Georgia Department of Transportation

Blocked Railroad Crossings Study

MAY 2026

Georgia Department of Transportation
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GDOT
Georgia Department of Transportation

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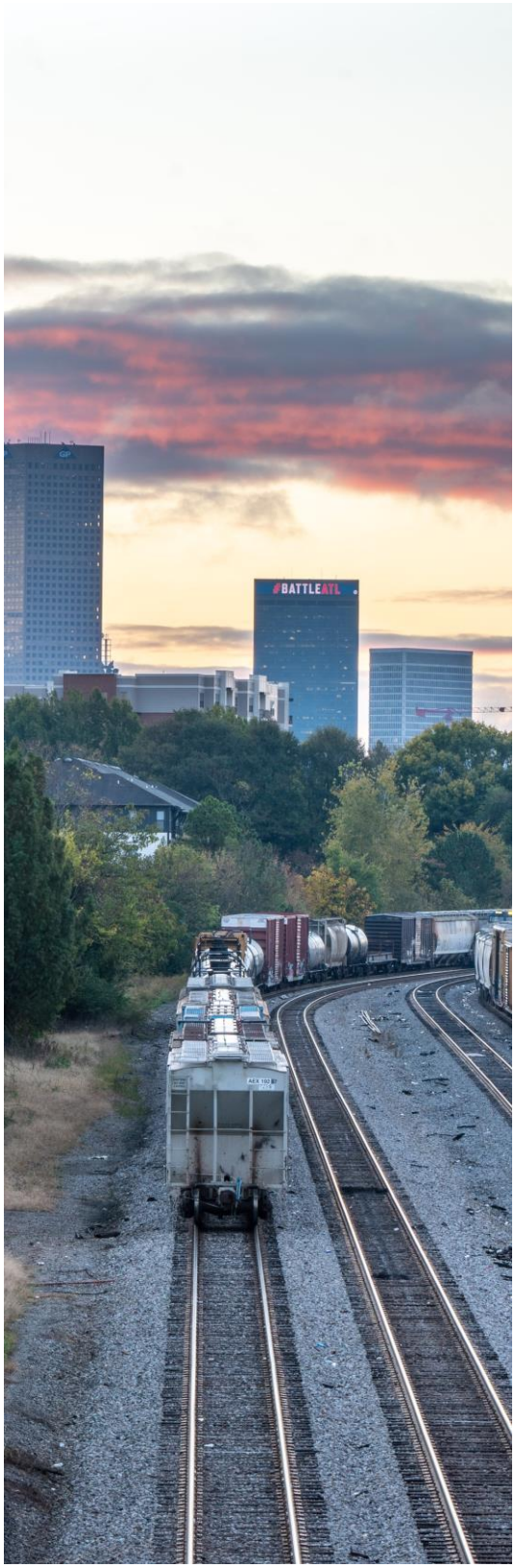


As identified in the Georgia 2023 Freight Plan, population growth, industrial activity, and the expansion of the Port of Savannah have all contributed to increased freight and passenger traffic on rail lines and roads within the state. With more than 5,000 at-grade railroad crossings in the state of Georgia, this growth has led to increased interaction between trains and cars, resulting in an increase in delays to commercial and personal vehicle traffic, first responders, and impacts to local businesses. With freight tonnage expected to continue to grow 91% between 2023 and 2050 and an additional 1.9 million personal vehicles on the road by the same year, crossing interactions are anticipated to continue to increase.

As rail traffic has increased, railroads have also changed their operations to be more efficient. Increases in train lengths and "precision scheduled railroading" have impacted crossings, with trains longer than sidings were designed to hold, and trains running on less regular schedules. As these operational changes have taken hold, instances of crossing blockages have also increased.

Blockage complaints are increasing

Rail crossing blockage complaints in Georgia have grown from 131 per year in 2019 to 670 per year in 2024.

Most crossings are not monitored to log traffic levels and blockages. However, following the establishment of the Federal Railroad Administration's (FRA) complaint database in 2019, rail crossing blockage complaints in Georgia have grown from 131 per year to 670 per year in 2024. Complainants have also noted significant increases in duration of blockages, with reported blockages of almost 2,000 total hours in 2024 alone. Patterns of blockages appear to be emerging. Each year, an increasing number of complaints have occurred at crossings that had at least one complaint in a previous year.

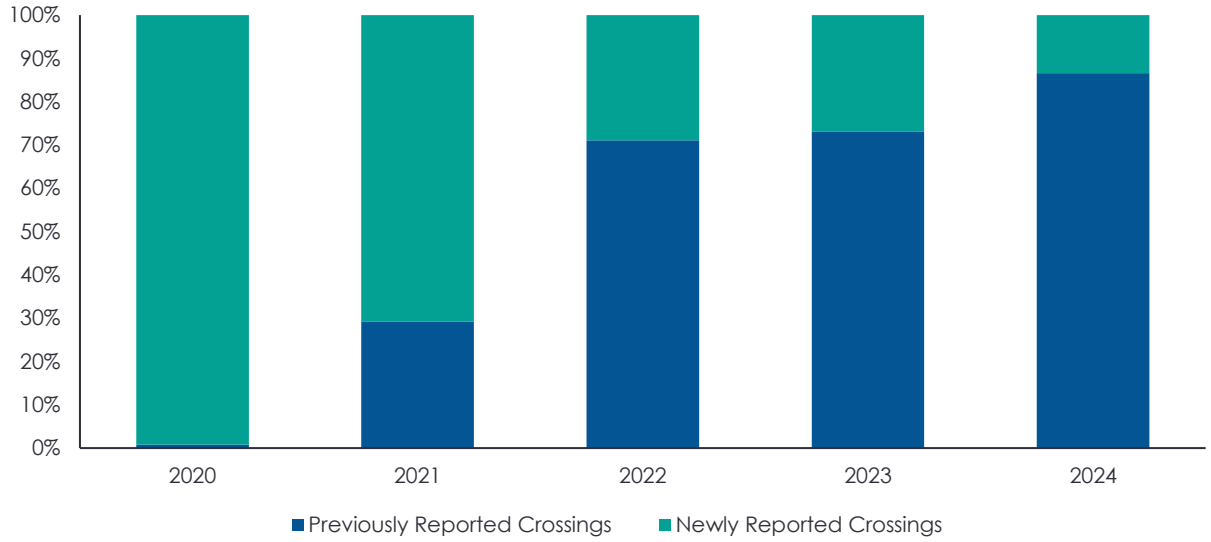


Figure 1: Percentage of Crossings Previously Reported in the Complaint Database by Year

These blockages have an adverse impact on communities

When trains block crossings, drivers and passengers cannot reach their destinations, commercial vehicles are delayed, and emergency services providers cannot reach their destinations. Public safety issues created by pedestrian attempts to cross tracks while trains are blocking crossings have also drawn scrutiny across the country.[1] [2]

Blockages have differing effects on communities. While they most frequently occur in urban areas due to road traffic density, other clusters of complaints concentrate in less urbanized areas like McDonough and Waycross, where rail traffic is high. Across the state, communities, including Garden City and Pierce County, are completely cut-off by road and isolated if a single rail crossing is blocked. This can have catastrophic impacts for first responders: 53% of local government survey respondents indicated the impact of blocked rail crossings on emergency services as their biggest concern. Notably, an increasing percentage of complaints logged in the FRA Complaint Database involve first responders or pedestrians.

[1] https://www.ajc.com/life/opinion-residents-still-feeling-railroaded/2HM4HHIPLFH5TM5CCGKJIJWZ3A/
[2] https://www.11alive.com/article/news/investigations/safety-concerns-grow-as-trains-block-traffic-in-dekalb-county/85-ab72d11b-45ee-450c-a0bf-270ad4c58774

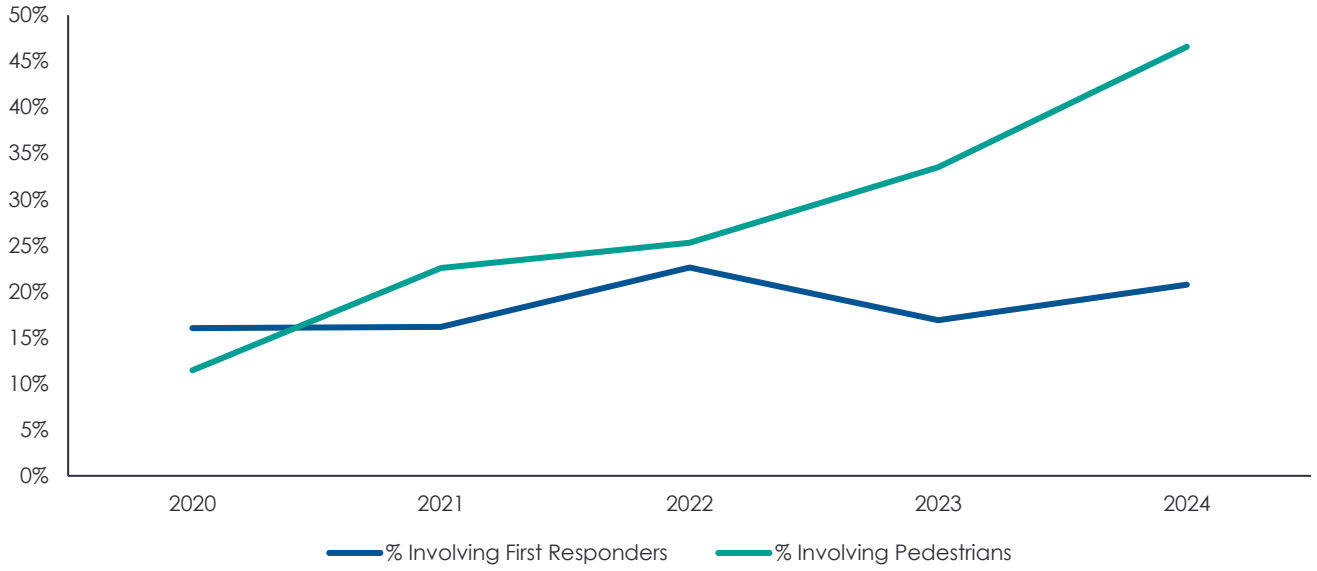


Figure 2: Percentage of Blockage Complaints Involving First Responders or Pedestrians by Year (FRA Blocked Crossing Database)

Empirical data on blockages is currently limited

As there is no comprehensive objective data source documenting railroad crossing blockages in Georgia, blockages are identified by anecdotal and self-reported sources, captured through complaints submitted anonymously to the FRA Complaint Database, and solicited via surveys. This inherently results in incomplete information and focuses attention where observers are most vigilant and willing to spend the time to report. Railroads have limited incentive to monitor or record blockages, and monitoring equipment has historically been considered cost prohibitive.

However, the increase in complaints and the corroboration of survey data indicates that crossing blockages are widespread. Improving data collection and promoting greater awareness of complaint-reporting tools can form an important element of the State's strategy. Leveraging sensors to monitor crossings can be cost-effective and also support targeting of investment in the most efficient manner, while encouraging the public to use the FRA database can continue to improve upon the best existing source.

Most blockages are occurring at a small subset of crossings

Using existing data sources, 226 crossings across Georgia have been identified as frequently impacted by blockages. Key areas impacted by blocked crossings include **Savannah**, **Waycross**, and **Fairburn**.

This subset of the 5,000+ railroad crossings in Georgia includes locations with notably differing characteristics in terms of proximity to communities, traffic levels, and potential impacts to services.

Blocked crossings were identified and listed using twelve factors which reflect impacts of blockage on the community and economy, to create three prioritized tiers of crossings most severely impacted by blockages.

Furthermore, as railroad schedules change, traffic increases, and economic development shifts travel patterns, periodic analysis of crossings will be critical to validate the locations of the crossings with the most urgent blockage issues.

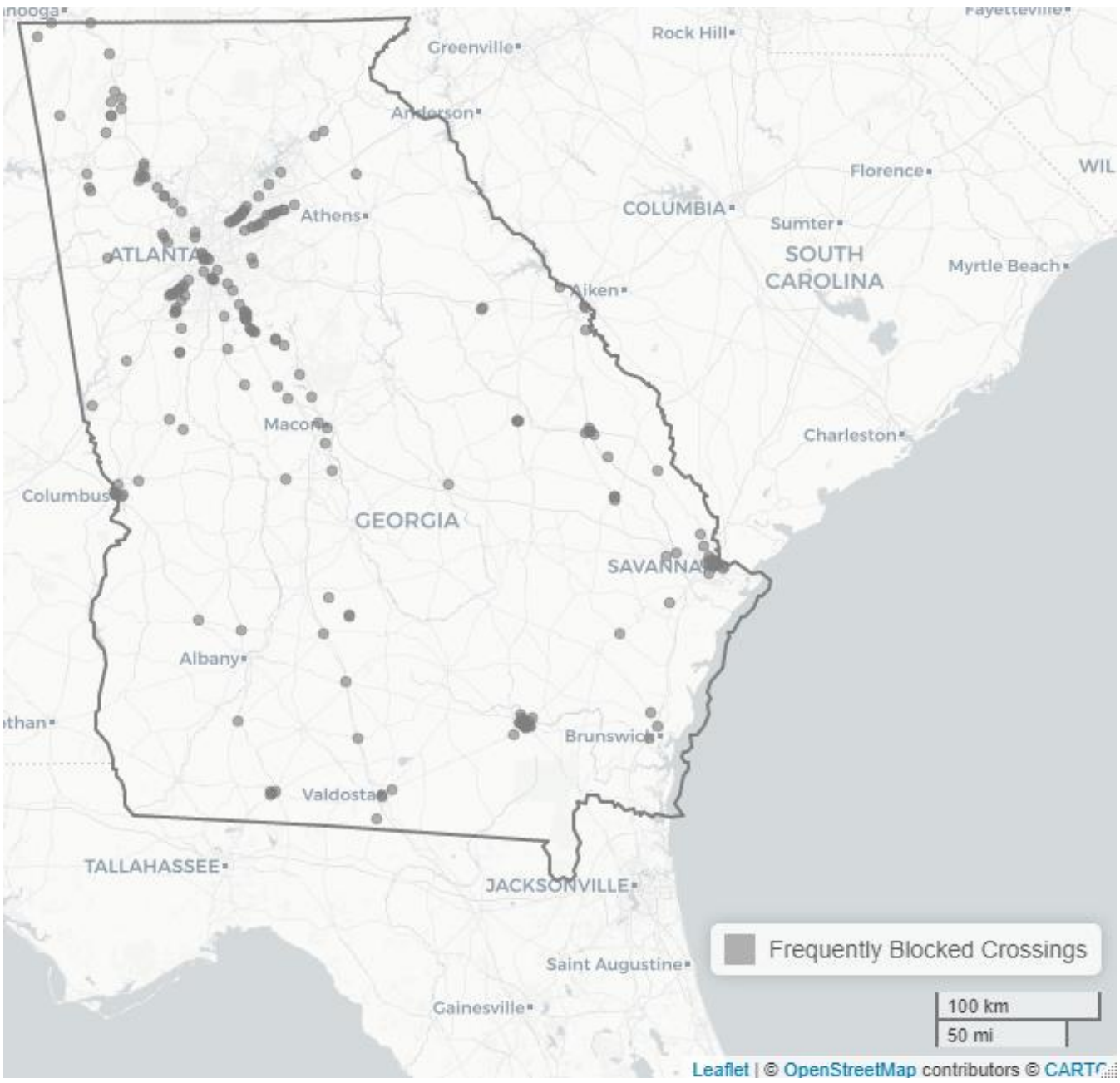


Figure 3: Priority Blocked Crossing Locations

A menu of potential solutions and delivery methods has been developed for the state's priority blocked crossing locations.

Grade separation is the most effective solution, but can be challenging to deliver, while other alternatives may be cost-effective

Grade separating highway and rail right-of-way is the most effective solution: eliminating the interface between road and rail also removes blockage and safety issues. However, grade separation can be prohibitively expensive, with the average grade separation project costing approximately **$34 million** in 2024 dollars, although can vary greatly based on the specific circumstances of the location.

There are currently six grade separation projects programmed in the state: Millen, Brampton Road[3], SR 307 at Augusta Road, SR 307 at US 80, Ossie Davis Parkway, and SR 12 at two new CSX locations.

The table below indicates the national average cost of a grade crossing based on the FY23-24 Railroad Crossing Elimination Grants:

Priority Factors

Near-Term:

- Flagged by Class 1s
- Travel time to nearest grade separation
- Complaints
- Proximity to railyards
- Current AADT
- Proximity to critical infrastructure (schools, fire, police, hospital)
- Highway prioritization (e.g. GRIP)

Mid-Term:

- Proximity to industrial sites
- Proximity to ports
- Rural crossings

Long-Term:

- Future AADT
- Socioeconomic factors (e.g. unemployment)

Grade Separation Costs, FY23-24 Railroad Crossing Elimination (RCE) Grants		
Minimum Cost (2024$)	**Maximum Cost (2024$)**	**Average Cost (2024$)**
$5M	$92M	$34M

The cost of grade separation projects requires the use of federal funding in most cases. The size and complexity mean that costs skew high, with some individual grade separation projects approaching $100 million. Other solutions, including siding extensions and other rail infrastructure upgrades, offer opportunities to realize similar benefits, often at a lower cost.

Low Capital Investment	Moderate Capital Investment	High Capital Investment
• Close crossing • Inform highway drivers	• Change road geometry • Relocate siding • Increase track speed • Add staging capacity	• Grade separate • Incentivize uncoupling

Table 1: Solutions by Capital Investment Required

[3] Delivered by Georgia Ports Authority

In particular, technological solutions present opportunities for cost-effective improvements, using data and improving information available to drivers to avoid blockages. For example, it is possible to implement sensors to detect when trains are approaching or blocking crossings and notify drivers via vehicle messaging signs and navigation apps to proactively re-route traffic.[4] Such sensors can be installed for as little as $11,000 each.

In Vancouver, Canada, changes in rail operations meant that a major arterial road was blocked as frequently as ten times per day, with a daily average total blockage time of 2 hours. By deploying TRAINFO sensors, the city was able to predict when blockages would occur and re-route traffic, resulting in a 30% reduction in traffic delays from train traffic.

In the future, the deployment of autonomous road and rail vehicles, such as the Parallel Systems technology currently undergoing testing in Georgia, could potentially reduce blockage issues by automatically ensuring that trains do not stop on crossings and interfacing with vehicle-to-infrastructure technologies to redirect traffic to alternative routes.

Parallel Systems is a startup developing autonomous, self-propelled railcars that can automatically couple and uncouple. This functionality enables long trains to quickly and safely split into multiple pieces, with the individual pieces moving away from crossings.

A systematic, portfolio approach can enable GDOT to significantly mitigate impacts of blockages in the most impacted locations

A portfolio approach will allow GDOT to leverage economies of scale, build capability and target limited public funding towards high priority locations. Problem crossings have been identified using defined factors, quantitative criteria that capture public and Class 1 feedback, community impacts, and economic development considerations.

Based on the aggregate score across all priority factors using the information available in this report, the highest priority (Tier 1) crossings are indicated in the figure below. The crossing locations included in Tier 1 should be considered preliminary. As detailed in this report, data on the duration and frequency of blocked crossings is limited. The prioritization process and three-tier system may be improved as more granular data on duration and frequency of blocked crossings becomes available:

[4] https://trainfo.ca/wp-content/uploads/TRAINFO-Case-Study-Vancouver-ITS.pdf

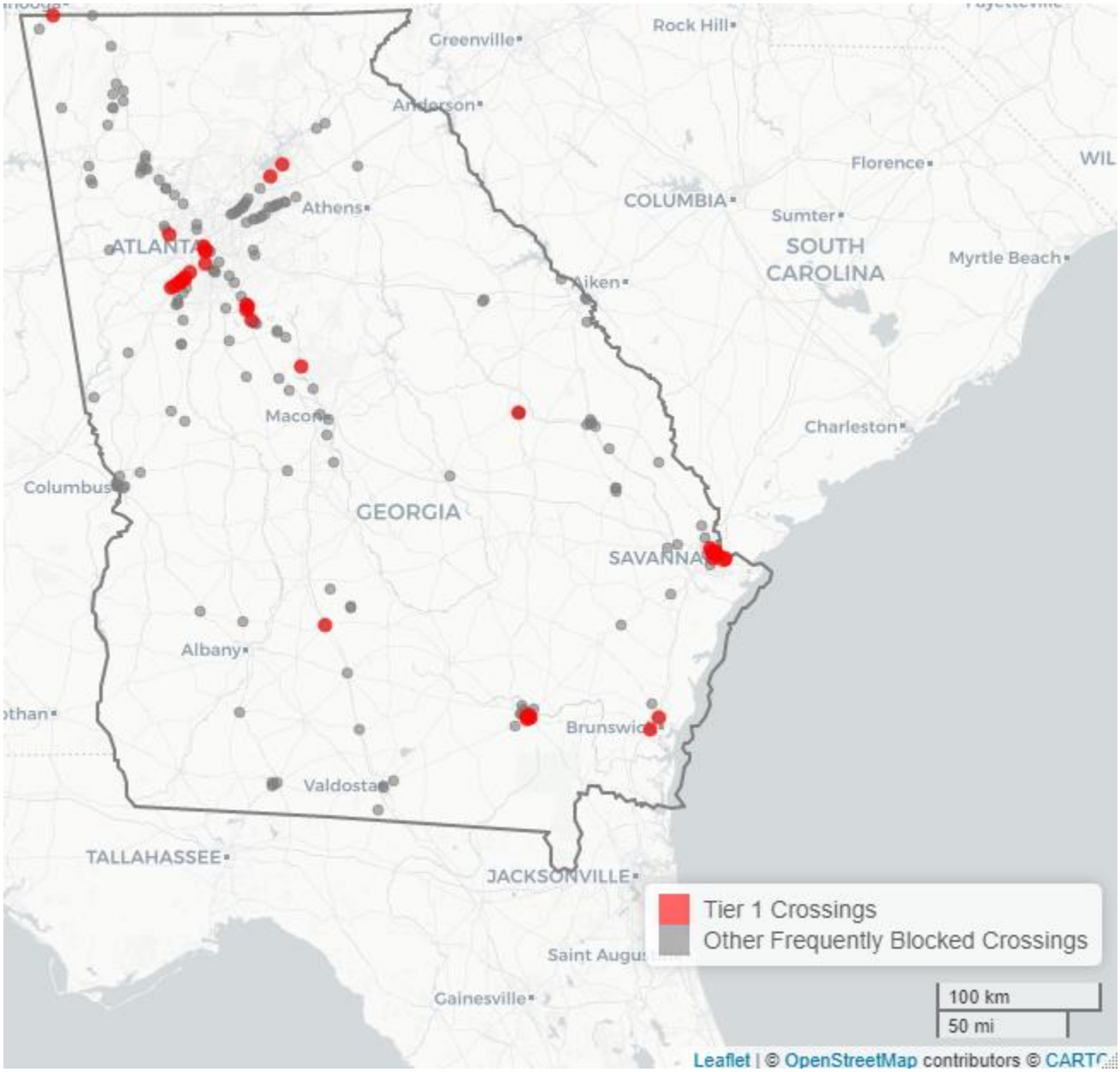


Figure 4: Tier 1 Crossings

The portfolio approach is characterized by a replicable, scalable approach to crossing investment that considers the negative impacts of frequently blocked crossings and the cost to mitigate these impacts, grouping and prioritizing crossings accordingly.

The prioritized list can be updated periodically and benefit from an investment in, and a systematic approach to, data collection, including AI-enabled monitoring. Delivery can focus on opportunities to partner with railroads and package multiple crossings into bundled projects.

GDOT can invest limited funding to enable future work in projects to mitigate blocked crossings

GDOT can set the groundwork to address blocked crossings by taking the following next steps:

Strategy	Next Steps
Improve understanding and recording of crossing blockages	• Promote reporting of blockages at community meetings and with stakeholders • Conduct regular outreach to identify problem locations, including communities that are cut off by crossings • Explore opportunities with the FRA and through the Manual on Uniform Traffic Control Devices (MUTCD) to streamline blockage reporting
Advance opportunities for technology-driven monitoring	• Develop formal RFI for monitoring and technology providers to gauge interest and capability for crossings monitoring technologies • Subject to RFI feedback, consider a pilot program for monitoring systems at prioritized crossings around the State • Install digital message signs near crossings displaying rerouting information and post crossing status online
Promote ongoing collaboration within GDOT and with Class 1 Railroads	• Establish coordination plans across GDOT offices to prioritize and advance projects • Present crossings portfolio plan to Class 1s and seek feedback • Develop ongoing protocols for periodic updates of the priority list, including discussion with Class 1s regarding identified issues
Advance projects in priority locations	• Program regular funding to complete scoping studies on priority crossings to refine scope, cost, and funding requirements ○ Approximately $1 million could cover roughly 3 scoping studies per year • Formalize clusters of priority projects by geography and solution type to be delivered together

Table 2: Next Steps

INTRODUCTION

Report Objectives

The Georgia 2023 Freight Plan recommended addressing blocked railroad crossings to remove impediments to growth. The purpose of this report is to provide a prioritized list of investment options statewide, as well as planning level cost estimates, funding considerations, and other recommendations to address blocked crossings in the state of Georgia.

GDOT Office of Utilities currently reviews crossings based on safety-relevant criteria and is aware of blockage challenges. There are scoping efforts underway on several crossings, but no comprehensive study or investment effort has been undertaken with the goal of mitigating the economic effects of blocked crossings.

This report considers the community and economic impacts of blocked crossings; while safety is one of those impacts, blockages do not result in collisions between trains and roadway vehicles. The GDOT Office of Utilities has been consulted throughout this study and evaluates and prioritizes crossings for safety improvements to avoid train and roadway vehicle interactions. Analysis and prioritization of blocked crossings and crossing upgrades for interaction safety have been, and should continue to be, coordinated to develop a comprehensive GDOT crossing investment program.

Methodology

To gather the data used to support conclusions in this report, both quantitative and qualitative methods were used. The identification process incorporated several key data sources, supporting a multi-faceted selection of problem crossings. There were two main data processes: the establishment of a long list of crossings, and the prioritization of crossings using multiple criteria.

Additionally, stakeholder surveys and interviews were conducted to gather feedback on underlying causes and proposed solutions.

Stakeholder Interviews

Interviews were conducted with three key groups of stakeholders:

These interviews provided context and information on the causes of blockages, as well as context for solutions and delivery strategies. Interviews were used to complement the quantitative data gathered through the long list and priority factors.

Key insights gathered included:

- Perspectives on the drivers of blockages,
- The impact of development on blocked crossings,
- Possible methods to incentivize railroad cooperation,
- Innovative solutions and delivery methodology,
- Funding mechanisms to support investment, and
- Opportunities to increase coordination between stakeholders.

Survey

Surveys about blocked crossings and their impact were distributed to various stakeholders. The survey covered two key themes:

- the general impact of blocked crossings on communities, and
- specific crossing locations that were frequently blocked

There were two different surveys distributed. One focused on local governments and the other focused on state-level and other public sector employees. Both surveys were available online through the ArcGIS Survey123 platform from July 30 to October 18, 2024, and could be completed on either desktop or smartphone devices. The local government survey consisted of 13 questions, primarily fill-in-the-blank, with some multiple-choice and yes/no questions that prompted additional details for "yes" responses. Participants were also asked to map locations with known crossing issues. The public sector survey had four questions, mostly multiple-choice, and similarly asked participants to map locations with known crossing issues.

Long Listing Process

The long list of crossings which experience most significant blockages was derived from a broad range of data sources; primarily:

Survey data from a range of stakeholders,	**Feedback from Class 1 Railroads,**	**FRA Complaints Databases, and**	**Supplementary sources, including the GDOT Traffic Analysis and Data Application (TADA).**

Every crossing identified by Class 1 railroads, survey respondents, and 2024 complaints in the FRA complaint database was mapped using latitude and longitude to a specific crossing ID in the FRA Form 71 database and included in the long list. Further detail on sources and information gained from each is included in Appendix A.

Note that certain sources, particularly surveys, also provided qualitative information on crossing issues.

The use of GPS data was explored as part of this study; however, it proved to be both incomplete and inconclusive. Both Geotab and INRIX information was analyzed, but the results these data sets produced could not be corroborated by any other source (railroads, FRA complaint data) and frequently identified crossings that did not appear to have any meaningful blockages. As such, GPS data has not been used as a significant data source for this study.

Priority Factors

To rank the crossings identified as having frequent blockage issues in a long list, twelve factors were used to prioritize. The long list crossings were scored according to each factor and then normalized. Each factor was sorted into a near-, mid-, or long-term priority and weighted accordingly to prioritize all crossings identified in the long list. The priority factors include:

Factor	Near/Mid/Long-Term	Source Data
Class 1 Flag	Near	Stakeholder feedback
Travel Time to Nearest Grade Separation	Near	Esri
Complaints (FRA)	Near	FRA Database
Railyard Proximity	Near	Georgia Freight Plan, OpenStreetMap, GIS Analysis
Critical Infrastructure	Near	GIS Analysis
Current AADT	Near	GDOT Traffic Data, GIS Analysis based on count stations in the state
Route Prioritization	Near	National Freight Network & State Freight Corridors STRAHNET National Highway System GRIP Corridors (2024)
Industrial Sites	Mid	Georgia Freight Plan, OpenStreetMap, GIS Analysis
Rural Classification	Mid	Form 71, FRA
Port Proximity	Mid	Georgia Freight Plan, OpenStreetMap, GIS Analysis
2050 AADT	Long	GDOT Traffic Data, GIS Analysis based on count stations in the state

Factor	Near/Mid/Long-Term	Source Data
Socioeconomic (Low Income, High Unemployment)	Long	Census Data

Table 3: Summary of Priority Factors

Each of the priority factors corresponds to a particular data source and scoring method. Further detail on each is provided in Appendix B.

Report Structure

This report is structured to follow the Situation-Complication-Resolution framework, as summarized below.

Situation	Complication	Resolution
Georgia is experiencing significant increases in road, rail, and port traffic: • Georgia's population is projected to **grow 25%** by 2060[5], driving land use and highway traffic • US freight traffic is forecast to **grow 30%** between 2023 and 2040[6] • Georgia is the **fourth-largest state** by number of railcars moved[7] • The Port of Savannah is expected to grow from **6M to 12M TEUs** by 2030[8] • Due to the benefits of rail, Georgia ports are targeting a **50% rail mix**, up from 30% today • There are **5,000+ public crossings** in Georgia[9] • Existing sidings can no longer handle **ever-longer and more frequent** trains • Land use **patterns change**, resulting in new traffic patterns that intersect with pre-existing rail operations in unexpected ways	**The increased frequency and duration of blocked crossings adversely impacts communities in multiple ways:** • **Residents, students, commuters, and businesses** face delays • First responders **cannot reach emergencies in time** • **Limited empirical data on crossing blockages** exists, making it difficult to measure frequency and duration of blockages, or objectively prioritize locations • Railroads have **limited incentives** to resolve blocked crossings • Most effective solutions, such as grade separation, have a high cost, **limiting applicability**	**To address these impacts, GDOT, railroads, and other stakeholders must identify and implement solutions at the portfolio level:** • Identify the **most problematic** blocked crossings across Georgia against a range of criteria • **Prioritize investments** into near-, mid-, and long- term horizons, based on existing conditions and projected future blocked crossing issues • Triage crossings into a typology based on **relevant characteristics**, identifying a set of preferred solutions suited to the crossing location • Develop **planning level estimates** based on preferred solutions and identify **funding opportunities** to aid deliverability

Table 4: SCR Framework

The first main section, Situation, covers the current environment and describes the factors, rail, truck, and port, that drive growth in the freight market in Georgia. This is followed by Complication, which describes how this growth leads to blocked crossings and how those blockages affect communities. This section also covers how the problem has grown, as well as

[5] Georgia Office of Planning and Budget (https://opb.georgia.gov/census-data/population-projections)
[6] FreightWaves (https://www.freightwaves.com/news/daily-infographic-demand-for-freight-transportation-projected-to-rise-30-by-2040)
[7] AAR 2021 State Rankings (https://www.aar.org/wp-content/uploads/2023/03/AAR-State-Rankings-2021.pdf)
[8] SEDA (https://seda.org/do-business-here/infrastructure/)
[9] Georgia Freight Plan

the existing challenges in addressing it. The report concludes with the Resolution, which describes the results of data analysis, the location of frequently blocked crossings, and the factors relevant in prioritizing those crossings for investment. It also covers the available solutions, delivery methods, funding options, and recommendations regarding implementation of a blocked crossing elimination program.

SITUATION

Georgia's economic growth and population increase have significant implications for its transportation infrastructure, especially its road and rail networks. In turn, this has important ramifications for at-grade crossings between these two modes. Three key aspects of this situation highlight why at-grade crossings play a key role in Georgia's transportation system: freight growth, change in infrastructure usage, and grade crossing impacts.

Freight Growth

The freight sector has been a key driver of Georgia's economy. The 2023 Georgia Freight Plan notes that while Georgia makes up approximately 17% of the population in the southeast, it contributes approximately 20% of the share of the population employed in freight industries nationwide, and freight-intensive industries such as manufacturing and freight moving employ approximately 40% of Georgia's workforce. This exposure to freight is expected to grow, as tonnage is expected to increase by 91% and value by 141% by 2050. This will necessarily lead to more rail traffic at crossings: almost 100% of freight tonnage and 95% of freight value is transported either by truck or rail as of 2019.[10]

One of the key drivers of growth in the State is the Port of Savannah. As the fourth busiest container port in the US and the largest single terminal in North America, the Port has experienced a 90% increase in trade over the past decade. The port is increasing capacity from 5.4 million TEUs in 2023 to 12 million by 2030.[11], with virtually all of this volume expected to move by either rail or truck, supported by facilities such as the Mason Mega Rail Terminal which supports a rail lift capacity of over 1 million annual TEUs. With a capital plan of $3.5 billion[12] as identified in the 2023 Georgia Freight Plan, Savannah is likely to continue to drive both significant road and rail traffic in the coming decades.

With a capital plan of $3.5 billion, the Port of Savannah is likely to continue to drive both significant road and rail traffic in the coming decades.

[10] Georgia Freight Plan
[11] SEDA (*https://seda.org/do-business-here/infrastructure/*)
[12] Georgia Freight Plan

Of the over 31 million tons imported by sea in 2019, 67% remained within Georgia. Between 2019 and 2050, freight transported within Georgia is expected to grow fastest, at an average annual rate of 3.8%.

The growth of Savannah is directly linked to the growth of freight intensive industries within Georgia. Of the over 31 million tons imported by water in 2019, 67% remained within Georgia.[13] Between 2019 and 2050, freight transported within Georgia is expected to grow fastest, at an average annual rate of 3.8%.[14] This illustrates the reliance of local industry on seamless connections between ports and inland areas, including both rail and road connections. Private investment in the State's freight and logistics network also continues to increase, with both Savannah and Atlanta ranking among the largest growth markets for warehousing in the United States in 2022.[15] Two inland port facilities, the Appalachian Regional Port and the Northeast Georgia Inland Port (opened on May 4, 2026), connect Savannah to inland Georgia, creating additional rail and truck traffic further from the port.

This growth drives both road and rail traffic. The latest data from the Association of American Railroads indicates that Georgia is the fourth largest state by number of railcars moved.[16] It is anticipated that by 2050, rail transport will accommodate 13% of the increase in freight tonnage and an even greater proportion of the freight value (17%), largely as a result of the transition towards intermodal traffic[17], while trucks will carry the remaining 87% of the increase in tonnage and 83% of the value.

Changing Infrastructure Usage

As freight traffic grows, supporting infrastructure is placed under additional strain, and usage patterns change. The 2023 Georgia Freight Plan projects that there will be a move towards higher value industries and commodities within Georgia; as this happens, speed and reliability of the transportation network will become increasingly important to Georgia business. Freight Advisory Committee members identified real-time optimization as one of the most important trends in the freight market, defined as the ability to optimize immediate, on-the ground route choices, timing, and functional sequences using real-time information feeds about operating conditions.

Georgia contains 125,000 miles of highways and 4,607 miles of rail, the latter of which is the seventh-largest network in the country.

To meet these demands, Georgia must leverage its 125,000 miles of highways and 4,607 miles of rail, the latter of which is the seventh-largest network in the country. These networks are already congested and are expected to become more so. Both rail and highway freight are expected to grow in absolute terms by 2050, with approximately 53 million additional tons moving by rail and 484 million more by truck.

This will impact Georgia's already congested highways. Nine out of the top 100 and four of the top 10 worst truck bottlenecks are in Georgia, according to the

[13] Georgia Freight Plan
[14] Georgia Freight Plan
[15] https://www.cbre.com/press-releases/atlanta-savannah-among-north-americas-top-big-box-warehouse-growth-markets
[16] AAR 2021 State Rankings (https://www.aar.org/wp-content/uploads/2023/03/AAR-State-Rankings-2021.pdf)
[17] Georgia Freight Plan

American Transportation Research Institute, as of 2026.[18] Personal vehicles are likely to exacerbate the problem: with a forecasted increase of over 2.2 million residents[19] and 0.87 vehicles per person[20], Georgia is forecast to add over 1.9 million vehicles to its roads by 2050.

The congestion problems for railroads are harder to measure, as rail companies do not generally release state-specific congestion data. However, the congestion at rail terminals across the country after the COVID-19 pandemic illustrates the broader requirement to add capacity. Railroads have struggled to hire[21], and both Norfolk Southern (NS) and CSX indicated that lack of crews is a contributing factor for trains blocking crossings. Furthermore, while highway congestion is often concentrated in metro areas, rail congestion is regional. NS described how congestion in terminals such as Birmingham and Chattanooga results in delays and stopped trains in Georgia.

Simultaneously, train lengths have been increasing. The national average number of cars per train in 2018 was approximately 63; by 2022 this number had grown to 77.[22]

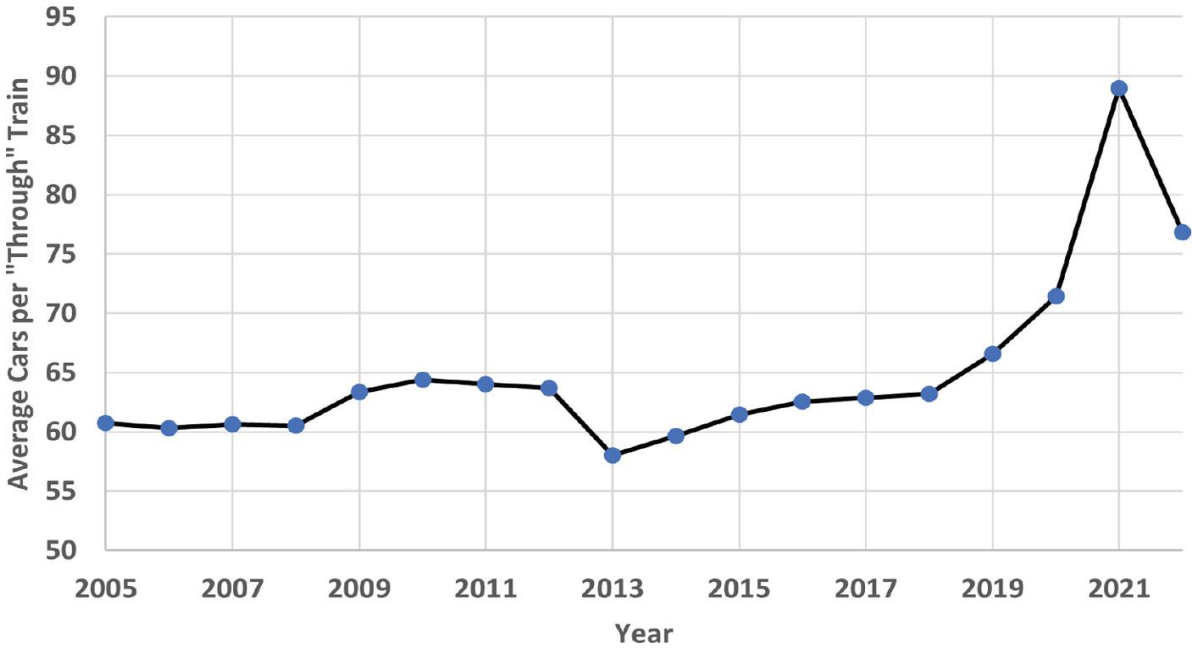


Figure 5: Train Length in Rail Cars by Year, 2005-2022 (The National Academies)

Longer trains require longer yard tracks and passing sidings to pass one another without complex, time-intensive switching maneuvers. The Federal Railroad Administration (FRA) indicated that these maneuvers, as well as the increased amount of time it takes for a longer train to clear a crossing, may be driving blockages. While Association of American Railroads (AAR) data also indicates a trend towards longer trains[23], CSX and NS contend that longer trains

[18] Top 100 Truck Bottlenecks – 2026
[19] https://opb.georgia.gov/census-data/population-projections
[20] https://metroatlantaceo.com/news/2021/03/georgia-has-18th-fewest-cars-person/
[21] https://www.freightwaves.com/news/railroads-dilemma-the-good-jobs-no-one-knows-about
[22] https://nap.nationalacademies.org/read/27807/chapter/4#22
[23] https://www.aar.org/wp-content/uploads/2023/05/AAR-Train-Length-Chart.jpg.webp

themselves increase blockages, noting that fewer, but longer, trains may in fact result in fewer, if slightly longer, crossing blockages.

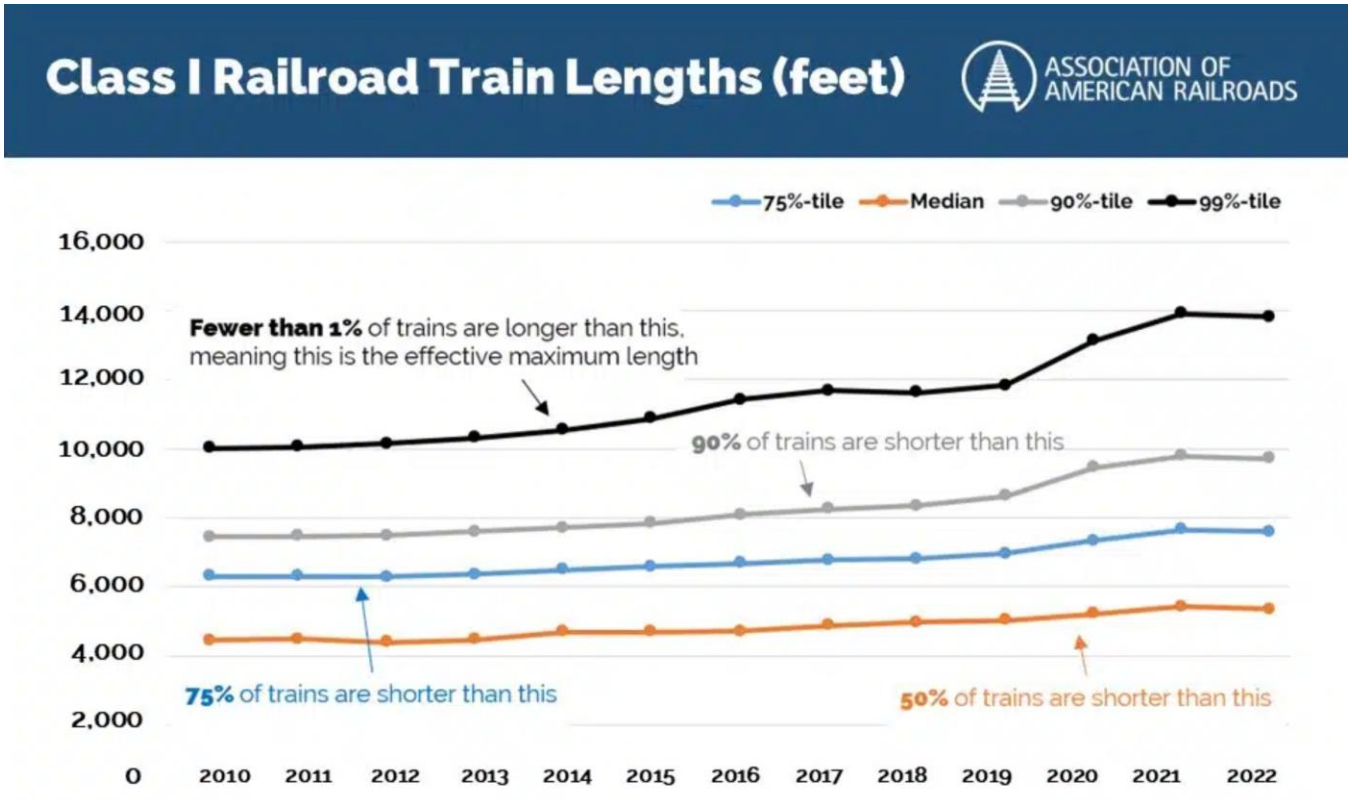


Figure 6: Class 1 Railroad Train Lengths in Feet by Year (Association of American Railroads)

Despite the trend towards longer trains, the impact on blocked crossings is unclear. A report[24] by the National Academies Press concludes that there is insufficient data to definitively state whether train length positively or negatively impacts blockages.

Independent of blocked crossings, railroads have recognized the importance of making infrastructure investments to support changing operating and commercial environments. CSX spent over $220 million on capital improvements in Georgia in 2023[25], and in late 2024, it announced a capacity boost at Rice Yard in Waycross.[26] NS has also made significant investments in the state, with an annual average spend of $195 million[27], and major projects including a siding improvement in McDonough funded in part by the Georgia Freight Rail Program. To date, over $10 million dollars have been invested via this program.[28]

Technology is also likely to impact the usage of infrastructure in the long term. Connected Autonomous Vehicles (CAV) have the potential to mitigate delays at crossings using intelligent routing, although vehicle-to-infrastructure functionality upgrades may be required at crossings to ensure safety and optimize interaction with trucks. Additionally, a pilot program to

[24] https://nap.nationalacademies.org/read/27807/chapter/7#81
[25] https://www.csx.com/share/wwwcsx15/assets/File/About_Us/State_Facts/Georgia_StateFactSheet.pdf
[26] https://www.trains.com/trn/news-reviews/news-wire/csx-aims-to-boost-throughput-at-its-largest-and-busiest-hump-yard/
[27] https://filecache.mediaroom.com/mr5mr_norfolksouthern/180876/369250%20State%20fact%20sheets%20update_2023%20-%20GA_FINAL_updated.pdf
[28] https://www.dot.ga.gov/GDOT/Pages/GAFreightRailProgram.aspx

demonstrate the operational viability of autonomous rail vehicle technology from Parallel Systems on the Georgia Central and Heart of Georgia railroads is underway. The technology being tested in this program could enable trains to automatically stop before or after crossings to avoid blockages.

At-Grade Crossings in Georgia

The growth in freight and changes in infrastructure usage have impacted the over-5,000 public at-grade crossings in the state. Most of these crossings are located on Class 1 railroads, with 1,492 located on CSX and 1,814 located on NS. Together, these two railroads operate 68% of the trackage in the state of Georgia and are responsible for 3,306 crossings.[29] The remaining 1,218 crossings are spread across Georgia's 29 short line railroads.

Based on FRA data, 57% of operational at-grade crossings in Georgia are located in rural areas, despite the fact that only 21% of the state's population resides in rural counties.[30] Urban counties have a higher concentration of crossings, with Lowndes County containing the most at 116 crossings, followed by Chatham County (111) and Richmond County (111).

County	Number of Crossings
Lowndes	116
Chatham	111
Richmond	111
Fulton	107
Thomas	83
Muscogee	81
Ware	77
Colquitt	75
Coweta	74
Crisp	74

City	Number of Crossings
Augusta	95
Valdosta	91
Savannah	85
Columbus	83
Albany	74
Cordele	65
Macon	64
Waycross	61
Brunswick	58
Atlanta	51

Table 5: Crossings by County and City

There are at least 14 efforts that have been identified to address blocked crossings in the state of Georgia. The figure below indicates the location of these projects.

[29] According to the USDOT Crossing Inventory (Form 71), CSX has 1492 crossings, NS has 1814 crossings, and other railroads account for 1729 crossings.

[30] https://www.house.ga.gov/Documents/CommitteeDocuments/2021/Rural_Development_Council/CVIOG%202020%20Census%20Data.pdf

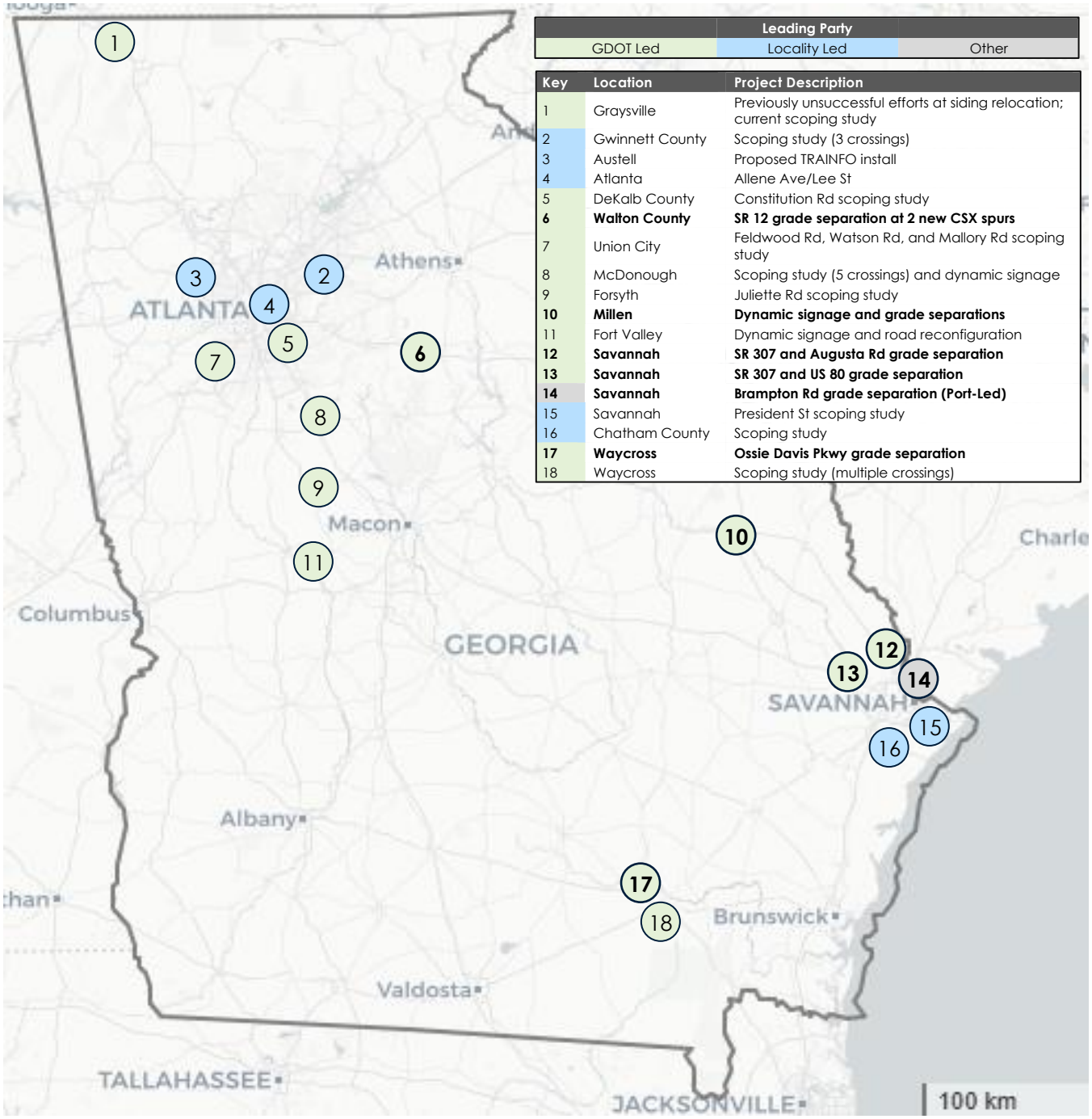
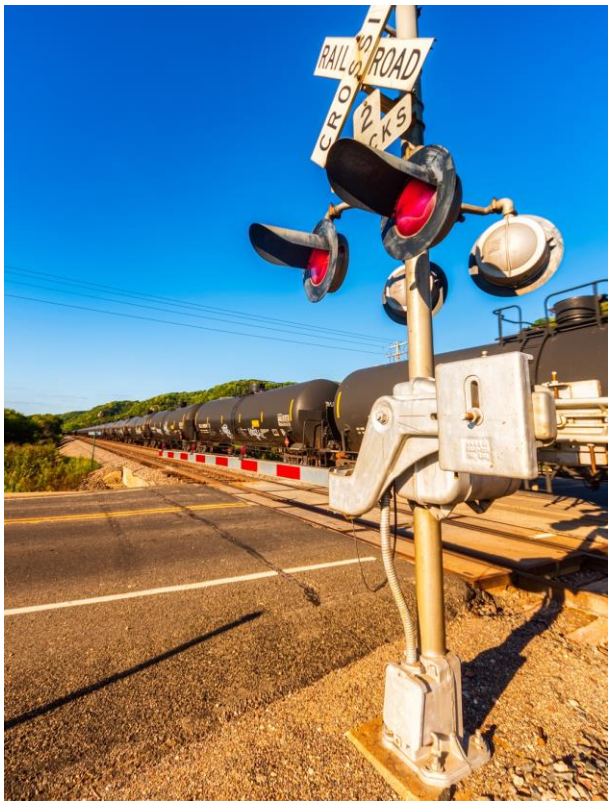


Figure 7: Existing Crossing Projects in Georgia

COMPLICATION

As a result of the significant and ongoing increases in rail and road traffic, anecdotal evidence indicates that at-grade crossings in the State have experienced an increase in blockages, with attendant impacts on communities and the economy. These impacts take many forms, including delays to first responders and increased congestion.



In addition to understanding the severity of the complication, two second-order complications must be addressed:

- Data availability and limitations
- Implementation challenges

A more comprehensive understanding of these complications provides additional context in developing proposed solutions.

Data Availability and Limitations

To fully understand the impact of blocked crossings on communities and to prioritize investments efficiently, decisions are ideally based upon empirical data. However, objective and comprehensive data on the scale and duration of blocked crossings in the state is currently limited.

Most current data on blocked crossings relies on the interaction between GDOT, railroads, local government, and members of the public to identify the location of blocked crossings. As a result, information is at-best incomplete and prioritizes focus on those crossings identified by the most vocal stakeholders, regardless of the severity of blockages.

Ideally, this ad-hoc method of identifying blocked crossings would be replaced by objective empirical data. However, Class 1 railroads do not track when crossings are activated, and GPS data collection through databases such as INRIX and Geotab can be inconclusive. There are private providers of detailed information on traffic delays at blocked crossings, but access to these service providers (e.g., TRAINFO) typically requires the upfront purchase and installation of hardware sensors along with the ongoing cost of a software subscription. By collating

information from a variety of sources, it is possible to generate a cohesive understanding of which blocked crossings present the greatest challenges, and how those blocked crossings harm communities.

Data Source	Description	Advantage	Disadvantages
INRIX and Geotab	• INRIX and Geotab are location-based data providers that track vehicular traffic • Geotab focuses on commercial traffic while INRIX includes all kinds of vehicles • Data is gathered from diverse sources including onboard devices and wayside infrastructure	• Theoretically objective quantitative data • Parameters of what constitutes a blockage can be well-defined • Multiple off-the-shelf databases available (e.g. INRIX, Geotab)	• Data is based on road segment, requiring inferences about which segment corresponds to a particular crossing • Certain road segments do not have data or are limited to particular types of traffic, e.g. commercial only • Contradictory and inconsistent results that cannot be independently verified, **rendering the data ineffective**
FRA Complaint Database	• The FRA hosts a web portal where users can report blockages, including duration and any special notes regarding the blockage • These complaints are organized into a database, which includes additional information such as the railroad responsible for the crossing	• Independent community perspective • Can be used to generate quantitative data on location and impact of blockages • Diverse, high volume of quantitative data	• Self-reported and vulnerable to distortion by motivated users • Based on perception of what constitutes a blockage, not any clear criteria • Requires users to have access to technology • Users may not report blocked crossings if they believe no action will be taken
Stakeholder Interviews	• Stakeholders including Class 1 railroads, GDOT offices, and solution providers were interviewed • Further detail on stakeholder interviews is available in Appendix A	• Expert opinion from key stakeholders, especially Class 1s • Useful data on resolution options as well as complication	• Limited number of data points • Stakeholders are biased by their own incentives • Does not generate quantitative data
Surveys	• Surveys of local and state officials were conducted by the project team • Respondents answered questions regarding the impact of blockages, and identified crossings where they frequently occurred	• Captures perspective of local and state officials • Can be used to generate quantitative data on location and impact of blockages	• Self-reported • Relatively low number of data points • Based on perception of what constitutes a blockage, not any clear criteria

Table 6: Advantages and Disadvantages of Data Sources

Community Impacts

This aggregation of data illustrates that blockages are currently having a significant impact that communities are ill-equipped to deal with. Moreover, the problem has grown notably in recent years and is likely to continue to do so in the future as freight movements increase.

Existing Issues

Based on survey responses from local government leaders, GDOT officials, and other stakeholders, many communities across Georgia are impacted by blocked crossings, with 41% of all survey respondents indicating that blocked crossings are a daily issue. A further 18% indicate that they occur on a weekly basis. While 56% of respondents indicated that blockages usually last between 0 and 60 minutes, 12% indicated they last up to 2 hours. Correspondingly, there is a significant impact on motor vehicle traffic, with 74% of survey respondents saying that this is the most important issue. 79% of respondents suggested that most residents have no option other than to wait for the crossing to clear.

79%

of respondents have no option other than to wait for the crossing to clear.

47%

noted that pedestrians have crawled under or climbed across trains blocking crossings.

Slowed vehicle traffic has significant impacts on business and social services, as residents struggle to reach their workplaces and make appointments for doctors and childcare. Furthermore, blocked crossings have become a health and safety issue: 53% of survey respondents indicated that the impact on emergency services was their biggest concern. Survey responses are corroborated by the FRA complaint database; 21% of complaints in 2024 referenced impacts to first responders. A further 47% of those same responses noted that pedestrians have crawled under or climbed across trains blocking crossings, demonstrating how an issue typically considered in terms of lost economic productivity can become a direct safety hazard.

Growth in Blockages

Complaint data indicate that blocked crossings and their attendant impacts have been growing for some time. In 2020, the first full year in which the FRA Complaint Database was active, there were 131 reports of blocked crossings. In 2024, this number was 670, implying a compound annual growth rate in excess of 50%.

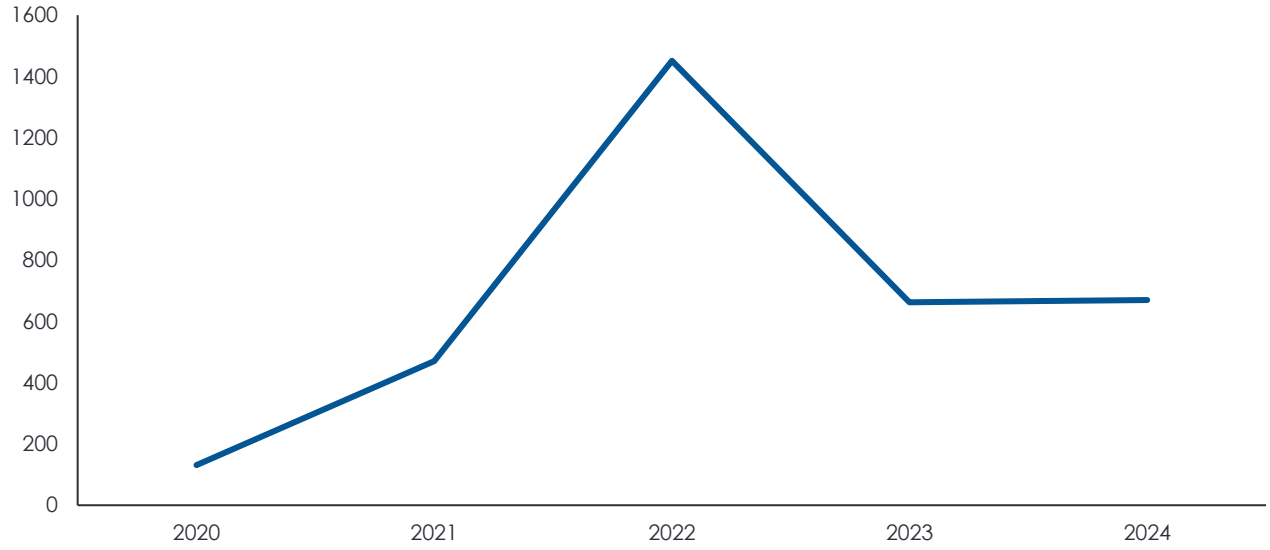


Figure 8: Blocked Crossing Reports by Year

Correspondingly, the issues created by blocked crossings, particularly those relating to safety and first responders, have continued to multiply. In 2020, 15 reports (11% of all reports) referenced pedestrians crawling under or over trains. By 2024, this number increased to 312 reports, or almost half of the 670 reports submitted that year. Similarly, first responders featured in 21 of the 131 reports in 2020, but by 2024 delays to first responders were referenced in 139 separate reports.

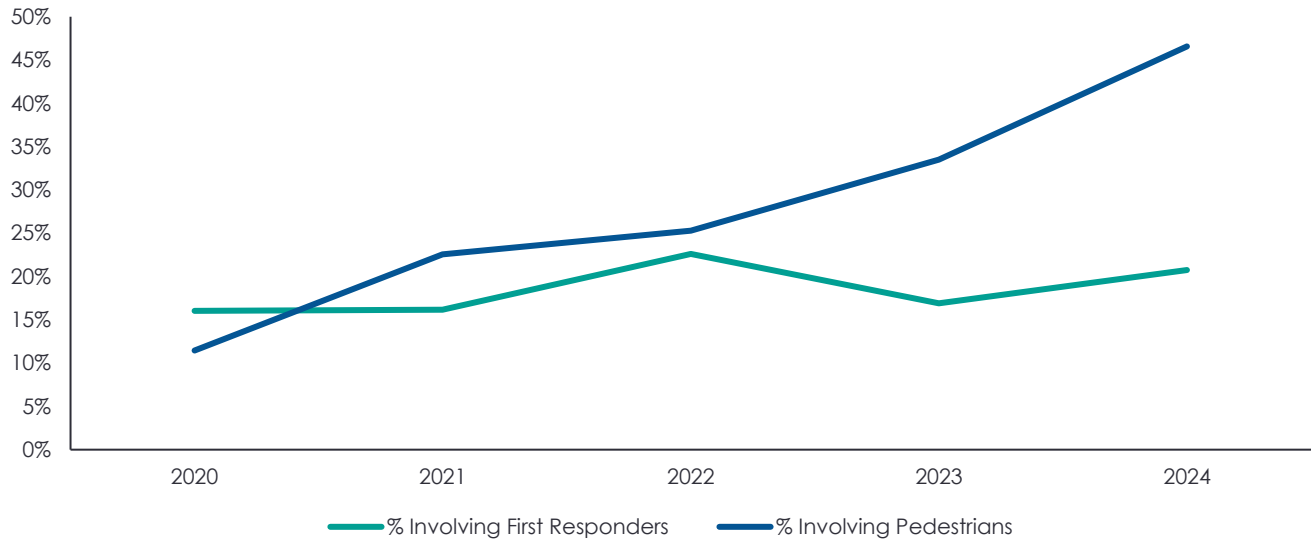


Figure 9: Percentage of Blockage Complaints Involving First Responders or Pedestrians by Year

This problem is likely to be exacerbated as Georgia grows. GDOT, the FRA, and Class 1 railroads all highlighted a frequent phenomenon occurring across the southeast and particularly in Georgia: the development of parcels adjacent to rail lines. When areas that were previously farmland or industry are developed, additional burdens are placed on local crossings that may

have been designed to handle light traffic. Even if railroad operations remain unchanged, the increase in drivers magnifies the effect of blockages.

Implementation Challenges

Not only is the problem acute, communities also suffer from an inability to address blocked crossings once they have been identified. Survey responses indicate that obstacles to implementation of solutions fall into two broad categories:

- **Funding**. Respondents frequently indicated a lack of funding as a primary obstacle to addressing crossing issues.
  - The GDOT Office of Utilities indicated that a single grade separation may consume multiple years of Section 130 funding. Section 130 funding is apportioned to states formulaically and is targeted towards the "elimination of hazards" at grade crossings.
  - Stakeholders noted that there are no financial incentives for railroads to invest in infrastructure or operational solutions to blocked crossings, as these do not generate operational or financial benefits for the railroad.
  - Lack of funding limits the ability to perform scoping studies for individual crossings. Without a scoping study, a preferred solution cannot be identified, meaning crossings lack solutions even when funding becomes available.
  - Class 1 railroads note that public funding challenges result in projects being put on hold and disrupt the ability of railroads and the public sector to collaborate on long-term solutions.
  - Grade separations are prohibitively expensive given state and local budgets and federal Section 130 funding.

- **Organizational capability**. Stakeholders and survey respondents indicated that there is a lack of ability to pursue funding and execute projects once problems have been identified.
  - Only 22% of survey respondents planned or budgeted crossing projects.
  - 81% of survey respondents do not leverage technology in their crossing solutions, which may mean they pursue more expensive options.
  - 53% of survey respondents are unfamiliar with different types of solutions as well as the process for implementing these
  - Interviews with Class 1 railroads indicated that while solutions are often identified, there is no consistent follow-up on solutions and funding from the public sector, making it hard to collaborate on solutions.
  - Other stakeholders interviewed noted that they had challenging experiences working with Class 1s, finding them often unresponsive to community concerns. At the same time, stakeholders indicated an understanding that railroads' requirement to earn a return on their investment meant that they were generally unwilling to invest their own capital.

Solution Costs

Mitigating blockages is complicated by the high cost of solutions, with emerging efforts to leverage technology in mitigating these costs. Stakeholders indicate that grade separations are the most frequently considered, but also the most expensive approach. Recently, GDOT received a $12 million grant to complete a grade separation in Millen. Similar efforts are underway at Brampton Road in Savannah (led by the Georgia Ports Authority) and Ossie Davis Parkway in Waycross (also led by GDOT).

A review of the FY 2023-2024 Railroad Crossing Elimination Grant awards nationally indicates that of 18 funded grade separation constructions, the minimum cost was $4.8 million and the maximum cost was $91.8 million, with an average cost of $33.7 million.

State	Project	Federal Grant (YOE $M)	Non-Federal Match %	Total Cost
AK	Parks Highway	29,803,280	20%	35,763,936
AZ	Diamond Creek Road	22,989,751	20%	27,587,701
AZ	Cortaro Farms Road	20,400,000	20%	24,480,000
CA	Parkway Boulevard	25,221,639	20%	30,265,967
ID	Brunner Road	14,373,128	20%	17,247,754
IL	Gougar Road	27,127,100	20%	32,552,520
IL	Grand Avenue	13,100,000	20%	15,720,000
IN	Hively Avenue	19,818,219	33%	26,358,231
IN	Airport Expressway	23,200,000	20%	27,840,000
IA	Clay County Crossing	3,280,000	31%	4,311,560
KY	Quarry Road	9,589,600	20%	11,507,520
MI	M-85	73,446,704	20%	88,136,045
OH	East Orange Road	21,000,000	39%	29,106,000
OH	Hines Hill Road	13,705,000	30%	17,775,385
OH	Race Road	26,250,000	20%	31,500,000
OH	S. Court Street	20,000,000	20%	24,000,000
OR	Reed Market Road	32,321,299	30%	42,017,689
TX	Texico Road Bypass Construction	73,061,388	20%	87,673,666

Table 7: FY 2023-2024 Railroad Crossing Elimination Grant Grade Separation Costs

Communities have also considered implementing technological solutions to address blocked crossings. These systems use a variety of methods including acoustic analysis and machine vision to identify when trains are approaching and occupying a crossing. Some of these systems, which range from off-the-shelf TRAINFO technology to a camera linked to a YouTube livestream, are under consideration or have already been installed in Georgia in Austell, Millen, Fort Valley, and Forsyth. However, these systems have not been deployed at scale and are unfamiliar to many localities. They also require an ongoing financial commitment to support software costs, which many public entities may not be willing to pay.

RESOLUTION

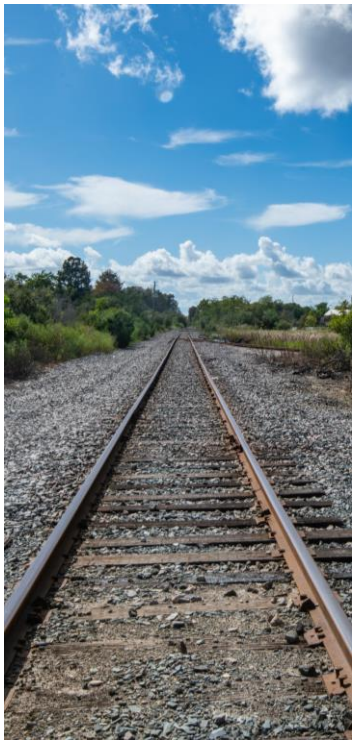
To address the complications that arise from blocked crossings, this report:

- establishes a long list of all at-grade crossings identified via various data sources as being impacted by blockages,
- determines a three-tier system to prioritize investment, and
- identifies possible solutions.

The combination of this prioritization and the menu of solutions forms the basis of an investment program to address blocked crossings on a portfolio basis.

Identification of Problem Crossings – Long List

Using the information sources and criteria outlined above, a multi-faceted analysis was undertaken using complaints data, railroad input and surveys to determine crossing locations experiencing significant and frequent blockages, assess their severity, and prioritize them for possible investment. The analysis identified 226 problem crossings, with a small number of locations accounting for the majority of reported delays and disruptions. Specifically:



- The top 39 crossings account for 50% of all FRA complaints.
- Six crossings were identified by all three sources as consistently problematic (complaints, railroads, and surveys), while 99 were identified by two out of three sources.
- 51 crossings (23%) are located within a 0.5-mile radius of multiple types of critical infrastructure, including hospitals, fire stations, and police stations.
- Urban centers and major transportation corridors, particularly those with high daily traffic volumes, exhibited the most severe congestion.
- Several key hotspots emerged, including Metro Atlanta, Graysville, Savannah, Waycross, and McDonough, where a combination of high train frequency, roadway constraints, and nearby industrial or commercial activity contributed to persistent delays.
- These findings underscore that blocked crossings are not evenly distributed across the state, but instead follow identifiable patterns driven by traffic demand, freight movement, and surrounding land use. This geographic concentration of problem areas suggests targeted interventions in these high-impact locations would yield the greatest benefits.

The complete long list of blocked crossings can be found in Appendix D, with the geographic distribution of these crossings highlighted in the figure below:

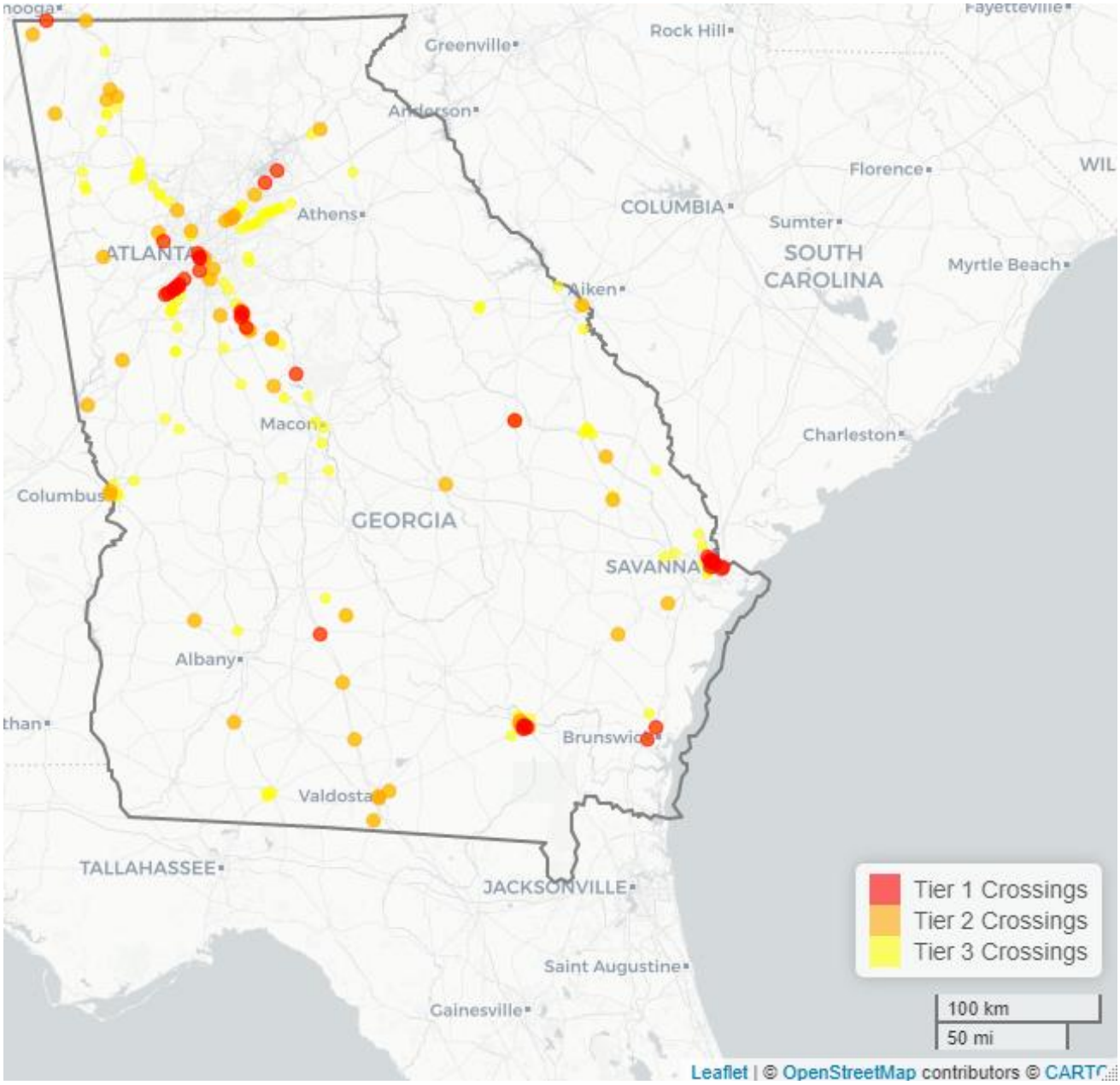


Figure 10: Final Results Heatmap
226 identified problem crossings; color intensity based on severity measured by final normalized scores

The most frequently represented municipalities in the long list are:

City	Number of Crossings in Long List
Waycross	25
Savannah	9
McDonough	8
Columbus	8
Cartersville	7

Priority Factors

Once the long list of problem crossings was identified, a structured prioritization framework was developed to determine which locations should receive immediate attention. The prioritization framework was built upon key factors that reflect both present-day impact and future risk. The economic, community, and safety factors that define the impact of a blocked crossing on a community are referred to in this report as "priority factors". The goal of this process was to identify crossings where blockages have the most significant impact on mobility, safety, and economic activity while also considering future traffic and demographic trends.

To achieve this, the analysis assigned specific priority factors to each crossing, categorized into near-term, mid-term, and long-term considerations with different weights to each category. These factors were selected based on their direct influence on the severity and urgency of crossing blockages. The weighting system was designed to prioritize immediate operational and safety concerns. This enables GDOT to categorize crossings based on their impact on the community and take a portfolio-based approach to investing in crossing improvements for maximum impact. The methodology used to rank crossings for each factor is described in detail in Appendix B and involves normalizing the scores for each priority factor to ensure comparability of crossings across factors

The prioritization system was structured around three time horizons: near-term, mid-term, and long-term. Each horizon was assigned a specific weight based on its urgency and certainty of impact.

Near-Term Priorities (70% of Total Weight)

Near-term factors were given the greatest emphasis in the ranking system because they directly affect safety and immediate operational concerns. These are factors that currently contribute to severe crossing blockages and would benefit from urgent mitigation. The following factors were included:

- **Identified by Class 1s (stakeholder meetings):** Class 1s are familiar with their networks and frequently field complaints about blocked crossings. As such, crossings flagged by them are likely to have a high incidence of blockages.
- **Travel Time to Nearest Grade Separation:** Measuring the travel time to the nearest grade separation is a proxy for alternative routes that can be used to avoid congestion. These locations were identified with GIS analysis.
- **Number of Complaints (from FRA database):** This measure, provided by the FRA, assesses the risk level of crossings based on reported complaints during 2024, signaling immediate safety concerns.

As most crossings can be approached from two directions on a single road, travel time to the nearest grade separation identifies the shortest distance from either side of the crossing. This means it does not take into account crossings where one side of the crossing does not have an alternative, or the alternative is significantly longer. Complex additional GIS techniques outside the scope of this report should be investigated as a possible solution to this shortcoming.

- **Proximity to Rail Yards (categorical variable):** Crossings near large freight yards frequently experience extended delays due to switching operations and train assembly. These locations were identified through GIS mapping and rail network data.
- **Current Road Usage - AADT:** Crossings with high AADT (Average Annual Daily Traffic) and significant truck traffic were prioritized because blockages in these locations lead to widespread congestion.
- **Proximity to Critical Infrastructure:** Crossings near schools, hospitals, fire stations, police stations, and emergency response facilities were prioritized due to the potential for life-threatening delays. This was mapped using GIS proximity analysis.
- **GDOT Route Prioritization:** GDOT designates key corridors as part of the state's freight and commuter network. Crossings along these routes were weighted more heavily because blockages here have a wider economic impact.

The **70% total weighting for near-term factors** reflects their immediate effect on public safety, emergency response, and economic activity.

Metric	Importance & Alignment with GDOT Goals	Impact Indicators where Improvements might be reflected	Weight	How It's Scored	Why It's high priority
Flagged by Class 1s	Supports GDOT collaboration with railroads; leverages the expertise of a key stakeholder	• Whether a crossing is flagged by a Class 1	10%	10% if flagged by a Class 1, 0% otherwise	These crossings are known issues for Class 1s, who will be a partner in any resolution
Travel Time to Nearest Grade Separation	Used as a proxy for out-of-route distance to alternatives and thus network fluidity; parallels similar data for GDOT bridges	• A shortening of travel time to the nearest grade separation	10%	0-10% based on travel time to the nearest grade separation	Captures the social and economic impacts on communities that lack alternatives when crossings are blocked
Number of Complaints (from FRA's database)	Direct alignment with GDOT's primary mission of safety; Addresses immediate safety concerns; Reflects existing hazard conditions	• History of complaints, • Impact on first responders and pedestrians.	10%	0-10% based on number of complaints	High priority due to immediate safety implications and GDOT's core mission
Proximity to Rail Yards	Reflects operational intensity; Higher train movements increase risk; Direct impact on rail operations	• Train frequency, • Switching operations, • Operational complexity.	10%	10% if within 1 mile of a railyard, 0% otherwise	Key indicator of operational intensity and potential conflict points
Current AADT	Current operational environment; Existing demand patterns; Freight movement	• Traffic volumes, • Truck percentages, • Congestion levels.	10%	0-10% based on current AADT	Reflects current operational demands
Proximity to Critical Infrastructure	Ensures essential public services remain accessible;	• Emergency response times for fire and police	10%	3% added to score for each	Critical for maintaining vital community

Metric	Importance & Alignment with GDOT Goals	Impact Indicators where Improvements might be reflected	Weight	How It's Scored	Why It's high priority
	Aligns with emergency response priorities; Important for community resilience	• Access to hospitals • Access to schools		type of critical infrastructure	services and emergency response capabilities
GDOT Route Prioritization	Aligns with existing GDOT priorities; Network significance; Strategic importance	Located on: • STRAHNET, • National Freight Corridor, • State Freight Corridor, • GRIP.	10%	3% added to score for each corridor	Reflects established GDOT priorities and network hierarchy

Table 8: Near-Term Priority Justification Summary

Mid-Term Priorities (24% of Total Weight)

Mid-term factors were given moderate weight as they represent ongoing operational conditions that impact mobility and network efficiency. These factors do not pose immediate safety risks but significantly affect transportation efficiency.

- **Proximity to Industrial Sites:** Crossings near industrial sites, as identified in the 2023 Georgia Freight Plan, were included since blockages at these crossings impede essential freight movement and delay nearby business operations within the state's industrial centers.
- **Rural Crossings Accessibility:** In rural areas, alternate routes are often unavailable, leading to longer delays when crossings are blocked. These crossings were weighted higher due to their lack of viable detour options.
- **Proximity to Ports:** Crossings near major ports, especially the Port of Savannah, were included because rail traffic in these areas is expected to **increase significantly** in the coming years.

Metric	Importance & Alignment with GDOT Goals	Impact Indicators	Weight	How It's Scored	Weight Justification
Proximity to Industrial Sites	Economic development impact; Freight mobility; Business continuity	• Economic activity, • Freight movement, • Business operations.	8%	8% if within three miles of an industrial site as identified in the Georgia Freight Plan	Essential for supporting current economic activity and freight mobility
Rural Crossings	Rural connectivity; Agricultural access; Economic equity	• Rural accessibility, • Agricultural operations, • Community connections.	8%	8% if denoted as "Rural" on FRA Form 71; states are responsible for identifying rural crossings to FRA	Important for maintaining rural economic vitality
Proximity to Ports	Economic development; Freight network	• Port access, • Freight movements, • Economic impact.	8%	8% if within one mile of a port facility	Critical for freight network efficiency

	efficiency; Strategic connectivity				and economic growth

Table 9: Mid-Term Priority Justification Summary

Long-Term Priorities (6% of Total Weight)

Long-term factors were assigned a lower overall weight (6%) due to their higher uncertainty and the fact that their impact is projected rather than currently observed. These factors help account for future planning requirements rather than existing congestion.

- **2050 AADT:** Using traffic forecasts from GDOT, crossings expected to experience significant traffic increases were given additional weight.
- **Local Economic and Demographic Characteristics:** Median household income and unemployment rates from ACS-5 were factored in to anticipate future transportation infrastructure impacts. Crossings in regions with higher vulnerability (combination of unemployment and lower income levels) received a higher normalized score.

Metric	Importance & Alignment with GDOT Goals	Impact Indicators	Weight	How It's Scored	Weight Justification
2025 AADT	Future capacity demands; Long-term planning; Investment efficiency	• Growth projections, • Development patterns, • Future demand.	3%	0-3% based on future AADT	Essential for proactive planning but less certain than current traffic
Socio-economic Factors	Economic development	• Income levels, • Unemployment.	3%	0-3% based on low income and high unemployment	Important for equitable development but balanced with immediate priorities

Table 10: Long-Term Priority Justification Summary

Solutions and Delivery

In addition to establishing the factors that make a crossing a candidate for investment, it is also necessary to define that investment. Typical approaches focus on grade separation, but there are potentially also lower cost alternatives that may deliver effective benefits. By identifying the solutions and delivery methods best suited to a particular crossing or group of crossings, it may be possible to unlock innovative approaches and efficiencies that may not be possible with intermittent, single investments. This report considers eight possible approaches, as defined below:

Establish Agreement: GDOT promotes and supports railroads to establish agreements with landowners on whose property private crossings are located. Agreements will govern responsibility for upgrading the crossing if traffic increases as a result of changing land use and development. Since these agreements generally cover private crossings, GDOT does not have the ability to implement this solution directly.

Low Capital Investment:

- Close Crossing: GDOT closes the segment of road that crosses a rail line at grade, eliminating potential for rail-highway interaction and forcing drivers to find a different route. Railroads are positively disposed to this solution and some have programs to provide matching funding. This solution is best used at crossings with many alternate routes or low traffic or as part of a broader multi-crossing solution.

- Inform Highway Drivers of Blockages: GDOT installs sensors integrated with traffic signals or variable message signs (VMS) around a crossing. Public information on a website or API alerts drivers when a crossing is or will be blocked and provides alternative routes. With this information, drivers can choose to plan travel ahead and mitigate delays. GDOT pays third-party licensing fees for the underlying technology and software. This solution is best used at crossings close to schools, hospitals, and other critical infrastructure, where alternative routes are available, and as part of multi-crossing solutions.

Moderate Capital Investment:

- Change Road Geometry: GDOT modifies road designs to optimize traffic flows around crossings and avoid blockages. This solution is best used to connect crossings to grade-separated alternatives or to add additional routes for crossings that have no alternative routes (one way in/one way out) or to mitigate the impact of backups that occur when crossings are blocked.

- Relocate Siding: GDOT promotes and supports railroads to move or extend sidings so that trains stopped in the siding do not block crossings. This solution is best used at crossings where blockages are driven by trains stopped in sidings

- Increase Track Speed: GDOT promotes and supports railroads to upgrade tracks at crossings to allow higher train speeds and throughput, helping them to clear crossings faster. This solution is best used at crossings where train speeds are slow.
- Add Staging Capacity: GDOT promotes and supports railroads to add or extend tracks to enable improvements in rail operation efficiency that relieve blockages at or near yards. This solution is best used at crossings where blockages are caused by switching maneuvers, or where a lack of staging capacity forces railroads to park trains in locations where crossings are blocked.

High Capital Investment:

- Grade Separate: GDOT and railroads eliminate at-grade crossings by constructing over- or underpasses for rail or highway infrastructure. This solution is best used at crossings where no other solution is feasible or effective, or where significant road and rail traffic justify investing.
- Incentivize Uncoupling: GDOT promotes and supports the railroads to deploy technology-enabled rail operations to incentivize the automatic coupling and uncoupling of trains stopped at crossings. This solution is best used once the applicable coupling technology is deployed at scale, either via automatic couplers on traditional railcars, or the widespread adoption of autonomous rail vehicles.

Costs of Solutions

The table below outlines the solution type by its Foundational, Catalytic, Innovative (FCI) rating, as well as its indicative investment cost per crossing. Note that some of the indicative investment ranges are large and may vary significantly based on the variety of factors at play at any given crossing; for example, relocating an entire siding will be significantly more expensive than extending it 2000'.

Solution Type	FCI Rating	Indicative Investment Range	Main Cost Drivers
Close Crossing	Foundational	$90,000+	Requirement for traffic study
Inform Highway Drivers	Innovative	$26,000 - $600,000+	Extent of deployment; technology used; economies of scale can bring costs down to $11,000 per sensor; recurring software or licensing costs after installation
Change Road Geometry	Foundational	$268,000 - $2.6M+	Number of lanes; availability of right-of-way; linear feet of new or modified road surface
Relocate Siding	Catalytic	$3.8M - $14.5M+	Length of extension or relocation; availability of right-of-way
Increase Track Speed	Catalytic	$1.5M - $3.0M+	Length of track to be upgraded; magnitude of speed increase
Add Staging Capacity	Catalytic	$460,000 - $920,000+	Length and number of tracks to be added

Solution Type	FCI Rating	Indicative Investment Range	Main Cost Drivers
Grade Separate	Foundational	$25M[31] - $92M+	Number of road lanes; local geometry
Establish Fines	Foundational	None	None
Incentivize Uncoupling	Innovative	Unknown	Development of technology

Table 11: Solution FCI Rating, Cost, and Cost Drivers

Solution Effectiveness

Crossing investments have differing levels of effectiveness, the extent to which the proposed solution could eliminate the blockage issue, regardless of the severity of the issue. Highly effective interventions include grade separations and crossing closures, which eliminate all blockages by separating road and rail traffic. Less effective solutions such as increasing line speed may make blockages less severe, but do not eliminate the source of the conflict. The chart below separates these solutions into four categories based on effectiveness and the required financial investment. Establishing agreements and incentivizing train uncoupling are not included because these options have unknown levels of effectiveness.

Financial Investment vs. Effectiveness

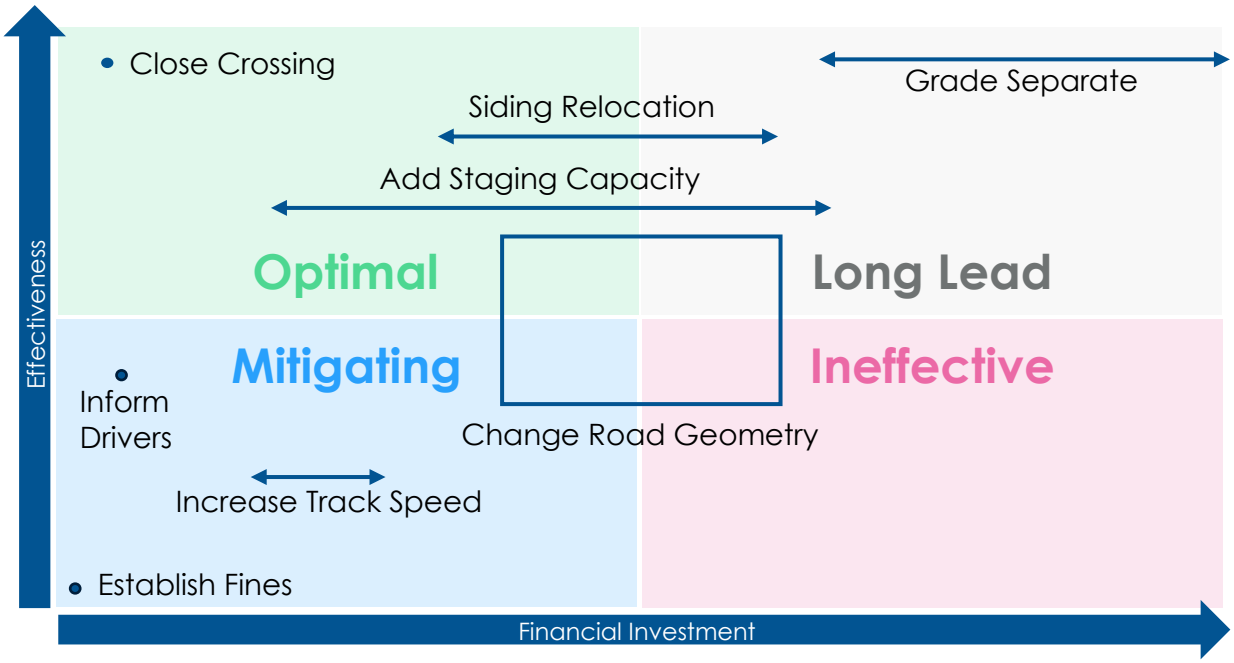


Figure 11: Investment vs. Effectiveness by Solution

[31] Based on discussion with GDOT Planning regarding the Millen grade separation. This is higher than the $4.8 million in the FY2023-FY2024 railroad crossing elimination grants to provide a more realistic lower boundary based on an existing project in Georgia.

Solution Key Performance Indicators (KPIs)

Each solution affects drivers and commerce beyond just whether the blockage is resolved. A core example of this tradeoff is the closing of a crossing. While a closing may no longer involve the interaction of drivers and trains, it does not solve pedestrians using prior routes and it may create untenable additional drive times for drivers. The 2023 GDOT Freight Plan KPIs are used to evaluate solutions across these additional metrics. KPI definitions are provided below:

KPIs	Business Definitions	Infrastructure Metrics
Ⓐ Reliability	Meeting a committed delivery/ pick-up window	Reduction in hours spent in non-recurring traffic
Ⓑ Speed	Door-to-door travel time	Increases in average truck speed
Ⓒ Cost	Shipping cost/ freight spend	Impact on congestion costs
Ⓓ Risk	Potential for interference in operations, cost structure, market, or resource access	Increased availability of alternate routes and shift to rail
Ⓔ Safety/Security	Mitigated harm for people, products, and systems	Social cost of safety as an annual cost and reduction in annual truck crashes

The impact of each solution type on KPIs is summarized in the table below:

Solution	Reliability	Speed	Cost	Risk	Safety/ Security
Close Crossing	Positive	Negative	Negative	Negative	Positive
Establish Agreement	Neutral	Neutral	Neutral	Positive	Neutral
Inform Highway Drivers	Positive	Positive	Positive	Neutral	Neutral
Change Road Geometry	Positive	Positive	Positive	Positive	Positive
Move Siding	Positive	Positive	Positive	Positive	Positive
Increase Track Speed	Positive	Positive	Positive	Positive	Negative
Add Staging	Positive	Positive	Positive	Positive	Positive
Grade Separate	Positive	Positive	Positive	Positive	Positive
Establish Fines	Neutral	Neutral	Neutral	Negative	Neutral
Incentivize Uncoupling	Positive	Positive	Positive	Positive	Positive

Table 12: Summary of Impacts on KPIs by Solution

Further detail regarding how each solution type affects KPIs can be found in Appendix C.

Delivery Methodology

In addition to choosing the most appropriate solution type, the value of a crossing solution depends on effective delivery. This report outlines five different possible approaches to project delivery: GDOT Traditional, GDOT Alternative, Railroad-led, Local-led, and Vendor-led.

GDOT TRADITIONAL DELIVERY

Definition: GDOT's traditional method of delivery for rail crossing improvements varies depending on the proximity of the work to the actual crossing.

For work occurring within several feet of the crossties, GDOT will use a force account approach with the railroads. Force accounts are generally structured such that GDOT hires and pays for the design of the improvements and provides materials to the railroad, while the railroad provides labor according to rates in the force accounting agreement. Railroads are not permitted to charge a mark-up or directly profit from force accounting agreements.

If the project requires any work beyond the limited envelope covered by the railroad, GDOT will design the improvements and seek bids for construction. In this case, the bidders must comply with railroad requirements to perform work at crossings. GDOT monitors compliance with these requirements and coordinates with the contractor and railroad.

GDOT Traditional	
Pros	• Tested and effective method that also ensures low cost to the state • Force accounting agreements limit ability of railroads to mark up prices • Achievable with in-house resources
Cons	• Design-Bid-Build may not be suitable for delivering more complex projects (see GDOT alternative) • Force accounting agreements do not align with railroad financial incentives to limit costs
Best Suited to:	• Smaller projects • Projects with significant highway improvements and relatively minor rail-side upgrades
Not Suited to:	• Complex projects with significant risk profiles • Projects largely focused on rail infrastructure upgrades
GDOT Role	• Procure and manage designer and contractor (if applicable) • Liaise with railroads • Provide overall project management

Table 13: GDOT Traditional Delivery Description

GDOT ALTERNATIVE DELIVERY

Definition: GDOT alternative delivery approaches leverage private sector expertise to deliver large, complex projects.

Examples of these include design-build, construction manager at-risk, design-build-finance-operate-maintain, and comprehensive development agreement approaches. Under these types of delivery methods, GDOT contracts with a third party to take certain risks for design, project bundling and raising of finance in addition to construction. The variety of risks that can be transferred requires a nuanced view of the transfer mechanism and what Georgia statutory authority could be used to procure the third party.

In the context of rail crossings, this would likely mean setting a procurement for a third party to deliver blocked crossing improvements as a package, bringing expertise in collaborating with the Class 1s and how to design a system of crossing improvements to mitigate blockages. Integrating knowledge of rail operations, traffic impacts and construction methods could result in innovative individual and comprehensive network designs that benefit GDOT.

GDOT Alternative	
Pros	• Design innovation • Single entity responsible for accelerated delivery • Comprehensive, cohesive approach to delivery • Risk transfer to the private sector • Flexible procurement options
Cons	• Procurement structuring complexity • Potential gratuities clause issues if asset is not owned by the State • Project sizes may not be large enough to attract interest • Requires effective GDOT oversight • Reliance on private sector
Best Suited to:	• Large, more complicated projects likely to generate significant private sector interest, with numerous unique challenges
Not Suited to:	• Smaller, standalone projects
GDOT Role	• Oversee contractor, approve designs, administer contract payments, work in concert with contractor and Class 1s

Table 14: GDOT Alternative Delivery Description

RAILROAD-LED DELIVERY

Definition: Railroad-led delivery enables the railroad to carry out work in partnership with GDOT to mitigate blocked crossings, frequently as a part of a larger railroad capital project.

In this case, GDOT plays a supporting role focused on funding and coordination with any road improvements.

To take the lead in project delivery, railroads must be incentivized by the benefits to their business, meaning this approach is limited to projects that are primarily about generating benefits for railroads. However, by participating in the delivery process and providing funding, GDOT can influence projects to ensure that they also create public benefits.

A key consideration is how any funding could conflict with the gratuities clause. Existing GDOT experience through the Georgia Freight Rail Program can provide practical examples of ensuring that funding contributed to private sector projects brings commensurate public benefits.

Railroad-Led	
Pros	• Leverage private sector resources to fund and deliver the project • Limits GDOT risk exposure • Supports a collaborative approach with railroads
Cons	• Complexity around gratuities clause • Complexity balancing public vs. private benefits • Lack of influence in contractor selection and project execution
Best Suited to:	• Solutions focused on rail infrastructure changes
Not Suited to:	• Any project not primarily driven by rail infrastructure upgrades
GDOT Role	• Provide funding • Coordinate crossing work with railroads • Ensure sufficient public benefits are generated

Table 15: Railroad-Led Delivery Description

LOCAL-LED DELIVERY

Definition: In this approach to project delivery, the locality impacted by the crossing takes a leading role, with GDOT providing a specified level of support depending on project characteristics and requirements. GDOT support can include items such as funding, coordination, and administrative support for grant applications.

Because Section 130 funding cannot be combined with grants, encouraging localities to take the lead in grant applications can unlock additional project funding and allow GDOT to redeploy Section 130 funds elsewhere.

Local-Led	
Pros	• Aligns state and local incentives • Unlocks additional funding • Less demanding on GDOT resources
Cons	• Limited by the ability of localities to execute projects • GDOT has limited input on the solution chosen and delivery method, as well as cost
Best Suited to:	• Large, sophisticated localities • Off-system roads
Not Suited to:	• Localities that lack the ability to deliver large projects • Projects that involve on-system roads • Projects above a certain size • Projects involving multiple localities
GDOT Role	• Support grant applications • Coordinate any work on GDOT system roads • Provide advice and know-how

Table 16: Local-Led Delivery Description

VENDOR-LED DELIVERY

Definition: For specific types of solutions (e.g., informing highway drivers) vendors who provide the technology solution may be appropriate to lead delivery.

Many vendors represent nascent technology providers who are eager to establish their product in the wider market and some may have a greater appetite for delivering the solution themselves if they can use the data generated by sensors for their own commercial or testing purposes.

Vendor-Led	
Pros	• GDOT receives mitigation benefits at a low level of resource dedication
Cons	• Impacts are limited to mitigation only and not a full solution to blockages • Data architecture may suit private sector rather than GDOT requirements • Limited to solution providers looking to test a product or whose business involves monetization of data • Location may not align with GDOT prioritization
Best Suited to:	• Technology-enabled solutions • Locations where data can be monetized or used by the technology provider for commercial purposes • Proof-of-concept for emerging technologies
Not Suited to:	• Projects requiring infrastructure upgrades rather than sensors • Situations where the data gathered by sensors cannot be monetized
GDOT Role	• Coordinate installation and integration with traffic systems (signals, VMS, emergency dispatch, etc.) and provide limited funding if available

Table 17: Vendor-Led Delivery Description

Funding Options

There are various approaches to funding crossing upgrades. These include:

- Consolidated Rail Infrastructure and Safety Improvements (CRISI) program,
- Railroad Crossing Elimination (RCE) Grants,
- Section 130,
- Georgia Freight Rail Program,
- Class 1 Partnerships,
- Local Funding, and
- Vendor Funding.

The table below illustrates the source and usage of each, as well as offering a summary of relevant characteristics.

Funding Type	Source	Characteristics	Usage
Consolidated Rail Infrastructure and Safety Improvements (CRISI) Program	Federal	• Projects that improve safety, efficiency, congestion, and multimodal connection • Discretionary federal funding; may vary by year • Set asides for rural and trespassing-related projects • Open to states, agencies, localities, and short line railroads • May be subject to additional reporting and permitting requirements • Requires 20% non-federal share	• Large individual projects that cannot be funded from state or programmatic federal funding • Projects being delivered by the private sector
Railroad Crossing Elimination (RCE) Grant Program	Federal	• Only public entities are eligible • Specifically focused on improvements to railroad crossings • Discretionary federal funding; may vary by year • Technology solutions are encouraged • Historically has had less funding than CRISI • Requires 20% non-federal share	• Individual projects that did not receive/are not eligible for CRISI funding and are being delivered by the public sector
Section 130	Federal	• Programmatic funding based on a DOT formula • Does not require any match and can fund projects at 100% • Safety projects are likely to be prioritized above blocked crossing projects	• Smaller projects accepted on a rolling basis that do not receive CRISI or RCE funding
Georgia Freight Rail Program	State	• Funded via the Locomotive Fuel Tax • 67% of funding goes to Class 1s, the remainder to shortlines • Public and private entities are eligible to apply; however, the	• Larger projects that require a match for federal funds • Projects being delivered by railroads • Smaller projects on shortlines

Funding Type	Source	Characteristics	Usage
		applicant must have an ownership interest in the rail asset	
Class 1	Private	• Solicited on a project-by-project basis • Only available where the Class 1 has a commercial interest in improving the crossing • May be required by statute	• Crossing closures • Crossings with significant rail infrastructure upgrades • Projects delivered by the railroad • Grade separations that require Class 1 contributions by statute
Local	Local	• Limited by local budget • Only available from large, sophisticated municipalities • Can enhance grant applications • Can support local delivery of projects	• Smaller projects • Projects of any size where delivery is led by the locality
Vendor	Private	• Private technology providers may discount their technology to harvest marketing or data benefits	• Smaller projects that use technology and are delivered by the vendor

Table 18: Funding Approaches

Crossing Portfolio

By normalizing, scoring, and aggregating the priority factors discussed earlier in this report, it is possible to prioritize blocked crossings based on their impact on communities in which they are located. This enables a portfolio-based approach to addressing crossing problems, which has several advantages:

- **Universal:** Consistent criteria can be applied to all crossings, including those not on the long list.
- **Transparent:** The criteria can be easily understood, communicated and modified as required as circumstances evolve.
- **Explanatory:** The ranking reflects the factors that make blocked crossings a problem for communities.
- **Decision-Useful:** The results indicate where investments should be made.
- **Scalable:** The crossings can be aggregated into increasingly large groups, depending on the available funding.
- **Complete:** The crossings each receive an individual score and are assigned a tier in the three-tier system, resulting in a prioritization of all crossings in the long list.

The complete list of all crossings evaluated according to this portfolio approach is available in Appendix D. By consulting the potential solutions, delivery methods, and range of cost estimates provided in the Solutions and Delivery section of this report, the basis of a planning-level cost estimate can be formulated for mitigating any individual crossing or set of crossings. Since there is no comprehensive objective data source documenting railroad crossing blockages in Georgia, data on blockage frequency and duration is limited. Newer data sources like TRAINFO can be utilized as crossing locations are reassessed periodically in future updates to the long list presented in Appendix D.

It is important to note that data inaccuracies, as well as nuances in the weighting, mean that while it is possible to rank all crossings, this should not be treated as deterministic. Certain factors not captured here, such as observed frequency and duration of blocked crossings or whether a single crossing cuts off a community when blocked, are difficult to estimate empirically but provide the basis for a discretionary reprioritization of a crossing. Simultaneously, as data is updated in the future it should be checked for inaccuracies or counterintuitive results. Any crossings with identified data issues should be reprioritized or removed accordingly. The current data includes several such instances, which are described in Appendix D.

With over 226 crossings left after controlling for errors, a specific solution has not been assigned to each. However, to illustrate the potential of the portfolio approach, the crossings have been split into three tiers based on their overall score. Tiers were established at clear break points in the data. The 39 crossings in Tier 1 generated over 50% of all 2024 complaints and represent 77% of crossings identified by Class 1s. The additional 66 crossings in Tier 2 are responsible for over 50% of all other near-term priority factors, including 74% of all 2024 complaints, and represent 100% of crossings identified by Class 1s.

Tier 1

The 39 Tier 1 crossings demonstrate a clear pattern that reflects high-growth areas and key corridors within the state. The top five municipalities represented in Tier 1 were:

City	Number of Crossings in Tier 1	All Other Long List Crossings in City
Savannah	5	4
Garden City	5	1
Waycross	4	21
Fairburn	4	2
Atlanta	3	3

Table 19: Tier 1 Crossings by City

The geographic dispersion of the crossings identified several clear clusters as noted in the figure below:

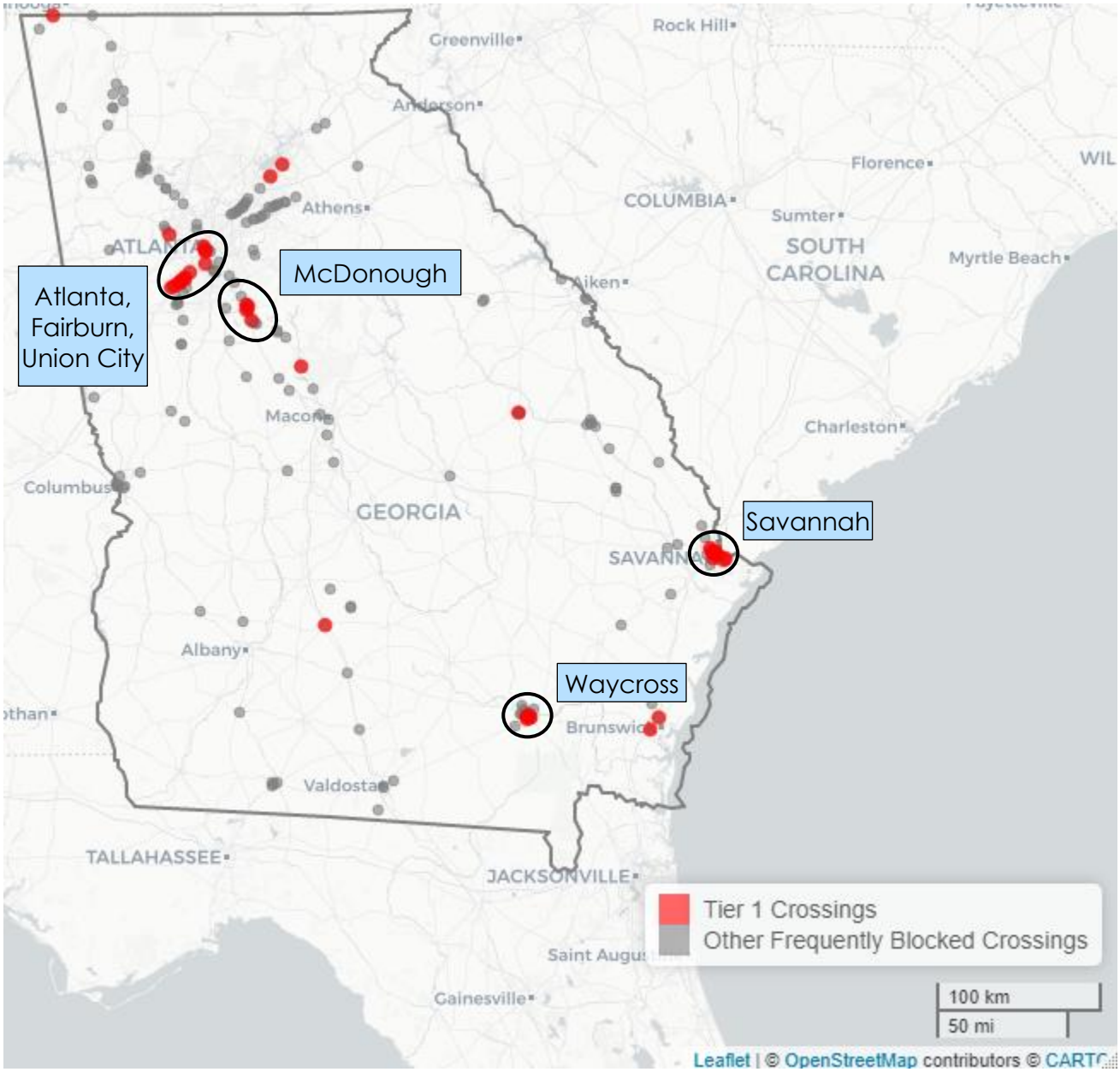


Figure 12: Tier 1 Priority Clusters

Given the clustered nature of many of these crossings, there may be opportunities to pursue comprehensive solutions that tackle multiple crossings with a single set of interventions. As previously discussed, delivering multiple crossings as part of a single project package may allow GDOT to achieve efficiencies of scale. Several methods for clustering crossings include:

Method	Description	Example
Geographic proximity	Clusters are formed by grouping crossings in a small area	Waycross
Rail line proximity	Clusters are formed by grouping crossings on the same rail line	NS SW Corridor
Solution type	Crossings are grouped based on solution type	Deploying sensors and VMS signs at a package of 10 different crossings
Project synergies	Clusters are formed by grouping crossings that are located where existing road or rail improvements may be occurring	Savannah Brampton Road

Table 20: Clustering Strategies

Tier 2

The next 66 crossings exhibit similar patterns to Tier 1. The most frequently represented municipalities were:

City	Number of Crossings in Tier 2	All Other Long List Crossings in City
Waycross	9	16
McDonough	5	3
Valdosta	4	0
Norcross	3	3
Savannah	3	6

Table 21: Tier 2 Crossings by City

The figure below exhibits a similar level of clusters and corridors, in many of the same places:

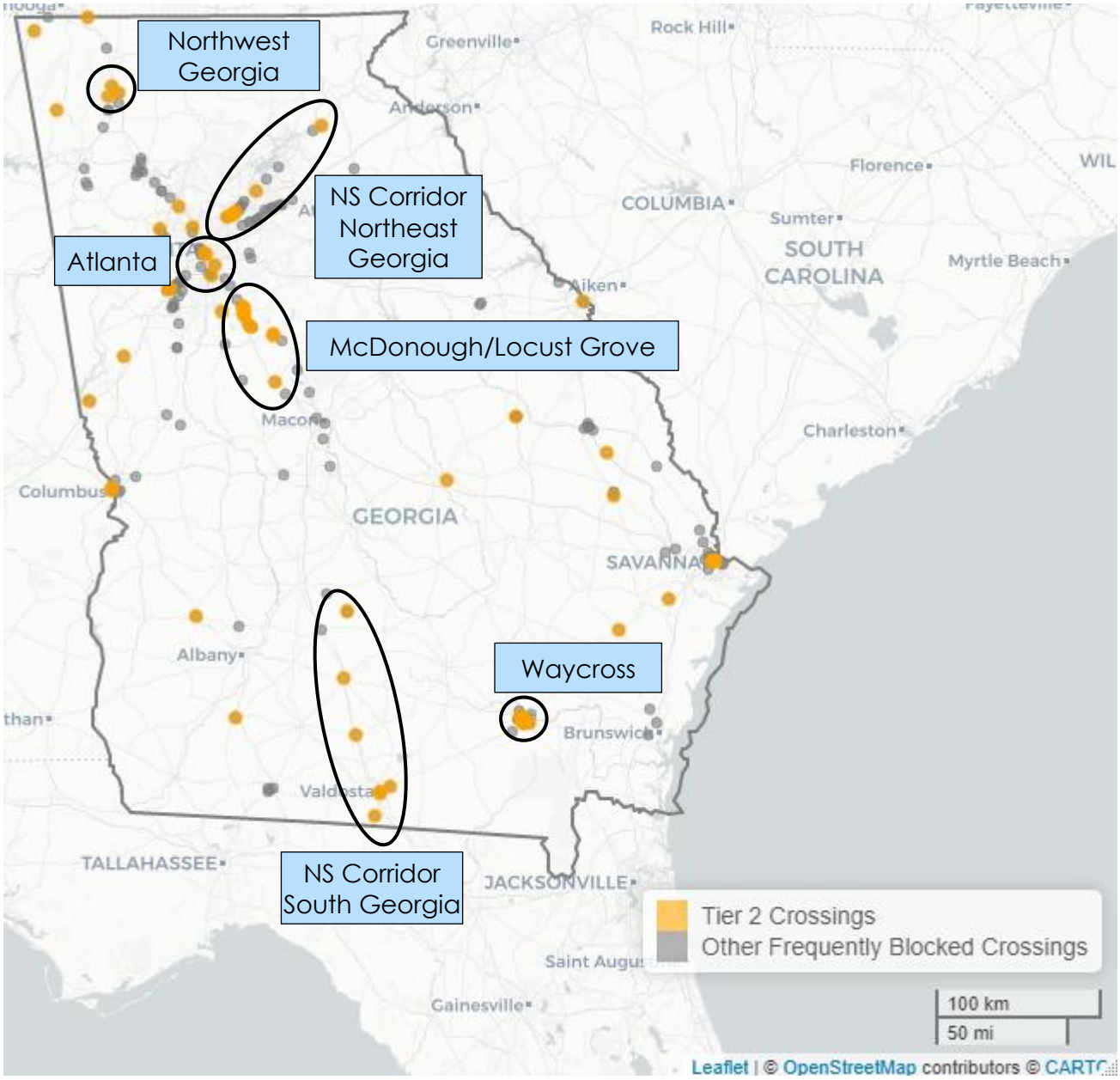


Figure 13: Tier 2 Priority Clusters

Graysville, a crossing frequently identified by stakeholders and survey respondents, is not in Tier 1. This is because it is not located in proximity to first responders, industrial facilities, and other near- and mid-term factors that lead to a high ranking.

Crossings are similarly clustered in Waycross, McDonough, along NS lines in South Georgia and Northeast Georgia, with additional crossings in metro Atlanta and Northwest Georgia. These trends continue to indicate that as GDOT pursues solutions, it can consider approaches that provide holistic solutions for an entire cluster.

NEXT STEPS

This section provides detail on the proposed next steps identified. These steps are grouped into four overarching strategies below:

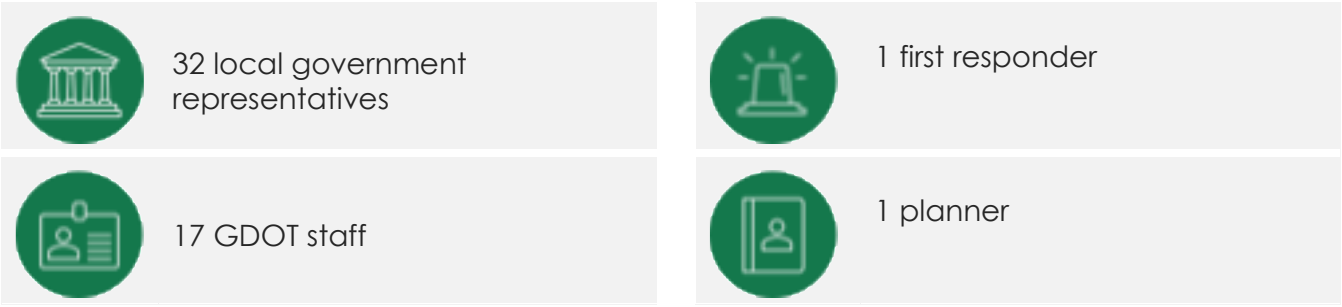
Strategy	Next Steps
Improve knowledge and recording of crossing blockages	• Promote reporting of blockages at regional events • Conduct an annual survey of key stakeholders to identify emerging locations • Explore opportunities to permit QR codes and signage with links to the complaint database in vicinity of crossings in the next MUTCD • Work with the FRA to add location indexing to the complaint form, allowing automatic identification of the crossing ID • Undertake a statewide study to identify where communities are completely cut off by a single crossing • Identify maximum out-of-route distance to the nearest grade separation for all crossings to assist in prioritizing projects
Advance opportunities for technology-driven monitoring	• Develop a formal Request for Information (RFI) for monitoring and technology providers to gauge capability, data gathering, and cost savings of technology-enabled solutions • Subject to RFI feedback, consider a pilot program for monitoring systems at select Tier 1 crossings • Install digital message signs near crossings displaying rerouting information and interface with navigation apps where possible
Promote ongoing collaboration within GDOT and with Class 1 Railroads	• Establish a regular working group meeting between the GDOT Office of Planning, Office of Utilities, and Intermodal Division to align on crossing prioritization and progress • Present crossings portfolio plan to Class 1s and seek feedback • Develop ongoing protocols for periodic updates of the priority list, including discussion with Class 1s regarding identified issues • Solicit capital improvement plans from Class 1s and coordinate to combine crossing improvements with existing projects • Coordinate with road maintenance projects near crossings to foster a dig once mentality
Advance projects in priority locations	• Program recurring annual funds for scoping studies on priority crossings to identify scope, cost, and funding requirements

Strategy	Next Steps
	○ Approximately $1 million per year can fund 3 scoping studies • Leverage report findings and continue analysis of priority clusters to be programmed

APPENDIX A

Survey Data

Surveys were completed by representatives from local governments, GDOT, first responders, and senior planners. The breakdown by respondent type is as follows:



Surveys generated both quantitative and qualitative data. Quantitative data was generated by asking respondents to identify problematic crossings on a map, which was then tagged using GIS analysis to the nearest crossing. By comparing the number and source of the flags at an individual crossing, it is possible to infer which crossings are frequently blocked.

The surveys also generated additional qualitative feedback regarding communities' ability and expertise in solving the problem themselves, as well as data regarding the impacts of blocked crossings. These responses are the primary source of information regarding the complication, namely the impact on communities of the increasing number of blocked crossings as rail and truck traffic increase.

Source Description:

- Local government responses identified 41 validated crossing locations which experience significant block rail crossing challenges.
- GDOT district office input identified 80 distinct crossing with blockage issues.
- Survey responses were mapped to individual crossings in the FRA's Grade Crossing Inventory System using latitude and longitude.

Class 1 Railroad Priority Lists

Representatives of the Class 1 railroads operating in Georgia were asked to provide details of crossings that they believe experience the most acute blockages, and which in their judgement, would generate the greatest benefits to the state if the blockage issue could be mitigated. As such, the Class 1 perspective was explicitly incorporated into crossing evaluations.

Source Description:

- Norfolk Southern: 10 priority crossings identified
- CSX Transportation: 12 priority crossings identified

- Railroad submissions included operational justification for certain crossings

Federal Database Records

The Federal Railroad Administration (FRA) established the Blocked Crossing Incident Reporter portal in December 2019 to collect data on instances where trains obstruct highway-rail grade crossings. This initiative allows the public and law enforcement to report such incidents, providing insights into the frequency, duration, and impact of blocked crossings.

When submitting a report through the portal, users are prompted to provide specific details, including:

- Date and time of the incident
- Location of the blocked crossing
- Duration of the blockage
- Immediate impacts observed (e.g., first responders unable to cross, pedestrians climbing over or through train cars)
- Additional comments or context

Source Description:

- FRA Complaint Database: 168 crossings with documented blockage issues in the state between January 2024 - December 2024
- Complaint categorization included:
  - Emergency vehicle delays
  - Pedestrian safety concerns
  - Commercial traffic impacts
  - Community access issues

While the FRA's database offers valuable insights, several limitations may impact its reliability:

- **Voluntary Reporting:** The system relies on individuals and local authorities to submit reports, which can lead to underreporting, especially in areas with lower public awareness of the portal.
- **Verification Challenges:** The FRA faces difficulties in verifying the accuracy of the reports. Comparisons with Positive Train Control (PTC) data have shown discrepancies, with some reported incidents not matching recorded train movements[32]
- **Limited Railroad Participation:** Railroads are not required to respond to or verify specific incidents reported through the portal. This limits the ability to cross-validate public reports with railroad operational data.
- **Regulatory Constraints:** The FRA does not have regulatory authority to enforce resolutions for blocked crossings. The database serves primarily as an informational tool to highlight issues and facilitate discussions between stakeholders.

[32] For more information, please refer to the Report to Congress on Blocked Crossing Portal

Stakeholder Interviews

Stakeholder interviews were conducted with the following individuals and groups:

Name	Company	Title
Craig Camuso	CSX	Regional Vice President – Public Affairs
Todd Allton	CSX	Public Project Manager - Community Affairs
Will Miller	NS	Corporation, Director of Public Engagement
Jason Mobley	GDOT Office of Utilities	State Railroad Crossing Engineer
Justin Thrift	GDOT Office of Intermodal	Rail Program Manager
Warren Flateau	FRA	Director of Public Affairs
Liz Hudd	FRA	Grade Crossing Manager
Corwyn Foster	FRA	Railroad Safety Inspector
Neil Ternowetsky	TRAINFO	CTO and Co-Founder
Danny Gioia	TRAINFO	Account Manager
Mark Guedri	Onyx	COO
Mike Lusk	Island Radar	Business Development Manager
Jamie Heller	Rail State	CEO and Co-Founder
John Schmitter	Rail State	COO and Co-Founder
Evan Korte	Noema	Account Executive
Bruno Oliveira	Noema	VP of Engineering
Clay Packard	TSC-HMS	Principal Software and Systems Engineer

Table 22: List of Stakeholders

Supplementary Data Sources

Other data sources used include:

- **GDOT Traffic Count Stations**: Data was extracted from GDOT's Traffic Analysis and Data Application (TADA), focusing on annual traffic statistics across the state. This dataset was used to identify crossings with high Average Annual Daily Traffic (AADT), allowing us to prioritize crossings that impact the greatest number of road users.
- **Geographic Information System (GIS) Baseline Data:** GIS data provided the foundational spatial framework for mapping crossings, traffic segments, and surrounding infrastructure. It was critical for conducting spatial analyses, including buffer and intersection analyses, to identify crossings near key infrastructure such as schools, hospitals, and industrial sites. This helped in assessing the broader impact of blocked crossings on critical community assets and/or facilities.
- **Census Information (American Community Survey - ACS, 5-Year Estimates as of 2023):** ACS data was utilized to incorporate socioeconomic factors into the analysis. Specifically, variables such as unemployment rates, median income, and demographic data were used to evaluate the potential social impact of blocked crossings on different communities. This helped ensure that crossings affecting vulnerable populations were adequately represented in the prioritization process.

These datasets were processed and merged, enabling a comprehensive view of the most problematic crossings. Any crossing identified in surveys, Class 1 priority lists, and federal database records, was included in the Long List of crossings available in Appendix D.

APPENDIX B – PRIORITY FACTORS

This appendix includes a detailed description of each of the twelve priority factors used to develop the prioritized list of crossings. It is split into two sections: Sources and Scoring, which describes the different sources and the range of scores each can take, and Data Integration and Normalization, which describes the process of normalizing the scores to ensure that they could be compared and aggregated.

Sources and Scoring

Each priority factor corresponds to a particular data source and scoring method. The table below illustrates these, as well as the range of scores that each factor could take:

Factor	Source Data	Scoring Method	Range of Scores
Class 1 Flag	Stakeholder feedback	Binary score based on whether a Class 1 identified the crossing as being frequently blocked	0 – Not flagged by a Class 1, 100 – Flagged by a Class 1
Travel Time to Nearest Grade Separation	Esri	Travel time in minutes to the nearest grade separated crossing	0 – Lowest travel time to a grade separated crossing; 100 – Highest travel time to a grade separated crossing
Complaints (FRA)	2024 FRA complaint data	Each complaint adds 0.01 points to the score	0 - No complaints, 100 – most complaints
Railyard Proximity	Georgia Freight Plan, OpenStreetMap, GIS Analysis	Binary score based on being within 1-mile buffer of railyard	0 - Not near railyard, 100 - Near railyard
Critical Infrastructure	GIS Analysis	Cumulative score based on proximity to schools, hospitals, fire stations, police stations (within 1 mile of distance). Final discrete values are then normalized	0 - No critical infrastructure nearby, 25 - One type, 50 - Two types, 75 - Three types, 100 - All four types
Current AADT	GDOT Traffic Data. GIS Analysis based on count stations in the state.	Normalized score based on AADT volume relative to other crossings	0 - Lowest AADT, 100 - Highest AADT
Route Prioritization	National Freight Network & State Freight Corridors STRAHNET National Highway System GRIP Corridors (2024)	Tiered scoring based on number of routes the crossing is on	0 - Not on priority route, 25 – one type of route, 50 – two types of route, 75 – three types of route, 100 – four types of route
Industrial Sites	Georgia Freight Plan, OpenStreetMap, GIS Analysis	Binary score based on being within a 3-mile buffer of major industrial sites (as identified in the Georgia Freight Update of 2023)	0 - Not near industrial site, 100 - Near industrial site
Rural Classification	Form 71, FRA	Binary score based on highway classification	0 - Urban, 100 - Rural

Factor	Source Data	Scoring Method	Range of Scores
Port Proximity	Gorgia Freight Plan, OpenStreetMap, GIS Analysis	Binary score based on being within 1-mile buffer of port facility	0 - Not near port, 100 - Near port
2050 AADT	GDOT Traffic Data. GIS Analysis based on count stations in the state.	Normalized score based on AADT volume relative to other crossings	0 - Lowest projected AADT, 100 - Highest projected AADT
Socioeconomic	Census Data	Combined normalized score of median income (inverse) and unemployment rate	0 - Best socioeconomic conditions, 100 - Most challenging socioeconomic conditions

Table 23: List of Priority Factors

Data Integration and Normalization

Each dataset was processed to ensure consistency, with variables normalized on a **0-100 scale using min-max normalization** to allow for direct comparisons between different factors. This ensured that no single factor disproportionately influenced the ranking while maintaining the integrity of the raw data.

Since the priority factors that were used came from diverse data sources and had varying units (e.g., number of complaints, traffic volume, distance to infrastructure, and categorical variables such as "near a railyard" or "near critical infrastructure"), a standardization approach was followed to establish a common scale for fair comparison. To achieve this, a min-max normalization approach was followed, which scales all values to a range between 0 and 100. This method preserves the relative differences between crossings while ensuring that no single metric dominates due to its raw numerical scale. The formula used for normalization is:

$$Normalized\ Value = \left(\frac{X - X_{min}}{X_{max} - X_{min}}\right) * 100$$

where:

- X is the original value for a given factor (e.g., AADT at a crossing).
- X_{min} and X_{max} are the minimum and maximum observed values across all crossings for that factor, respectively.
- The result is a normalized score between 0 and 100.

Example: Normalizing Average Annual Daily Traffic (AADT)

The example below serves as an example to illustrate how normalization works, specifically for the case of AADT (Average Annual Daily Traffic):

Crossing ID	AADT Value
Crossing A	2,500
Crossing B	15,000
Crossing C	50,000

The minimum observed AADT across all crossings is 2,500, and the maximum is 50,000.:

$$Crossing\ A\ norm_{AAD} = \left(\frac{2{,}500 - 2{,}500}{50{,}000 - 2{,}500}\right) * 100 = 0$$

This crossing gets a normalized score of 0, as it has the lowest AADT in the dataset.

$$Crossing\ B\ norm_{AAD} = \left(\frac{15{,}000 - 2{,}500}{50{,}000 - 2{,}500}\right) * 100 = 26.3$$

This crossing gets a normalized score of 26.3.

$$Crossing\ C\ norm_{AAD} = \left(\frac{50{,}000 - 2{,}500}{50{,}000 - 2{,}500}\right) * 100 = 100$$

This crossing gets a normalized score of 100, as it has the highest AADT in the dataset.

After normalization, all crossings now have a comparable score on a scale of 0 to 100, regardless of their original values.

For factors like proximity to critical infrastructure (e.g., whether a crossing is near a hospital, school, or fire station), binary values (0 or 1) were assigned and scaled to 0 or 100 to match the format of the normalized scores.

The min-max normalization method was chosen because it maintains the relative differences between crossings, ensuring that:

A. The most problematic crossings in each factor receive the highest normalized scores.
B. Every metric contributes proportionally to the final ranking, rather than being skewed by large numerical differences in the raw data.
C. Weighting could be applied effectively, as all values were now on a common 0-100 scale.

APPENDIX C – KPI IMPACTS BY SOLUTION

Close Crossing

KPI	Impact	Description
Reliability	Positive	Reduces hours spent in non-recurring traffic resulting from blockages
Speed	Negative	May cause slightly longer routes, increasing door-to-door travel time and lowering average truck speeds
Cost	Negative	May cause slight increases in congestion as traffic increases on alternative routes
Risk	Negative	Creates potential interference in operations by decreasing availability of alternative routes
Safety/Security	Positive	Prevents accidents by avoiding interaction between rail and highway operations, assuming alternative route avoids rail crossings

Establish Agreement

KPI	Impact	Description
Reliability	Neutral	No immediate impact on freight operations
Speed	Neutral	No immediate impact on freight operations
Cost	Neutral	No immediate impact on freight operations
Risk	Positive	Encourages proactive thinking and agreement on alternative routes in case of traffic increases
Safety/Security	Neutral	No immediate impact on safety

Inform Highway Drivers of Blockages

KPI	Impact	Description
Reliability	Positive	Informs drivers of non-recurring traffic, allowing them to seek an alternate route and avoid queuing at the blocked crossing
Speed	Positive	Decrease in average speed due to alternative routes offset by avoidance of extended blockages
Cost	Positive	Minimizes congestion costs by encouraging the use of alternate routes
Risk	Neutral	No impact on availability of alternatives or shift to rail
Safety/Security	Neutral	No immediate impact on safety

Change Road Geometry

KPI	Impact	Description
Reliability	Positive	Increases the number of alternative routes, allowing drivers to avoid non-recurring traffic, or mitigates the impact non-recurring traffic by flushing queues more quickly
Speed	Positive	Increases average speeds by clearing queues more quickly or providing alternatives to blocked routes
Cost	Positive	Minimizes congestion costs by encouraging the use of alternate routes
Risk	Positive	Increases the availability of alternative routes
Safety/Security	Positive	Improves safety if connected to a grade-separated route

Siding Relocation

KPI	Impact	Description
Reliability	Positive	Decreases the number of extended blockages caused by trains parked at crossings on sidings, reducing non-recurring traffic
Speed	Positive	Increases average speeds by eliminating extended blockages
Cost	Positive	Minimizes congestion costs by avoiding extended blockages
Risk	Positive	Improves rail network fluidity/operations and supports a shift to rail
Safety/Security	Positive	Mitigates extended blockages which may otherwise encourage pedestrians to climb across or under trains

Increase Track Speed

KPI	Impact	Description
Reliability	Positive	Decreases the amount of time trains take to pass through the crossing, decreasing non-recurring traffic
Speed	Positive	Increases average speeds by decreasing the length of blockages
Cost	Positive	Minimizes congestion costs by decreasing the length of blockages
Risk	Positive	Improves rail network fluidity/operations and supports a shift to rail
Safety/Security	Negative	Increased train speeds may exacerbate accident severity

Add Staging Capacity

KPI	Impact	Description
Reliability	Positive	Decreases instances of railroads parking or switching trains on crossings, significantly decreasing extended blockages and corresponding non-recurring traffic
Speed	Positive	Increases average speeds by decreasing the frequency of extended blockages
Cost	Positive	Minimizes congestion costs by decreasing the frequency of extended blockages
Risk	Positive	Improves rail network fluidity/operations and supports a shift to rail
Safety/Security	Positive	Mitigates extended blockages which may otherwise encourage pedestrians to climb across or under trains

Incentivize Uncoupling

KPI	Impact	Description
Reliability	Positive	Can be designed to occupy crossings at regular windows, eliminating non-recurring traffic
Speed	Positive	Increases to average truck speed through the elimination of congestion
Cost	Positive	Eliminates significant amounts of crossing congestion, though not all
Risk	Positive	Supports a shift to rail
Safety/Security	Positive	Can reduce crossing incidents

APPENDIX D – LONG LIST

Crossing ID	County	City	Street	Existing Scoping Study	Tier
641185D	Chatham	Garden City	Augusta Road		1
632474F	Chatham	Garden City	Big Hill Road		1
641184W	Chatham	Garden City	Byck Street		1
734161Y	Chatham	Garden City	Main Street		1
635907U	Chatham	Garden City	Telfair Road		1
734168W	Chatham	Savannah	Bay Street		1
641194C	Chatham	Savannah	Bay Street		1
855067U	Chatham	Savannah	Bourne Road		1
641125U	Chatham	Savannah	E Anderson Street		1
641134T	Chatham	Savannah	President Street	Yes	1
719829A	Cobb	Austell	Joe Jenkins Boulevard		1
725692W	Dade	Trenton	Steele Road		1
718079N	Fulton	Atlanta	Allene Avenue/ Lee Street	Yes	1
638642E	Fulton	Atlanta	Chappell Road NW		1
718082W	Fulton	Atlanta	Sylvan Road		1
050383R	Fulton	Fairburn	Broad Street		1
050394D	Fulton	Fairburn	Peters Street		1
050391H	Fulton	Fairburn	Roberts Street		1
050389G	Fulton	Fairburn	Senoia Road		1
718001U	Fulton	Hapeville	Virginia Avenue		1
050397Y	Fulton	Palmetto	Tatum Road		1
050370P	Fulton	Union City	Feldwood Road	Yes	1
639518C	Fulton	Union City	Flat Shoals Road		1
050377M	Fulton	Union City	Watson Street	Yes	1
903695H	Glynn	Brunswick	Andy Tostensen Road		1
729234W	Glynn	Brunswick	Community Road		1
717820G	Gwinnett	Buford	Near Selma Street		1
717811H	Hall	Flowery Branch	Spring Street		1
718421Y	Henry	Locust Grove	Brown Avenue		1
718409S	Henry	McDonough	Hampton Street/ SR 81	Yes	1
904897J	Henry	McDonough	Kings Mill Road/ Midland Industrial	Yes	1
718412A	Henry	McDonough	Racetrack Road	Yes	1
732763H	Jefferson	Wadley	Main Street		1
718474X	Monroe	Forsyth	Juliette Road	Yes	1
723622A	Turner	Ashburn	Washington Avenue		1
637722U	Ware	Waycross	City Boulevard	Yes	1
637721M	Ware	Waycross	Harrison Street	Yes	1
637248Y	Ware	Waycross	Knight Avenue	Yes	1
637584H	Ware	Waycross	Sweat Street	Yes	1

Crossing ID	County	City	Street	Existing Scoping Study	Tier
717648N	Banks	Lula	Barefoot Road		2
620182A	Bulloch	Statesboro	S Main Street		2
718450J	Butts	Jackson	3rd Street		2
718448H	Butts	Jackson	Covington Street		2
726632R	Carroll	Temple	James Street		2
340584H	Catoosa	Graysville	Graysville Road	Yes	2
901221R	Chatham	Garden City	Chatham Parkway		2
641189F	Chatham	Savannah	Gwinnett Street		2
641191G	Chatham	Savannah	Louisville Road		2
641179A	Chatham	Savannah	Telfair Road		2
719539S	Chattooga	Summerville	Commerce Street		2
717971W	Clayton	Forest Park	Phillips Drive		2
340396T	Cobb	Elizabeth	Marble Mill Road		2
719824R	Cobb	Powder Springs	Brownsville Road		2
340370R	Cobb	Vinings	Paces Ferry Road SE		2
723588V	Cook	Adel	4th Street		2
725773W	Dade	Trenton	Harris Street		2
718386M	DeKalb	Conley	Henrico Road		2
718062K	Fulton	Atlanta	Hank Aaron Drive		2
718058V	Fulton	Atlanta	McDaniel Street		2
901264J	Fulton	Fairburn	McLarin Road		2
901265R	Fulton	Fairburn	McLarin Road		2
340521D	Gordon	Resaca	Nicklesville Road		2
719727G	Gordon	Sugar Valley	Midway Road		2
719733K	Gordon	Sugar Valley	SR 143		2
717880R	Gwinnett	Doraville	Amwiler Road		2
717853U	Gwinnett	Norcross	Holcomb Bridge Road		2
717851F	Gwinnett	Norcross	Langford Drive		2
717857W	Gwinnett	Norcross	Stevens Road		2
717832B	Gwinnett	Suwanee	Suwanee Dam Road		2
718157T	Henry	Hampton	SR 81		2
718427P	Henry	Locust Grove	Grove Drive		2
718426H	Henry	Locust Grove	N Jackson Street		2
718411T	Henry	McDonough	Griffin Road		2
718408K	Henry	McDonough	Jonesboro Street	Yes	2
928874V	Henry	McDonough	Kings Mill Road		2
718415V	Henry	McDonough	Kings Mill Road	Yes	2
947299P	Henry	McDonough	Private		2
960404U	Jefferson	Wadley	Main Street		2
641038R	Laurens	East Dublin	SR 199		2
637340Y	Liberty	Fleming	Mt Olivet Church Road		2

Crossing ID	County	City	Street	Existing Scoping Study	Tier
637353A	Long	Ludowici	McDonald Street		2
723545C	Lowndes	Valdosta	Lee Street		2
866806V	Lowndes	Valdosta	Madison Highway		2
713649G	Lowndes	Valdosta	Madison Highway		2
637462D	Lowndes	Valdosta	Morrison Road		2
637109D	Mitchell	Camilla	Broad Street		2
718326D	Monroe	Forsyth	Mize Street		2
718982M	Muscogee	Columbus	3rd Avenue		2
718966D	Muscogee	Columbus	Veterans Parkway		2
633718R	Richmond	Augusta	Greene Street/ Private Road		2
620250Y	Screven	Rocky Ford	Rockford Road		2
733873W	Terrell	Dawson	M.L. King Jr Drive		2
723668N	Tift	Tifton	5th Street/ Highway 82		2
050468T	Troup	Hogansville	Johnson Street		2
050504L	Troup	West Point	Gabbettville Road		2
638296S	Turner	Rebecca	Franklin Street		2
636830M	Ware	Waycross	Albany Avenue	Yes	2
637582U	Ware	Waycross	Brunel Street		2
637707S	Ware	Waycross	Carswell Avenue	Yes	2
637724H	Ware	Waycross	Cross Over	Yes	2
637249F	Ware	Waycross	Dewey Street	Yes	2
637622P	Ware	Waycross	Dresden Street		2
637615E	Ware	Waycross	E Waring Street	Yes	2
637246K	Ware	Waycross	Gilmore Street	Yes	2
637702H	Ware	Waycross	Nicholls Street	Yes	2
640141A	Barrow	Auburn	Etheridge Road		3
340426H	Bartow	Acworth	Old Allatoona Road		3
340445M	Bartow	Cartersville	Carter Street		3
340441K	Bartow	Cartersville	East Main Street		3
639332N	Bartow	Cartersville	Euharlee Road		3
340363F	Bartow	Cartersville	Mission Road		3
340732A	Bartow	Cartersville	Peeples Valley Road		3
936007K	Bartow	Cartersville	Peeples Valley Road		3
340455T	Bartow	Cartersville	Sugar Valley Road		3
732340H	Bibb	Macon	7th Street		3
729386T	Bibb	Macon	Allen Road		3
718363F	Bibb	Macon	Brookdale Avenue		3
635927F	Bryan	Ellabell	Bill Futch Road		3
620164C	Bulloch	Statesboro	E Parrish Street		3
620165J	Bulloch	Statesboro	Northside Drive		3
718458N	Butts	Flovilla	Higgins Road		3

Crossing ID	County	City	Street	Existing Scoping Study	Tier
635910C	Chatham	Pooler	Old Dean Forest Road		3
635119C	Chatham	Port Wentworth	Meinhard Road		3
641163D	Chatham	Savannah	Buckhalter Road		3
717972D	Clayton	Forest Park	Ash Street		3
717973K	Clayton	Forest Park	Lake Drive		3
717974S	Clayton	Forest Park	West Street		3
718394E	Clayton	Rex	Mill Walk		3
351830W	Cobb	Acworth	Lemon Street		3
340417J	Cobb	Acworth	Smith Street		3
340408K	Cobb	Kennesaw	Cherokee Street		3
719827L	Cobb	Powder Springs	Oglesby Road		3
340367H	Cobb	Smyrna	Woodland Brook Drive		3
633759V	Columbia	Evans	Hardy McManus Road		3
639453L	Coweta	Haralson	Depot Street		3
639451X	Coweta	Haralson	Line Creek Road		3
638301L	Crisp	Rebecca	Williford Crossing Road		3
279683S	DeKalb	Lithonia	Cagle Street		3
279699N	DeKalb	Lithonia	Chapman Road		3
635923D	Effingham	Meldrim	Old River Road		3
635121D	Effingham	Rincon	Goshen Road		3
639467U	Fayette	Peachtree City	Dividend Drive		3
639482W	Fayette	Peachtree City	Rockwood Road		3
639491V	Fayette	Tyrone	East Crestwood Road		3
639498T	Fayette	Tyrone	Sandy Creek Road		3
639489U	Fayette	Tyrone	Senoia Road		3
639492C	Fayette	Tyrone	Valleywood Road		3
719772B	Floyd	Aragon	Byrd Station Road		3
719770M	Floyd	Lindale	Brice Station Road		3
719128L	Floyd	Lindale	Reeceburg Road		3
719751H	Floyd	Plainville	Legg Road		3
638643L	Fulton	Atlanta	Joseph Boone Boulevard		3
639503M	Fulton	Union City	Spence Road		3
729224R	Glynn	Brunswick	Green Swamp Road		3
340514T	Gordon	Calhoun	Henderson Bend Road		3
719742J	Gordon	Sugar Valley	Oostanaula Bend		3
719739B	Gordon	Sugar Valley	Roland Hayes Parkway		3
717849E	Gwinnett	Berkeley Lake	Berkley Lake Road		3
640147R	Gwinnett	Dacula	Broad Street		3
640149E	Gwinnett	Dacula	Circle Road		3
717843N	Gwinnett	Duluth	Parsons Road		3
717840T	Gwinnett	Duluth	W Lawrenceville Street		3

Crossing ID	County	City	Street	Existing Scoping Study	Tier
639788B	Gwinnett	Lawrenceville	Arnold Road		3
639779C	Gwinnett	Lawrenceville	Cedars Road		3
639780W	Gwinnett	Lawrenceville	Hosea Road		3
936045U	Gwinnett	Lawrenceville	Hurricane Shoals		3
639783S	Gwinnett	Lawrenceville	Maltbie Street		3
639786M	Gwinnett	Lawrenceville	Patterson Road		3
639746P	Gwinnett	Lawrenceville	Seaboard Industrial Drive		3
639791J	Gwinnett	Lilburn	Arcado Road		3
639790C	Gwinnett	Lilburn	Lester Road		3
639789H	Gwinnett	Lilburn	Oak Road/ Gloster Road		3
639794E	Gwinnett	Lilburn	Rockbridge Road		3
717845C	Gwinnett	Norcross	Buford Highway		3
916933L	Gwinnett	Norcross	Jones Mill Road		3
717848X	Gwinnett	Norcross	Peachtree Road		3
717780L	Hall	Lula	Cagle Road		3
718405P	Henry	Flippen	Jodeco Road		3
718428W	Henry	Locust Grove	CR 340/ S Jackson Street		3
718425B	Henry	Locust Grove	Peeksville Road		3
718397A	Henry	Stockbridge	Valley Hill Road		3
729207A	Houston	Warner Robins	Booth Road		3
904647W	Jackson	Commerce	Bypass US 441/ SR 15		3
732764P	Jefferson	Wadley	Martin Luther King Drive		3
732996E	Jenkins	Millen	Old Eighty Road		3
620260E	Jenkins	Millen	Pine Street		3
620266V	Jenkins	Millen	S Gray Street		3
620268J	Jenkins	Millen	W Winthrope Avenue		3
620269R	Jenkins	Millen	Winthrope Avenue		3
718241B	Lamar	Barnesville	Elm Street		3
733560G	Lee	Leesburg	Fourth Avenue		3
638670H	Meriwether	Manchester	Judson Bulloch Road		3
718486S	Monroe	Bolingbroke	Popes Ferry Lane		3
718344B	Monroe	Smarr	Gose Road		3
718902S	Muscogee	Columbus	10th Avenue		3
718898E	Muscogee	Columbus	10th Street		3
719058Y	Muscogee	Columbus	54th Street		3
718920P	Muscogee	Columbus	Andrews Road		3
718919V	Muscogee	Columbus	Shep Street		3
733980L	Muscogee	Columbus	Tech Parkway		3
734052V	Peach	Fort Valley	Green Street		3
637253V	Pierce	Waycross	Oak Ridge Circle		3
956411X	Richmond	Augusta	Doug Barnard Parkway		3

Crossing ID	County	City	Street	Existing Scoping Study	Tier
864844X	Richmond	Augusta	Fenwick Street		3
620076S	Screven	Newington	Main Street		3
718195C	Spalding	Griffin	Hill Street		3
638449T	Talbot	Woodland	Pleasant Valley Road		3
637488F	Thomas	Thomasville	Ben Grace Drive		3
637033A	Thomas	Thomasville	Oak Street		3
636978U	Thomas	Thomasville	West Jackson Street		3
643088B	Thomas	Thomasville	West Jackson Street		3
638295K	Turner	Rebecca	Ashley Street		3
638156P	Ware	Waycross	Atwater Road		3
637435G	Ware	Waycross	Augusta Avenue		3
637619G	Ware	Waycross	Blackshear Avenue E		3
637716R	Ware	Waycross	Garlington Avenue		3
637433T	Ware	Waycross	Garlington Avenue		3
637624D	Ware	Waycross	Genoa Street		3
637388B	Ware	Waycross	Jenkins Street		3
637436N	Ware	Waycross	McKinley Road		3
637251G	Ware	Waycross	Morningside Drive		3
918076V	Ware	Waycross	Needham Road		3
638154B	Ware	Waycross	Wacona Drive E		3
279517A	Warren	Camak	Highway 80		3
279521P	Warren	Camak	Railroad Street		3
340559A	Whitfield	Tunnel Hill	Beaver Road		3

Crossing locations are organized alphabetically within each tier

Long List Crossings Not Considered

The list below includes crossings that were removed from the long list for a variety of reasons, including: inaccurate data, an existing project at the crossing, or very low rail traffic including spurs and side tracks. In most instances, multiple factors resulted in the removal of a crossing (the exception being those with existing grade separations, which are assumed to be solved once grade separated). Should more accurate data become available or additional stakeholder feedback specifically reference these crossings, they may merit additional attention.

Crossing ID	County	City	Street	Complaints	Reason Excluded
935039M	Gwinnett	Norcross	Nancy Hanks Drive	0	Minor industrial branch
717874M	Gwinnett	Norcross	Button Gwinnett Drive	1	Minor industrial branch
935041N	Gwinnett	Norcross	Best Friend Road	0	Minor industrial branch
632470D	Chatham	Savannah	Sav Water Supply	0	Single small industry
340320M	Fulton	Atlanta	Baker Street	1	Convention center entrance
340319T	Fulton	Atlanta	Park Avenue West	1	Convention center entrance
718092C	Fulton	Atlanta	Murphy Avenue	1	Inactive crossing
734163M	Chatham	Garden City	Brampton Road	0	Grade separation underway
637621H	Ware	Waycross	Ossie Davis Parkway	10	Grade separation underway
641182H	Chatham	Savannah	Telfair Road	2	Minor industrial spur