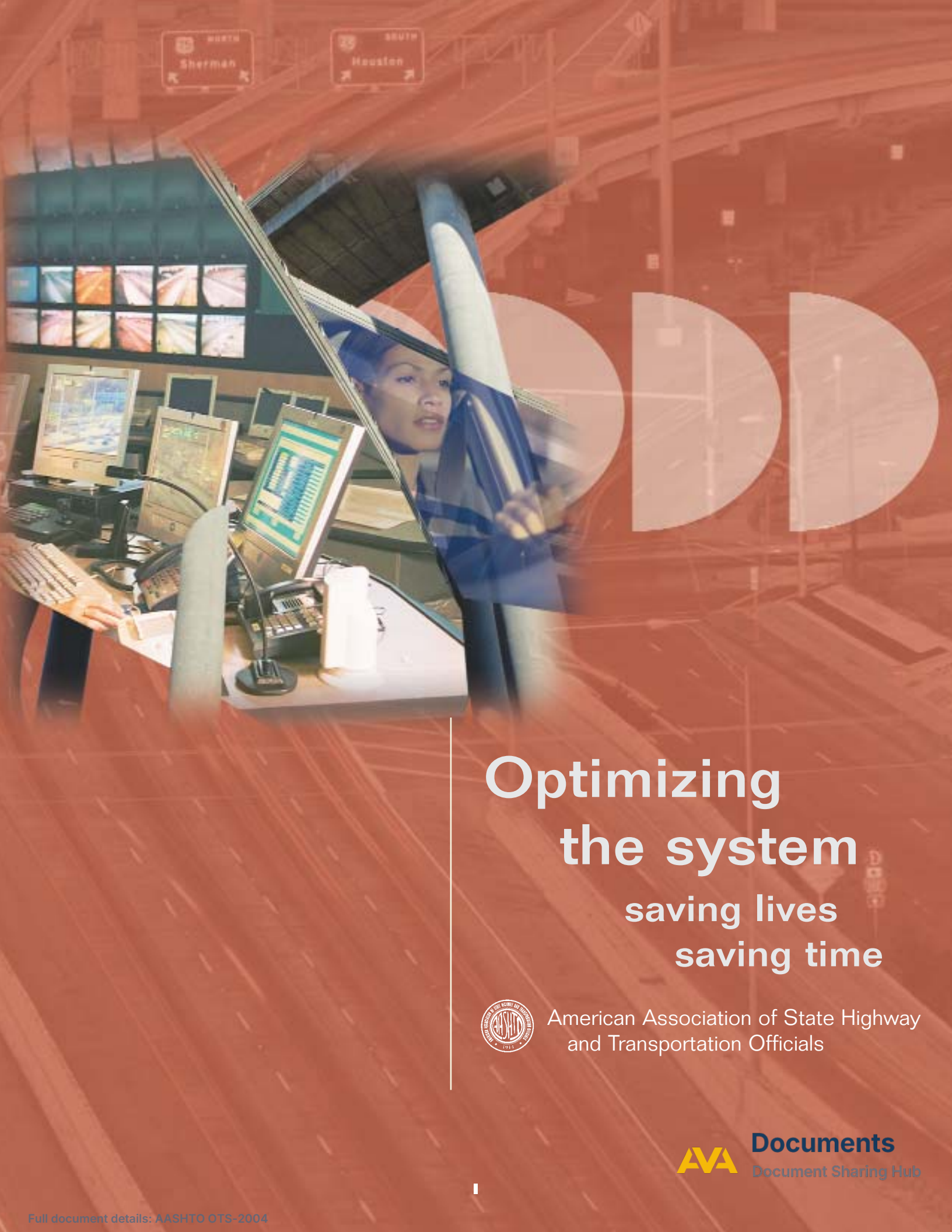




Optimizing the system

saving lives
saving time



American Association of State Highway
and Transportation Officials



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Optimizing the system

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Publ. No.: OTS-1



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Foreword

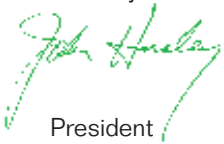
Optimizing is defined as “improving or developing to the greatest extent possible.” Optimizing the system describes the mission embraced by most state departments of transportation as they seek the ultimate in the safe and efficient operation of the transportation network we have today.

The need to optimize our transportation system springs from the recognition that growth in demand has far outstripped our ability to provide adequate new capacity. Between 1980 and 1999, the number of vehicle miles traveled on America’s roads and highways increased by 76 percent, while capacity grew by only 1.5 percent. Expert analysis estimates that less than half of the new roadway that was needed to handle even current levels of traffic was added in that time.

So our goal must be to make the system work better, safer and smarter, to both save lives and save time for our citizens. There is no single solution to this challenge, there are many, from the rapid clearing of traffic accidents, to advising motorists of traffic tie-ups or weather delays, to improving highway work zones for the safety of both drivers and workers. There is a tremendous amount of technology that can be deployed, and models that can be used. This AASHTO report showcases examples of what is working well in states across the country.

There are also exciting opportunities within our reach in the next decade. AASHTO is working with the nation’s auto industry and the federal government to create a new capability in which vehicles collect and communicate traffic and roadway information to other drivers and to transportation operators. The potential payoffs — in lives saved and delays avoided — are dramatic. The technology is doable, the incentives are high, and all that is needed is the commitment to work cooperatively to achieve this quantum leap forward.

John Njord



President

Acknowledgements

AASHTO expresses its appreciation to the many state departments of transportation who supplied information for this report and for the accompanying video. It also acknowledges the contributions and advice of:

Jeff Peniati, Jeff Lindley, Bob Rupert and Zia Burleigh of the Federal Highway Administration.

Brian Hansen, author.

John Njord, Executive Director, Utah Department of Transportation and AASHTO President. Tom Hudachko and Linda Toye Hull, Utah Department of Transportation

John Conrad, Chairman, Highway Subcommittee on Systems Operation and Management.

Bruce A. Warner, Chairman, Standing Committee on Highway Traffic Safety.

Valerie Kalhammer, Keith Sinclair, James Wright, Tony Kane, Shane Artim and Sunny Mays Schust of the AASHTO Staff.

Melinda Appel, Appelgrafix, graphic design and photography.

Preface

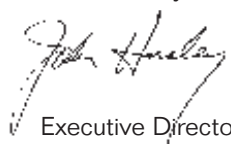
There is a changing dynamic underway in state departments of transportation across America — a new paradigm in which the agencies that were responsible for building the world's greatest transportation system are now focusing on operating it at its maximum capacity.

That shift has been reflected within the American Association of State Highway and Transportation Officials. The Standing Committee on Highways, which has set the standards for highway construction world wide, has further evolved, creating a new Highway Subcommittee on Systems Operation and Management. A key responsibility of the subcommittee is advancing the deployment of Intelligent Transportation Systems and other new technologies, some of which are highlighted in this report. Important leadership is also being provided by the Federal Highway Administration, ITS America, and other industry organizations.

As this report reflects, there are many approaches to maximizing the efficiency and safety of our transportation network. The techniques described here benefit the operations of automobiles, trucks and transit vehicles that use the highway system. Other techniques that add to that efficient operation are traffic demand management and shifting traffic from single occupancy vehicles to transit and van pools to ease the demands on our highway system. Those important topics are to be addressed in other AASHTO reports.

The many successful examples depicted in *Optimizing the System: Saving Lives; Saving Time* are a credit to state DOTs who are making the most of their transportation resources, on behalf of their customers — the public.

John Horsley,



Executive Director



this page, left to right: photos courtesy of Caltrans and VDOT opposite page, left to right: photos courtesy of Caltrans and VDOT



Contents

Introduction	1	A green light for intersection safety	33
Reducing delay	5	Making the existing system work better	37
The dreaded orange cones: workzones	15	ITS: keeping America truckin'	47
Weather	31	Preparing for tomorrow's solutions	51
Rural, but still risky	25	Conclusion	59



Argh! Stuck in traffic again

Three lanes of gridlock. You drum your fingers anxiously on the steering wheel, hoping you'll get to the office on time. Tomorrow, you vow to leave the house earlier. But for now, you're going nowhere fast.

Sound familiar? Millions of American motorists battle traffic congestion every day. Some 39,000 miles of highways were routinely congested in 2001, according to the Federal Highway Administration (FHWA).¹ That's enough gridlock to stretch back and forth between New York and Los Angeles nearly 16 times.

Arterial roads (major surface streets) aren't any better. Sixty-one percent of the arterial "lane-miles" in America's 75 largest urban areas were routinely congested in 2001, according to the Texas Transportation Institute (TTI), a research agency based at Texas A&M University.²

What causes all this gridlock? About half is "recurring" in nature, meaning it stems from factors that exist daily. Chief among these is a shortage of roadway "capacity," meaning there is simply not enough pavement to handle the traffic volume.

The other half of congestion is "nonrecurring;" it stems from temporary disruptions such as traffic accidents, construction zones and inclement weather. This type is especially aggravating because it can't be anticipated: A minor fender-bender that's not immediately cleared to the shoulder, for example, might turn your normal 20-minute commute into a two-hour ordeal.

But whatever the cause, traffic congestion is more than just exasperating — it's also tremendously costly. In America's 75 largest urban areas, an astronomical 3.5 billion hours of people's time and 5.7 billion gallons of fuel were wasted in 2001 because of congestion, TTI estimates. The cost of these squandered resources? A staggering \$69.5 billion, the group estimates.



But as bad as this is, there's an immeasurably more costly and tragic measure of the system's performance: the human toll. Every year, more than 43,000 people are killed and more than three million others are injured in crashes on our nation's roads and highways. Many of these deaths and injuries are directly related to traffic congestion. The economic cost of vehicle crashes annually is over \$230 billion dollars.

What's being done to address the situation? Plenty. First and foremost, the federal government and the states are adding new capacity to the system whenever practicable. But this approach is both costly and politically difficult, and it's clearly not keeping pace with the demands being placed on the system. According to the FHWA, the number of "vehicle miles" traveled on America's roads and highways increased 76 percent between 1980 and 1999, while capacity grew only 1.5 percent.³ TTI estimates that less than half (49 percent) of the new roadway that was needed to maintain even the current congestion level was actually added during the period.

So, in addition to adding whatever capacity they can, many transportation agencies are working to "optimize" the roadway system as it exists today. The goal of this approach is simple: revamp the existing infrastructure so that it can handle more traffic in a safer manner.

"Travel in this country is growing so fast that we can't keep up with it," says John Njord, director of the Utah Department of Transportation and the current president of AASHTO. "Part of the solution is to build more capacity, but we don't have the resources to solve the problem with new capacity alone. That's why it's critical that we optimize what we've already got."

While transportation agencies are playing a central role in this effort, they are by no means alone. The optimize-the-system campaign is really a team effort involving many different players — including elected officials, law-enforcement and fire departments, emergency-services providers, private towing and construction companies, and even the automobile industry.

So what exactly, are these groups doing to optimize the system? Currently, much of the focus is on developing and deploying "intelligent transportation systems" technologies, or ITS. These utilize the latest in computer and communications technologies to improve traffic flow and reduce the incidence of crashes and disabled vehicles.

Some ITS technologies are easy to spot: Those closed-circuit television cameras you see along the highway, for example, are ITS components. Ditto for dynamic message signs that warn you about hazards up the road. But there's plenty about ITS that you don't see: high-tech sensors embedded in the highway, for example. Computers that run mathematical algorithms to pinpoint traffic tie-ups. And a rapidly expanding wireless communications network that disseminates critical traffic and weather information among transportation officials, emergency responders and the general public alike. ITS technologies such as these are being deployed around the country, and they're doing much to reduce congestion and save lives. Here are few examples:⁴

In Colorado, the installation of a downhill speed-warning system along a mountainous stretch of Interstate 70 led to a 13 percent drop in tractor-trailer accidents.

In Arizona, the synchronization of traffic signals along a major commuting corridor in the Phoenix area boosted travel speeds and decreased crash risk by nearly seven percent.

In California, signal-synchronization projects undertaken along 76 travel corridors across the state decreased the number of "vehicle-hours" of delay by 25 percent.

In Texas, the deployment of dynamic message signs, closed-circuit television cameras and other ITS technologies along 29 miles of highways near San Antonio eased congestion and reduced the number of traffic accidents by nearly three percent.

In New Jersey, the implementation of the E-ZPass electronic toll-collection system reduced delay at toll plazas by 85 percent, saving motorists an estimated \$19 million in otherwise lost productivity time and \$1.5 million in fuel costs every year.

In New Mexico, the deployment of variable message signs, automated traffic sensors and other ITS technologies at a freeway construction project in Albuquerque reduced the average clearance time for traffic incidents by 44 percent.

Three of the most widely-used ITS technologies — traffic-signal coordination, ramp metering and incident-management programs — together reduced delay by some 206 million person-hours in 2001, according to TTI.

Most of the ITS technologies described are integrated into the transportation infrastructure; others are incorporated into vehicles themselves. General Motors' OnStar system — available on some vehicles — is of this type. OnStar-enabled vehicles are linked to a customer service center via cellular phone and Global Positioning System (GPS) satellite technology. Motorists stuck in traffic can contact an OnStar advisor to get turn-by-turn directions to an alternate route. Drivers involved in accidents can touch a button to have an advisor alert the nearest emergency-services provider. If a vehicle's air bag deploys, a signal is automatically sent to the OnStar Center, where an advisor will dispatch emergency responders to the scene.

Systems like OnStar are just the beginning. "Intelligent" vehicle technologies now under development can do far more, such as warn drivers when the roadway they're driving on is frozen (and thus hazardous). New technologies can also warn drivers when they're about to rear-end or sideswipe someone, or drive off the road. Some systems will even automatically apply the brakes when onboard sensors determine that a crash is imminent. Early versions of this automated braking technology have been used by the intercity bus industry for buses following too closely.

A Virginia motorist uses OnStar to call for help

Cindy Ensinger was lucky. Cindy, her two daughters and their dog were on their way home to Virginia Beach, Virginia, one evening two years ago when Cindy decided to pass a vehicle that seemed to be swerving. But as she was passing, the other vehicle inched toward her sedan and forced her off the road, causing her car to roll over three times.

Fortunately, Cindy's car was equipped with General Motors' OnStar system. With the touch of a button, Cindy was able to immediately contact an OnStar advisor, who asked if there was an emergency in the vehicle. "Yes, I need the ambulance! I have three people in the car. I went off the side of the road. Please hurry!" Cindy said.

Using information from the vehicle's embedded Global Positioning System receiver, the advisor was able to pinpoint Cindy's exact location, which he passed along to the local emergency dispatcher. "I probably would have been sitting out in that field unless someone had seen me go off the side of the road," Cindy says. "But since I had OnStar, I was able to push the emergency button and get help for me and my family."

That's not all. Recently, the automobile industry, the U.S. Department of Transportation (USDOT) and AASHTO joined forces to explore the feasibility of a far more ambitious vision: equipping all new cars and trucks with mobility- and safety-enhancing "intelligent vehicle" technologies, while at the same time outfitting roadways and intersections throughout America with ITS technologies. All of the "smart" vehicles, then, would be linked to the "smart" highway infrastructure (as well as each other) via a nationwide, wireless communications network.

The project — still in the exploratory stage — is known as the Vehicle/Infrastructure Integration initiative, or VII. It has "enormous potential" for reducing crashes and enhancing the mobility of the roadway system, says Bill Jones, Technical Director of the USDOT's Intelligent Transportation Systems Joint Project Office.

"The purpose behind VII is to examine the feasibility of establishing a communications link between vehicles and the transportation infrastructure," Jones says. "If every car in the country had this communications link and we had it all over the roadways, we [transportation professionals] could do some things that we have only dreamt about for decades."

The federal government, the 50 state departments of transportation, the automobile industry, and other industries are working cooperatively to develop and deploy ITS

technologies. They must continue to do so. More than 43,000 people are killed on the nation's roadways every year. Traffic congestion and delay on rural and urban roads costs the nation hundreds of billions of dollars annually. We can't combat these problems with new capacity alone. We've got to optimize the system. This report takes a closer look at what transportation agencies and their partners are doing towards that end.

Endnotes

1. Source: Dale Thompson, congestion expert, FHWA, interviewed May 26, 2004. The number for the year 2000 (42,500 miles) is cited online at <http://fhwa.dot.gov/congestion.tidbits.htm>
2. Texas Transportation Institute 2003 Urban Mobility Study, Exhibit A-11, p. 73. Available online at <http://mobility.tamu.edu/ums/>
3. FHWA Office of Operations Web site: <http://www.ops.fhwa.dot.gov/aboutus/opstory.htm>
4. See Mitretek Systems, "Intelligent Transportation Systems Benefits and Costs: 2003 Update," (Report No. FHWA-OP-03-075), May 2003. Available online at http://www.mitretek.org/its/benecost/BC_Update_2003/index.html



Reducing delay

Unless you live in the hinterlands far off the beaten path, you probably can't hop in your car and drive somewhere without being delayed somewhat along the way. Many things slow us down in our daily pursuits: traffic accidents, construction zones, bad weather, tollbooths, and good-old-fashioned "volume" delays.

Whatever the cause, these delays really add up: According to TTI, drivers and passengers were delayed an incredible 3.546 billion hours — that's 404, 794 years — on roads and highways in the nation's 75 largest urban areas in 2001. The average delay was 26 hours per person. The longest was in Los Angeles, where the average road-system user was delayed 52 hours over the course of the year.

About 45 percent of all delay-causing congestion stems from problems that exist every day — the principal ones being too little roadway, poorly timed traffic signals, and lack of fully deployed ITS technologies. The other 55 percent of congestion is caused by "non-recurring," or temporary, disruptions in the traffic flow. About one-quarter of total congestion is caused by traffic incidents, a category that includes everything from disabled vehicles (due to flat tires, overheated engines, etc.), to fender-benders, to overturned tanker trucks. Other non-recurring disruptions include weather (15 percent), work zones (10 percent), and things such as special events (five percent).

Traffic incidents

Any sort of incident that blocks a travel lane — from an overheated car to a minor fender-bender to an overturned tanker truck — can cause a lengthy delay if not dealt with immediately. A crash that blocks one lane of a two-lane, two-mile section of freeway for example, could cause congestion to mushroom 250 percent over the "normal" level if the vehicle(s) involved are not moved to the shoulder within 10 minutes.¹ Such an incident would likely delay motorists for hours.

The task of clearing traffic incidents from highways typically involves many different actors, including transportation agencies; law-enforcement agencies; fire and rescue departments; hazardous material ("hazmat") teams; and private towing companies. State legislators, governors and other elected officials often help out "behind the scene" by passing laws that expedite the incident-clearance process.

Coordinating the response

Clearing traffic incidents quickly requires coordination, cooperation and communication.

At least 25 states have established "traffic management centers" (TMCs) or "traffic operations centers" (TOCs) as the central hub for managing traffic incidents. Technicians at these centers monitor roadway cameras, evaluate sensor data, and field motorists' calls about incidents. They relay this information as needed to police and fire departments, tow-truck companies, and any other agencies whose presence is needed at an accident scene.

In addition to dealing with traffic accidents, TMCs also perform other system-related tasks, such as timing traffic signals; managing freeway on-ramps and work zones; handling weather-related situations; and disseminating information about these and other matters to the general public so that motorists can make travel decisions.

Inside a traffic management nerve center

Walking into the Statewide Operations Center (SOC) of the Maryland CHART program is not unlike walking into the control room of a nuclear power plant — or at least the Hollywood version of one. More than two-dozen television monitors of various sizes — including one that measures 16 feet across — cast an electronic glow across the windowless room. Most are mounted in a 40-foot-long, two-story-high “video wall” that forms the back wall of the SOC. The monitors display real-time pictures and video taken by some 60 cameras mounted along various roads throughout the state. Technicians can toggle back and forth between cameras and project different various roadway locations on the monitors as needed. Work-station consoles, each housing a computer monitor, telephone and comfortable swivel chair for the technician, stretch out in front of the video wall. To the rear, behind a wall of smoked-glass windows, is a battery of powerful computers. They run specially designed software that allows technicians to view a host of information on their computer screens, including real-time travel speeds and the location of emergency-response vehicles. With the click of a mouse, a technician can even check the salinity level of a stretch of road on the other side of the state. With this information, the technician can determine if a salt truck needs to revisit an ice-prone area.

Maryland CHARTing the Coarse

The state of Maryland's incident-management program is among the most advanced in the nation. It is part of a larger organization known as the Coordinated Highways Action Response Team, or CHART. In addition to managing traffic incidents, CHART also deals with weather-related emergencies, construction-related road closures and other issues.

CHART is headquartered near Baltimore/Washington International Airport in a 17,000-square-foot facility known as the Statewide Operations Center, or SOC. Like the traffic it monitors, the SOC operates 24 hours a day, 365 days a year. The facility works in conjunction with several smaller, regional TOCs located throughout the state. The complete CHART program is a joint effort of the Maryland State Highway Administration; the Maryland Transportation Authority; and the Maryland State Police.

To be sure, CHART stays busy. In 2001, program personnel dealt with 4,599 “serious” incidents that blocked one or more freeway travel lanes, according to an analysis conducted by experts at the University of Maryland.² CHART also handled 16,555 “minor” incidents involving disabled or abandoned vehicles on freeway shoulders, researchers found. Most of the incidents occurred on freeways in the heavily traveled Baltimore/Washington, D.C. area.



Clearing major incidents: policy matters

A tractor-trailer rig that overturns on a highway can easily block all available travel lanes, either because of spilled cargo, fuel, or the wreckage of the vehicle itself. Wrecks involving tanker trucks or vehicles transporting other kinds of hazardous materials can be even more devastating. Technically, accidents with an expected duration of more than 2 hours are classified as “major” incidents. Naturally, these require more responder-resources and take longer to clear than do minor fender-benders. And for motorists, that can mean more congestion and longer delays.

Clearing such incidents can require serious hardware, such as cranes, front-end loaders, heavy-duty tow-trucks, highway sweepers, and recovery trucks equipped with “rotators” (for righting overturned trucks). Due to budget constraints, few transportation agencies own outright every piece of heavy equipment they need, so many contract out certain jobs — such as heavy-duty crane work — to private companies. The logistics of these arrangements are usually worked out well in advance.

Clearing incidents quickly requires not only the right equipment, but trained personnel as well. Seventy percent of the agencies surveyed last year by a panel of the Transportation Research Board (TRB) said they provide some form of incident-clearance training to staff members (surveyed agencies include state DOTs, police and fire departments, emergency medical units, and private towing companies).³ Most of these — 82 percent — said they trained jointly with other agencies.

An 18-wheeler rolls over on the highway. The road is littered with smashed-up furniture. The driver is injured and can’t talk. Traffic is backing up. What does the response team do? The answer is: It depends.

Different locales have different policies for clearing debris from the road. Fifty-seven percent of jurisdictions in the TRB survey can relocate non-hazardous cargo (such as furniture) from travel lanes without driver consent if necessary. Another 25 percent said they act without permission only if the vehicle operator is not present. Eighteen percent said they require the approval of the vehicle owner and/or a law-enforcement agency before

moving spilled cargo. Obviously, this type of policy can result in the lengthiest delays.

Similar differences exist with respect to hazardous materials. To be sure, all jurisdictions commit high levels of resources — hazmat teams, environmental specialists, etc. — to a catastrophic incident such as a completely ruptured tanker truck. But is the same response necessary if a truck leaks just a few gallons of fuel? Some jurisdictions say no — and this policy choice can reduce delays. Roughly 57 percent of the jurisdictions in the TRB survey don’t call out hazmat teams to incidents involving “incidental” amounts of spilled fuel. And what agencies define as incidental varies from five gallons in the most restrictive cases, up to 150 gallons.

But any type of incident involving a big-rig can be costly, and some states have stopped picking up the tab. Nearly 40 percent of the agencies surveyed in the TRB report said they have policies or state laws on the books requiring commercial carriers or cargo owners to reimburse them for costs incurred during clearance activities.

Treating traffic fatalities with care

Sadly, people die in traffic accidents — more than 43,000 annually in recent years. Agencies of all types are working hard to reduce this terrible toll, as well as the especially long delays fatal accidents can cause. Such delays can be deadly themselves, due to the increased risk of secondary accidents.

Why can it take so long to clear fatal accidents? One reason is that most jurisdictions — 73 percent of the TBR survey respondents — require medical examiners or coroners to respond to crash sites before bodies can be removed. And therein lies the Catch-22: medical examiners can be slowed in responding to crash scenes by the traffic congestion the accidents themselves create.

Some locales have decided that the risk of secondary crashes outweighs the practice of allowing only medical examiners to move bodies. Connecticut, Maryland, Virginia, and some parts of Texas and Florida, for example, have policies allowing responders other than medical examiners — such as police or fire fighters — to move bodies in order to expedite the clearance process.

Minor incidents: If you can steer it, clear it!

Policy can also do much to reduce delays caused by “minor” incidents: those not involving serious injury or death, and which can be cleared in 30 minutes or less. These include “fender-benders” and incidents where vehicles become disabled due to flat tires, overheated engines and the like.

States are taking several policy-related steps to expedite the clearance of such incidents. The most common approach is by enacting measures known as “quick clearance” laws. While these take different forms, they are all designed to get vehicles involved in minor incidents out of roadway travel lanes as soon as possible.

At least 14 states have laws on the books requiring motorists to remove their vehicles from travel lanes — even before officials arrive on the scene, if possible — if their vehicles are drivable and no one was seriously injured or killed as a result of the incident.⁴ These are generally known as “driver removal” laws. States usually publicize them with catchy names: “Move It,” “Steer-Clear,” “Steer It and Clear It,” and “If You Can Steer It, Clear It,” among others.

Closely related are “authority removal” laws. These allow designated responders, such as police and highway-helper teams, to move damaged or disabled vehicles before a tow truck arrives on the scene (and even if the driver objects or is absent). Likewise, some states have “authority tow” laws, which allow pre-designated towing companies to move vehicles before the police show up.

Quick-clearance laws can be extremely effective in reducing delays caused by minor incidents. Their biggest weakness? Motorists don’t know about them — especially those requiring drivers to move their vehicles before the “officials” arrive.

That’s where education comes in. Many agencies are making some kind of effort to educate motorists about existing quick clearance laws. These include the use of



highway signs, billboards and web sites, and by emphasizing the laws in driver’s license testing manuals and high school driver-education courses. Agencies are also reaching out to the media. Some have gotten TV or radio “traffic” reporters to remind their audiences about the laws. Others develop relationships with print reporters. The New Jersey State Patrol and New Jersey DOT, hold special media-education workshops.

Freeway service patrols: the proactive approach

You’re driving along the freeway at rush hour when you suddenly get a flat tire. Or your engine overheats. Or embarrassingly, you run out of gas. You manage to get your car to the shoulder, but you’re backing up traffic anyway. Stranded on the side of the road, you fear you may be in for a long ordeal.

But then, out of the blue, a tow-truck pulls up behind you. The driver changes your flat tire, or fills your radiator with water, or gives you a gallon of gas. And amazingly, the service is free! The crisis averted, you continue on your way.

Fairy tale? Urban legend? Nope — stuff like this happens every day. Many transportation agencies have programs for assisting motorists who run out of gas, suffer flat tires, or encounter other minor problems. Known generally as “service patrols,” these programs are designed to get disabled vehicles back on the road as quickly as possible so they won’t cause traffic back-ups. If a disabled vehicle can’t be repaired on the spot, a service patrol operator will typically offer to tow it to a safe location off the highway —



sometimes even to a nearby service center. Service patrols almost never charge for their services, and operators are usually prohibited from accepting tips.

The Illinois DOT has operated its “Minuteman Service Patrol” program in the Chicago area for decades. The program utilizes medium-duty tow trucks outfitted with a wide variety of tools and supplies, allowing operators to deal with many different kinds of incidents. Minuteman “Emergency Patrol Vehicles,” as they are called, are designed so their operators can “grab” stalled or wrecked cars without exiting the cab. This enhances both the safety of the operator as well as the efficiency of the clearance procedure. As the program’s name implies, Minuteman operators strive to — and frequently do — relocate disabled vehicles from travel lanes in 60 seconds or less.

The Ohio DOT operates a “Freeway Service Patrol”(FSP) program over some 88 miles of highway in the Cincinnati region. In 2001, the FSP responded to 21,004 traffic-related incidents.

The Tennessee DOT (TDOT) operates its “Freeway Service Patrol” program over about 365 miles of highway in four metropolitan areas: Knoxville, Chattanooga, Memphis and Nashville. The program has a staff of 89 full-time operators and supervisors. It utilizes some 46 medium-duty patrol vehicles equipped with changeable message boards and other tools needed to respond to different types of incidents. In 2001, TDOT FSP units responded to 12,662 crashes blocking travel lanes or shoulders; 5,910 incidents involving debris; and 5,726 disabled/abandoned vehicles.

Caltrans and the California Highway Patrol (CHP) operate Freeway Service Patrols in

several parts of the Golden State. The largest, in Los Angeles County, patrols more than 400 miles of freeways with about 350 tow trucks during peak hours. Last year, the patrol assisted more than 350,000 motorists.

Public feedback for the program has been overwhelmingly positive. “We get lots of letters; people absolutely love the program,” says Lt. Joe Vizcarra of the CHP, who runs the patrol. “It keeps traffic flowing, and it cuts down on secondary accidents, which prevents injuries and saves lives.”

Not surprisingly, these programs are wildly popular with motorists, and the source of many letters of thanks to the agencies that operate them. Here’s what one grateful motorist had to say in a letter to the Florida DOT.

Dear FDOT:

I want you to know how much I appreciate your wonderful road rangers. Yesterday ... my car broke down on I-275 northbound just north of the I-4 overpass. I could not get my car off the road so I was blocking part of the far left lane. I have rarely been as frightened. I didn’t even dare unbuckle my seat-belt, because I was certain the next car flying by might be the one that hit me. Your Road Rangers came to my rescue!!! Two Road Rangers stopped. One offered me his cell phone to call for a tow, while they hooked up my car and towed me to safety. Both were kind, courteous, and reassuring. I truly feel that they saved my life. Previous to yesterday, I didn’t even know there were Road Rangers, now I thank God for them. I don’t know their names, but I want all the Road Rangers to know how much I appreciate the job they do.

Sincerely,
Tracie Patel
Tampa, Florida
Oct. 10, 2003

photo courtesy of MoDOT

Service patrol helps motorists in the mile-high city

In her 25 years of driving, Anne Radecky had never had a flat tire. So Radecky, a resident of Greeley, Colorado, was a little freaked out when she suffered one while driving on Interstate 25 through Denver a couple of years ago. Fortunately, Radecky managed to maneuver her 1994 Ford Explorer to the shoulder of the busy highway. But as morning rush-hour traffic screamed by just a few feet away, Radecky was sure she was in for a long ordeal.

Joanne McCarthy had a similarly bad experience when one of her tires blew out near the "Mousetrap," the busy interchange between Interstates 25 and 70 in Denver. McCarthy, of Evergreen, Colorado said she felt "vulnerable" as she was stranded on the side of the road during the evening rush hour.

Fortunately for both women — as well as myriad other motorists in the Denver area — the Mile High Courtesy Patrol quickly came to the rescue. A component of the Colorado Department of Transportation (CDOT), the patrol helps motorists whose vehicles run out of gas or become disabled due to flat tires, overheated radiators or various other conditions. As is the case with service patrols in other parts of the country, many Denver-area motorists aren't even aware that the Courtesy Patrol exists until a truck pulls up to help them. Then, stranded motorists are almost always grateful — especially when they learn that the patrol's services are free.

It was such a nice experience," Joanne McCarthy said of the technician who came to her aid on I-25. "I went from feeling vulnerable to uncertain to being very well taken care of."

At present, CDOT's Courtesy Patrol consists of about 14 flat-bed tow-trucks that traverse about 69 miles of highways (as well as a stretch of a major arterial road) in the Denver area. Its primary purpose is to clear disabled vehicles and minor accidents before they cause major traffic tie-ups. The patrol operates weekdays during both morning and evening rush hours. Between rush hours, most of the patrol's 14 drivers work for private towing companies that contract with CDOT for other incident-response functions.

The Courtesy Patrol responds to about 1,000 incidents a month, according to CDOT. Joseph Vialpando, a former deputy sheriff who has worked for the patrol for about two years, says the job is never boring. "The people that you deal with are as different as night and day," Vialpando says. "You never really know what you're going to come up on."

Vialpando's normal "beat" is an eight-mile stretch of I-25 north of downtown Denver. He stays in constant radio contact with a dispatcher at CDOT's Traffic Operations Center, who directs him to some incidents. But frequently, he just comes upon incidents during his routine patrol. What he does then depends on the circumstances: Maybe he adds a little gasoline to an empty tank. Maybe he changes a tire. If he can't fix a disabled vehicle on the spot, he'll offer to tow it to a spot off the highway where the driver can come back for it. That's often the best solution. Vialpando says, because many stranded motorists are in no condition to wait for a private wrecker. "Some people actually have anxiety attacks," he says. "It just scares them to death to be on the side of the highway with other vehicles flying by. So I say, 'let me take you off the highway where it's quieter and calmer, where you won't get killed.'"

Vialpando has had close calls himself. Earlier this year, a car came careening towards him as he was working on the shoulder. "The guy was over the line, coming right at me," Vialpando says. "He couldn't have missed me by more than a few inches."

Vialpando is especially wary of "secondary" accidents — those caused by "rubberneckers" or people don't slow down sufficiently for a primary incident. "While you're on one accident, it's not unusual to have another one right next to you, or a few lanes over, or just ahead or behind you," he says. "People drive too fast and crash, or they slow down to take a better look and somebody runs into them."

Despite the constant dangers and challenges of his job, Vialpando finds working on the Courtesy Patrol very rewarding. "A lot of people out there are so pleasantly surprised and happy to find out that we're there to help them," he says. "To me, it's fun. I like helping people."



And the results show... traffic incident management pays off

Reducing delay

Service patrols and specialized incident-management programs can greatly reduce the duration of delays caused by accidents and disabled vehicles. Maryland's CHART program, for example, slashed the time needed to clear traffic incidents by some 43 percent in 2001, from an average of 50.7 minutes per incident to just 28.8 minutes,— saving travelers an estimated 26 million hours of delay.⁵

Enhancing safety

Reducing the time it takes to clear disabled or wrecked vehicles from roadways has a host of spin-off benefits. Among them: reducing the likelihood of “secondary” accidents caused by things such as drivers making sudden lane changes in order to avoid the “primary” accident; drivers plowing into the back of the traffic queue caused by the first accident; and “rubberneckers” who crash while



above and below: photos courtesy of VDOT and ILDOT



trying to catch a glimpse of the primary accident scene. One study found that the likelihood of a secondary crash increases by 2.8 percent for each minute the “primary” accident continues to be a hazard.⁶

In addition to simply causing further delays, secondary crashes pose especially grave risks for police officers, firefighters and other officials who respond to primary accidents. In 2001, 28 law-enforcement officers, firefighters, and emergency medical technicians were killed in secondary crashes.⁷

Well-designed incident-management programs can reduce these risks. Maryland’s CHART program, for example, may have prevented as many as 766 secondary incidents in 2001 through its prompt clearing of primary incidents, according to experts at the University of Maryland.

Saving money

Reducing incident-related delay time has other benefits as well: It saves fuel and reduces the level of emissions vehicles pump into the air. Again, Maryland’s CHART program illustrates this point. Researchers estimate that

the 25.80 million vehicle-hours of delay “eliminated” by the program in 2001 saved 4.35 million gallons of fuel and kept 4,027 tons of vehicular emissions (carbon dioxide, HC and NO) out of the air.

By affixing per-unit costs to each hour of delay, each gallon of fuel and each ton of emissions, researchers estimate that the CHART program saved Marylanders a whopping \$378 million in 2000 and nearly \$403 million in 2001!

AASHTO in action

AASHTO is also taking action to improve the way traffic incidents are managed on the nation’s roadways. In June 2004 AASHTO convened the inaugural meeting of the National Traffic Incident Management Coalition.

Led by AASHTO and including representatives from the fire, police, emergency medical services, emergency communications, insurance, trucking, towing and recovery, and traffic safety communities, the Coalition’s purpose is to advance practices that promote the safe and efficient management of incidents affecting traffic on our nation’s roadways. “Although there are some outstanding models