident management saves 2,600-7,700 gallons per major incident” is based on two articles from the ITS Benefits Database:
<table>
<thead>
<tr>
<th>Document Referenced</th>
<th>Simulated v. Measured Data</th>
<th>Location</th>
<th>Date of Study</th>
<th>Decrease in Fuel Consumption per Incident</th>
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6. The summary fact “Traffic incident management reduces incident durations by up to 65 percent” is based on five articles from the ITS Benefits Database:

<table>
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<tr>
<th>Document Referenced</th>
<th>Simulated v. Measured Data</th>
<th>Location</th>
<th>Date of Study</th>
<th>Percent Decrease in Incident Duration</th>
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</table>
### Table 1: Summary of Studies

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<thead>
<tr>
<th>Document Referenced</th>
<th>Simulated v. Measured Data</th>
<th>Location</th>
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7. The summary fact “Traffic incident management reduces secondary crashes by 30-50 percent” is based on two articles from the ITS Benefits Database:

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<tr>
<th>Document Referenced</th>
<th>Simulated v. Measured Data</th>
<th>Location</th>
<th>Date Conducted</th>
<th>Percent Decrease in Secondary Crashes</th>
</tr>
</thead>
</table>
8. The summary fact “Motorist assistance patrols’ benefit-cost ratio ranges from 2:1 to 36:1” is based on four articles from the ITS Benefits Database:

<table>
<thead>
<tr>
<th>Document Referenced</th>
<th>Simulated v. Measured Data</th>
<th>Location</th>
<th>Date of Study</th>
<th>Benefit-Cost Ratio</th>
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<tbody>
<tr>
<td>Document Referenced</td>
<td>Simulated v. Measured Data</td>
<td>Location</td>
<td>Date of Study</td>
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Page 2: Quicker Response, Fewer Secondary Incidents

www.ops.fhwa.dot.gov/aboutus/one_pagers/tim.htm
Article: www.itsdocs.fhwa.dot.gov/ipodocs/repts_te/14296.htm
Article: timcoalition.org/sites/ntimc/docs/NTIMC%20article%20for%20R_B%20magazine2.mht
ITS Benefits Database Entry: www.itsbenefits.its.dot.gov/its/benecost.nsf/ID/9FBABB7833F303C3852571B8004D4EF5
Journal of Transportation Engineering, Volume 125, Number 5, September/October 1999.
ITS Benefits Database Entry: www.itsbenefits.its.dot.gov/its/benecost.nsf/0/B32DDE9827B2177852569610051E25C

Page 2: FDOT Budget Supports a Variety of Traffic Incident Management Programs

15. Florida Department of Transportation, District IV: Broward County, FL, 2005 Annual Report
SMART SunGuide Transportation Management Center (TMC), Ft. Lauderdale, FL: January 2006, p. 19.
ITS Costs Database Entry: www.itscosts.its.dot.gov/its/benecost.nsf/0/0C66A52D53BD8592852571420066DCB4
Report: www.smartsunguide.com/PDF/Annual%20Report%202006_JAN_31%20FINAL.pdf
ITS Costs Database Entry: www.itscosts.its.dot.gov/its/benecost.nsf/0/0C66A52D53BD8592852571420066DCB4
Report: www.smartsunguide.com/PDF/Annual%20Report%202006_JAN_31%20FINAL.pdf
19. Ibid.
21. Ibid.
22. Ibid.
23. Ibid.

Page 2: Service Patrols Promote Fuel Conservation and Public Safety


27. Ibid.
28. Ibid.


Page 3: ITS Benefits All Responders

   (1) www.itslessons.its.dot.gov/its/benecost.nsf/Lesson?OpenForm&032E7396049034CE8525718F0062E879,
   (2) www.itslessons.its.dot.gov/its/benecost.nsf/Lesson?OpenForm&457366209E8D9BEA8525718F00648AA1 and
   (3) www.itslessons.its.dot.gov/its/benecost.nsf/Lesson?OpenForm&A636DFCF4D1A89278525718F00661959
   (Lesson learned point of contact: Cheryl Lowrance, Mitretek Systems, 202-863-2986, cheryl.lowrance@mitretek.org)

Page 3: Motorist Assistance Patrols Prove Cost Effective


   ITS Costs Database Entry: www.itscosts.its.dot.gov/its/benecost.nsf/0/13AE8D48114F8EC885257218006876D3
   ITS Costs Database Entry: www.itsbenefits.its.dot.gov/its/benecost.nsf/0/66F24F4460E32E938525725F00501B12


34. Florida Department of Transportation, Road Ranger Benefit-Cost Analysis, Tampa, FL: 2006. ITS Costs Database Entry: www.itscosts.its.dot.gov/its/benecost.nsf/0/2FA61263C877AE88525722900608B08


Page 3: How Can You Save $8 Million per Year?

39. Ibid.
40. Ibid.

Page 3: Trends in Detection and Verification

42. Ibid.
48. Ibid.

Page 4: Managing Traffic Incidents – Lessons from Experience

Traffic Incident Management Program Development

50. Ibid.
Incident Detection, Verification, and Response


55. Ibid.

Incident Clearance and Evaluation


58. Ibid., p.12.


Pages 1 and Page 4: San Antonio Reduces Response Times by 20 Percent


61. Ibid.
62. Ibid.
63. Ibid.
64. Ibid.