



2020 ANNUAL REPORT



PREPARED BY THE TEXAS A&M TRANSPORTATION INSTITUTE
JULY 2021

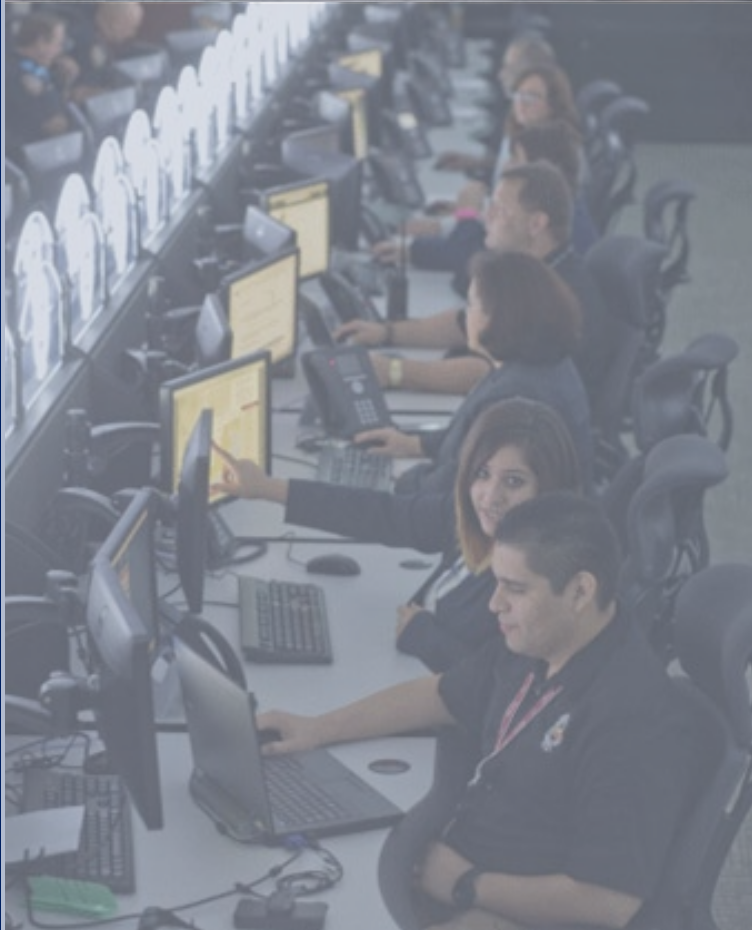
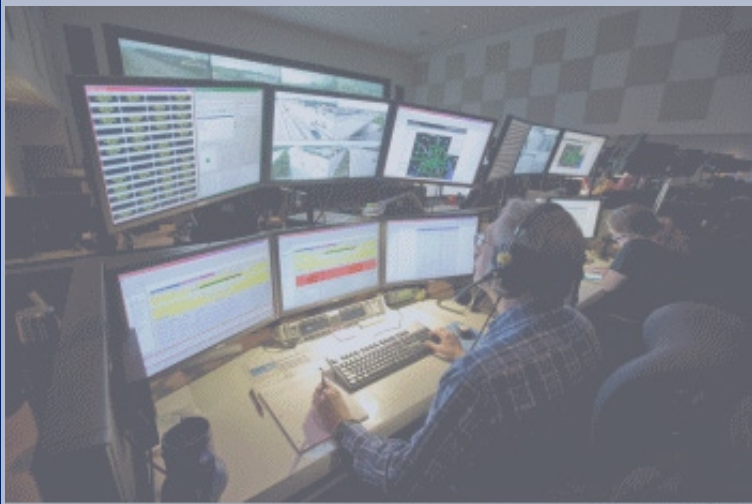






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Established in 1993, Houston TranStar is a formal collaboration among principal transportation and emergency management agencies in Harris County. It houses multi-agency operations and management of the region’s transportation system.

This affiliation has evolved into a primary resource from which multiple federal, state, county and local agencies respond to incidents and emergencies in Harris County and beyond. Houston TranStar provides highly effective transportation and emergency management services through the combined use of the partners’ collective resources to maximize safety and improve mobility for the public.

HOUSTON TRANSTAR PARTNER AGENCIES	
ITS & SAFETY ITS PLAN REVIEW MOBILITY AND TRAFFIC FLOOD WARNING SYSTEMS	 METRO POLICE  BUS RAPID TRANSIT LIGHT RAIL SYSTEM REGIONAL BUS SYSTEM OFFICE OF EMERGENCY MANAGEMENT
MOTORIST ASSISTANCE PROGRAM SHERIFF'S INCIDENT MANAGEMENT UNIT (IMU) TRAFFIC & TRANSPORTATION GROUP, OFFICE OF HOMELAND SECURITY & EMERGENCY MANAGEMENT (HCOHSEM).	 FREEWAY OPERATIONS, MEDIA CONTRACTORS INTELLIGENT TRANSPORTATION SYSTEMS (ITS)  SH 288 TOLLING SUPPORT OPERATIONS TRANSPORTATION MANAGEMENT SYSTEMS.

The Houston TranStar Annual Report reviews the center’s performance and summarizes the 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.

Due to the COVID-19 pandemic, 2020 proved to be a unique year in terms of Houston TranStar’s operations. With businesses shutting down or operating remotely, traffic was much lighter than normal compared to previous years. Less traffic resulted in fewer incidents overall; however, partially due to faster freeway speeds, Houston TranStar staff addressed 26 percent more fatal crashes in 2020 than in the previous year. In addition, the pandemic made TranStar a regional focal point of COVID operations as HCOHSEM operated at Level I activation for most of the year. Partner agencies also needed to adjust internal operations to take social distancing into account, resulting in a combination of in-person and remote operations.

In 2020, the travel time savings attributable to TranStar's operation were estimated at more than 6.9 million vehicle-hours. This is worth nearly \$169 million in road user cost savings and an additional \$25 million (approximately 13 million gallons) in reduced fuel consumption. This is a significant decrease from 2019, primarily attributed to far fewer cars on the roadway and faster overall speeds.

The total estimated benefits of TranStar operation in 2020 were nearly \$194 million. Comparing these benefits to the annualized TranStar operating cost estimate of \$23.6 million yields an estimated benefit/cost ratio for Houston TranStar center operation of 8.2-to-1 for 2020. In other words, for every dollar spent on Houston TranStar’s operations, the region realizes a benefit of \$8.20.

Since 1997, Houston TranStar’s pivotal role in the transportation of people and goods in the greater Houston region has saved motorists an estimated \$7.3 billion in reduced travel costs.

HOUSTON TRANSTAR ACTIVITIES IN 2020

TranStar member agencies continued ongoing 24-7 transportation system operations and emergency planning and response. Significant agency activities at the center included the following:

- Since March, Houston TranStar hosted more than 80 on-site media events, most in response to COVID-19. TranStar played a crucial role in keeping residents informed during the pandemic.
- When the region's "Stay Home, Work Safe" announcement was declared in March, TranStar's partner agencies began observing significant drops in traffic volumes on regional freeways. TranStar's in-depth monitoring of traffic volume, vehicle speeds and travel times has been highly sought after by local and national media.
- In July, TranStar published a new Public Service Announcement (PSA) to promote its Roadway Flood Warning System, designed to alert travelers to streets likely experiencing high water conditions during heavy rainfall.
- TranStar activated its Emergency Operations Center(s) with internal partners in response to Hurricane Laura and Tropical Storm Marco in August and Tropical Storm Beta in September.
- TranStar hosted a media event on October 1st to kick-off "Distracted Driving Awareness Month" alongside COH, TxDOT, HCSO and AAA partners. TranStar also presented at the "U in the Driver Seat" Symposium in October, providing conference attendees an in-depth look at 2020 traffic volumes compared to previous years.
- To increase the public's awareness of TranStar and its services, TranStar launched a video podcast titled "Talk Traffic to Me" in December, featuring local celebrity guest hosts and government partners alike.
- TranStar launched a new driver safety campaign titled "It's Only a White Line" in November. The "white line" refers to the paint stripe separating moving vehicles from road shoulders. This campaign seeks to reduce freeway deaths caused by secondary crashes.

ABOUT THE TRANSTAR PARTNERSHIP

MISSION

The Houston TranStar consortium provides coordinated, innovative transportation and emergency management services to the region.

VISION

- Maximize safety and mobility by building, operating and advancing an innovative regional transportation network.
- Save lives and protect property by coordinating large-scale emergency management planning, response and recovery.
- Inform and educate the public about safety, travel conditions and emergency preparedness and response.

GOALS

- Improve travel safety and reliability.
- Expand and enhance the Traffic Incident Management Program throughout the region.
- Enhance emergency planning, coordination of resources and delivery of information during hazardous events.
- Increase the public's awareness and use of our services.
- Ensure sustainable financial resources for TranStar operations.



CITY OF HOUSTON

The City of Houston manages:

- 2,490 traffic signals
- 1,400+ School Zone Beacons
- 180,000 streetlights
- 1,800 freeway safety lights
- 200+ miles of fiber cable
- 1,600+ wireless devices
- 600 Arterial Bluetooth travel time devices
- 92 Arterial DMS signs
- 115 CCTV Cameras

The City of Houston's Transportation and Drainage Operations (TDO) is responsible for the operations and maintenance of traffic signals and ITS, as well as the design and installation of new traffic signal and ITS infrastructure.

The TDO's Traffic Signal Performance Improvement Program (TSPIP) ensures that the City's traffic signals are using the most up-to-date traffic data while taking advantage of the newest technologies to produce improved signal timings. TSPIP's revolving program is scheduled to revisit each signalized intersection every three years for retiming and optimization.

Major activities conducted by the City in 2020 include:

- Started the upgrade of the City's WiMAX wireless communications system to cellular LTE/5G for signal and other ITS communications (approximately 400 locations to date).
- Advertised the RFP for the Houston Roadway Flood Warning System (HRFWS) for critical underpasses in the region.
- Began deployment of Adaptive Traffic Control Systems (ATCS) along selected arterial corridors, which has the goal to optimize in real-time signal timing based on actual traffic demand.
- Continued the expansion and integration of the City's Advanced Traffic Management System, which includes an upgraded traffic management central software, installation of additional CCTV cameras, Arterial DMS, enhanced vehicle detection, and permanent count stations, which will allow quicker detection and response to abnormal traffic conditions and incidents and share real-time information with the traveling public.



- Coordinated with METRO for a successful implementation of the Bus Rapid Transit (BRT) in Uptown, that improves public transportation in the Houston area.
- Started the implementation process of a Connected School Beacon System, which allows for remote programming and efficient monitoring of the existing school zone beacons and deploys connected vehicle technologies that improve overall pedestrian safety.



HARRIS COUNTY TRAFFIC MANAGEMENT

The Harris County Public Infrastructure Department’s Traffic Maintenance Group operates and maintains the County’s traffic signal infrastructure, including the fiber optic communications network.

Major activities during 2020 included:

- The County substantially completed the implementation of Flashing Yellow Arrow (FYA) signal operations at four-legged intersections.
- The County advertised and awarded a project to replace LEDs at all traffic signals.
- Harris County continued the coordination and optimization of traffic signal timings as part of its annual program.

Harris County Traffic manages:

- 1,000 Active Traffic Control Signals
- 572 School Zone Beacons
- 46 Warning Beacons
- 32 Street Lights
- 10 Dynamic Message Signs
- 16 Changeable Lane Signs
- 135 CCTV Cameras
- 435 Miles of Fiber Optic Cable



Houston TranStar houses several METRO operations including bus dispatch, Light Rail, Bus Rapid Transit, METRO Police Communication Section, High-Occupancy Vehicle management systems, METRO’s social media program, the Office of Emergency Management (OEM) and traffic incident management programs.

METRO Services in 2020 Include

- Service to 15 cities within Harris County
- 100 bus routes and one Bus Rapid Transit line
- 22 miles of light-rail on three lines
- 4.3 million average monthly passenger trips



METRO activity highlights for 2020 included:

- In March, METRO began a comprehensive response to the COVID-19 pandemic and ensured that all METRO employees at Houston TranStar adhere to strict protocols such as temperature screening, facial covering, and social distancing policies.
- To improve internal and external partner coordination, The METRO OEM restructured and transitioned onto the Leadership Team of the Executive Vice-President and Chief Operating Officer.
- The METRO Rapid Silver Line began operating in August with controllers based at Houston TranStar. The Silver Line combines elements of light rail and bus for faster connections and a convenient ride.
- The METRO Emergency Operation Center activated along-side County and City partners for regional events, including Hurricane Laura and Tropical Storm Marco in August and Tropical Storm Beta in September. Due to COVID-19, these activations were partially virtual for internal groups with a physical presence at Houston TranStar by METRO’s Interim Emergency Management Coordinator, MPD and representatives of Bus Operations.

TxDOT is responsible for traffic management on freeways and state-maintained roads in the region. Since the 1980's, TxDOT's Computerized Traffic Management System (CTMS) has grown to nearly 1,600 bi-directional miles in the urban areas of the Houston District and evacuation routes on IH-10, IH-45 and US 290. CTMS consists of multiple technologies to enhance monitoring of the transportation system, allow faster detection of slowdowns and incidents, and improve management of the freeway system.

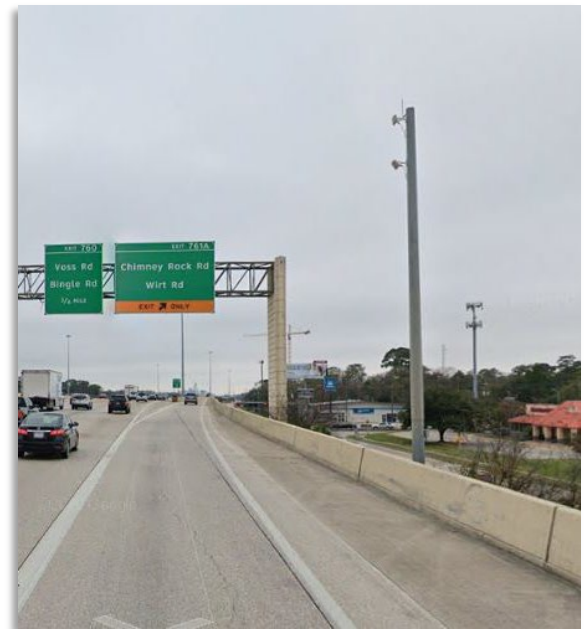


These systems include:

- Closed-Circuit TV (CCTV) cameras to monitor roadways and provide visuals for responding agencies during incidents
- Dynamic Message Signs (DMS) to provide traveler information about slowdowns, incidents, and special events
- Bluetooth devices to capture system travel times and speeds and identify roadway segments with abnormal traffic.
- Radar units to capture traffic volumes and spot speeds

Major activities conducted by TxDOT in 2020 included:

- Installed five new CCTV cameras on SH 99 and 12 CCTV camera replacements.
- Upgraded 10 DMS signs on IH 45 North, US 290 Northwest and SH 249
- Installed Bluetooth travel time/speed detection on SH 6 in Brazoria County
- Began expansion of CTMS network on SH 6 and IH-69 in Fort Bend County, including fiber, CCTV, Bluetooth, and DMS
- Installed Bluetooth travel-time readers on the SH 249 extension from Tomball to FM 1488 in Magnolia.
- Upgraded readers at the Galveston-Bolivar Ferry to Bluetooth Low Energy, improving data capture and accuracy of reporting travel times via the ferry.



TxDOT-Houston District Manages:

- 790 Fiber-based and Wireless CCTV Cameras
- 199 Dynamic Message Signs (DMS)
- 335 Bluetooth/AVI Travel Time Readers
- 209 Radar Units
- 61 Ramp Meters
- 17 Wrong Way Driver Detection Devices



HARRIS COUNTY OFFICE OF HOMELAND SECURITY AND EMERGENCY MANAGEMENT

The Harris County Office of Homeland Security & Emergency Management (HCOHSEM) plans, coordinates, and implements all emergency management and homeland security-related activities for Harris County. When a disaster occurs, HCOHSEM works with federal, state, and local partners to facilitate quick and effective recovery efforts.

HCOHSEM monitors severe weather, industrial accidents, and other emergencies round-the-clock. Depending on the nature, scale, and severity of an incident, HCOHSEM activates the Harris County Emergency Operations Center (EOC). For large-scale emergencies and events, additional staff and partners will deploy to the EOC to support response and recovery operations.

HCOHSEM also serves as the communication hub for the coordination of emergency public information. During a disaster, HCOHSEM keeps elected officials, stakeholders, emergency management partners, residents and the media informed through its Regional Joint Information Center.



For the Harris County Office of Homeland Security & Emergency Management, 2020 was defined by two events: COVID-19 and the record shattering hurricane season.

- The COVID-19 pandemic represents the longest Level-1 activation in HCOHSEM history, beginning on March 5th and continuing into 2021.



- HCOHSEM supported Harris County Public Health's testing, vaccination, and public information efforts, coordinating with local, state, and federal partners throughout the pandemic.
- HCOHSEM Logistics, with the assistance of the HCOHSEM Community Emergency Response Team and volunteers, bottled and distributed over 5,000 gallons of hand sanitizer, inventoried and distributed over 400,000 gloves, 40,000 face shields, and 2,200,000 masks. More than 2,000 pallets of goods were stored and delivered, and over 100 Harris County agencies, cities and partners were served.

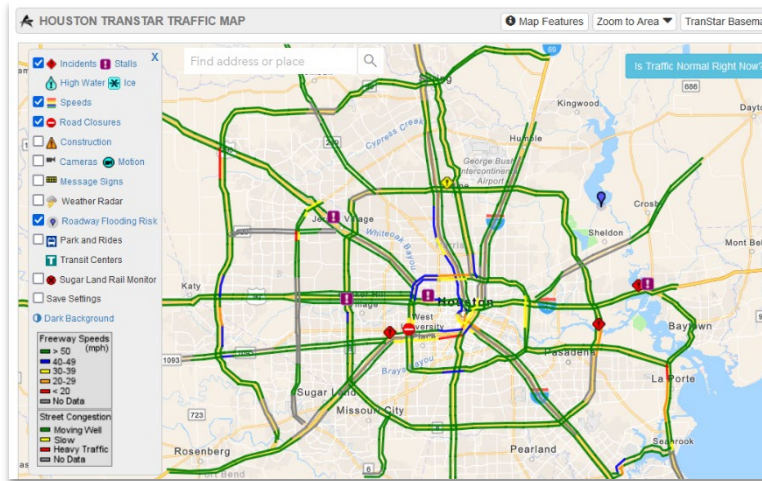
- With 2020 being the most active hurricane season in recorded weather history, HCOHSEM activated the EOC nine times for storms that entered the Gulf of Mexico. Hurricanes Laura, Marco, and Delta, along with Tropical Storm Beta threatened the region.

- HCOHSEM Staff updated the Harris County Hazard Mitigation Plan, a comprehensive risk analysis of the county coupled with a slate of projects proposed to lessen or "buy down" those risks. This two-year effort and resulting Plan, which included input from more than 50 partner organizations and the public, was approved by the Harris County Commissioners' Court, the Texas Division of Emergency Management, and the Federal Emergency Management Agency.



TRAVELER INFORMATION

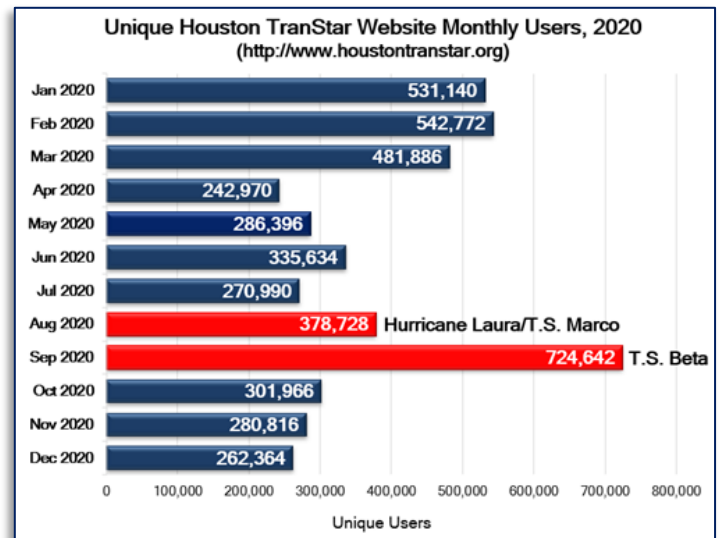
While traffic decreased significantly in 2020, Houston TranStar continued to provide traveler information to road users throughout the year. Houston TranStar provides camera feeds, incident information, and roadway travel times through the Internet, media partners, and dynamic message signs on the roadways.



In 2020, Houston TranStar transitioned its mapping platform this year from Google Maps to the ESRI platform shared by TxDOT and the City of Houston. While perhaps unperceivable for its users, this change allows for a better display of traffic information at a far lower cost to Houston TranStar partners, especially during emergency events.

In addition, TranStar-based traveler information on the TranStar website in 2020 included:

- The addition of 114 City of Houston intersection camera views to the TranStar website.
- The integration of Fort Bend Toll Road Authority information to the TranStar website
- An average of 386,700 monthly unique website users, down 44.2 percent from 2019
- 161 million CCTV camera views, down 48.1 percent
- The installation of the TranStar Web App on 23,381 devices, down 56.8 percent from 2019

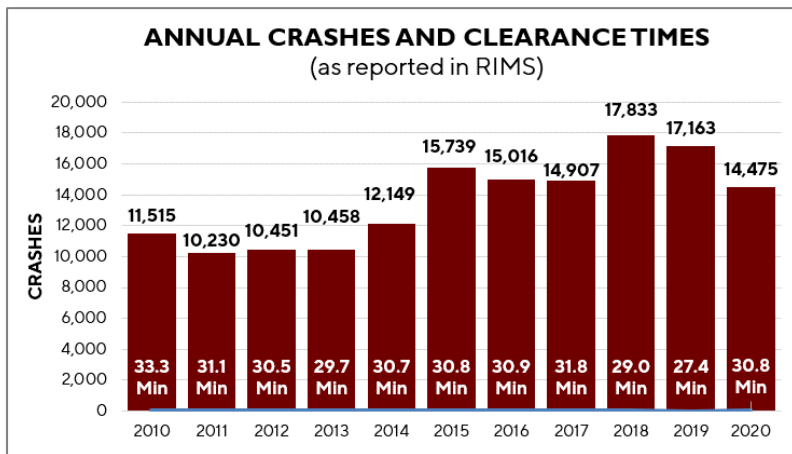


Much of 2020's decline in users can be attributed to the COVID Pandemic. With many businesses shuttered and others working from home, fewer drivers on our roads meant less need for traffic information. Several severe weather events, including Hurricane Laura and Tropical Storm Marco in August and Tropical Storm Beta in September, did contribute to higher access rates during the summer. However, due to their relative strength and lower threat to the region, site usage did not reach the high levels normally seen during a tropical event.

TRAFFIC INCIDENT MANAGEMENT

Perhaps one of the most critical functions of Houston TranStar is Traffic Incident Management (TIM). TIM brings together many of Houston TranStar's resources to facilitate the detection, response and clearing freeway incidents in a rapid manner. The facility houses staff from several incident management programs, who monitor the freeway system with its CCTV cameras and speed detection systems, coordinate response, inform the public, and actively address crashes and stalls. The following organizations play key roles in addressing incidents to promote quick clearance:

- TxDOT staff monitor the freeway system 24/7 for stalls and incidents, notifying responder agencies of incidents, tracks incident progress, coordinates with the media about major incidents, posts messages on DMSs and updates the Houston TranStar traffic map.
- The Tow-and-Go program dispatches tow trucks to stalls and crashes on the freeway system within most of Harris County.
- METRO Police monitors the HOV lanes and provides assistance for an incident.
- HCSO's Incident Management Unit (IMU) monitors the freeway to dispatch MAP units, provide remote authorization of Tow-and-Go tows for disabled vehicles and coordinate with other responding agencies for collisions.
- The Blueridge Transportation Group (BTG), the operator of SH 288, monitors the freeway for incidents and coordinates responses.



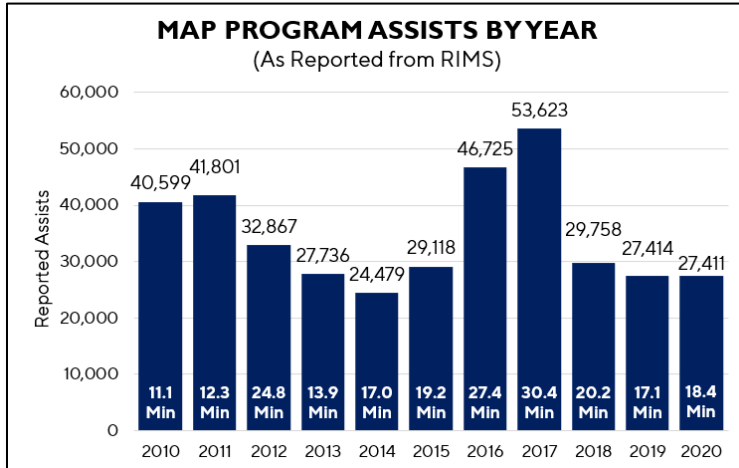
TIM programs recorded 14,475 crashes in 2020, down 15.7% from 2019. The reduction in traffic contributed to overall decline in crashes. However, the number of fatal crashes increased from 119 in 2019 to 150 in 2020. The increased speeds resulting from less traffic most likely contributed to more severe crashes and more fatalities.

HARRIS COUNTY INCIDENT MANAGEMENT UNIT

The Harris County Incident Management Unit (IMU) conducts traffic monitoring, response coordination, and tow authorizations throughout Harris County. The IMU consists of dispatchers, who monitor the freeway for incidents, contact law enforcement for response, and coordinate with the Tow-and-Go program for the removal of disabled vehicles. In addition, deputies from the Harris County Sheriff's Office provide verification and remote authorization for the Tow-and-Go program. Using CCTV cameras and other information from tow operators, the deputies can authorize tow trucks to remove vehicles without the physical presence of law enforcement personnel at a stall.

MOTORIST ASSISTANCE PROGRAM

The Harris County Motorist Assistance Program (MAP) began in 1986. MAP operates Monday through Friday, 24 hours a day, and consists of 18 Harris County Sheriff's Office (HCSO) deputies operating in two shifts. Patrons call 713-CALL-MAP (713-225-5627) to reach a dispatcher. MAP services include:



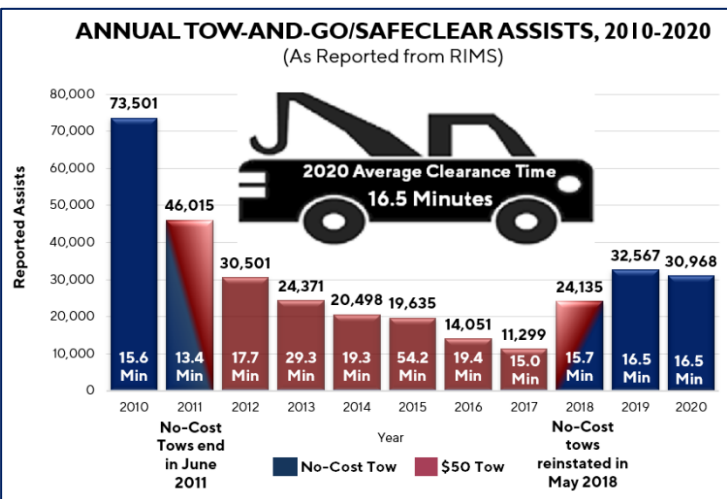
- Traffic and scene management during incidents
- Changing a flat tire
- Supplying fuel, water and/or air
- Jump starting vehicles
- Assisting with minor engine repair
- Removing stranded vehicles from the roadway

MAP conducted 27,411 assists in 2020, nearly the same as in 2019. MAP extended its operations in 2020 from 16 hours a day to 24 hours a day, Monday through Friday.



The Gulf Coast Regional Tow and Go™ (TAG) Program (formerly known as SAFEClear) was developed to keep motorists safe and traffic moving through no-cost, quick clearance of vehicle breakdowns on camera-monitored sections of the freeway. Each tow is authorized by law enforcement and provided by TAG responders who meet strict performance standards.

TAG operators remove disabled vehicles from freeways, at no cost to drivers, towing them to safe locations at the nearest freeway exit. The program increases traveler safety, reduces secondary crashes, and decreases travel delays.



The Houston-Galveston Area Council (H-GAC) manages the TAG Program through funding provided by the Federal Highway Administration and TxDOT.

In August 2020, the TAG program expanded to unincorporated Harris County and the Cities of Bellaire, Humble, Jersey Village, and La Porte. This increased coverage from 175 to 244 centerline miles.

There were 30,968 "No Cost" TAG tows in 2020, a 5% decrease from 2019. This decline is most likely the result of decreased travel due to COVID-19. Tow operators averaged a 16.5-minute clearance time, measuring from initial notification to traveler drop-off in a safe location.

TRANSTAR'S BENEFIT TO THE REGION

Since the opening of Houston TranStar in 1996, the Annual Report has estimated operational benefits of the Partnership and its activities in terms of freeway motorist delay savings. Determining benefits is treated conservatively because many are not easily quantifiable, and some are intangible.

Traffic delays on freeway mainlanes were estimated using TxDOT's travel time monitoring system, traffic volumes from TxDOT's roadway inventory files and HCTRA's toll road system. The evaluation process employs national benchmarks and experience to establish Houston TranStar goals for expected benefits. TranStar staff is relied upon to assess performance of the transportation systems in terms of percent attainment of goals.

Annual benefits due to TranStar operations in 2020 were nearly \$194 million, which included:

- 6.9 million fewer vehicle-hours - \$168.9 million
- 13.0 million gallons of fuel saved - \$25.0 million

In addition, emissions were reduced as follows:

Hydro-carbons	Carbon Monoxide	Carbon Dioxide	Nitrogen Oxide
336 tons	2,170 tons	114,920 tons	488 tons

With an annualized cost estimate of center operation calculated at \$23.6 million in 2020, the center recognized an 8.2-to-1 benefit-cost ratio.

Benefit Cost Calculation:	
Annual Benefits	\$193,803,000
Annualized Costs	\$23,598,000
Benefit/Cost Ratio	8.2 to 1

Two key factors contributed to the decline in benefits in 2020:

- Fewer vehicles on the road meant less traffic and less traffic delay. Travelers were able to get to destinations faster, meaning less "lost" time spent in traffic. The estimated delay reduced by Houston TranStar's operations dropped from 19.2 million vehicle-hours in 2019 to 6.9 million in 2020.
- Less travel at faster speeds meant significantly less fuel consumed sitting in traffic. Combined with the average price of fuel dropping from \$2.38/gallon to \$1.92/gallon, travelers spent considerably less on fuel

