



2023 ANNUAL REPORT

PREPARED BY THE TEXAS A&M TRANSPORTATION INSTITUTE
JULY 2024



Established in 1993, Houston TranStar is a formal collaboration among the principal transportation and emergency management agencies in Harris County. It houses multi-agency operations and management of the region's transportation system. The following agencies and operations are co-located at TranStar:

HOUSTON TRANSTAR PARTNER AGENCIES

<p>INTELLIGENT TRANSPORTATION SYSTEMS ITS PLAN REVIEW MOBILITY AND TRAFFIC FLOOD WARNING SYSTEMS</p>		<p>METRO POLICE BUS RAPID TRANSIT LIGHT RAIL SYSTEM REGIONAL BUS SYSTEM HOV/HOT LANE OPERATIONS OFFICE OF EMERGENCY MANAGEMENT</p>	
<p>MOTORIST ASSISTANCE PROGRAM SHERIFF'S INCIDENT MANAGEMENT UNIT (IMU) TRAFFIC & TRANSPORTATION GROUP, OFFICE OF HOMELAND SECURITY & EMERGENCY MANAGEMENT (HCOHSEM)</p>		<p>FREEWAY OPERATIONS MEDIA CONTRACTORS INTELLIGENT TRANSPORTATION SYSTEMS SH 288 TOLLING SUPPORT OPERATIONS TRANSPORTATION MANAGEMENT SYSTEMS</p>	

The 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.

The total estimated benefits of TranStar's operations in 2023 were \$544.6 million. Travel time savings attributable to TranStar's operation were estimated at more than 15.9 million vehicle-hours. This is worth nearly \$455.0 million in road user cost savings and an additional \$89.6 million (nearly 29.8 million gallons) in reduced fuel consumption.

Comparing these benefits to the annualized TranStar operating cost estimate of \$25.3 million yields an estimated benefit/cost ratio for Houston TranStar Center's operations of 21.5-to-1 for 2023. In other words, for every dollar spent on Houston TranStar's operations, the region realizes a benefit of \$21.50.

Since 1996, Houston TranStar's pivotal role in the transportation of people and goods in the greater Houston region has saved motorists an estimated \$8.7 billion in reduced travel costs.

ABOUT THE HOUSTON 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.

TRANSTAR 2023 ACTIVITIES

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

- TranStar welcomed 1,380 tour visitors in 2023. Notable visitors included Taiwan officials from the Taipei Economic Culture Office, a Delegation from the country of Finland, the California Contra Costa Transit Authority, and numerous local elected officials.
- TranStar, along with partner agencies, activated four times in 2023:
 - Tornado/severe weather in January
 - Rodeo Houston in March
 - NCAA Final Four in March
 - Freedom Over Texas in July
- TranStar partners officially deactivated for COVID-19 in June.
- TranStar Director's Office staff held multiple local TV media interviews (English and Spanish) to discuss TranStar's efforts during severe weather, including the "It's Only a White Line" driver safety campaign and overarching safety messaging.
- TranStar hosted a First Responder Crash Safety Week media availability to keep residents informed on roadway safety.
- TranStar hosted a "No Refusal" Safety Press Conference with multiple regional law enforcement agencies ahead of New Years Eve.
- TranStar Director's Office staff participated in multiple community events in 2023, presenting on TranStar resources and safety information:
 - Southern Pacific Railroad Club
 - IIAH Houston Insurance Day 2023
 - Klein United Methodist Women of the Well
 - Texas Municipal League Region 14
 - Windsor Club
 - River Oaks Women's Breakfast Club
 - Texas Technology Task Force in Austin
 - ITS Conference in Grapevine
 - Councilmember Mary Nan Huffman Town Hall
 - Lee College's Safety Summer Bash
 - Traffic Safety and Resource Fair
 - Auto Dealers Association Luncheon
 - Houston Association of Realtors Conference
 - Governor's EMS and Trauma Advisory Council

CITY OF HOUSTON



The City's Transportation and Drainage Operations (TDO) group is responsible for the operations and maintenance of traffic signals and ITS, as well as the design and installation of new 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 most recent technologies to produce new customized signal timings. TSPIP's revolving program is scheduled to revisit each signalized intersection every three years for retiming and optimization.

The City of Houston manages:

- 2,500 traffic signals
- 1,450 School Zone Beacons
- 180,000 streetlights
- 1,800 freeway safety lights
- 300+ miles of fiber cable
- 2,000+ wireless devices
- 600 Arterial Bluetooth travel time devices
- 92 Arterial DMS signs
- 115 CCTV Cameras

Major activities conducted by the City in 2023 include:

- Contracted with HDR to conduct needed corridor retiming efforts to nearly 400 pre-timed signalized intersections located in Downtown and Midtown.
- Contracted with Paradigm to install audible push buttons for 50 Downtown intersections around George R. Brown Convention Center and Discovery Green.
- Along with partnering agencies, continuing the process of amending the agreement and scope for the Houston Roadway Flood Warning System (HRFWS) for critical underpasses in the region.
- Contracted with Kimley-Horn to develop an Advance Traffic Management System (ATMS) master plan, Transportation System Management and Operation (TSMO) master plan, and corresponding Concept of Operation.

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.

Harris County manages:

- 1,050 Active Traffic Control Signals
- 1,344 School Zone Beacons
- 59 Warning Beacons
- 43 Street Lights
- 8 Changeable Lane Signs
- 210 CCTV Cameras
- 435 Miles of Fiber Optic Cable

Major activities during 2023 included:

- Completed deployment of wireless communication connectivity to all traffic signals that are not currently interconnected via Fiber Optic Cable.
- Transition of CENTRACS ATMS from Virtual Server to On Premise servers doubling system capacity.
- Harris County continued the coordination and optimization of traffic signal timings as part of its annual program.
- Contracting for replacement of approximately 250 static School Zone signs with solar powered beacons.

HARRIS COUNTY TOLL ROAD AUTHORITY (HCTRA)



The Harris County Toll Road Authority (HCTRA) operates 128 miles of tolled facilities throughout Harris County. In 2023, nearly 1.8 million vehicles a day utilized the system.

HCTRA and Houston TranStar share travel information on its systems with travelers not only to provide information about significant events that impact traffic, but to also display route options and information that can save travelers time.

While not physically located at TranStar, HCTRA's traffic management center monitors the toll road system and serves as the coordination center for its Incident Response Team and law enforcement

activities to enhance toll road safety. These operations responded to the following during 2023:

- Addressed 5,237 crashes.
- Handled 14 fatality crashes on the system.
- Assisted 39,134 stranded vehicles.
- Addressed 1,798 commercial vehicle incidents.
- Repaired 16,311 vehicles.
- Provided 8,383 complimentary tows.
- Responded to 136 HAZMAT incidents.

HARRIS COUNTY OFFICE OF HOMELAND SECURITY AND EMERGENCY MANAGEMENT (HCOHSEM)

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. HCOHSEM works in cooperation with incorporated cities, first response agencies, all levels of government, and the private sector to prepare for and mitigate the effects of natural and human-caused disasters.

HCOHSEM monitors severe weather, industrial accidents, and other emergencies 24/7. Depending on incident nature, scale, and severity, HCOHSEM activates the 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 serves as the primary communication hub for coordinating 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 (JIC).

To help build resilient communities, HCOHSEM promotes disaster preparedness year-round through regional emergency planning, training, and community outreach programs.

HCOHSEM 2023 activities included:

- In January, severe weather and heavy rainfall produced street flooding and high winds that developed into tornadic supercells. Estimated peak winds reached 140 mph with reports of damage to hundreds of homes, structures, vehicles, and utilities spanning 24 miles across Southeast Harris County. HCOHSEM activated the EOC to Level 2 - High Readiness to amplify

emergency public information and support recovery efforts.

- Monitoring tropical storm activity and activating the EOC to Level 3 - Increased Readiness when the forecast cone touches or is in the proximity of the Texas coast. This year produced 20 named storms, three of those intensifying into major hurricanes (none of which impacted the Houston area). HCOHSEM did not have to activate to the same levels as in previous years.
- Following the end of the federal Public Health Emergency, which occurred on May 11, 2023, all disaster declarations and declarations related to the COVID-19 pandemic ended on June 15, 2023 in the State of Texas. HCOHSEM and the EOC returned to Level 4 - Normal Readiness, ending 1,201 days of activation in support of the county's response to COVID-19. This was the longest and most complex public health activation in recent history.
- With the generous support of sponsors, HCOHSEM hosted the inaugural EM Impact program in June at Houston TranStar. The program is designed for young women interested in exploring a career in emergency management. Participants had the opportunity to explore careers related to disasters and emergency response and interact with panels featuring professionals from different facets of emergency management including public information, GIS, and education.
- In the late summertime, drought conditions and 100+ degree temperatures led Harris County Commissioner's Court to issue a burn ban from August 8 to October 10. HCOHSEM coordinated with local, state, and federal partners to provide necessary resources, operational guidance, and situational awareness of incident locations to quickly mitigate hazards. The Harris County Fire Marshal's Office reported 1,385 wildfires during the burn ban.

TEXAS DEPARTMENT OF TRANSPORTATION



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 has grown to nearly 1,600 bi-directional

miles in the urban areas of the Houston District and evacuation routes on IH-10-Katy, IH-45-North, and US 290-Northwest Freeways.

CTMS consists of multiple technologies to enhance monitoring of the transportation system, allow faster detection of slowdowns and incidents, and improve freeway management. 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 estimate system travel times and speeds and identify roadway segments with abnormal traffic.
- Radar to capture traffic volumes and spot speeds.

TxDOT-Houston District manages:

- 1,198 Fiber-based & Wireless CCTV Cameras
- 309 Dynamic Message Signs (DMS)
- 517 Bluetooth/AVI Travel Time Readers
- 490 Radar Units
- 61 Ramp Meters
- 18 Wrong Way Driver Detection Devices

TxDOT activities conducted in 2023 included:

- Installation of 61 CCTV cameras
- Installation of two DMS signs on IH 45, one DMS sign on IH 610, and two DMS signs on IH 69.
- Removed eight radar units on SH 99.
- Developed connected vehicle Signal Phasing and Timing (SPaT) with wireless communication technology at locations on FM1960.



Houston TranStar houses several of METRO's operations including bus dispatch, METRO Police Communication Section operations, High-Occupancy Vehicle management systems, METRO's social media program, the Office of Emergency Management, and traffic incident management programs.

METRO's services include:

- Service to 15 cities within Harris County
- 113 bus routes
- 27 miles of light-rail and bus-rapid transit
- 5,740,000 average monthly passenger trips

METRO activity highlights for 2023 included:

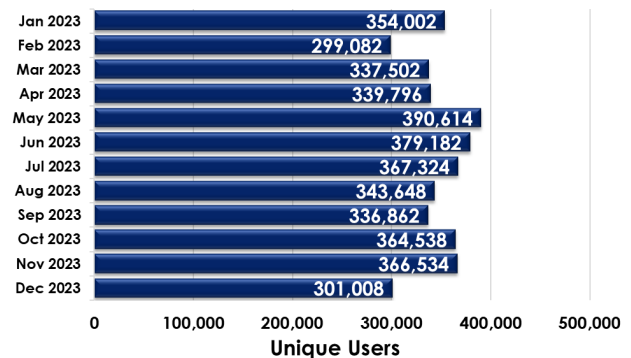
- METRO EOC staff coordinated with local partners in January to provide transportation assistance to people impacted by tornados that struck the Pasadena-Deer Park area on January 24th. This included providing transportation to the Pasadena Convention Center, which served as the recovery center for the event.
- METRO supported the 2023 Final Four as the official NCAA transportation partner. METRO provided free rides on all its METRORail lines between March 31 and April 3.
- METRO entered into a \$26 million partnership to provide LED displays at nearly 3,000 locations on its system. These signs will provide real-time information about bus and train arrival times to enhance the traveling experience for METRO passengers.
- METRO began testing solar-powered fans to provide better airflow and cooling at its bus shelters. The concept, proposed to METRO by Congresswoman Lizzie Fletcher, will be initially prototyped at 50 locations.
- CEO Tom Lambert retired from METRO on December 31st after 45 years of service. While recognized for his work as METRO Police Chief, Chief Administrative Officer, and eventually, CEO, Tom has been one of Houston TranStar's most ardent champions since its inception. The partners at Houston TranStar wish him the best in his retirement.

One of the most visible products of Houston TranStar is traveler information. Local Internet and media outlets use the TranStar CCTV feeds, incident reporting, and travel time reporting systems in their daily traffic functions.

Highlights for TranStar-based traveler information on the TranStar website in 2023 included:

- An average of 348,300 monthly unique users.
- Nearly 174.5 million CCTV views.
- The Houston TranStar Mobile Application was installed on 19,092 devices.

Houston TranStar Website Unique Users, 2023



Average monthly unique website users were up 4.0 percent from 2022. Similar to 2022, the greater Houston area did not receive any major weather threats in 2023, which kept unique views of the system relatively stable.

In addition, TxDOT, in conjunction with the Texas A&M Transportation Institute (TTI), integrated 9-1-1 data into Houston TranStar to help improve incident detection in terms of detection speed and quantity. TTI is working with other law enforcement agencies throughout the Houston region to grow the system and increase coverage on the freeway system.

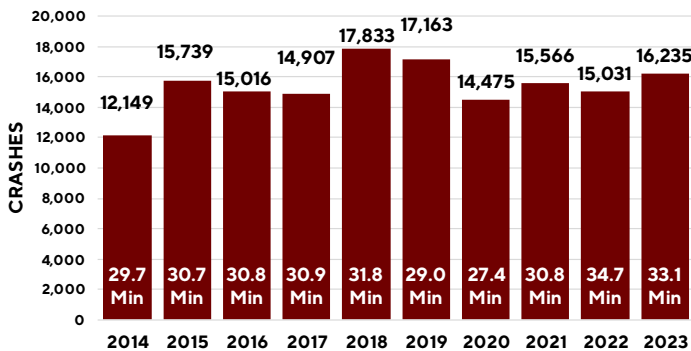
Accept/Reject ID	Agency	Timestamps	EDS Location	Code/Rainfall	Lat/Long
Accept 911	City of Houston	Status: 2024-07-25 15:23:16 Call In: 2024-07-25 14:57:56 Dispatch: 1900-01-01 00:00:00 Arrival: 1900-01-01 00:00:00 Closed: 1900-01-01 00:00:00	5683 64440 (MINOR SOUTHWEST ACCIDENT)	29 6748 -95 5426	520 IH 49 Southwest @ Bissonnet Nearest Camera: #520 View at 29.676, -95.541 distance: 0.16 miles #521 View at 29.667, -95.551 distance: 0.81 miles #1158 View at 29.676, -95.563 distance: 1.28 miles
Accept 911	City of Houston	Status: 2024-07-25 15:27:08 Call In: 1900-01-01 00:00:00 Dispatch: 2024-07-25 15:31:00 Arrival: 2024-07-25 15:35:36 Closed: 1900-01-01 00:00:00	7601 NORTH 4440 (CRASH/MINOR)	29 8716 -95 4051	221 IH 45 North @ Little York Nearest Camera: #221 View at 29.870, -95.408 distance: 0.11 miles #222 View at 29.877, -95.412 distance: 0.42 miles #220 View at 29.860, -95.403 distance: 0.88 miles
Accept 911	City of Houston	Status: 2024-07-25 16:22:19 Call In: 2024-07-25 15:46:18 Dispatch: 2024-07-25 15:46:18 Arrival: 2024-07-25 15:59:07 Closed: 1900-01-01 00:00:00	6189 2410 (CRASH/MAJOR/IN FATAL)	29 7235 -95 4505	515 IH 49 Southwest @ Westpark Nearest Camera: #1515 View at 29.724, -95.490 distance: 0.04 miles #2587 View at 29.724, -95.492 distance: 0.04 miles #1588 View at 29.724, -95.492 distance: 0.13 miles
Accept 911	City of Houston	Status: 2024-07-25 15:42:12 Call In: 1900-01-01 00:00:00 Dispatch: 1900-01-01 00:00:00 Arrival: 2024-07-25 15:42:12 Closed: 1900-01-01 00:00:00	WH1100B 2489 (CRASH/MINOR/FWY)	29 7777 -95 4292	314 IH-10 Katy @ Washington Nearest Camera: #314 View at 29.778, -95.430 distance: 0.85 miles #313 View at 29.778, -95.432 distance: 0.51 miles #312 View at 29.778, -95.418 distance: 0.76 miles

TRAFFIC INCIDENT MANAGEMENT

One of Houston TranStar's multiagency efforts is the detection, response, and clearing of freeway incidents. The facility houses multiple programs involved in the region's traffic incident management activities. Agencies utilize CCTV cameras, DMS signs, and travel time systems to detect, monitor, and notify the public about incidents. TranStar houses the following incident management activities:

- TxDOT staff monitor the freeway system 24/7 for stalls and incidents, notify responder agencies of incidents and track incident progress. TxDOT staff coordinates with the media about major incidents, posts messages on DMS signs, and updates the Houston TranStar traffic map.
- The Tow-and-Go program dispatches tow trucks to stalls and crashes on the freeway system within the City of Houston and Harris County.
- HCSO's Incident Management Unit (IMU) monitors freeways to dispatch MAP units, remotely authorize Tow-and-Go tows for disabled vehicles, and coordinates with other responding agencies for collisions.
- METRO Police monitor the HOV/HOT lanes and provide assistance for an incident.

ANNUAL CRASHES AND CLEARANCE TIMES
(as reported in RIMS)



In 2023, Houston TranStar staff identified and monitored 16,235 crashes, up 8.0% from 2022. Incidents monitored by staff included crashes, as well as large-scale events including:

- 206 HAZMAT Events,
- 23 Bridge Hits,
- 80 Lost Loads,
- 417 Vehicle Fires, and
- 344 Overturned Vehicles

TOW AND GO™

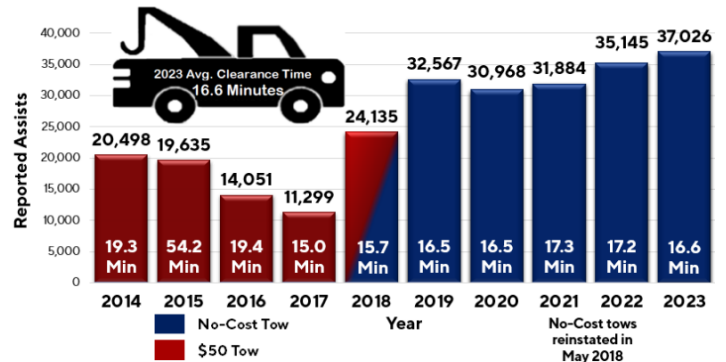


Tow-and-Go, formerly known as SAFEClear, brings quick response to disabled vehicles to

reduce traffic congestion and increase safety. Operating within the majority of Harris County on the freeway system, tow operators remove a vehicle from the freeway to a safe location within a mile of the freeway or to a secured vehicle storage facility for 48 hours, without storage fees, where drivers can arrange to retrieve their vehicles.

The program utilizes qualified, vetted towing companies to rapidly remove disabled vehicles from the freeway to increase patron safety, reduce secondary crashes, and decrease incident-related travel delays. The program is free of charge to motorists thanks to the Houston-Galveston Area Council.

TOW-AND-GO/SAFECLEAR ASSISTS, 2014-2023



In 2023, there were 37,026 Tow-and-Go assists, a 5.4% increase from 2022. Clearance times decreased from 17.2 minutes in 2022 to 16.6 minutes in 2023. Tow-and-Go reported a 7.4-minute average response time to an incident with a 9.2-minute average clearance time upon arrival.

The Tow-and-Go Program continued to expand in 2023, adding the City of Pasadena, as well as the remainder of US 290 from FM 1960/SH 6 to the Waller County line. Currently, Tow-and-Go covers approximately 271 centerline miles of freeway.

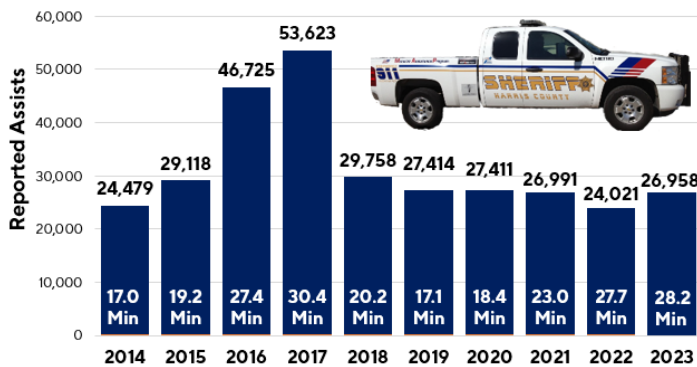
MOTORIST ASSISTANCE PROGRAM (MAP)

The Motorist Assistance Program (MAP) began in 1986. MAP operates 24 hours a day, Monday through Friday, consisting of Harris County Sheriff's Office (HCSO) deputies. Patrons can 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.
- Transporting motorists to a safe location.

The program costs about \$2.4 million per year, funded through HCSO and the Houston-Galveston Area Council.

MAP PROGRAM ASSISTS BY YEAR



MAP conducted 26,958 assists in 2023, up 12.2% from 2022. In addition to providing services, MAP deputies aid stranded patrons and provide scene and traffic management for freeway crashes. In 2023, MAP reported its one-millionth assist to freeway patrons since its inception 38 years ago.

TRANSTAR'S REGIONAL BENEFIT

For the past 27 years, this report has estimated operational benefits in terms of freeway motorist delay savings. Determining benefits is treated conservatively because many are not easily quantifiable, and some are intangible.

The evaluation process looks at freeway and toll road traffic estimates and 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 from TranStar operations were nearly \$544.6 million. The increase in monetary benefits is partially due to an increase in the value of vehicle delay, full depreciation of assets, and increased traffic levels. Time and fuel savings were:

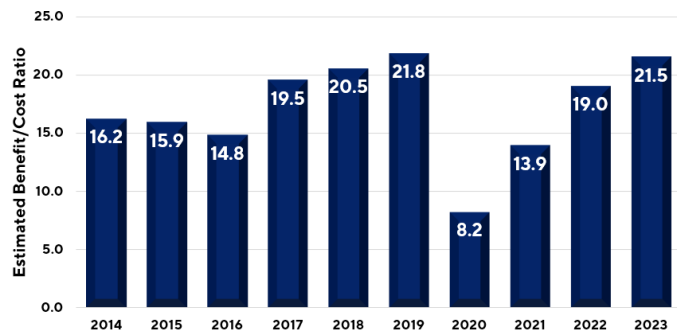
- 15.9 million fewer vehicle-hours - \$455.0 million
- 29.7 million gallons of fuel saved - \$89.6 million.

Benefit Cost Calculation:

Annual Benefits	\$544,599,000
Annualized Costs	\$25,335,000
Benefit/Cost Ratio	21.5

With an annualized cost estimate of Center operations calculated at \$25.3 million in 2023, the Center recognized a 21.5-to-1 benefit-cost ratio.

Houston TranStar Benefit/Cost Ratios 2014-2023



Based on USDOT's Bureau of Transportation Statistics, the reduction in fuel consumed resulted in the following estimated emissions reductions compared to the absence of TranStar and its systems:

Hydro-carbons	Carbon Monoxide	Carbon Dioxide	Nitrogen Oxide
768 tons	4,969 tons	263,167 tons	1,118 tons