

2019

REPORT CARD FOR
GEORGIA'S
INFRASTRUCTURE



Georgia Section of the American Society of Civil Engineers
INFRASTRUCTUREREPORTCARD.ORG/GEORGIA



ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

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EXECUTIVE SUMMARY

The U.S. Census report published in early January 2019 shows that Georgia's population has grown from 9.7 million in 2010 to 10.5 million in 2018. Georgia's growth begs many questions: How will all of these people move around? Will they have adequate drinking water and electricity? What types of facilities will be available for their recreation? How suitable are the school buildings? Every day, civil engineers focus on these types of infrastructure questions.

Because infrastructure impacts so many aspects of the lives of Georgia's citizens, every five years the Georgia Section of the American Society of Civil Engineers (ASCE) evaluates key aspects of our state's infrastructure. Citizens of Georgia benefit from an objective review undertaken by dozens of experts in their respective fields. The 2019 Georgia Infrastructure Report Card represents the fourth evaluation performed by the Georgia Section of ASCE and focuses on 14 categories of infrastructure.

In 2019, the overall grade for Georgia's infrastructure improved for the first time ever, rising to a cumulative grade of C+. The grade for nine of the categories increased, went down for two categories and stayed the same for three categories. Since 2014, significant progress has been made in several areas, including:

- Already about half complete, the Savannah River Harbor Expansion project will allow larger post-Panama expansion ships to transport freight in and out of Georgia. This will have a significant, lasting impact on Georgia's economy.
- Passage of House Bill 170 added nearly \$1 billion per year to Georgia's transportation funding. The Georgia Department of Transportation quickly responded by expanding road and bridge maintenance programs and focusing on effective project delivery to complete road improvements on time and on budget.
- Georgia Safe Dams staff has more than doubled and there has been significant improvement in the number of dams inspected and the number of dams with emergency action plans in place to ensure downstream protection of lives and property.
- Transit legislation was passed creating The ATL, which brings together Atlanta's multiple transit systems for the first time.
- The addition of nearly 20 stormwater utilities within the Georgia represents a 44% increase in these utilities since 2014. Stormwater utilities allow for dedicated funding and much needed maintenance of publicly-owned stormwater pipes, culverts and structures.

While significant improvements headline this positive story, many challenges remain as addressed in our five Key Solutions to Raise the Grade:

- Recent passage of transit legislation created The ATL, a landmark event, and now the metro Atlanta region must focus on effectively implementing a regional transit system strategy that includes adequate, reliable funding, and an excellent user experience to provide competitive alternative commuter options.



- A significant number of our water-related utilities (drinking water, wastewater and stormwater) are consistently underfunded. The long-term viability of these utilities will require adequate user fees that cover the full cost of service.
- Since 2014, Georgia has more than doubled its dam safety staff and significantly improved the number of emergency action plans. As more deficient dams are identified, the state should press for alternative funding options such as grant programs to ensure private dams are repaired in order to protect downstream lives and property.
- The ongoing Savannah Harbor Expansion Project remains a bright spot in Georgia's efforts to create deep water ports. The long-term viability of these ports will require improved rail and truck freight transportation networks to efficiently get goods to and from the port.
- Landfill owners should consider raising solid waste tipping fees for out-of-state waste. Georgia's per capita waste generation is skewed to almost double the national average due to our tipping fees being significantly less than bordering states.

How will these questions be addressed? The answer begins with engagement and we hope the 2019 Infrastructure Report card will help by increasing awareness of infrastructure needs to help focus valuable resources on improving infrastructure to support Georgia's economy and quality of life.





ABOUT THE INFRASTRUCTURE REPORT CARD

GRADING CRITERIA

ASCE-GA's 2019 Report Card Committee is a group of dedicated civil and environmental engineers from Georgia, who volunteered their time to collect and analyze data, prepare, review, and revise each section, and develop the final Report Card. The committee worked with ASCE's Committee on America's Infrastructure and ASCE Infrastructure Initiative staff to provide Georgia with a snapshot of the state of our infrastructure, as it relates to us at home, and on a national basis.



The Report Card Sections are analyzed based on the following eight criteria:

CAPACITY Does the infrastructure's capacity meet current and future demands?

CONDITION What is the infrastructure's existing and near-future physical condition?

FUNDING What is the current level of funding from all levels of government for the infrastructure category as compared to the estimated funding need?

FUTURE NEED What is the cost to improve the infrastructure? Will future funding prospects address the need?

OPERATION AND MAINTENANCE What is the owners' ability to operate and maintain the infrastructure properly? Is the infrastructure in compliance with government regulations?

PUBLIC SAFETY To what extent is the public's safety jeopardized by the condition of the infrastructure and what could be the consequences of failure?

RESILIENCE What is the infrastructure system's capability to prevent or protect against significant multi-hazard threats and incidents? How able is it to quickly recover and reconstitute critical services with minimum consequences for public safety and health, the economy, and national security?

INNOVATION What new and innovative techniques, materials, technologies, and delivery methods are being implemented to improve the infrastructure?

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GRADING SCALE



EXCEPTIONAL: FIT FOR THE FUTURE

The infrastructure in the system or network is generally in excellent condition, typically new or recently rehabilitated, and meets capacity needs for the future. A few elements show signs of general deterioration that require attention. Facilities meet modern standards for functionality and are resilient to withstand most disasters and severe weather events.



GOOD: ADEQUATE FOR NOW

The infrastructure in the system or network is in good to excellent condition; some elements show signs of general deterioration that require attention. A few elements exhibit significant deficiencies. Safe and reliable with minimal capacity issues and minimal risk.



MEDIocre: REQUIRES ATTENTION

The infrastructure in the system or network is in fair to good condition; it shows general signs of deterioration and requires attention. Some elements exhibit significant deficiencies in conditions and functionality, with increasing vulnerability to risk.



POOR: AT RISK

The infrastructure is in poor to fair condition and mostly below standard, with many elements approaching the end of their service life. A large portion of the system exhibits significant deterioration. Condition and capacity are of significant concern with strong risk of failure.



FAILING/CRITICAL: UNFIT FOR PURPOSE

The infrastructure in the system is in unacceptable condition with widespread advanced signs of deterioration. Many of the components of the system exhibit signs of imminent failure.

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2019 REPORT CARD FOR GEORGIA'S INFRASTRUCTURE



 AVIATION 

 RAIL 

 BRIDGES 

 ROADS 

 DAMS 

 SCHOOLS 

 DRINKING
WATER 

 SOLID WASTE 

 ENERGY 

 STORMWATER 

 PARKS &
RECREATION 

 TRANSIT 

 PORTS 

 WASTEWATER 

2019

**REPORT CARD FOR
GEORGIA'S
INFRASTRUCTURE**


COMPARISON OF 2014 AND 2019 GRADES

| GEORGIA | | | |
|--------------------|----------|----------|-----------|
| Category | 2014 | TREND | 2019 |
| Aviation | B+ | ↔ | B+ |
| Bridges | C- | ↑ | C+ |
| Dams | D- | ↑ | D |
| Drinking Water | C+ | ↑ | B- |
| Energy | B | ↔ | B |
| Parks & Recreation | D+ | ↑ | C- |
| Ports | C+ | ↑ | B- |
| Rail | B | ↔ | B |
| Roads | C- | ↑ | C+ |
| Schools | C+ | ↑ | B |
| Solid Waste | C+ | ↓ | C |
| Stormwater | D+ | ↑ | C- |
| Transit | D- | ↑ | D+ |
| Wastewater | C | ↓ | D+ |
| Overall | C | ↑ | C+ |



AVIATION



PASSENGER AIRCRAFT ROW, AIRPLANE PARKED ON SERVICE BEFORE DEPARTURE AT THE AIRPORT, OTHER PLANE PUSH BACK TOW.



AVIATION

GRADE: B+ (2014 GRADE: B+)

EXECUTIVE SUMMARY

There are 103 publicly-owned, public use airports in Georgia, including Hartsfield-Jackson Atlanta International Airport (ATL), the busiest airport in the world for passenger traffic. The state's aviation system continues to have excess capacity, and some of the more congested airspace has been helped with Federal Aviation Administration-mandated technology and process improvements, as well as increased efficiencies in aircraft operational movement. Additionally, the state's aviation system budget has grown significantly, from just under \$2 million in 2013 to just over \$13 million in 2016 and 2017. Also encouraging is that 98% of Georgia's primary runways meet the state's goal of maintaining a 70 or greater Pavement Condition Index (PCI). At ATL, a \$6 billion expansion plan has been underway since 2016 that will result in updated terminals, increased capacity, and other benefits for travelers.



AVIATION



RECOMMENDATIONS TO RAISE THE GRADE

- **PLAN AND FUND FOR THE FUTURE:** While the system continues to enjoy excess capacity and increased accessibility, it still needs continued focus on funding projects that remedy non-standard conditions (conditions that do not comply with FAA regulatory guidelines). Funding fluctuates and the limited amount requires large projects to be phased, resulting in less effective use of funds.
- **KEEP AIRPORT LAYOUT PLANS UP TO DATE:** While the FAA and GDOT Aviation Programs permit the airports to rely on their most recent Airport Layout Plan beyond the five-year period if there are no new requirements, there are still improvements to be accomplished from the most recent plans. Continuous monitoring and identification of immediate needs should be incorporated into plans.
- **USE TECHNOLOGY TO IMPROVE:** Encourage airports to use innovative technology and processes when expanding and enhancing their infrastructure. Use the NextGen system to maximize the capacity of existing infrastructure.



INTRODUCTION

Georgia is served by a system of 103 publicly-owned, public use airports ranging from small general aviation airports to the busiest commercial service airport in the world by passenger traffic, Hartsfield-Jackson Atlanta International Airport (ATL). Of the 103 publicly-owned, public use airports in Georgia, the Federal Aviation Administration (FAA) National Plan of Integrated Airport Systems (NPIAS) report for Fiscal Years (FY) 2017 to 2021 included 98 existing Georgia airports and one new airport. The NPIAS identifies airports that are in the national airport system, the roles the airports currently serve, and the types and quantities of airport development eligible for federal funding under the Airport Improvement Program (AIP) over a five-year period.

NPIAS airport categories are as follows:

- **COMMERCIAL SERVICE AIRPORTS:** Publicly-owned airports that receive a minimum of 2,500 scheduled passenger service boardings each calendar year. Commercial Service Airports include large, medium, small hub, and non-hub primary airports as well as nonprimary commercial service airports.
- **CARGO SERVICE AIRPORTS:** Airports that, in addition to any other air transportation services that may be available, are served by aircraft providing air transportation of only cargo with a total annual landed weight of greater than 100 million pounds. An airport may be both a commercial service and a cargo service airport.
- **RELIEVER AIRPORTS:** Publicly or privately-owned FAA-designated airports that relieve congestion at Commercial Service Airports, as well as provide improved general aviation access.
- **GENERAL AVIATION AIRPORTS:** Public use airports that do not have scheduled service or have less than 2,500 annual passenger boardings.

Table 1 includes the number of Georgia airports in each category listed in the FY2017-2021 NPIAS report:

TABLE 1 – NPIAS REPORT 2017 TO 2021

| CATEGORY | NUMBER OF AIRPORTS |
|---------------------------------|--------------------|
| Georgia NPIAS Airports | 99 |
| General Aviation – Unclassified | 8 |
| General Aviation – Basic | 18 |
| General Aviation – Local | 43 |
| General Aviation – Regional | 18 |
| General Aviation - National | 4 |
| Commercial – Large Hub | 1 |
| Commercial – Small Hub | 1 |
| Commercial – Nonhub | 5 |
| New Airport | 1 |



Table 2 compares general information on the Georgia aviation system between the years 2012 and 2017.

TABLE 2 GEORGIA AVIATION SYSTEM GENERAL INFORMATION

| CRITERIA | 2012 | 2017 | DIFFERENCE |
|---|------------|------------|------------|
| Total Number of Airports | 104 | 103 | -1 |
| General Aviation Airport Arrivals and Departures | 1,617,000 | 1,716,000 | +99,826 |
| Air Carrier Airport Arrivals and Departures (not including ATL) | 141,336 | 141,895 | +559 |
| Aircraft Based at Georgia Airports | 4,996 | 4,923 | -73 |
| Square Yards of Pavement at Georgia Airports | 16,170,000 | 16,584,000 | +414,000 |
| Average Number of Daily Arrivals and Departures at ATL | 2,549 | 2,401 | -148 |
| Airports with Runway Length of 4,000 feet or greater | 87% | 89% | +2% |
| Airports with Runway Length of 5,000 feet or greater | 76% | 78% | +2% |
| Airports with Runway Length of 5,500 feet or greater | 43% | 43% | +0% |
| Airports in the National Plan of Integrated Airport Systems (NPIAS) | 99 | 99 | 0 |
| Airports that Meet or Exceed a PCI Rating of 70 for Their Primary Runway* | 81% | 98% | +14% |

*2017 data estimates based on 2012 PCI numbers and recent pavement rehabilitation and maintenance projects

Source: FAA, GDOT

The state's aviation assets include ATL, which is the busiest airport in the world by passenger traffic with a daily average of 275,000 passengers and 2,700 flight arrivals and departures. In 2017, ATL had the highest number of total commercial service airport enplanements at 50.2 million – over 10 million higher than Los Angeles International, Chicago O'Hare International, and Dallas-Fort Worth International. In 2016, passenger traffic increased by 2.6% to 104.2 million. ATL serves 150 U.S. destinations and more than 75 international destinations in 50 countries.

CAPACITY

A statewide aviation system should include sufficient airside and landside facilities to meet current and future demand. The FAA has determined that as an airport's annual demand reaches 60% or more of the airport's calculated airfield operating capacity, delays to aircraft on the ground and in the air begin to increase and capacity-enhancing capital projects should be planned. As annual demand equals or exceeds 80% of an airport's operation capacity, delays can increase dramatically, and capacity projects should be implemented.

Current data suggests that Georgia has significant excess capacity; however this may be reduced as air travel increases with the improvement in the economy. Updated projections for 2021 show that the state will continue to have usage rates well below the 60% level.

Between 2001 and 2016, general aviation operations in Georgia decreased from 2.2 million to 1.6 million. The average annual operations rate decrease is -2.6% which is in-line with the national trend of -2.7% over the same time period. The decrease in general aviation operations is due to a number of factors, including the economic downturn of mid 2000s, the increased cost of owning/operating aircraft, and pilot shortages. The decrease in the number of operations has resulted in increased capacity without additional infrastructure. The Statewide Forecast for General Aviation Operations predicts a 0.54% annual growth rate resulting in 1.7 million general aviation operations by 2035. These numbers still lag from the high of 2.2 million and allows for sufficient capacity in the near future.



For commercial service airports, capacity can be looked at in terms of operations and passenger enplanements. In 2006, Georgia airports, excluding ATL, had a total of 1.2 million enplanements and more than 51,000 commercial operations. In 2016, the passenger enplanements have grown to just over 1.5 million and operations have decreased to just over 48,000. These statistics follow the recent commercial service trends of using larger aircraft with more seats. Statewide enplanements are projected to grow by 3% per year to 2.6 million by 2035 and operations by 1.5% per year to 63,000.

At ATL, efficiency is measured by the FAA using performance indicators, including average gate arrival delay, average gate to gate time and taxi times, amongst others. Though ATL is the world's busiest airport in terms of passenger traffic and numbers of take-offs and landings, it has seen steady improvement in all efficiency metrics over the past five years.

At this time, Georgia airports have sufficient runway capacity to handle the near-term forecast of operations. Metro Atlanta and Savannah area airports should be monitored as operations continue to grow for potential capacity constraints.

CONDITION, OPERATION AND MAINTENANCE

The statewide aviation system should comply with applicable state and federal design, safety, and development standards. Many of the airports in the state were constructed to design standards that were significantly different from what is mandated by current use of the airports. Because some of the new design standards are more stringent, some of these airports will require significant improvements to comply with standards. Therefore, although the goal is to have 100% compliance with state and federal standards, this is unlikely until major capital projects can be funded. Below is a summary of significant aspects of this performance measure:

- Pavement Condition Index (PCI) is a method to measure the condition of pavement. 100 refers to new pavement, and as the pavement ages this number is reduced as the pavement is damaged and worn. The state's goal is that all primary runways have a PCI rating of 70 or greater. Currently, 98% of Georgia airports meet the standard based on PCI data and estimates from pavement rehabilitation and maintenance projects constructed since the 2012 study. A Pavement Management Study that includes updating PCI data is currently underway and will be completed in 2019.
- The Runway/Taxiway Separation refers to the distance between the primary runway centerline and any full or partial parallel taxiway centerline. The separation is necessary for safe operations on both runway and taxiway. Each runway's standard is determined by its current FAA Runway Reference Code (RRC). Currently, 91% of Georgia airports meet the standard.

PHOTO (TOP) FROM BACON COUNTY AIRPORT PAVEMENT REHABILITATION PROJECT AND (BOTTOM) FROM HABERSHAM COUNTY AIRPORT PROJECT CONSTRUCTING TAXIWAY TO MEET RUNWAY/TAXIWAY SEPARATION STANDARDS.





- The Runway Safety Area (RSA) is the surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway. The Standard for Primary Runways RSA has a certain width and length beyond both ends of the runways; the dimensions increase with the size and landing speed of aircraft using the runway. One of FAA's highest safety goals is that all runways should have sufficient RSA for all aircraft with 500 operations or more annually. Currently, 84% of Georgia airports meet the RSA standard on their primary runway.

FUNDING AND FUTURE NEED

Georgia relies on a variety of sources to maintain funding. These include bonds, grants, and passenger facility charges. For the Georgia airport system to remain viable, significant investment will be required. The average annual investment needed to maintain state system plan recommendations is at least \$261 million. This funding need is not all-inclusive, as it only includes the estimated cost for airports to meet the minimum recommendations for their assigned airport level in the Georgia Statewide Aviation System Plan. There will undoubtedly be additional funding requirements that exceed the estimated cost for airports to meet system plan recommendations. On average, annual funds available to apply to the needs of the Georgia airport system, from both the FAA and GDOT, have averaged \$63.7 million. Based on the historic average annual level of funding, there will be a significant funding gap.

TABLE 4 FUNDING GAP – STATE SYSTEM PLAN AIRPORTS (NOT INCLUDING ATL)

| | |
|--|----------------|
| Estimated five-year system planning funding needs | \$1.3 billion |
| Estimated average annual system planning funding needs | \$261 million |
| Estimated state/federal funds available to address annual need | \$63.7 million |
| Estimated annual economic impact of system plan airports | \$4.4 billion |

Airports in Georgia, not including ATL, have an annual economic benefit of \$4.4 billion. ATL on its own has an economic impact of \$34.8 billion in metro Atlanta, \$70.9 billion in the state, and serves as a major employer. Georgia airports are providing an annual economic benefit that exceeds the anticipated annual financial need to maintain and develop the state airport system.

The last three fiscal years of federal funds to Georgia are shown in Table 5. On average over the past three years, the state received an average of about \$80 million in federal AIP funding, with an average of almost \$33 million being administered through GDOT Aviation Programs via the State-Block Grant Program.

TABLE 5 FEDERAL FUNDING FOR GEORGIA AIRPORTS

| FISCAL YEAR | 2015 | 2016 | 2017 | THREE-YEAR AVERAGE |
|--|-----------------|-----------------|-----------------|--------------------|
| Total Funding | \$70,148,895.00 | \$94,302,041.00 | \$75,442,142.00 | \$79,964,359.33 |
| Hartsfield-Jackson Atlanta International Airport | \$19,050,802.00 | \$44,991,495.00 | \$33,995,235.00 | \$32,679,177.33 |
| Primary Airport Grants | \$9,183,472.00 | \$22,499,948.00 | \$11,276,119.00 | \$14,319,846.33 |
| State-Block Grant Program Funds | \$41,914,621.00 | \$26,810,598.00 | \$30,170,788.00 | \$32,965,335.67 |

Source: GDOT



The state program helps support the allocation of federal funds and typically pays 50% of the non-federal share of eligible project costs. If federal AIP funding covers 90% of a project, the state funding typically covers 5% and local funds the remaining 5%. Currently, if requested, the state participates in the 50% non-federal share of projects at all airports except ATL. In addition, the state supports a state/local project program for projects/airports that are not eligible for FAA funds or do not score well from a federal AIP priority funding perspective. These projects are typically funded at 75% by the state and 25% from local funds. The state aviation program budget has grown significantly over the last five years, from just under \$2 million in 2013 to just over \$13 million in 2016 and 2017. Of the available \$13 million in state funding, an average of roughly \$2.6 million goes towards paying the 5% state match on federal grants.

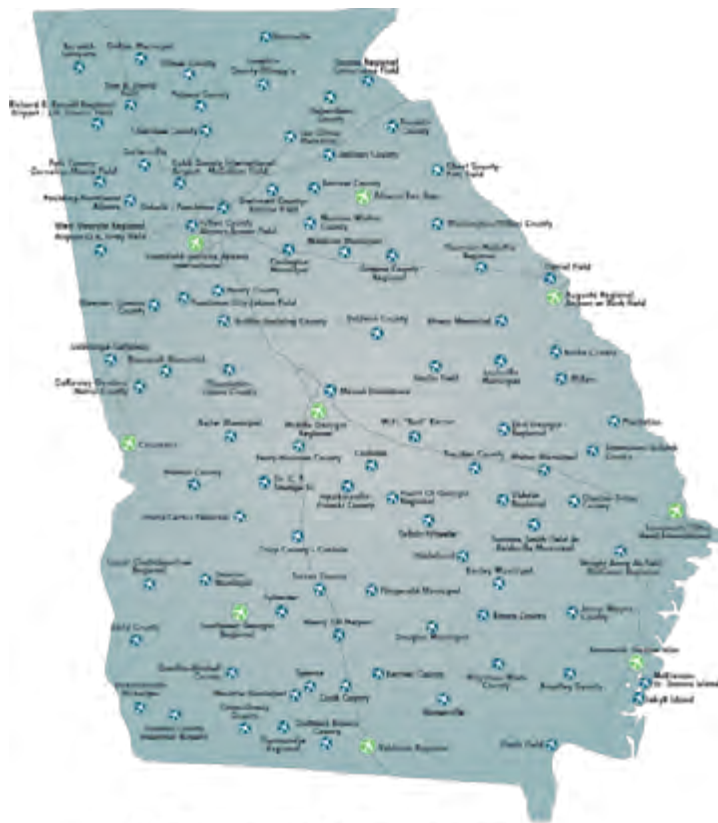
Major improvements are underway at ATL. The airport expansion and modernization program is over \$6 billion, utilizing various funding sources such as Passenger Facility Charges, AIP funding, bonds, and other grants. In 2017, Hartsfield-Jackson received almost \$34 million in AIP funding. They also received over \$5.1 billion since 2001 utilizing their \$4.50 PFC.

PUBLIC SAFETY AND RESILIENCY

Most of Georgia's airport facilities have been in existence for over 50 years, and many of their roots trace back to simple landing strips that have evolved into public use facilities with more demanding safety standards. In most cases, relocating and establishing a new airport facility to replace an aging facility that does not meet current standards isn't feasible. Therefore, a continuous investment in current facilities must exist to maintain and improve the system to ensure public safety for commercial and general aviation airport users.

Maintaining public safety and protection against injury, loss of life, and property damage remains a top priority in Georgia. Potential safety issues identified during routine airport inspections are considered an airport's highest priority project and receive highest priority for funding consideration. Continuous improvement projects are working to sustain the majority of current needs. However, additional funding is needed to ensure these improvements continue and to ensure the system will be able to meet future needs.

Airport security and the safety of the traveling public is an ongoing challenge for the nation's commercial service airports. The needs of additional security to address the threats posed to airports and aircraft have had an impact on the operation of the nation's aviation system. The Transportation Security Agency (TSA) spent \$7.6 billion on aviation security in 2017; this does not include the financial burden on airports to accommodate security requirements.



GENERAL AVIATION AIRPORT COMMERCIAL SERVICE AIRPORT



The cost of additional security is measured not just in terms of the direct cost of security personnel, but also in terms of the footprint and additional infrastructure needed. Security measures also include hidden costs, such as the additional time spent by passengers undergoing security procedures, up to and including missed flights. The TSA has evolved from a one-size fits all security screening approach to a risk-based, intelligence – driven strategy designed to improve both security and the passenger experience. Implementations such as Automated Screening Lanes, TSA Precheck, and The U.S. Customs and Border Control's Global Entry Program have helped improve the efficiency of security processes at ATL and other commercial service airports.

Airports are critical to moving goods and people in the event of a catastrophic event. Airports often serve as a gateway to urgent relief supplies during large events and are interdependent on other forms of transportation to work efficiently. When evaluating public safety and resiliency related to recovery from a catastrophic event, airport accessibility is important. The goal is to provide an airport system that is easily accessible from both the ground and the air.

- 30 Minute Accessibility to an Airport with a Runway Length of 5,000 feet or greater – 91% of Georgia's residents are within 30 minutes or less driving time to one or more Georgia airports that have a runway length of 5,000 feet or more.
- 45-Minute Accessibility to an Airport with a Runway of 5,500 feet or greater – 97% of Georgia's residents are within 45 minutes or less driving time to one or more Georgia airports that have a runway length of 5,500 feet or more.
- 60-Minute Accessibility to a Commercial Service Airport in Georgia – 81% of Georgia's residents are within 60 minutes or less driving time to a commercial service airport in Georgia.

The widespread effects to changes in FAA policy regarding licensing and flight procedures, as well as new technologies and mandates such as Unmanned Aerial Systems (UAS) and NextGen implementation, have yet to be seen. Consolidation and restructuring of the airline industry in the United States has left the country with only four major mainline carriers. Increases in efficiency have led to a reduced number of flights, larger aircraft, and also fewer empty seats per flight. Ancillary costs, such as baggage fees, and food and drinks have led to a reduction in airline airfares and therefore an increase in the number of passengers, while providing airlines additional revenue streams and net profits over the past five years. The shortage in pilots and qualified personnel in the aviation field will increase the strain on the ability of airlines to keep up with future air traffic demand. The changes in policy as well as the dynamics of the market will drive the need for changes in future airport layouts. With anticipated changes necessary to accommodate future capacity and peak traffic, it may be necessary in the near future to determine new, more efficient methods to handle the large influx of passengers arriving and departing.

INNOVATION

Implementation of the NextGen system, including capabilities such as the Automatic Dependent Surveillance-Broadcast(ADS-B), Cockpit Display of Traffic Information (CDTI) and Time Based Meeting (TBM) improve the ability of controllers to reduce separation between aircraft, boosting arrival capacity. Equivalent Lateral Spacing Operations (ELSO) also allows reduced separation between departures and new Standard Instrument departure procedures provide more precise guidance. ATL is the first airport where the FAA implemented ELSO, and the technology is increasing capacity by enabling more aircraft to take off from the same runway during the same time period, resulting in a greater number of flights processed due to freed up airspace and reduced taxi-times. The implementation of this system translates to nearly \$20 million dollars of fuel savings per year in ATL. If demand increases 10%, the savings will more than double to \$50 million a year.



AVIATION



DEFINITIONS

ENPLANEMENTS – Individual trip segments for each passenger.

LARGE HUB AIRPORTS – The FAA defines as airports that account for one percent or more of total U.S. enplanements.

MEDIUM HUB AIRPORTS – The FAA defines as airports that account for between 0.25 and 1% of the total U.S. enplanements.

SMALL HUB AIRPORTS – The FAA defines as airports that account for between 0.05 and 0.25% of the total U.S. enplanements.

NON-HUB PRIMARY AIRPORTS – The FAA defines as airports that enplane less than 0.05% of all commercial passengers, but more than 10,000 annual enplanements.

NONPRIMARY COMMERCIAL AIRPORTS – The FAA defines as airports that have less than 10,000 commercial passenger enplanements annually.

SOURCES

Georgia Department of Transportation (GDOT) Aviation Programs

National Plan of Integrated Airport Systems (NPIAS)

Hartsfield-Jackson Atlanta International Airport Fact Sheet

FAA Planning Capacity

FAA Grant Histories

FAA – The Economic Impact of Civil Aviation on the U.S. Economy

https://www.faa.gov/news/fact_sheets/news_story.cfm?newsId=18675

<https://www.tsa.gov/news/testimony/2016/03/01/hearing-fy17-budget-request-transportation-security-administration>

<https://www.atl.com/passenger-information/passenger-security/>



BRIDGES



BOAT TRAFFIC AT DUSK ON SAVANNAH RIVER BELOW THE
EUGENE TALMADGE MEMORIAL BRIDGE.



BRIDGES

GRADE: C+ (2014 GRADE: C-)

EXECUTIVE SUMMARY

The Transportation Funding Act of 2015 (TFA) provided nearly \$1 billion in additional revenue for Georgia's transportation system each year, including for the 14,863 bridges and culverts across the state. As a result, Georgia has decreased the percentage of structurally deficient bridges, from 8.6% in 2014 to 4.6% in 2017. In addition to replacing and rehabilitating structurally deficient bridges, the state has implemented asset management programs and focused on preventive maintenance. In 2014, the general condition of the bridge infrastructure was in decline, but today this trend has been reversed and the rate of improvement is increasing each year as new funding and programs mature. However, at the local level, municipalities and counties often lack the tools needed to strategically prioritize bridge maintenance and struggle to find funding to improve the condition of bridges. The Transportation Investment Act gave Georgia voters the ability to approve regional sales taxes for transportation infrastructure. However, these measures have not been approved by voters in all parts of the state, meaning some localities have better bridge funding than others.



RECOMMENDATIONS TO RAISE THE GRADE

- **Develop additional tools, programs, and funding that help local owners maintain and repair existing bridges. Current programs may encourage locals to allow bridges to deteriorate until they receive attention from the state.**
- **Expand asset management implementation. Encourage local governments to use the system to manage their local bridge infrastructure.**
- **Continue to develop resiliency plans for specific critical assets located on interstate systems and coastal regions. Resiliency plans should address possible man-made or natural disasters.**
- **Continue to expand research and implementation of innovative materials and techniques to increase sustainability and enhance durability and decrease construction impacts.**
- **Sustain current momentum to remove all posted bridges and bridges in poor condition on both the state and local systems.**

2019

REPORT CARD FOR
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INTRODUCTION

Georgia's bridge infrastructure consists of approximately 9,198 bridges and 5,665 culverts. Of these, the Georgia Department of Transportation (GDOT) owns and operates 4,619 bridges and 2,071 culverts. Local governments and other entities own the remaining structures. "Bridges" are defined as structures having a span length, the distance between supports, exceeding 20 feet and usually have some combination of deck, beam, substructure and foundation elements, while culverts are buried structures. The following discussion focuses primarily on bridges.

CONDITION AND CAPACITY

GDOT inspects its bridge infrastructure every two years in accordance with federal requirements. Currently, FHWA collects data on the condition of bridges and classifies them on a scale of 0 to 9. Bridge condition is determined based on the lowest condition assigned to various structural components of a bridge. The condition assigned ranges from good to fair to poor. Overall, 39.6% of all bridges in Georgia are rated good condition, 55.2% are rated fair condition, and 5.3% are rated poor condition. The bridges owned and operated by GDOT (interstate and state route) are generally in better condition with 46.4% rated good condition, 52.3% rated fair condition, and 1.3% rated poor condition.

In the 2014 ASCE Report Card it was reported that 8.6% of bridges in Georgia were rated structurally deficient. A poor condition rating is roughly equivalent to the previously used FHWA term structurally deficient. In 2017, FHWA reported that nationally, 8.9% of bridges are structurally deficient, demonstrating that Georgia is better than the national average. Further, the substantial reduction in the number of bridges in poor condition is indicative of the improvements to Georgia's bridge infrastructure over the last five years. Every bridge in poor condition on the state system is currently programmed for replacement, therefore further improvement in the statewide rating is anticipated.

Structural capacity is another critical feature of bridge infrastructure. Some bridges with inadequate structural capacity are posted to limit the weight of vehicles they carry. Posted bridges can have significant impacts on communities. School buses and emergency vehicles may be forced to use alternate routes. The associated delays can be significant, especially in rural areas where alternate routes are limited. Further, the presence of structurally inadequate bridges can severely hinder economic growth by limiting access to commercial vehicles. Structurally inadequate bridges can also negatively impact nearby rural farming communities. Modern agriculture equipment has become very heavy, yet these vehicles often utilize public roads. Since the 2014 ASCE Report Card, GDOT has reduced the number of posted bridges from 2% to 1.5% of all bridges on the state system. The number of posted local bridges has been reduced from 34.6% to 31.1% of all local bridges. GDOT is currently programming all posted bridges on the state system for repair or replacement.

Improving local bridges is still a significant challenge because 159 counties and hundreds of other municipalities own local bridges, and bridge replacement projects can have long-lasting impacts on small community budgets. Additionally, local owners can be less familiar with procuring bridge design and construction services. To mitigate these challenges, GDOT has implemented a Low Impact Bridge Program (LIBP) for local bridge replacements. This program allows for a more streamlined, accelerated delivery of all phases within the bridge replacement process. However, few bridges qualify due to its stringent environmental impact criteria. GDOT is also implementing a Local Bridge Replacement Program (LOCBR) which attempts to strategically identify and program posted local bridges for replacement. This program requires only minimal contributions from the local governments.



FUNDING & FUTURE NEED

In 2015, the Governor signed the milestone legislation Transportation Funding Act (TFA) into law. TFA changed the method for capturing transportation funding at the state level by replacing the existing gasoline tax with an excise tax of 26 cents per gallon on gasoline and 29 cents on diesel; adding a \$200 fee on personal electric vehicles and a \$300 fee for commercial electric vehicles; instating a \$5 per night hotel room tax; and including a heavy truck impact fee. The new fee structure does not prohibit localities with gasoline sales tax from continuing to collect this revenue. According to the FY 2019 Georgia Governor's Budget report, GDOT will receive over \$3.5 billion in annual funding. TFA alone generates an estimated \$830 million to \$1 billion in revenue each year; funding is directed to bridge and road maintenance and capital projects.

Thanks in part to TFA, the GDOT Bridge Office has programmed the replacement of all state route bridges categorized as poor condition and more than doubled bridge maintenance funding. They have added and expanded programs to assist in the repair and replacement of off-state system bridges through the Local Maintenance and Improvement Grant program, the Low Impact Bridge Program, and the Local Bridge Replacement Program. These programs have allowed GDOT to increase its annual bridge replacement rate from about 67 bridges per year in 2011-2015 to more than 232 bridges per year in 2016-2020. The increased transportation funding levels have enabled GDOT to conduct traditional operations to address current need, and expand their program through the development of the Major Mobility Investment Program (MMIP). The MMIP will address growing congestion and truck volumes through a series of "mega" projects. The current level of transportation funding is enabling the state to conduct vital bridge maintenance and bridge replacement projects that will serve Georgia's transportation needs in the upcoming decade.

Special Purpose Local Option Sales Tax (SPLOST) and Transportation Special Purpose Local Option Sales Tax (TSPLOST) are sales taxes that can be approved by voters on a local level. The SPLOST has been used effectively in the metro Atlanta Area (notably Cobb, Fulton and Gwinnett counties) as a means to move transportation projects forward, including local bridge projects. The Transportation Investment Act of 2010 (TIA), provides a legal mechanism in which regions throughout Georgia have the ability to impose a 1% sales tax to fund transportation improvements. To date, three regions (River Valley, Central Savannah River Area and the Heart of Georgia Altamaha) across middle Georgia have implemented TSPLOST, and a fourth in southern Georgia has been approved by voters. While these additional funding sources are not used uniformly throughout the state, they are gaining support as local officials and voters see the impact of SPLOST programs in other regions.

RESILIENCY

Resilience is defined as the infrastructure system's capability to prevent or protect against multi-hazard threats and incidents and how quickly it can recover and reconstitute critical services with minimum consequences for public health and safety, the economy, and national security. Not only must the individual infrastructure exhibit resiliency, but also the entire infrastructure system. Georgia is addressing resiliency through an alternative approach outlined in the Transportation Asset Management Plan (TAMP). Through this plan, GDOT is incorporating risk considerations into the prioritization of bridge preservation projects and moving away from a "worst-first" and more towards a "most at risk" approach. This methodology considers asset condition and the inherent risk associated with failure. The Bridge Prioritization Formula (BPF) is a tool currently used by GDOT to identify and manage these assets by examining combined asset risk. The formula determines risk based on structural capacity and user demand. The TAMP also addresses access to assets due to natural disasters. One of the strategies identified in the TAMP to address this risk is to review and update the Emergency Management Plan (EMP) annually.



The Interstate 85 bridge collapse that occurred in March of 2017 was a recent incident which tested the infrastructure’s resilience and ability to recover. Through this incident, GDOT developed a plan to rebuild the bridge that included alternative routes and expedited construction materials and methods, which allowed for the bridge to be reopened several weeks ahead of schedule. GDOT continues to examine ways to prevent and protect against such incidents in the future. GDOT also implemented new rules prohibiting the storage of flammable materials near and under bridges.

Resilience is also achieved by extending service life and preventing structural deterioration and failure in extreme environments through improved durability of materials. Conventional substructure materials currently exhibit a service life of approximately 40 years in coastal environments. GDOT is implementing the use of high-strength stainless steel prestressing strands in precast concrete piles. This improves substructure durability, and it is anticipated to achieve a 100+ year service life for those elements in marine environments.

Bridge Funding

FY 2015 thru FY 2019



Source: Georgia Department of Transportation

INNOVATION

Georgia is making significant strides in the use of innovative techniques, materials, technologies and delivery methods to improve bridge infrastructure. In addition to the precast piles discussed above, the GDOT Office of Materials and Research has also evaluated and implemented the use of bridge girders constructed with high strength lightweight concrete. This innovative approach allows for a 20% reduction in the weight of the girders. The lightweight concrete material was recently used for the construction of the girders on the I-85 ramp bridge crossing SR 34 in Coweta County and is the first of its kind in Georgia.

GDOT is also exploring the use of alternatives to the traditional design-bid-build project delivery method such as design-build (DB) to reduce project costs and expedite project schedules. GDOT also recently replaced the bridge carrying State Route 299 over I-24 in northwest Georgia using an accelerated bridge construction (ABC) method, allowing for full replacement of the bridge to occur over a single weekend. The Courtland Street Bridge replacement project is currently underway in downtown Atlanta which uses DB and ABC. Both projects have also utilized advanced concrete mixes.



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DAMS



DAMS

GRADE: D (2014 GRADE: D-)

EXECUTIVE SUMMARY

Over the last five years, progress has been made toward addressing dam safety in Georgia. Staffing levels supporting the Georgia Safe Dams Program have more than doubled, from four to 10 full time employees (as of December 2018). Additionally, significant progress has been made in developing Emergency Action Plans (EAPs) to address dam safety; as of December 2018, 58% of high hazard potential dams had EAPs, up from 5% in 2014. Nevertheless, major challenges remain. With increased funding for inspection, 87 additional state regulated deficient dams have been identified and catalogued since 2014. In another challenge, most dams in Georgia are privately-owned, and the significant cost associated with dam operation and maintenance remains a challenge for many property owners.



RECOMMENDATIONS TO RAISE THE GRADE

- **PUBLIC AWARENESS:** Increase awareness of dams to help bolster support for additional funding to mitigate the risks associated with potential dam failures.
- **INCREASE STATE FUNDING:** Additional funding is needed to assist with the backlog of classification of dams to be reviewed by the state safe dams' program.
- **IMPROVED EMERGENCY PLANNING:** With the improved recognition and development of EAPs it will be imperative to provide the outreach to dam owners and communities and begin systematic training and exercising of EAPs to enhance the purpose, function and effectiveness of these living documents.
- **OWNER ASSISTANCE:** Create and fund grant programs that provide funding mechanisms that will support dam owners in the fulfillment of dam safety and rehabilitation requirements.

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INTRODUCTION

In Georgia, dams are owned by federal, state and local governmental jurisdictions as well as private organizations and citizens. These owners are responsible for mitigating potential risks posed by these structures in the event they fail. In Georgia, dams under the jurisdiction of a federal agency or those regulated by the Federal Energy Regulatory Commission (FERC) are excluded from the requirements of the Georgia Safe Dams Act.

Dams serve a variety of purposes, including fire protection, flood control, irrigation, and water supply. The vast majority – 3,120 according to the 2016 National Inventory of Dams (NID) – are for recreational purposes. Almost all dams are earthen embankments, although there are a few that are concrete or rockfill as well.

In the last 40 years, developing and managing dam infrastructure has lagged behind the demand for the resource itself. Additionally, as this infrastructure ages, the cost of maintaining it in a workable, usable and safe condition increases while more dams fall into disrepair. Innovative solutions will be needed to forestall the risk posed to people, property and the environment. These solutions cannot be provided solely by engineers but will require cooperation from engaged stake-holders, including users, owners and local governments.

CONDITION

According to the NID, there are 5,420 dams in Georgia. The vast majority of them – 4,570 – are privately owned. An additional 59 dams are owned by federal agencies, 337 are owned by local governments, 324 by the state, and 43 by public utilities. The remaining 87 dams' owners are not listed.

The state-regulated dams are classified as Category I dams, meaning failure of the structure would cause probable loss of human life. The Georgia Safe Dams Act requires regular inventory of Category 2 (non-high hazard) dams. The Act also requires inspection of high hazard (Category I) dams to ensure regulatory compliance.

Federally-regulated dams in Georgia are categorized as follows:

- Satisfactory – 24 dams
- Fair – 17 dams
- Poor – 9 dams



Based on the increase in state-level inspections, it would appear that the overall condition of Georgia’s state-regulated dams worsened since 2014. In reality, the true condition of these dams improved as the inspection backlog was addressed with increased funding:

| | TOTAL DAMS IN FEDERAL INVENTORY | TOTAL DAMS UNDER STATE OVERSIGHT ¹ | HIGH HAZARD DAMS ² | STATE HIGH HAZARD DEFICIENT DAMS ³ | STATE DAM SAFETY BUDGET (\$ THOUSANDS) | NO. STATE STAFF ON DAM SAFETY | NO. STATE REGULATED DAMS PER FTE STAFF |
|------------------|---------------------------------|---|-------------------------------|---|--|-------------------------------|--|
| Change | +1,367 | +59 | +6 | +87 | +\$73 | +6 | -602 |
| As of 2018* | 5,420 (2016) | 4,112 (2017) | 490 | 217 | \$673 (2017) | 10 | 411 |
| As of 2013** | 4,053 (2011) | 4,053 | 484 | 130 | \$600 (2013) | 4 | 1,013 |
| Georgia (2008)** | 4,883 | 3,703 | 450 | 155 | \$727 (2005) | 8 | 463 |
| Georgia (2003)** | 4,977 | 3,412 | 399 | 105 | \$682 | 10 | 341 |

Source: Association of State Dam Officials and the Environmental Protection Division of Georgia DNR

*Data as of December 2018, except as noted.

**Indicates figure taken from National Inventory of Dams (NID) and based on NID definitions.

¹ Estimated number of all dams under state oversight. Data for 2013 could not be verified and thus is not reported for some national categories.

² Includes dams, not regulated by the US government that are 25 feet high or greater or impound a volume of 100 acre-feet or greater at the maximum dam height.

³ High-hazard dams with identified deficiencies by state definition.

CAPACITY

Since 2014, categorical usage of dams in Georgia has remained constant. While the number of state-regulated dams remains steady, the largest increase in dams has been among those used for water supply. This increase in water supply dams is consistent with the increase in Georgia population (6.5% since 2010) and is expected to continue into the foreseeable future.

OPERATION AND MAINTENANCE

One of the most significant challenges facing dams in Georgia remains operation and maintenance. With most dams in Georgia in private hands, the significant cost associated with dam operation and maintenance remains a daunting challenge. The 11 inspectors in the Georgia Safe Dams Program devotes significant resources to working with private property owners to help in bringing their dams into compliance, which often takes months or years. Some owners do not have the means to repair their dams, and the best option to deal with a deficient dam can be a controlled breach to eliminate the risk of failure.



PUBLIC HEALTH AND SAFETY

According to the NID, including those under federal and state purview, there are 596 high hazard dams, 41 significant hazard dams, and 3,587 low hazard dams in the state, with a hazard potential classification unknown for the final 196 dams. Hazard classification is an indication of the impact of a dam failure, should one occur. The failure of a high hazard dam would result in probable loss of human life, while a significant hazard dam failure would result in probable economic loss.

Every high hazard dam in Georgia should have an Emergency Action Plan (EAP). EAPs create standard procedures in case of dam breach or failure. These standard procedures include lists of which agencies to alert, as well as flood inundation maps so officials know who needs to evacuate. These plans help people get out of harm's way in advance of a catastrophe. The need to develop EAPs for high hazard dams has been addressed by regulatory changes. The number of current EAPs for high hazard (Category I) dams has increased dramatically from approximately 5% in 2014 to 58% in 2018. The EAP requirement has been effective and will require continued vigilance by those responsible and those who oversee this major change.

These largely regulatory changes demonstrate significant progress during the period. These regulatory changes lay the groundwork for real improvement in dam infrastructure which will occur among owners and operators. Continued review and updating of EAPs will be a necessity.

INNOVATION

The dramatic increase in high hazard deficient dams from 130 in 2013 to 217 in 2018 represents a major dichotomy: Real progress in identifying the deficiencies and a significant challenge to address these issues. Georgia will need to rely on innovation to increase owner awareness and facilitate the funding needed to address deficiencies.

FUNDING

The 2014 Georgia ASCE Report Card contained four recommendations for increases and improvements considered fundamental for improving the state of dams. These included increases in funding and staffing for regulatory functions, ensuring Emergency Actions Plans are in place for the most critical dams and public education on the importance of dam safety activities such as repair and maintenance for dam owners and operators. More than doubling the state staff has helped address the backlog of review and enforcement activity and slightly decreased the number of dams which need to be assessed for compliance with the Rules for Dam Safety. The funding for dam repairs and operations and maintenance remain the responsibility of owners. Given the typical cost of dam repairs, the Georgia Section believes that a grant program would be appropriate to address these expenses.

FUTURE NEED

With Georgia's population forecast to increase an additional 27% by 2050, it is reasonable to expect that water supply needs will continue to rise, resulting in the need for more dam structures. Dams are also used to create stormwater detention ponds for new development. This comprises the vast majority of small dams. As the number of dams under state regulation continues to increase, the needs for funding and staffing for the Georgia Dam Safety Program will continue to increase.

2019

REPORT CARD FOR
GEORGIA'S
INFRASTRUCTURE



RESILIENCE

The Georgia Safe Dams Program has coordinated with the Association of State Dam Safety Officials (ASDSO) to organize, prepare and present educational training seminars and materials on Dam Safety for Businesses and Homeowners Responsible for Dams. Of particular note is their training entitled “Georgia Dam Safety Workshop for Owners and Operators” which includes educational materials developed and provided to homeowners and businesses responsible for dam repair and maintenance. These materials should be made available to realty companies, chambers of commerce, libraries and on-line through Georgia Safe Dams Program and local governments. Professional organizations such as ASCE can assist in developing these materials.



DRINKING WATER



DRINKING WATER

GRADE: B- (2014 GRADE: C+)

EXECUTIVE SUMMARY

In Georgia, treated water capacity generally meets current demands. The widespread use of new technologies and practices, such as smart pressure reducing valves, pressure data loggers, automated metering infrastructure, Computer Maintenance Management Systems (CMMs), and “on condition” maintenance has improved the safety and reliability of drinking water service. Georgia is a nationwide leader in water loss control initiatives, and is shifting toward comprehensive water loss control programs. Drought protection has significantly improved over the past four years. Meanwhile, Georgia’s relatively low incidence of health-based violations is reflective of these new innovations. Sustaining this performance will require Georgia’s rate structures to be continually re-examined to ensure adequate funding. The state will need approximately \$12.5 billion over the next 20 years to meet capital improvement demands.



**DRINKING
WATER**



RECOMMENDATIONS TO RAISE THE GRADE

- **RESILIENCE:** Continue to focus on drought protection by expanding regional water planning. Utilizing strong conservation methods and regional planning, Georgia must be prepared for the next significant drought event before it occurs.
- **INNOVATION:** New approaches have historically led to many drinking water safety and capacity improvements, among them the implementation of chlorine as a disinfectant in 1908, which has been called the most life saving innovation in human history. Water loss control techniques, pressure management, and remote water quality sensing should be prioritized as essential improvements at every Georgia water agency.
- **IMPROVED TOOLS:** At this point, a statewide or nationwide regulatory framework similar to CMOM could benefit water systems by formalizing approaches to asset management. This approach would drive replacement of aging drinking water infrastructure. Increasing use of GIS and CMMS tools to manage vertical and linear assets is imperative. These tools have become affordable to every Georgia agency.
- **WATERSHED PROTECTION:** Formalize plans to protect water sources from contamination in stormwater runoff, point sources, and extreme weather events.
- **WORKFORCE:** As the workforce ages, publicize the need for engineers and operators who will commit to a career in drinking water innovation.
- **RATES:** Utility rates should provide for the full cost of service, including operation and maintenance and capital projects.



INTRODUCTION

Georgia's public water systems serve a population of over 10 million citizens, with the remainder of the population, less than 5%, served by private well systems. There are 5,490 Public Water Systems (PWSs) in Georgia. These systems stand ready to deliver water to homes and businesses around the clock. In addition to supplying drinking water and water for industrial needs, at any time of day, the PWSs provide fire protection on public water mains and reserve capacity for fire suppression systems connected to institutional, commercial and industrial facilities. In addition to expecting reliability and availability, Georgia's public water utility customers have high expectations for aesthetics.

Much of Georgia's water infrastructure is well into its predicted service life, and management of assets is crucial to maintaining an acceptable service level. Aging infrastructure results in increasing funding demands for additional water supply projects, improvements to treatment plants and distribution systems, operations and maintenance needs, and process improvements to meet water quality regulations.

CONDITION

Since the early 2000s, with the adoption of better accounting standards for public assets, public water agencies have improved methods of tracking and assessing the condition of pipes, water plants, and other components of their water systems. Asset management has become essential to responsible water stewardship, and these initiatives continue to proliferate in Georgia. As digital tools such as CMMS and Geographic Information Systems (GIS) become more affordable and robust, utilities increasingly rely on these tools to manage their assets.

Since state-wide data on the condition of water infrastructure is not compiled, regulation similar to CMOM (Capacity, Management, Operation, and Maintenance) applied to wastewater systems by the U.S. Environmental Protection Agency (EPA) could improve tracking and accountability of the condition of drinking water infrastructure.

CAPACITY

The Georgia Water Stewardship Act of 2010 incentivizes water conservation, encourages water loss abatement, improves public outreach, and examines rate structures of public water utilities. This Act is an important step toward improving water conservation and likely influenced the Metropolitan North Georgia Planning District (MNGPD) to reduce its 2050 demand forecast by 25% in 2017 when compared to the similar projection in 2009.

Since 2001, per capita water use has fallen significantly (by over 30%) due to the adoption of conservation measures. Incentives such as tax breaks and rebate programs have, for example, led to widespread adoption of low-flow toilets and shower heads. The MNGPD plan accounts for these trends by delaying the need for certain capacity expansions, but the population in Georgia is projected to continue to grow.

Groundwater sources comprise about 22% of the total water supply in Georgia. Since 2000, the Georgia Department of Natural Resources Environmental Protection Division (EPD) prohibited new groundwater permits in coastal counties due to salt water intrusion (Lower and Upper Floridian aquifers and Flint River), presenting a challenge for water supply infrastructure, especially as demand for water increases due to population growth. This will lead to consideration of other sources such as surface water, seawater desalination, and other aquifers.

2019

REPORT CARD FOR GEORGIA'S INFRASTRUCTURE



Since the 2014 Report Card, drought protection has increased substantially in north Georgia with 18 billion gallons of new water supply capacity either developed or in development at Walton County's Hard Labor Creek Reservoir, City of Atlanta's Bellwood Quarry, and Paulding County's Richland Creek Reservoir.

OPERATION AND MAINTENANCE

Operation of water plants and distribution systems has evolved significantly in the past several years. Pressure management is regularly used by Georgia water agencies to reduce the incidence of pipe breaks and to reduce water loss through leakage. Because of the advent of new monitoring technologies, System Controls and Data Acquisition Systems (SCADA) are ever more useful as a tool for operators to monitor and control all aspects of the plants and distribution networks.

Georgia water agencies are using more sophisticated maintenance strategies. For example, the use of CMMS is considered an industry best practice and is widely employed. The future holds further advancements, including a transition from frequency-driven to "on condition" maintenance, guided by condition monitoring using ultrasound, temperature, vibration, and other advanced sensors, but utilities must continue to invest to manage their data.

PUBLIC HEALTH AND SAFETY

The safety of drinking water in Georgia is regulated by the EPA, with permitting and enforcement delegated to EPD. Georgia residents have an expectation that their water is safe and aesthetically pleasing. Generally speaking, this expectation is consistently met by Georgia water utilities.

The vast majority of public water systems in Georgia operate without health-based water quality violations. In the years 2013-2017, Georgia excelled in compliance with EPA drinking water regulations, ranking 35th nationally in health-based violations (201 PWSs in violation) of the Safe Drinking Water Act, according to EPA's Safe Drinking Water Information System.

INNOVATION

Georgia water systems are beginning to benefit from new technologies. Distribution system pressure management initiatives now make use of modern, high-frequency pressure data loggers and "smart" pressure reducing valves. Automated Metering Infrastructure (AMI) provides granular data to operators and customers, for more sophisticated management of drinking water. Reliable remote water quality monitoring is also on the horizon for some Georgia water agencies. These innovations improve the safety and reliability of drinking water service in Georgia by reducing pressure fluctuations and by tracking water loss.

FUNDING

Water infrastructure operation, rehabilitation, replacement, and expansion are typically funded completely by rates paid by customers. When setting rates, utilities must consider full life-cycle costs to sustainably manage their assets. Many effective tools are available to accomplish this important goal. The University of North Carolina's Environmental Finance Center offers an effective tool for utilities to use in setting rates, and most Georgia utilities show sufficient cost recovery.



The median monthly water bill in Georgia is \$14.50, which is significantly below the most recently published national average, \$34 per month, in 2014. Funding for water system improvements in Georgia varies by the ownership of the system. Some agencies are entirely self-funded through capacity fees and rates paid by customers. Large projects are often funded through capacity fees paid by those expanding the systems or the issuance of municipal bonds. Others rely on outside funding sources such as loans through the Georgia Environmental Finance Authority (GEFA). The Georgia Reservoir Fund provides loans for water supply projects, including reservoirs, interconnections between water systems, and water system consolidation projects. Other GEFA funds focus on various kinds of drinking water infrastructure.

Many more rural communities and smaller systems find funding for water distribution and storage projects through economic incentive grants from the U.S. Department of Commerce, U.S. Department of Agriculture and Community Development Block Grant programs, generally administered through the Georgia Department of Community Affairs.

FUTURE NEED

Improvements to Georgia's water infrastructure will be essential to providing safe and reliable water service in the coming years. Deficiencies in the condition and capacity of vertical assets (water plants and pumping/storage stations) and linear assets (pipes and related infrastructure) will need to be addressed through capital improvement projects statewide.

According to the U.S. EPA's Needs Survey, Georgia is facing a funding need of \$12.5 billion over the next 20 years to meet capital improvement demands. This estimate may very well be low, given that completion of the survey was not mandatory. Funding for improvements should be sourced directly from capacity fees and rates paid by water customers, but also from bond issuance and low interest GEFA loans. The past decade has seen extremely low borrowing costs, especially for Georgia's WaterFirst communities.

RESILIENCE

Protection from drought and other water supply threats is a priority for all Georgia water agencies. Planning for water crises through good water stewardship is the most effective tool for confronting this threat. Post-crisis recovery must rely on strict water management policies so the available water supply returns to normal as quickly as possible.

Recognizing the importance of unified management of assets, in 2008 Georgia enacted the State Water Plan. Ten Regional Water Planning Councils completed their respective Regional Water Plans in 2011. These plans identify policies and actions to improve water quantity and water quality. Updated Regional Water Plans were finalized in 2017, and form the basis for statewide water resilience.

Water conservation continues to be an important component in extending Georgia's water supply capacity. Along with other proactive states, Georgia is a nationwide leader in water loss control initiatives. For each PWS serving over 3,300 people, a Water Audit is required to be certified by a Qualified Water Loss Auditor and submitted to the EPD annually. The focus is shifting toward comprehensive Water Loss Control Programs, and regulatory steps have been taken to ensure compliance from the PWSs serving over the 3,300-person threshold.



**DRINKING
WATER**



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ENERGY



BOAT TRAFFIC AT DUSK ON SAVANNAH RIVER BELOW THE
EUGENE TALMADGE MEMORIAL BRIDGE.



ENERGY

GRADE: B (2014 GRADE: B)

EXECUTIVE SUMMARY

Energy in Georgia is primarily generated by natural gas, followed by nuclear and coal, and finally, renewables. In 2016, the state led the nation in the use of wood and wood-derived fuels for generation and in 2017, Georgia was ranked third in the amount of generation from all biomass resources. In recent years, Georgia has increased its electric power capacity by focusing on alternative resources, such as nuclear and solar. With 1556.33 MW of installed solar, Georgia moved up from 22nd to 10th for electricity generated by solar in 2017. The condition of the grid is aging and the commitment to add, maintain and/or replace infrastructure is vital in ensuring a safe and reliable system. Georgia Transmission Corp. plans to invest more than \$100 million annually in power line and substation construction and upgrades. Similarly, Georgia Power plans to invest \$3 billion on system upgrades in the near future. Storm-hardening of the system remains critical to ensuring reliability.



ENERGY



RECOMMENDATIONS TO RAISE THE GRADE

While technical, regulatory and financial obstacles may slow down progress, addressing the recommendations below can improve Georgia's energy grade in the future.

- **Institute tax credits for renewable investment, storage and redeployment of stored energy and for developing on “abandoned” properties in disadvantaged areas**
- **Increase funding, research and education in energy storage to help flatten the demand/supply curve making Georgia operate much more efficiently with the resources we already own**
- **Streamline permitting processes to facilitate prompt construction of critical new transmission lines and natural gas pipelines**
- **Expand energy efficiency programs**
- **Increase funding for coal ash pond mitigation**
- **Promote smart grid technologies in both transmission and distribution power**

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CONDITION & CAPACITY

The footprint of high-voltage, long-distance transmission lines and lower voltage distribution lines carrying electricity to end users has remained largely the same in Georgia. In collaboration, the investor-owned utilities, customer-owned utilities (cooperatives) and government-owned utilities (municipals), produce, transmit and distribute power throughout the state. Georgia's Integrated Transmission System (ITS), jointly owned by Georgia Power, Georgia Transmission Corp., Municipal Electric Authority of Georgia (MEAG) and Dalton Utilities, plan and operate the electric transmission system ensuring transmission remains efficient and reliable. According to the U.S. Energy Information Administration (EIA), in 2017 Georgia ranked eighth in the nation both in net electricity generation and in retail sales of electricity. In 2017, natural gas accounted for 41% of Georgia's net electricity generation, nuclear for 26%, coal for 25%, and renewable energy, including hydroelectric power, contributed 8%. The share from solar power requiring grid integration to accommodate its natural intermittency exceeded 1% for the first time in 2017.

While the condition of the grid is naturally aging, the commitment to add, maintain and/or replace infrastructure is vital in ensuring a safe and reliable system. Georgia Transmission Corp. states they plan to invest more than \$100 million annually in power line and substation construction and upgrades. Similarly, Georgia Power plans to invest \$3 billion on system upgrades over the next few years.

The state has increased its electric power capacity focusing on alternative resources such as nuclear and solar. Renewable resources fuel almost one-tenth of Georgia's net electricity generation, where about half comes from biomass at pulp and paper mills that have cogeneration systems, according to EIA. In 2016, the state led the nation in the use of wood and wood-derived fuels for generation. In 2017, Georgia was nationally ranked third in the amount of generation from all biomass resources. While the state is ranked first in the nation for commercial timberland, is home to the largest wood pellet plant and exports the most wood pellets nationally, the federal tax incentives for biomass are only a fraction of other renewable sources.

The rising demands for electricity combined with concerns about carbon emissions and clean air are among the leading issues motivating support for new nuclear facilities. Plant Vogtle's Units 3 and 4 are the first new generation of nuclear energy facilities and only active units under construction in the U.S. With planned startup dates of 2021 and 2022, it is stated these units will generate enough electricity to power 500,000 homes and businesses (2200 MW) for the next 60 years.

Joint efforts with the Georgia Public Service Commission under the direction of Chairman Lauren MacDonald helped increase the solar footprint in Georgia. While only 1% of the state's electricity is generated from solar, the cost of solar power has fallen 47% in the last year favoring Georgia as a state for solar. Projected solar energy growth in Georgia is 2,747 MW over the next five years with investments of \$2 billion. With approximately 200 solar companies (manufacturers, installers/developers, etc.) working in Georgia, solar is powering 174,013 homes while creating thousands of jobs. Large utility-scale solar continues to soar with the Butler Solar project (103 MW) leading the way in 2016 with little sign of the trend slowing down. When completed, the new 200MW facility in Twiggs County will become the largest solar power plant in the SE U.S.

Georgia has little to no natural gas reserves or production, no known petroleum reserves or crude oil production, only minor estimated recoverable coal reserves and no coal production. Southern Company Gas serves customer demands with Liquefied Natural Gas (LNG) and propane.



O&M, FUNDING & FUTURE NEED

In July 2018, the Atlanta Journal-Constitution (AJC) reported Georgia ranked as third highest in energy costs at \$349 per month. While Georgia ranked low on electric rates when compared nationally, other energy sources pushed the ranking higher. However, these costs reflect needed infrastructure investments made such as replacing bare steel and cast-iron gas pipelines and upgrading Georgia Power's 2.4 million customers to the Smart Meter to be more cost-efficient in the long term.

Current efforts to reduce costs include diversifying the energy portfolio and incorporating alternative resources. While Plant Vogtle delays and cost overruns have made national news, the commitment to finish the nuclear Units 3 and 4 remains, providing a long-term solution for low-carbon energy. Nuclear energy produces large amounts of essentially carbon-free power, proving it advantageous over the variability found with wind and solar. A report from the Massachusetts Institute of Technology (MIT) proposes nuclear can be more competitive with other kinds of power plants if the cost of building new nuclear power plants is linked to carbon emissions. Some states have already rewritten emission policies to do so. MIT suggests the expense of building a plant becomes viable when considering the reduced carbon emissions rate. Until it becomes cost-effective to add grid-scale battery storage, nuclear has an opportunity to provide base-load zero-carbon electricity.

As energy diversity is key, offering tax credits for renewable investment, storage and redeployment of stored energy and for developing on "abandoned" properties in disadvantaged areas will stimulate development. Additionally, utilities should consider encouraging and increasing time of use rates to manage peak load. As expensive efforts continue with coal ash disposal, funding will be needed for retrofitting legacy coal ash ponds with lining, advises Tim Echols, Vice-Chairman of the Georgia Public Service Commission.

PUBLIC SAFETY, RESILIENCE & INNOVATION

U.S. News & World Report ranks Georgia 31st in grid reliability based on outage times. Because of Georgia's Atlantic coastal location, the frequency and severity of extreme weather events increases the need for reliability and resilience. Other states like Florida and New Jersey have created grid hardening programs in the wake of recent catastrophic storms and Georgia should consider similar programs to avoid massive outages such as those resulting from Hurricane Michael. Additionally, while a strike on the electric grid could have devastating effects on the economy, the North American Electric Reliability Corporation (NERC) reported in 2016 no cyber or physical security incidents resulted in a loss of load. However, as threats increase and become more serious, vigilance to create a reliable and resilient system should be at Georgia's forefront.

Looking forward, Commissioner Echols is evaluating ways to mitigate coal ash and is considering SEFA's STAR® Technology which turns legacy ash into usable construction ash. Advanced energy technologies and smart grid investments have improved system reliability, but more efforts should be placed in battery energy storage. The National Electric Energy Testing Research and Applications Center (NEETRAC), along with researchers at Georgia Tech, are developing a wide range of lightweight, cost-effective, and high-energy density storage devices, such as fuel cells, solar cells, high-energy density batteries, and super capacitors to address limitations of energy capacity and charge rates. Georgia Tech's Center for Distributed Energy and others are proposing novel means of instrumenting, sensing and responding to grid variations dynamically, so as to optimize existing infrastructure and facilitate the transformation of the grid.

As population increases, demand for energy in our digital world does also. Changes need to be made to ensure our system can withstand the elements, integrate renewable energy and meet the public's expectation for affordable, reliable power. Georgia must continue to support research in energy storage to flatten the supply/demand curve, promote and encourage solar development with tax credits, fund and upgrade the aging infrastructure, invest and expand energy efficient programs, continue implementation of smart grid energy technologies and stay vigilant in protecting against security threats.



ENERGY



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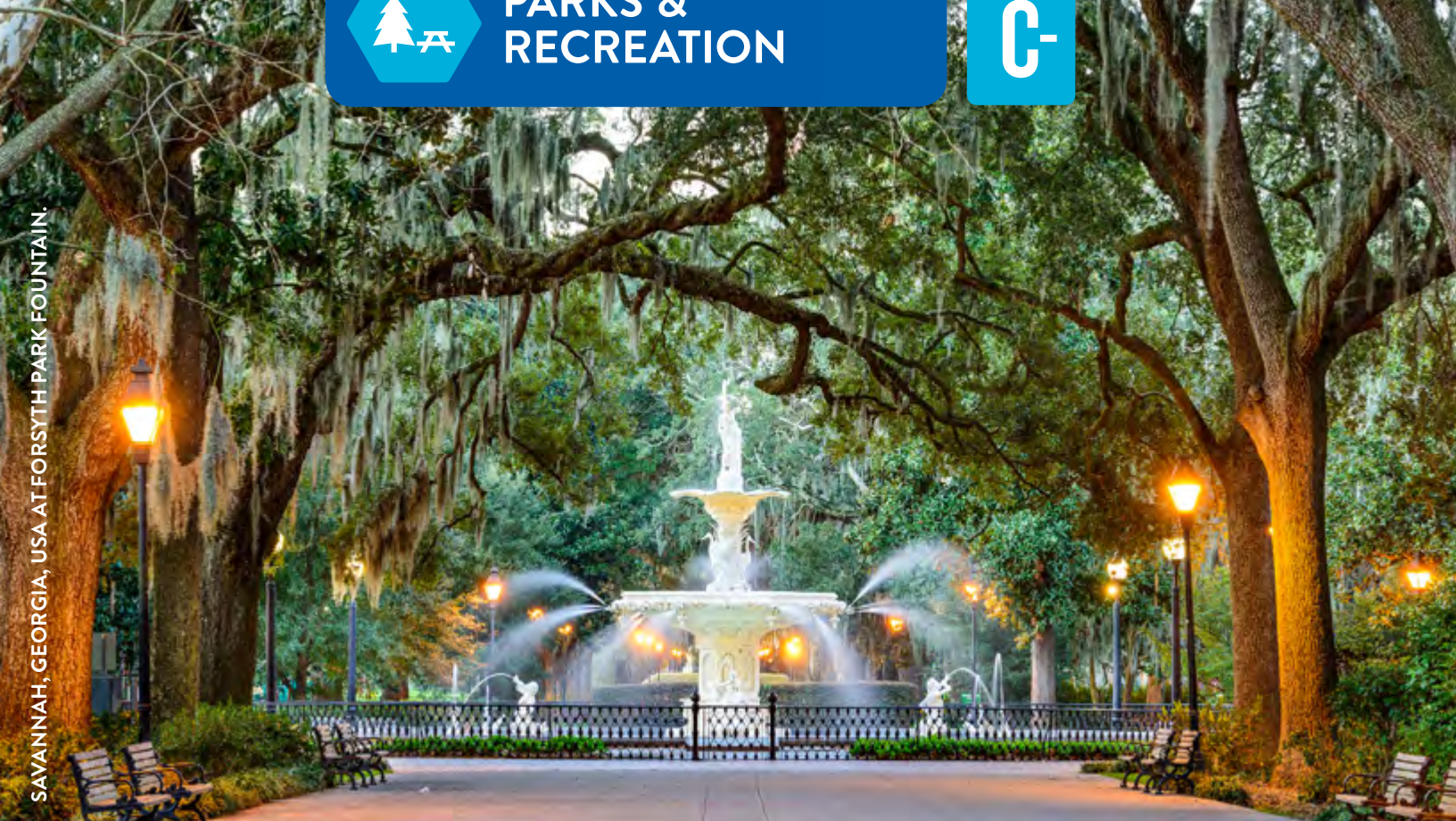
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SAVANNAH, GEORGIA, USA AT FORSYTH PARK FOUNTAIN.



PARKS & RECREATION



PARKS AND RECREATION

GRADE: C- (2014 GRADE: D+)

EXECUTIVE SUMMARY

Georgians value parks and recreation and support investing in associated infrastructure, as demonstrated by a statewide survey published by the Georgia Department of Natural Resources. Fortunately, commensurate with the improving economy, state funding for parks has steadily increased in recent years; in FY 2017, \$9.2 million was provided for infrastructure repairs and upgrades, up from \$8.4 in FY 2008, just before the onset of the Great Recession. The future also looks bright. In November 2018, Georgia voted to direct 80% of revenue from the sales and use tax on outdoor recreation equipment to the Georgia Outdoor Stewardship Trust Fund. Meanwhile, Georgia uses federal Land and Water Conservation Fund grants primarily for maintaining and rehabilitating existing facilities, to effectively mitigate the impacts of age in parks across the state. While the additional funding is encouraging, most of Georgia’s land is private, and access to parks, especially in the growing Atlanta region, can at times be insufficient. Atlanta was ranked 43rd by the Trust for Public Lands in 2018 in terms of how city parks are meeting citizen needs.



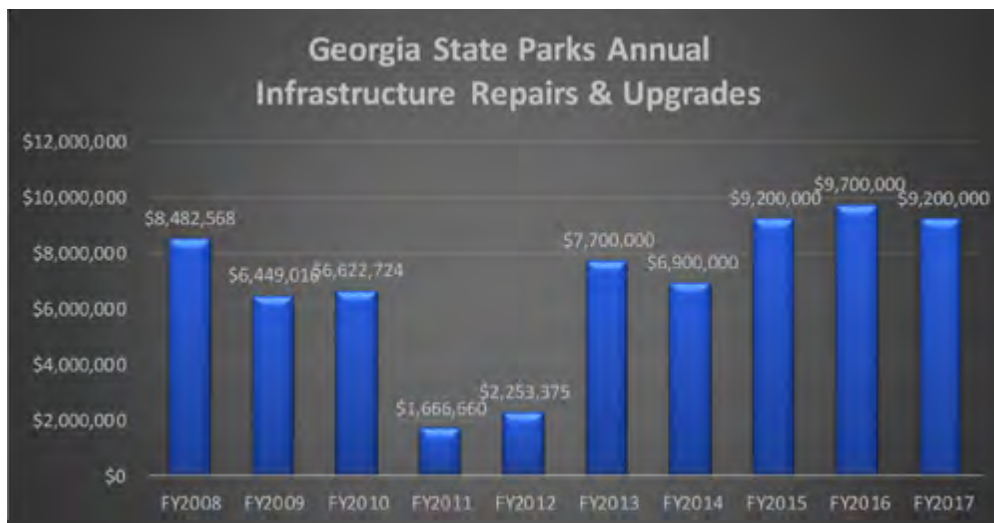
RECOMMENDATIONS TO RAISE THE GRADE

- **THE LAND AND WATER CONSERVATION FUND (LWCF) SHOULD BE REAUTHORIZED AND FULLY FUNDED.**
- **COLLABORATE WITH LOCAL AND STATE AGENCIES AND COMMUNITY LEADERS** to leverage the valuable information provided through Georgia's extensive park inventory database to ensure that recreational opportunities are being added to address areas where they are needed the most and areas where they will pay the most dividends.
- **EXPAND UPON THE COLLABORATION WITH MARKETING AND ECONOMIC DEVELOPMENT PROFESSIONALS** to make more information and programs available to more Georgians. This may include expanding social media presence and private/public partnerships.
- **PROVIDE TRANSPARENT AND SCALABLE METRICS THAT SHOW THE MANY SOCIAL AND ENVIRONMENTAL BENEFITS** that result from the creation and use of parks and protected lands. Work with other state agencies in the areas of environmental protection and mental and physical health to share goals, strategies, and success stories.
- **CONTINUE TO MAXIMIZE THE THOUGHT, EFFORT, AND RESPONSIVENESS** to the process around the Statewide Comprehensive Outdoor Recreation Plan by involving more agencies and organizations. Specifically focus on expanding the partnership with Georgia Recreation and Parks Association (GRPA) to bring more local park systems in to the process.
- **EMPHASIZE CONNECTIVITY** within communities among parks and key community and social services with multi-use trails.



CONDITION

The State Parks and Historic Sites Division of the Georgia Department of Natural Resources (DNR) conducted a survey as part of the 2017-2021 Statewide Comprehensive Outdoor Recreation Plan (SCORP). Sixty-three percent of statewide respondents self-identified as “recreators” and the remainder, 37%, responded as “non-recreators.” For many of these recreators, the 2017-2021 SCORP notes that a significant portion of the quality of the park experience depends on the quality of the facility. Since 2014, Georgia has leveraged the strengthening economy to increase funding for repairs and upgrades, as shown in the following chart:



Source: Georgia Department of Natural Resources

Periodically, DNR issues an update to the SCORP, which is required so that state parks are eligible for federal funds from the Land and Water Conservation Fund (LWCF). The LWCF grants assist state and local governments in acquiring, redeveloping and rehabilitating outdoor recreational facilities and resources, but require a 50% match. As noted in the SCORP, the focus of local (city and county) federal grants has been on maintaining the condition of these facilities by directing approximately 60% of the grant monies toward rehabilitation projects. This focus is well-placed as these parks continue to age.

| Category | 2006 - 2008 | | 2009 - 2010 | | 2013 - 2015 | | 2015 | | Total | |
|----------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-----------|-------------|-----------|-------------|
| | Grants | % of Total | Grants | % of Total | Grants | % of Total | Grants | % of Total | Grants | % of Total |
| Rehabilitation | 7 | 54% | 8 | 50% | 14 | 100% | 8 | 42% | 37 | 60% |
| Acquisition-Development | | | 1 | 6% | | | 1 | 5% | 2 | 3% |
| Development | 3 | 23% | 4 | 25% | | | 7 | 37% | 14 | 23% |
| Acquisition | 2 | 15% | 3 | 19% | | | 1 | 5% | 6 | 10% |
| Disadvantaged | 1 | 8% | | | | | | | 1 | 2% |
| Rehabilitation-Development | | | | | | | 2 | 11% | 2 | 3% |
| Total | 13 | 100% | 16 | 100% | 14 | 100% | 19 | 100% | 62 | 100% |



CAPACITY

The DNR oversees a broad range of recreation-related facilities in the state. These include:

- 65 state parks and historic sites;
- Eight golf courses;
- 134 wildlife management areas (WMAs);
- 10 public fishing areas and nine fish hatcheries; and
- 43 shooting ranges.

The total number of facilities has remained approximately constant since the 2014 Georgia Infrastructure Report Card.

Since 2014, attendance at Georgia parks has steadily climbed, with fiscal year 2018 attendance up to 9,063,094 million visitors. This marks a 17.3% increase over the last four fiscal years. Overall, annual attendance is still down compared to 2008 through 2010, but the steady increase is encouraging.



Source: Georgia Department of Natural Resources

FUNDING

State funding for parks was decimated following the 2008/2009 recession but has recovered significantly as the economy has improved.

| Fiscal Year | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|--------------------------------------|-----------|-----------|-----------|-----------|------------|------------|------------|------------|------------|
| State Parks Funding (\$000) | \$ 14,677 | \$ 13,388 | \$ 13,190 | \$ 13,385 | \$ 13,615 | \$ 14,549 | \$ 14,797 | \$ 18,080 | \$ 15,171 |
| Georgia Population | 9,712,696 | 9,819,595 | 9,911,171 | 9,992,167 | 10,121,139 | 10,250,112 | 10,379,084 | 10,508,057 | 10,637,029 |
| State Park Funding per 100 Residents | \$ 151.11 | \$ 136.34 | \$ 133.08 | \$ 133.95 | \$ 134.52 | \$ 141.94 | \$ 142.57 | \$ 172.06 | \$ 142.62 |

Source: Georgia Governor's Office of Planning and Budget



It is encouraging to note that funding on a population-adjusted basis has also been increasing to pre-recession levels.

Parks generate economic activity. The latest SCORP report cites examples showing that the Okefenokee National Wildlife Refuge generated \$1.38 of total economic effect for every \$1.00 spent. The Georgia Recreation and Park Association reported several examples of parks and outdoor recreation generating economic impact for local communities. For example:

- The City of Bainbridge generated \$1.89 million with seven fishing tournaments;
- The City of Dalton generated \$3.2 million with a 4-week senior softball tournament; and
- The City of Tifton and Tift County generated \$3.4 million while hosting a state swim meet.

Local municipalities and private investors have shown through many projects that money spent on facilities for hosting youth sports events can be a major economic stimulus. The most notable example in Georgia is the 1,300-acre LakePoint Sporting Community that opened in 2013. The project initially experienced financial challenges including a bankruptcy filing, but a recent article in the Cartersville Patch noted that the complex has a strong financial outlook and is currently moving forward with additional expansion. The article reports that the park attracts more than 1 million annual visitors, creating an economic impact of nearly \$100 million for the community's restaurants, hotels, and other businesses. Local municipalities have taken notice that investing in parks that host sporting events to tap into the passion for youth sports is an economic multiplier.

Many types of recreation activities have proven to be viable for generating revenue; however, public funding will likely always be necessary for some of the more remote parks and historic sites. Based on the public survey of 1,100 telephone respondents, the 2017-2021 SCORP reports that 56% of those respondents had paid program or user fees at a park over the past year. Of those respondents, about 83% found the fees to be reasonable. Only 14% found the fees to be too much and 4% felt that the fees were too low. The survey went further to inquire about willingness to pay increased park user fees. The survey found that 52% of respondents were "willing" or "very willing" to pay higher fees and an additional 17% were "somewhat willing" to pay increased fees. The remaining 31% were either "unwilling" or "very unwilling" to pay more fees. The SCORP survey also measured support for public funding for outdoor recreation. An impressive 85% of respondents indicated a support for public funding, with 68% supporting additional funding above existing levels. The findings of this survey proved accurate in the November 6, 2018 statewide election, where an overwhelming 83% of voters supported Georgia Amendment 1. Amendment 1 authorized the legislature to dedicate up to 80% of revenue from the sales and use tax on outdoor recreation equipment to the Georgia Outdoor Stewardship Trust Fund to fund land conservation. It is estimated that the passing of this amendment will generate approximately \$20 million in annual funding for a period of 10 years. The impact of this legislation should be felt for generations to come. While it is too early to tell exactly how this will impact land conservation, the high level of public acceptance toward funding land conservation is encouraging.





FUTURE NEED

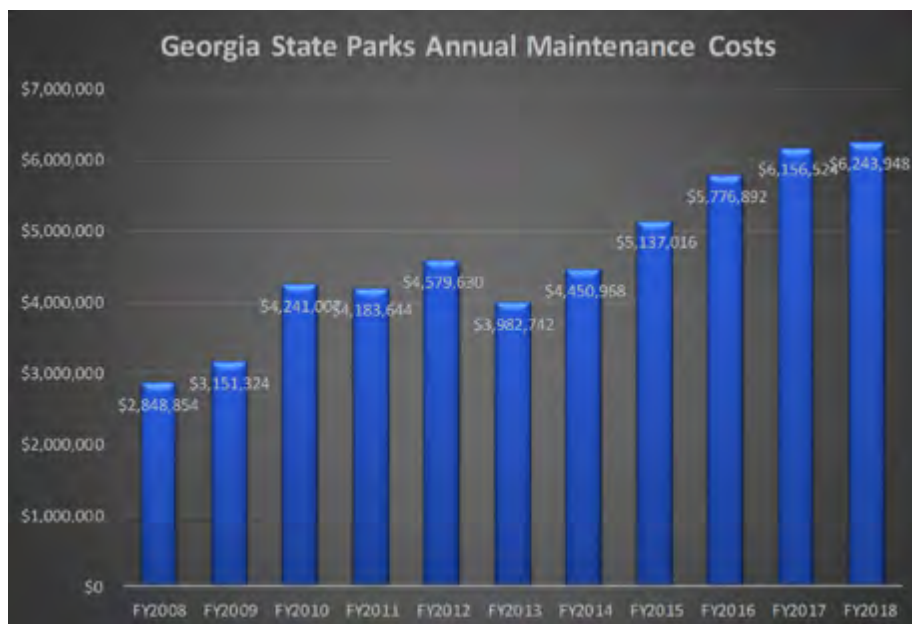
As with its neighbor to the south Florida, Georgia's population has been growing significantly in recent years. Georgia has a total land area of roughly 37 million acres which is comparable to the land area of Florida. Unfortunately, only 1.2% of Georgia's total area is owned by the state, compared with 14.6% in Florida. Protected lands make up approximately 3.6% of the total land area of Georgia, significantly less than Florida.

Urban areas are also growing quickly. Atlanta is one of the fastest developing regions in the country, but it ranked 43rd out of 97 in the 2018 ParkScore ranking by the Trust for Public Lands (TPL), which indicates how well each city is meeting the need for parks. By comparison, Florida had two cities ranked ahead of Atlanta by the TPL, further indication that there is room for improving urban park systems. The Atlanta Beltline is a planned loop connecting 45 intown neighborhoods via 33 miles of multi-use trails and 2,000 acres of parks and has spurred over \$3 billion in private economic redevelopment. The continued focus on completing the Atlanta Beltline project by 2030 provides a possible model for future, large-scale urban parks in Georgia.

Georgians support parks through volunteer efforts and contributions. The 2017-2021 SCORP survey indicates that 85% of Georgia residents support funding parks and recreation and 68% support increased funding for these facilities. Additionally, as discussed above, Georgia Amendment 1 passed in 2018, which will direct additional funding towards parks across the state.

OPERATION AND MAINTENANCE

Spending on maintenance has increased 119% since 2008. As park facilities throughout the state aim to be more financially self-sufficient, maintaining clean and attractive facilities has become a necessity.



Source: Georgia Department of Natural Resources

2019

REPORT CARD FOR
GEORGIA'S
INFRASTRUCTURE



PUBLIC SAFETY

The 2017-2021 SCORP public survey found that approximately 30% of respondents reported that safety was “sometimes” or “always” a concern that affected their use of parks in Georgia. This concern was cited more often from women and minority respondents. With valuable feedback like this, park planners and park officials can target solutions to specific issues to continue to improve both the safety and the perception of safety in parks. Parks themselves can be an important tool for enhancing public safety in the surrounding communities.

Well-kept parks can be a source of pride for a community and can promote social interaction for community members from diverse backgrounds. Social benefits for park users include reduction in anti-social behavior, shared community involvement, understanding and inclusion of those with disabilities, reduction in loneliness and alienation, promotion of family values, as well as encouragement of ethnic and cultural harmony.

INNOVATION

Georgia has begun to harness the power of collaboration among municipal leaders with professionals in marketing and economic development to promote public awareness of parks and their benefits. Georgia Department of Natural Resources has partnered with the U.S. Department of Agriculture’s Natural Resource Conservation Service, through their Voluntary Public Access & Habitat Incentive Programs, to open an additional 5,871 acres in 14 counties to public access for hunting, fishing or wildlife viewing. This is a new program that can help provide broader access to the public in a state where 93% of the land is privately owned.

Perhaps the most impressive and impactful innovation for use of parks in Georgia lies in the use of the new park inventory database, one of the most complete parks and recreation databases in the country (www.protectedlands.net). Georgia Department of Natural Resources partnered with the non-profit GreenInfo Network to create an extensive new-generation inventory system. This system represents thousands of public outdoor recreation areas on millions of acres of land that are managed by hundreds of unique agencies and organizations. This database should serve as an invaluable tool for planners and decision makers as they look to improve their strategies for making parks more productive and accessible to everyone.



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PORTS



AERIAL VIEW OF TALMADGE BRIDGE, A SUSPENSION BRIDGE OVER THE SAVANNAH RIVER IN GEORGIA.



PORTS

GRADE: B- (2014 GRADE: C+)

EXECUTIVE SUMMARY

The capacity of Georgia's ports has increased over the past five years. Today, the Port of Savannah is the busiest export port in the U.S. and is competitive in a post Panama Canal expansion global marketplace. The Georgia Ports Authority has embarked on a planned growth strategy that will require funding from the federal government as well as Georgia state funds. When finished, the Port of Savannah's Garden City Terminal will be home to the largest on-dock intermodal rail facility in North America. Meanwhile, the Savannah Harbor Expansion Project (SHEP) continues to be a major priority. When completed, SHEP will cost an estimated total of \$973 million. Critical to the success of Georgia's ports will be ensuring adequate capacity on roads, rail and inland waterways to carry goods to and from the ports.



RECOMMENDATIONS TO RAISE THE GRADE

- **COMPLETE THE PORT DEEPENING:** The U.S. Congress should ensure that funds collected by the HMTF are used only for harbor maintenance, such as completion of the Inner-Harbor Dredging of the Savannah Harbor Expansion Project (SHEP), and not for unrelated government spending. HMTF collections far exceed fund appropriated for harbor maintenance; the surplus of collections has grown to over \$9 billion. WRDDA 2014 included a phased-in approach to reach full HMTF spending for its designated purpose by FY2025, and we encourage Congress to continue to work towards full appropriations of these funds.
- **INLAND INTERMODAL TRANSPORTATION:** Georgia Ports Authority provides unrivaled on-dock rail connectivity with 18 weekly Class I Trains to key markets such as Atlanta. Daily service is provided to every major destination east of the Mississippi with fastest East Coast connections to/from Alabama, Tennessee, Louisiana and Texas. However, continued investment in rail infrastructure expansion is needed to support greater inland access for GPA customers. The U.S. Congress should pass a reauthorized multi-year transportation bill that targets federal dollars toward economically strategic multimodal freight transportation infrastructure of national and regional significance.
- **INFRASTRUCTURE IMPROVEMENTS:** Increase education efforts to state and federal policymakers about the importance of interconnectivity of the multimodal freight network. For example, while GPA is making major investments into Georgia's port facilities, the intermodal links such as roads, railroads, bridges and federal navigation channels to access these facilities require sustained attention by state and federal agencies responsible for their upkeep. Georgia's major interstate highways linking Savannah, I-16 to Atlanta and I-95 along the Atlantic seaboard, are critical to future growth.
- **LAST MILE PROJECTS:** GA DOT should complete freight transportation projects that will reduce traffic, turn times, and emissions. Specifically, the terminal's truck traffic must seamlessly connect to the major interstate highways leading out of Savannah. Important projects for future connectivity include the Brampton Road Connector with expected completion in 2020 and the Jimmy Deloach Parkway Extension to I-16 which is expected to be completed by 2021. Growth continues to congest freeways throughout Georgia without additional funding solutions for our state's freight traffic.

INTRODUCTION

The Georgia Ports Authority (GPA) is the single port authority in the state. GPA is tasked with overseeing the operation and maintenance of their facilities and maintaining a state of good repair; their business depends on it. While GPA has control over some aspects of their infrastructure, others, including multimodal connections such as inland waterways projects, transportation connections, and rail connections – are outside their jurisdiction. Accordingly, the focus of this assessment was on both “inside” and “outside the fence” and how the comprehensive port system works.



Georgia has two main ports – the Port of Savannah and the Port of Brunswick, and three inland ports – Port Appalachia, Port Bainbridge and Port Columbus. The Port of Savannah has two terminals: Garden City and Ocean. The Port of Brunswick has three terminals: Mayor’s Point, Colonel’s Island and Marine Port. A terminal is where cargo is transferred between ships and other modes of transportation, such as rail and roads. Therefore, other modes of transportation are vital to the success of ports.



CAPACITY AND CONDITION

In 2018, Georgia Ports Authority handled over 4.2 million TEUs. A TEU is equivalent to one twenty-foot container. Containerized cargo handled by Georgia ports increased 8.4% over the previous year. The Port of Savannah exported 36 million containerized tons in 2018, an increase of 7.9% when compared to 2017. Currently, the Port of Savannah is the busiest U.S. port for exports. There were 434,505 intermodal container rail moves in 2018, a record, and 16.1% increase from the previous year. Breakbulk volumes totaled 2.8 million tons for 2018, a 5.8% increase over 2017. If all planned projects are completed, future capacity for throughput growth into FY 2028 will more than double to 9.38 million TEUs.

Garden City Terminal at the Port of Savannah is the fourth-largest container port in the U.S. and the largest single-terminal operation in North America. Garden City terminal consists of over 1,200 acres and nine containership berths, as well as access to two interstates and two rail carriers. The terminal averages 10,500 gate moves per day, reporting only 32 minutes for singles and 53 minutes for doubles. Garden City Terminal also boasts four gates, 48 lanes including 28 pre-check lanes, and 12 portal approach lanes. There is unrestricted double-stack service via rail and overnight service to Atlanta. Additionally, there are 17 high-volume retail import distribution centers in the Savannah area. GPA uses the interactive Global Carrier Services tool to provide worldwide transit times to and from Savannah, as well as rail and road transit times for major inland U.S. hubs. Looking forward, Garden City Terminal has plans to expand.

The Port of Brunswick in Georgia includes three terminals: Colonel’s Island, Mayor’s Point, and Colonel’s Island’s Roll on Roll off (RoRo) facility. The RoRo facility specializes in automobile transportation and is used by automobile manufacturers and industrial and agricultural equipment manufacturers. In 2018, GPA RoRo capacity was 630,000 units. However, the GPA RoRo has reached its capacity and future funding will be required to increase efficiency. Colonel’s Island also has an agri-bulk facility which handles agricultural products that can be transported and stored in bulk. The agri-bulk facility includes flat and silo storage facilities totaling 64,800 tons. The Mayor’s Point terminal specializes in wood products such as woodpulp, linerboard, plywood and paper products.

There are other smaller ports as part of the GPA network. Port Columbus is a liquid bulk facility on the Chattahoochee River with access to the Gulf of Mexico through the Appalachicola-Chattahoochee-Flint waterway system. Port Bainbridge is also located on the Chattahoochee River and has a large storage facility. There is also a new Appalachian Regional Port in northwest Georgia and planned new regional ports in northeast and west-central Georgia. Table 1 summarizes these ports and their access.

TABLE 1 GEORGIA'S PORTS

| PORT | TERMINAL | AVAILABLE RAIL | INTERSTATE ACCESS |
|---------------------------|------------------|-------------------------|-------------------|
| Port of Savannah | Garden City | Norfolk Southern | I 95 - 5.6 miles |
| | | CSX | I 16 - 6.3 miles |
| | Ocean | Norfolk Southern | I 16 - 1.2 miles |
| | | CSX | I 95 - 10 miles |
| Port of Brunswick | Colonel's Island | Norfolk Southern | I 95 - 2.5 miles |
| | | CSX | |
| | Mayor's Point | Norfolk Southern | I 95 |
| | | CSX | |
| | Marine Port | Norfolk Southern | I 95 - 5 miles |
| | | CSX | |
| Port Bainbridge | | CSX | Hwys 84 and 27 |
| Port Columbus | | Norfolk Southern | I 85, I 185 |
| Appalachian Regional Port | | Norfolk Southern CSX | I 16, I 75 |

Any discussion of port capacity must include a discussion of the Panama Canal expansion. Larger ships, about the size of three and half football fields, can now pass through the Panama Canal locks. In response to the expansion of the Panama Canal, ports have had to increase dredging and modernize their equipment and supply chains to handle these larger ships. The Georgia Port Authority has begun the modernization process by dredging its outer harbor, which involved digging existing navigation channels deeper. GPA has already installed larger Konecranes required for material handling. GPA will also need to make many other miscellaneous process improvements to get the products to flow off these large ships and onto trains and trucks.

One ongoing post-Panama Canal expansion project is the Mega Rail Project. When finished in 2020, the Port of Savannah's Garden City Terminal will be home to the largest on-dock intermodal rail facility in North America. Connecting mainline rail improvements are expected to be completed by December 2021. It is critical that GPA continue to prioritize projects that add capacity for post-Panamex ships to maintain the Port of Savannah's competitiveness and help maintain its customer base.

FUNDING/FUTURE NEED

A major priority and ongoing project in the region is the Savannah Harbor Expansion Project (SHEP). When completed, SHEP will cost an estimated total of \$973 million. The project stands to majorly impact GPA's customers by reducing per-box costs, saving shippers \$213 million a year. SHEP reached a major milestone in 2018, with 50% completion. If all expected funding is secured, the deepening of the harbor should be completed by the end of 2021. The State of Georgia proactively allocated \$231.1 million in 2014 toward the state's share of the port deepening costs. The federal budgets for years 2020 and 2021 will need to include funding to complete the project. Over \$260 million has already been locally funded. The federal government has recognized this project as a project of national economic significance and continued attention is needed to ensure the project crosses the finish line.



Port projects are funded with a combination of private investment and state and federal dollars. Federal support for landside projects are provided through grant programs, including TIGER and INFRA. However, port projects must compete with other surface transportation projects in both of these programs. Additionally, the federal Harbor Maintenance Trust Fund is designed to pay for dredging in harbors. The fund collects revenue through a 0.125% user fee on the value of the cargo in imported containers. The Fiscal Year 2019 federal funding for SHEP is about \$101 million. This is significantly higher than previous years.



Sept 1, 2017: Super Post-Panamax 14,100 TEU CMA CGM

Meanwhile, successfully obtained state and federal investments for intermodal connections have increased efficiency and created jobs. Striving to keep capacity well ahead of demand, GPA has successfully received approval for a \$236 million capital budget, the most ever approved for a single year. This is necessary for continued growth to compete. Other port authorities and their business partners are making major investments as well into their port facilities. Meanwhile, studies show that intermodal links such as roads, bridges, tunnels and federal navigation channels that allow access to port facilities require continued funding support by state and federal agencies responsible for their upkeep in order to eliminate traffic bottlenecks, reduce product costs and create job growth. The Mason Mega Rail Terminal should be completed by 2020 and will expand the Port of Savannah's rail capacity to 1 million containers per year. Funding for the project totaling \$218 million has been secured. A total of \$44 million was awarded to the GPA through the FASTLANE federal program and the remaining \$174 million is through GPA capital funds.



Completion of dredging investment is crucial for the entire economy of Georgia. Such investment will continue to generate much-needed, long-term jobs for our region. Georgia's deepwater ports are the gateway for trade in the southeast. This tremendous growth thus far and the increasing importance of the Port of Savannah to the nation's international commerce were two of the reasons the U.S. Army Corps of Engineers agreed that the Savannah Harbor Expansion Project (SHEP) provides at least a 7.3 to 1 cost-benefit ratio, or return on investment – one of the highest for any deepening project in the nation. The Corps' study went on to conclude that the SHEP is not only a project of national importance, but that it will reduce shipping costs by \$213 million a year and, in turn, make American exports more competitive globally.

Since 2014, the U.S. Congress has passed three biennial Water Resources Development Act (WRDA) bills, all of which authorize billions of dollars for critical water infrastructure investments such as dams, levees, harbor, flood control, ecosystem restoration, and river navigation projects. The Water Resources Reform and Development Act (WRRDA) of 2014 allows for work to proceed on 23 shipping channels, flood management and other water projects that the Corps of Engineers has started studying. Actual funding for the work was provided with a bill appropriating numerous port projects, including a more than \$461 million of expansion of the Port of Savannah. The Fiscal Year 2019 Energy & Water Development appropriations bill included \$1.5 billion for the Harbor Maintenance Trust Fund, which exceeds the target set by it in WRRDA 2014.



Four Konecranes Super Post Panamax STS cranes are on their way to the Port of Savannah, Georgia, operated by the Georgia Ports Authority (GPA).

CONDITION/OPERATION AND MAINTENANCE

GPA has made many operational and maintenance improvements in recent years, including the installation of additional Konecranes Super Post Panamax STS cranes in 2013. GPA has also made sustainable decisions that simultaneously improve capacity. For example, in 2012, the Georgia Port Authority's initiated the electrification of ship-to-shore cranes to eliminate reliance on diesel.



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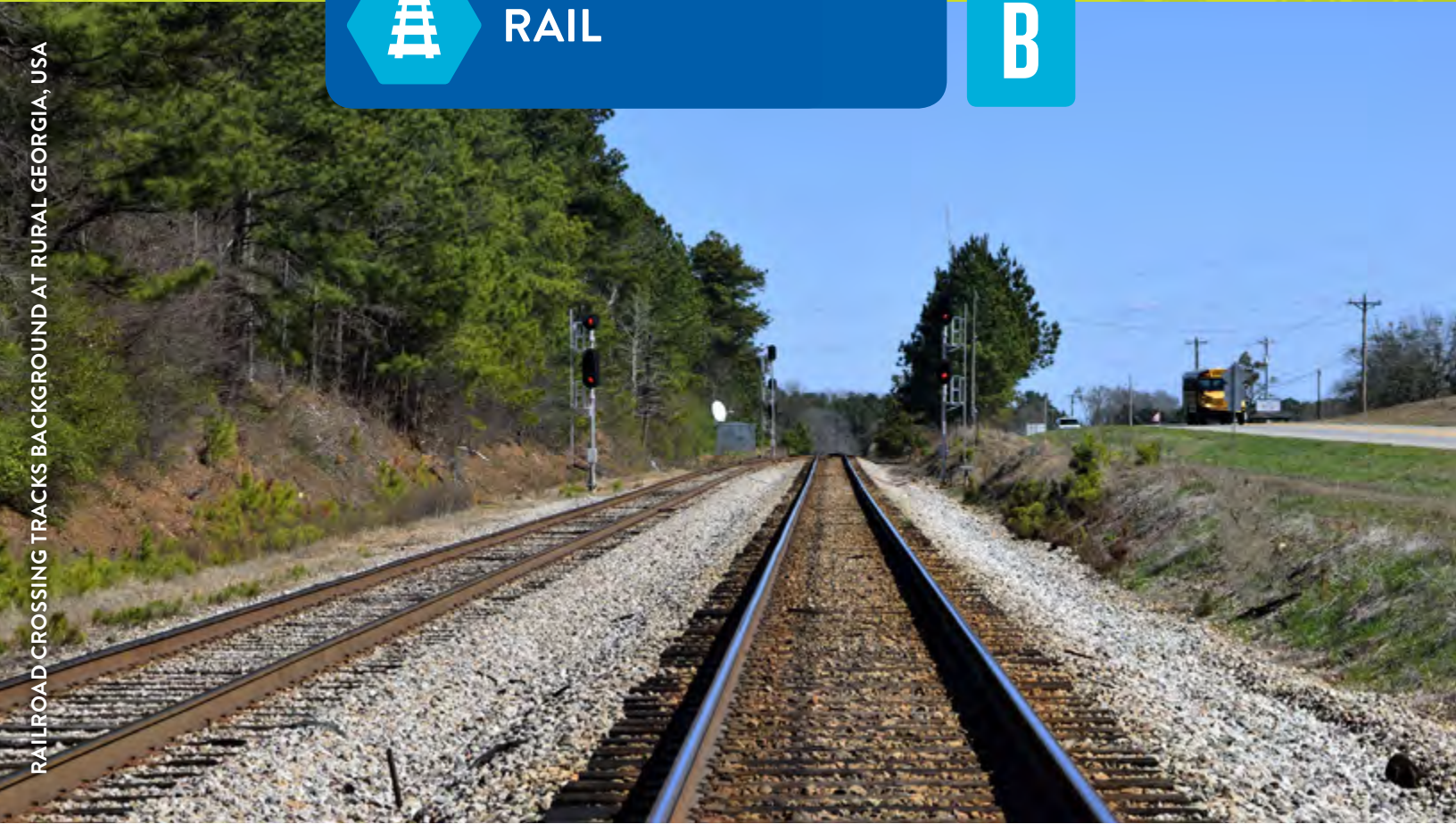
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RAIL



RAIL
GRADE: B (2014 GRADE: B)

EXECUTIVE SUMMARY

Georgia boasts one of the most extensive freight rail systems in the U.S., with nearly 5,000 miles of track transporting more than 196 million tons of freight annually. The two Class I railroads operate 78% of the total track mileage in the state, while 25 Class III (also known as shortline) railroads operate the remaining 22%. Class I railroads are privately owned and generate sufficient revenue from their operations to maintain and modernize their infrastructure and equipment. Most of the Class III Railroads in Georgia are privately owned as well, but these smaller operations struggle to generate the revenue needed to materially improve their rail infrastructure or upgrade their aging equipment. The Class III Railroads owned by Georgia Department of Transportation fare somewhat better, but still lack sufficient funding to substantially improve their overall operations. Amtrak operates routes along two corridors in the state, providing service to nearly 154,000 passengers per year.



RECOMMENDATIONS TO RAISE THE GRADE

Class I Railroads are generally self-sufficient in their operations, but do need to have a working partnership with various state and federal agencies in order to improve their rail corridors to accommodate the ever increasing volume of rail traffic through the state. Georgia should:

- Coordinate state bridge projects to replace structures that have insufficient clearances to pass double stack trains.
- Work closely with the Class I Railroads to facilitate the installation of additional tracks in critical rail corridors.
- Where appropriate, replace existing at-grade crossings with grade separated structures that will greatly improve safety and directly benefit the travelling community.
- Consider funding improvements when capacity needs or FRA mandated changes make this necessary.

Class III Railroads need both state and federal assistance to upgrade their operations. Georgia should:

- Continue to provide maintenance funding to private and GDOT owned railroads to ensure that these lines are kept operational and in good repair.
- Continuously monitor the shortline railroads to prevent the abandonment of rail corridors that could result in economic harm to portions of the state.
- Actively encourage the closure of superfluous at-grade crossings to improve public safety and reduce operational maintenance costs.
- Continue to establish grants to encourage economic development through the improvement of local rail infrastructures.



INTRODUCTION

Georgia's rail system is similar to the rail systems of all other states in the Union. It is composed of two distinct classes of railroads: Class I and Class III (there are no Class II railroads in the state.) For 2018, the American Association of Railroads defined a Class I Railroad as having an annual operating revenue in excess of \$457.9 million. By comparison, Class III Railroads, also known as shortline railroads, have annual operating revenues of less than \$36.6 million.

There are currently only seven Class I Railroads operating in the United States, two of which operate in Georgia: CSX Transportation (CSXT) and Norfolk Southern Corporation (NS). CSXT owns or operates 1,614 route miles located in five main corridors through the state. By comparison, NS owns or operates 1,721 route miles located primarily in two main corridors, but these two corridors carry the heaviest density of rail traffic in Georgia. Passenger rail service is carried on two main corridors through the state, one on CSXT lines along the Atlantic coast, and one on NS lines passing through Atlanta.

There are currently twenty-five Class III Railroads operating within the state. All together, these railroads own or operate 1,362 route miles in the State of Georgia. Shortline and terminal railroads currently operate 29% of the state's rail system. The Class III Railroads do not carry any passenger service and are primarily engaged in freight or line haul services. The Georgia Department of Transportation (GDOT) owns 19 line segments on eight different Class III Railroads comprising 490 miles of the track and right-of-way, making GDOT the third largest owner of rail route mileage in the state.

CONDITION AND CAPACITY

There are three major components of the rail infrastructure: track, bridges, and communications and signaling (C&S). All three of these components are rated and monitored by a system established by the Federal Railroad Administration (FRA). Track is classified by the safe operating speed of the rail traffic it carries. Bridges are classified by the loadings which can safely be passed across the structure. C&S is evaluated by the safe operation of trains along the various routes, and the interaction between rail and roadway traffic over at-grade crossings.

Most of the track over which the Class I Railroads operate within the state is FRA Class IV. This is representative of track that is maintained in Good condition. The track gage is constant, the rail is not greatly worn or fatigued, the ties are intact, the ballast is well tamped and regulated, and the roadbed is densely compacted. This track classification is what is required for the Class I Railroads to consistently operate at train speeds of up to 60 miles per hour (mph) for freight and 80 mph for passenger service. The majority of the track over which the Class III Railroads operate within the state is FRA Class I, although there are some lines that operate on FRA Class II track. This is representative of tracks that are classified as being in Fair condition with maximum operating speeds of 15 mph (Class I) and 30 mph (Class II) respectively. The slower operating speeds are acceptable for the Class III Railroads as most of their operations involve service to local industries. The time dependent, long hauls undertaken by the larger carriers are not a concern for the short lines.

Most of the bridges over which the Class I Railroads operate within the state carry an E80 Load Rating. This rating allows them to safely pass the most modern locomotives and 110 Ton railcars over their structures at their typical operating speeds. By comparison, most of the Class III Railroads typically operate over structures that carry a Load Rating somewhere between E60 and E80. These structures will generally still pass the same traffic, but at lower operating speeds. Passage of the heavier loads over bridges rated at less than E80 does, however, serve to shorten the operational life of these structures as the stresses generated by the loads are much closer to the overall capacity of the bridge.



C&S for the Class I Railroads is constantly improving. Class I Railroads are investing significant funds into the development and implementation of Positive Train Control (PTC) Systems that will automatically slow or stop a train under certain circumstances. PTC is a major technological advancement in the railroad industry designed to reduce the number of train-to-train collisions by eliminating human error. Class III Railroads generally do not possess the resources to implement this new technology in train control and continue to primarily rely on radio communications to facilitate their movements.

Class I Railroads are also investing in signalization of at-grade grade crossings, to better protect the public and warn of oncoming traffic. Most of the at-grade crossings associated with the Class III Railroads continue to carry only passive warning devices, i.e. crossbucks without flashers and gates, although they do have some access to state and federal funded programs that are dedicated to improving the safety of at-grade crossings throughout the nation.

Over the past five years, the Class I Railroads have invested significant funds into the improvement of their rail corridors throughout Georgia. They have been highly proactive in identifying future service requirements and improving their rail corridors to accommodate the anticipated, future needs. Nearly all of their corridors have been designated to carry two mainline tracks in the future, with their more critical corridors carrying as many as four mainline tracks. Economic factors that are driving these improvements in rail capacity include the widening of the Panama Canal that was completed in 2016, and the ongoing dredging operation in the Port of Savannah to allow larger ships to access their facilities.

During this same time period, the Class III Railroads have not been able to materially increase the capacity of their corridors due to a lack of profit in their operations that would allow for capital improvements. Although some of these rail lines will also benefit somewhat from the improvements to the Port of Savannah, the impact on their operations will not be as significant as it will be for the Class I Railroads.

USAGE

Georgia's rail system usage is divided into two categories: Freight and Passenger. Although each of these services has unique needs, most of the passenger service in the state is carried on Class I freight lines. Given the faster operating speeds and highly restrictive timetables of the passenger service, careful communication and coordination is required by the operating railroads to enable these two disparate services to operate on the same rail lines.

Freight Rail System

Georgia's rail infrastructure is critical to the movement of goods into and out of the state. The state is heavily dependent on this rail system for the distribution of containers arriving at the Port of Savannah to all points in the eastern United States. The chart below shows a summary of the top 10 commodities shipped by rail in the United States in 2015, as well as Georgia's ranking for each of these commodities. Georgia heavily relies on its rail infrastructure as both a producer, and consumer, of these commodities. Georgia ranked first for shipments of pulp and paper products, and fourth for shipments of intermodal containers and nonmetallic minerals, out of the state in 2015. Georgia ranked fourth for shipments of intermodal containers, food products, and farm products into the state during the same period. A well maintained and operated rail infrastructure is essential to Georgia's economy.



| Commodity | | Originated in Georgia | | | Terminated in Georgia | | |
|-----------|-------------------------|-----------------------|----------|------------|-----------------------|----------|------------|
| Rank | Description | Rank | Carloads | % US Total | Rank | Carloads | % US Total |
| 1 | Intermodal | 4 | 684,700 | 6.3% | 4 | 657,200 | 6.0% |
| 2 | Coal | - | - | - | 11 | 168,200 | 3.3% |
| 3 | Chemicals | - | - | - | 5 | 88,200 | 4.2% |
| 4 | Food Products | - | - | - | 4 | 95,900 | 9.0% |
| 5 | Farm Products | - | - | - | 4 | 77,800 | 6.5% |
| 6 | Nonmetallic Minerals | 4 | 115,000 | 10.2% | - | - | - |
| 7 | Transportation Equip. | - | - | - | - | - | - |
| 8 | Pulp and Paper | 1 | 93,000 | 16.7% | - | - | - |
| 9 | Motor Vehicles & Equip. | - | - | - | - | - | - |
| 10 | Petroleum, Gas | - | - | - | - | - | - |

Source: Association of American Railroads, 2015 AAR.

Passenger Rail System

Two Amtrak corridors pass through Georgia.



CRESCENT ROUTE (NS)



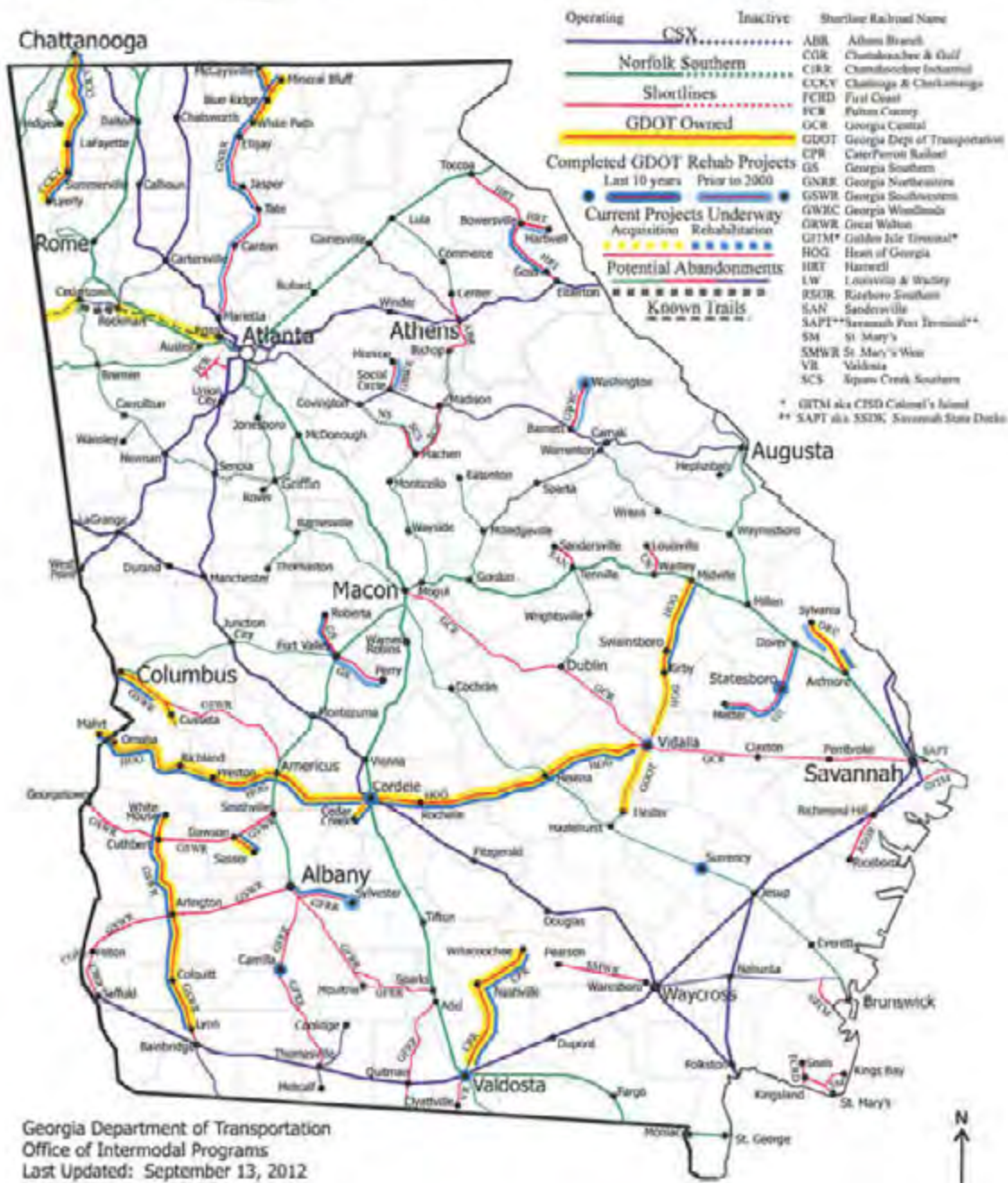
SILVER SERVICE ROUTE (CSXT)

The northernmost corridor, the Crescent Route, operates on NS rail lines providing passenger service through the state between Spartanburg, South Carolina via Atlanta, Georgia to Birmingham, Alabama.

The southernmost corridor, the Silver Service Route, operates on CSXT rail lines providing passenger service through the coastal area of the state between Columbia, South Carolina via Savannah, Georgia to Jacksonville, Florida.



Georgia's Rail System





OPERATION AND MAINTENANCE

All railroads operating in the United States are required to operate and maintain their infrastructure in accordance with the requirements established by the FRA for the track classification and operating speed of their rail lines. Due to the higher operating speeds and greater tonnage of annual rail shipments, the Class I Railroads require significantly more maintenance than the Class III Railroads. The higher revenue earned through the operations of the Class I Railroads is sufficient to meet their needs, as well as provide the necessary funding for capital improvements, equipment upgrades, and capacity increases. Class III Railroads are much more limited in what they are able to spend for improvements to their rail lines, with the bulk of their revenue being spent to maintain their current operation. Class III Railroads typically need some measure of federal and/or state financial assistance to upgrade their infrastructure to handle heavier railcars, improve safety, and increase their operating speeds.

FUNDING

Both of the Class I Railroads operating in Georgia are privately-owned and publicly-traded. Their revenue is generated from carload movements, lease agreements for the use of their rights-of-way, and other service-generating activities. They are self-sufficient in terms of their daily operations but can require additional state or federal funding for very large-scale capital improvements that are of direct benefit to the state or the nation.

Many of the Class III railroads in the state are privately owned as well, but others are owned by GDOT with services provided to them by Class III operators. The short line railroads owned by GDOT generally receive more funding than those that are privately owned, but GDOT's funding sources for railroads is limited. The Georgia Constitution restricts the state's ability to use State Highway Accounts for purposes other than highway and roadway use, which precludes its use for capital improvements to the state's rail infrastructure. This restriction limits GDOT's ability to provide discretionary grants or loans to railroads for strategic rail investments within the state. While there are numerous federal programs to provide funding for the nation's rail infrastructure, these are also limited and the competition for them is fierce.

In the 2015 State Rail Plan, GDOT provides a summarization of Georgia's Rail Service and Investment Program. This includes short and long-range projects, along with the estimated costs for each as follows:



| Short-Range Projects and Studies (Years 1-4) | Cost in Millions |
|---|------------------|
| Passenger Improvements | |
| ADA compliance and state of good repair improvements at Amtrak stations (5) | 11.7 |
| Atlanta region commuter rail plan update | 1.5 |
| Downtown Atlanta Multimodal Passenger Terminal planning and design | 0.5 |
| Analysis of alternative locations for relocation of existing Atlanta Amtrak station | 0.5 |
| Studies of new intercity service from Atlanta to Charlotte, Chattanooga, Macon and Columbus | 43.6 |
| Pilot shuttle bus between Macon and Atlanta tied to Amtrak <i>Crescent</i> study | 1.0 |
| Subtotal | 58.8 |
| Freight and Safety Improvements | |
| GDOT owned short line track and structure improvements | 37.8 |
| Atlanta region rail capacity study | 2.0 |
| Short line economic impact analysis | 1.0 |
| GDOT owned short line infrastructure inventory and needs analysis | 1.0 |
| Grade crossing safety improvement projects | 36.0 |
| Subtotal | 77.8 |
| Short-range Total | \$136.6 |

| Long-Range Projects and Studies (Years 5-25) | Cost in Millions |
|--|------------------|
| Passenger Improvements | |
| Atlanta Multi-Modal Passenger Terminal engineering and design | 50.0 |
| Atlanta commuter rail engineering and design | 50.0 |
| Engineering and design for new passenger services from Atlanta to Charlotte and Atlanta to Chattanooga | 100.0 |
| New Atlanta Amtrak station | 35.0 |
| Intercity passenger rail network vision* | TBD |
| Subtotal | 235.0 |
| Freight and Safety Improvements | |
| Atlanta region rail capacity solution engineering and design | 5.0 |
| Specifically identified short line infrastructure projects | 218.1 |
| Ongoing maintenance of GDOT owned short line railroads (lump sum) | 877.8 |
| Crossing safety improvement program (lump sum) | 189.0 |
| Subtotal | 1,289.9 |
| Long-range Total | \$1,524.9 |
| Rail Program Total | \$1,661.5 |

*Costs to be determined during future, corridor specific studies

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INFRASTRUCTURE



FUTURE NEED

Both Class I and Class III Railroads remain subject to future federal mandates that will increase their need for funding. The implementation of PTC, the FRA Bridge Management Program, and improvements to the Port of Savannah have placed an additional burden on Georgia's rail system in recent years. Improving public safety will continue to be a goal for the railroads and the state and federal agencies. The continued investment in the steady maintenance of track, bridge, and crossing protection systems will continue to be critical in ensuring that our state's rail systems remain a viable transportation system for the movement of goods throughout Georgia. Additional funding will certainly be required to meet the future needs of the state's rail system, particularly as it applies to the Class III Railroads. Studies indicate that there will be a 5.2% growth in intrastate movements and a 44.2% growth in through-state movements, with an overall rail tonnage increase of 14.7% for Georgia by 2040.

RESILIENCE

Due to their extensive network of tracks, coupled with the financial resources at their immediate disposal, Class I Railroads are well prepared for dealing with accidents and natural disasters whenever they occur. In general, the Class I Railroads can quickly and effectively respond to natural calamities and effect the necessary repairs to restore their infrastructure to operation in a short period of time.

By comparison, the Class III Railroads operate at a much greater risk as they often lack alternate route options and material resources to overcome natural calamities. If they are unable to serve their local shippers for any extended period of time, the Class III Railroads run the direct risk of losing their limited revenue base to other forms of transportation which can have a very damaging, long-term effect on the local rail service.



RAIL



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ROADS



ROADS

GRADE: C+ (2014 GRADE: C-)

EXECUTIVE SUMMARY

Georgia has significantly improved funding for the state's transportation system with the Georgia General Assembly's passing of the Transportation Funding Act of 2015 (House Bill 170 or TFA). The legislation is expected to provide an additional \$900 million per year for transportation. The proceeds from TFA has allowed the Georgia Department of Transportation (GDOT) to increase the miles of roads resurfaced annually by more than two and a half times and implement major congestion relief projects. GDOT has begun using innovative materials, design and delivery methods to decrease construction time and cost and reduce inconvenience to drivers. However, there is still a need for additional funding to improve the state's current pavement condition and relieve congestion, particularly with three of the nation's top twenty interstate bottlenecks located on I-285, Atlanta's perimeter interstate.



ROADS



RECOMMENDATIONS TO RAISE THE GRADE

- **Increase funding to fill the funding gap between the unconstrained program of \$86 billion and the Transportation Funding Act of 2015 forecast funds of \$65 billion.**
- **Implement improvements to address the interchange of I-285 and I-85 north, which is the number one nationally ranked freight bottleneck.**
- **GDOT should work to deliver the MMIP projects as scheduled utilizing the 2015 TFA funds.**
- **Implement pedestrian safety projects where reoccurring fatalities warrant.**
- **Local governments should utilize the HB170 provision that allows counties, either alone or in groups if they have common projects, to ask voters to fund local transportation projects with an additional sales tax up to 1 cent.**



CAPACITY

The state of Georgia added 5,703 miles of roadway between 2010 and 2013, which moved Georgia from eighth to seventh place in total miles of public roads with 128,620 total miles. This increase was mostly due to an increase of 5,633 miles of local roads. Georgia has approximately 90 lane-miles of HOV lanes that operate on I-75, I-85 and I-20 in the Atlanta metropolitan area and 94 lane-miles of express lanes that operate on I-85 north of Atlanta, and on I-75 north and south of Atlanta.

The population of the state is expected to increase by 2.5 million people over the next two decades, with an anticipated population of 12.8 million by 2040. Traffic congestion imposes costs on commuters, businesses, shippers and manufacturers, which are often passed on to consumers.

To address congested corridors the state completed the I-75 South Metro Express Lanes in 2017 and completed the I-85 North Express Lanes and the Northwest Corridor (I-75 North) Express Lanes in 2018. Another congestion relief project that was started in 2018 is the I-285 and SR 400 Interchange Improvements project. In addition to these projects, the state has the Major Mobility Investment Program (MMIP) which is comprised of 11 major projects estimated to cost approximately \$14 billion and be completed by 2029. These projects will add 76 general purpose lane miles, 163 express lane miles and 77 commercial lane miles. The Georgia Department of Transportation (GDOT) estimates that these projects will reduce travel delay by 5%.

The American Transportation Research Institute (ATRI) conducted a research project to identify freight plan “best practices” utilizing 10 criteria required in the FAST Act and ranked Georgia’s freight plan second in the nation. However, ATRI also designated Atlanta’s I-285 at I-85 North interchange as the top truck bottleneck interchange in the country, and since commuters use the same general purpose lanes as freight, they are impacted as well. There are currently no plans to improve this interchange. The interchange of I-285 and I-75 North is ranked fourth worst in the nation, but has improved since the express lanes on I-75 North opened in September 2018. Additionally, the interchange of I-285 and I-20 West is ranked seventeenth worst in the nation, but will be improved since it is one of the projects in the MMIP.

CONDITION

The proceeds from TFA has allowed GDOT to increase by more than two and a half times the miles of roads resurfaced annually. An average of 1,277 center lane miles were resurfaced annually from 2011 to 2015, and average of 3,527 miles will be resurfaced annually between 2016 and 2020. Based on the GDOT FY 2017 Accountability and Investment Report in 2015 (before TFA), the investment in routine maintenance projects was \$224 million, and in 2019 (after TFA) the average investment in routine maintenance projects is \$422 million. Because of the accelerated maintenance and repairs, the share of state-maintained roads in bad or poor condition is projected to fall from 13% in 2016 to 0% by 2019. However, the share of state-maintained roads in excellent or good condition is projected to decline significantly, falling from 49% in 2016 to just 15% in 2024. While the additional funding has been beneficial, it is not sufficient to address the rate of deterioration of the pavement. GDOT has estimated the annual funding needs to be \$1.6 billion to maintain Georgia’s excellent pavement condition.



OPERATIONS & MAINTENANCE

Following an intense winter storm season in 2014, the GDOT, along with the Governor's Winter Weather Task Force, set out to evaluate the state's inclement weather roadway preparations, response plans, processes and resources, resulting in increased planning and resource allocation efforts. As of 2016, the GDOT has a total of 30, 5,000-gallon brine tankers, 55 Road Weather Information System sensors, 18 interstate winter weather teams, and 40 special response teams. Over 40,000 tons of both salt and gravel are available statewide for use in response to winter weather. Since Georgia is in a unique location where different regions of the state can experience hurricanes, tornadoes, snow and ice storms, GDOT must plan to strategically locate statewide resources (manpower and equipment) to address extreme weather conditions wherever they may occur, at times simultaneously.

FUNDING

The federal, state, and local governments all assess user fees on the price of motor fuels. In 2015, the Georgia General Assembly, led by Governor Nathan Deal, passed the Transportation Funding Act (HB 170) (TFA). The approval of the TFA replaced the existing gasoline tax with an excise tax of 26 cents per gallon on gasoline, 29 cents on diesel, added a \$200 fee on personal electric vehicles and a \$300 fee for commercial electric vehicles, instated a \$5 per night hotel room tax, and included a heavy truck impact fee. TFA provided a significant boost in funds throughout the state to improve road and bridge conditions, relieve traffic congestion, and improve traffic safety. The legislation is expected to provide an additional \$5.4 billion for transportation from 2016 to 2021, an average of approximately \$900 million per year.

In addition to state funding, many counties have Special Purpose Local Option Sales Tax (SPLOST) Programs. These programs are used to fund local county and city road maintenance and capital improvement projects.

In 2012, Georgia held a state wide vote on a T-SPLOST and it passed in three regions of the state. These regions have an additional 1 cent sales tax for a 10-year period that is currently being used to fund local county and city projects. There are 46 counties included in these three regions and the tax is estimated to generate \$1.8 billion.

FUTURE NEED

The GDOT 2040 Statewide Transportation Plan analyzed Georgia's five highway system programs – pavement, bridges, roadway capacity, roadway operations, and safety. A performance curve for each program was generated to determine the investment unconstrained need. The total of all programs unconstrained is \$86 billion over the plan years (2015-2040). The total revenue forecasted utilizing the 2015 Transportation Funding Act is \$65 billion. Due to the difference between the unconstrained funding need and forecasted revenue, it is projected that there will be some deterioration in pavement condition from today's condition. However, TFA funding will provide improvement in capacity on priority freight corridors, a reduction in the total user delay cost by \$58 million per day, and a reduction in roadway fatalities of 124 annually.

The efficiency of Georgia's transportation system is critical to the state's economy. Although the additional funds from TFA will allow for the advancement and completion of many needed projects, it is not sufficient to fully address the needs of Georgia's system, or to allow the state to provide other infrastructure improvements needed to promote and support economic growth.



PUBLIC SAFETY

The total number of traffic fatalities in Georgia has changed from 1,244 in 2010 to 1,556 in 2016 to 1,540 in 2017. Unfortunately, traffic fatalities nationally have increased in recent years, a trend that's also been observed in Georgia. In 2017, 37,133 individuals lost their lives in vehicle-related fatalities across the U.S., a decrease of 2.2% when compared to 2016, after two years of steep increases.

GDOT has implemented two awareness campaigns – DriveAlert ArriveAlive was relaunched in April 2018 and See & Be Seen was launched in 2016. Both programs call attention to driver and pedestrian behaviors that could reduce fatalities. Traffic fatalities across the state decreased by a modest 1% when comparing 2016 to 2017 data.

In an effort to curb distracted driving habits that can often result in vehicle traffic crashes and fatalities, House Bill 673, also known as the “Hands Free Law”, was passed by the Georgia General Assembly and signed into law by Governor Nathan Deal in 2018. The 15 states that have previously passed hands-free driving laws saw a 16% decrease in traffic fatalities in the two years after the law was passed and further reductions in subsequent years.

RESILIENCE

GDOT has implemented the Highway Emergency Response Operators (HEROs) program to manage incidence occurrences on high volume freeways. More effective incident management will relieve congestion and maintain consistent traffic flow. In recent years Georgia has expanded the HERO program to interstates outside of the Atlanta area with the Coordinated Highway Assistance & Maintenance Program (CHAMP). In 2017, CHAMP operators performed 60,000 highway assists.

In 2017, GDOT showed its remarkable ability to quickly realign its resources to rebuild a collapsed section of I-85, a commuter highway that services over 200,000 vehicles per day in metro Atlanta, in just six weeks. This remarkable accomplishment using innovative design and materials, innovative contracting that gave the contractor a bonus to finish early, close coordination with state officials, and streamlined federal funding, bolstered citizens' trust in GDOT's ability to deliver for Georgia's citizens.

INNOVATION

Georgia has used several new innovative designs to relieve congestion. A continuous flow intersection (CFI) at SR 400 and SR 53 was completed in 2017. The CFI design greatly improves intersection capacity at a significant construction cost savings. A CFI separates the left turns on the primary roadway from the through traffic in both directions so that the signal time for the through traffic can be longer, thereby allowing more vehicles to pass through the intersection. Another innovation that accelerates construction and minimizes traffic interruption is Accelerated Bridge Construction (ABC) method. Georgia completed an ABC project at SR 299 over I-24 near Trenton, Georgia in 2017. Also, in 2017, Georgia launched the North Avenue Smart Corridor Demonstration Project. This project utilizes the latest technology in adaptive signal systems that improves flow for transit vehicles, personal vehicles, bicyclists and pedestrians. Georgia has also designated I-75 & I-85 as Alternate Fuel Corridors (AFC). AFC is a FHWA program to plan and promote an Interstate network of natural gas and electric charging stations across the entire nation.



ROADS



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SCHOOLS



SCHOOLS

GRADE: B (2014 GRADE: C+)

EXECUTIVE SUMMARY

The capacity and condition of Georgia's public schools have improved over the past five years. A number of new schools have been built. More recently, the Governor and state legislature have fully funded the Quality Basic Education (QBE) formula which benefits school facilities. More than \$1.14 billion in funding has been restored to the school system since 2015. Additionally, attention has been placed upon the future needs of schools, setting money aside for the inevitable growth to come. Georgia is slightly above the national average in terms of school construction capital outlays. The state spends \$19,502 per student on school construction, whereas the national average is \$19,454. This spending average stands to grow as the Georgia legislature voted to significantly increase available funding for school facilities and students on the FY 2019 appropriations bill.



RECOMMENDATIONS TO RAISE THE GRADE

- Continued support for E-SPLOST while developing a permanent, reliable source and equitable scheme of funding that will benefit all schools and all students.
- Shift in funding from capital investments to operation and maintenance to ensure the longevity of recently built schools.
- Consider establishing a revolving school fund for school system improvements with a short term dollar-for-dollar payback.

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INTRODUCTION

Georgia has a variety of public school facilities, ranging from kindergarten through high school, to educate students across the state. The Georgia Department of Education (DOE) provides oversight of the corresponding educational facilities in 207 school districts. They include county, city, charter, state-operated schools (for the blind and deaf) and schools in the 181st district which are run by the Georgia Department of Juvenile Justice (DJJ). All facilities encompass 2,299 schools, serving 1.7 million students. Table 1 shows the number of schools in each type whereas Table 2 presents different schools and their members.

TABLE 1: TYPES OF SCHOOLS

| SCHOOL TYPE | NUMBER OF SCHOOLS | PERCENT OF TOTAL |
|--------------|-------------------|------------------|
| Elementary | 1323 | 57.55% |
| Middle | 484 | 21.05% |
| High | 479 | 20.83% |
| K through 12 | 13 | 0.56% |
| Total: | 2,229 | 100% |

Source: Georgia Department of Education

There are five types of school systems that comprise the 207 school systems in Georgia:

TABLE 2: TYPES OF SCHOOL SYSTEMS

| TYPE OF SCHOOL SYSTEM | NUMBER OF SYSTEMS |
|--|-------------------|
| County | 159 |
| City | 21 |
| State Chartered Special Schools | 23 |
| Department of Juvenile Justice (Georgia's 181st School District) | 1 |
| State Schools (for the blind and deaf) | 3 |
| Total Number of School Systems: | 207 |

Source: Georgia Department of Education

School facility funding is provided to the school districts by local governments, which may be at the city or county level. An education special purpose local option sales tax (E-SPLOST) may also be employed to supplement local school district funding. The Georgia DOE identifies supplemental funding needed to ensure that schools meet the requirements established by state and federal laws and regulations.

In recent years, the state of Georgia has seen an uptick in economic growth, resulting in an increase in population and in the recovery of its housing industry and market. The same trend extends to the Georgia DOE, which has seen an increase in funding over the last five years. As a result of this positive trend, Georgia has started moving to meet demands on new and upgraded schools. However, Georgia must continue investing in its schools in order to keep up with population growth and to ensure preparedness for future educational needs. Although new schools are being built and funds have increased, public school buildings on average in the U.S., are more than 40 years old, and this does not exclude Georgia. Now sights need to be set upon ensuring schools facilities will be adequate for the next 40 years.



CAPACITY

Since 2014, 26 new schools have been built in Georgia. In 2016/2017, there were 2,299 schools, up from 2,273 in 2012/2013. Among these new schools, five new charter schools were built and recently opened across the state. Three of the five are in the Metro Atlanta area, one is in Bibb County and the other in Richmond County. With the recent increase in funding, four more charter schools are on track to be built. Schools built in the last five years have been constructed with the total lifecycle cost in mind, not just the construction cost, bringing the newest technology.

CONDITION AND OPERATION & MAINTENANCE

The 2016 State of Our Schools Report states that nationally, school districts spend an average 10% of their annual operating budget on facility operation and maintenance. Georgia is the lowest of 50 states in this metric; on average spending only 7.6%, or \$702 dollars per student in 2013. However, Georgia is slightly above the national average in terms of school construction capital outlays. The state spends \$19,502 per 2013 student on school construction, whereas the national average is \$19,454. It is important to note that these numbers were calculated before the Georgia legislature voted to significantly increase available funding for school facilities and students on the FY 2019 appropriations bill.

FUNDING

School funding is comprised of local, state, and federal funds. Thanks to the growing economy, the state legislature was able to provide a significant funding boost in the fiscal year 2019 appropriations bill. Georgia House Bill (HB) 684 will provide \$166.7 million to school systems to eliminate austerity reductions and fully fund the Quality Basic Education (QBE) formula. More than \$1.14 billion has been restored to school systems since FY 2015.

About \$9.1 million is new money for the State Commission Charter School supplement. This funding is to cover growth in existing state charter schools and to establish four new schools of this type. An allotment of \$7 million has been set aside for facility repairs at the Department of Juvenile Justice. This school system has 29 schools that are open year-round to assist students transition in and out of Georgia DJJ system. One quarter, or \$305 million, of the state's FY 2019 bond package is dedicated to K-12 education. Of that amount, one quarter, or about \$259.5 million, is for new construction, renovation and additional projects in 77 local school systems. HB 684 also provides \$16 million to fund school security grants and \$1.1 million for facility repairs and improvements at the state schools.

Local funds for facilities come largely from property taxes. E-SPLOSTs have been a critical and major source of local funding to build and renovate schools. Since Georgia voters legalized this self-imposed, local one cent sales tax 20 years ago, it should be noted that 98.7% of counties collect E-SPLOST. However, not all schools – and therefore not all students – equally benefit. Schools that have a higher percentage of low-income and minority families are more likely to have decaying buildings, subpar technology and other problems that deter learning, while the majority of new schools are built to serve more affluent populations in growing suburbs.

For low income areas, the federal government provides funds for the schools, through Title I of the Elementary and Secondary Education Act. In those areas, students come to school with extra needs, requiring additional resources. This federal money can only be used for betterment of the students, such as after school programs and supplies. Meeting those needs, while coping with budget cuts and escalating costs presents an ongoing challenge.

Approximately 62% of students in Georgia are eligible for free/reduced lunch. This number is the fourth highest in the country and has been steady since 2013. With these types of demographics, dependence cannot be placed on inequitable E-SPLOSTs to rebuild schools and provide the necessary funding that the most fragile communities need. It should be noted that E-SPLOST funds must be spent on capital projects such as new schools, renovations, technology, buses or debt reduction and not on items such as salaries or amount of personnel.



Table 3 shows a breakdown on funding that the Georgia DOE has received since 2014.

TABLE 3: SCHOOL FUNDING

| | TOTAL STATE FUNDS | TOTAL FEDERAL FUNDS | TOTAL FUNDS |
|------|-------------------|---------------------|------------------|
| 2014 | \$7,409,293,094 | \$1,643,907,471 | \$9,102,713,725 |
| 2015 | \$7,944,481,675 | \$1,989,757,930 | \$10,054,575,082 |
| 2016 | \$8,502,129,564 | \$1,982,964,757 | \$10,606,281,685 |
| 2017 | \$8,911,091,964 | \$1,916,490,630 | \$10,866,623,330 |
| 2018 | \$9,427,358,368 | \$1,917,274,955 | \$11,391,296,360 |

Source: Governor's Office of Planning and Budget

The condition of school facilities has a direct impact on the health of students, teachers, and staff, and the overall environment, and the value of property owned by the served community. Additionally, the condition of facilities has been linked to academic achievement. Consequently, it is crucial that the school facilities in Georgia are up to par to ensure an adequate education of all students.

FUTURE NEED

Although school funding has increased in HB 684, not all of the funds will go toward the school facilities in Georgia. Categories that have been underfunded for years, such as teacher salaries and retirement benefits, will receive a portion of these funds. For example, HB 684 provides \$361 million for the teacher retirement pension system. A lump sum of money has also been invested into future needs, such as growth in enrollment and providing necessary resources.

As the state population continues to grow, so will the number of enrolled students. Since 2012, there has been an increase in student enrollment by almost 200,000, or about 13%. This trend ensures that more funding will be required for future needs. Table 4 provides full-time equivalency (FTE) enrollment count for Georgia school systems showing this growth trend.

TABLE 4: ENROLLMENT IN GEORGIA SCHOOLS BY SEMESTER

| | FALL ENROLLMENT | SPRING ENROLLMENT | AVERAGE NUMBER OF STUDENTS: |
|-----------|-----------------|-------------------|-----------------------------|
| 2016-2017 | 1,604,895 | 1,706,558 | 1,655,726 |
| 2015-2016 | 1,709,894 | 1,669,530 | 1,689,712 |
| 2014-2015 | 1,697,880 | 1,553,163 | 1,625,521 |
| 2013-2014 | 1,678,012 | 1,667,697 | 1,672,854 |
| 2012-2013 | 1,657,507 | 1,507,631 | 1,582,569 |

Source: The Governor's Office of Student Achievement

PUBLIC SAFETY

With the occurrence of school shootings, upgrades to security as well as specific school-related safety measures aim to ensure the safety of students, teachers and staff. Funding to support these measures will continue to grow as this concern for prevention grows.



SOLID WASTE



AN IMAGE OF BLUE WASTE TRANSFER BINS AT A LANDFILL FACILITY.



SOLID WASTE

GRADE: C (2014 GRADE: C+)

EXECUTIVE SUMMARY

Georgia's solid waste issues center around an ever-increasing population, the rising life-cycle cost of materials, the citizenry's resistance to the opening of new landfills, and the impact of transporting increasing volumes of solid waste on public roads. From 2013 to 2017, the population of the state has grown by approximately 4.5%. Meanwhile, during that same period, waste disposal rates have increased by 35%. Cheap disposal rates in Georgia bring out-of-state waste and are a major factor in the overall waste picture. The availability of disposal capacity at competitive rates provides little incentive to reduce waste generation, prohibit importing waste, or increase recycling. The lack of funding for future solid waste handling facilities, minimal efforts to promote alternatives for waste management disposal options, and little advancement in the development of conservation and recycle markets all compound solid waste issues in Georgia.



RECOMMENDATIONS TO RAISE THE GRADE

- **WASTE REDUCTION:** Waste generation needs to be reduced and more waste needs to be diverted from landfills through recycling programs. The state's commitments to waste reduction in the Georgia Comprehensive Solid Waste Management Act of 1990 caused substantial diversion of waste to recycling programs during the mid 1990s, but the current lack of similar emphasis has allowed goals to go unmet.
- **EXPAND RECYCLE PROGRAMS:** Previously, the DCA has promoted several major recycling programs in recent years that are beginning to show tangible results in consumer awareness and waste diversion. Education of consumers on the value of recycling and the proper disposal of hazardous waste needs to continue. This agency is an ideal entity to provide information to local governments and communities and in turn receive data from the solid waste industry in an effort to track future progress. Promotion of conservation methods and educational programs as well as the tracking and reporting of recycling success is vital to keep all sectors of the public engaged. The defunding of this entity and reliance on local communities to self-regulate and self-promote is not sufficient for a state as large as Georgia with more than adequate resources to support such programs. Funding should be returned to DCA allowing them to continue their mission of community outreach to the local communities and municipalities.
- **MAINTAIN THE SOLVENCY OF THE SOLID WASTE AND HAZARDOUS WASTE TRUST FUNDS:** The state Legislature needs to ensure that fees citizens pay for solid waste management are devoted to those programs. Hazardous waste management, contaminated site cleanup and waste reduction programs are among the environmentally critical programs funded by these fees. The legislature needs to appropriate more funds to these programs.
- **WASTE-TO-ENERGY PROGRAMS:** A focus should be placed on increasing the use of landfills for waste to energy purposes. Tipping fees for out of state waste could be increased with the extra revenue being used to develop new forms of solid waste disposal such as waste-to-energy facilities.



INTRODUCTION

Over the past four years, management of Georgia's solid and hazardous waste has evolved in an effort to keep up with the state's steadily increasing population and growing awareness of environmental impacts of waste disposal. While Georgia continues to regulate the processing and disposal of solid waste, to a large degree, the industrial and commercial sectors provide a significant level of self-regulation and oversight. Meanwhile, the management of hazardous waste in Georgia is primarily directed and guided by the Environmental Protection Division (EPD) under the Department of Natural Resources (DNR). The EPD has made significant progress over the last four years to address and close hazardous waste sites across the state.

Unfortunately, the State of Georgia has not published a consolidated Solid Waste Management Report since 2011. At that time, the State Legislature passed legislation removing the requirement that Solid Waste Management Plans be shared with the Department of Community Affairs (DCA). Consequently, Annual Reports are no longer generated by local governments and the DCA no longer acts as a clearinghouse for this information.

CONDITION AND CAPACITY

The per capita waste disposal rate in municipal solid waste (MSW) landfills was approximately 7.39 lbs/person/day in 2004. That rate dropped to 6.43 lbs/person/day in 2011. In 2013, however, the rate rose again to 7.40 lbs/person/day and then had a significant increase to 9.51 lbs/person/day in 2017. The increase was primarily due to the heavy inflow of waste brought in to Georgia from surrounding states, which greatly skews the high per capita generation rate. The share of out-of-state waste could not be determined from the available sources, however it is higher than the 13% of total waste documented in 2014. Currently, Georgia does not have a commercial hazardous waste landfill (HWL) and only 21 exist in the entire U.S. There are currently no plans to construct a HWL in Georgia.

As of 2017, the EPD published data listing the capacities of 105 permitted solid waste landfills as 718 million cubic yards. This is a 4% reduction when compared to the state's capacity five years ago of 748 million cubic yards. In 2017, 18.2 million tons of solid waste was deposited in Georgia as compared to 13.5 million tons deposited in 2013, an increase of over 35%. With increasing tonnage and decreasing capacity, it continues to be necessary to increase recycling and volume reduction programs.

Nearly half of Georgia's MSW waste is disposed at five large landfills in Georgia. Of the over 18.2 million tons of waste disposed in 2017, the majority (over 80%) was disposed in lined MSW landfills while close to 15% of the total waste was disposed in construction and demolition (C&D) landfills.

Though there still appears to be an adequate supply of permitted MSW disposal capacity as of 2017, with over 30 years remaining of permitted MSW landfill space and just below 40 years of permitted C&D landfill space based on current disposal rates, no new significant construction of Subtitle D landfills took place from 2013 to 2017 that would significantly increase the total landfill capacity.

Georgia manages its hazardous waste sites through three state programs and through the federal Superfund. The state Hazardous Sites Response Act (HSRA), the Voluntary Remediation Program (VRP), and the Brownfields Program are administered by EPA.

Georgia manages a database called the Hazardous Site Inventory (HSI), which is an inventory of sites where contaminated soil and/or water have been evaluated and some form of remediation and monitoring is required. Currently, there are a total of 521 sites listed on the HSI, which has decreased from 552 in 2013. Georgia added a Voluntary Remediation Program (VRP) in 2009 to encourage voluntary investigation and remediation of contaminated properties. There are currently 116 sites listed on the VRP database, which is an increase from 66 sites in 2013. The Brownfields Program, started in 2003, has received almost 950 applications, 104 of them in 2017. The total increase in listed hazardous waste sites is related to the recent growth in Georgia's economy, as most new sites are discovered during property transactions. However, the VRP incentives encourage faster remediation timelines.



The federal Superfund, which is a program to fund the cleanup of toxic sites, is administered by EPA Region 4. There are currently 16 federal Superfund sites in Georgia. No sites have been delisted since 2013 and one additional site is currently being proposed for listing.

FUNDING

Full-Cost Accounting Rules established by the Georgia Comprehensive Solid Waste Management Act of 1990 require that local collection entities demonstrate how revenues cover costs and that disposal capacity is available for the next 10 years. Costs associated with long-term environmental monitoring and maintenance of facilities are incorporated in tipping fees accounting for current facilities, while some restoration of “orphan” or abandoned landfills is covered by the Solid Waste Trust Fund.

Disposal costs for solid waste continue to be almost entirely funded from tipping fees, so expenses for ongoing operations are expected to continue to be covered by available revenues. Unlike most infrastructure in the state of Georgia, solid waste is generally owned and operated by private industry. The private sector, if waste collection and disposal remain profitable, will generate the funds to continue its operation. There are a few government operated collection and disposal facilities in the state and they remain sensitive to government funding.

An April 2018 survey of tipping fees showed Georgia at \$43.80 per ton (an increase of nearly 22% from 10 years ago). This compares to a high of \$151.19 in Alaska and a low of \$24.75 in Mississippi. The national average tipping fee is \$55.11, meaning Georgia’s tipping fees are 79% of the national average. Three of the five states that Georgia shares a border with (Florida, Tennessee, and South Carolina) have higher average tipping fees than Georgia, thus potentially encouraging solid waste to be shipped in-state for economic reasons. Florida, with an average tipping fee of \$54.67 per ton – nearly \$11.00 higher than Georgia – is the major source of out-state solid waste.

The Solid Waste Trust Fund (established in 1990) is funded with a \$1 fee on every new tire sold in the state. Besides providing local governments financial resources in planning, expanding, improving, and implementing waste reduction programs such as the Recycling and Waste Reduction Program and the scrap tire recycling program, the Fund is authorized to expend funds for the following uses:

- Scrap Tire Management and Abatement
- Emergency Response and Corrective Action
- Abandoned Landfills
- Operations and Fund Administration
- Waste Reduction and Litter Education
- Litter Enforcement

Revenue to the Solid Waste Trust Fund has been relatively steady at \$6 million to \$7 million per year. While the Georgia Legislature appropriations from the Fund have risen from less than \$1 million in 2013 to over \$3 million in 2017, more than 50% of the Fund is still diverted to non-solid waste activities. The reserve balance in 2017 was approximately \$3 million.

By contrast, the Hazardous Waste Trust Fund is funded by fees (hazardous waste and solid waste fees), civil penalties, and fines collected from the regulated community. These fees totaled \$15.2 million in 2017 (compared to \$11.2 million in 2013 and \$19.5 million in 2008). While the Georgia Legislature appropriations of these fees have totaled \$13 million, \$3.5 million, and \$14.4 million for 2017, 2013, and 2008, respectively, there is still room for improvement.

2019

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Federal funded Brownfield grant awards have decreased over the last decade, with \$718,000 awarded in 2017 (compared to just over \$1 million in 2008 and \$755,000 in 2013). Therefore, more state resources are being used to fund Brownfield projects from the Hazardous Waste Trust Fund.

PUBLIC SAFETY

Most of public safety concern revolves around abandoned landfills. Many of these older closed landfills lack a responsible party to pay for remediation of existing groundwater contamination. Landfill design and management practices changed dramatically when Subtitle D of the Resource Conservation and Recovery Act rules became effective in 1991 that require existing landfills to meet extensive post-closure responsibilities. EPD manages remediation of these pre-Subtitle D sites through the Solid Waste Trust Fund. The Georgia Legislature's appropriations for orphan landfill cleanup have increased from \$1.9 million in 2013 to \$2.9 million in 2017 and recent stakeholder attention predicts that this trend will continue.

FUTURE NEED

Though the population in Georgia is growing at a manageable, steady pace, the per capita waste generation rates are near double the national average. This is primarily due to the imported waste coming from outside Georgia. Because tipping fees in Georgia are much less than the surrounding states, importation of waste needs to be monitored closely. Fees applied to the importation of waste can be a major source of revenue to be used to promote source reduction methods within Georgia.

With just under 30 years of remaining permitted disposal capacity throughout the state as of 2017, landfill tipping fees remain highly competitive, increasing the challenge many local governments face in maintaining or implementing aggressive recycling programs. The state regulatory agency is needed to lead the industry and play a key role in assisting local governments in promoting recycling markets, the materials reclamation industry, and support several initiatives to increase community awareness in recycling and conservation throughout the state. These initiatives include the development of a statewide media campaign, investment in special event collections, investment in Regional Recycling Transfer Hubs and environmental education at the K-12 school level. However, these initiatives have failed or remain stagnant. Recycling is a low priority among residents with no incentive to participate. Several waste management companies have stopped collecting various recyclable materials due to the comingling of waste thus making it uneconomical to perform.



RECOMMENDATIONS (CONT.)

- **DEVELOPMENT OF MATERIAL MARKETS:** The construction focused industrial base in Georgia allows for a significant amount of materials that are ideal for recycling but are currently disposed of in C&D landfills taking up vital space. Markets need to be developed and managed at the State level to promote the materials exchange with tax incentives and financial reward given to those who use it. Also, with the discontinuation of shipping waste overseas for recycling/ disposal, the US needs to better manage plastic waste and promote further recycling. Georgia needs to promote this market and secure additional revenue streams as a result.

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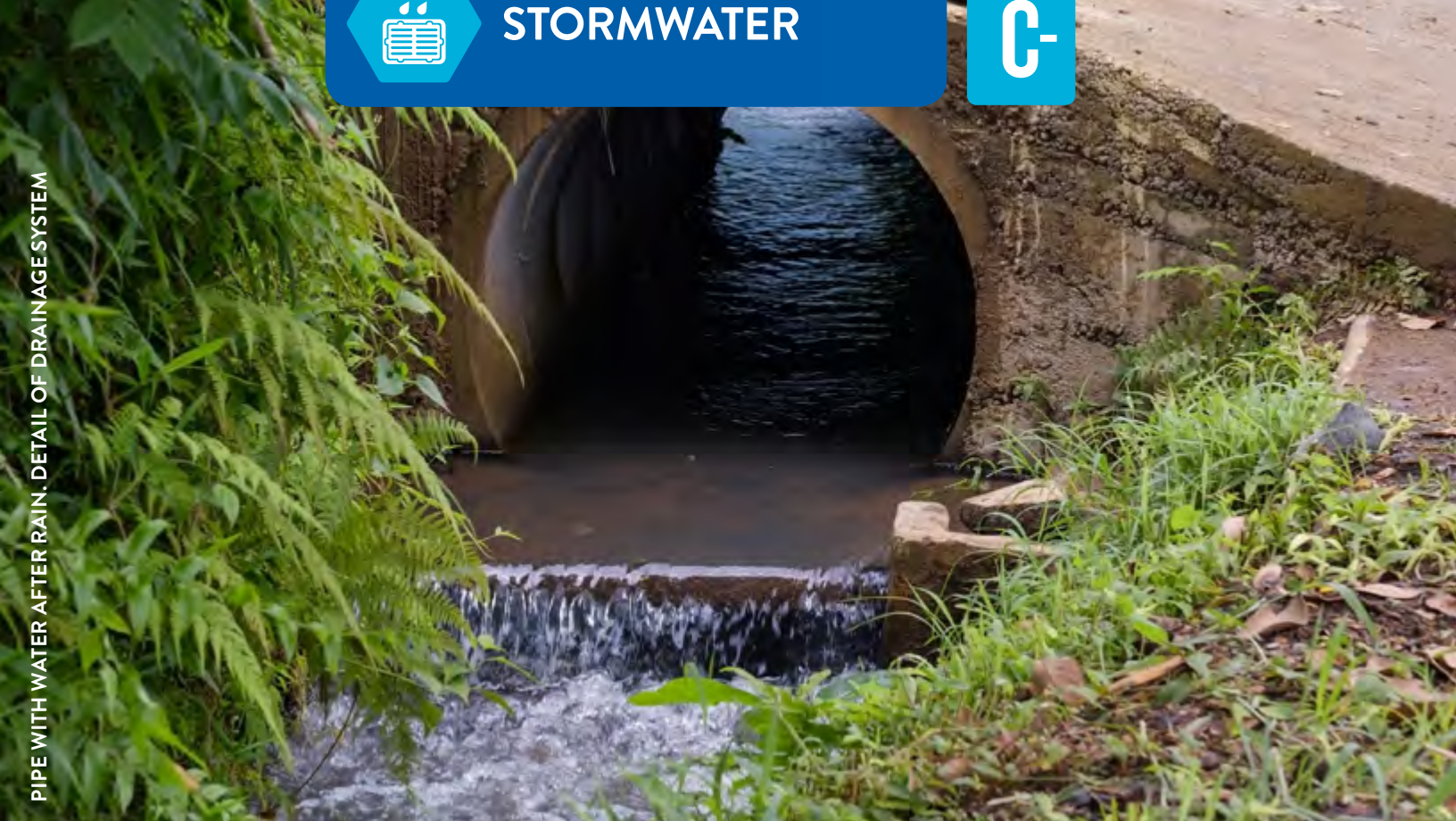
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PIPE WITH WATER AFTER RAIN. DETAIL OF DRAINAGE SYSTEM



STORMWATER



STORMWATER GRADE: C- (2014 GRADE: D+)

EXECUTIVE SUMMARY

Georgia’s stormwater infrastructure – drains, manholes, pipes, ditches and more – has improved over the past five years. More localities are creating designated stormwater funding sources, as evidenced by the 44% growth in stormwater utilities since 2014. This increase in funding, a shift to integrated water planning, and the addition of volume reduction requirements in recent MS4 permits are the major factors in the slight grade increase. While this progress is significant, substantial funding needs remain. A limited stormwater program survey indicated a median of \$6 per capita per year is spent on new or renovated stormwater infrastructure, much less than the \$85 need projected by the Environmental Protection Agency. Looking forward, Georgia’s growing population is likely to continue to stress its stormwater management infrastructure and additional action will be needed to protect water quality in streams, rivers and lakes.



RECOMMENDATIONS TO RAISE THE GRADE

- **AGENCY COORDINATION:** Current efforts to address stormwater vulnerability are generally uncoordinated. As with other areas of infrastructure, such as roadways, stormwater protection efforts could greatly benefit from regional coordination among the various agencies responsible for stormwater management, including MS4s as well as unregulated cities and counties. It makes sense to organize this coordination based on watershed boundaries.
- **CONDITION:** Because streams and lakes throughout Georgia are used for fishing, recreation and drinking water, it is important that they be protected from pollutants, so that citizens recreating and consuming fish from them are not sickened or prevented from using them. Increased emphasis should be placed on educating the population about the need for protecting the environment and the water resources of the state. This would include an emphasis on the importance of environmental regulations to protect the health and welfare of people.
- **CAPACITY ANALYSIS:** Challenges arising from population growth and development underscore the need to manage stormwater utility capacity. The State of Georgia should require that a capacity analysis be performed as part of the MS4 permitting process.
- **INTEGRATED PLANNING:** Although stormwater, water, and wastewater have frequently been managed separately, the demands resulting from Georgia's growing population provide a compelling reason to integrate the management of these water resources. More education on the importance and relevance of stormwater planning as well as consequences of not planning is needed on local and state levels.
- **SUPPORTING STORMWATER INFRASTRUCTURE:** While the trend toward the use of green stormwater infrastructure continues, the innovative management of stormwater underscores the need for adequate funding. All MS4s should have access to dedicated, local funding. We encourage more communities to develop stormwater utilities. Additionally, these utilities and/or general fund budgeting should be increased to cover the full projected stormwater needs for the community.



INTRODUCTION

Stormwater runoff can contain debris, chemicals, sediment, and other pollutants that can adversely impact downstream rivers. Excessive flow can cause property damage due to flooding, and various debris and chemicals can degrade surface water and groundwater quality. Construction and development add more impervious surfaces, increasing the rate and volume and decreasing the quality of runoff entering downstream water bodies.

Stormwater challenges tend to be most severe in highly developed areas that typically have higher populations. Increasing population numbers and density can increase pollutant loads, resulting in water quality degradation. The various sources of stormwater pollutants include runoff from population centers (urban area), poor farming practices, industrial activity, and construction. These sources of stormwater pollution are managed and regulated under the National Pollutant Discharge Elimination System (NPDES) in the following categories:

- Urban areas - 171 cities and counties and the Georgia Department of Transportation are permitted by the Georgia Department of Natural Resources Environmental Protection Division (EPD) through Municipal Separate Storm Sewer System (MS4) permits
- Industrial facilities – 3,195 sites permitted by EPD
- Construction - EPD permits for erosion and sediment control at sites with over 1 acre disturbed
- Agricultural practices – permitted by Georgia Department of Agriculture

Surface water bodies such as lakes and rivers that exceed water quality criteria (demonstrate elevated levels of certain pollutants) are considered to be impaired. Impairment of surface water bodies is tracked by EPD and can result in the imposition of additional best management practices to reduce stormwater pollution.

CONDITION

Stormwater infrastructure consists of structures such as storm drains and manholes and conveyance components such as pipes, culverts, ditches, and streams. Stormwater infrastructure also includes best management practices (BMPs) which are intended to minimize the water quality and quantity impacts that can be associated with development. Stormwater BMPs can include water quantity controls such as ponds and green infrastructure practices such as buffers, filter strips, and bioretention which provide filtering for water quality improvement.

A fully functioning stormwater infrastructure system is essential to public health and safety, but stormwater infrastructure is owned and managed by both local governments and private property owners, complicating management of the system. Proper maintenance of stormwater systems must include regular inspections and removal of accumulated pollutants, especially sediment. However, many local governments are struggling just to maintain their basic stormwater pipes and structures. Enforcement of private stormwater infrastructure maintenance is even more challenging due to a lack of enforcement personnel and property owners lacking funds for maintenance. This can be further complicated by other factors such as transfers of property ownership where a new owner may have no knowledge of the infrastructure they acquire, including its condition and maintenance requirements.

Streams and lakes throughout Georgia are used for fishing, recreation, and drinking water. Urban runoff and non-point source pollution are the most common causes of impairment and can impact these uses. Currently, 59% of the 14,415 miles of streams and rivers and 79% of the 122,239 acres of lakes and reservoirs assessed by the Georgia Department of Natural Resources were found to be impaired (i.e., not supporting their designated uses) by violating at least one water quality criterion. Since the 2014 Georgia Infrastructure Report Card, 21 impaired waterways were re-classified as supporting their designated uses and de-listed; however, an additional 24 surface water bodies were added to the “Not Supporting” list in 2016.



CAPACITY

Georgia's existing stormwater infrastructure has been constructed over decades, using a variety of design criteria. Current standards for water quality have only been in place since 2001 and flow reduction measures are only now beginning to be implemented in regulated MS4 areas. MS4 permit requirements include inventory and inspection of existing stormwater systems. A detailed flow and storage capacity analysis is often not completed since it is not required by the MS4 permit. Even less is generally known about the stormwater systems located in rural areas that are not regulated.

FUNDING

Funds needed for stormwater infrastructure construction, operations, inspection, maintenance, educational programs, regulatory coordination, and other activities may come from:

- Local government tax funds
- Stormwater utility revenue
- Private property investment
- State revolving fund loans to local governments
- Clean Water Act 319(h) grants for nonpoint source projects
- Environmental Quality Initiatives Program (EQIP) financing through the USDA

Alternative funding methods for stormwater management programs include general obligation bonds, development impact fees, special assessment or tax districts, and the creation of user fees through stormwater utilities. The user fees are calculated based on the impact a property has on the stormwater system, using the amount of impervious surfaces such as roofs, driveways, parking areas and sidewalks. Stormwater utility fees create a dedicated funding source that can be used for activities related to water quality and quantity and their impacts on natural resources, as well as maintenance of failing infrastructure such as pipes and dams. Currently, Georgia has approximately 62 stormwater utilities in 159 counties, an increase of 44% since 2014. Eighty-nine percent of the 62 stormwater utilities in Georgia are operated by regulated MS4s. For Georgia stormwater utilities, the median utility fee equates to \$45.80 per capita per year.

FUTURE NEED

The 2012 EPA Clean Water Needs Survey identifies about \$8.7 billion in stormwater conveyance needs, \$6.1 billion in stormwater treatment needs and \$2.8 billion in green infrastructure needs across the state over the next 20 years. This equates to about \$84.45 per capita per year over the next 20 years, far less than what is currently being budgeted. However, we have seen reductions to the above totals since the 2008 EPA Clean Water Needs Survey, so progress is being made.

In general, communities lack the funding required to adequately maintain their stormwater conveyance systems. As a result, communities without a dedicated funding source must rely on general tax funds. In this case, community leaders may be forced to choose between stormwater programs and other community services (fire, police, transportation, etc.) when developing budgets. Unfortunately, in many cases stormwater system upgrades do not make the final list of funded projects because of a lack of information on the subject, or lack of urgency regarding the importance of these systems to community health and welfare.

Even communities with stormwater utilities face challenges with setting rates that are proportional to the work required to maintain and improve the capacity of their stormwater systems. Additional education is needed to convince the public and elected officials that stormwater utilities are a fee for services, rather than a tax.



As communities continue implementing MS4 permit requirements, including inventory, inspection, maintenance of existing facilities, and implementation of green infrastructure practices, the burden of inspection continues to increase. The use of green infrastructure BMPs is increasing, but the learning curve and resources required to properly inspect and maintain them can hinder a community's ability to keep up with their requirements. With the population of many urban areas continuing to rise, the strain on existing systems in urban areas continues to increase.

OPERATIONS AND MAINTENANCE (O&M)

The operation and maintenance of stormwater infrastructure in Georgia is largely the responsibility of local government. In urban areas, resources for storm system maintenance may come from stormwater utilities or from special stormwater program funds; however, in many Georgia communities, drainage O&M funding comes from the general fund. A limited survey of 2018 budgets from eight Georgia communities representing about 13% of the state's population shows that only half of these communities have a stormwater taxing authority or dedicated stormwater fund. While these surveyed communities have median annual budgets of about \$1,221 per capita (ranging from \$785 to \$4,351), median per capita spending on stormwater O&M is about \$36 (ranging from \$0 to \$421). Additionally, median per capita spending on capital projects for new or renovated drainage infrastructure was only \$6 (ranging from \$0 to \$107).

PUBLIC SAFETY

Many local governments are struggling to proactively maintain stormwater pipes and structures due to limited funding and staffing resources. If these structures are not maintained properly and repaired or replaced when necessary, public safety can be significantly impacted by collapsed roads, sinkholes, flooding, and polluted drinking water sources. Public health can also be affected by degraded water quality and wildlife habitat. Some local governments have developed inventories of their stormwater infrastructure and some include condition assessment as part of their maintenance program, but these proactive steps are more common in MS4-regulated communities.

Flooding is a significant concern related to increased stormwater runoff. Georgia flood insurance policy holders have received over \$315.8 million in claim payments for 16,200 losses since 1978, but this figure underestimates total damages because most of the state's flood-prone property owners do not have flood insurance. Georgia DNR is helping increase public awareness of flood hazards by providing current online digital Flood Insurance Rate Maps. All Georgia counties and cities that participate in the National Flood Insurance Program are represented in this data.

RESILIENCE

Georgia communities are vulnerable to many potential hydrologic disasters including hurricane impact, extreme rainfall events from both tropical and frontal storms, and drought. Georgia has experienced extreme weather events in recent years including the metro Atlanta flooding in 2009 and the statewide drought in 2012, both of which demonstrated the vulnerability of its infrastructure, population and economy. It can be expected that hydrologic events will continue to test the capacity and effectiveness of Georgia's stormwater infrastructure, the failure of which can cause additional surface water quality impairments and significant loss of life and property. Currently, more than 500,000 Georgia citizens live within FEMA's 100-year floodplain boundaries, and many of these areas are expecting large population growth.

Georgia's 2014 Hazard Mitigation Strategy and its Flood Mitigation Assistance Program show the state is actively identifying its current and future hydrologic hazards. However, there is plenty of work left to address hydrologic vulnerability as local efforts to address current and future vulnerabilities are at various stages of implementation.

2019

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INFRASTRUCTURE



INNOVATION

The Georgia Stormwater Management Manual (the state stormwater design manual) was updated in 2016 to include guidance and design criteria for stormwater runoff reduction/infiltration, with the goal of decreasing runoff and allowing stormwater to infiltrate back into the ground through the use of green infrastructure practices. Past guidance and design criteria focused on controlling peak flow and providing some water quality treatment for the first flush. However, the most recent Phase II MS4 permits include requirements for implementation of runoff reduction practices and the next round of Phase I permits are expected to include these requirements as well. Currently, runoff reduction requirements are just starting to be implemented by those who are required to do so by their Phase II MS4 permit.

The planning community is also starting to shift from viewing infrastructure as separate entities (e.g., stormwater, water, wastewater, etc.) to planning methodologies focused on developing holistic solutions to issues impacting multiple aspects of infrastructure planning. The Metro North Georgia Planning District (MNGPD), for instance, approached the most recent update of their Water Resources Management Plan with integrated planning in mind. Recommended action items to improve stormwater quality, for instance, were also given credit for addressing source water protection and the assimilative capacity of streams.



STORMWATER



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TRANSIT



MARTA TRAIN



TRANSIT

GRADE: D+ (2014 GRADE: D-)

EXECUTIVE SUMMARY

Funding for public transit infrastructure has increased significantly over the past five years. New state funding has been augmented by local sales tax initiatives, including Clayton County’s one-cent sales tax in 2015 and the City of Atlanta’s “More MARTA” half-cent sales tax increase in 2016. “More MARTA” is expected to raise \$2.5 billion over 40 years. Additionally, the Georgia General Assembly designated the Atlanta Transit Link (ATL) as the umbrella organization for regional coordination of transit systems and funding. While these recent developments are encouraging, the state is still heavily car centric. In 2016, 90% of trips in Georgia were made using automobiles, while only 2% were made by transit. In 2016, Atlanta ranked 32nd in the nation in transit access. Meanwhile, Atlanta is the eighth most congested city in the world. More funding and collaboration between systems is needed to continue to maintain existing systems, improve access for all citizens, and make transit a more attractive option.



TRANSIT



RECOMMENDATIONS TO RAISE THE GRADE

To improve the State's competitiveness, Georgia's transit strategy should be to increase access to public transit, increase the percentage of transit trips while providing increased mobility alternatives, reduce dependency on automobiles, increase travel time reliability, and increase access to jobs. To achieve these goals, Georgia should:

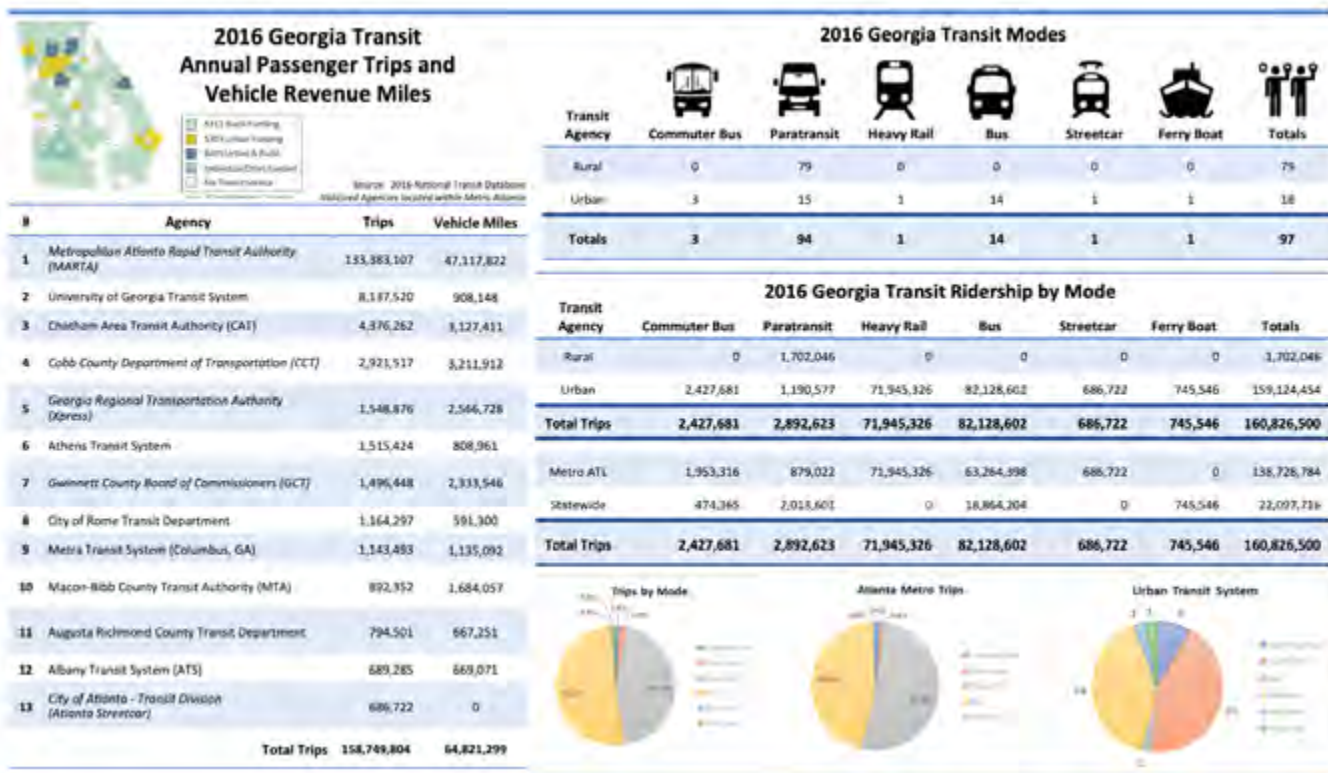
1. **Improve funding for transit by (for example):**
 - **Removing restrictions on motor fuel tax usage under O.C.G.A. § 32-1-1 et seq that prevent funds from being used for transit.**
 - **Reinstating the motor fuel tax exemption for public transit agencies.**
 - **Establishing other funding mechanisms that provide a funding stream dedicated to transit.**
2. **Finalize the structure and mission of the ATL, so that Atlanta riders enjoy a seamless transit experience by:**
 - **Ensuring organizational elements are clarified, and**
 - **Establishing a permanent funding mechanism.**
3. **Encouraging innovative efforts that make transit attractive for all.**
4. **Establishing a multi-modal center(s) to facilitate transfers and create a hub for transit activities.**
5. **Build more dedicated transit lanes and facilities.**



INTRODUCTION

In 2016, Georgians made almost 161 million trips by public transit. These trips were made on the 97 public transit agencies in the state serving 123 of the 159 counties. The agencies consist of 16 urban and 79 rural agencies, with the 13 busiest agencies, all urban, accounting for 99% of all trips. Figure 1 profiles the 2016 public transit operations within the state.

FIGURE 1 - 2016 GEORGIA TRANSIT RIDERSHIP DATA



All the transit agencies operate either fixed route, demand service buses, or both. However, only the Metropolitan Atlanta Rapid Transit Authority (MARTA) operates heavy passenger rail. MARTA took over the Atlanta Streetcar operations from the City of Atlanta in July 2018. The Chatham Area Transit Authority (CATS) is the only system to provide ferry boat service, known as the Savannah Belles Ferry. All of the rural transit agencies provide paratransit/demand response services, whereas the urban transit agencies provide a wide variety of transit services.



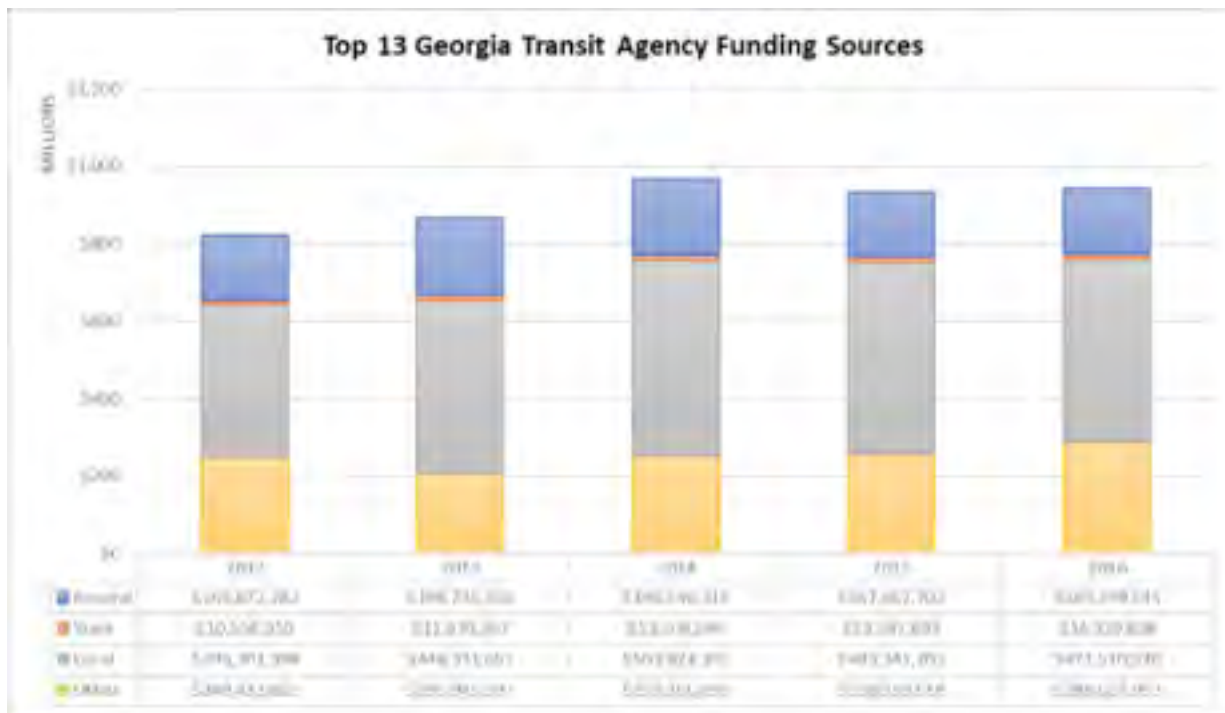
FUNDING

The primary source of transit funding in Georgia is federal, state and local taxes and other revenues such as fares, advertising, concessions, and parking. MARTA's farebox recovery for 2016 was 26%, while the overall farebox recovery in Georgia was 24%. National farebox recovery rates average 14%. The State Public Transportation Fund (funded by the motor fuel tax) is limited to paying the costs of maintaining, improving, constructing, and reconstructing public roads and bridges and cannot be used for transit.

A significant source of revenue at the local level is from sales taxes. For example, Clayton County passed a one-cent sales tax and joined MARTA in 2015. The City of Atlanta passed the More MARTA half-cent sales tax increase in 2016 which is expected to raise \$2.5 billion over 40 years.

Figure 2 summarizes the funding sources for public transit in Georgia between 2012 and 2016. State funding has increased in recent years. In 2015, the Georgia General Assembly recognized that transit systems needed state support, so \$75 million in grants have been issued by the State Road and Tollway Authority (SRTA) to 11 systems statewide. In 2018 the Georgia General Assembly approved \$100 million in grants for the GA-400 Bus Rapid Transit project. Furthermore, the Assembly passed HB 930 which created the Atlanta Transit Link (ATL) as the umbrella organization for regional coordination of transit systems and funding. It also outlines funding for public transit through optional local taxes Transit SPLOST of up to 1% for up to 30 years. However, when the ATL was created, the agency's operations were not funded beyond some minor start-up dollars. This shortfall will need to be addressed in the future.

FIGURE 2 – GEORGIA TRANSIT FUNDING SOURCES





FUTURE NEEDS & CAPACITY

Atlanta ranks 32nd in transit access and 21st for automobile access to jobs among major metropolitan areas in the United States. Figures 3 and 4 show a slight (5%) improvement in job accessibility. Ninety percent of Georgia trips in 2016 were made using automobiles, and only 2% of trips were made by transit. Congestion has a profound impact on travel times, especially for commutes under 30 minutes, where congestion accounts for more than 30% of the travel time. Travel time reliability is another casualty of the auto-centric commute patterns. State Farm, NCR, Worldpay, Athenahealth, PulteGroup and Mercedes-Benz have relocated to Atlanta, many near MARTA rail stations, bringing 15,000 jobs. It is important that commuters to these and other businesses have reliable service so that employees and the companies can expect uninterrupted work schedules. There is a direct relationship between availability of reliable transit and a region's ability to attract large employers. Future transit expansion strategies should include increasing access to public transit, increasing the percentage of transit trips, providing mobility alternatives, reducing dependency on automobiles, increasing travel time reliability, and increasing access to jobs.

FIGURE 3- TRANSIT ACCESS TO JOBS 2014

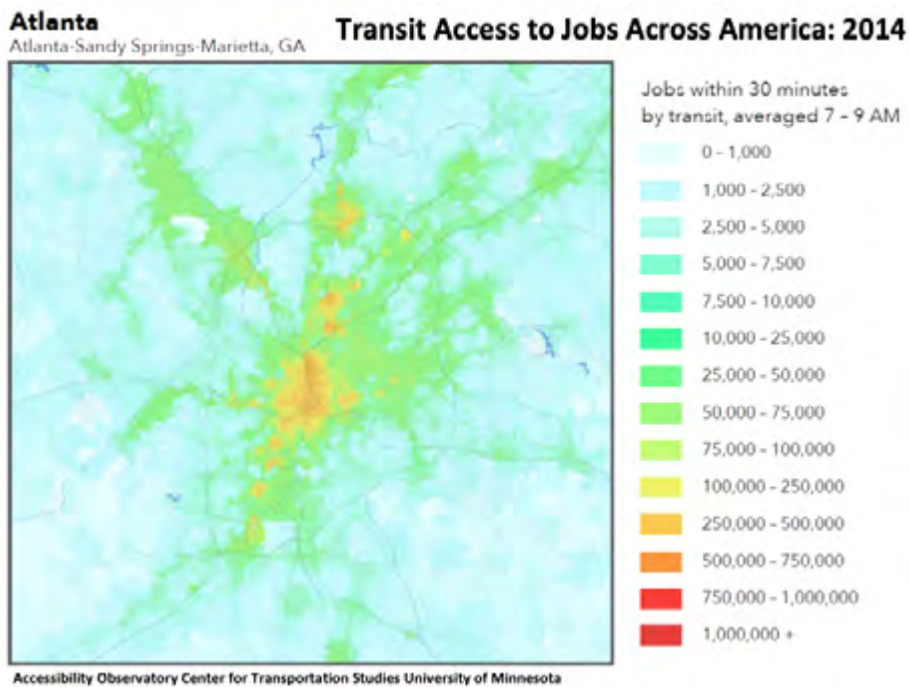
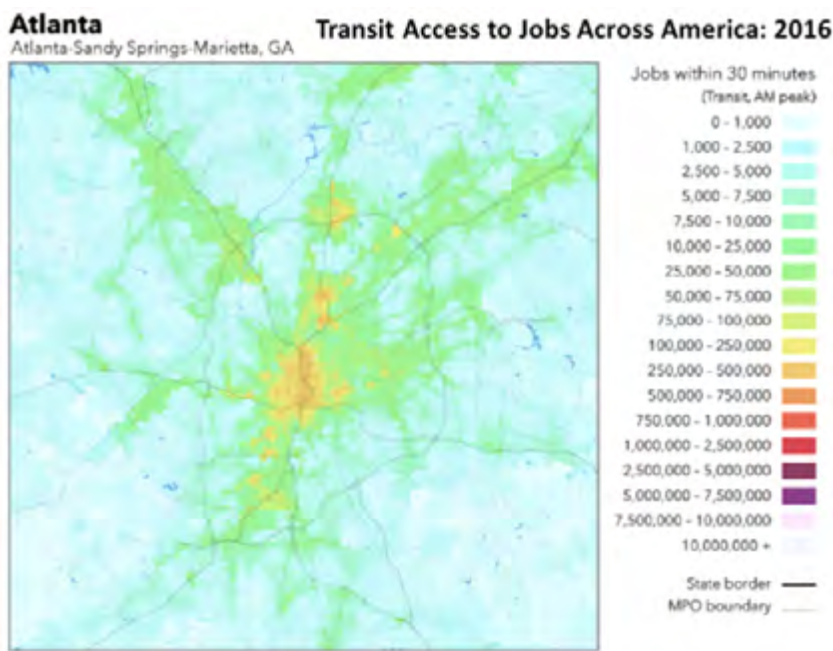




FIGURE 4 - TRANSIT ACCESS TO JOBS 2016



CONDITION AND OPERATIONS AND MAINTENANCE

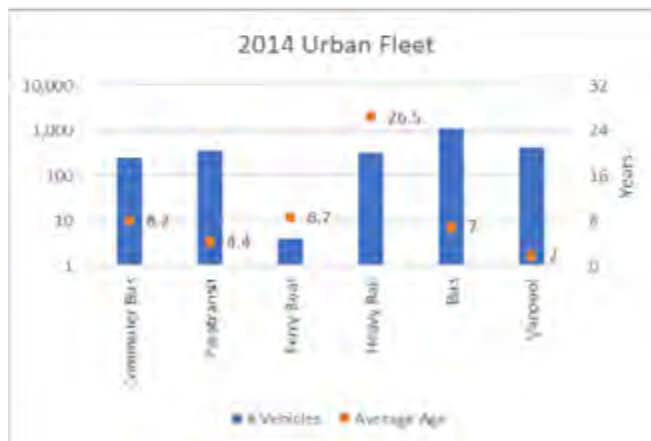
The operations and maintenance of the transit network is divided between rural transit systems providing paratransit operations to the elderly and disabled, and urban transit systems that provide regular bus service in addition to paratransit operations. The vehicle fleet is the largest expense after labor costs. Georgia provides no dedicated capital funding for large urban transit systems (MARTA, CAT, etc.) and thus these agencies must rely solely on local and federal funds to replace vehicles. In 2016, rural transit agencies maintained a fleet of 500 vehicles with an average age of five years. Urban transit agencies maintained a fleet of 2,500 vehicles. On the positive side, between 2014 and 2016, the average age of buses dropped from 7 to 4.2 years due to purchases of new buses, as shown in Figure 5.

MARTA is responsible for maintaining a transportation infrastructure valued at \$6.5 billion, which consists of 48 miles of heavy rail with 38 stations, maintenance facilities, and a fleet of buses and trains. Their Capital Improvement Program represents 25% of their expenditures. Previously, 50% of their funding had to be used for capital improvements, but this was hampering MARTA's operations. The 2014 Georgia Infrastructure Report Card recommended that this rule be repealed, and it was repealed shortly thereafter. The Capital Improvement Projects in the FY2018 Budget have been allocated \$284.7 million in funding, as part of the \$3.2 billion dollar, 10-year capital program. Additionally, the largest future program will be the replacement of 304 heavy rail vehicles beginning in 2022 with an estimated \$700 million cost. Other notable programs underway include:

- Train Control System Upgrade (\$69 million);
- Traction Power Substation Upgrade (\$221 million);
- Tunnel Ventilation System (\$154 million);
- Auxiliary Power Switch Gear (\$194 million); and
- Escalator Rehabilitation (\$98 million).



FIGURE 5 - URBAN FLEET AGE BY MODE 2014 TO 2016



PUBLIC SAFETY

Most public transit agencies rely on local municipalities to provide security for employees and riders. However, MARTA maintains a police department of over 400 sworn positions and over 55 civilians, which is the ninth largest police force in Georgia. Units patrol all buses, trains, stations and parking lots utilizing more than 10,000 surveillance cameras to protect the MARTA system, employees, and riders against criminal/terrorist activity. In addition to the regular police force, the department maintains a variety of specialized units (Special Operation Response Team, Bomb Assessment Team, Explosive K-9 and Disposal Technicians) that provide tactical police, counter-terrorism, chemical/biological weapons, and explosives expertise. MARTA is permanently expanding its force by 40 officers in advance of Super Bowl 53 at Mercedes-Benz Stadium (February 2019). To enhance communications and command-and-control response capabilities, in 2017, MARTA began operating a new \$1.2 million mobile command center, see Figure 6. This Center was financed entirely through the Federal Transit Urban Grant Program for security investments.

RESILIENCE

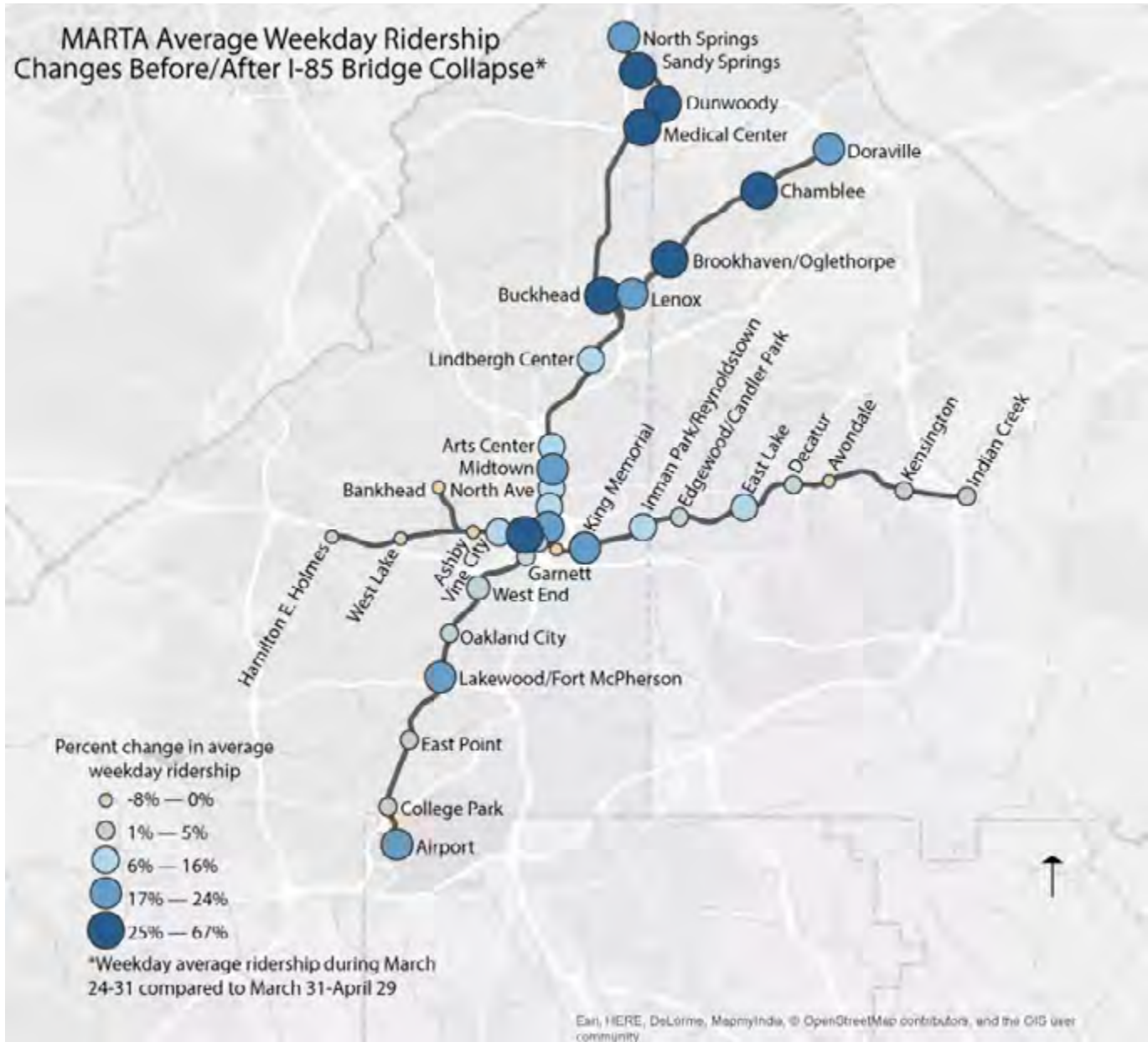
The I-85 bridge fire in downtown Atlanta in 2016 demonstrated MARTA's vital role in the resilience of the transportation network. During the six weeks that I-85 was closed to rebuild the bridge, MARTA was a vital alternative for the 200,000 users per day that travel that section of I-85, and experienced an overall 11.5% increase in ridership, see Figure 7.



FIGURE 6 - MOBILE COMMAND CENTER



FIGURE 7 - MARTA I-85 BRIDGE COLLAPSE RIDERSHIP INCREASE.



MARTA has an active resilience program within their Enterprise Asset Management System that specifically tracks weather impacts. Examples of how this information enhances the system by making it more resilient include: adding weather related identification codes to maintenance work orders; adding a module to the Enterprise Asset Management System for capital projects that specifically references resilience; incorporating risk management as an explicit component of each asset management plan; and, modifying the agency’s capital improvement plan checklist to include resilience and sustainability components. Smaller systems are also concerned with sustainability and resilience. For example, Chatham Area Transit (CAT) has developed a sustainability program and Disaster Recovery Plan.



INNOVATION

Mobility is rapidly changing, and transit is adapting to the market. Transportation Network Company (TNC), Mobility Service Providers (MSP), and Mobility as a Service (MaaS) are providing a variety of mobility options as shown in Figure 8 to address the first and last mile challenge of getting to and from transit. Transit agencies are actively seeking ways to leverage these changes and improve mobility options. Cobb County is considering replacing its Flex Bus service, which picks up and drops off riders in selected areas without regular stops, with a private ridesharing app, either Uber or Lyft. MARTA was one of the two first place winners of the TransLoc's MicroTransit Accelerator Challenge in 2017. Microtransit is a form of demand-response that offers flexible routing and scheduling using minibuses. Gwinnett County is running a Microtransit pilot program through the first quarter of 2019.

Additionally, MARTA is implementing an Authority-Wide Energy Savings Performance Project. The project will include replacing and retrofitting more the 40,000-existing fluorescent light fixtures with more efficient LED lighting systems. It will also include upgrading existing, aging HVAC systems with more reliable energy efficient HVAC systems that will be controlled by a newly installed Building Automated System (BAS).

FIGURE 8 - ATLANTA MOBILITY OPTIONS





TRANSIT



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WASTEWATER



WASTEWATER

GRADE: D+ (2014 GRADE C)

EXECUTIVE SUMMARY

Georgia's wastewater infrastructure continues to age, and wastewater agencies struggle to upgrade wastewater treatment systems to meet changing water quality standards. While progress has been made in dealing with the threats of overflows from combined sewer systems, slow progress in addressing overflows from sanitary sewer systems, aging wastewater infrastructure and the demands of a growing population have resulted in lowering of the grade. In 2017, the Georgia Water & Wastewater Report found that 45% of the 373 local government water or wastewater agencies in Georgia did not generate enough revenue to cover their operations and maintenance costs and account for future capital costs. Systems need to be properly maintained and expanded for future growth. Nearly half of all Georgians do not have access to public sewers, many relying on septic systems.



RECOMMENDATIONS TO RAISE THE GRADE

- **PLAN FOR FUTURE FUNDING:** To improve system performance, municipalities need to improve their planning efforts for obtaining timely funding from traditional sources of financed loans and user revenue. Also, agencies must ensure that costs for new capacity required by development are fairly allocated to those users driving the development. Increased federal funding could also be obtained through a unified appeal, illustrating the capacity for collaboration among local, regional and state interests.
- **IMPLEMENT AND IMPROVE ASSET MANAGEMENT PROGRAMS:** Municipalities should ensure availability of adequate collection and conveyance capacity, proper operation of all sewer system components, and reduction or elimination of wastewater overflows and spills. Utilities need to develop a comprehensive inspection and maintenance program including near-term and long-term program goals. The reduction of infiltration and inflow into the sanitary systems is a worthy goal that essentially “buys back” treatment capacity at the treatment plant.
- **KEEP UP WITH INSPECTION NEEDS:** In support of more stringent surface water standards, Georgia EPD is expected to modify existing permits and future permits with more stringent requirements. The State of Georgia should increase staff to provide inspections.
- **IMPROVE AND MAINTAIN TECHNICAL SKILLS:** Training courses on advanced technology and tools will be necessary to keep pace with stricter regulatory requirements, replace an aging workforce, and attract from a limited recruitment pool. Position descriptions and qualifications should reflect the increasing technical complexities of the field.
- **ESTABLISH A SEPTIC SYSTEM INSPECTION AND MAINTENANCE PROGRAM:** Implement stricter state-level guidance for site selection, design and construction, and maintenance of septic systems while increasing enforcement and education.
- **FOCUS ON COST RECOVERY RATIO:** Many utilities are not covering all of their needs with existing rates. The strong economy presents an opportunity to establish rate/fee structures that allow systems to pay for themselves, which means paying for the full cost of service including operation, maintenance and capital needs.



INTRODUCTION

Clean drinking water and excellent wastewater / sanitation infrastructure have contributed significantly to the standard of living and economy in our nation. Without adequate and properly maintained wastewater and sanitation infrastructure, cities cannot serve the existing population, nor accommodate growth. Failure to maintain and upgrade this infrastructure has consequences, including sewage overflows into receiving waters or even into homes and businesses. In addition to conveying wastewater to treatment facilities, the system must treat wastewater to very high standards to avoid degradation of streams, rivers, lakes, and oceans.

CONDITION AND CAPACITY

Georgia's wastewater utilities are facing challenges brought on by aging infrastructure. As a result, it is not difficult to find collection system elements that are approaching the end of their predicted design life and in need of replacement. At the same time, capacity needs for future growth must be considered. Georgia has 334 operational wastewater treatment facilities and 337 wastewater collection systems, as reported in the 2008 and 2012 U.S. Environmental Protection Agency (EPA) Clean Watershed Needs Surveys (CWNS). The number of publicly-owned treatment plants increased from 306 to 334 from 2008 to 2012 and the population served by these plants reached 5.6 million. The estimated population of Georgia in July 2017 was 10.5 million people according to the U.S. Census Bureau. This means that nearly half of Georgians do not have access to public sewers, many relying on septic systems.

The growing population is mainly in separate sewer areas, since combined sewers have not been normal practice since the late 1970s. The older combined systems, which handle stormwater and wastewater, have been the focus of federal consent orders and much progress has been made in dealing with these antiquated systems. Looking toward the future, separate systems, which only handle wastewater, will need to receive more attention in the form of increased monitoring and maintenance programs.

The number of onsite wastewater treatment systems (septic tanks) in the 16-county Metropolitan North Georgia Water Planning District is estimated to be over 500,000 with approximately 12,000 systems being added per year. At one point, septic systems were considered only temporary wastewater management systems; however, the District now considers onsite wastewater treatment systems as permanent solutions for many households where sanitary sewer is less feasible. However, septic systems require larger lot sizes and suitable soils, so they are better solutions for rural areas than densely populated urban areas. Metropolitan Atlanta counties with septic systems on small lots may consider installing sewer to ensure water quality and home values long-term.

Ensuring septic systems are repaired when they fail is the responsibility of local health departments, which are often understaffed and underfunded. Septic systems will remain a viable wastewater management option in rural Georgia into the foreseeable future, underscoring the importance of ensuring that they are designed, constructed and maintained properly. Water agencies must understand and include sufficient means and treatment capacity to support the disposal needs created by maintenance of septic systems.

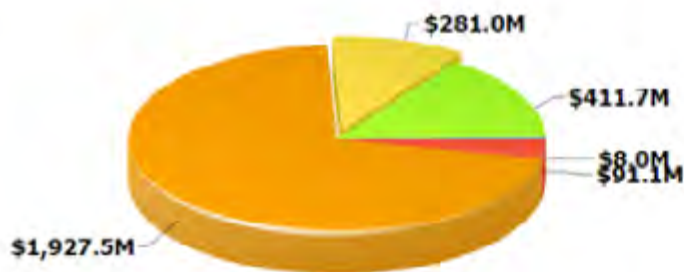


O&M, FUNDING AND FUTURE NEED

The estimated municipal wastewater needs for Georgia total \$2.7 billion. The needs are categorized and presented in the figure below.

Total Documented Needs by Category

Total Needs: \$ 2,719.4M



Most of the funding for wastewater infrastructure comes from sewer user fees. Sewer connection fees also pay for capital expenditures for new treatment capacity and conveyance infrastructure.

The Georgia Environmental Finance Authority (GEFA) administers the Clean Water State Revolving Fund (CWSRF) for Georgia and \$92,300,000 in loans has been planned or provided by the program since 2014. The State of Georgia is required to match 20% of the sum provided through CWSRF loans.

In 2017, 338 agencies provided rate structure information to the Georgia Water & Wastewater Report (GEFA and UNC EFC). The report showed that the median base charge for wastewater service was \$15 per month. This is significantly lower than the 2014 monthly national average of \$42. The majority of the current rate structures were put in place during 2016-2017 with only about a quarter (93) being in place since before 2012. Median wastewater bills in Georgia break down as follows:

- \$15 for zero gallons
- \$31.06 for 5,000 gallons disposed
- \$51.97 for 10,000 gallons disposed

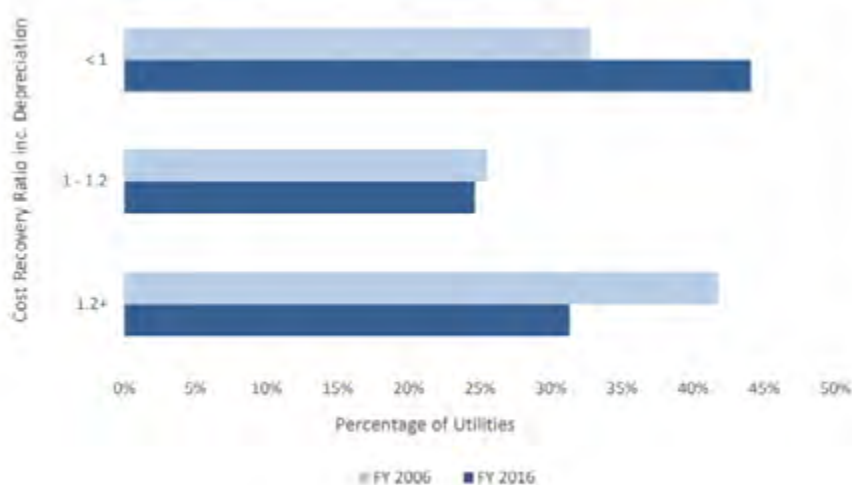
The report also showed that 37.5% of wastewater collection utilities increased their residential rates by a median of 5.6% (\$1.75/month). Compared to the median household incomes of the communities served by the 358 wastewater agencies, most of the wastewater rates fall between 0.5% and 1.5% MHI, with 111 utilities in Georgia charging more than 2.5% MHI for combined water and wastewater at 5,000 gallons per month.



In addition, the report showed that 45% of the 373-local government water or wastewater agencies in Georgia did not generate enough revenue to cover their operations and maintenance costs and account for future capital costs. This condition is largely seen in smaller systems serving fewer than 1,000 connections. Overall, the cost recovery ratios (the ratio of total revenues to total costs) for systems in Georgia have declined from 2006 to 2016 as presented in the figure below.

For some agencies, stormwater fees are included in the sewer bill; however, there is a trend for system owners to create a separate stormwater utility department. Stormwater is covered separately in this Report Card.

Figure 39: Percentages of 345 Water and Wastewater Utilities in Cost Recovery Ratio Ranges, 10 Years Apart



Data analyzed by the Environmental Finance Center at the University of North Carolina, Chapel Hill.
Data Sources: Georgia Department of Community Affairs. Data self-reported by utilities in FY 2006 and 2016.

PUBLIC SAFETY & RESILIENCE

The core mission of wastewater treatment agencies is to maintain public health and safety and environmental integrity. Public safety is impacted through noncompliance with permits, sanitary sewer overflows (SSO) which consist only of wastewater, and combined sewer overflows (CSO), which consist of wastewater and stormwater. U.S. EPA Region 4 through the Georgia EPD oversees permit compliance. In cases of extreme noncompliance, a consent decree can be issued ordering a utility to bring their system into compliance. There are currently two active consent decrees in Georgia: DeKalb County's consent decree is anticipated to be complete in 2020 and the City of Atlanta's consent decree is scheduled to be complete by 2027.

Wastewater treatment plants are typically located at the bottom of watersheds in close proximity to stream discharge points and so are at a high risk of flooding from extreme rain events. Following record rainfall in 2009, the City of Atlanta's R. M. Clayton Water Reclamation Center was flooded, as were several other treatment facilities throughout metro Atlanta. More recently, Hurricane Harvey damaged Houston, TX wastewater plants and flooding led to sewage spills and threatened public health and safety arising from exposure to contaminated floodwaters. This threat is heightened along Georgia's coastline, which is vulnerable to extreme weather events.

In addition to the potential for flooding from nearby streams, treatment facilities can be inundated from groundwater and stormwater entering the collection system (known as infiltration and inflow), significantly increasing the flows being treated. Utilities must maintain vigilant infiltration and inflow detection and rehabilitation programs to reduce the potential for overwhelming their facilities during rain events.



Emergency Response Plans (ERPs) are essential to protect public health against threats to wastewater infrastructure. Georgia municipalities have begun to implement ERPs, but also need additional training conforming to the National Incident Management System (NIMS). Such training should be mandatory for all essential utility personnel.

INNOVATION

Innovation in Georgia's wastewater infrastructure has been fostered through many opportunities such as partnership with Water Environmental Foundation's Leaders Innovation Forum for Technology (LIFT) initiative. Recently, Gwinnett County has proposed building a water innovation center that will house innovative research for the water, wastewater, and stormwater industries. Georgia leads the southeast with two facilities that are part of the Facilities Accelerating Science & Technology (FAST) network as part of the LIFT initiative. The FAST network is intended to assist in accelerating the development and adoption of innovative water, wastewater and stormwater treatment technologies.

Specific examples of innovation include:

- Cogeneration (using gases from wastewater to produce energy) and nutrient recovery processes (removing nitrogen and phosphorus that can be reused as fertilizer) in place at Gwinnett County's F. Wayne Hill Water Reclamation Center and the City of Atlanta's R.M. Clayton Water Reclamation Center.
- Emory University's WaterHub, an on-site water recycling system.
- Allowance of decentralized "black-water" treatment systems in Atlanta. These systems reclaim and treat wastewater locally to the source/discharge and reduce the flow and load to the collection system. These systems are particularly helpful to overburdened collection systems or to make capacity available for additional economic growth.



WASTEWATER



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