Georgia Department of Audits and Accounts
Performance Audit Division
Greg S. Griffin, State Auditor
Leslie McGuire, Director

Highway Emergency Response Operators (HERO) and Towing and Recovery Incentive Program (TRIP)

Opportunities Exist to Increase Usage

Why we did this review

The Highway Emergency Response Operators (HERO) Program and the Towing and Recovery Incentive Program (TRIP) are components of the Georgia Department of Transportation's (GDOT) Intelligent Transportation System. These programs improve congestion by quickly clearing incidents from travel lanes. The audit evaluates whether GDOT manages and utilizes HERO and TRIP effectively and efficiently.

About HERO and TRIP

GDOT established HERO in 1996 as a freeway service patrol. Its operators patrol Metro Atlanta roadways 24 hours a day, 365 days a year in specialized vehicles equipped to provide both traffic incident management and motorist assistance. HERO currently has over 100 trucks patrolling interstates and major roadways in the Metro Atlanta area. In fiscal year 2017, HERO responded to over 100,000 traffic incidents.

TRIP focuses on commercial vehicle accidents. Implemented in 2008, prequalified heavy towing companies that respond to a commercial vehicle accident, and successfully clear it within 90 minutes, are eligible for a monetary award. In fiscal year 2016, the TRIP incentive option was used in 136 commercial vehicle accidents.

HERO and TRIP help restore capacity lost due to the effects of accidents, debris, stalls, and other events blocking the travel lanes.

What we found

Programs like HERO and TRIP are effective at reducing the duration of traffic incidents on Metro Atlanta's roadways, saving drivers both time and money by clearing lanes quickly. Currently, however, there are more accidents occurring than the programs are addressing. Our review found HERO assisted in 14% (14,367) of the total accidents law enforcement reported during fiscal years 2015 and 2016 combined. The TRIP incentive was used in approximately 6% (136) of the incidents involving tractor-trailers in fiscal year 2016.

While not all accidents require HERO or TRIP assistance, given the relatively low percentage of accidents in which assistance was provided, and the significant impact accidents have on traffic conditions, it is reasonable to expect that a percentage of the unassisted incidents would have benefited from HERO or TRIP intervention. To determine whether or how to expand HERO, GDOT must first ensure current deployment is appropriate and that the impact on traffic incidents is maximized. Changes to TRIP could include increasing the number of accidents it assists, or increasing the types of incidents it assists.

In the current HERO deployment, there are variations by roadway, unit, and type of call. Absent goals or targets for how much incident coverage to provide, it is not clear whether such variations are reasonable. We found roadways with the highest accident rates were not the roadways with the most HERO activity. For example, in fiscal year 2016, I-75 South was one of the top five roadways for accidents reported by law enforcement, with over 4,300; however, HERO provided assistance in only 329 (8%) of these accidents. During fiscal year 2016, the average number of accidents worked by HERO units varied from 1 to 15 per day. Finally, in fiscal year

2016, HERO's activity was primarily focused on motorist assistance, which accounted for 83% of HERO activity, while accidents accounted for 13%.

GDOT management indicated HERO deployment is based on an analysis of the number of motorist assistance requests per roadway received by the state's Traffic Management Center (TMC). However, additional data on all incidents, not only those reported through the TMC, may be useful in planning deployment. Additionally, GDOT should determine the degree to which it seeks to use HERO to address incidents and use that goal to benchmark by roadway and by operator. This data could be used to evaluate deployment to ensure it is appropriate for current conditions. It could also be used to ensure current resources are maximized.

As with HERO, there is potential to consider expanding the TRIP program. Currently, TRIP is used only in commercial vehicle incidents. However, we identified other states that have elected to use similar services, in conjunction with freeway service patrols such as HERO, to include non-commercial incidents. Other states have also expanded their TRIP-type program to include disabled large trucks or trailers.

Atlanta's congestion problem is well documented, and the costs of congestion, including lost time, fuel, and environmental impact, are high. According to the Texas Transportation Institute's (TTI) 2015 Urban Mobility Scorecard, Atlanta ranked 12th of 101 urban areas for the highest overall minutes of delay per commuter and estimated commuters lost $1,130 per year in lost time and fuel. According to the Texas A&M Transportation Institute, every hour of congestion costs drives, on average, between $18-$94 in lost wages and fuel. Both HERO and TRIP reduce driver delays by quickly clearing lane-blocking incidents, which are a primary cause of congestion. According to studies, the duration of traffic incidents is reduced by an average of 46 minutes due to HERO and NaviGAtor, the statewide Intelligent Transportation System (ITS). Similarly, when TRIP is used, roadways are cleared 165 minutes faster. As a result, determining how to ensure HERO and TRIP are optimized, whether through additional resources, or different deployment is critical.

In addition to optimizing usage of the programs, we also identified areas where HERO management could improve operations. Additional controls are needed over inventory and supply systems. Turnover of HERO operators also continues to be an issue.

What we recommend

We recommend GDOT assess its current deployment plan and collect information to develop response rate and coverage targets. It should ensure it is maximizing the impact of its current resources.

Additionally, HERO management should establish policies governing the identification and tracking of repairs as well as the replacement needs of its fleet. It should also ensure proper inventory controls over supplies and document the reasons for turnover to identify actions it can take to address the problem.

Finally, GDOT should evaluate the benefits and costs of expanding HERO and TRIP.

Appendix A includes a detailed listing of recommendations.

Table of Contents

Purpose of the Audit

This report examines whether the Georgia Department of Transportation (GDOT) is effectively and efficiently managing its traffic incident management programs and whether those programs could be expanded. Specifically, the audit objectives were to determine if GDOT is:

1) ensuring the Highway Emergency Response Operator (HERO) Program is utilized effectively and efficiently by using relevant data and analyses to inform program funding, staffing, and operating decisions;
2) ensuring that HERO Program operations are managed effectively and efficiently; and,
3) ensuring that the Towing and Recovery Incentive Program (TRIP) is fully utilized for all qualifying traffic incidents.

A description of the objectives, scope, and methodology used in this review is included in Appendix B. A draft of the report was provided to GDOT for review, and pertinent responses were incorporated into the report.

Background

Overview

Efficiently removing incidents from traffic lanes allows traffic to flow, which saves drivers time and money lost to delays.

In 1996, GDOT established Georgia's statewide Intelligent Transportation System (ITS) to create and operate statewide transportation management systems and traffic incident management initiatives designed to reduce congestion and improve air quality.[1] Causes of congestion include the number of vehicles on the road as well as traffic incidents that cause delays. As much as 50% of the congestion in the Atlanta area is caused by non-recurring traffic incidents, including accidents, stalls, and other events. Accidents, including collisions, wrecks, and overturned vehicles, often lead to secondary incidents. GDOT's Traffic Operations Office within the Permits and Operations Division, and under the coordination of the State Traffic Engineer, oversees the state's ITS (see **Exhibit 1**). Appendix C provides additional information on Georgia's ITS and related transportation management programs.

The Highway Emergency Response Operator (HERO) and the Towing and Recovery Incentive Program (TRIP) are components of Georgia's traffic incident management system. Both have a primary purpose of improving response to traffic incidents, reducing incident duration, minimizing incident impact, improving safety, and reducing the risk of secondary incidents.

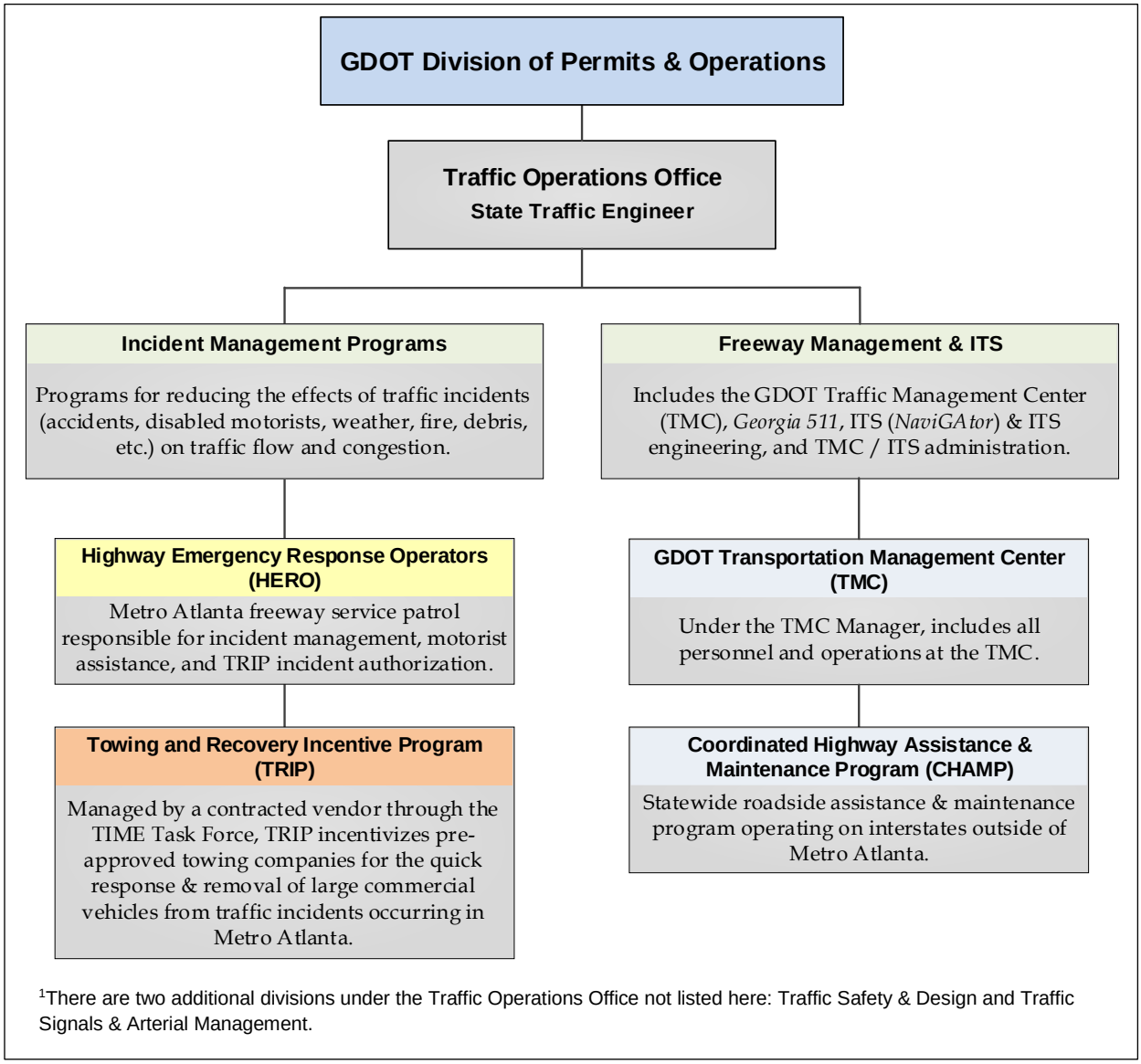
HERO and TRIP help restore roadway capacity lost due to the effects of traffic incidents. These incidents may include accidents, disabled vehicles, vehicle fires, debris, stalls, and other events blocking the travel lanes and/or the road shoulder. According to the Federal Highway Administration (FHWA), traffic incidents make

[1] The Federal Highway Administration (FHWA) created a Traffic Incident Management (TIM) system, which is a system of principles, guidelines and best practices focused on detecting, responding, and clearing traffic incidents as quickly as possible. The system calls for cooperation and coordination between state and local partners, including law enforcement, fire and rescue, emergency medical services, towing and recovery, and hazardous materials contractors, among others.

up 25% of all congestion and 40% of non-recurring congestion. In Atlanta, traffic incidents make up as much as 50% of all congestion. Traffic incidents lead to a considerable amount of delay and cost. Efficiently removing these incidents from affecting traffic flow saves commuters time and money.

In 2014, each Atlanta commuter experienced, on average, 52 hours of delay at a cost of $1,130 per commuter per year, according to the Texas A&M Transportation Institute. Every hour of congestion costs, on average, between $18-$94 additional dollars in lost time, wages, and fuel. Overall, congestion cost the Atlanta area $3.2 billion in 2014. For this reason, Atlanta was ranked 13th among major metro areas for highest congestion costs in the United States in 2014.

Exhibit 1
HERO and TRIP are Traffic Incident Management Programs[1]



[1]There are two additional divisions under the Traffic Operations Office not listed here: Traffic Safety & Design and Traffic Signals & Arterial Management.

Source: GDOT

Highway Emergency Response Operator (HERO)

The HERO program was established in 1996 to assist with traffic control in the Atlanta area during the Olympics.

HERO is a freeway service patrol and traffic incident response unit. Its operators patrol Metro Atlanta roadways 24 hours a day, 365 days a year in specialized vehicles equipped to provide both traffic incident management and motorist assistance (see **Exhibit 2** below). HERO was established in January 1996, prior to the Summer Olympic Games, to ensure efficient traffic flow on I-75, I-85, I-20, and portions of I-285 and US-78. With an initial staff of 12 operators and 7 trucks, the HERO Operators' primary duty was to respond to minor stalls and other traffic-related incidents and to "clear the roads so that the normal traffic flow can be restored."

According to management, HERO operators undergo six months of classroom training on how to reestablish regular traffic flow after an incident as quickly as possible. They receive training on the equipment they use, including their specialized HERO trucks. Trainees also undergo 6-16 weeks of field training, during which time they conduct ride-alongs with an experienced operator.

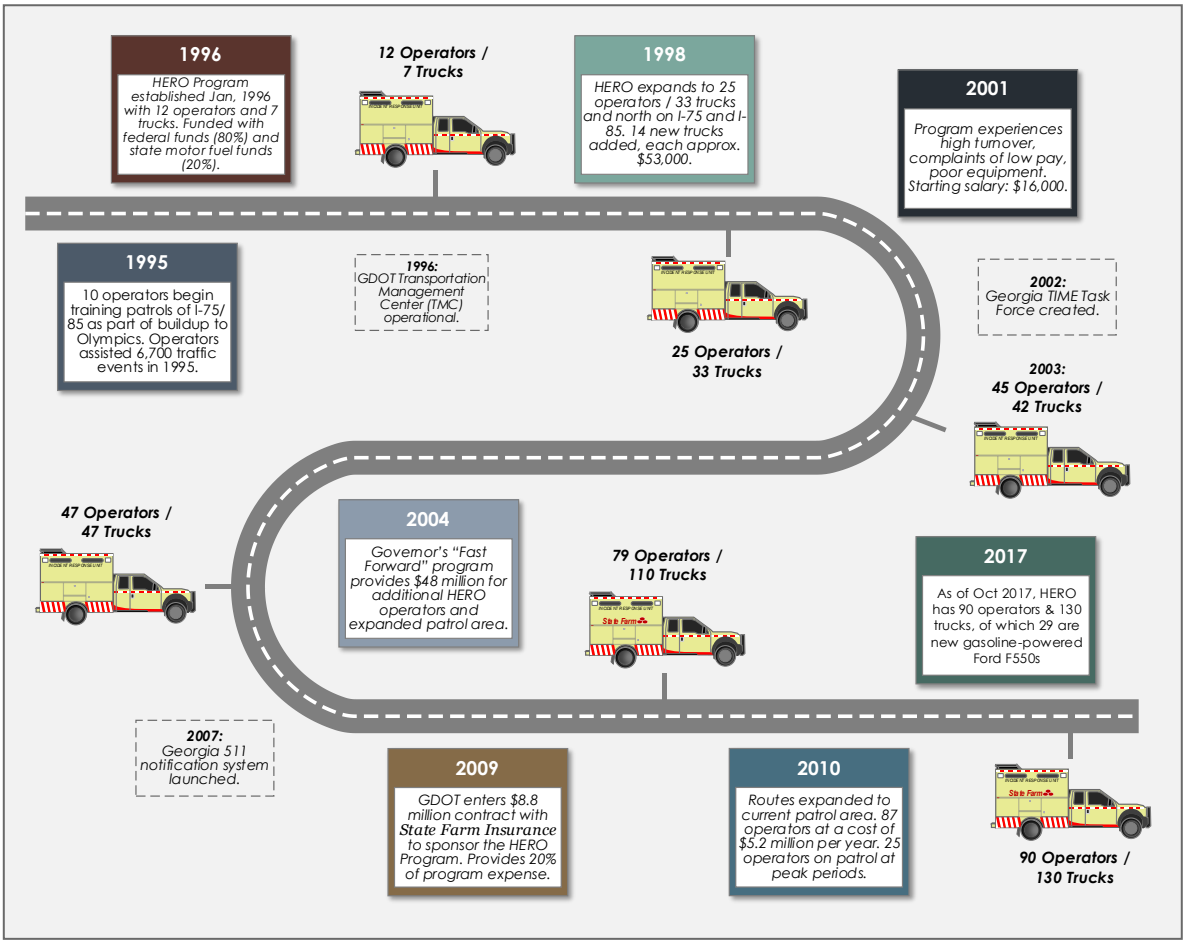
The majority of HERO vehicles are stored at HERO Headquarters. Vehicles needing repair are also stored at HERO Headquarters or GDOT's primary vehicle repair facility operated by GDOT's Office of Equipment Management (OEM).

Exhibit 2
HERO Trucks are Specially Equipped to Assist in Traffic Incidents

Push Bumpers	**P.A. System**
Retractable Message Boards	**Fuel and Oil Absorbent**
Jump Starting System	**Road Flares**
Flood Lights	**Air Compressor**
Hand Tools	**Gasoline, Engine Coolant**
Floor Jack	**800MHz Radios**
	First Aid Kit

Source: GDOT / DOAA (image)

Exhibit 3
HERO Program has Expanded Since its Inception

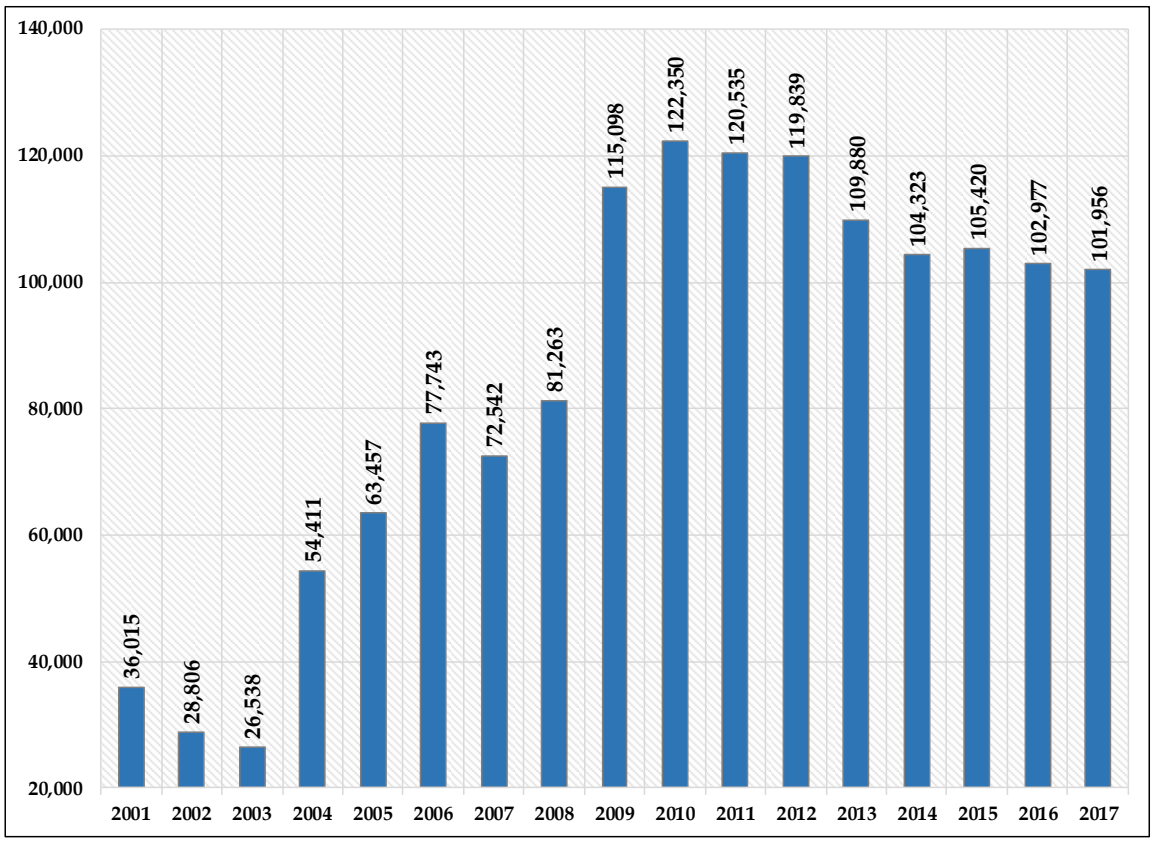


Source: GDOT, AJC

As shown in **Exhibit 3**, the HERO program has grown steadily since inception, adding additional operators, trucks, and patrol routes. Since 1996, the number of operators has increased from 12 to 90 and the number of trucks has increased from 7 to 130. In fiscal year 1997, a year after the program officially began, HERO operators assisted in 13,170 traffic incidents (see **Exhibit 4**). Between fiscal years 2009 and 2017, HERO operators assisted an average of 111,375 traffic incidents per year (ranging from 122,350 in 2010 to 101,956 in 2017).

In 2009, GDOT entered into an agreement with State Farm Insurance. In exchange for advertising on HERO trucks, State Farm Insurance paid GDOT $8.76 million over 5 years for operating expenses. This agreement was renewed in 2014 for an additional five years. Overseeing the HERO operators are twelve field supervisors, two assistant managers, one unit manager, and additional support personnel operating out of HERO Headquarters in Midtown Atlanta.

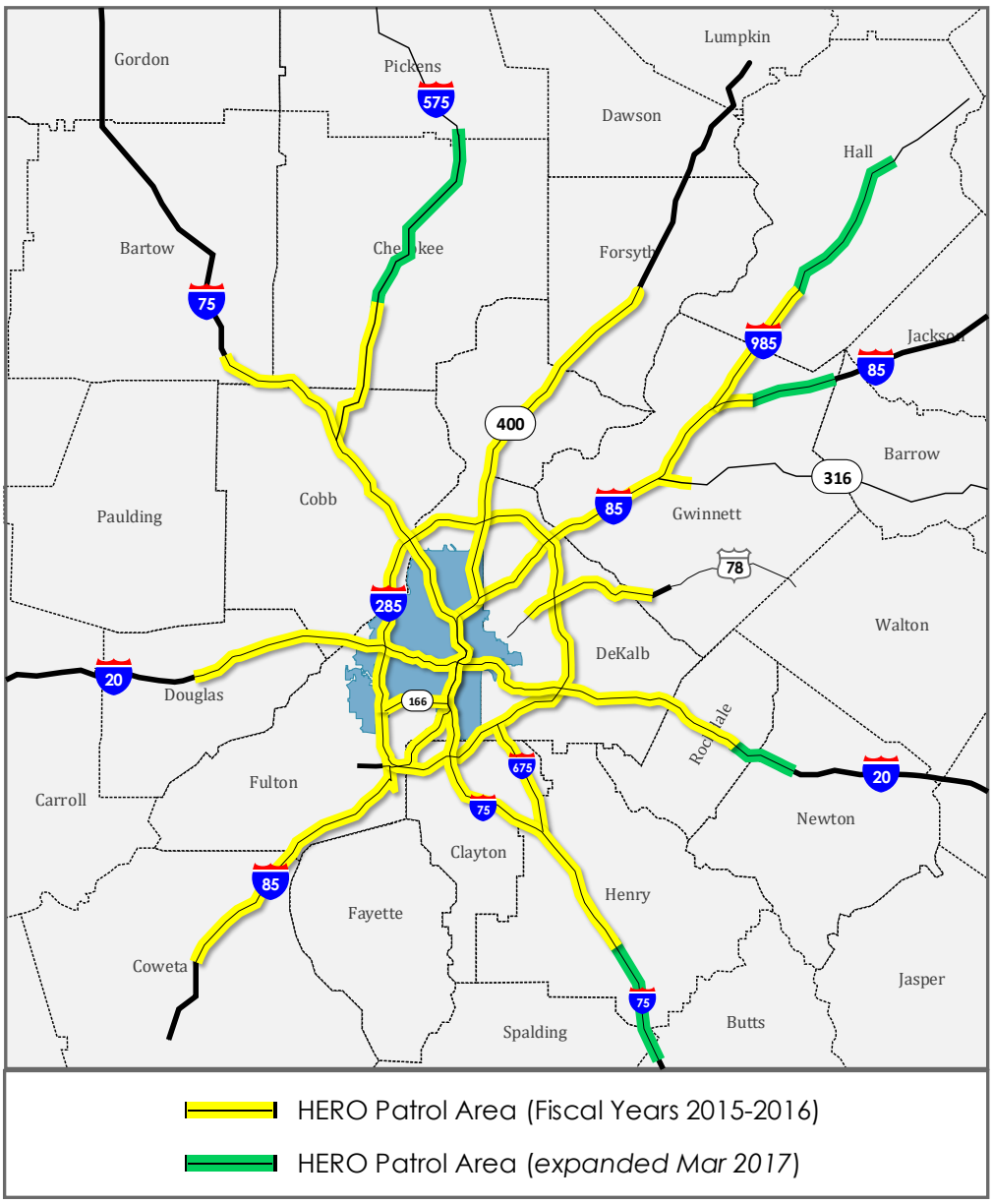
Exhibit 4
HERO Program Total Assists, Fiscal Years 2001-2017



Source: GDOT

The HERO Program's patrol routes have also expanded steadily since 1996. At the time of inception, HERO operators primarily patrolled Interstate routes inside the Atlanta perimeter. Now, operators patrol 400 miles of Interstate and major roadways in and around the Metro Atlanta area (see **Exhibit 5** for HERO Coverage map). In March 2017, GDOT expanded the patrol area north on I-575 and I-985, south on I-75, and southeast on I-20.

Exhibit 5
HERO Patrol Areas Were Recently Expanded



Source: GDOT

According to management, HERO operators spend their shifts patrolling the routes, scanning for, and clearing roadways of, disabled vehicles, accidents, or debris. Transportation Management Center (TMC) employees may also dispatch operators to traffic incidents via the laptop computers or radios in the operators' trucks. TMC operators identify incidents using NaviGAtor sensors and cameras or via calls through the Georgia 511 telephone system.[2] Approximately 32 HERO units (including 4 supervisors) are on patrol per shift during peak traffic periods (morning and afternoon

[2] The TMC monitors Metro Atlanta roadways using a system of cameras and sensors 24 hours per day, 365 days per year. Employees identify traffic incidents, and stalled vehicles. See **Appendix C** for further detail.

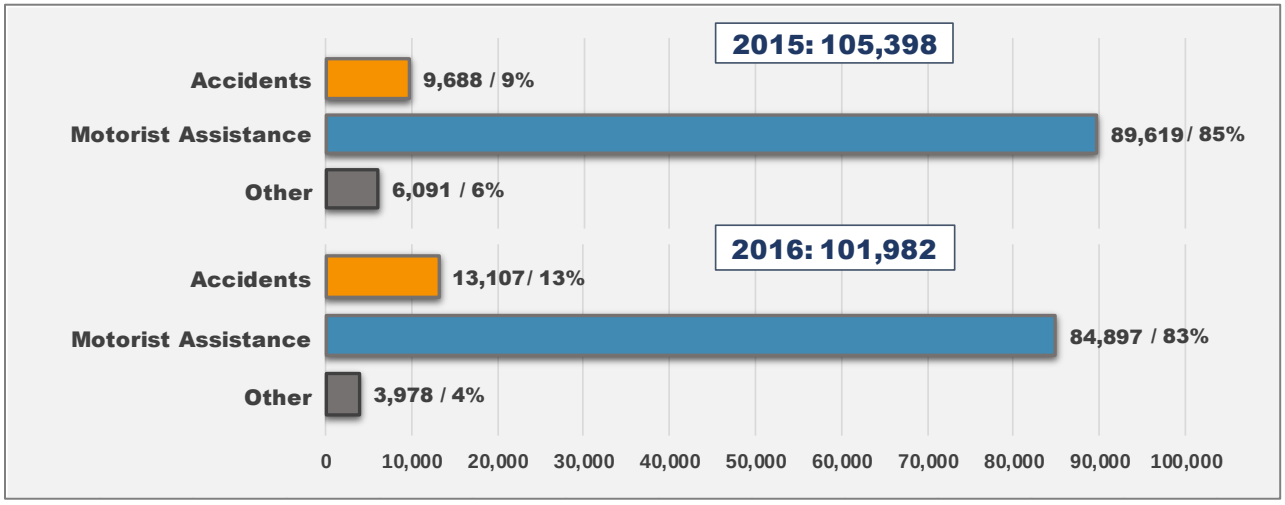
shifts Monday through Friday). The Program operates multiple shifts to cover 24 hours per day and 7 days per week of activity, with more trucks on patrol during peak traffic times and less at non-peak times. At any one time, there are as many as 38 or as few as 6 HERO trucks patrolling Metro Atlanta.

HERO Performance

In fiscal years 2015 and 2016, HERO operators assisted in 105,398 and 101,982 traffic incidents respectively. Incidents generally fell into two categories: accidents and motorist assistance. Accidents include single or multiple vehicle accidents or incidents involving commercial vehicles, such as tractor-trailers. On average, accidents block more lanes, which causes more congestion and longer delays than a disabled vehicle. Motorist assistance includes moving disabled vehicles on the shoulder or blocking the travel lanes. HERO operators' first responsibility is to ensure the disabled vehicle is moved out of the travel lanes. After that, if possible, operators assist the motorist (e.g., provide a gallon of fuel, change a flat tire, jump off a dead battery, etc.) or offer to contact a tow truck.

As shown in **Exhibit 6**, the majority of HERO activities were related to motorist assistance. In fiscal year 2015, motorist assistance accounted for 85% of all HERO activities; similarly, motorist assistance accounted for 83% of all HERO activities in 2016. HERO operators also assisted with 9,688 accidents in fiscal year 2015 and 13,107 accidents in fiscal year 2016. "Other" incidents includes debris, weather-related incidents, police activity, and fire.

Exhibit 6
HERO Unit Assistance Activities, Fiscal Years 2015-2016



Source: GDOT

GDOT's Traffic Operations Office uses several traffic incident management performance measures, including those that are federally recommended. It publishes the following three metrics in weekly status reports.

- *Response Time* is the time from dispatch to arrival at the scene of the incident. As of June 2016, HERO's average response time was 11 minutes; for calendar year 2015, the average was also 11 minutes.

- *Roadway Clearance Time* is the time between the first recordable awareness of an incident and the first confirmation that all lanes are available for traffic flow. In calendar year 2015, HERO's roadway clearance times averaged from 11 to 19 minutes.
- *Incident Clearance Time* is the time between the first recordable awareness of an incident and the time at which the last responder has left the scene. In calendar year 2015, HERO's incident clearance times averaged from 28 to 35 minutes.

The GDOT TMC monitors the flow of traffic on highways and major state routes throughout Georgia, and specifically in the Atlanta area, and records observed or known incidents in its Advanced Traffic Management System (ATMS) database. Incidents to which HERO operators are dispatched or respond are also recorded. ATMS includes time stamps and logs of each event and details such as the GPS location of the incident, number of lanes, number of lanes blocked, severity of the incident, HERO unit, and other metrics. Roadway sensor data may also be available for incidents, which can provide a snapshot of the traffic flow prior to, during, and after the incident. HERO operators also have a laptop in their vehicle to enter incident data directly into ATMS.

Towing and Recovery Incentive Program (TRIP)

In 2002, GDOT and a group of regional and local transportation agencies and first responders formed the Georgia Traffic Incident Management Enhancement Task Force (TIME) as an inter-agency forum to coordinate traffic incident management practices and training among police, fire, Haz-mat, and towing companies. TRIP is one initiative of the TIME Task Force. [3] Created in 2007 and implemented in January 2008, TRIP reduces the effects of traffic incidents by promoting the quick removal of disabled or wrecked commercial vehicles (tractor-trailers, buses, etc.) from major travel lanes in the Atlanta area. A traffic incident is TRIP-eligible if it involves:

- A commercial vehicle defined as a tractor-trailer, truck over 26,000 lbs., large motor home, recreational vehicle, bus, and aircraft; and,
- An accident, crash, rollover, jack-knifed vehicle, fire, impact with a guard rail, or any event resulting in blocking of any of the travel lanes; or,
- A lost load/load shifted blocking any of the travel lanes.

TRIP pays prequalified heavy towing companies that respond to a call for removal of a commercial vehicle blocking the travel lanes if they successfully remove the vehicle in 90 minutes or less. To be prequalified, towing companies must be available 24 hours per day / 7 days per week, have 30-ton and 50-ton recovery wreckers, have support trucks with tools, traffic controls, and fluid-spill recovery equipment, as well as other specialized equipment potentially needed to remove a commercial vehicle or its load from the travel lanes. Towing company drivers and personnel also receive certification training developed by the TIME Task Force and FHWA, including training on Quick Clearance strategies, hazardous materials, and traffic control. There are currently 16 approved towing companies assigned a portion of the TRIP incentive area. Towing

[3] Other TIME initiatives include the Georgia Open Roads Policy, and the establishment of TIM Teams throughout the state.

companies may apply to become TRIP-eligible once every two years. TRIP payouts are made as follows:

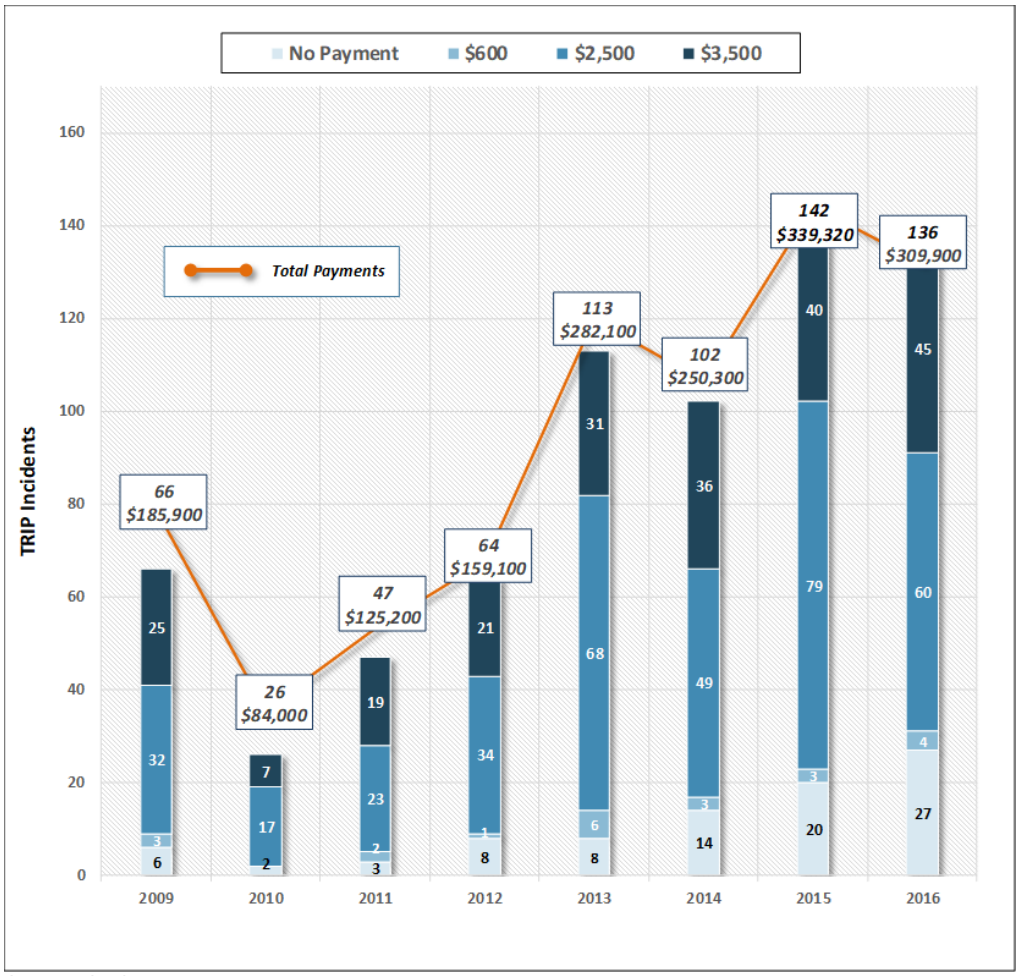
- $600 if the company is called, responds within the specified time, but is not needed.
- $2,500 if the company is called, responds within the specified time, and has the roadway cleared and opened to traffic within 90 minutes after receiving the notice to proceed.
- An extra $1,000 (for a total of $3,500) if additional special equipment was required and provided, and all time requirements were met.

If the towing company fails to meet the response requirements, it may not receive any payment. Additionally, if the towing company fails to clear the road within three hours of the notice to proceed after TRIP activation, it can be fined $600 in damages plus $10 per minute for each minute over the 3 hours the road is still blocked.

A GDOT-commissioned study conducted in February 2011 found that TRIP allowed the roadway to be re-opened to traffic approximately 165 minutes faster than before the TRIP program had been implemented. According to a cost-benefit analysis by GDOT, the benefit in reduced delays and emissions from 2008 to 2009 was at least $4.5 million.

Since the program began in 2008, approximately $1.74 million in federal funds have been expended in incentive payments. The cost of the program also included $551,000 in administrative costs during the start-up and expansion years of 2008 and 2009. Since inception, TRIP has been activated and towing companies compensated an average of 87 times per year, ranging from 26 to 142 (see **Exhibit 7**). Total incentive payments ranged from a low of $84,000 in fiscal year 2010 to $339,320 in fiscal year 2015. There are activations each year that do not result in payments to the towing companies. As noted above, TRIP does not make payment if the roadways are not cleared within established timeframes. The number of unpaid activations ranged from 2 in fiscal year 2010 to 27 in fiscal year 2016.

Exhibit 7
TRIP Activations and Payouts Vary; Fiscal Years 2009-2016



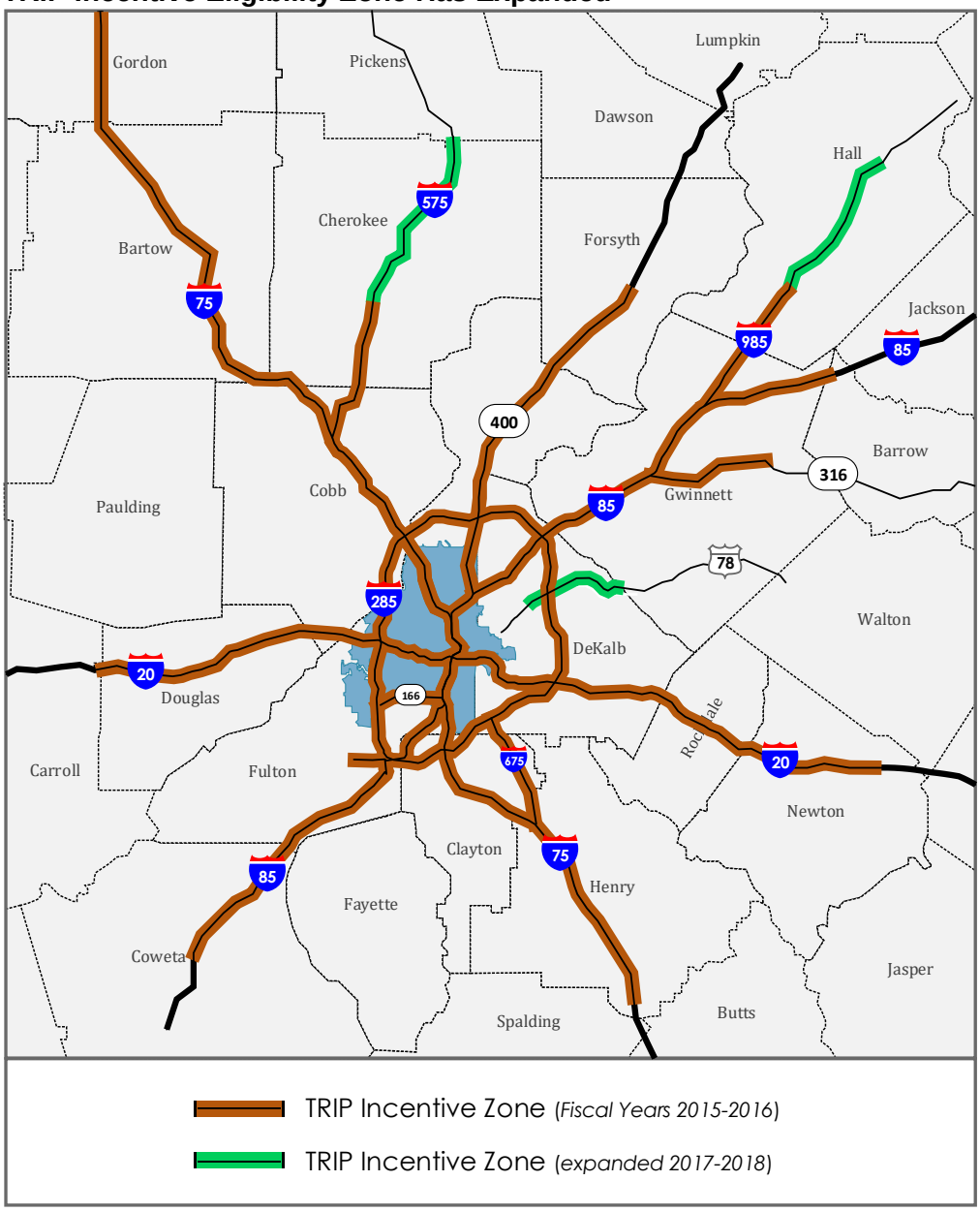
Source: GDOT

When the TRIP program began, eligible areas included I-285 and all interstates inside I-285. In 2009 and 2010, GDOT expanded coverage to stretches of I-75 and I-85 north and south of the perimeter and I-20 East and West (see **Exhibit 8**).

HERO operators support the authorization of TRIP incidents and HERO personnel serve on the TIME Task Force. According to GDOT, HERO Master Operators (which are the most senior operators on staff) and Supervisors authorize TRIP activation. Incidents involving commercial vehicles are declared "TRIP eligible" if the local police or HERO operator at the scene agree. Additionally, if HERO is unavailable, local police can authorize TRIP by contacting the TMC. According to TMC staff, each local government managing law enforcement entities along the TRIP routes are required to sign the Georgia Open Roads Policy. [4]

[4] Georgia Open Roads Policy is a TIME initiative. This statewide agreement is between local police, fire, and other emergency responders. It states that the local government has agreed that it will quickly clear travel lanes within its jurisdiction when an incident occurs.

Exhibit 8
TRIP Incentive Eligibility Zone Has Expanded



Source: GDOT

Funding

The HERO Program is primarily funded with a combination of federal funds from the National Highway Performance Program and private funds from a five-year contract with State Farm Insurance (see **Exhibit 9**). In May 2009, State Farm began sponsoring the HERO Program in exchange for advertising on all HERO vehicles and uniforms. The contract required State Farm to pay $8.76 million over a five year period; $1.7 million per year for the first three years, and $1.825 for the remaining two years. The contract was extended in 2014 for $1.95 million per year. These funds are used to meet the 20% match required to draw federal transportation funds for the program.

The HERO program cost, on average, approximately $9.6 million per year to operate during fiscal years 2015 to 2018, but additional costs were incurred for the repair and replacement of HERO vehicles. For example, in fiscal year 2017, GDOT spent over $6 million to order 40 new HERO trucks for program expansion and to replace older vehicles.[5]

Exhibit 9
HERO Program Fund Sources and Expenses, Fiscal Years 2015-2018

Fund Sources	2015	2016	2017	2018[1]
Federal	$6,394,358	$8,730,657	$13,548,223	$11,066,747
Motor Fuel	-$40,278	-$292,240	$118,858	$3,410,271
Other	$1,681,608	$1,937,049	$3,265,231	$1,786,485
State Farm Sponsorship[2]	$1,339,683	$1,944,201	$3,263,693	$1,781,716
Other	$341,925	-$7,152	$1,538	$4,769
State	$17,213	$10,861	-$686	$0
Total	**$8,052,901**	**$10,386,328**	**$16,931,625**	**$16,263,504**
Expenses				
Personal Services	$4,649,114	$4,711,270	$5,430,641	$6,646,564
Regular Operating	$2,394,610	$1,963,102	$2,174,987	$2,635,385
Motor Vehicles[3]	$182,277	$2,365,647	$6,564,700	$2,310,982
Equipment	$0	$0	$34,666	$0
I.T.	$622,990	$638,914	$275,311	$58,372
Voice/Data Comm.	$124,553	$304,864	$143,759	$229,655
Capital Outlay	$0	$17,603	$0	-$14,495
Contracts	$79,357	$384,927	$2,307,560	$2,397,040
Other[4]	$0	$0	$0	$2,000,000
Total	**$8,052,901**	**$10,386,328**	**$16,931,625**	**$16,263,504**

[1]Unaudited.

[2]In 2009, GDOT began a sponsorship agreement with *State Farm Insurance Co.* and the HERO program. Based on the most recent agreement, *State Farm* pays $1.95 million per year to GDOT for advertising on HERO vehicles. These funds are generally used to satisfy the state's match requirement for federal funds to operate the program.

[3]Purchase and outfitting of new HERO vehicles. 60 new HERO operator vehicles were purchased and outfitted during fiscal years 2016 to 2018 using a mix of federal and other funds. These vehicles have been used to replace aging fleet and expand services.

[4]Funds for the expansion of HERO facilities in Cobb County to support units operating in the Northwest area.

Source: *TeamWorks*

From 2009 to 2014, TRIP received approximately $380,000 per year from the Congestion Management and Air Quality (CMAQ) grant program to fund incentive

[5] These funds supported the March 2017 expansion of the patrol area north on I-575 and I-985, south on I-75, and southeast on I-20

payments to pre-approved towing companies that meet the response requirements. [6] In fiscal year 2015 and 2016, the allotment increased to $530,000 and $500,000, respectively. There have also been additional TRIP expenses over the life of the program, such as for initial launch of the program, administration, outreach, and planning.

Other States

TIM strategies such as HERO and TRIP are recommended by the FHWA as effective congestion mitigation tools and freeway service patrols have been in use since 1960. A 2008 study of FSPs nationwide found that at least 40 states have similar service patrol programs operating in medium to large urban areas.

While these programs operate on similar principles of traffic incident management, there are differences in how patrols are administered and delivered. For example, 39% of FSP programs surveyed contract with private vendors to provide the patrol services. Program administration also varies. We found that approximately 61% of patrol programs surveyed were operated by the state transportation agency while 25% are operated by local municipalities or the area metropolitan planning organization (MPO). MPOs are regional authorities vested with transportation planning responsibilities for a region encompassing multiple local governments. For a map of Georgia's MPOs, see Appendix D. There are also volunteer programs and private programs. For example, since 1978, CVS Health (parent company of CVS pharmacy) has operated CVS Samaritan Vans in nine cities at no charge to the public. The vans operate on select roadways and are reportedly offered as an advertising vehicle for CVS stores.

How states and local governments operate towing and towing incentive programs to ensure that they are fast and efficient at roadway clearance also varies. For example, at least one locale was found to have an extensive towing program employed to remove *all* identifiable vehicles, debris, etc. from travel lanes as quickly as possible. In this model, contracted tow companies or state-managed operators remove all disabled vehicles as quickly as possible off the freeways, regardless of the vehicle owner's wishes. Motorists are charged a fee for the tow (for example, a flat rate of $60 is charged in Houston) and cannot legally refuse the tow, or the fee, or their car will be impounded. Finally, in some states, towing companies are required to seek compensation from owners' insurance companies for the cost of every tow initiated to clear the travel lanes.

[6] The CMAQ grant is managed by FHWA and has a 20% state match requirement. For the $380,000 awarded annually from 2009 to 2015, the state match was $76,000; federal was $304,000. In fiscal year 2016, the state match increased to $100,000, federal to $400,000.

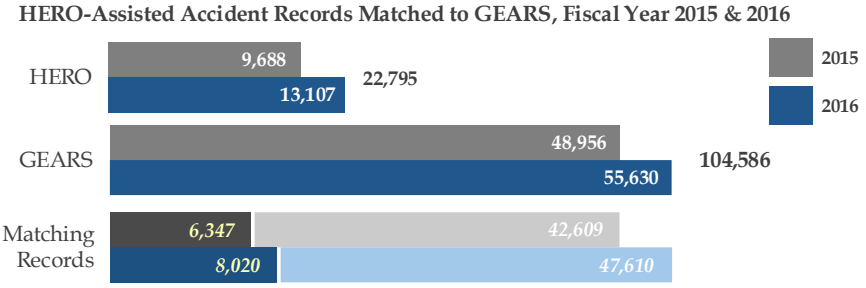
Findings and Recommendations

Finding 1: HERO may be able to optimize accident response through changes to deployment, expansion, or both.

Currently, there are more accidents occurring on HERO-patrolled routes than the program is addressing. To determine HERO's coverage of traffic accidents in the Atlanta area, we compared data from the Georgia Electronic Accident Reporting System (GEARS) to the Program's records.[7] HERO assisted 22,795 accidents during fiscal years 2015 and 2016; during the same period, 104,586 accidents were reported to GEARS as occurring on HERO-patrolled routes. Based on a geospatial match of records from both databases, 14% (14,367) of GEARS-recorded accidents were assisted by HERO (see **Exhibit 10**).[8] For every one accident assisted by HERO during this period, there were 4.6 accidents reported to GEARS. (See Appendix E for an example of geographic accident data.)

Not all accidents will require HERO assistance. However, studies of the effects of accidents on freeway capacity have found that accidents result in reduced roadway capacity of 50% or more. Given the gap between accidents reported and assisted, and the potential for roadway impacts of these accidents, it is reasonable to conclude that HERO assistance would have proven beneficial in a percentage of the 90,000 unassisted accidents. The HERO program has grown steadily since inception, adding operators, trucks and patrol routes. Additional expansion may be necessary to address this gap in service; however, other potential causes for the gap should be explored as well.

Exhibit 10
14% of GEARS-Reported Accidents Received HERO Assistance, Fiscal Years 2015 - 2016



Total Matching Records: 14,367 (14% of GEARS Records (104,586))

[1]Atlanta: The above HERO and GEARS-reported incident counts are limited geographically to the major highways and state routes in the Atlanta area patrolled by the HERO unit during fiscal years 2015 & 2016.

[2]HERO-Assisted Accident Matches: The number of GEARS-reported incidents also assisted by HERO. Incidents from both databases matched using geospatial mapping and a comparison of reported dates and times.

Source: GDOT ATMS and GEARS data

[7] The Program's records are maintained in the Advanced Transportation Management System (ATMS). Only traffic incidents identified by TMC staff or HERO operators are included in ATMS. GEARS includes records of all accidents reported by law enforcement officials statewide.

[8] Not all accidents reported to HERO require law enforcement intervention and not all accidents that law enforcement responds to require HERO assistance. Therefore, a 100% match was not expected.

GDOT should confirm that HERO's deployment of current resources is appropriate. It should ensure the deployment is maximizing its impact on traffic incidents that cause the greatest delays. Each of these areas is discussed in more detail in the following sections. In addition to assessing coverage and deployment, GDOT should also determine the amount of coverage HERO should provide and consider setting appropriate benchmarks or targets. For example, it could identify a percentage of incidents or accidents that it seeks to cover or the degree of congestion reduction it seeks to achieve. The GEARS data could be a useful tool in assessing the current coverage for setting these types of metrics.

Deployment of existing resources

Currently, GDOT does not analyze its data to determine how many assists are occurring by roadway or HERO unit to determine if variations in coverage are appropriate. It is reasonable to expect that some roadways or shifts would experience higher incident rates due to increased traffic; however, it is also reasonable to expect that these variations would be considered in deployment decisions. According to HERO management, it relies on the number of motorist requests for assistance per roadway to guide its deployment. We analyzed deployment by roadway and HERO unit and found coverage varied significantly by roadway and by unit, but absent goals or targets for coverage and operator activity, it is not clear whether these observed variations are reasonable.

Using GEARS data to determine the number of traffic accidents by roadway, we analyzed how many of these HERO assisted with and whether the assistance reflected the volume of accidents by roadway. As expected, the number of accidents varied by roadway, as did the assistance. For example, during fiscal year 2016, the number of accidents reported ranged from 8,628 on I-85 North to 374 on I-675 (see **Exhibit 11**). HERO's rate of assistance for these accidents ranged from 2% to 29% depending on the roadway. However, the roadways with the most accident activity were not the roadways with the most HERO assistance. For example, I-75 South was one of the top five roadways for accidents in both fiscal year 2015 and 2016, accounting for approximately 4,000 accidents each year. However, HERO assistance was provided in only 5% and 8% of the accidents, respective to each year. Assistance coverage changed over the period as well. For example, accident coverage by HERO on I-285 Northeast dropped by 6.7% (from 22% coverage to 15%) from fiscal year 2015 to 2016, but coverage on I-285 Southeast increased by 7.1% during the same period (from 12% coverage to 19%).

Exhibit 11
Rate of Assistance Varied by Roadway from 2% to 29%
Fiscal Years 2015 - 2016

	Roadway	Fiscal Year 2015 GEARS[1]	Fiscal Year 2015 HERO[2]	Fiscal Year 2015 % Assisted by HERO	Fiscal Year 2016 GEARS[1]	Fiscal Year 2016 HERO[2]	Fiscal Year 2016 % Assisted by HERO
Top 5 Roadways for Accidents	I-85N	7,756	1,039	13%	8,628	1,274	15%
	I-75/85	5,793	1,392	24%	7,220	2,109	29%
	I-75N	4,793	493	10%	6,283	754	12%
	I-75S	4,208	205	5%	4,325	329	8%
	I-20E	3,970	476	12%	4,506	562	12%
	I-285NW	3,737	537	14%	4,211	604	14%
	I-285NE	3,489	759	22%	4,074	615	15%
	SR-400	3,437	360	10%	3,595	361	10%
	I-20W	2,656	309	12%	2,994	324	11%
	I-285SE	2,357	276	12%	2,859	537	19%
	I-85S	1,698	131	8%	1,676	114	7%
	I-285SW	1,649	181	11%	1,504	245	16%
	I-575	984	29	3%	1,064	34	3%
	US-78	858	52	6%	971	57	6%
	Other[3]	726	78	11%	819	64	8%
	I-985	431	8	2%	527	13	2%
	I-675	414	22	5%	374	24	6%
	Totals	48,956	6,347	13%	55,630	8,020	14%

[1] All traffic accidents assisted by law enforcement and reported to GDOT's GEARS accident database and occurring on the above roadways within the area patrolled by HERO.

[2] Accidents assisted by HERO operators matching the GEARS incidents by date, time, and location. NOTE: HERO units also assisted additional accidents that did not match one reported by law enforcement.

[3] Includes incidents occurring on SR-14, SR-166, and SR-316.

Source: DOAA Analysis of GDOT ATMS and GEARS Data

We also analyzed information on activity by individual HERO unit. As with coverage by roadway, the data showed variation. Absent goals or additional information on the underlying causes for the variation, it is not possible to determine whether the observed variation is appropriate.

During fiscal year 2016, the number of traffic incidents units assisted with per day ranged from 1 to 40. In fiscal year 2015, it ranged from 1 to 47. Overall, individual HERO units averaged 10 assists per day; the majority of which were for motorist assistance calls (see **Exhibit 12**). In fiscal year 2016, the HERO Program worked an average of 282 incidents in a 24-hour period.

Exhibit 12
Number of Assisted Incidents per HERO Unit per Day Varied by Year and Type of Incident
Fiscal Years 2015 - 2016

	FY2015	FY2016
All Traffic Incidents		
Individual Unit Average	10	10
Individual Unit Range	1 - 47	1 - 40
Program Average	293	282
Program Range	1 - 556	7 - 438
Accidents Only		
Individual Unit Average	2	2
Individual Unit Range	1 - 11	1 - 15
Program Average	27	36
Program Range	1 - 79	1 - 93
Motorist Assistance Only		
Individual Unit Average	9	9
Individual Unit Range	1 - 38	1 - 35
Program Average	249	234
Program Range	1 - 497	6 - 375

[1]The above figures represent the average number and range of assisted traffic incidents for an individual HERO unit (vehicle) (the "Individual Unit" Average and Range) and for all HERO vehicles combined (the "Program" Average and Range) for a 24-hour period.

Source: GDOT ATMS Data

Maximizing Impact

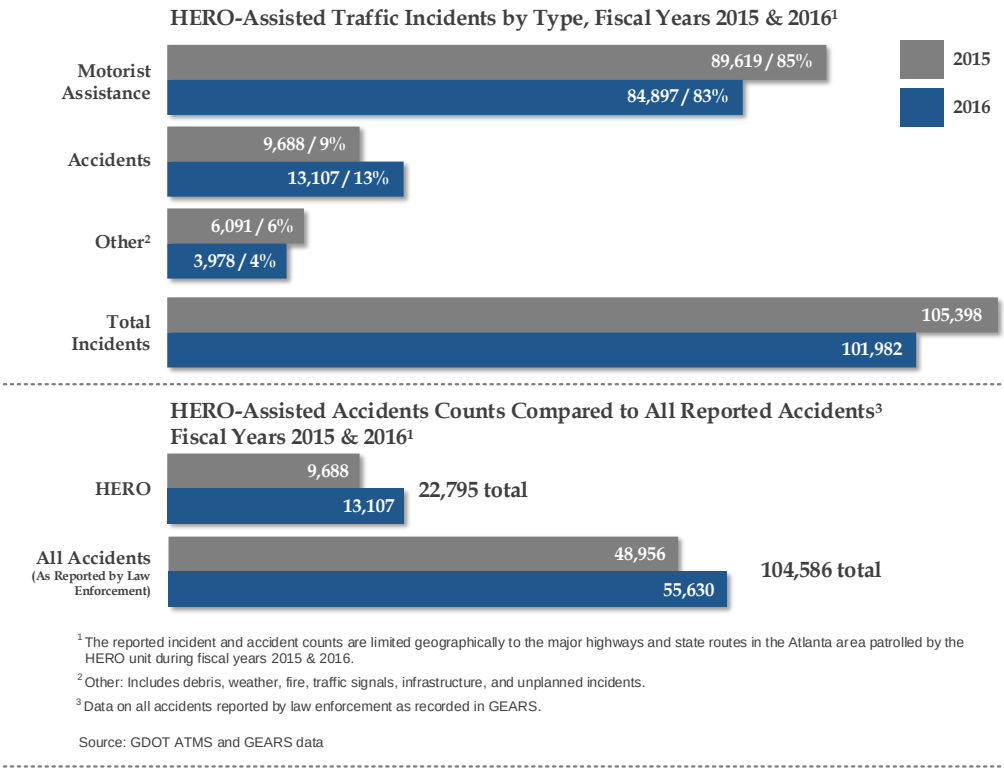
According to the Program, its primary responsibility is to reduce congestion caused by lane-blocking incidents; its secondary responsibility is to attend to stranded motorists by providing assistance such as changing flat tires or providing fuel. Analysis of HERO-assisted incidents confirmed that accidents resulted in a greater percentage of available traffic lanes being blocked, and for a longer period of time, than incidents involving motorists needing assistance (see Appendix F), supporting the unit's primary mission. However, as shown in **Exhibit 13**, the majority of calls HERO responded to were for motorist assistance not accidents.

An analysis of HERO-assisted traffic incidents during fiscal years 2015 and 2016 found that 84% of HERO assistance activity was dedicated to assisting stranded motorists, while traffic accidents made up 11% of HERO assists (see **Exhibit 13**). In fiscal year 2016, the Program increased the number of accidents assisted by 35% (from 9,688 in 2015 to 13,107 in 2016). During the same period, the number of motorist assists decreased by 5% (from 89,619 to 84,897). GEARS-reported accidents also increased by 14% during the same period (from 48,956 to 55,630).

According to staff, HERO operators are dispatched by the GDOT TMC to incidents that cause a disruption in the travel lanes or, when no such incidents are present, to

assist motorists. Motorist assistance is a valid use of HERO resources, and arguably prevents accidents from occurring. In addition, there appears to be a significant need for these types of services based on the number of calls received. However, utilizing more complete accident data could make more transparent those opportunities for putting greater focus on accident assistance.

Exhibit 13
Most HERO Assisted Incidents were for Motorist Assistance
Fiscal Years 2015 - 2016



[1] The reported incident and accident counts are limited geographically to the major highways and state routes in the Atlanta area patrolled by the HERO unit during fiscal years 2015 & 2016.

[2] Other: Includes debris, weather, fire, traffic signals, infrastructure, and unplanned incidents.

[3] Data on all accidents reported by law enforcement as recorded in GEARS.

Source: GDOT ATMS and GEARS data

HERO Benefits

While GDOT has not conducted a cost-benefit analysis of the HERO program specifically, in the past it has studied the benefits of the overall ITS system, NaviGAtor, including HERO[9] intervention, and found that, on average, NaviGAtor and HERO reduced the duration of traffic incidents by an average of 46 minutes (from 67 minutes to 21 minutes). NaviGAtor reduces the time taken to detect incidents and HERO the time to remove incidents from the roadways. The 2006 analysis estimated that NaviGAtor and HERO provided a 4.4:1 benefit-to-cost ratio (for every dollar spent on the program, $4.40 is returned in fuel/delay savings) and an annual savings of $187 million per year. GDOT has not measured the cost-benefit of HERO specifically, or measured the benefits of NaviGAtor since this review. A current assessment of HERO's benefits would provide GDOT with more information to determine whether expansion is warranted and how much.

[9] *Benefits Analysis for the Georgia Department of Transportation NaviGAtor Program, Final Report, August 2006*

There have been multiple studies of the effects of freeway service patrols on traffic incidents. A study by the I-95 Corridor Coalition found that patrols improved incident clearance times by an average of 20 minutes. [10] A 2008 Vanderbilt University study[11] of freeway service patrols similar to HERO found the benefit-to-cost ratio ranged between 4.6:1 and 42:1 based on total program costs. Estimated benefits attributed to these types of programs ranged from $10 million to over $100 million per year in savings due to reduced delays, fuel consumption, and emissions. [12] Given the impact HERO can have on, and the significant costs related to, congestion in the Atlanta area, it is worth determining whether additional resources or redeployment of existing resources can provide further relief.

Atlanta's congestion problem is significant. According to the Texas Transportation Institute's (TTI) *2015 Urban Mobility Scorecard*, Atlanta ranks 12 of 101 large urban areas for overall minutes of delay per commuter per year and annual congestion cost approximately $3.2 billion. It estimated these delays cost Metro Atlanta commuters an additional $1,130 per person per year in time and fuel. The Texas A&M Transportation Institute estimates that every hour of congestion costs drivers, on average, between $18-$94 in lost wages and fuel. As a result, programs that reduce congestion and delays provide a cost savings for drivers.

RECOMMENDATIONS

1. GDOT should utilize available data to determine whether current deployment of HERO resources is appropriate, where gaps in coverage exist, and whether additional resources are needed.

2. GDOT should routinely determine the cost-benefit of the HERO Program.

3. GDOT should establish benchmarks that address individual HERO unit performance as well as coverage of various roadways.

4. GDOT should analyze and monitor the performance of the individual HERO units based on program benchmarks and goals.

GDOT's Response: *GDOT expressed concern over our use of GEARS data to evaluate deployment, citing the differences between the two databases. It noted that HERO response time is "driven on real time deployment to incidents however the GEARS data is useful in the overall deployment strategy." GDOT noted that it is "committed to continually examine HERO routing and deployment to best optimize the program." It agrees that continual evaluation of the value of the HERO program is important and noted that it "believes that the value of the program is effectively established through active management of monthly performance metrics and assistance surveys," which establish the value of HERO to the state. It agreed that a benefit-cost ratio could be an effective tool to demonstrate value, but expressed concern over the reliance on multiple assumptions. With regard to benchmarks, GDOT noted it has implemented tracking of benchmarks within the last year and program level performance management has been in place.*

---

[10] *Benefits Of Highway Service Patrols, H.E.L.P. Program Evaluation: Benefit/Cost Analysis, 2008*

[11] *Overview of Freeway Service Patrols in the United States, 2008*

[12] The cost-benefits of freeway service patrols are dependent on the size of the program, coverage area, and number/frequency of incidents.

Auditor's Response: *We agree the GEARS and ATMS systems are different. The overlay of assists with reported accidents was intended to identify where accidents are occurring and provide information that could be used to inform strategic deployment decisions, current and future, to facilitate reaching a larger number of accidents.*

Finding 2: HERO's turnover rate among new staff is costly and could impact its ability to meet its mission.

During fiscal year 2016, HERO hired and trained 44 new operators; as of July 2017, 22 had left the unit. [13] Turnover is expensive in terms of onboarding and training costs. It may also affect the unit's ability to respond quickly and effectively to incidents.

According to management, it takes from seven to ten months to train a HERO operator at a cost of $15,500 to $22,100 (depending on the timeframe).[14] The process begins with individuals passing state and federal background checks as well as a drug test. Afterwards, they undergo six months of classroom training and one to four months of in-vehicle training (riding along with an experienced driver). Historically, trainees were required to take and pass the Commercial Driver's License (CDL) test within six months of their hire date. Once trainees pass the test, the Program reimburses them for the cost of the CDL permit and license, which is approximately $50. Effective March 2018, they are no longer required to obtain the CDL; however, they must still complete the training. In addition to the salary and time spent, the classroom training also has a value. While Georgia regulations do not require CDL applicants to take a driver training course, such courses are recommended. HERO has not estimated the cost of the training it provides. However, private companies also offer CDL training classes that meet these requirements; the cost per class ranges from $1,200 to over $3,000.

In addition to the cost of turnover, there is a risk of continually having inexperienced operators on staff. According to management, because of their lack of experience, new operators may not be able to handle a scene as quickly or adeptly as experienced operators, leading to lost time due to longer incident duration and additional congestion costs.

There are several potential causes for the high turnover, including a hazardous work environment and low pay compared to similar positions in other industries. HERO unit drivers work close to high-speed traffic in and out of travel lanes, which can lead to injuries. During the last quarter of 2016 (October 1 to December 31), seven operators were injured on the job and were unable to patrol. There are also two operators with long-term injuries from previous periods.[15] HERO's annual starting salary of $26,500 may also contribute to turnover. As noted earlier, HERO training allows operators to test for the CDL and the training is provided at no charge. HERO management has not conducted any comprehensive review to determine whether operators are using the training to obtain the CDL and leaving to take a more lucrative job that requires this

[13] New hires are individuals undergoing preliminary training prior to becoming a HERO operator.

[14] Cited cost is based on salary. Additional costs to the unit include: background check, drug test, and reimbursement of the costs to obtain a Commercial Driver's License.

[15] As of January 2017, 8 of 9 drivers were still on administrative leave or restricted duty.

license. In order to address turnover, the Unit needs to determine why it is occurring and identify potential solutions to address the root causes.

RECOMMENDATION

1. GDOT should institute exit interviews to identify reasons for departure and/or a satisfaction survey of current staff to identify potential areas for improvement.

GDOT's Response: *GDOT indicated that it has taken actions to address recruiting and retention. It has conducted salary analyses and conducts an annual survey for all employees focusing on job satisfaction.*

Finding 3: HERO operators have complied with safety and training requirements.

In order to be a HERO operator, candidates must pass state and federal background checks, pass a drug test and complete six months of classroom training. According to the HERO Program, all operators have met the requirements of the background check and completed the classroom training. Additionally, all had met the drug test requirements as of January 2018. Operators are required to inform management if they lose their license or have points assigned to their license. According to HERO Program management, the operators driving records are reviewed monthly to ensure that drivers have satisfactory driving records.

Finding 4: Performance appraisals could be improved with additional information and additional goals.

While the HERO Program has established minimum performance standards for all staff and annually evaluates performance against these criteria, the program has not incorporated traffic incident management-specific metrics into operator evaluations. As discussed below, the current evaluation focuses on technical proficiency, compliance with policies, and vehicle care and maintenance. The appraisal does not include measures of the operator's effectiveness or efficiency related to incident management or an evaluation of the services provided to the public.

The HERO appraisal currently includes a 15-point document outlining expectations ranging from observing traffic flow to properly maintaining their vehicle. Annually, HERO unit management evaluates operators on their ability to, among other things:

- analyze a situation and develop a plan for removing an incident;
- inspect their own vehicle for proper operating condition and perform routine maintenance;
- assist motorists with disabled vehicles on the interstate;
- observe traffic and report to TMC as appropriate;
- maintain their certification; and,
- use proper emergency response methods when responding to an incident.

HERO management does not monitor or analyze incident management performance by individual operator as part of operator evaluations nor does it use such data to set performance goals/targets for operators. The effectiveness and efficiency of the operators is a key factor in ensuring that the program meets its objectives to reduce incident response time and incident duration. In order to include such targets, HERO management would have to establish measurable goals and objectives for the program.

In addition, HERO management does not include all public comments it receives as part of the appraisal process. Individual comments from motorists may or may not be included in an operator's appraisal, but the overall number, type, or subject of such comments is not monitored or analyzed by the program. While GDOT's TMC and State Farm Insurance receive comments from the public on behalf of the HERO program, the Program does not have a process for compiling and applying such feedback.

From January 2015 to October 2016, the State Farm Insurance website (assistpatrol.com) received approximately 1,100 comments from motorists. While less than 1% of these comments were categorized as unfavorable, collecting such information could still be useful in ensuring proper training and compliance with state requirements.[16] Systematically collecting such information could inform assessments of the HERO operators' training, and ensure that the HERO personnel maintain high ethical standards while in the field. According to HERO management, revisions to performance appraisals are being considered.

By including such indicators in HERO evaluations, the program could ensure it has a complete picture of the operator's performance that aligns with the goals and objectives of the program.

RECOMMENDATIONS

1. GDOT should include customer service measures informed by public input, and measures that reflect goals and objectives of the program, in its performance appraisals.

2. GDOT should establish activity and/or performance targets for individual HERO operators.

GDOT's Response: *GDOT indicated that, within the last year, it "has instituted objective performance metrics into annual reviews," which are reflective of the overall goals and objectives of the programs. Customer service surveys are distributed as a component of the State Farm partnership and these surveys are used for operator recognition.*

[16] Motorist comments, including compliments and complaints are submitted to the program via direct-mailed letters, calls to the TMC, comments submitted to the GA 511 website, and via surveys submitted to State Farm's assistpatrol.com website.

Finding 5: The HERO Program has not established complete policies and procedures for managing its fleet.

To manage its fleet effectively, HERO must ensure trucks are appropriately equipped to conduct the necessary activities. In addition, management must repair and replace vehicles as necessary. As of the time of this report, HERO had not established any internal policies for tracking necessary repairs or repair costs, nor did the program have polices detailing when fleet vehicles would need to be replaced. It should be noted that the Office of Planning and Budget (OPB) sets policies for the replacement of state vehicles and allowed a threshold of 5-7 years for the HERO program due to the extreme wear they receive. Currently, the HERO Program does not monitor the repair costs by individual truck or for the unit as a whole.

Assessing the Adequacy of the Fleet

HERO purchased 40 new vehicles in fiscal year 2017 to replace aging fleet and provide expanded coverage for the new GDOT managed lanes on I-75 North and I-85 South. These newer models have lower profiles and do not include fuel recovery systems (see **Exhibit 14**). This represented a change in truck configuration from the Ford F-450 diesel units with service boxes that make up the majority of the fleet. Each F-450 carries a fuel-recovery system for removing fuel from vehicles that have been in a traffic incident and leakage or fire is a risk. However, because this system is primarily used during commercial vehicle incidents, HERO personnel report that they seldom use this equipment as wrecker companies provide this service. Prior to the purchase of Ford F-550 gas units in fiscal years 2016 and 2017, the last time GDOT assessed the overall format and equipment of the HERO trucks was 1996.

Exhibit 14
New HERO Vehicles were Purchased in 2016 and 2017

Source: GDOT

Repairs to Fleet

The HERO Program spent at least $900,000 per year in fiscal years 2015 and 2016 (11% of annual unit expenditures minus purchases of new vehicles) on vehicle repairs, including parts and supplies. However, information on repairs to HERO vehicles is incomplete for January-December 2016. Information is supposed to be entered into and maintained in the Georgia Asset Management System (GAMS) by the entity responsible for identifying and managing the repairs, the GDOT Office of Equipment Management (OEM). During this time, HERO had a staff person assigned to manage the fleet; he determined when repairs were needed and which vendor would do the work. However, he did not consistently enter the information into GAMS.

In June 2016, we found that 49 of the unit's 111 HERO operator trucks (44%) were inoperable or out of service due to unrepaired mechanical or other issues. [17] When we attempted to compile a record of repair costs for individual trucks, we were unable to do so because of the lack of complete entry into GAMS. Because of this gap, HERO does not have a complete electronic record for repairs to all trucks. It should be noted that in September 2016, OEM began to work the backlog of HERO vehicles needing repair and by December took back responsibility for managing the HERO fleet. According to OEM staff, it had eliminated the backlog of HERO vehicle repairs by the end of December 2016. According to staff at OEM, the trucks continue to require frequent repair for all components related to the fuel systems in the trucks using diesel fuel.

Replacement of Fleet

OPB's policy states that state agencies seeking to replace existing vehicles should do so after the vehicle reaches 135,000 miles or 10 years. As of March 2017, of the 118 operable HERO vehicles, 60 have been in service more than 7 years and 74 were over 135,000 miles. Of the 118 trucks, 37 (31%) have 200,000 or more miles.[18] Personnel at HERO and OEM have attributed many of the repairs issues to problems with the durability of the HERO trucks' diesel engines. The trucks also operate in a harsh environment, covering over 300 miles a day with quick stops and starts. Since 2017, the program has purchased a total of 60 new gasoline-powered HERO trucks for use on additional routes and to replace the oldest service vehicles. The HERO Program used, on average, 283,000 gallons of fuel per year during fiscal year 2015 and 2016, at a cost of $816,000 and $550,000 respectively. In addition to mileage or age, other factors such as frequency of repair and operating costs should influence replacement decisions.

RECOMMENDATIONS:

1. GDOT should assess the suitability of the current fleet of trucks and determine if new trucks should be equipped differently.
2. GDOT should ensure cost related to maintenance and repairs for the HERO fleet are routinely monitored.
3. GDOT should ensure policies are established to govern purchase and replacement for the HERO fleet.

[17] The HERO Program had a total of 116 vehicles; 99 HERO box trucks (Ford-450 and International Terrastars), 12 Ford-250s (field supervisors), and 5 Ford Expeditions (management).

[18] No mileage data was available for 10 of 118 vehicles.

GDOT's response: *GDOT indicated an assessment of suitability is underway. It noted that "new vehicles currently being purchased differ from those of prior years as the Department works to refine the efficiency, effectiveness, and safety of the fleet". It also noted that it has engaged a private sector, third party company to assist in managing the fleet maintenance and repair needs. It also indicated its agreement that the fleet should be managed in accordance with OPB and GDOT policy. It is currently working to expand the size of the fleet. GDOT indicated purchases are challenging given the need for a Federal Buy American waiver, as all candidate fleet vehicles are subject to this requirement*

Finding 6: The HERO program's controls over equipment and supply inventory do not provide sufficient protection against misuse.

HERO unit management does not effectively control access to supplies. In addition, it does not routinely verify supply counts with usage records for supplies kept at HERO headquarters to stock the HERO vehicles. The HERO unit expended $430,000 in fiscal year 2016 on supplies for HERO operators, including tools, uniforms, and traffic cones, which represents 4% of its $10.4 million in annual expenditures. However, the HERO unit also stocks tools such as vehicle jacks and emergency medical equipment such as Automated External Defibrillators (AED), bandages, and tourniquets. These supplies are stored at the headquarters office, behind a locked chain link fence. See **Exhibit 15**. It should be noted that during the audit, the flares were moved to an alternate location, along with the unit's tank for holding recovered fuel.

Exhibit 15
HERO Program Supplies

Water	Oil Dry	Rubber Gloves
Road Flares	Brake Fluid	Safety Gear
Tires	Operator uniforms	Transmission Fluid
Emergency Medical Supplies	Tools	Wipes
	Gas Cans	Traffic Cones

Source: HERO Program & TeamWorks

Management has not established a written set of policies guiding the storage and use of supplies used by the operators. As a result, operators determine their own needs, request access to the supply area from an assistant manager, and take the necessary supplies without supervision. Operators are supposed to sign a hard-copy form indicating supplies taken and how many of each but there is no regular supervision of this process. There is no assurance that the form is being used appropriately and that all items are recorded as they are removed. The form does not have to be witnessed and signed by anyone other than the operator.

According to management, the supply inventory is not reconciled with usage. Previously, a Fleet Coordinator ordered and stocked the supplies; he was transferred to another GDOT facility in October 2016. While management indicated they do reconcile supplies with purchases, there is no inventory against usage.

RECOMMENDATION

1. GDOT should establish controls over supply management (inventory, monitor, checkout and use per operator, etc.) to ensure staff adhere to policies.

GDOT's response: *GDOT indicated that specific policies governing supply management are included within the HERO standard operating procedures. GDOT will examine specific controls governing supply management.*

Finding 7: Expansion of TRIP may be warranted; GDOT should analyze information to determine how much to expand the program.

Our review indicates GDOT should consider expanding use of the TRIP program. TRIP assisted in approximately 136 (6%) of the 2,408 incidents involving tractor-trailers and other commercial vehicles recorded by GDOT as occurring on roadways patrolled by the HERO Program during fiscal year 2016. These figures suggest that additional or expanded services would continue to provide additional congestion relief. The TRIP program is primarily funded with federal funds from the Congestion Mitigation and Air Quality (CMAQ) program. Some state funds are also required.

As noted earlier, Atlanta ranks 12th among urban areas for overall minutes of delay per commuter per year at an estimated cost of approximately $3.2 billion. A 2011 study conducted by GDOT found the TRIP program has an 11:1 benefit-to-cost ratio, reducing average roadway clearance times caused by incidents involving commercial vehicles (e.g., tractor-trailer trucks) by 165 minutes. Faster clearance resulted in a calculated benefit of approximately $4 - $9 million.

Currently TRIP is used in commercial vehicle incidents; the types of incidents include roll-over crashes, multiple truck crashes, a jack-knifed tractor trailer, an inoperable truck, lost or shifted loads, vehicle fires, and crashes that result in major impacts with guard rails or bridge supports. GDOT could expand the program to include incidents involving non-commercial vehicles and/or additional types of incidents such as disabled large trucks or trailers. Our review of other states found that similar programs are used in conjunction with freeway service patrols to ensure the quick clearance of commercial incidents. Making such changes may require adjustments to how GDOT uses CMAQ funding.

RECOMMENDATIONS

1. GDOT should analyze additional HERO and TRIP activity data already available to ensure that HERO and TRIP are achieving efficient and effective results.
2. GDOT should use the above analysis to set baselines and performance expectations for both programs.
3. GDOT should use the above information to determine if and how the program should be expanded.

GDOT's response: *As noted in the report, GDOT most recently adjusted TRIP coverage areas during calendar year 2018. It noted its commitment to "continually examine HERO (and TRIP) routing and deployment to best optimize the program." It indicated it is hesitant to advocate for TRIP expansion as described; however, it is considering expanding TRIP to other geographic areas for potential management under CHAMP. GDOT indicated a "key element of this expansion would be assessment of the capability and capacity of the statewide towing industry" to determine whether they have the necessary equipment to meet TRIP requirements.*

Appendix A: Table of Recommendations

Finding 1: HERO may be able to optimize accident response through changes to deployment, expansion, or both.
1. GDOT should utilize available data to determine whether current deployment of HERO resources is appropriate, where gaps in coverage exist, and whether additional resources are needed. 2. GDOT should routinely determine the cost-benefit of the HERO Program. 3. GDOT should establish benchmarks that address individual HERO unit performance as well as coverage of various roadways. 4. GDOT should analyze and monitor the performance of the individual HERO units based on program benchmarks and goals.
Finding 2: HERO's turnover rate among new staff is costly and could impact its ability to meet its mission.
5. GDOT should institute exit interviews to identify reasons for departure and/or a satisfaction survey of current staff to identify potential areas for improvement.
Finding 3: HERO operators have complied with safety and training requirements.
No recommendations
Finding 4: Performance appraisals could be improved with additional information and additional goals.
6. GDOT should include customer service measures informed by public input, and measures that reflect goals and objectives of the program, in its performance appraisals. 7. GDOT should establish activity and/or performance targets for individual HERO operators.
Finding 5: The HERO Program has not established complete policies and procedures for managing its fleet.
8. GDOT should assess the suitability of the current fleet of trucks and determine if new trucks should be equipped differently. 9. GDOT should ensure costs related to maintenance and repairs for the HERO fleet are routinely monitored. 10. GDOT should ensure policies are established to govern purchase and replacement for the HERO fleet.

Appendix A: Table of Recommendations continued

Finding 6: The HERO program's controls over equipment and supply inventory do not provide sufficient protection against misuse.
11. GDOT should establish controls over supply management (inventory, monitor, checkout and use per operator, etc.) to ensure staff adhere to policies.
Finding 7: Expansion of TRIP may be warranted; GDOT should analyze information to determine how much to expand the program.
12. GDOT should analyze additional HERO and TRIP activity data already available to ensure that HERO and TRIP are achieving efficient and effective results. 13. GDOT should use the above analysis to set baselines and performance expectations for both programs. 14. GDOT should use the above information to determine if and how the program should be expanded.

Appendix B: Objectives, Scope, and Methodology

Objectives

This report examines the Georgia Department of Transportation's (GDOT) Highway Emergency Response Operators (HERO) Program and Towing and Recovery Incentive Program (TRIP). Specifically, our audit set out to determine if GDOT is:

1) ensuring the Highway Emergency Response Operator (HERO) Program is utilized effectively and efficiently by using relevant data and analyses to inform program funding, staffing, and operating decisions;
2) ensuring that HERO Program operations are managed effectively and efficiently; and,
3) ensuring that the Towing and Recovery Incentive Program (TRIP) is fully utilized for all qualifying traffic incidents.

Scope

This audit covered HERO and TRIP activities occurring during fiscal years 2015-2017 with consideration of earlier or later periods when relevant. Information used in this report was obtained by reviewing relevant laws, rules, and regulations, interviewing agency officials and staff from GDOT and the HERO Program and experts at the Georgia Institute of Technology's Center for Transportation Operations and Safety. Information was also obtained by analyzing and comparing activity data from GDOT's Advanced Transportation Management System (ATMS) and the Georgia Electronic Accident Reporting System (GEARS). Finally, we reviewed analyses, studies, and best practice recommendations by authorities and experts in traffic management including, but not limited to, the Federal Highway Administration (FHWA), the Texas A&M Transportation Institute, other states, and universities. We also observed HERO operations directly by riding with HERO operators and visiting HERO Headquarters and GDOT's Transportation Management Center (TMC).

Government auditing standards require that we also report the scope of our work on internal control that is significant within the context of the audit objectives. We reviewed internal controls as part of our work on Objectives 1 and 2. Specific information related to the scope of our internal control work is described by objective in the methodology section below.

Methodology

To determine the extent to which the HERO program is utilized effectively and efficiently by using relevant data and analyses to inform program decisions, we analyzed GDOT ATMS data on the number, type, duration, and location of HERO-assisted traffic incidents during fiscal year 2015 and 2016, and analyzed the number and location of all traffic accidents reported by state law enforcement entities to the GEARS database during the same period. Using a Geographic Information System (GIS) application to map and geospatially compare the incidents from both databases, we compared the location of HERO-assisted traffic accidents and accidents assisted by law enforcement for the area patrolled by HERO operators (Metro Atlanta). We also used ATMS and other GDOT data to determine the duration of HERO-assisted traffic incidents.

We also researched federal and other states' incident management and freeway service patrol programs to determine the different models used to manage such programs and how performance might be measured and reported. We also reviewed HERO policies and procedures and interviewed HERO Program management to determine regarding operations, including the staffing and deployment of HERO operators and vehicles, the hiring and training of operators, etc. With regard to activity and incident location data extracted from ATMS and GEARS, we determined the data was reliable for the analyses conducted during this review. We did not assess the overall accuracy or completeness of either data set as a whole and do not comment on that. We did not sample the data, nor were we attempting to extrapolate findings from our analysis to all accidents.

To determine the extent to which GDOT is ensuring that HERO Program operations are managed effectively and efficiently, we visited HERO Program headquarters and reviewed their operations, including interviewing program management regarding the policies and procedures governing vehicle management, the management and control over HERO operator supplies, operator performance and overall program performance, etc. We also analyzed the costs associated with operating the HERO Program, including vehicle purchases, outfitting, repairs, fuel, and equipment. We interviewed personnel from GDOT's Office of Equipment Management (OEM) regarding the management of GDOT vehicles' life cycle and repair and maintenance operations.

To determine the extent to which GDOT is ensuring that the TRIP Program is effective and fully utilized, we interviewed GDOT and HERO personnel and reviewed a GDOT evaluation of the program from 2011. We also reviewed federal best practices and recommendations for the TRIP program and other similar programs as well as the existence of other quick towing programs in other states. We also analyzed TRIP activity data provided by GDOT for fiscal years 2007 - 2016 as well as TRIP data from the ATMS system for fiscal years 2015 - 2016. With regard to TRIP data, we determined the data was reliable for the analyses conducted during this review. We did not assess the overall accuracy or completeness of either data set as a whole and do not comment on that.

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Appendix C: Georgia's Intelligent Transportation System

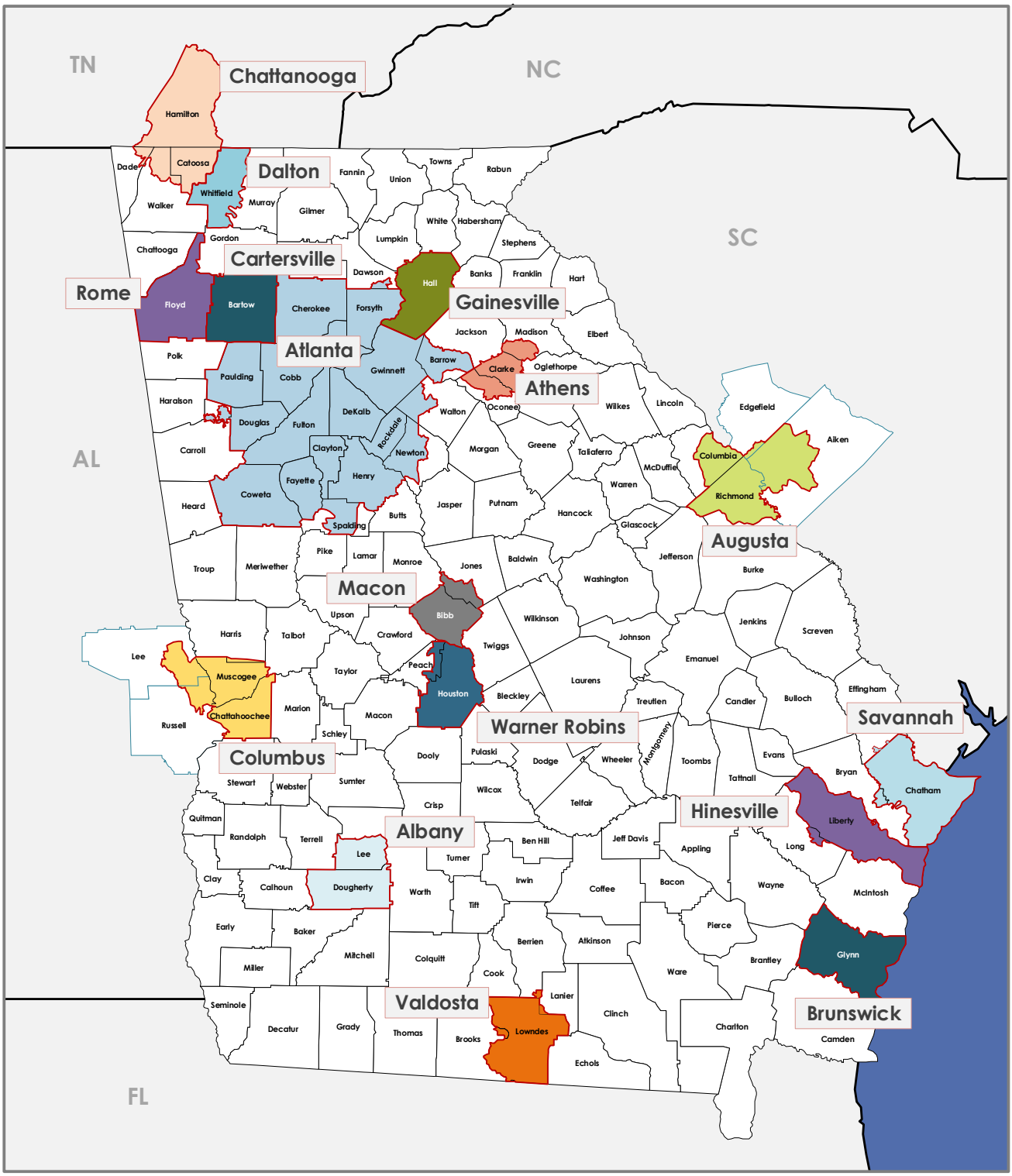
Georgia's Intelligent Transportation System (ITS), also known as NaviGAtor[19], was established in January, 1996. The components for operating the ITS include Georgia 511, GA NaviGAtor, and the Traffic Management Center (TMC). Each is described below.

- Georgia 511 is a free phone service providing motorists with real-time traffic information and assistance 24 hours a day. 511 can be accessed anywhere in Georgia by dialing 5-1-1. HERO operators are deployed to the majority of 511 assistance requests (for those calls occurring in the Metro Atlanta area). Average weekly call volume: 20,000 calls per week in 2014.
- GA NaviGAtor website (www.511ga.org) provides real-time traffic information including traffic incidents, construction, etc. NaviGAtor includes a map of Georgia roadways with traffic flow information collected from 1,645 specialized traffic flow cameras placed every 1/3 mile along major interstates in the Atlanta area and remote access to 988 traditional traffic cameras, of which 500 are full-color cameras posted every mile.
- The TMC is a 24/7 statewide operations center where traffic is monitored, evaluated, and, if necessary, interventions are initiated. The TMC utilizes multiple traffic information systems and is the hub for all NaviGAtor and 511 traffic data. This information and information from additional sources is used to determine traffic levels across the state, with particular focus on Metro Atlanta. The TMC also connects and shares information with another statewide TMC in Macon and other smaller Transportation Control Centers (TCC) throughout the state. The TCCs are funded and managed by local governments to monitor their local road systems.

Other traffic information systems include thousands of permanent and portable roadway sensors, remote control of traffic signals for over 1,200 intersections, 203 changeable freeway message signs, 160 ramp meters, etc. All of the above connected systems feed the NaviGAtor website and all GDOT traffic-related response activities.

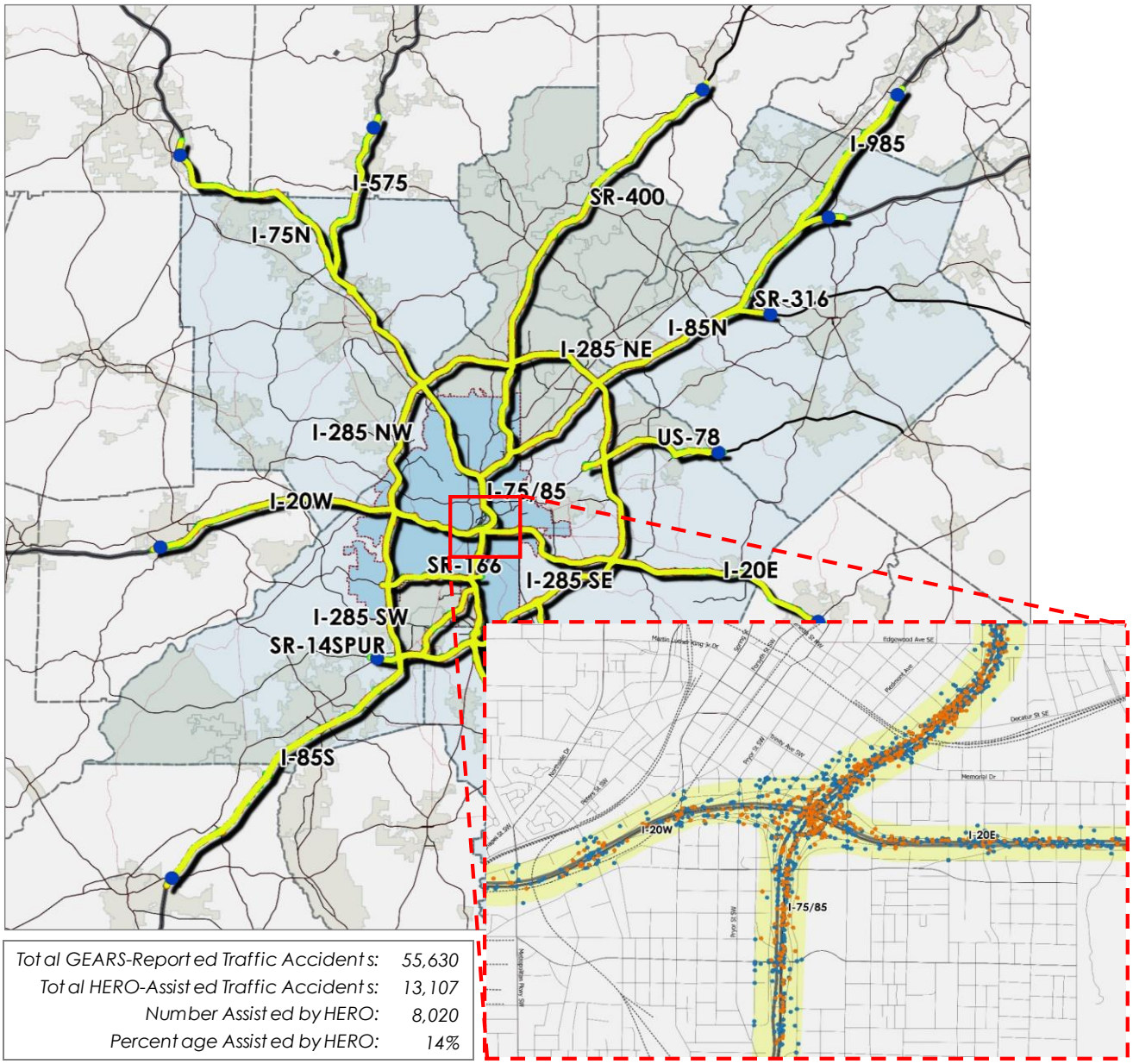
[19] NaviGAtor is used to designate the entire state ITS system as well as the specific website for viewing traffic information in the state.

Appendix D: Georgia MPO Transportation Planning Zones



Source: DOAA

Appendix E: HERO Patrol Area and HERO & GEARS Traffic Incidents, Fiscal Year 2016

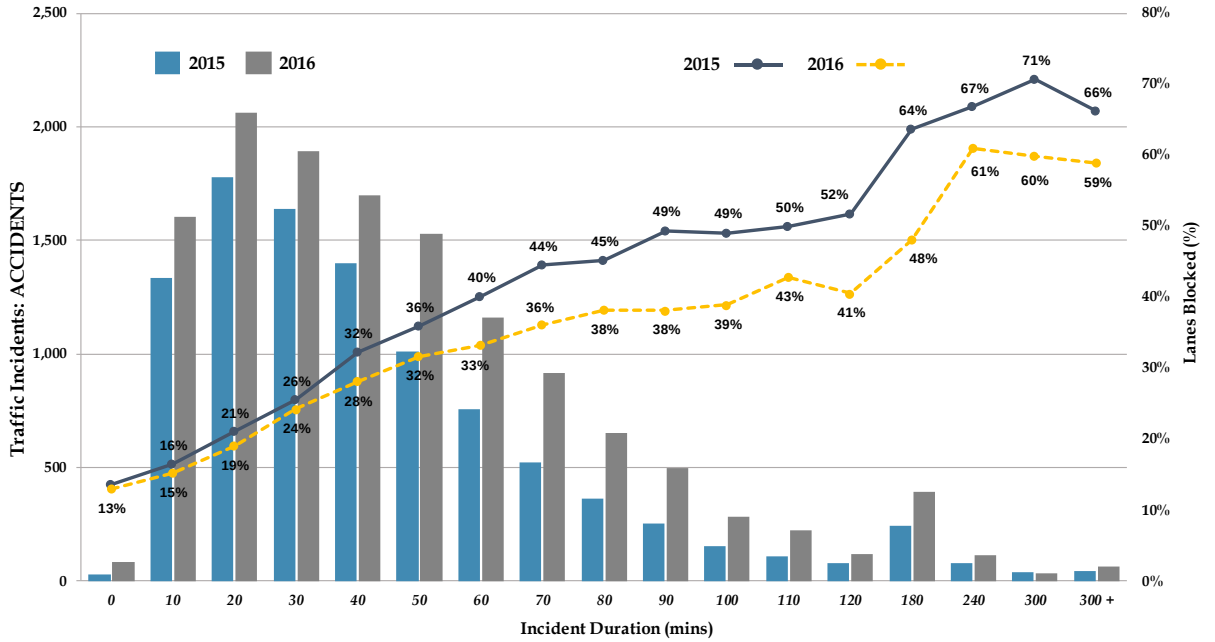


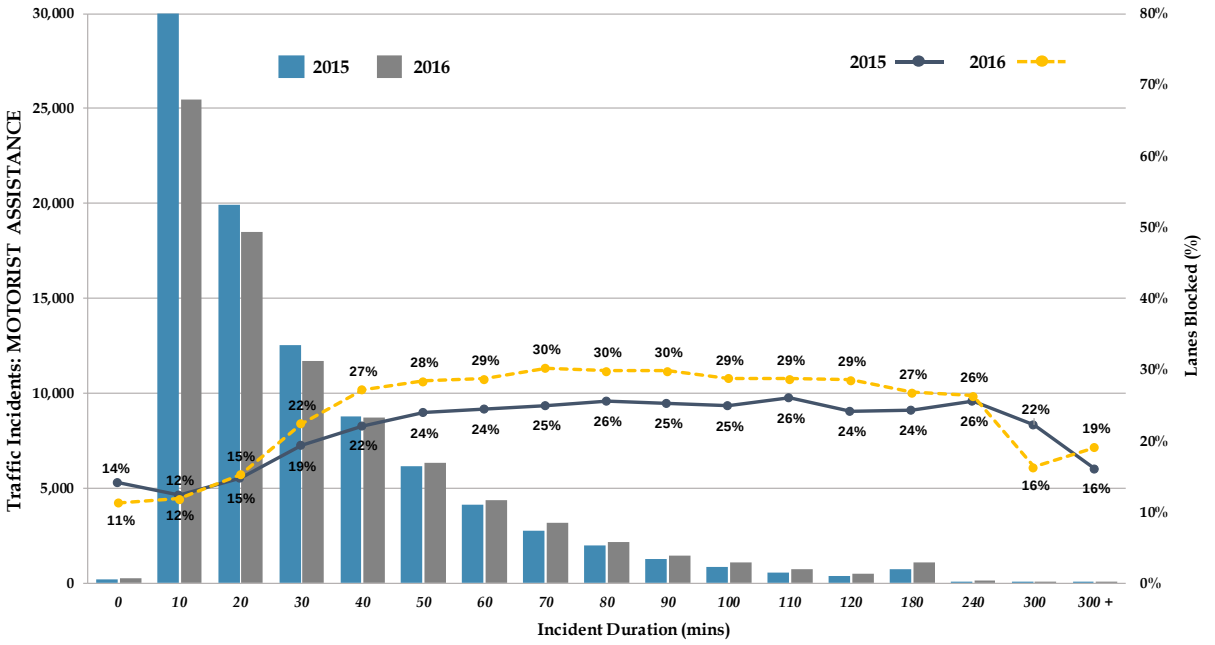
Total GEARS-Reported Traffic Accidents:	*55,630*
Total HERO-Assisted Traffic Accidents:	*13,107*
Number Assisted by HERO:	*8,020*
Percentage Assisted by HERO:	*14%*

*Records of HERO-assisted traffic accidents (see inset – **orange** points) and GEARS-reported accidents (**blue** points) were matched using a GIS mapping application, QGIS. All incident records from both databases were narrowed to include only those incidents occurring on HERO-patrolled routes in the Atlanta area (interstates and main roads) (highlighted in yellow). HERO-assisted incidents were matched to any GEARS incident occurring within a 2,000 ft buffer and (+/-) 5 hours.*

Source: GDOT / DOAA

Appendix F: Accidents Have a Greater Effect on Available Traffic Lanes than Incidents Involving Motorists Needing Assistance, Fiscal Year 2015 & 2016





The above graphs show the number of traffic incidents, including traffic **accidents** (*top*) and incidents involving **motorist assistance** (*bottom*), assisted by HERO operators during fiscal years 2015 and 2016 based on the duration of the incidents (time from identification to road clearance) and the percentage of available lanes closed.

The Performance Audit Division was established in 1971 to conduct in-depth reviews of state-funded programs. Our reviews determine if programs are meeting goals and objectives; measure program results and effectiveness; identify alternate methods to meet goals; evaluate efficiency of resource allocation; assess compliance with laws and regulations; and provide credible management information to decision makers. For more information, contact us at (404)656-2180 or visit our website at www.audits.ga.gov.