

Benefits By Program Area

Program Area / Benefit Measure		Summary
Arterial Management	Safety	Speed camera programs can reduce crashes by 9 to 51%.
	Mobility	Field studies in several cities have shown that adaptive signal control systems can reduce peak period travel times 6-53%.
	Productivity	Benefit-to-cost ratios for traffic signal optimization range from 17:1 to 175:1.
	Efficiency	Adaptive signal control integrated with freeway ramp meters in Glasgow, Scotland increased vehicle throughput 20% on arterials and 6% on freeways.
	Energy/Environment	Signal retiming projects in several U.S. and Canadian cities reduced fuel consumption by 2 to 9%.
Customer Satisfaction	Survey data collected from an organization of approximately 500 businesses in London indicated that 69% of respondents felt that congestion charging had no impact on their business, 22% reported positive impacts on their business, and 9% reported an overall negative impact.	
Freeway Management	Safety	A survey of traffic management centers in eight cities found that ramp metering reduced the accident rate by 24-50%.
	Mobility	In Salt Lake Valley, Utah a ramp metering study showed that with an 8 second metering cycle, mainline peak period delay decreased by 36 percent, or 54 seconds per vehicle.
	Productivity	A study found that the benefit-to-cost ratio of the Minneapolis-St. Paul ramp metering system was 15:1.
	Efficiency	After ramp meters were experimentally turned off in the Twin Cities, MN, freeway volume declined 9% and peak period throughput decreased 14%.
	Energy/Environment	A simulation study in Minneapolis-St. Paul estimated that ramp metering saved 2 to 55% of the fuel expended at each ramp.
Customer Satisfaction	In Houston, 85% of motorists surveyed changed their route after viewing real-time travel time information on freeway dynamic message signs.	
Crash Prevention & Safety	Safety	In Myrtle Creek, Oregon an advanced curve speed warning system installed on I-5 reduced the speed of 76% of drivers surveyed.
	Mobility	Models of increased traffic flow at a San Antonio rail crossing showed dynamic message signs with delay information can reduce system delay 6.7%.
	Productivity	
	Efficiency	
	Energy/Environment	An automated horn warning system in Ames, Iowa, reduced elevated noise impact areas 97% adjacent to a highway rail intersection.
Customer Satisfaction	In Los Angeles, 93% of the survey respondents believed that the "second train coming" warning signs improved the safety at the light rail transit grade crossing.	
Roadway Operations & Maintenance	Safety	In Nebraska, a portable speed detection and warning system placed upstream from an I-80 work zone decreased the highest 15% of vehicle speeds by about 5 mi/hr as vehicles approached the work zone lane merge area.
	Mobility	In North Carolina, a modeling study indicated that work zone delay messages reduced maximum traffic backups by 56% and contributed to 55% reduction in traveler delay.
	Productivity	A Kansas DOT survey of transportation agencies found that AVL applications for highway maintenance can have b/c ratios ranging from 2.6:1 to 24:1.
	Efficiency	Modeling data indicated that an automated work zone information system deployed on I-5 near Los Angeles contributed to a 4.3% increase in diversions and an 81% increase in average network speed.
	Energy/Environment	
Customer Satisfaction	In North Carolina, a survey of local residents near Smart Work Zone systems found that over 95% would support use of these systems in the future.	
Road Weather Management	Safety	In North Carolina, a wet pavement detection system on I-85 yielded a 39% reduction in the annual crash rate under wet conditions.
	Mobility	Signal timing plans implemented in Minnesota to accommodate adverse winter weather resulted in an 8% reduction in delay.
	Productivity	In Salt Lake City, Utah, staff meteorologists stationed at a TOC provided detailed weather forecast data to winter maintenance personnel, reducing costs for snow and ice control activities, and yielding a b/c ratio of 10:1.
	Efficiency	
	Energy/Environment	Evaluation data show that anti-icing and pre-wetting strategies can reduce sanding applications by 20% to 30%, decrease chemical applications by 10%, and reduce chloride and sediment runoff in local waterways.
Customer Satisfaction	In Idaho, 80% of motorists surveyed who used Road-Weather Integrated Data System information as a traveler information resource indicated that the information they received made them better prepared for adverse weather.	
Transit Management	Safety	
	Mobility	Transit signal priority systems improved bus travel times 1-42%.
	Productivity	An evaluation of scheduling software for the paratransit service in Billings, Montana found that the break-even point for savings as a result of the software implementation was a 3% improvement in efficiency.
	Efficiency	In Portland, OR, models of transit data showed AVL/CAD may allow same level-of-service to more travelers using the same rolling stock.
	Energy/Environment	Simulation of a transit signal priority system in Helsinki, Finland indicated that fuel consumption decreased by 3.6%, Nitrogen oxides were reduced by 4.9%, Carbon monoxide decreased by 1.8%, hydrocarbons declined by 1.2%, and particulate matter decreased by 1.0%.
Customer Satisfaction	Surveys found that riders on Vancouver's 98 B-line Bus Rapid Transit (BRT) service, which implemented transit signal priority to improve schedule reliability, rated the service highly with regard to on-time performance and service reliability (an average of 8 points on a 10 point scale).	
Transportation Management Centers	Safety	
	Mobility	
	Productivity	
	Efficiency	In the Minneapolis/St. Paul, traffic speed data collected at two interstate work zones showed that when portable traffic management systems were deployed, work zone traffic volumes increased 4% to 7% during peak periods.
	Energy/Environment	
Customer Satisfaction	TMC staff in Pittsburgh, Pennsylvania found real-time traffic information useful and noted that it improved coverage for incident management.	
Traffic Incident Management	Safety	The Maryland State CHART highway incident management system facilitated a 28.6% reduction on the average incident duration leading to an estimated 377 fewer secondary incidents.
	Mobility	In Georgia, the NaviGator incident management program reduced the average incident duration from 67 minutes to 21 minutes, saving 7.25 million vehicle-hours of delay over one year.
	Productivity	In 2004, a survey was conducted by the University of California, Berkeley, which found that the benefits of the Los Angeles Metro Freeway Service Patrols outweighed the costs by more than 8 to 1.
	Efficiency	
	Energy/Environment	In Georgia, the NaviGator incident management program reduced annual fuel consumption by 6.83 million gallons, and contributed to decreased emissions: 2,457 tons less Carbon monoxide, 186 tons less hydrocarbons, and 262 tons less Nitrous oxides.
Customer Satisfaction	In Atlanta, satisfaction with motorist assistance patrols ranged from 93% to greater than 95% in two surveys of drivers already aware of the service.	
Emergency Management	Safety	HAZMAT safety and security technologies can reduce the potential for terrorist consequences by approximately 36%.
	Mobility	In Hampton Roads, Virginia, a hurricane evacuation plan indicated that lane reversal is warranted for any hurricane predicted to make landfall as a Category 4 or 5 storm, and is strongly recommended for any Category 3 storm.
	Productivity	HAZMAT safety and security technologies can have tremendous societal cost savings well beyond the break even point for benefits and costs.
	Efficiency	Freeway lane reversal improved traffic volumes by 44% following South Carolina hurricane.
	Energy/Environment	
Customer Satisfaction	Survey responses from key professionals in five states indicate the following ITS technologies have the highest potential to benefit emergency transportation operations: interoperable radio communications, dynamic message signs, GPS and geographical information systems, closed circuit television roadway surveillance, and Enhanced 911.	
Electronic Payment & Pricing	Safety	In Florida, the addition of Open Road Tolling to an existing Electronic Toll Collection mainline toll plaza decreased crashes by an estimated 22% to 26%.
	Mobility	In Florida, the addition of Open Road Tolling (ORT) to an existing Electronic Toll Collection (ETC) mainline toll plaza decreased delay by 50% for manual cash customers and by 55% for automatic coin machine customers, and increased speed by 57% in the express lanes.
	Productivity	Traditional resource-based estimates of benefits and costs in London produced b/c ratios of 2.0:1 with the £5 charge and 2.5:1 with the £8 charge.
	Efficiency	For toll facilities, average travel time savings ranged from 13 to 55 seconds per transaction, with a simple unweighted average of 30 seconds time savings, valued at \$0.59 per event.
	Energy/Environment	An evaluation of electronic toll collection systems at three major toll plazas outside Baltimore, Maryland indicated these systems reduced environmentally harmful emissions by 16% to 63%.
Customer Satisfaction	In California, public support for variable tolling on SR91 was initially low, but after 18 months of operations; nearly 75% of the commuting public expressed approval of virtually all aspects of the Express Lanes program.	
Traveler Information	Safety	IDAS lanes of ARTIMIS in Cincinnati and Northern Kentucky estimated traveler information reduced fatalities 3.2%.
	Mobility	In the Washington DC metropolitan area, drivers who use route-specific travel time information instead of wide-area traffic advisories can improve on-time performance by 5% to 13%.
	Productivity	In the DC area, models showed pre-trip departure notification can reduce early/late arrivals and save 40% of users \$60 or more each year in lost time.
	Efficiency	Modeling studies in Detroit, Seattle, and Washington, DC have shown slight improvements in corridor capacity with provision of traveler information.
	Energy/Environment	A simulation study indicated that integrating traveler information with traffic and incident management systems in Seattle, Washington could reduce emissions by 1% to 3%, lower fuel consumption by 0.8%, and improve fuel economy by 1.3%.
Customer Satisfaction	Customer satisfaction with 511 ranged from 68% to 94% in four deployments studied.	
Information Management	Safety	
	Mobility	
	Productivity	A study evaluating data archiving at more than 60 organizations found that data warehousing generated an average return on investment of 401% over 3 years.
	Efficiency	In Portland, Oregon, the Tri-Met transit agency used archived AVL data to reduce variation in run times by 18% and improve schedule efficiency by 9%.
	Energy/Environment	
Customer Satisfaction		
Commercial Vehicle Operations	Safety	HAZMAT safety and security technologies can reduce the potential for terrorist consequences by approximately 36%.
	Mobility	In Colorado, an automated commercial vehicle pre-screening system installed at three ports of entry check stations saved approximately 8,000 vehicle hours of delay per month.
	Productivity	Approximately 50% of Commercial Vehicle Information Systems and Networks (CVISN) managers surveyed indicated that CVISN electronic credentialing systems can save staff time and labor, allowing additional support to be assigned to more critical agency functions.
	Efficiency	Pre-clearance systems that use interagency coordination to deploy interoperable electronic toll collection (ETC) and electronic screening (E-screening) systems can save carriers between \$0.63 and \$2.15 per event at weigh stations.
	Energy/Environment	In Colorado, an automated commercial vehicle pre-screening system installed at 3 ports of entry check stations saved 48,200 gallons of fuel per month.
Customer Satisfaction	Greater than 50% of highway maintenance users said they wanted to continue using FORETELL, a multi-state weather information network, in the future, and about 20% said they would pay for the service.	
Intermodal Freight	Safety	
	Mobility	A modeling study found that an appointment system for scheduling truck arrivals at cargo transfer facilities could reduce truck's in-terminal time by 48%.
	Productivity	Evaluation data collected from the Freight Information Real-time System (FIRST) for Transport project estimated that savings per drayage trip to an ocean terminal would range from \$21.36 to \$247.57.
	Efficiency	With potential cost saving benefits ranging from \$11.77 to \$16.20 per air-freight shipment, Electronic Supply Chain Manifest could save the freight industry more than \$2 billion per year.
	Energy/Environment	In Chicago, a feasibility study indicated that automated truck-way technologies (automatic truck steering, speed, and platoon spacing control) would save travel time and reduce fuel consumption.
Customer Satisfaction	Carriers surveyed indicated they were very satisfied with the ability of electronic supply chain manifest systems to duplicate paper-based systems.	
Intelligent Vehicles	Safety	Based on all police-reported crashes in 7 states over 2 years, electronic stability control reduced single-vehicle crash involvement risk by approximately 41% and single-vehicle injury crash involvement risk by 41%.
	Mobility	Modeling performed as part of an evaluation of 9 ITS implementation projects in San Antonio, Texas indicated that drivers of vehicles with in-vehicle navigation devices could experience an 8.1% reduction in delay.
	Productivity	The combined benefit-cost analysis showed positive b/c ratios in all categories, from a low of 1:1 in the less than truckload environment to a high of 97:1 in the truckload explosives operations.
	Efficiency	In Erie County, New York, a field operational test found that automated collision notification systems reduced incident notification time from an average of 3 minutes to less than 1 minute.
	Energy/Environment	In Torino, Italy, a simulation study found that an automated speed control system designed to optimize travel speeds between green lights can reduce fuel consumption by 8.3% to 13.8%, reduce CO2 emissions by 3.9% to 5.4%; reduce hydrocarbon emissions by 4.2% to 6.9%, and reduce NOx emissions by 7.9% to 11.3%.
Customer Satisfaction	Two surveys asked motor carriers what the motivation was for safety technology installation. A clear majority of the respondents indicated that crash reduction (68%) and lower insurance rates (52%) were key benefits.	

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