



1. CHART Transportation System Management & Operations

A major source of congestion along roadways is non-recurring congestion. Non-recurring congestion includes crashes, vehicle breakdowns, work zones, special events, and weather events. Non-recurring congestion is estimated to account for about 50% of all delays on Maryland roadways. The importance of avoiding crashes and providing emergency response in a timely manner is critical both for safety and mobility. From a safety standpoint, minimizing incident clearance times reduces the potential for secondary incidents caused by the original collision. Other benefits of reducing incident clearance times include lower user and agency costs in terms of travel delay and fuel consumption are reduced. Proper incident management also benefits the environment by reducing the amount of greenhouse gases emitted. The Coordinated Highways Action Response Team (CHART) Program, a joint effort between the Maryland Department of Transportation (MDOT) and Maryland State Highway Administration (SHA), in partnership with the Maryland State Police (MSP), and the Maryland Transportation Authority (MDTA), improves real-time operations for Maryland's highway system through communication, system integration, incident response and management, service patrols, and advanced traffic management systems. CHART's mission is to "Improve mobility and safety for the users of Maryland's highways through the application of intelligent transportation systems (ITS) technology and interagency teamwork." CHART is involved in the following areas:

- Emergency & Weather Operations
- Emergency Preparedness
- Incident Management
- Traffic & Roadway Monitoring
- Traffic Management
- Traveler Information

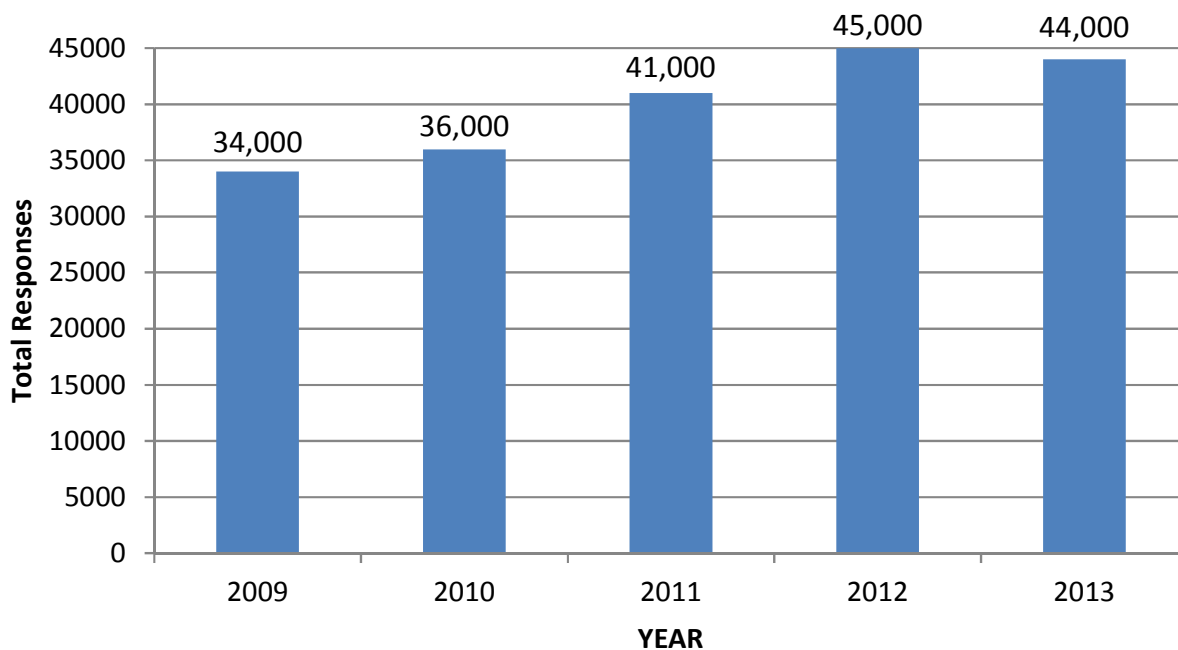
2014 Maryland State Highway Mobility Report

a. CHART Incident Management

In order to improve traffic operations during events that cause non-recurring congestion, CHART provides a variety of services. One of the major emphases for CHART is incident management. One goal of CHART related to incident management is to improve response times and clear incidents quickly. One way this is accomplished is proactively providing service patrols along major roadways. SHA and MDTA operate emergency traffic patrols to assist drivers when their vehicles become disabled. SHA has partnered with State Farm Insurance to expand CHART's emergency traffic patrol coverage. These daily patrols supplement CHART's current coverage and optimize incident response in identified high-volume/high-incident locations. There are currently 46 full-time and ten part-time Emergency Traffic Patrols (ETP's) in the Baltimore, Washington and Frederick regions that offer various types of motorist assistance on the freeways. In addition, from May through September, extra patrols are assigned in response to the increased traffic volume traveling to and from Maryland's Eastern Shore. At its Statewide Operations Center (SOC) near BWI Airport and three regional operations centers, traffic is monitored through closed-circuit television (CCTV) cameras, speed sensors, and weather stations. When an incident occurs, the necessary information is relayed to emergency service personnel tasked with responding to an incident. With the use of various ITS technologies, travel time information is available to motorists along the major roadways. As a result of all of these incident management and traveler information system initiatives, CHART has saved billions of dollars since its inception for the roadway user in terms of lost time, fuel, and emissions.

The CHART Program responded to and cleared more than 17,000 incidents and assisted almost 27,000 stranded motorists in 2013. The total number of CHART responses on a yearly basis is illustrated in the following graph.

CHART SERVICE PATROL RESPONSES





A timely response and efficient management have been shown to reduce the potential of secondary incidents. The faster the incident clearance the greater the benefits in reducing delay, improving mobility, and providing safer conditions. Once the traffic and roadway monitoring system has identified a problem, an immediate response is initiated to clear the incident and re-open lanes as quickly as possible, while protecting the safety of those involved in the incident, the emergency personnel responding, and other travelers in the vicinity. CHART operates a nationally recognized incident management program which depends heavily on the cooperation of the SHA, MSP, MDTA and numerous other agencies.

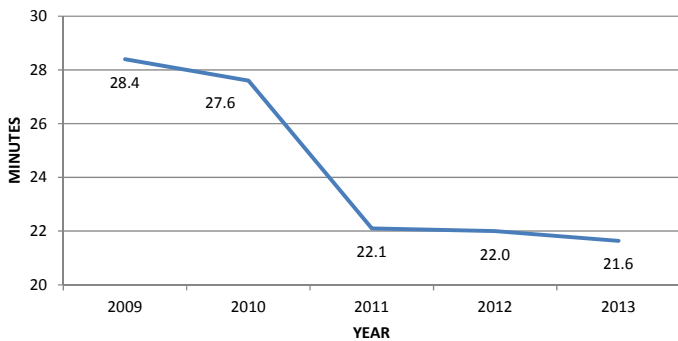
Some tools used for incident management include:

- Emergency Traffic Patrols (ETP's), which are used to provide emergency motorist assistance and to clear disabled vehicles from the travel lanes.
- Emergency Response Units (ERU's), which establish overall traffic control at crash locations.
- Freeway Incident Traffic Management (FITM) trailers, which are pre-stocked with traffic control tools including detour signs, cones, and trailblazer signs and are used to quickly set up pre-planned detour routes when incidents require full roadway closure.
- A "Clear the Road" policy, which provides direction for the rapid removal of vehicles from the travel lanes rather than waiting for a private tow service or time-consuming off-loading of disabled vehicles which are blocking traffic.
- An Information Exchange Network (IEN) Clearinghouse, provided by an I-95 Corridor Coalition workstation at the SOC, which shares regional incident and traveler information to member agencies along the corridor.

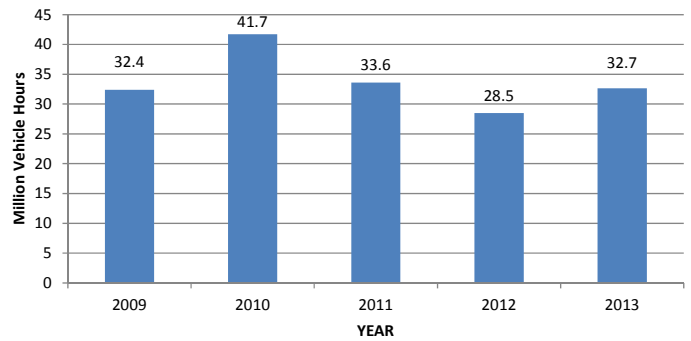
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CHARTs' goal is to provide quick response time to reduce the duration of incidents and, therefore, reduce the amount of delay that motorists experience. This, in turn, provides user cost savings to the motorists. In 2013, CHART's average response time was less than 10 minutes, and the average incident took 22 minutes to clear. This saved almost 33 million vehicle hours in delay to motorists. The following graphs show the trends of average incident duration and reduction in delay for the last five years.

AVERAGE INCIDENT DURATION

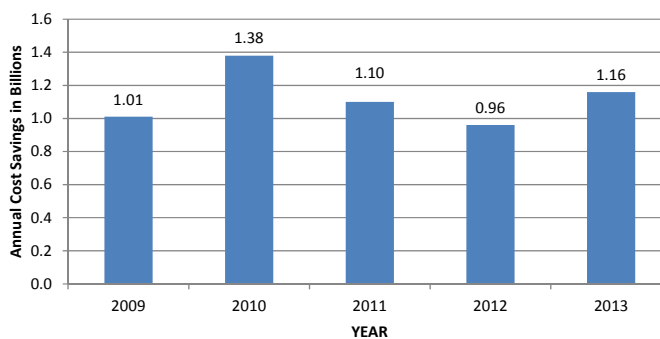


REDUCTION IN DELAY



The combination of a quick response time plus reducing delays means a savings in annual user costs. The following graph depicts the savings to motorists due to the CHART system in 2013, which is almost \$1.16 billion on annual basis.

ANNUAL USER COST SAVINGS



b. ITS/511

ITS devices deployed throughout the state assist motorists to warn them of traffic operations and incidents. These ITS devices include:

- 600+ CCTV Cameras which include video feeds from other agencies
- 200+ Speed Detectors
- 85+ Dynamic Message Signs (DMS)



- 50+ Roadway Weather Information Systems
- 35+ Traveler Advisory Radios

CHART is involved in the following areas:

- Emergency Preparedness - Redundant Power and Communication, Decentralized Communications, and Department of Transportation Emergency Operations (DOTOPs)
- Emergency Weather Operations - Automatic Vehicle Location Fleet Management System and Resource Tracking System
- Incident Management - Emergency Traffic Patrols, CHART Operations Center, and Emergency Response Units
- Traffic Management - Special Event and Work Zone Management
- Traffic and Roadway Monitoring - Cell phone #77, CCTV, and Public/Private Partnerships
- Traveler Information - Maryland 511 Traveler Information System - High-quality, Timely, and Comprehensive Travel Information to Motorists, CCTV Camera Video Sharing with First Responders, and Internet (www.traffic.md.gov)

Each year possible improvements to the CHART system are analyzed and implemented as funding is available. The expansion of the CHART system will further assist travelers by providing better traffic operations statewide. In 2013, CHART deployed and integrated two Dynamic Message Signs (DMS) into the network. Through real-time analysis of INRIX traffic probe data, CHART posts travel time information on more than 100 DMS which includes signs owned by MDTA. The Maryland 511 Travel Information System continues to provide useful, high-quality, timely, and comprehensive travel information. In May 2013, work began on an enhancement to provide customized information to support the commercial vehicle industry.