

Houston TranStar 2009 Annual Report



METRO



The Houston TranStar Consortium is a Partnership of Four Government Agencies
Responsible for Providing Transportation Management and
Emergency Management Services to the Greater Houston Region

INTRODUCTION

Houston TranStar is a formal partnership among the principal transportation and emergency management agencies in Harris County, including the Texas Department of Transportation (TxDOT); Metropolitan Transit Authority of Harris County (METRO); Harris County (including Traffic & Transportation Group, Harris County Toll Road Authority, and Office of Homeland Security & Emergency Management); and the City of Houston.

Established in 1993, Houston TranStar provides for multi-agency operations and management of the region's transportation system and has evolved into a primary resource from which multiple state, county and local agencies respond to incidents and emergencies in Harris County and beyond. Houston TranStar plays a pivotal role in the travel of people and goods in the greater Houston region, with an estimated savings to motorists of nearly \$2.5 billion in reduced travel time costs over the 13 years of Center operation from 1997 to 2009.

This document is the 13th annual report for the Houston TranStar Transportation Management and Emergency Operations Center. This annual report provides a review of the performance of the center and summarizes the estimated return on investment as quantified by the estimated benefit/cost ratio. It also includes conservative estimates of the impact of center operation on regional mobility (travel time, speed and delay), customer satisfaction, and energy and environmental benefits.

In 2009, the reduction of travel time attributable to Houston TranStar operation was estimated to be almost 11.3 million vehicle-hours. This level of delay savings has a corresponding value of nearly \$227 million in road user cost savings and over \$47 million (or 21 million gallons) in reduced fuel consumption.

The total estimated benefits of Center operation in 2009 were over \$274 million. Comparing the annualized TranStar operating cost estimate of \$27.7 million to the estimated annual benefit of \$274 million yields an estimated benefit/cost ratio for Houston TranStar center operation of 9.9.



Houston TranStar

Houston TranStar's Mission

It is the mission of Houston TranStar and its partner agencies to provide highly effective transportation and emergency management services through the combined use of the partners' collective resources to maximize safety and mobility to the public.

TRANSTAR OPERATIONS FRAMEWORK

Houston TranStar is staffed by employees from the member agencies which support the three levels of management in operating the systems and programs housed in the Center. Operation of the Center is coordinated by a small management staff that is responsible for operating and maintaining Houston TranStar facilities, coordinating multi-agency activities, coordinating budget preparation, hosting workshops and meetings, conducting facility tours, and managing public information activities.

Houston TranStar uses a three-tiered management structure with representation of each of the four agencies on each committee. The structure and functions of the three committees are:

- Executive Committee – includes agency- or division-level executive administrators; the committee sets policy and manages fiscal and staffing matters;

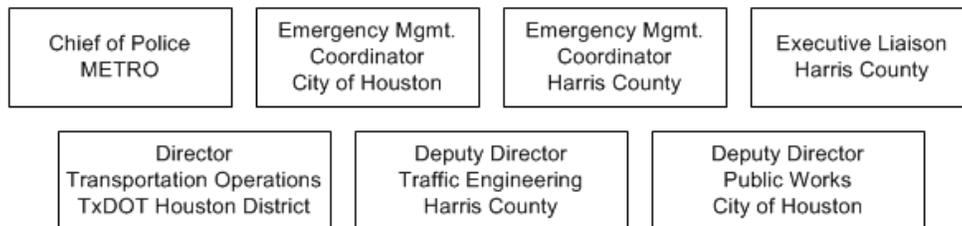
- Leadership Team Committee – includes administrators of the transportation and emergency management groups; the team administers implementation of various projects and activities and reviews funding commitments; and
- Agency Managers Committee – includes managers of the transportation and emergency management groups; the agency managers are responsible for daily operations.

Houston TranStar Organizational Chart

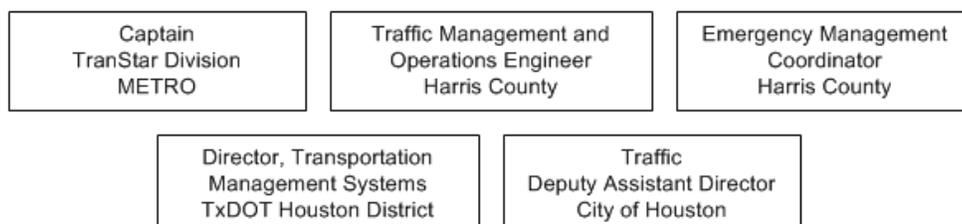
Executive Committee



Leadership Team



Agency Managers



SUMMARY OF 2009 ACTIVITIES

In 2009, the TranStar Partner Agencies continued transportation system operations and emergency response. Significant agency activities at the center in 2009 are highlighted in the following sections of this report. Some of these highlights and significant accomplishments of TranStar included:

- Harris County's Office of Homeland Security and Emergency Management activated for, responded to, and/or monitored 60 events during 2009. Activations included response to various weather, hazmat, and health-related events.
- Harris County Traffic and TxDOT teamed to finalize installation and integrated the intelligent transportation system infrastructure for the IH-10 Katy Freeway and Katy Managed Lanes into Houston TranStar.
- Harris County successfully linked the incident reporting system for the HCTRA Command Center to TranStar's RIMS system. This allowed HCTRA and TranStar to convey incident information between the centers.
- METRO instituted the PIERS notification system for METRO emergency response.
- The Center's Emergency Activation Task Force participated in a series of meetings to address issues raised by the Hurricane Ike After-Action Report.
- A regional plan for towing vehicles from evacuation routes during a hurricane evacuation was developed. The system will provide tracking for vehicles that are towed and inform the public of their whereabouts.
- A new interactive Web-based 2009 Hurricane Evacuation Map was presented to a representative from the Department of Public Safety. Ongoing meetings informed other officials and law enforcement agencies of this tool to monitor resources deployed during an evacuation event.
- After meeting with METRO personnel, Houston TranStar staff took steps to incorporate transit information into the Center's Real Time Traffic Map.
- TEEX conducted two Incident Management Training classes at Houston TranStar, their inaugural sessions of this new program offering.
- Building expansion plans continued with funding agreements and architectural planning underway.
- Mr. T. Boone Pickens held a media conference on alternative energy sources and how reducing dependence on foreign oil could help with decreasing traffic congestion.
- A collaboration of several law enforcement agencies held a media conference at Houston TranStar to inform the public about the "Move Over or Slow Down" law passed in 2003, and to notify the public that the week of February 16 would be devoted to enforcing the law.
- TranStar acquired the SnapStream system, which is used to monitor and archive multiple media stories on any named topic. This will be useful during major events such as hurricanes as it allows emergency responders to review articles, issue corrections and determine media shortages on topics of public importance.
- On March 30, Harris County Judge Ed Emmett held a media conference to release the Hurricane Ike After-Action Report.
- Monthly Control Room configuration meetings were initiated; a separate bi-weekly meeting for console, hardware and other purchasing issues was set up.

SUMMARY OF 2009 ACTIVITIES

- In May, Houston TranStar participated in Texas Southern University's Summer Transportation Institute, a nine-week learning experience for high school students in the region. Three groups toured TranStar over the summer as part of the program.
- TranStar's PIO appeared on KHOU's morning show to highlight TranStar's use of Twitter.
- Representatives from TranStar attended the Intelligent Transportation Society of America's annual conference to showcase TranStar's innovative new projects, including Bluetooth-based technology for travel time monitoring, center-to-center data exchange and the interactive Web-based evacuation tool.
- June 29: The Houston Chronicle ran a story on the City of Houston's flexible workplace initiative: "Flex in the City" and cited TranStar's speed data collection system as part of the calculation of benefits.
- An initiative to communicate evacuation preparedness and outreach to groups with special needs received two major public relations awards:
 - The 2009 Excalibur award from the Houston chapter of the Public Relations Society of America. This is the highest honor annually awarded by the organization.
 - The "Together Against the Weather" DVD received a national Telly Award in the category of Health and Wellness. This prestigious competition honors outstanding broadcast, video, film and online productions, and receives an average 13,000 entries each year from all 50 states and countries around the world.
- In June, TranStar hosted a meeting with FEMA on using rail to evacuate certain population groups and special needs persons for hurricanes.
- In July, KXLN-TV produced a story on the new law regarding mandatory evacuations and TranStar's role in planning an evacuation; it was filmed in the Transportation Control Room and outside the building.
- In August, TranStar hosted a delegation from Vietnam's Intelligent Highway Systems, including the Deputy Minister for Transportation.
- In September, Texas Transportation Institute staff and the TranStar PIO attended the Greater Houston Partnership Transportation Roadway Issues meeting, presenting information about the 2008 TranStar Annual Report and TranStar's community benefits.
- An initiative kicked off to provide surface street transportation information on the TranStar website. All partner agencies are involved in the process to provide travel time, incident, and transit information on surface streets. The pilot project uses data fusion among existing databases to populate incident information and other facts about inner-city traffic issues.
- In December, the Beijing Urban Traffic Delegation, comprising 10 transportation officials from the City of Beijing, visited Houston TranStar.
- OHSEM had four activations in December, including for the December 3-5 winter weather event. TxDOT monitored snow and ice conditions and issued an ice storm warning from the Houston TranStar website. The Houston TranStar Website experienced more than 1.19 million Web accesses in the 24-hour period December 4-5 surrounding inclement winter weather.

2009 HOUSTON TRANSTAR PARTNER AGENCY ACTIVITIES

The following sections summarize each partner agency's activity during 2009. This includes various measures of performance of the Center and programs operated from Houston TranStar.

Texas Department of Transportation

The Texas Department of Transportation (TxDOT) is responsible for traffic management of freeways and state-maintained



arterial highways in the region. TxDOT's Computerized Traffic Management System (CTMS) has been in continuous deployment on Houston area freeways since the late 1980s. The total extent of the system is about 825 directional miles, including 754 directional freeway miles and 89 miles on HOV and Managed Lanes. The IH-10 (Katy Freeway) Managed Lanes were included in these totals in 2009. Also not separately monitored are the non-barrier-separated HOV "diamond lanes" on US-59 (Southwest) and IH-10 (Katy Freeway) as these are currently included with mainlane monitoring.

Major components of the CTMS include CCTV, DMS, highway advisory radio (HAR), freeway entrance ramp flow signals, travel time monitoring using the Automatic Vehicle Identification (AVI) system, and related communications systems and central facility computer systems.

TranStar's traveler information systems are the cornerstone of the partner agencies' traffic management function and its ability to respond to and manage incidents. Monitoring systems at Houston TranStar provide extensive information of value to motorists as well as to traffic management operators at Houston TranStar. TxDOT operates and maintains this system for TranStar. Information is provided to motorists by four primary means: DMS, HAR, the Internet, and the local media.

Total TxDOT ITS field equipment deployed as of the end of 2009 included:

- Closed Circuit Television;
 - 661 freeway CCTV cameras;
 - 71 regional hurricane evacuation cameras (on rural and/or remote routes);
- Dynamic Message Signs – 216 total DMS;
 - 172 for freeway operations;
 - 41 for HOV and park and ride operations;
 - 3 portable units;
- Highway Advisory Radio;
 - 12 fixed transmitting locations;
 - One portable transmitting station;
- Radar-based Vehicle Volume and Speed Detection – 104 total detectors;
 - 28 locations on evacuation routes (primarily on rural and/or remote highway routes);
 - 76 locations on freeway facilities in the urban area, including 30 on the I-10 Managed Lanes operated in coordination with HCTRA;
- Flow Signals in Operation – 86 on six facilities (IH-45 North, IH-45 Gulf, US 59 Southwest, US 290 Northwest, IH-610 North Loop, and IH-610 West Loop); and
- Travel Time Monitoring System – 825 directional miles of coverage.

2009 HOUSTON TRANSTAR PARTNER AGENCY ACTIVITIES

The 213 permanent roadside DMSs provide information on traffic incidents and planned construction, giving location, travel direction, and nature of the incident or activity. The system is also used to display current travel times; weather alerts; and Amber, Silver, and Blue Alerts.

There were an estimated 138,000 operator activated messages and over 1.5 million automated messages displayed on DMSs in 2009. The total number of operator-activated and automated messages increased about 2% over 2008 levels, while the number of state-mandated Amber, Silver, and Blue Alert messages increased about 32% over 2008.

TxDOT operators use HAR broadcasts to disseminate travel information via the 12 fixed HAR sites located throughout the area. HAR was activated to broadcast 2,876 messages in 2009, a decrease of 6% over 2008 levels. Of the 2,876 messages broadcast, there were 2,355 HAR broadcasts for incidents, 339 messages for road closures, 182 messages broadcast for special events.

The types of DMS messages posted in 2009*, and the corresponding estimated number of messages posted included:

- Operator Activated (138,000 total);
 - 70,000 operator activated messages for incidents;
 - 19,000 operator activated messages for road closures or construction;
 - 4,000 operator activated messages for weather-related events, including
 - 3,200 for general weather events, including hurricane preparation;
 - 800 ozone alerts;
 - 31,000 operator activated messages for public service messages, including
 - 9,000 for safety campaigns;
 - 15,000 MAP/PEAT assistance information;
 - 7,000 for other informational messages;
 - 7,200 operator-activated messages for Special Events;
 - 5,700 Amber Alert and Silver Alert messages;
 - 1,050 for Statewide Amber Alerts;
 - 310 for Local Amber Alerts;
 - 4,200 for Silver Alerts; and
 - 140 for Blue Alerts.
- Automated travel time/ferry wait time messages (1,570,000 total);
 - 1,558,000 automated travel time messages; and
 - 12,000 Galveston-Port Bolivar ferry wait time messages.

*Note: these totals are estimated 12-month figures, scaled upwards due to database archiving issues late in the year.

2009 HOUSTON TRANSTAR PARTNER AGENCY ACTIVITIES

City of Houston

The City of Houston Traffic Operations Branch, located at Houston TranStar, directs the design and installation of new traffic signals, operates and manages the city's signal system, and oversees operations and development of the signal communications infrastructure. The need for optimal traffic signal operation has never been greater. Traffic congestion is a major issue for Houstonians, making signal timing optimization an excellent investment with significant benefits for the City's future traffic operations. Houston has more than 2,400 signalized intersections maintained and operated by the city.



The Public Works and Engineering Department's Traffic Signal Timing Optimization Program (TSTOP) is a coordinated effort between many agencies to ensure the city's traffic signals are using the most up-to-date traffic data, while taking advantage of the most recent technologies to produce new customized signal timings. TSTOP'S revolving program is scheduled to revisit each major corridor every four years for retiming. The central approach of TSTOP is to provide an optimized level of traffic signal operation on the city's most heavily-traveled corridors and throughout some of its most heavily-populated employment areas.

In addition to providing the program management for TSTOP, the Traffic Operations Branch is responsible for developing signal optimization plans for the selected zones. The Traffic Operations Branch's role in this process consists of field data collection, timing plan design, and signal timing implementation. Between 500 and 600 traffic signals are evaluated and optimized each year. During 2009, corridors in the far western portion of the City (south of IH-10 and west of the Sam Houston Toll Road), Kingwood and east Houston were evaluated and traffic signal timing adjustments were made.

Evaluations of TSTOP corridors have indicated travel time savings of 10 to 25 percent. The City also actively coordinates signal operations in work zones and at political boundaries with TxDOT and Harris County.

Communications between Houston TranStar and traffic signals have always been problematic within the City using a combination of different technologies including fiber optics, twisted pair, cellular modems and other technologies. In 2009, the City of Houston began investigating the use of WiMax radios as a cost effective communications solution to provide reliable communications between field devices and Houston TranStar. The preliminary testing was successful and the City of Houston pursued American Reinvestment and Recovery Act (ARRA) funds to pursue the city-wide implementation of a WiMax communications system. The installation of field equipment is scheduled to begin in 2010 and continue through 2011.

Additionally, the City Traffic Operations Branch reported the following in 2009:

- Completed the installation of LED traffic signal modules in more than 1,700 signalized intersections,
- Began final design for the West Houston ATMS project,
- Continued research with the Texas Transportation Institute into the use of Bluetooth™ technology as a probe based method for calculating arterial travel times, and
- Continued joint operations of the Mobility Response Team with the Houston Police Department.

2009 HOUSTON TRANSTAR PARTNER AGENCY ACTIVITIES

Metropolitan Transit Authority of Harris County

The Metropolitan Transit Authority of Harris County provides bus and light rail transit

METRO



services as its core function but is also involved

in other transportation and law enforcement functions. METRO is an active partner in the operation of Houston TranStar, and by using Houston TranStar's collection of ITS technologies, METRO provides improved service to the Authority's patrons. METRO programs operated from Houston TranStar include METRO bus and METRO Rail dispatch, traffic signalization systems, HOV management systems and incident management programs. METRO highlights for 2009 include:

- Implementation of the Public Information and Emergency Response (PIER) System. PIER is a site-notification system to improve multi-agency interoperability for METRO Emergency Response. PIER is a Web-based, on-demand communication management application. It allows both core communicators and an extended team to work together from anywhere (at any time) to manage a wide range of critical communication tasks. During 2009 all in-house users were trained regarding the use of PIER. METRO's Emergency Notification process was revised to ensure a more consistent means of notifying all appropriate staff.
- METRO MAP Program consisting of civilian staff members continued providing METRO Motorist Assistance Program (MAP) services in close coordination with the SAFEClear program. Both METRO MAP and SAFEClear on the HOV lanes are coordinated through Houston TranStar in partnership with the Houston Police Department and the SAFEClear Management team. In 2009, METRO's MAP personnel assisted 14,993 motorists on regional freeways.
- METRO continued efforts to prepare for major incidents through on-going meetings and training events with TranStar partner agencies.
- METRO continued remote security monitoring of the Park and Ride facilities through the use of the METRONet System from Houston TranStar. While incidents reported in 2009 increased 67% over 2008 levels, several measures were implemented to assist with deterring crime on Park and Ride facilities. Steps to close park and ride lots during non-peak hours allowed TranStar staff to remotely open and close a facility based on patrons request. Additional staff was assigned to assist with the monitoring of cameras on Park and Ride facilities. A fail/pass report card is placed on patron's vehicles pointing out crime prevention tip specific to that vehicle. Additional steps were taken to alert TranStar staff on all behaviors and movements within Park and Ride Facilities.
- METRO maintained an increased state of situational awareness during the 2009 hurricane season, and continued to adjust from lessons learned following the 2008 hurricane season. While there was no local hurricane impact during the 2009 season, METRO, like many partner agencies, continued their planning and preparation focus with partner agencies as planned. METRO's after-action Hurricane Ike review spurred revisions in the agency's emergency management plan to incorporate the lessons learned for the next regional hurricane event. During 2009, METRO sent representatives to the Texas Homeland Security Hurricane Conference, the FEMA Region 6 National Exercise Division Seminar, and participated in the National Level Exercise-2009, conducted by FEMA and DHS.

2009 HOUSTON TRANSTAR PARTNER AGENCY ACTIVITIES

Harris County Traffic Management

The Harris County Public Infrastructure Department's (HCPID) Traffic Management and Operations Section is responsible for the operation of the County's traffic signal



infrastructure and communications system from offices located within Houston TranStar. The scope of these activities includes management, operation, and construction of the County's traffic signal communications infrastructure. Significant accomplishments during 2009 included:

- Worked with TxDOT on a joint pilot project to develop coordination timing plans at the IH-10 Barker Cypress diamond interchange. Future deployments at critical intersections along area freeways where Harris County signal systems cross TxDOT freeways will mimic this successful prototype.
- Coordinated installation of the IH-10 managed lane fiber with Harris County construction, TxDOT and HCTRA to expedite fiber communications critical to the implementation of tolling in the managed lanes.
- The department continued efforts toward a regional data-sharing platform for transportation- and security-centered data. The following advanced the connection between HCTRA and Houston TranStar
- Harris County installed high water detection devices on Westpark Toll Road US 59 underpass to the Post Oak Road at Richmond Street intersection. This system was integrated into Harris County's Flood Control District's gage system and is monitored by the HCTRA Incident Management system during potential flood events.

- The department began integration of the traffic incident management data switch developed by HCTRA to be deployed in TranStar. The switch will tie the traffic incident management system in HCTRA into RIMS, and in the long term, will allow other agency partners to communicate traffic incident management with TranStar.
- The department performed a comprehensive review of the Port Security Project including evaluation of integration, sensor construction, and fiber optic plant installation to ensure coordination and communication with TranStar. County Traffic made significant design changes to the infrastructure for the project and began construction of the fiber-optic cable plant and 10 GB network that will form the backbone of the system.

Harris County Office of Homeland Security and Emergency Management

Harris County is the third most populous county in the United States, with a population of nearly 4 million. Its proximity to the Texas Gulf Coast makes it vulnerable to hurricanes, but also to other natural and man-made emergencies. Harris County encompasses 34 municipalities, including Houston, the nation's fourth most populous city. It is also home to the Port of Houston and the nation's largest petrochemical complex.



As the region's largest emergency management organization, the Harris County Office of Homeland Security and Emergency Management (OHSEM) Emergency Operations Center and primary offices are located at Houston TranStar. The regional transportation assets and agencies housed at the TranStar facility are strategic partners in numerous local

2009 HOUSTON TRANSTAR PARTNER AGENCY ACTIVITIES

and regional disaster scenarios. Harris County's Joint Information Center, the leading source of vital public information during times of disaster, is also supported by Houston TranStar.

OHSEM stands ready to activate its Emergency Operations Center (EOC) for both natural and man-made disasters, ranging from weather events (including floods, hurricanes and wildfires) to incidents involving pandemics, terrorism, hazardous materials and industrial accidents. TranStar's partners assist the EOC during activations by providing unique technical and managerial expertise, as well as additional manpower and facility support. The joint effort by the Houston TranStar agencies enables faster response times in dispatching the appropriate equipment and manpower, which results in more effective and efficient responses that reduce the loss of life and property of our residents.

OHSEM's EOC at Houston TranStar was updated in 2009. The facility's upgrades and new technology systems provide various enhanced capabilities and situational awareness during activations. Examples of how OHSEM's continued operation at TranStar benefit the community include:

- Texas ranks as the state with the highest number of declared presidential disasters, many of which have occurred in Harris County. OHSEM's mission is to help prepare, safeguard, and protect the residents and property of Harris County from the effects of disasters through effective planning, preparation, response, and recovery activities. During severe weather, hazardous materials incidents and other emergencies, OHSEM exercises its basic emergency management

plan routinely throughout the year. In doing so, the department is meeting the growing expectations of emergency management officials by delivering:

- Coordination and maintenance of a comprehensive emergency management plan;
- Successful activation of the EOC to coordinate and support efforts in response to emergencies and disasters;
- Dynamic public education and outreach programs;
- Timely and accurate information to residents, elected officials, the media, partners and other stakeholders; and
- Comprehensive classes, drills, and exercises to help partner agencies prepare for and respond to emergencies.

In 2009, despite a quiet hurricane season, OHSEM activated, responded or monitored 60 incidents including; severe weather events, the long summer drought, public health emergencies/H1N1 and other regional incidents.



Regional Joint Information Center at Houston TranStar

2009 HOUSTON TRANSTAR PARTNER AGENCY ACTIVITIES

OHSEM works hand-in-hand with the Harris County Citizen Corps to strengthen community preparedness. With nearly 230 Community Emergency Response Teams (CERT) and over 21,000 trained disaster volunteers, the Citizen Corps is a national best-practice. In August 2009, The Harris County Citizen Corps was honored with the National Citizen Corps Achievement Award for Volunteer Integration. The Volunteer Integration Award recognizes the Citizen Corps Council for effectively tapping into the service of dedicated community residents in supporting emergency services year round and that has integrated volunteers in preparedness and response efforts.

With Houston TranStar's unique ability to coordinate traffic management, emergency management, and homeland security, the Emergency Operations Center continues to act as a base for regional and multi-jurisdictional training and exercises. In recognition of this ability, the State of Texas has designated the EOC and Houston TranStar as its Regional Operations Center for evacuations. Houston TranStar's mission during evacuation events is to coordinate and enhance the operations of the region's offices of emergency management (all city and county Offices of Emergency Management in the region).

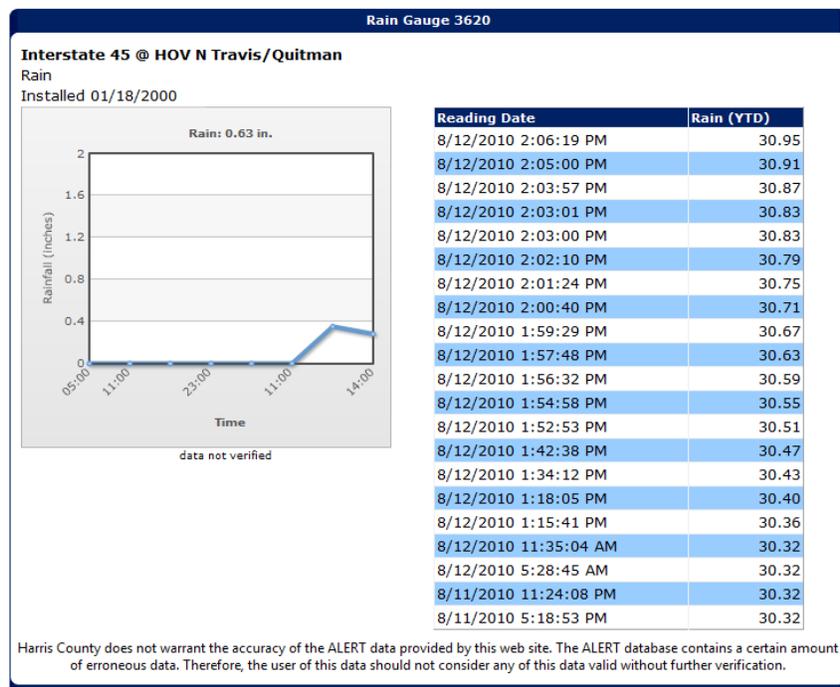
To accomplish this, the partner agencies have the combined ability to monitor and coordinate regional transportation routes based on current and forecasted weather conditions. The EOC can communicate with those agencies and jurisdictions having homeland security roles.

In conjunction with Harris County OHSEM, TxDOT, and other regional entities, a Roadway Weather Information System (RWIS) has been deployed within a larger

regional weather data reporting system. Over 800 various sensors are part of the weather data network, with Harris County having 351 sensors deployed and TxDOT having 249 sensors deployed. In addition to the rain and stream level instruments deployed for flood monitoring by TxDOT, the following numbers of RWIS, stream monitoring and weather sensing devices are reported through the joint OHSEM/TxDOT Web-based reporting system:

- Rainfall: 38 roadway sensors & 207 stream sensors;
- Roadway Flood: 19 sensors;
- Air Temperature: 24 sensors;
- Road Temperature: 11 sensors;
- Virtual Ice: 5 sensors
- Stream Gauges: 102 sensors;
- Barometric Pressure: 11 sensors;
- Wind: 29 sensors (speed and direction); and
- Humidity: 22 sensors.

Participating entities include Brazoria County, City of Houston, Fort Bend County, Harris County, METRO, City of Pearland, San Jacinto River Authority, City of Sugar Land, Trinity River Authority and TxDOT.



Roadway Rain Gauge Report Output

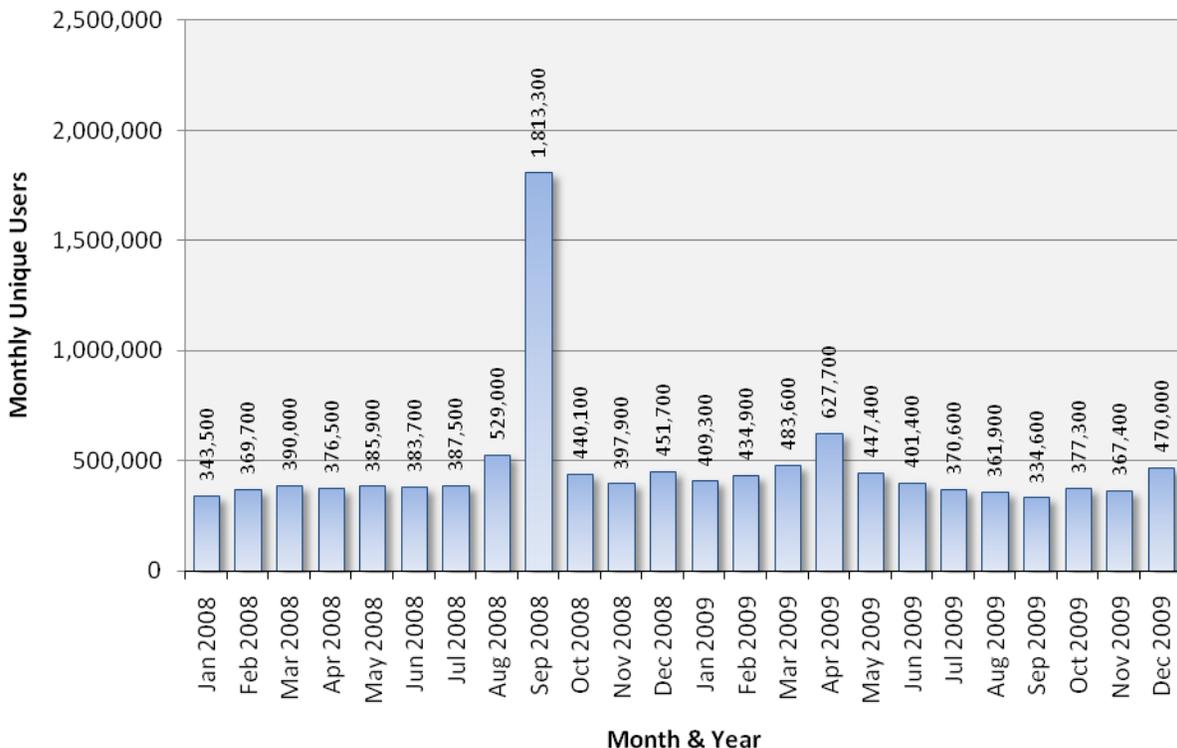
TRAVELER INFORMATION PROVIDED BY HOUSTON TRANSTAR AGENCIES

Perhaps the most visible product of the Houston TranStar center operation on a daily basis is travel information. Local Internet and media outlets use the TranStar CCTV feeds, Internet-based incident reporting capabilities, and travel time reporting systems in their daily traffic reporting functions. In addition, traffic service organizations are housed on the operations floor of Houston TranStar. The Houston TranStar Website is also the centerpiece for dissemination of detailed traveler information for public use in the Houston region.

Operational highlights for the TranStar Website in 2009 included:

- Average unique monthly users increased to 420,900 in 2009, a 24% increase over 2007 levels. The 2008 monthly average is skewed by the 1.8 million unique users who visited the site in September 2008 (surrounding the Hurricane Ike event). If we discount the extraordinary number of visitors in September 2008, the average monthly users was up about 6% over 2008.
- Monthly Webpage accesses in 2009 ranged from 5.6 to 9.4 million, with a monthly average of about 6.3 million accesses. Total Webpage accesses for the year were 76.4 million, down 20.6% from 2008. Hurricane Ike's influence on higher 2008 numbers and map enhancements to increase website efficiency are thought to have influenced the drop in measured access numbers.
- TranStar's home page (www.houstontranstar.org) received 982,000 visits in 2009 (down about 17% from 2008).
- Access to the route builder system increased from 4.0 million total accesses in 2008 to 5.0 million total accesses in 2009, an increase of 25%.

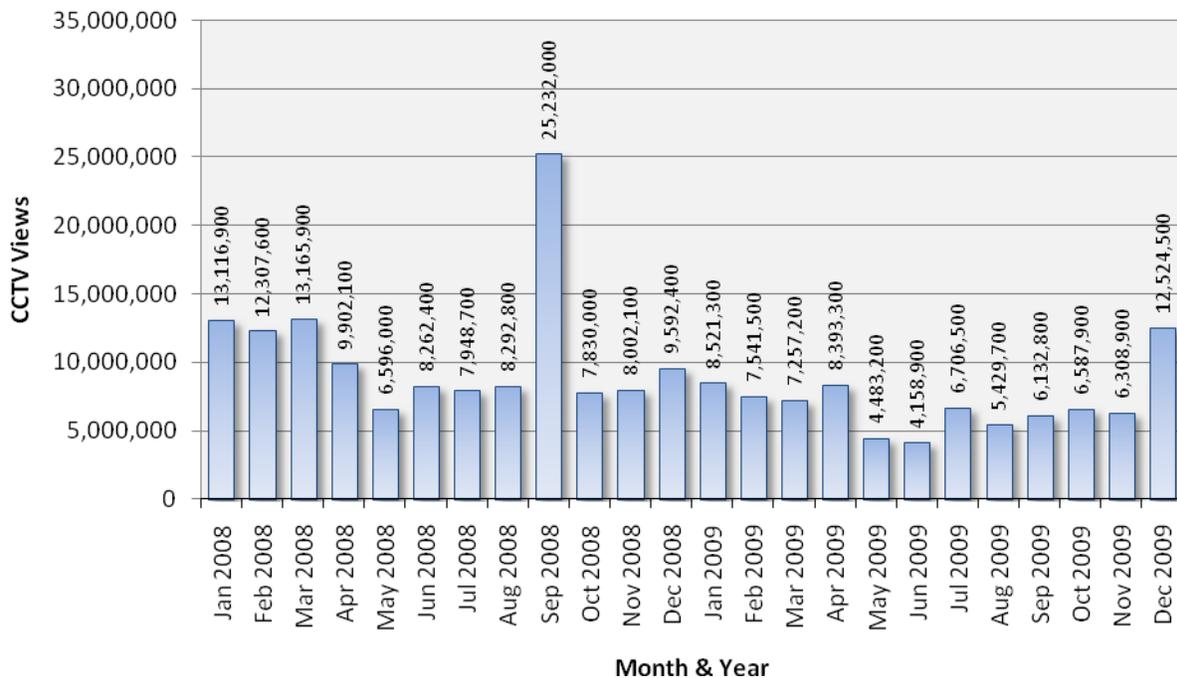
**Total Monthly www.houstontranstar.org Unique Users
January 2008 to December 2009**



TRAVELER INFORMATION PROVIDED BY HOUSTON TRANSTAR AGENCIES

- CCTV Views:
 - Views of CCTV images decreased from 130.2 million in 2008 to 84.0 million in 2009, a decrease of 35%, returning to 2007 levels. However, since 2006, CCTV snapshot views have increased 637%.
 - Views of the regional cameras (primarily used for hurricane evacuation route monitoring) totaled 5.8 million in 2009.
- Traffic data information to third-party providers via the TranStar data feed increased 2.5% in 2009 (5.7 million accesses) over 2008. This represents a 200% increase from accesses in 2006 when data feed service began.
- The number of personalized “travel speed and time report” page accesses increased to 21.0 million (from 14.6 million in 2008), an increase of 72%.

Houston TranStar CCTV Views, 2008-2009



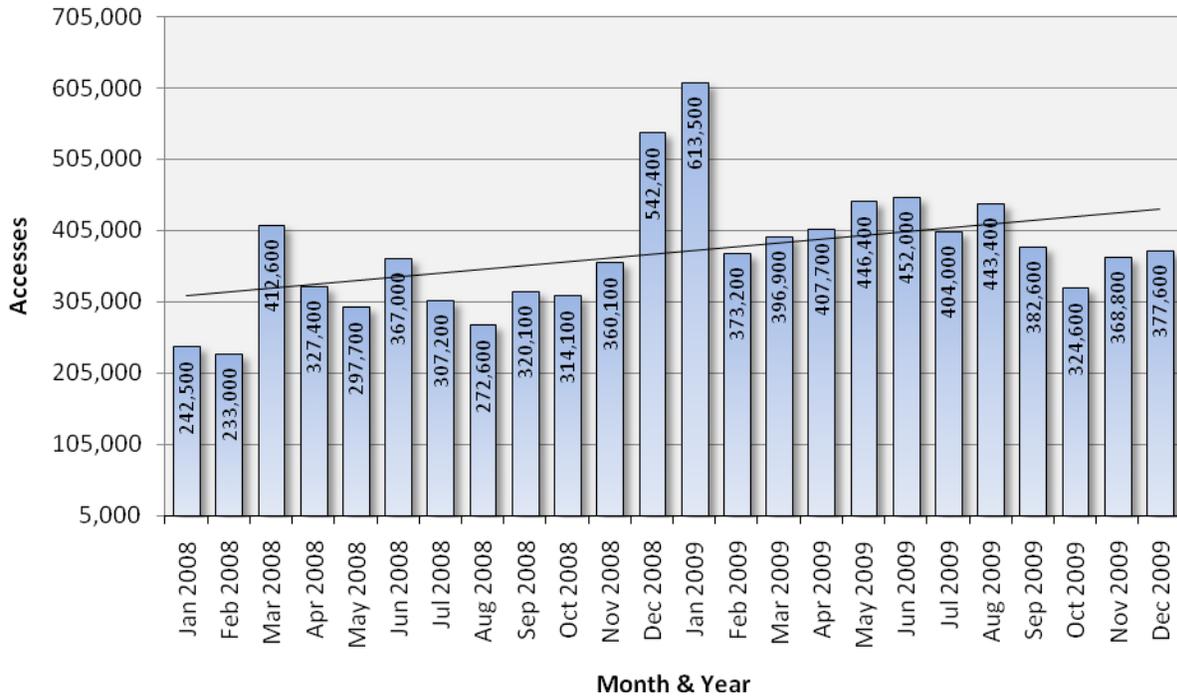
- Traffic alert subscribers increased from an average monthly subscriber base of 7,530 in 2008 to 8,400 in 2009, an increase of 12%. Total monthly users at the end of 2009 were more than 8,900.
- Mobile traffic data accesses decreased a bit in 2009 to 7.4 million accesses as opposed to 10.7 million in 2008, a 31% decrease. However, in the past five years mobile traffic data accesses have increased more than 450%.
- DMS information viewed increased by 90% from 2008 to 2009, with more than 1.5 million views.

TRAVELER INFORMATION PROVIDED BY HOUSTON TRANSTAR AGENCIES

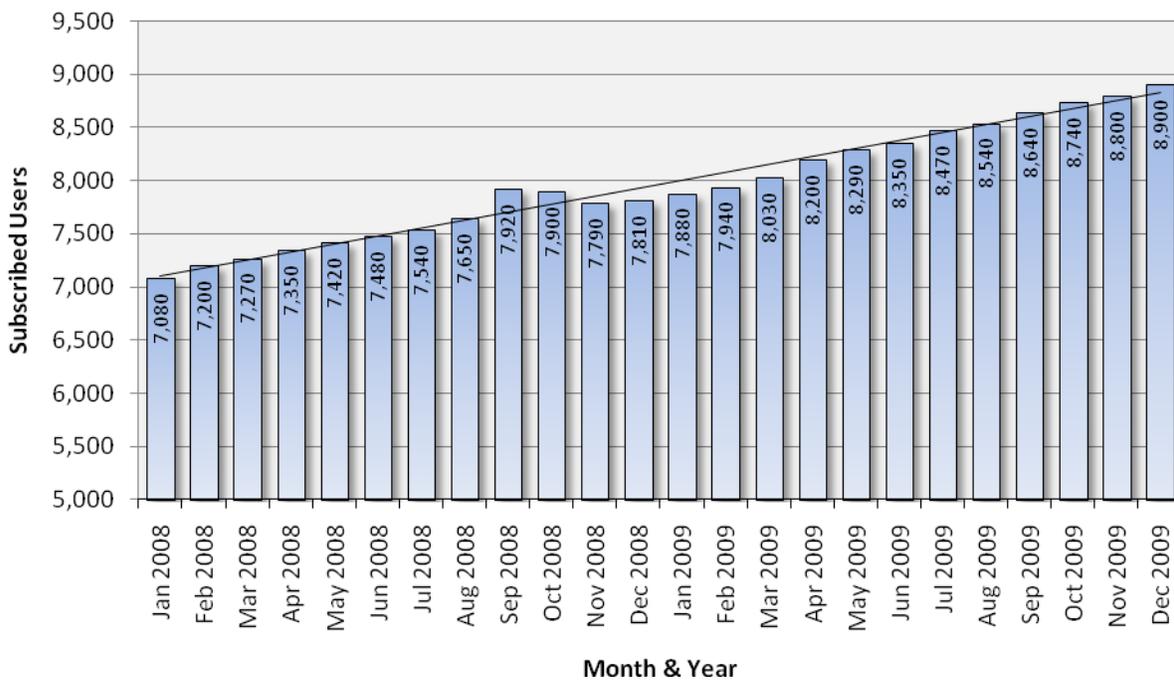
- Average monthly accesses to the Virtual Earth version of the speed map was up 44% in 2009 over 2008 levels (discounting the 2008 Hurricane Ike event). This service began in March 2008 and allows zoom-in

capability to street level. The Virtual Earth platform is a viable foundation for providing street level traveler information as capabilities evolve in the region.

Monthly Route Builder Use Trending Upwards Over 2008 & 2009



Traffic Alert Subscriptions Continue Increasing Trend, Monthly 2008-2009



INCIDENT MANAGEMENT

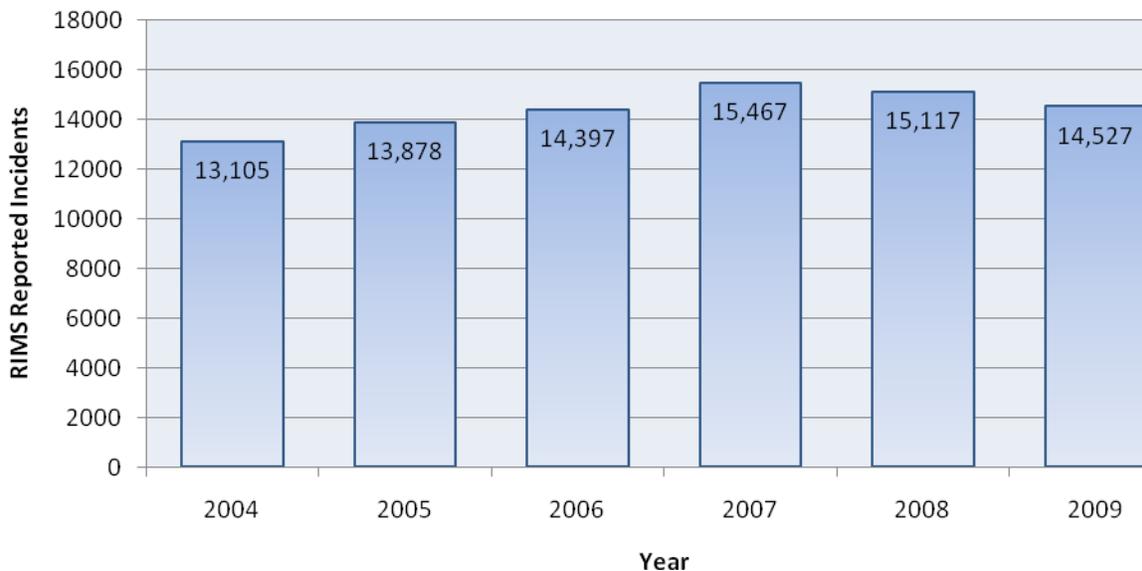
Detection, response, and clearing of freeway incidents are important functions of Houston TranStar, and the Houston TranStar agencies play a major role in incident response management and information dissemination.

A majority of incidents are entered into the Regional Incident Management System (RIMS) operations database by agency personnel. In 2009 there were 14,527 incidents recorded by Houston TranStar operators, largely by TxDOT personnel. This is a decrease of 3.9% when compared to total incidents entered into RIMS in 2008, and a 6.1% decrease compared to 2007.

The top five incident locations managed and/or monitored from TranStar in 2009 included:

- US-59 Southwest Freeway Northbound at IH-610 West Loop (142 incidents);
- IH-45 Gulf Freeway Northbound at US-59 Eastex Freeway (121 incidents);
- West Sam Houston Tollway Northbound at South Sam Plaza (91 incidents);
- West Sam Houston Tollway Southbound at Central Plaza (91 incidents); and
- IH-610 West Loop Northbound at US-59 Southwest Freeway (85 incidents).

RIMS Entered Managed Incidents, 2004-2009



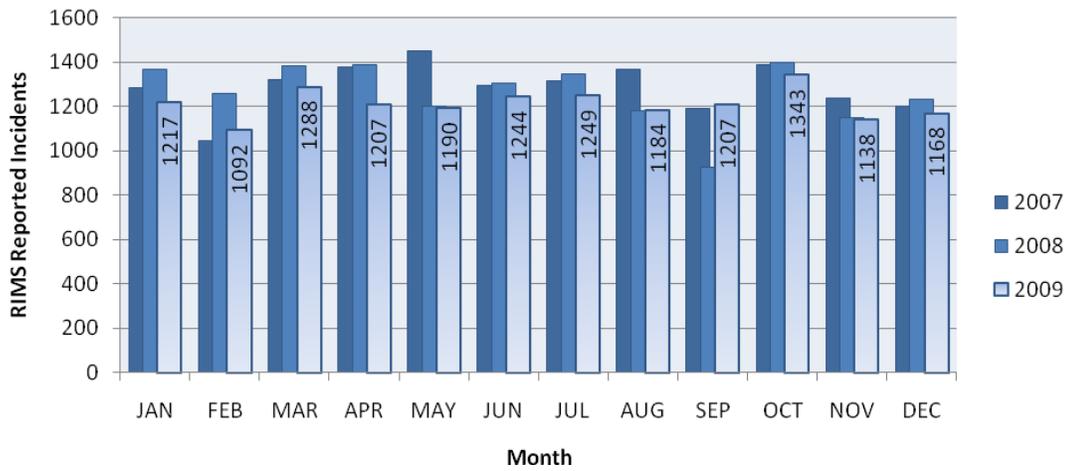
Some of the incident related performance measures determined for 2009 include:

- There were 8,873 incident-hours managed from the Center in 2009
- The average incident clearance time in 2009 was 36.6 minutes, which is in line with historic averages.

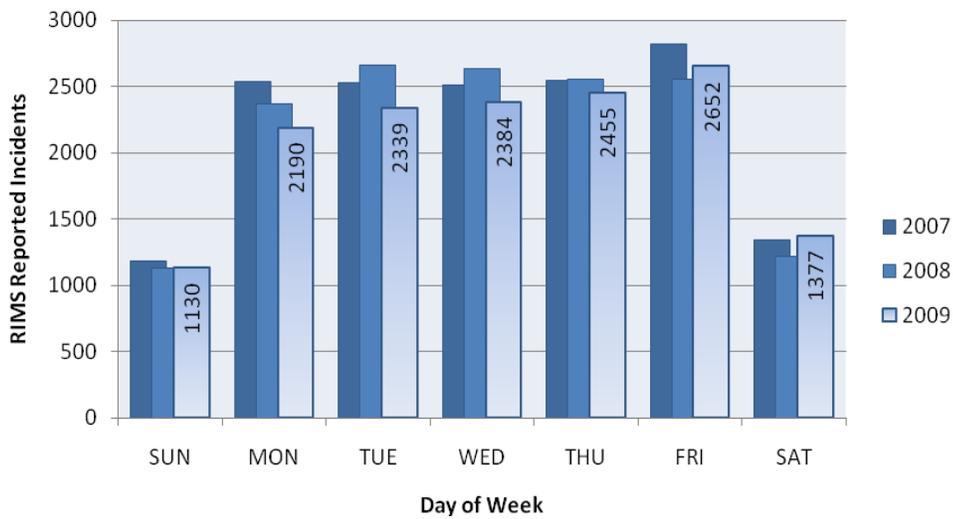
RIMS incident location and status are automatically provided on the traffic Website. Operators develop and activate DMS messages providing information on the incident (e.g., traffic direction, location, type incident, lanes blocked).

INCIDENT MANAGEMENT

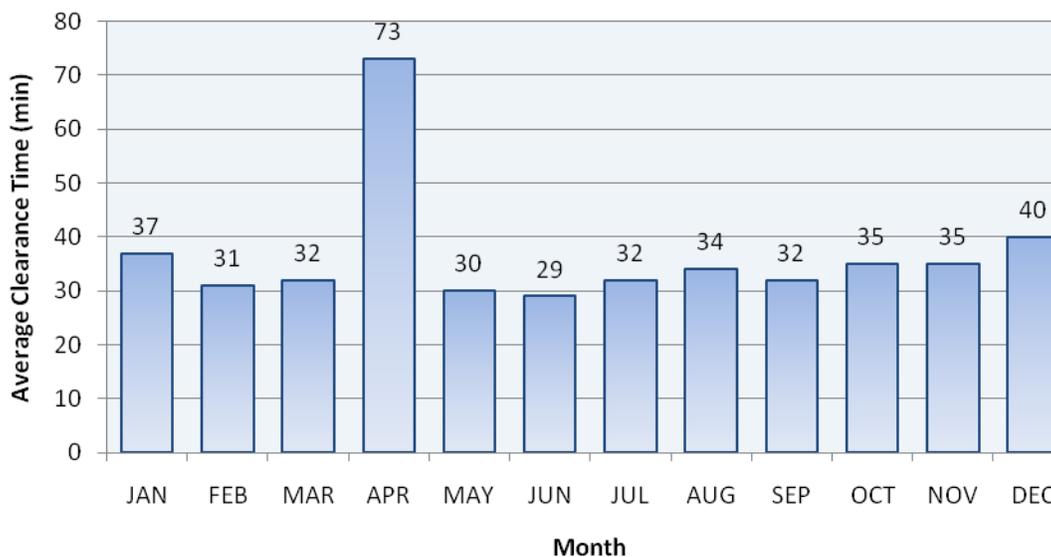
TranStar Managed Incidents By Month, 2007-2009



TranStar Managed Incidents By Day of Week (2007-2009)

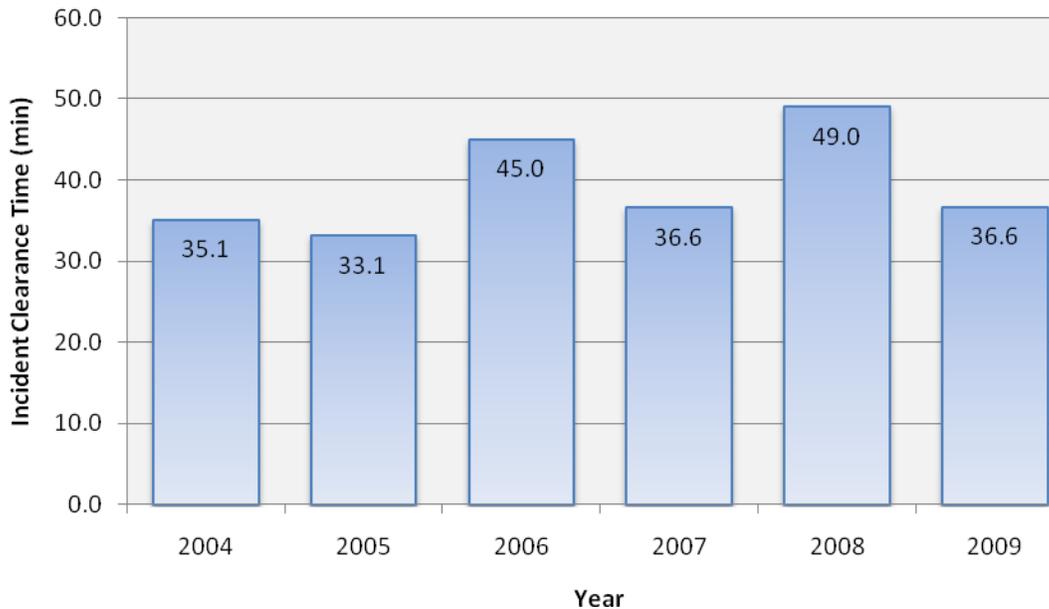


Average Incident Clearance Time By Month, 2009



INCIDENT MANAGEMENT

Annual Average Incident Clearance Time, 2004-2009



Motorist Assistance Program (MAP)

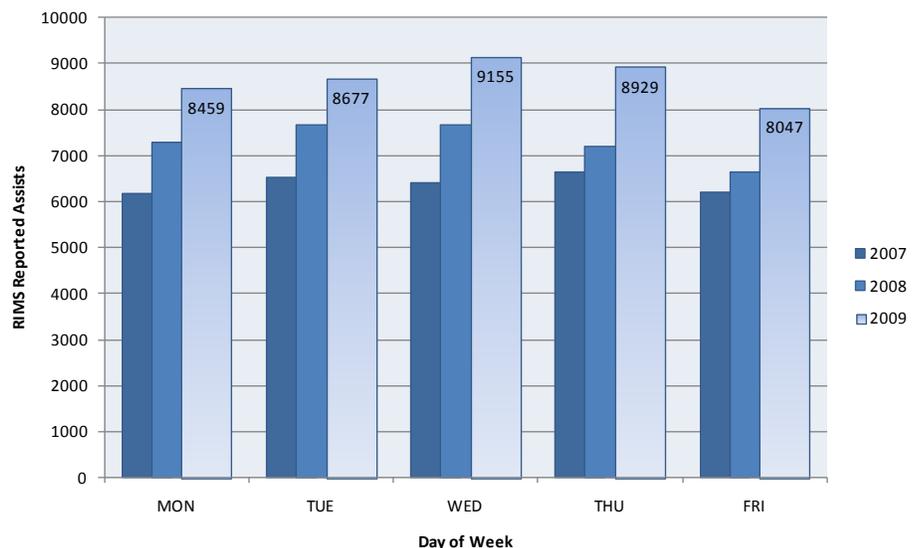
The Motorist Assistance Program (MAP) continues to be one of the most visible services operated by the Houston TranStar agency partnership.

MAP started in 1986 with two vans operating eight hours per day. The program has expanded significantly since, operating 16 hours per day on all major freeways, Monday through Friday. The program was expanded in 2005 to include the participation of METRO Police in addition to Harris County Deputies. In 2008, METRO replaced METRO Police with METRO civilian staff members to participate in MAP activity.

There were 43,267 RIMS-reported assists handled by MAP in 2009, an increase of about 18.5%

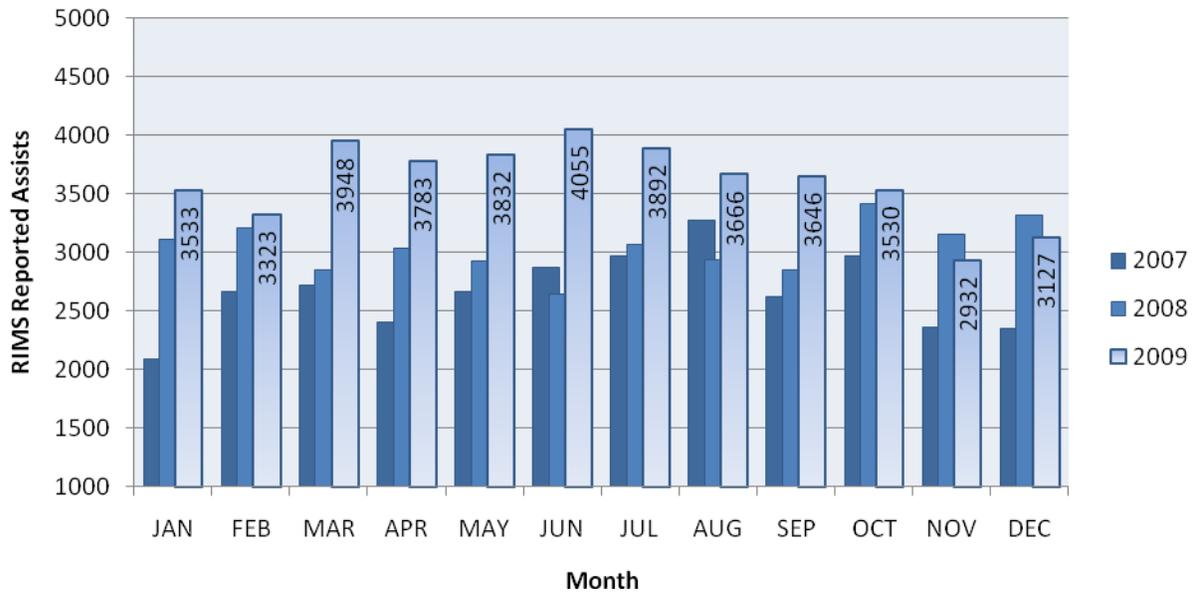
from 2008. The RIMS-reported MAP assists are for Harris County Deputy MAP activity only. METRO reported an additional 14,993 assists, but those are not currently entered into RIMS, the TranStar Incident Database. TxDOT operators provide dispatch service to the MAP program.

MAP Assists by Day of Week, 2007-2009

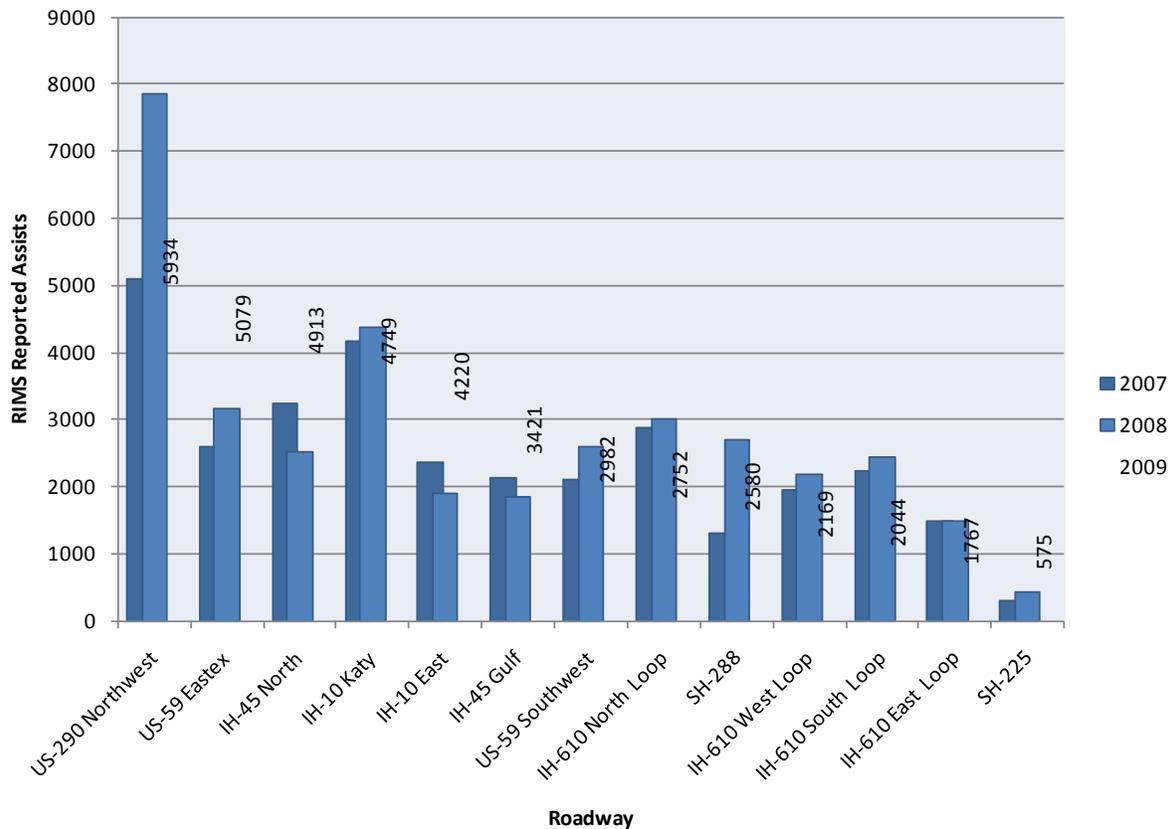


INCIDENT MANAGEMENT

MAP Assists by Month, 2007-2009



MAP Assists by Roadway, 2007-2009



INCIDENT MANAGEMENT

SAFEClear

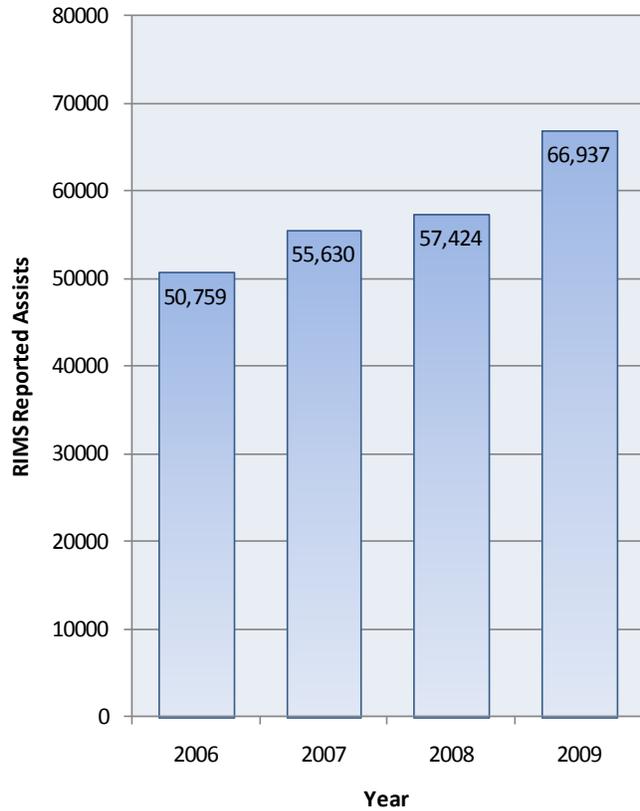
SAFEClear, the City of Houston's rapid clearance program, was instituted in 2005. SAFEClear is intended to bring quick response to disabled vehicles to reduce the occurrence of secondary crashes in the freeway queue.

There were 66,937 RIMS reported SAFEClear assists in 2009; an increase of 16.6% from 2008 assists. In 2009, the average time from tow authorization to clearance was 19.5 minutes. The monthly average ranged from 14 minutes in June and July to 32 minutes in April.

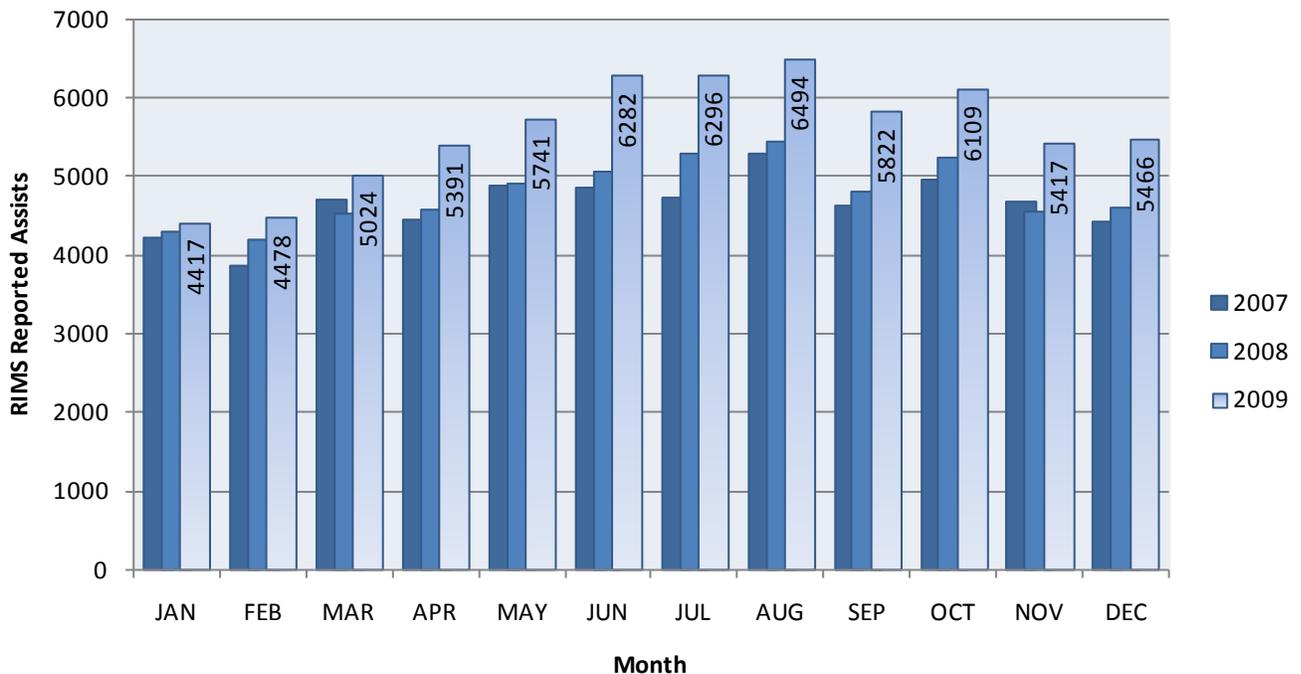


SAFEClear Driver

Annual Total SAFEClear Assists 2006-2009



SAFEClear Assists by Month, 2007-2009



ESTIMATED TRANSTAR OPERATIONAL BENEFITS

This report develops estimates of those benefits which are quantifiable, such as the cost of motorist delay savings (in time and dollars), fuel savings (in gallons and dollars), and emissions reductions (in tons of emissions). However, determining the benefits of Houston TranStar is treated conservatively because many benefits are not easily quantifiable and some are intangible.

For the past 12 years, this report has used an approach which estimates the operational benefits in terms of freeway motorist delay savings. Traffic delays on the freeway mainline system were estimated using the TxDOT travel time monitoring system and traffic volumes from the TxDOT annual volume-roadway inventory files.

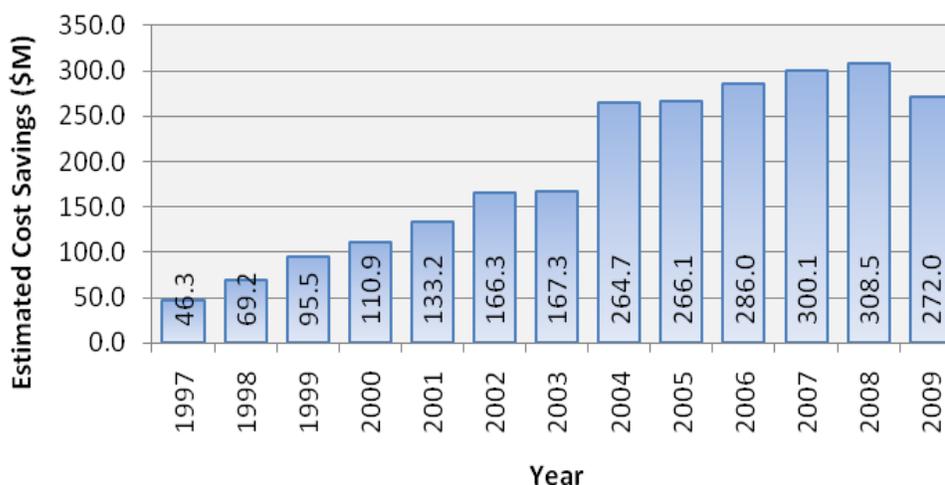
The procedure for evaluation uses national benchmarks and experience to establish Houston TranStar quantitative goals for expected benefits. The expertise of Houston TranStar staff is relied upon to estimate performance of the transportation systems in terms of percent attainment of the goals.

The estimated costs of congestion in the Houston TranStar region were calculated to be just under \$534 million in 2009. Annual benefits in the reduction of travel time were estimated to be more than 11.3 million vehicle-hours with an estimated monetary benefit of nearly \$227 million. The saving in travel time is equivalent to reducing fuel consumption more than 21.2 million gallons, which results in an

additional savings of about \$47.3 million. Thus, the total 2009 motorists' savings was in excess of \$274 million. Since 1997 (when benefits were first estimated), Houston TranStar has saved Houston area motorists an estimated \$2.5 billion in reduced traveler delay and fuel costs.

An estimated reduction in the amount of fuel consumed would also result in a reduction of mobile source exhaust emissions. Based on USDOT Bureau of Transportation Statistics, the reduction of 21.2 million gallons of fuel is equivalent to an estimated reduction of 458 tons of hydrocarbons; 2,964 tons of carbon

Estimated Annual Motorist Cost Savings Attributed to Houston TranStar Operation



monoxide; and 667 tons of nitrogen oxides.

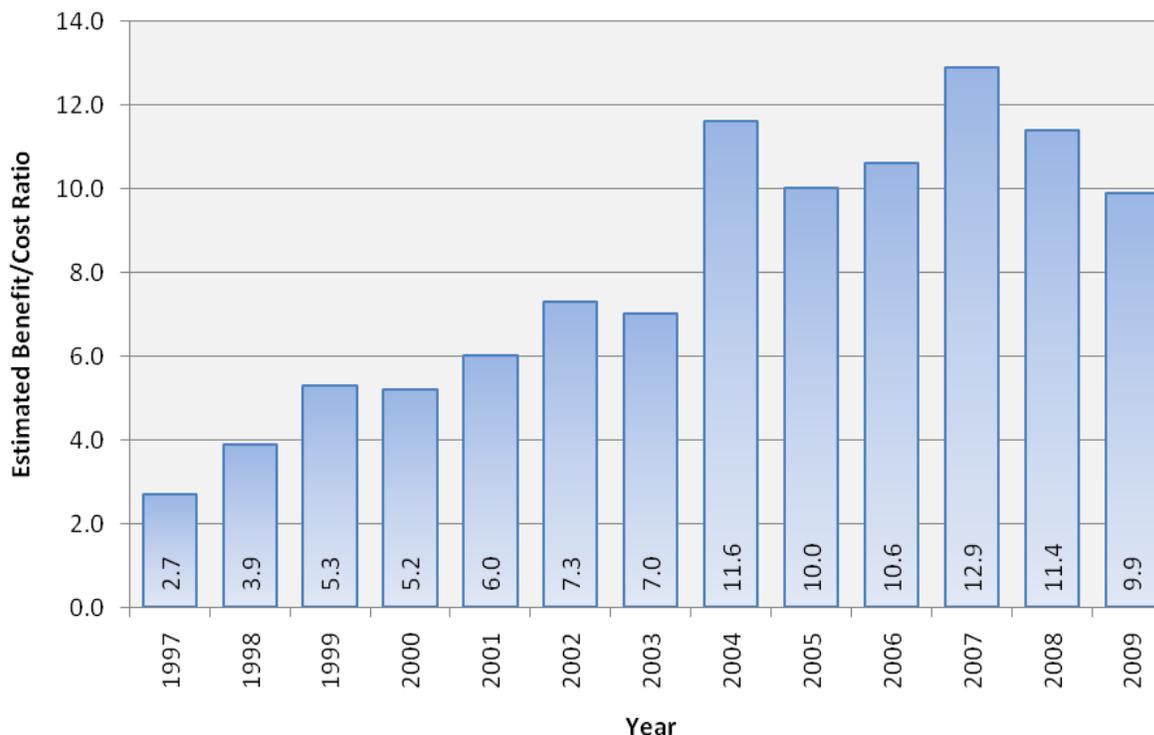
A benefit/cost analysis for 2009 was performed, comparing the benefits discussed previously to the annual costs of Houston TranStar. Annual costs include annualized capital costs, annual operational costs of the Houston TranStar systems, and the annual cost of operation and maintenance of the field installations. The annualized cost estimate of \$27.7 million is divided into the annual benefit estimate of \$274.1 million, yielding a 2009 estimated benefit/cost ratio of 9.9.

ESTIMATED TRANSTAR OPERATIONAL BENEFITS

Since 2004, the benefit/cost ratio of Houston TranStar has ranged from 10.0 to 12.9. In 2009, the benefit/cost ratio is 9.9, which is in the lower tiers of this range. Several factors enter into this calculation when comparing 2009 to previous years:

- The motorist value of time decreased slightly from \$20.10 in 2008 to \$20.00 per vehicle-hour in 2009.
- The average cost of fuel in the Houston area decreased significantly, from \$3.14/gal in 2008 to \$2.23/gal in 2009 (a decrease of 29%). While fuel savings in gallons was nearly the same as in 2008, the dollar value of fuel saved was a much lower contributor to the benefit ratio.
- Total measured congestion via the travel time monitoring system decreased from 27.6 to 26.2 million vehicle-hours in the TranStar managed region (a 5.7% decrease).
- Agency managers rated center effectiveness in 2009 as nearly equal to 2007 & 2008 in most categories; however agency managers remain concerned about staff effectiveness as agencies were not able to maintain adequate staffing levels and/or staff training levels to address increased responsibilities.
- With the close of construction and opening of the Katy Freeway Managed Lanes, congestion on IH-10 West reduced 9.2% in 2009 compared to 2008 levels. As compared to 2007 levels, congestion is down 58% on the Katy Freeway due to new capacity additions.
- While Houston has fared fairly well in the economic downturn which began in 2008, greater unemployment and less construction activity in the region have likely contributed to decreased congestion on freeways and tollways in 2009.

Houston TranStar Benefit/Cost Ratios 1997-2009



GLOSSARY

TxDOT	Texas Department of Transportation
METRO	Metropolitan Transit Authority of Harris County
HCTRA	Harris County Toll Road Authority
RIMS	Regional Incident Management System
TEEX	Texas Engineering Extension Service
PIO	Public Information Officer
FEMA	Federal Emergency Management Agency
CTMS	Computerized Traffic Management System
CCTV	Closed Circuit Television
DMS	Dynamic Message Sign
HAR	Highway Advisory Radio
AVI	Automatic Vehicle Identification
HOV	High Occupancy Vehicle
MAP	Motorist Assistance Program
PEAT	Patron Emergency Assist Team
TSTOP	Traffic Signal Optimization Program
HCPID	Harris County Public Infrastructure Department
OHSEM	Office of Homeland Security and Emergency Management
EOC	Emergency Operations Center
CERT	Citizens Emergency Response Team
RWIS	Roadway Weather Information System
USDOT	United States Department of Transportation